## 6.6 Measurement procedures

## 6.6.1 Intra-frequency measurements

## 6.6.1.0 Minimum conformance requirements

6.6.1.0.1 Minimum conformance requirements for event-triggered measurement without gap

[TS 38.133, clause 9.2.5.1 and 9.2.5.2]

The UE shall be able to identify a new detectable intra frequency cell within T<sub>identify\_intra\_without\_index</sub> if UE is not indicated to report SSB based RRM measurement result with the associated SSB index(*reportQuantityRsIndexes* or *maxNrofRsIndexesToReport* is not configured), or the UE is indicated that the neighbour cell is synchronous with the serving cell (*deriveSSB-IndexFromCell* is enabled). The UE shall be able to identify a new detectable intra frequency SS block of an already detected cell within T<sub>identify\_intra\_without\_index</sub>. It is assumed that *deriveSSB-IndexFromCell* is always enabled for FR1 TDD and FR2.

 $T_{identify\_intra\_without\_index} = (T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}) ms$ 

#### Where:

T<sub>PSS/SSS</sub> <sub>sync</sub> <sub>intra</sub>: it is the time period used in PSS/SSS detection given in table 6.6.1.0.1-1.

T <sub>SSB\_measurement\_period\_intra</sub>: equal to a measurement period of SSB based measurement given in table 6.6.1.0.1-2.

CSSF<sub>intra</sub>: it is a carrier specific scaling factor and is determined according to CSSF<sub>outside\_gap,i</sub> in TS 38.133 [6] clause 9.1.5.1 for measurement conducted outside measurement gaps.

When intra-frequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs, Kp=1.

When intrafrequency SMTC is partially overlapping with measurement gaps, Kp = 1/(1 - (SMTC period / MGRP)), where SMTC period < MGRP

Table 6.6.1.0.1-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	TPSS/SSS_sync_intra
No DRX	max( 600ms, ceil( 5 x K <sub>p</sub> ) x SMTC period ) <sup>Note 1</sup> x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max( 600ms, ceil(1.5x 5 x K <sub>p</sub> ) x max(SMTC period,
·	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle>320ms	ceil([5] x Kp) x DRX cycle x CSSFintra
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

Table 6.6.1.0.1-2: Measurement period for intra-frequency measurements without gaps (Frequency Range FR1)

DRX cycle	T ssb_measurement_period_intra
No DRX	max( 200ms, ceil( 5 x K <sub>p</sub> ) x SMTC period ) <sup>Note 1</sup> x
	CSSFintra
DRX cycle≤ 320ms	max( 200ms, ceil(1.5x 5 x K <sub>p</sub> ) x max(SMTC period,
·	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle > 320ms	ceil( 5 x K <sub>p</sub> ) x DRX cycle x CSSF <sub>intra</sub>
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	·

[TS 38.133, clause 9.2.4.3]

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in TS 38.133 [6] clause 10.1.2.1, 10.1.7.1 and 10.1.12.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times TTI_{DCCH}$ . This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T identify intra without index defined in TS 38.133 [6] clause 9.2.5.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period than  $T_{identify\ intra\ without\ index}$  defined in TS 38.133 [6] clause 9.2.5.1 becomes undetectable for a period and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than  $T_{measurement,\ Intra}$  provided the timing to that cell has not changed more than  $\pm$  3200 Tc while the measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used, an additional delay can be expected.

[TS 38.133, clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] sections 10.1.12 are fulfilled for a corresponding Band,
- SSB\_RP and SSB Es/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

References: The conformance requirements covered in the current TC are specified in: TS 38.133 [6], clauses 9.2.2, 9.2.4.3, 9.2.5.1 and 9.2.5.2.

### 6.6.1.0.2 Minimum conformance requirements for event-triggered measurement with gap

[TS 38.133 [6], clause 9.2.6.2, 9.2.6.3]

The UE shall be able to identify a new detectable intra frequency cell within T<sub>identify\_intra\_without\_index</sub> if UE is not indicated to report SSB based RRM measurement result with the associated SSB index (*reportQuantityRsIndexes* or *maxNrofRSIndexesToReport* is not configured), or the UE is indicated that the neighbour cell is synchronous with the serving cell (*deriveSSB-IndexFromCell* is enabled). It is assumed that *deriveSSB-IndexFromCell* is always enabled for FR1 TDD and FR2.

$$T_{identify\_intra\_without\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra} \quad ms$$

Where:

 $T_{PSS/SSS\_sync\_intra}$ : it is the time period used in PSS/SSS detection given in table 6.6.1.0.2-1.

T<sub>SSB</sub> measurement period intra: equal to a measurement period of SSB based measurement given in table 6.6.1.0.2-2.

 $CSSF_{intra}$ : it is a carrier specific scaling factor and is determined according to  $CSSF_{within\_gap,i}$  in TS 38.133 [6] section 9.1.5.2.2 for measurement within outside measurement gaps.

Table 6.6.1.0.2-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	T <sub>PSS</sub> /SSS_sync_intra
No DRX	max( 600ms, 5 x max(MGRP, SMTC period)) x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max( 600ms, ceil(1.5x 5) x max(MGRP, SMTC period,
	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle > 320ms	5 x max(MGRP, DRX cycle) x CSSF <sub>intra</sub>

Table 6.6.1.0.2-2: Measurement period for intra-frequency measurements with gaps (Frequency Range FR1)

DRX cycle	T SSB_measurement_period_intra
No DRX	max( 200ms, 5 x max(MGRP, SMTC period)) x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max( 200ms, ceil(1.5x 5) x max(MGRP, SMTC period,
•	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle>320ms	5 x max(MGRP, DRX cycle) x CSSF <sub>intra</sub>

[TS 38.133 [6], clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] Sections 10.1.12 are fulfilled for a corresponding Band,
- SSB\_RP and SSB £s/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

[TS 38.133 [6], clause 9.2.4.2]

The RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.2.1.1 and 10.1.2.1.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.7.1.1, and the SINR measurement accuracy for all measured cells shall be as specified in the TS 38.133 [6] clause 10.1.12.1.1.

Reported RSRP, RSRQ and SINR measurements contained in event triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.1.2.1.1, 10.1.2.1.2, 10.1.7.1.1 and 10.1.12.1.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times \text{TTI}_{DCCH}$ . This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T<sub>identify\_intra\_without\_index</sub> defined in TS 38.133 [6] section 9.2.6.2. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 38.133 [6] clauses 9.2.2, 9.2.4.2, 9.2.6.2 and 9.2.6.3.

## 6.6.1.0.3 Minimum conformance requirements for event-triggered measurement without gap with SSB index reading

[TS 38.133 [6], clause 9.2.5.1, 9.2.5.2]

UE shall be able to identify a new detectable intra frequency cell within Tidentify intra with index.

 $T_{identify\_intra\_with\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra} + T_{SSB\_time\_index\_intra} \ ms$ 

### Where:

T<sub>PSS/SSS</sub> <sub>sync intra</sub>: it is the time period used in PSS/SSS detection given in table 6.6.1.0.3-1.

T<sub>SSB time index intra</sub>: it is the time period used to acquire the index of the SSB being measured given in table 6.6.1.0.3-2.

T<sub>SSB\_measurement\_period\_intra</sub>: equal to a measurement period of SSB based measurement given in table 6.6.1.0.3-3.

CSSF<sub>intra</sub>: it is a carrier specific scaling factor and is determined according to CSSF<sub>outside\_gap,i</sub> in TS 38.133 [6] section 9.1.5.1 for measurement conducted outside measurement gaps

When intrafrequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs,  $K_p=1$ 

When intrafrequency SMTC is partially overlapping with measurement gaps,  $K_p = 1/(1 - (SMTC \ period \ / MGRP))$ , where SMTC period < MGRP

Table 6.6.1.0.3-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	T <sub>PSS/SSS_sync_intra</sub>
No DRX	max( 600ms, ceil( 5 x K <sub>p</sub> ) x SMTC period ) <sup>Note 1</sup> x
	CSSF <sub>intra</sub>
DRX cycle ≤ 320ms	max( 600ms, ceil(1.5x 5 x K <sub>p</sub> ) x max(SMTC period,
	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle > 320ms	ceil(5 x K <sub>p</sub> ) x DRX cycle x CSSF <sub>intra</sub>
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	d ·

Table 6.6.1.0.3-2: Time period for time index detection (Frequency range FR1)

DRX cycle	Tssb_time_index_intra
No DRX	max(120ms, ceil( 3 x K <sub>p</sub> ) x SMTC period) <sup>Note 1</sup> x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max(120ms, ceil (1.5 x 3 x K <sub>p</sub> ) x max(SMTC period,
	DRX cycle)] x CSSF <sub>intra</sub>
DRX cycle>320ms	Ceil(3 x K <sub>p</sub> ) x DRX cycle x CSSF <sub>intra</sub>
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

Table 6.6.1.0.3-3: Measurement period for intra-frequency measurements with gaps (Frequency Range FR1)

DRX cycle	T SSB_measurement_period_intra
No DRX	max( 200ms, ceil( 5 x K <sub>p</sub> ) x SMTC period ) <sup>Note 1</sup> x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max( 200ms, ceil(1.5x 5 x K <sub>p</sub> ) x max(SMTC period,
·	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle>320ms	ceil( 5 x K <sub>p</sub> ) x DRX cycle x CSSF <sub>intra</sub>
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	

[TS 38.133 [6], clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] Sections 10.1.12 are fulfilled for a corresponding Band,
- SSB\_RP and SSB Ês/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

[TS 38.133 [6], clause 9.2.4.2]

The RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.2.1.1 and 10.1.2.1.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses

10.1.7.1.1, and the SINR measurement accuracy for all measured cells shall be as specified in the TS 38.133 [6] clause 10.1.12.1.1.

Reported RSRP, RSRQ and SINR measurements contained in event triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.1.2.1.1, 10.1.2.1.2, 10.1.7.1.1 and 10.1.12.1.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times \text{TTI}_{DCCH}$ . This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than  $T_{identify\_intra\_with\_index}$  defined in TS 38.133 [6] section 9.2.5.1. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 38.133 [6] clauses 9.2.2, 9.2.4.2, 9.2.5.1 and 9.2.5.2.

## 6.6.1.0.4 Minimum conformance requirements for event-triggered measurement with gap with SSB index reading

[TS 38.133 [6], clause 9.2.6.2, 9.2.6.3]

UE shall be able to identify a new detectable intra frequency cell within  $T_{identify\_intra\_with\_index}$ .

 $T_{identify\_intra\_with\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra} + T_{SSB\_time\_index\_intra} \ ms$ 

### Where:

T<sub>PSS/SSS\_sync\_intra</sub>: it is the time period used in PSS/SSS detection given in table 6.6.1.0.4-1.

 $T_{SSB\_time\_index\_intra}$ : it is the time period used to acquire the index of the SSB being measured given in table 6.6.1.0.4-2.

 $T_{SSB\_measurement\_period\_intra}$ : equal to a measurement period of SSB based measurement given in table 6.6.1.0.4-3.

 $CSSF_{intra}$ : it is a carrier specific scaling factor and is determined according to  $CSSF_{within\_gap,\,i}$  in TS 38.133 section 9.1.5.2.2 for measurement conducted within measurement gaps.

When intrafrequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs,  $K_n=1$ 

When intrafrequency SMTC is partially overlapping with measurement gaps,  $K_p = 1/(1 - (SMTC period / MGRP))$ , where SMTC period < MGRP.

Table 6.6.1.0.4-1: Time period for PSS/SSS detection (Frequency range FR1)

DRX cycle	Tpss/sss_sync_intra
No DRX	max( 600ms, 5 x max(MGRP, SMTC period)) x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max( 600ms, ceil(1.5x 5) x max(MGRP, SMTC period,
_	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle>320ms	[5] x max(MGRP, DRX cycle) x CSSF <sub>intra</sub>

Table 6.6.1.0.4-2: Time period for time index detection (Frequency range FR1)

DRX cycle	T <sub>SSB_time_index_intra</sub>
No DRX	max(120ms, ceil( 3 x K <sub>p</sub> ) x SMTC period) <sup>Note 1</sup> x
	CSSFintra
DRX cycle≤ 320ms	max(120ms, ceil (1.5 x 3 x K <sub>p</sub> ) x max(SMTC period,
-	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle>320ms	ceil(3 x K <sub>p</sub> ) x DRX cycle x CSSF <sub>intra</sub>
NOTE 1: If different SMTC periodicities are configured	for different cells, the SMTC period in the requirement is
the one used by the cell being identified	

Table 6.6.1.0.4-3: Measurement period for intra-frequency measurements with gaps (Frequency Range FR1)

DRX cycle	T <sub>SSB_measurement_period_intra</sub>
No DRX	max( 200ms, 5 x max(MGRP, SMTC period)) x
	CSSF <sub>intra</sub>
DRX cycle≤ 320ms	max( 200ms, ceil(1.5x 5) x max(MGRP, SMTC period,
	DRX cycle)) x CSSF <sub>intra</sub>
DRX cycle>320ms	5 x max(MGRP, DRX cycle) x CSSF <sub>intra</sub>

[TS 38.133 [6], clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] sections 10.1.12 are fulfilled for a corresponding Band,
- SSB\_RP and SSB £s/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

[TS 38.133 [6], clause 9.2.4.2]

The RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.2.1.1 and 10.1.2.1.2, the RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] clauses 10.1.7.1.1, and the SINR measurement accuracy for all measured cells shall be as specified in the TS 38.133 [6] clause 10.1.12.1.1.

Reported RSRP, RSRQ and SINR measurements contained in event triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.1.2.1.1, 10.1.2.1.2, 10.1.7.1.1 and 10.1.12.1.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times \text{TTI}_{DCCH}$ . This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than Tidentify\_intra\_with\_index defined in TS 38.133 [6] section 9.2.6.2. When L3 filtering is used an additional delay can be expected.

The normative reference for this requirement is TS 38.133 [6] clauses 9.2.2, 9.2.4.2, 9.2.6.2 and 9.2.6.3.

6.6.1.0.5 Minimum conformance requirements for event-triggered measurement without gap for UE configured with highSpeedMeasFlag-r16

[TS 38.133, clause 9.2.5.1 and 9.2.5.2]

The UE shall be able to identify a new detectable intra frequency cell within Tidentify\_intra\_without\_index if UE is not indicated to report SSB based RRM measurement result with the associated SSB index(reportQuantityRsIndexes or maxNrofRSIndexesToReport is not configured), or the UE is indicated that the neighbour cell is synchronous with the serving cell (deriveSSB-IndexFromCell is enabled). The UE shall be able to identify a new detectable intra frequency SS block of an already detected cell within Tidentify\_intra\_without\_index. It is assumed that deriveSSB-IndexFromCell is always enabled for FR1 TDD and FR2.

 $T_{identify\_intra\_without\_index} = (T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}) \ ms$ 

#### Where:

T<sub>PSS/SSS</sub> <sub>sync intra</sub>: it is the time period used in PSS/SSS detection given in table 6.6.1.0.1-1.

T SSB\_measurement\_period\_intra: it is specified in Table 6.6.1.0.5-1 when highSpeedMeasFlag-r16 is configured,

CSSF<sub>intra</sub>: it is a carrier specific scaling factor and is determined according to CSSF<sub>outside\_gap,i</sub> in TS 38.133 [6] clause 9.1.5.1 for measurement conducted outside measurement gaps.

When intra-frequency SMTC is fully non overlapping with measurement gaps or intrafrequency SMTC is fully overlapping with MGs, Kp=1.

When intrafrequency SMTC is partially overlapping with measurement gaps, Kp = 1/(1 - (SMTC period / MGRP)), where SMTC period < MGRP

Table 6.6.1.0.5-1: T<sub>SSB\_measurement\_period\_intra</sub> When *highSpeedMeasFlag-r16* is configured (Frequency range FR1

DRX cycle	T SSB_measurement_period_intra
No DRX Note 2	max(200ms, ceil( 5 x K <sub>p</sub> ) x SMTC period) <sup>Note 1</sup> x
	CSSF <sub>intra</sub>
DRX cycle≤ 160ms	max(200ms, ceil(5 x M2 Note 2 x Kp) x max(SMTC
	period,DRX cycle)) x CSSF <sub>intra</sub>
160ms < DRX cycle≤ 320ms	ceil(4 x M2 Note 2 x Kp) x max(SMTC period,DRX cycle)
DRX cycle>320ms ceil( Y Note 3 x K <sub>p</sub> ) x DRX cycle x CSSF <sub>intra</sub>	
NOTE 1: If different SMTC periodicities are configured for different cells, the SMTC period in the requirement is	
the one used by the cell being identified	
NOTE 2: M2 = 1.5 if SMTC periodicity > 40 ms, otherwise M2=1	
NOTE 3: Y=3 when SMTC <= 40ms, Y=5 when SMTC > 40ms	

[TS 38.133, clause 9.2.4.3]

Reported RSRP, RSRQ, and RS-SINR measurements contained in periodically triggered measurement reports shall meet the requirements in TS 38.133 [6] clause 10.1.2.1, 10.1.7.1 and 10.1.12.1, respectively.

The UE shall not send any event triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times TTI_{DCCH}$ . This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T  $_{identify\ intra\ without\ index}$  defined in TS 38.133 [6] clause 9.2.5.1. When L3 filtering is used an additional delay can be expected.

If a cell which has been detectable at least for the time period than  $T_{identify\ intra\ without\ index}$  defined in TS 38.133 [6] clause 9.2.5.1 becomes undetectable for a period and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than  $T_{measurement,\ Intra}$  provided the timing to that cell has not changed more than  $\pm$  3200 Tc while the measurement gap has not been available and the L3 filter has not been used. When L3 filtering is used, an additional delay can be expected.

[TS 38.133, clause 9.2.2]

The requirements given above apply, provided:

- The cell being identified or measured is detectable.

An intra-frequency cell shall be considered detectable when for each relevant SSB:

- SS-RSRP related side conditions given in TS 38.133 [6] sections 10.1.2 are fulfilled for a corresponding Band,
- SS-RSRQ related side conditions given in TS 38.133 [6] sections 10.1.7 are fulfilled for a corresponding Band,
- SS-SINR related side conditions given in TS 38.133 [6] sections 10.1.12 are fulfilled for a corresponding Band,

SSB\_RP and SSB Es/Iot according to TS 38.133 [6] Annex B.2.2 for a corresponding Band.

References: The conformance requirements covered in the current TC are specified in: TS 38.133 [6], clauses 9.2.2, 9.2.4.3, 9.2.5.1 and 9.2.5.2.

## 6.6.1.1 NR SA FR1 event-triggered reporting without gap in non-DRX

## 6.6.1.1.1 Test purpose

To verify the UE's ability to make a correct reporting of an event within intra-frequency cell search without gap under non-DRX.

#### 6.6.1.1.2 Test applicability

This test applies to all types of NR UE release 15 onwards.

## 6.6.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.1.

6.6.1.1.4 Test description

#### 6.6.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.1.4.1-1.

Table 6.6.1.1.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in non-DRX

Test Case ID	Description
6.6.1.1-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
6.6.1.1-2	15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode
6.6.1.1-3	30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode
Note: The UE is only required to be tested in one of the supported test configurations.	

Configure the test requirement and the DUT according to the parameters in Table 6.6.1.1.4.1-2.

Table 6.6.1.1.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in non-DRX

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies		in Annex E, Table E.4-1 and TS 38			
Channel bandwidth	As specified	s specified by the test configuration selected from Table 6.6.1.1.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.				

- 1. The test parameters for PCell and neighbour cell are given in Table 6.6.1.1.4.1-3 below.
- 2. Message contents are defined in clause 6.6.1.1.4.3.
- 3. There is one carrier and two cells specified in the test. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.1.4.1-3: General test parameters for SA intra-frequency event triggered reporting tests without gap for FR1 under non-DRX

Parameter	Unit	Test	Value	Comment
		configur ation		
Active cell		1, 2, 3	Cell 1	
Neighbour cell		1, 2, 3	Cell 2	Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and Cell 2	
SSB configuration		1	SSB.1 FR1	
		2	SSB.1 FR1	
		3	SSB.2 FR1	
SMTC configuration		1	SMTC.2	
-		2	SMTC.1	
		3	SMTC.1	
A3-Offset	dB	1, 2, 3	-4.5	
CP length		1, 2, 3	Normal	
Hysteresis	dB	1, 2, 3	0	
Time To Trigger	S	1, 2, 3	0	
Filter coefficient		1, 2, 3	0	L3 filtering is not used
DRX		1, 2, 3		OFF
Time offset between serving		1	3 ms	Asynchronous cells.
and neighbour cells				The timing of Cell 2 is 3 ms later
				than the timing of Cell 1.
		2	3 μs	Synchronous cells
		3	3 μs	Synchronous cells
T1	S	1, 2, 3	5	
T2	S	1, 2, 3	5	

#### 6.6.1.1.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (NR Cell 1) and a FR1 neighbour cell (NR Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.1.4.1-3 and Table 6.6.1.1.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR Cell 2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.1.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit *RRCReconfigurationComplete* message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.1.5-1. T2 starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set NR Cell 2 physical cell identity = ((current NR cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.

- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in NR Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5),
  - if the device has been switched off, switcheson the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.1.4.3-1: Common Exception messages SA intra frequency event triggered reporting tests without gap under non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1
·	Table H.3.1-2 with Condition INTRA-FREQ
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for configuration 6.6.1.1-1
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.1-2
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.2 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.1-3
	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 with Condition INTRA-FREQ
	Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.1-8 with Condition SSB RLM

## 6.6.1.1.5 Test requirement

Table 6.6.1.1.4.1-3 and Table 6.6.1.1.5-1 define the primary level settings including test tolerances for NR SA event triggered reporting test without gap under non-DRX.

Table 6.6.1.1.5-1: NR Cell specific test parameters for SA intra-frequency event triggered reporting tests without gap under non-DRX

Parameter	Unit	Test	Cell 1		Cell 2		
		configuration	T1 T2		T1	T2	
TDD configuration		1	N	N/A		N/A	
-		2	TDDConf.1.1		TDDConf.1.1		
		3	TDDConf.2.1		TDDC	TDDConf.2.1	
PDSCH RMC		1	SR.1.	1 FDD	N/	Ά	
configuration		2	SR.1.	1 TDD			
		3	SR.2.	1 TDD			
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	I FDD	
RMC		2	CR.1.	1 TDD	CR.1.	I TDD	
configuration		3	CR.2.	1 TDD	CR.2.	I TDD	
Dedicated		1	CCR.1	.1 FDD	CCR.1.	1 FDD	
CORESET RMC		2	CCR.1	.1 TDD	CCR.1.	1 TDD	
configuration		3	CCR.2	.1 TDD	CCR.2.	1 TDD	
OCNG Patterns		1, 2, 3	OF	P.1	OF	P.1	
TRS		1	TRS.1	.1 FDD	N/	Ά	
Configuration		2	TRS.1	.1 TDD	N/	Ά	
-		3	TRS.1	.2 TDD	N/		
Initial BWP		1, 2, 3	DLBV	VP.0.1	DLBWP.0.1		
configuration			ULBV	VP.0.1	ULBWP.0.1		
Active DL BWP		1, 2, 3	DLBWP.1.1		DLBWP.1.1		
configuration							
Active UL BWP		1, 2, 3	ULBWP.1.1		ULBW	/P.1.1	
configuration							
RLM-RS		1, 2, 3	SS	SB	SS	SB	
$N_{oc}^{}$ Note 2	dBm/SCS	1			98		
oc		2	-98				
		3			95		
$N_{oc}^{}$ Note 2	dBm/15 KHz	1		-	98		
1 voc		2					
		3					
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	4	-1.46	-Infinity	-1.46	
L <sub>s</sub> /L <sub>ot</sub>		2					
		3					
$\hat{E}_s/N_{oc}$	dB	1	4	4	-Infinity	4	
$L_s/V_{oc}$		2					
		3					
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
		2	-94	-94	-Infinity	-94	
		3	-91	-91	-Infinity	-91	
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified	in Cell 1	
	dBm/9.36 MHz	2	-64.60	-62.25	colu	mns	
	dBm/38.16 MHz	3	-58.50	-56.16			
Propagation Condition		1, 2, 3		AV	VGN		
Condition		<u> </u>	<u> </u>				

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report to NR Cell 2.

The overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay =  $T_{identify\_intra\_without\_index}$ 

 $T_{identify\_intra\_without\_index} = (T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}) ms$ 

 $T_{PSS/SSS\_sync\_intr} = max \; [\; 600 \; ms, \; ceil \; (5 \times K_p) \times SMTC \; period \; ] \times CSSF_{intra} = 600 \; ms$ 

T SSB measurement period intra= max [ 200 ms, ceil(  $5 \times K_p$ ) × SMTC period ] × CSSF<sub>intra</sub> = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

## 6.6.1.2 NR SA FR1 event-triggered reporting without gap in DRX

## 6.6.1.2.1 Test purpose

To verify the UE's ability to make a correct reporting of an event within intra-frequency cell search without gap under DRX.

## 6.6.1.2.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle.

## 6.6.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.2.

6.6.1.2.4 Test description

6.6.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.2.4.1-1.

Table 6.6.1.2.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in DRX

Test Case ID	Description			
6.6.1.2-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.1.2-2	15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.1.2-3	30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note: The UE is only required to be tested in one of the supported test configurations.				

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.2.4.1-2.

Table 6.6.1.2.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in DR	K

Parameter		Value	Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1.	
Channel bandwidth	As specified by the test configuration selected from Table 6.6.1.2.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.			

- 1. The test parameters for PCell and neighbour cell are given in Table 6.6.1.2.4.1-3 below.
- 2. Message contents are defined in clause 6.6.1.2.4.3.
- 3. There is one carrier and two cells specified in the test. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.2.4.1-3: General test parameters for SA intra-frequency event triggered reporting tests without gap for FR1 under DRX

Parameter	Unit	Test configur	Value		Comment
		ation	Test 1	Test 2	
Active cell		1, 2, 3	Cell 1		
Neighbour cell		1, 2, 3	Cell 2		Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and	Cell 2	
SSB configuration		1	SSB.1 FR1		
		2	SSB.1 FR1		
		3	SSB.2 FR1		
SMTC configuration		1	SMTC.2		
		2	SMTC.1		
		3	SMTC.1		
A3-Offset	dB	1, 2, 3	-4.5		
CP length		1, 2, 3	Normal		
Hysteresis	dB	1, 2, 3	0		
Time To Trigger	S	1, 2, 3	0		
Filter coefficient		1, 2, 3	0		L3 filtering is not used
DRX	ms	1, 2, 3	DRX.1	DRX.7	
Time offset between serving		1	3 ms		Asynchronous cells.
and neighbour cells					The timing of Cell 2 is 3ms later
					than the timing of Cell 1
		2	3 us		Synchronous cells
		3	3 us		Synchronous cells
T1	S	1, 2, 3	5	T	
T2	S	1, 2, 3	5	10	

## 6.6.1.2.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (NR Cell 1) and a FR1 neighbour cell (NR Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.2.4.1-3 and Table 6.6.1.2.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR Cell 2.

1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.

- 2. Set the parameters according to T1 in Table 6.6.1.2.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit *RRCReconfigurationComplete* message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.2.5-1. T2 starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms for Test 1 or less than 6402 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set NR Cell 2 physical cell identity = ((current NR cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in NR Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.1.2.4.1-1 as appropriate.

### 6.6.1.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.2.4.3-1: Common Exception messages for SA intra frequency event triggered reporting tests without gap under DRX

Default Message Contents					
Common contents of system information					
blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1				
·	Table H.3.1-2 with Condition INTRA-FREQ				
	Table H.3.1-3 with Condition INTRA-FREQ MO SSB.1 FR1, SMTC.2 for configuration 6.6.1.2-1				
	Table H.3.1-3 with Condition INTRA-FREQ MO SSB.1 FR1, SMTC.1				
	and synchronous cells for configuration 6.6.1.2-2				
	Table H.3.1-3 with Condition INTRA-FREQ MO SSB.2 FR1, SMTC				
	.1 and synchronous cells for configuration 6.6.1.2-3				
	Table H.3.1-4 with A3-offset = -4.5dB				
	Table H.3.1-5 with Condition INTRA-FREQ				
	Table H.3.1-7 with Condition INTRA-FREQ				
	Table H.3.1-8 with Condition SSB RLM				
	Table H.3.7-1 with Condition DRX.1 and Offset for test 1				
	Table H.3.7-1 with Condition DRX.7 and Offset for test 2				

## 6.6.1.2.5 Test requirement

Table 6.6.1.2.4.1-3 and Table 6.6.1.2.5-1 define the primary level settings including test tolerances for NR event triggered reporting in synchronous cells when DRX is used test.

Table 6.6.1.2.5-1: NR Cell specific test parameters for SA intra-frequency event triggered reporting tests without gap under DRX

Parameter	Unit	Test	Cell 1		Cell 2		
		configuration	T1 T2		T1	T2	
TDD configuration		1	N	N/A		N/A	
-		2	TDDConf.1.1		TDDConf.1.1		
		3	TDDConf.2.1		TDDC	TDDConf.2.1	
PDSCH RMC		1	SR.1.	1 FDD	N/	Ά	
configuration		2	SR.1.	1 TDD			
		3	SR.2.	1 TDD			
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	I FDD	
RMC		2	CR.1.	1 TDD	CR.1.	I TDD	
configuration		3	CR.2.	1 TDD	CR.2.	I TDD	
Dedicated		1	CCR.1	.1 FDD	CCR.1.	1 FDD	
CORESET RMC		2	CCR.1	.1 TDD	CCR.1.	1 TDD	
configuration		3	CCR.2	.1 TDD	CCR.2.	1 TDD	
OCNG Patterns		1, 2, 3	OF	P.1	OF	P.1	
TRS		1	TRS.1	.1 FDD	N/	Ά	
Configuration		2	TRS.1	.1 TDD	N/	Ά	
-		3	TRS.1	.2 TDD	N/		
Initial BWP		1, 2, 3		√P.0.1	DLBWP.0.1		
configuration			ULBV	√P.0.1	ULBWP.0.1		
Active DL BWP		1, 2, 3	DLBWP.1.1		DLBWP.1.1		
configuration							
Active UL BWP		1, 2, 3	ULBWP.1.1		ULBWP.1.1		
configuration			SSB				
RLM-RS		1, 2, 3	SS		SS	SB	
$N_{oc}^{}$ Note 2	dBm/SCS	1			98		
OC .		2	-98				
		3			95		
$N_{oc}^{}$ Note 2	dBm/15 KHz	1	_	-	98		
oc -		2					
- 1		3					
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	4	-1.46	-Infinity	-1.46	
s7 ot		2	4				
	i	3			1 6 1		
$\hat{E}_s/N_{oc}$	dB	1	4	4	-Infinity	4	
37 00		2	4				
OO DODD Note 3	ID (000 K)	3	0.4	0.4	1 6 1	0.4	
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
		2	-94	-94	-Infinity	-94	
le .	dD/0.00 MUI-	3	-91	-91	-Infinity	-91	
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified		
	dBm/9.36 MHz	2	-64.60	-62.25	colu	IIIIS	
Duana nati - :-	dBm/38.16 MHz	3	-58.50	-56.16	NON.		
Propagation Condition		1, 2, 3		AV	VGN		
Condition		<u> </u>	<u> </u>				

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

In Test 1 when DRX cycle length = 40 ms, the overall delay measured is defined as the time from the beginning of time period T2 to the moment the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 640 ms, the overall delay measured is defined as the time from the beginning of time period T2 to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to NR Cell 2 on PUSCH.

For both tests:

The overall delays measured is defined as the time from the beginning of time period T2 to the moment the UE send one Event A3 triggered measurement report to NR Cell 2.

The overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured when DRX cycle length is 40 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement \ reporting \ delay = T_{identify\_intra\_without\_index}$ 

 $T_{identify\_intra\_without\_index} = (T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}) ms$ 

 $T_{PSS/SSS\_sync\_intra} = max[600ms, ceil(1.5 \times 5 x K_p) \times max(SMTC period, DRX cycle)] \times CSSF_{intra} = 600ms$ 

 $T_{SSB\_measurement\_period\_intra} = max[200ms, ceil(1.5 \times 5 \times K_p) \ x \ max(SMTC \ period, DRX \ cycle)] \times CSSF_{intra} = 320ms$ 

TTI insertion uncertainty = 2 ms

The overall delay measured when DRX cycle length is 40 ms shall be less than a total of 922 ms.

The overall delay measured when DRX cycle length is 640 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement \ reporting \ delay = T_{identify\_intra\_without\_index}$ 

 $T_{identify intra without index} = (T_{PSS/SSS sync intra} + T_{SSB measurement period intra}) ms$ 

 $T_{PSS/SSS \ sync \ intra} = ceil(5 \times K_p) \times DRX \ cycle \times CSSF_{intra} = 3200 ms$ 

 $T_{SSB\_measurement\_period\_intra} = ceil(5 \times K_p) \times DRX \ cycle \times CSSF_{intra} = 3200ms$ 

TTI insertion uncertainty = 2 ms

The overall delay measured when DRX cycle length is 640 ms shall be less than a total of 6402 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

## 6.6.1.3 NR SA FR1 event-triggered reporting with gap in non-DRX

## 6.6.1.3.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event with gaps under non-DRX within intra-frequency cell search with gaps requirements.

6.6.1.3.2 Test applicability

This test applies to all types of NR UE release 15 onwards supporting 5GS NR SA FR1, CSI-RS-based RLM and BWP operation without bandwidth restriction.

6.6.1.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.3.

6.6.1.3.4 Test description

6.6.1.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.3.4.1-1.

Table 6.6.1.3.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting with gap in non-DRX

Test Case ID	Description			
6.6.1.3-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.1.3-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.1.3-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE	Note 1: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.3.4.1-2.

Table 6.6.1.3.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting with gap in non-DRX

Parameter	Value		Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1 and 4.4.2.
Channel bandwidth	As specified	rom Table 6.6.1.3.4.1-1.	
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.		

- 1. The general test parameter settings are set up according to Table 6.6.1.3.4.1-3.
- 2. Message contents are defined in clause 6.6.1.3.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.3.4.1-3: General test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1, 2, 3	Cell 1	
Neighbour cell		1, 2, 3	Cell 2	Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and Cell 2	
Measurement gap type		1, 2, 3	Per-UE gaps	
Measurement gap repetition periodicity	ms	1, 2, 3	40	
Measurement gap length	ms	1, 2, 3	6	
Measurement gap offset	ms	1, 2, 3	39	
SSB configuration		1	SSB.1 FR1	
_		2	SSB.1 FR1	
		3	SSB.2 FR1	
SMTC configuration		1	SMTC.2	
_		2	SMTC.1	
		3	SMTC.1	
CSI-RS parameters		1	CSI-RS.1.2 FDD resource #0	
		2	CSI-RS.1.2 TDD resource #0	
		3	CSI-RS.2.2 TDD resource #0	
A3-Offset	dB	1, 2, 3	-4.5	
CP length		1, 2, 3	Normal	
Hysteresis	dB	1, 2, 3	0	
Time To Trigger	S	1, 2, 3	0	
Filter coefficient		1, 2, 3	0	L3 filtering is not used
DRX	ms	1, 2, 3		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		2	3 μs	Synchronous cells
		3	3 μs	Synchronous cells
T1	S	1, 2, 3	5	
T2	S	1, 2, 3	5	

## 6.6.1.3.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.3.4.1-3 and Table 6.6.1.3.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.3.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.3.5-1.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 802 ms then the number of successful tests is increased by one. If the

UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.

- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

## 6.6.1.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.3.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting with gap in non-DRX

	Default Message Contents
Common contents of system information	
blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1
	Table H.3.1-2 with Condition INTRA-FREQ and GAP NEEDED
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for Configuration 6.6.1.3-1
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.1 and Synchronous cells for Configuration 6.6.1.3-2
	Table H.3.1-3 with ConditionINTRA-FREQ MO, SSB.2 FR1, SMTC.1 and Synchronous cells for Configuration 6.6.1.3-3
	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 with Condition INTRA-FREQ
	Table H.3.1-6 with Condition Pattern #0
	Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.1-8 with Condition CSI-RS RLM

## Table 6.6.1.3.4.3-2: ServingCellConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-167			
Information Element	Value/remark	Comment	Condition
ServingCellConfig ::= SEQUENCE {			
downlinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Downlink[1]	BWP-Downlink with	DLBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveDownlinkBWP-Id	1	Active DL BWP-ID (BWP2)	BWP-Id1
defaultDownlinkBWP-Id	0	Initial BWP (BWP1)	
uplinkConfig SEQUENCE {			
uplinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Uplink[1]	BWP-Uplink with	ULBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveUplinkBWP-Id	1	Active UL BWP-ID (BWP2)	BWP-ld1
}	_		
}			

Condition	Explanation
BWP-ld1	Active BWP (BWP2)

## 6.6.1.3.5 Test requirement

Table 6.6.1.3.4.1-3 and Table 6.6.1.3.5-1 define the primary level settings including test tolerances for NR SA FR1 event-triggered reporting with gap in non-DRX test.

Table 6.6.1.3.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX

Parameter	Unit	Test	Ce	Cell 1		Cell 2	
		configuration	T1	T2	T1	T2	
TDD configuration		1		/A	N/		
		2	TDDConf.1.1		TDDConf.1.1		
		3		onf.2.1	TDDC		
PDSCH RMC		1	SR.1.	1 FDD	N/	/A	
configuration		2	SR.1.	1 TDD			
		3	SR.2.	1 TDD			
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	1 FDD	
RMC		2	CR.1.	1 TDD	CR.1.	1 TDD	
configuration		3	CR.2.	1 TDD	CR.2.		
Dedicated		1		.2 FDD	CCR.1		
CORESET RMC		2		.2 TDD	CCR.1		
configuration		3		.1 TDD	CCR.2		
OCNG Patterns		1, 2, 3		P.1	OF OF		
TRS		1, 2, 3		.1 .1 FDD	N/		
Configuration		2		.1 TDD	N/		
Comigaration		3		.1 TDD	N/		
Initial BWP		1, 2, 3		VP.0.1	DLBW		
configuration		1, 2, 0		VP.0.1	ULBW		
Active DL BWP		1, 2, 3		VP.1.2	DLBW		
configuration		., _, -					
Active UL BWP		1, 2, 3	ULBV	VP.1.2	ULBW	/P.1.1	
configuration		, ,					
RLM-RS		1, 2, 3	CSI	-RS	SS	SB	
Note 2	dBm/SCS	1		-	98		
1 oc		2		-	98		
		3		-	95		
Note 2	dBm/15 KHz	1		-	98		
1 voc		2					
		3					
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	4	-1.46	-Infinity	-1.46	
L <sub>s</sub> /L <sub>ot</sub>		2					
		3					
$\hat{E}_s/N_{oc}$	dB	11	4	4	-Infinity	4	
-s/- · oc		2	_				
N		3					
SS-RSRP Note 3	dBm/SCS KHz	11	-94	-94	-Infinity	-94	
		2	-94	-94	-Infinity	-94	
	ID (0.55.11)	3	-91	-91	-Infinity	-91	
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified		
	dBm/9.36 MHz	2	-64.60	-62.25	colu	mns	
D .:	dBm/38.16 MHz	3	-58.50	-56.16			
Propagation Condition		1, 2, 3	1 1:= :		VGN		

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 $N_{oc}$  to be fulfilled

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report.

The overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

Measurement reporting delay =  $T_{identify\_intra\_without\_index}$ 

 $T_{identify\_intra\_without\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}$ 

 $T_{PSS/SSS \text{ sync intra}} = 600 \text{ ms}$ 

 $T_{SSB}$  measurement period intra = 200 ms

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 802 ms in this test case (note: this gives a total of 800 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

## 6.6.1.4 NR SA FR1 event-triggered reporting with gap in DRX

## 6.6.1.4.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event with gaps under DRX within intra-frequency cell search with gaps requirements.

#### 6.6.1.4.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1, CSI-RS-based RLM, BWP operation without bandwidth restriction and long DRX cycle.

## 6.6.1.4.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.4.

6.6.1.4.4 Test description

6.6.1.4.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.4.4.1-1.

Table 6.6.1.4.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting with gap in DRX

Test Case ID	Description			
6.6.1.4-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.1.4-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.1.4-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE	Note 1: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.4.4.1-2.

Table 6.6.1.4.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting with gap in DRX

Parameter		Value	Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified	pecified by the test configuration selected from Table 6.6.1.4.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram		apable UEs without any 2Rx RF A.3.2.5.2 for DUT part and		

- 1. The general test parameter settings are set up according to Table 6.6.1.4.4.1-3.
- 2. Message contents are defined in clause 6.6.1.4.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.4.4.1-3: General test parameters for NR SA FR1 event-triggered reporting with gap in DRX

Parameter	Unit	Test configur	Va	alue	Comment
		ation	Test 1	Test 2	
Active cell		1, 2, 3	Cell 1	•	
Neighbour cell		1, 2, 3	Cell 2		Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and	Cell 2	
Measurement gap type		1, 2, 3 1, 2, 3	Per-UE gaps		
Measurement gap repetition periodicity	ms		40		
Measurement gap length	ms	1, 2, 3	6		
Measurement gap offset	ms	1, 2, 3	39		
SSB configuration		1	SSB.1 FR1		
		2	SSB.1 FR1		
		3	SSB.2 FR1		
SMTC configuration		1	SMTC.2		
		2	SMTC.1		
		3	SMTC.1		
CSI-RS parameters		1	CSI-RS.1.2 F #0	DD resource	
		2	CSI-RS.1.2 T #0	DD resource	
		3	CSI-RS.2.2 T #0	DD resource	
A3-Offset	dB	1, 2, 3	-4.5		
CP length		1, 2, 3	Normal		
Hysteresis	dB	1, 2, 3	0		
Time To Trigger	S	1, 2, 3	0		
Filter coefficient		1, 2, 3	0		L3 filtering is not used
DRX	ms	1, 2, 3	DRX.1	DRX.7	
Time offset between serving and neighbour cells		1	3 ms		Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		2	3 μs		Synchronous cells
		3	3 μs		Synchronous cells
T1	S	1, 2, 3	5		
T2	S	1, 2, 3	5	10	

## 6.6.1.4.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.4.4.1-3 and Table 6.6.1.4.4.2-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

In Test 1 when DRX cycle = 40 ms is used, UE needs to be provided at least once every 500 ms with new Timing Advance Command MAC control element to restart the Timer Alignment Timer to keep the UE uplink time alignment. Furthermore, the UE is allocated with PUSCH resource at every DRX cycle. In Test 2 when DRX = 640 ms is used, the uplink time alignment is not maintained and the UE needs to use RACH to obtain uplink allocation for measurement reporting.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.4.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.4.5-1.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms for Test 1 or less than 6402 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.1.4.4.1-3 as appropriate.

## 6.6.1.4.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.4.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting with gap in DRX

	Default Message Contents				
Common contents of system information					
blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1				
	Table H.3.1-2 with Condition INTRA-FREQ and GAP NEEDED				
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for configuration 6.6.1.4-1				
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.1 and synchronous cells for configuration 6.6.1.4-2				
	Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.2 FR1, SMTC.1				
	and synchronous cells for configuration 6.6.1.4-3				
	Table H.3.1-4 with A3-offset = -4.5dB				
	Table H.3.1-5 with Condition INTRA-FREQ				
	Table H.3.1-6 with Condition Pattern #0				
	Table H.3.1-7 with Condition INTRA-FREQ				
	Table H.3.7-1 with Condition DRX.1 and Gap for test 1				
	Table H.3.7-1 with Condition DRX.7 and Gap for test 2				
	Table H.3.1-8 with Condition CSI-RS RLM				

Table 6.6.1.4.4.3-2: ServingCellConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-167			
Information Element	Value/remark	Comment	Condition
ServingCellConfig ::= SEQUENCE {			
downlinkBWP-ToAddModList SEQUENCE (SIZE (1maxNrofBWPs)) OF SEQUENCE {			
BWP-Downlink[1]	BWP-Downlink with condition BWP-Id1	DLBWP.1.2 configuration	
}			
firstActiveDownlinkBWP-Id	1	Active DL BWP-ID (BWP2)	BWP-ld1
defaultDownlinkBWP-Id	0	Initial BWP (BWP1)	
uplinkConfig SEQUENCE {			
uplinkBWP-ToAddModList SEQUENCE (SIZE (1maxNrofBWPs)) OF SEQUENCE {			
BWP-Uplink[1]	BWP-Uplink with condition BWP-Id1	ULBWP.1.2 configuration	
}			
firstActiveUplinkBWP-Id	1	Active UL BWP-ID (BWP2)	BWP-ld1
}			
}			

Condition	Explanation
BWP-Id1	Active BWP (BWP2)

## 6.6.1.4.5 Test requirement

Table 6.6.1.4.4.1-3 and Table 6.6.1.4.5-1 define the primary level settings including test tolerances for NR SA FR1 event-triggered reporting with gap in DRX test.

Table 6.6.1.4.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting with gap in DRX

Parameter	Unit	Test	Ce	Cell 1 Ce		ell 2	
		configuration	T1	T2	T1	T2	
TDD configuration		1		/A	N/		
		2	TDDConf.1.1		TDDConf.1.1		
		3		onf.2.1	TDDC		
PDSCH RMC		1	SR.1.	1 FDD	N/	N/A	
configuration		2	SR.1.	1 TDD			
		3	SR.2.	1 TDD			
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	1 FDD	
RMC		2	CR.1.	1 TDD	CR.1.	1 TDD	
configuration		3	CR.2.	1 TDD	CR.2.		
Dedicated		1		.2 FDD	CCR.1		
CORESET RMC		2		.2 TDD	CCR.1		
configuration		3		.1 TDD	CCR.2		
OCNG Patterns		1, 2, 3		P.1	OF OF		
TRS configuration		1, 2, 3		.1 FDD	N/		
Tivo configuration		2		.1 TDD	N/		
		3		.2 TDD	N/		
Initial BWP		1, 2, 3		VP.0.1	DLBW		
configuration		., _, 0		√P.0.1	ULBW		
Active DL BWP		1, 2, 3		VP.1.2	DLBW		
configuration		, , -					
Active UL BWP		1, 2, 3	ULBV	VP.1.2	ULBW	/P.1.1	
configuration							
RLM-RS		1, 2, 3	CSI	-RS	SS	SB	
$N_{ac}$ Note 2	dBm/SCS	1		-	98		
- voc		2			98		
		3		-	95		
Note 2	dBm/15 KHz	1		-	98		
1 voc		2					
		3					
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	1	4	-1.46	-Infinity	-1.46	
S / Tot		2					
		3					
$\hat{E}_s/N_{oc}$	dB	1	4	4	-Infinity	4	
s / oc		2	4				
OO DODD Note 2	15 (00010)	3	1				
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
		2	-94	-94	-Infinity	-94	
la .	dD/0 00 MUI-	3	-91	-91	-Infinity	-91	
lo	dBm/9.36 MHz	1	-64.60	-62.25	Specified		
	dBm/9.36 MHz	2	-64.60	-62.25	columns		
Dropogotion	dBm/38.16 MHz	3 1, 2, 3	-58.50	-56.16	VGN		
Propagation Condition		1, 2, 3	1 15				

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

In Test 1 when DRX cycle length = 40 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report on PUSCH.

In Test 2 when DRX cycle length = 640 ms is used, the overall delay measured is defined as the time from the beginning of time period T2, to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report on PUSCH.

For both tests:

The overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement\ reporting\ delay = T_{identify\_intra\_without\_index}$ 

 $T_{identify\_intra\_without\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}$ 

T<sub>PSS/SSS\_sync\_intra</sub> = 600 ms for Test 1, and T<sub>PSS/SSS\_sync\_intra</sub> = 3200 ms for Test 2

 $T_{SSB\_measurement\_period\_intra} = 320 \text{ ms}$  for Test 1, and  $T_{SSB\_measurement\_period\_intra} = 3200 \text{ ms}$  for Test 2

TTI insertion uncertainty = 2 ms

For Test 1, the overall delays measured shall be less than a total of 922 ms (note: this gives a total of 920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For Test 2, the overall delays measured shall be less than a total of 6402 ms (note: this gives a total of 6400 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

# 6.6.1.5 NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

#### 6.6.1.5.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event within intra-frequency cell search without gaps requirements.

#### 6.6.1.5.2 Test applicability

This test applies to all types of NR UE release 15 onwards.

## 6.6.1.5.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.5.

6.6.1.5.4 Test description

6.6.1.5.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.5.4.1-1.

Table 6.6.1.5.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Configuration		Description
6.6.1.5-1		15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
Note:	The UE is only red	quired to be tested in one of the supported test configurations.

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.5.4.1-2.

Table 6.6.1.5.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	l in Annex E, table E.4-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.		
Channel bandwidth	As specified	by the test configuration selected f	d from Table 6.6.1.5.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram		apable UEs without any 2Rx RF A.3.2.5.2 for DUT part and			

- 1. The general test parameter settings are set up according to Table 6.6.1.5.4.1-3.
- 2. Message contents are defined in clause 6.6.1.5.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.5.4.1-3: General test parameters for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1	Cell 1	
Neighbour cell		1	Cell 2	Cell to be identified.
RF Channel Number		1	1: Cell 1 and Cell 2	
SSB configuration		1	SSB.1 FR1	
SMTC configuration		1	SMTC.2	
A3-Offset	dB	1	-4.5	
CP length		1	Normal	
Hysteresis	dB	1	0	
Time To Trigger	S	1	0	
Filter coefficient		1	0	L3 filtering is not used
DRX	ms	1		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
T1	S	1	5	
T2	S	1	5	

#### 6.6.1.5.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.5.4.1-3 and Table 6.6.1.5.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.5.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.

- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.5.5-1.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the *MeasurementReport* message in step 6) or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.1.5.4.3 Message contents

Message contents are according to TS 38.508-1 clause 4.6 with the following exceptions:

Table 6.6.1.5.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Default Message Contents			
Common contents of system information blocks exceptions			
Default RRC messages and information elements	Table H.3.1-1		
contents exceptions	Table H.3.1-2 with Condition INTRA-FREQ Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1,		
	SMTC.2 for Configuration 6.6.1.5-1		
	Table H.3.1-4 with SSB Index and A3-offset = -4.5 dB		
	Table H.3.1-5 with Condition INTRA-FREQ		
	Table H.3.1-7 with Condition INTRA-FREQ and SSB Index		
	Table H.3.1-8 with Condition SSB RLM		

## 6.6.1.5.5 Test requirement

Table 6.6.1.5.4.1-3 and Table 6.6.1.5.5-1 define the primary level settings including test tolerances for SA event triggered reporting without gap under non-DRX with SSB index reading test.

Table 6.6.1.5.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting without gap in non-DRX with SSB index reading

Parameter	Unit	Test	Се	Cell 1		II 2	
		configuration	T1	T2	T1	T2	
TDD configuration		1	N/A		N/A		
PDSCH RMC		1	SR.1.1 FDD		N.	N/A	
configuration							
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	1 FDD	
RMC							
configuration							
Dedicated		1	CCR.1	.1 FDD	CCR.1	.1 FDD	
CORESET RMC							
configuration							
OCNG Patterns		1		P.1		P.1	
TRS configuration		1		.1 FDD		/A	
Initial BWP		1		VP.0.1	DLBWP.0.1		
configuration				VP.0.1	ULBWP.0.1		
Active DL BWP		1	DLBV	DLBWP.1.1		DLBWP.1.1	
configuration							
Active UL BWP		1	ULBV	VP.1.1	ULBV	/P.1.1	
configuration							
RLM-RS		1	S	SB		SB	
$N_{oc}^{}$ Note 2	dBm/SCS	1		•	-98		
$N_{oc}$ Note 2	dBm/15 KHz	1			-98		
$\hat{E}_{s}/I_{ot}$	dB	1	4	-1.46	-Infinity	-1.46	
$\hat{E}_s/N_{oc}$	dB	1	4	4	-Infinity	4	
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
lo	dBm/9.36 MHz	1	-64.60 -62.25 Specified in Cell 1		l in Cell 1		
			columns				
Propagation Condition		1	AWGN				

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{ac}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report.

The overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement\ reporting\ delay = T_{identify\_intra\_with\_index}$ 

 $T_{identify\_intra\_with\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra} + T_{SSB\_time\_index\_intra}$ 

 $T_{PSS/SSS\_sync\_intra} = 600 \text{ ms}$ 

 $T_{SSB\_time\_index\_intra} = 120 \text{ ms}$ 

 $T_{SSB\_measurement\_period\_intra}\!=200~ms$ 

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 922 ms in this test case (note: this gives a total of 920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

## 6.6.1.6 NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

## 6.6.1.6.1 Test purpose

The purpose of this test is to verify UE's ability to make a correct reporting of an event within intra-frequency cell search with gaps requirements.

#### 6.6.1.6.2 Test applicability

This test applies to all types of NR UE release 15 onwards supporting 5GS NR SA FR1, CSI-RS-based RLM and BWP operation without bandwidth restriction.

#### 6.6.1.6.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.4.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.6.

6.6.1.6.4 Test description

6.6.1.6.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.6.4.1-1.

Table 6.6.1.6.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Configuration	Description
6.6.1.6-1	15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode
Note: The UE is only re-	quired to be tested in one of the supported test configurations.

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.3.4.1-2.

Table 6.6.1.6.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	.508-1 [14] clause 4.3.1 and 4.4.2.		
Channel As specified by the test configuration selected bandwidth			rom Table 6.6.1.6.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE part.				

- 1. The general test parameter settings are set up according to Table 6.6.1.6.4.1-3.
- 2. Message contents are defined in clause 6.6.1.6.4.3.
- 3. There is one NR carrier and two cells specified in the test. Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.6.4.1-3: General test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Parameter	Unit	Test configur ation	Value	Comment
Active cell		1	Cell 1	
Neighbour cell		1	Cell 2	Cell to be identified.
RF Channel Number		1	1: Cell 1 and Cell 2	
Measurement gap type		1	Per-UE gaps	
Measurement gap repetition periodicity	ms	1	40	
Measurement gap length	ms	1	6	
Measurement gap offset	ms	1	39	
SSB configuration		1	SSB.1 FR1	
SMTC configuration		1	SMTC.2	
CSI-RS parameters		1	CSI-RS.1.2 FDD resource #0	
A3-Offset	dB	1	-4.5	
CP length		1	Normal	
Hysteresis	dB	1	0	
Time To Trigger	S	1	0	
Filter coefficient		1	0	L3 filtering is not used
DRX	ms	1		OFF
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
T1	S	1	5	
T2	S	1	5	

## 6.6.1.6.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (Cell 1) and a FR1 neighbour cell (Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.6.4.1-3 and Table 6.6.1.6.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of Cell 2.

There are two BWPs configured in Cell 1, BWP1 which contains the cell defining SSB, and BWP2 which does not contain any SSB of Cell 1. During the whole test, BWP2 is always scheduled as the active BWP for the UE.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.6.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.3.5-1.
- 6. UE shall transmit a MeasurementReport message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 922 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

### 6.6.1.6.4.3 Message contents

Message contents are according to TS 38.508-1 clause 4.6 with the following exceptions:

Table 6.6.1.6.4.3-1: Common Exception messages for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Default Message Contents					
Common contents of system information blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Condition INTRA-FREQ and GAP NEEDED Table H.3.1-3 with Condition INTRA-FREQ MO, SSB.1 FR1, SMTC.2 for Configuration 6.6.1.6-1 Table H.3.1-4 with SSB index and A3-offset = -4.5dB. Table H.3.1-5 with Condition INTRA-FREQ Table H.3.1-6 with Condition Pattern #0 Table H.3.1-7 with Condition INTRA-FREQ and SSB index Table H.3.1-8 with Condition CSI-RS RLM				

Table 6.6.1.6.4.3-2: ServingCellConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-167			
Information Element	Value/remark	Comment	Condition
ServingCellConfig ::= SEQUENCE {			
downlinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Downlink[1]	BWP-Downlink with	DLBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveDownlinkBWP-Id	1	Active DL BWP-ID (BWP2)	BWP-ld1
defaultDownlinkBWP-Id	0	Initial BWP (BWP1)	
uplinkConfig SEQUENCE {			
uplinkBWP-ToAddModList SEQUENCE (SIZE			
(1maxNrofBWPs)) OF SEQUENCE {			
BWP-Uplink[1]	BWP-Uplink with	ULBWP.1.2	
	condition BWP-Id1	configuration	
}			
firstActiveUplinkBWP-Id	1	Active UL BWP-ID (BWP2)	BWP-ld1
}			
}			

Condition	Explanation
BWP-Id1	Active BWP (BWP2)

## 6.6.1.6.5 Test requirement

Table 6.6.1.6.4.1-3 and Table 6.6.1.6.5-1 define the primary level settings including test tolerances for SA event triggered reporting tests with per-UE gaps under non-DRX with SSB index reading test.

Table 6.6.1.6.5-1: NR Cell specific test parameters for NR SA FR1 event-triggered reporting with gap in non-DRX with SSB index reading

Parameter	Unit	Test	Cell 1		Ce	Cell 2	
		configuration	T1	T2	T1	T2	
TDD configuration		1	N/A		N.	/A	
PDSCH RMC		1	SR.1.1 FDD		N/A		
configuration							
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	1 FDD	
RMC							
configuration							
Dedicated		1	CCR.1	.2 FDD	CCR.1	.1 FDD	
CORESET RMC							
configuration							
OCNG Patterns		1		P.1		P.1	
TRS configuration		1		.1 FDD		/A	
Initial BWP		1		VP.0.1	DLBWP.0.1		
configuration				VP.0.1	ULBWP.0.1		
Active DL BWP		1	DLBV	VP.1.2	DLBWP.1.1		
configuration							
Active UL BWP		1	ULBV	VP.1.2	ULBV	/P.1.1	
configuration							
RLM-RS	.= .= .	1	CSI	-RS		SB	
$N_{oc}$ Note 2	dBm/SCS	1		-	-98		
$N_{oc}$ Note 2	dBm/15 KHz	1		-	-98		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	1	4	-1.46	-Infinity	-1.46	
$\hat{E}_s/N_{oc}$	dB	1	4	4	-Infinity	4	
SS-RSRP Note 3	dBm/SCS KHz	1	-94	-94	-Infinity	-94	
lo	dBm/9.36 MHz	1	-64.60 -62.25 Specified in Cell 1		l in Cell 1		
			columns			mns	
Propagation		1	AWGN				
Condition							

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The overall delays measured is defined as the time from the beginning of time period T2, to the moment the UE send one Event A3 triggered measurement report.

The overall delays measured in the test may be up to 2xTTIDCCH higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delays measured test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement\ reporting\ delay = T_{identify\_intra\_with\_index}$ 

 $T_{identify\_intra\_with\_index} = T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra} + T_{SSB\_time\_index\_intra}$ 

 $T_{PSS/SSS\_sync\_intra} = 600 \text{ ms}$ 

 $T_{SSB time index intra} = 120 \text{ ms}$ 

 $T_{SSB\_measurement\_period\_intra} = 200 \text{ ms}$ 

TTI insertion uncertainty = 2 ms

The overall delays measured shall be less than a total of 922 ms in this test case (note: this gives a total of 920 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

## 6.6.1.7 NR SA FR1 event-triggered reporting without gap in DRX for UE configured with highSpeedMeasFlag-r16

#### 6.6.1.7.1 Test purpose

To verify the UE's ability to make a correct reporting of an event within intra-frequency cell search without gap under DRX for UE configured with highSpeedMeasFlag-r16.

## 6.6.1.7.2 Test applicability

This test applies to all types of NR UE release 16 onwards that supports measurement enhancements in high speed scenario.

#### 6.6.1.7.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.1.0.5.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.1.7.

6.6.1.7.4 Test description

6.6.1.7.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.1.7.4.1-1.

Table 6.6.1.7.4.1-1: Supported test configurations for NR SA FR1 event-triggered reporting without gap in DRX for UE configured with highSpeedMeasFlag-r16

Configuration	Description
6.6.1.7-1	15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
6.6.1.7-2	15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
6.6.1.7-3	30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note: The UE is only required to be tested in one of the supported test configurations.	

Configure the test equipment and the DUT according to the parameters in Table 6.6.1.7.4.1-2.

Table 6.6.1.7.4.1-2: Initial conditions for NR SA FR1 event-triggered reporting without gap in DRX for UE configured with highSpeedMeasFlag-r16

Parameter		Value	Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	in Annex E, table E.4-1 and TS 38.	508-1 [14] clause 4.3.1.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.1.2.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram		pable UEs without any 2Rx RF .3.2.5.2 for DUT part and				

- 1. The test parameters for PCell and neighbour cell are given in Table 6.6.1.7.4.1-3 below.
- 2. Message contents are defined in clause 6.6.1.7.4.3.
- 3. There is one carrier and two cells specified in the test. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.1.7.4.1-3: General test parameters for SA intra-frequency event triggered reporting tests without gap for FR1 under DRX for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Test configur ation	Value	Comment
highSpeedMeasFlag-r16		1,2,3	Present	To enable high speed measurement enhancements
Active cell		1, 2, 3	Cell 1	
Neighbour cell		1, 2, 3	Cell 2	Cell to be identified.
RF Channel Number		1, 2, 3	1: Cell 1 and Cell 2	
SSB configuration		1	SSB.1 FR1	
-		2	SSB.1 FR1	
		3	SSB.2 FR1	
SMTC configuration		1	SMTC.2	
_		2	SMTC.1	
		3	SMTC.1	
A3-Offset	dB	1, 2, 3	-4.5	
CP length		1, 2, 3	Normal	
Hysteresis	dB	1, 2, 3	0	
Time To Trigger	S	1, 2, 3	0	
Filter coefficient		1, 2, 3	0	L3 filtering is not used
DRX		1, 2, 3	DRX.7	640ms DRX cycle
Time offset between serving and neighbour cells		1	3 ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		2	3 μs	Synchronous cells
		3	3 μs	Synchronous cells
T1	s	1, 2, 3	5	
T2	S	1, 2, 3	6	

# 6.6.1.7.4.2 Test procedure

Two cells are deployed in the test, which are FR1 PCell (NR Cell 1) and a FR1 neighbour cell (NR Cell 2) on the same frequency as the PCell. The general and cell specific test parameters for PCell and neighbour cell are given in Table 6.6.1.7.4.1-3 and Table 6.6.1.7.5-1, respectively. In the measurement control information a measurement object is configured for the frequency of the PCell, and it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR Cell 2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.1.7.5-1.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.1.7.5-1. T2 starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 5122 ms then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set NR Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 1008) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in NR Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

# 6.6.1.7.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.1.7.4.3-1: Common Exception messages for SA intra frequency event triggered reporting tests without gap under DRX for UE configured with highSpeedMeasFlag-r16

Defau	It Message Contents
Common contents of system information blocks exceptions	Table H.2.1-3 with Condition HighSpeedMeas
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2
contents exceptions	Table H.3.1-4 with A3-offset = -4.5dB
	Table H.3.1-5 Table H.3.1-7 with Condition INTRA-FREQ
	Table H.3.1-8 with Condition SSB RLM Table H.3.7-1 with Condition DRX.7 and Offset
Specific message contents exceptions for Test	Table H.3.1-3 with Condition INTRA-FREQ MO
Configuration 6.6.1.7-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
Specific message contents exceptions for Test	Table 7.3.1-3a in TS 38.508-1 [14] with condition SSB.1 FR1 Table H.3.1-3 with Condition INTRA-FREQ MO and synchronous
Configuration 6.6.1.7-2	cells
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1 Table 7.3.1-3a in TS 38.508-1 [14] with condition SSB.1 FR1
Specific message contents exceptions for Test	Table H.3.1-3 with Condition INTRA-FREQ MO and synchronous
Configuration 6.6.1.7-3	cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
	Table 7.3.1-3a in TS 38.508-1 [14] with condition SSB.2 FR1

# 6.6.1.7.5 Test requirement

Table 6.6.1.7.4.1-3 and Table 6.6.1.7.5-1 define the primary level settings including test tolerances for NR event triggered reporting in synchronous cells when DRX is used

Table 6.6.1.7.5-1: NR Cell specific test parameters for SA intra-frequency event triggered reporting tests without gap under DRX for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Test configuration	Ce	II 1	Се	Cell 2	
		J	T1	T2	T1	T2	
TDD configuration		1	TN	I/A	TN	I/A	
		2	TDDConf.1.1		TDDC	TDDConf.1.1	
		3	TDDC	onf.2.1	TDDC	onf.2.1	
PDSCH RMC		1	SR.1.	1 FDD	N	/A	
configuration		2	SR.1.	1 TDD			
		3	SR.2.	1 TDD	1		
RMSI CORESET		1	CR.1.	1 FDD	CR.1.	1 FDD	
RMC		2	CR.1.	1 TDD	CR.1.	1 TDD	
configuration		3	CR.2.	1 TDD	CR.2.	1 TDD	
Dedicated		1	CCR.1	.1 FDD	CCR.1	.1 FDD	
CORESET RMC		2	CCR.1	.1 TDD	CCR.1	.1 TDD	
configuration		3	CCR.2	.1 TDD	CCR.2	.1 TDD	
OCNG Patterns		1, 2, 3	OI	P.1		P.1	
TRS configuration		1		.1 FDD		/A	
		2	TRS.1	.1 TDD	N	/A	
		3	TRS.1	.2 TDD		/A	
Initial BWP		1, 2, 3		VP.0.1		VP.0.1	
configuration				VP.0.1		VP.0.1	
Active DL BWP		1, 2, 3	DLBWP.1.1 DLBWP.1.1		VP.1.1		
configuration Active UL BWP		4.0.0	I II DIA/D 4.4			/D 4 4	
configuration		1, 2, 3	ULBWP.1.1 ULBWP.1.1			VP.1.1	
RLM-RS		1, 2, 3	SSB SSB				
	dBm/SCS	1, 2, 3	-98		<u> </u>		
$N_{oc}^{}$ Note 2	42, 555	2			-98		
		3			-95		
M Note 2	dBm/15 kHz	1			-98		
$N_{oc}^{}$ Note 2	G.Z, 10 III IZ	2			-50		
		3					
$\hat{E}_{s}/I_{ot}$	dB	1	4	-1.46	-Infinity	-1.46	
$\mathbf{L}_{\mathrm{s}}/1_{\mathrm{ot}}$		2					
		3					
$\hat{E}_s/N_{oc}$	dB	1	4	4	-Infinity	4	
$D_s/T_{oc}$		2					
		3					
SS-RSRP Note 3	dBm/SCS kHz	1	-94+TT	-94	-Infinity	-94	
		2	-94	-94	-Infinity	-94	
1-	-ID /O OC MIL!	3	-91	-91	-Infinity	-91	
lo	dBm/9.36 MHz	<u> </u>	-64.60	-62.25	-64.60	-62.25	
	dBm/9.36 MHz dBm/38.16 MHz	3	-64.60	-62.25T -56.16	-64.60 -58.50	-62.25 -56.16	
Propagation	udili/30.16 IVIMZ	1, 2	-58.50	GN	-58.50 AWGN 19		
Condition		3					
Condition		<u> </u>	AWGN AWGN 3334Hz Note		UHI IZ		

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: The AWGN 1944 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 1944Hz.

Note 5: The AWGN 3334 Hz condition is a non fading propagation channel with one tap. Doppler shift is a constant 3334Hz.

The overall delays measured is defined as the time from the beginning of time period T2 to the moment the UE send one Event A3 triggered measurement report to NR Cell 2. When DRX cycle length = 640 ms, the overall delay

measured is defined as the time from the beginning of time period T2 to the moment the UE starts to send preambles on the PRACH for Scheduling Request (SR) to obtain allocation to send the measurement report to NR Cell 2 on PUSCH.

The overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays because of TTI insertion uncertainty of the measurement report in DCCH.

The overall delay measured when DRX cycle length is 640 ms test requirement is expressed as:

Overall delays measured = measurement reporting delay + TTI insertion uncertainty

 $Measurement \ reporting \ delay = T_{identify\_intra\_without\_index}$ 

 $T_{identify\_intra\_without\_index} = (T_{PSS/SSS\_sync\_intra} + T_{SSB\_measurement\_period\_intra}) \ ms$ 

 $T_{PSS/SSS\_sync\_intra} = ceil(5 \times K_p) \times DRX \ cycle \times CSSF_{intra} = 3200ms$ 

 $T_{SSB\_measurement\_period\_intra} = ceil(Y \times K_p) \times DRX \ cycle \times CSSF_{intra} = 1920ms$ 

TTI insertion uncertainty = 2 ms

The overall delay measured when DRX cycle length is 640 ms shall be less than a total of 5122 ms.

For the test to pass, the total number of successful tests shall be more than 90% of the cases with a confidence level of 95%.

# 6.6.2 Inter-frequency measurements

# 6.6.2.0 Minimum conformance requirements for Inter-frequency measurements

Same as clause 4.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause 9.3.2, 9.3.4, 9.3.5, 9.3.6.3.

## 6.6.2.1 NR SA FR1-FR1 event-triggered reporting in non-DRX

## 6.6.2.1.1 Test purpose

To verify that the UE makes correct reporting of an event in non-DRX within inter-frequency NR cell search requirements without SSB time index detection in TS 38.133 [6] clause 9.3.4.

## 6.6.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards. Test 1 is applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 2 is applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

# 6.6.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.1.

6.6.2.1.4 Test description

## 6.6.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.1.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.1.4.1-2. Test environment parameters are given in Table 6.6.2.1.4.1-3.

Table 6.6.2.1.4.1-1: SA FR1-FR1 event triggered reporting tests in non-DRX supported test configurations

Test Case ID	Description			
6.6.2.1-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.2.1-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.2.1-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE is only required to be tested in one of the supported test configurations				
Note 2: target N	R cell has the same SCS, BW and duplex mode as NR serving cell			

Table 6.6.2.1.4.1-2: SA FR1-FR1 general test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in non DRX

Parameter	Unit	Test	Va	lue	Comment		
		configurati on	Test 1	Test 2			
NR RF Channel Number		Config 1,2,3	1	, 2	Two FR1 NR carrier frequencies are used.		
Active cell		Config 1,2,3	NR cell 1 (Pcell)		NR Cell 1 is on NR RF channel number 1.		
Neighbour cell		Config 1,2,3	NR cell2		NR cell 2 is on NR RF channel number 2.		
Gap Pattern Id		Config 1,2,3	0	4	As specified in TS 38.133 clause 9.1.2-1.		
Measurement gap offset		Config 1,2,3	9	9			
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Normal				
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0		L3 filtering is not used		
DRX		Config 1,2,3	OFF		DRX is not used		
Time offset between serving and neighbour cells		Config 1	3ms		3ms		Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		Config 2,3	3µs		Synchronous cells.		
T1	s	Config 1,2,3	5				
T2	S	Config 1,2,3	1	1			

Table 6.6.2.1.4.1-3: Test Environment parameters for SA inter-frequency event triggered reporting without SSB time index detection in non-DRX

Parameter	Value	Comment

Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	d in Annex E, Table E.4-1 and TS 3	88.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.2.1.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4	1			
Exceptions to connection diagram		apable UEs without any 2Rx RF A.3.2.5.1 for DUT part and				

- 1. Message contents are defined in clause 6.6.2.1.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Annex C.1.2.

## 6.6.2.1.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1 measurement gap pattern configuration # 0 as defined in Table 6.6.2.1.4.1-2 is provided for UE that does not support per-FR gap and in test 2 measurement gap pattern configuration #4 as defined in Table 6.6.2.1.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.1.4.1-2.
- 3. The SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit *RRCReconfigurationComplete* message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.1.4.1-2. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 920 ms for Test 1 and 760 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

# OR

- switch the UE off.
- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters

Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR:

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.1.4.1-2 as appropriate.

## 6.6.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.1.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQ Table H.3.1-4 with A3-offset = -6dB Table H.3.1-5 Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 for Test 1 Table H.3.1-6 with Conditions gapFR1, Pattern #4 and gap offset = 9 for Test 2 Table H.3.1-7 with Condition INTER-FREQ
Specific message contents exceptions for Test Configuration 6.6.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5
Specific message contents exceptions for Test Configuration 6.6.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4
Specific message contents exceptions for Test Configuration 6.6.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4

## 6.6.2.1.5 Test requirement

Table 6.6.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.1.5-1: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in non-DRX

Parameter		Unit	Test	Cell 1 Cell 2			
			configuratio n	T1 T2	T1 T2		
NR RF Cha	NR RF Channel Number		Config 1,2,3	1	2		
Duplex mod	le		Config 1		DD		
			Config 2,3	TDD			
TDD configu	uration		Config 1 Config 2	Not Ap	oplicable		
	-		Config 3	TDDConf.1.1 TDDConf.2.1			
BW <sub>channel</sub>		MHz	Config 1,2		RB,c = 52		
			Config 3	40: N <sub>R</sub>	B,c = 106		
BWP BW		MHz	Config 1,2	10: N <sub>F</sub>	RB,c = 52		
DWD	Initial DL DWD		Config 3	40: N <sub>R</sub>	B,c = 106		
BWP configurati	Initial DL BWP			DLBWP.0.1	NA		
on	Initial UL BWP		Config 1, 2,	ULBWP.0.1	NA		
	Dedicated DL BWP		3	DLBWP.1.1	NA		
	Dedicated UL BWP			ULBWP.1.1	NA		
TRS configu	uration		Config 1	TRS.1.1 FDD	NA		
			Config 2	TRS.1.1 TDD	NA		
			Config 3	TRS.1.2 TDD	NA		
OCNG Patte	erns		Config 1,2,3	OP.1	OP.1		
PDSCH Ref			Config 1	SR.1.1 FDD	-		
measureme	nt channel		Config 2	SR.1.1 TDD			
			Config 3	SR 2.1 TDD			
	ESET Reference		Config 1	CR.1.1 FDD	-		
Channel	-		Config 2 Config 3	CR.1.1 TDD CR 2.1 TDD			
Dedicated C	Dedicated CORESET		Config 1	CCR.1.1 FDD	_		
Reference C	<u> </u>		Config 2	CCR.1.1 TDD			
			Config 3	CCR.2.1 TDD			
SSB parameters			Config 1	SSB.1 FR1	SSB.5 FR1		
			Config 2	SSB.1 FR1	SSB.5 FR1		
01470 "			Config 3	SSB.2 FR1	SSB.6 FR1		
SMTC confi	guration		Config 1	SMTC.2	SMTC.5		
			Config 2, 3	SMTC.1	SMTC.4		
	CCH subcarrier	kHz	Config 1,2		15		
spacing	of PSS to SSS		Config 3	;	30 		
			_				
to SSS	of PBCH DMRS						
DMRS							
EPRE ratio of PDCCH DMRS to SSS							
EPRE ratio of PDCCH to PDCCH DMRS		Config 1,2,3	0	0			
to SSS			_				
PDSCH	of PDSCH to						
to SSS(Note	EPRE ratio of OCNG DMRS to SSS(Note 1)						
EPRE ratio							

$N_{oc}^{ m Note2}$	dBm/15 kHz		-98		-98	
$N_{oc}$ Note2	dBm/S CS	Config 1,2 Config 3	-98 -95		-98 -95	
SS-RSRP Note 3	dBm/S CS	Config 1,2 Config 3	-94 -91	-94 -91	-Infinity -Infinity	-91 -88
$\hat{E}_{s}/I_{ot}$	dB	Config 1,2,3,4,5,6	4	4	-Infinity	7
$\hat{E}_s/N_{oc}$	dB	Config 1,2,3	4	4	-Infinity	7
Io <sup>Note3</sup>	dBm/9.3 6MHz	Config 1,2	-64.59	-64.59	-70.05	-62.26
	dBm/38. 16MHz	Config 3	-58.49	-58.49	-63.94	-56.15
Propagation Condition		Config 1,2,3	AW	/GN	A	WGN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be
- Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 920 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90%, with a confidence level of 95%

In test 2 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 760 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1 and 2 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.2.2 NR SA FR1-FR1 event-triggered reporting in DRX

# 6.6.2.2.1 Test purpose

To verify that the UE makes correct reporting of an event in DRX within inter-frequency NR cell search requirements without SSB time index detection in TS 38.133 [6] clause 9.3.4.

#### 6.6.2.2.2 Test applicability

This test applies to all types of NR UE Release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle. Test 1 and Test 2 are applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 3 and Test 4 are applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

# 6.6.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.2.

6.6.2.2.4 Test description

6.6.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.2.4.1-2. Test environment parameters are given in Table 6.6.2.2.4.1-3.

Table 6.6.2.2.4.1-1: SA FR1-FR1 event triggered reporting tests in DRX supported test configurations

Test Case ID	Description			
6.6.2.2-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.2.2-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.2.2-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE is only required to be tested in one of the supported test configurations				
Note 2: target N	Note 2: target NR cell has the same SCS. BW and duplex mode as NR serving cell			

Table 6.6.2.2.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in DRX

Parameter	Unit	Test		Value			Comment
		configurati	Test	Test	Test	Test	
		on	1	2	3	4	
NR RF Channel Number		Config 1,2,3	1, 2			Two FR1 NR carrier frequencies are used	
Active cell		Config 1,2,3	NR ce	II 1 (Pce	ell)		NR Cell 1 is on NR RF channel number 1
Neighbour cell		Config 1,2,3	NR ce	II2			NR cell 2 is on NR RF channel number 2.
Gap Pattern Id		Config 1,2,3	0		4		As specified in TS 38.133 clause 9.1.2-1
Measurement gap offset		Config 1,2,3	9		9		
			_				
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Norma	al			
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0				L3 filtering is not used
DRX		Config 1,2,3	DRX .1	DRX .7	DRX .1	DRX .7	As specified in clause A.5
Time offset between serving and neighbour cells		Config 1	3ms				Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		Config 2,3	3μs				Synchronous cells
T1	S	Config 1,2,3	5				
T2	s	Config 1,2,3	1.1	11	1.1	11	

Table 6.6.2.2.4.1-3: Test Environment parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in DRX

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.		
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.2.2.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram		pable UEs without any 2Rx RF .3.2.5.1 for DUT part and			

- 1. Message contents are defined in clause 6.6.2.2.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Annex C.1.2.

## 6.6.2.2.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1&2 measurement gap pattern configuration # 0 as defined in Table 6.6.2.2.4.1-2 is provided for UE that does not support per-FR gap and in test 3&4 measurement gap pattern configuration #4 as defined in Table 6.6.2.2.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

UE needs to be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore UE is allocated with PUSCH resource at every DRX cycle.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.2.4.1-2 and 6.6.2.2.5-1.
- 3. The SS shall transmit an *RRCReconfiguration* message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.2.5-1. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1080 ms for Test 1, 10240 ms for Test 2, 1080 ms for Test 3 and 10240 ms for Test 4 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.

- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR
  - if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.2.4.1-2 as appropriate.

## 6.6.2.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.2.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQ Table H.3.1-4 with A3-offset = -6dB Table H.3.1-5 Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 for Test 1 and Test 2 Table H.3.1-6 with Conditions gapFR1, Pattern #4 and gap offset = 9 for Test 3 and Test 4 Table H.3.1-7 with Condition INTER-FREQ Table H.3.7-1 with Condition DRX.1 and Gap and INTER-FREQ for Test 1 and Test 3 Table H.3.7-1 with Condition DRX.7 and Gap and INTER-FREQ for Test 2 and Test 4
Specific message contents exceptions for Test Configuration 6.6.2.2-1	Table H.3.1-3 with Conditions INTER-FREQ MO and Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5
Specific message contents exceptions for Test Configuration 6.6.2.2-2	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4
Specific message contents exceptions for Test Configuration 6.6.2.2-3	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4

# 6.6.2.2.5 Test requirement

Table 6.6.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.2.5-1: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection

Parameter		Unit	Test	Cell 1	Cell 2	
			configuratio n	T1 T2	T1 T2	
NR RF Chann	nel Number		Config 1,2,3	1	2	
Duplex mode			Config 1		DD	
			Config 2,3		TDD	
TDD configura	ation		Config 1		pplicable	
			Config 2 Config 3		Conf.1.1 Conf.2.1	
BW <sub>channel</sub>		MHz	Config 1,2		RB,c = 52	
			Config 3	40: N <sub>F</sub>	RB,c = 106	
BWP BW		MHz	Config 1,2	10: N	RB,c = 52	
	T		Config 3		RB,c = 106	
BWP	Initial DL BWP		Config 1, 2,	DLBWP.0.1	NA	
configuratio n	Initial UL BWP		3	ULBWP.0.1	NA	
	Dedicated DL			DLBWP.1.1	NA NA	
	BWP			DLBWF.1.1	IVA	
	Dedicated UL BWP			ULBWP.1.1	NA	
TRS configura	ation		Config 1	TRS.1.1 FDD	NA	
			Config 2	TRS.1.1 TDD	NA	
			Config 3	TRS.1.2 TDD	NA	
OCNG Patter	ns		Config 1,2,3	OP.1	OP.1	
PDSCH Refer	rence		Config 1	SR.1.1 FDD	-	
measurement	t channel		Config 2	SR.1.1 TDD		
			Config 3	SR 2.1 TDD		
RMSI CORES	RMSI CORESET Reference		Config 1	CR.1.1 FDD	-	
Channel			Config 2	CR.1.1 TDD		
			Config 3	CR 2.1 TDD		
Dedicated CORESET Reference Channel			Config 1	CCR.1.1 FDD CCR.1.1 TDD	-	
Reference Cr	annei		Config 2 Config 3	CCR.1.1 TDD		
SSB paramet	ers		Config 1	SSB.1 FR1	SSB.5 FR1	
political			Config 2	SSB.1 FR1	SSB.5 FR1	
			Config 3	SSB.2 FR1	SSB.6 FR1	
SMTC configu	uration		Config 1	SMTC.2	SMTC.5	
			Config 2, 3	SMTC.1	SMTC.4	
PDSCH/PDC	CH subcarrier	kHz	Config 1,2		15	
spacing	. DOO 4 . COO		Config 3		30	
EPRE ratio of						
to SSS	PBCH DMRS					
EPRE ratio of DMRS	PBCH to PBCH					
EPRE ratio of to SSS	EPRE ratio of PDCCH DMRS					
EPRE ratio of PDCCH to PDCCH DMRS			Config 1,2,3	0	0	
	EPRE ratio of PDSCH DMRS		3 , ,=			
EPRE ratio of PDSCH	PDSCH to					
EPRE ratio of	OCNG DMRS					
to SSS(Note of EPRE ratio of	OCNG to					
OCNG DMRS	O (NOTE 1)	dBm/15	Config 1,2,3	-98	-98	
$N_{oc}$		kHz	55g 1,2,5			

$N_{oc}$ Note2	dBm/S	Config 1,2	-6	98	,	-98
	CS	Config 3	-9	95	,	-95
SS-RSRP Note 3	dBm/S	Config 1,2	-94	-94	-Infinity	-91
	CS	Config 3	-91	-91	-Infinity	-88
$\hat{E}_{s}/I_{ot}$	dB	Config 1,2,3,4,5,6	4	4	-Infinity	7
$\hat{E}_s/N_{oc}$	dB	Config 1,2,3	4	4	-Infinity	7
Io <sup>Note3</sup>	dBm/9. 36MHz	Config 1,2	-64.59	-64.59	-70.05	-62.2
	dBm/38 .16MHz	Config 3	-58.49	-58.49	-63.94	-56.15
Propagation Condition		Config 1,2,3	AW	'GN	A۱	WGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1080 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 2 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 10240 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 3 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1080 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 4 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 10240 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1, 2, 3 and 4 UE is not required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.2.3 Void

6.6.2.4 Void

6.6.2.5 NR SA FR1-FR1 event-triggered reporting in non-DRX with SSB time index detection

6.6.2.5.1 Test purpose

To verify that the UE makes correct reporting of an event in non-DRX within inter-frequency NR cell search requirements with SSB time index detection in TS 38.133 [6] clause 9.3.4.

6.6.2.5.4.1

# 6.6.2.5.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards. Test 1 is applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 2 is applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

6.6.2.5.3 Minimum conformance requirements

Initial conditions

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.5.

6.6.2.5.4 Test description

This test shall be tested using any of the test configurations in Table 6.6.2.5.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.5.4.1-2. Test environment parameters are given in Table 6.6.2.5.4.1-3.

Table 6.6.2.5.4.1-1: SA FR1-FR1 event triggered reporting tests in non-DRX with SSB time index detection supported test configurations

Test Case ID	Description			
6.6.2.5-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode			
6.6.2.5-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode			
6.6.2.5-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode			
Note 1: The UE is only required to be tested in one of the supported test configurations				
Note 2: target N	Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell			

Table 6.6.2.5.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection in non-DRX

Parameter	Unit	Test	Va	alue	Comment		
		configurati on	Test 1	Test 2			
NR RF Channel Number		Config 1,2,3	1, 2		1, 2		Two FR1 NR carrier frequencies are used
Active cell		Config 1,2,3	NR cell 1 (Pcell)		NR Cell 1 is on NR RF channel number 1		
Neighbour cell		Config 1,2,3	NR cell2		NR cell 2 is on NR RF channel number 2		
Gap Pattern Id		Config 1,2,3	0	4	As specified in TS 38.133 clause 9.1.2-1		
Measurement gap offset		Config 1,2,3	9	9			
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Normal				
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0		L3 filtering is not used		
DRX		Config 1,2,3	OFF		DRX is not used		
Time offset between		Config 1	3ms		Asynchronous cells.		
serving and neighbour					The timing of Cell 2 is 3ms later		
cells		Cartin 0.0			than the timing of Cell 1.		
		Config 2,3	3μs		Synchronous cells		
T1	S	Config 1,2,3	5				
T2	s	Config 1,2,3	1.1	1			

Table 6.6.2.5.4.1-3: Environment test parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in non-DRX

Parameter	Value		Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	I in Annex E, Table E.4-1 and TS 3	8.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.2.5.4.1-1.				
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.4				
Exceptions to connection diagram		apable UEs without any 2Rx RF A.3.2.5.1 for DUT part and				

<sup>1.</sup> Message contents are defined in clause 6.6.2.5.4.3.

<sup>2.</sup> There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Annex C.1.2.

## 6.6.2.5.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1 measurement gap pattern configuration # 0 as defined in Table 6.6.2.5.4.1-2 is provided for UE that does not support per-FR gap and in test 2 measurement gap pattern configuration #4 as defined in Table 6.6.2.5.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.5.4.1-2.
- 3. The SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.5.4.1-2. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1040 ms for Test 1 and 880 ms for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR
  - if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.5.4.1-2 as appropriate.

## 6.6.2.5.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.5.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

	Default Message Contents
Common contents of system information	
blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQ
	Table H.3.1-4 with A3-offset = -6dB and Condition SSB Index Table H.3.1-5
	Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 for Test 1
	Table H.3.1-6 with Conditions gapFR1, Pattern #4 and gap offset = 9 for Test 2
	Table H.3.1-7 with Conditions INTER-FREQ and SSB Index
Specific message contents exceptions for	Table H.3.1-3 with Conditions INTER-FREQ MO
Test Configuration 6.6.2.5-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5
Specific message contents exceptions for	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous
Test Configuration 6.6.2.5-2	Cells
0 10	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4
Specific message contents exceptions for	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous
Test Configuration 6.6.2.5-3	cells
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4

# 6.6.2.5.5 Test requirement

Table 6.6.2.4.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.5.1-3: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection

NR RF Channel Number	Para	meter	Unit Test		Cell 1		Cell 2	
Duplex mode				configuratio				
Config 2.3   TDD	NR RF Chann	el Number		Config 1,2,3	1 2			2
Config 1	Duplex mode			Config 1	FDD			
Config 2   TDDConf.1.1								
Config 3   TIDCOnf.2.1	TDD configura	tion						
BWcharmer    MHz   Config 1.2   10: Nesp. = 52   Config 3   40: Nesz. = 106   Mesp. = 52   Config 3   40: Nesz. = 106   Mesp. = 52								
Config 3	RWchannel		MHz					
BWP   BWP   Configuration   Configuration   BWP   Configuration   BWP   Initial UL BWP   Dedicated DL BWP   Dedicated DL BWP   Dedicated UL BWP	Dividianie							
BWP   Configuration   BWP   Initial DL BWP   Dedicated DL BWP   Dedicated DL BWP   Dedicated UL BWP   Dedi	BWP BW		MHz	Config 1,2		10: N	$I_{RB,c} = 52$	
BWP   Initial UL   BWP   Dedicated DL   BWP   Dedicated UL   DEDICATION   DEDCATION   DEDICATION   DEDICATION   DEDICATION   DEDICATION   DEDC		T		Config 3			RB,c = 106	
Initial UL BWP					DLBW	/P.0.1		NA
BWP   Dedicated DL BWP   Dedicated UL BWP   Dedicated Config 1   TRS.1.1 FDD   NA   NA   Dedicated Config 3   TRS.1.2 TDD   NA   Dedicated Config 1   SR.1.1 FDD   Dedicated Config 3   SR 2.1 TDD   Dedicated Coreset   Config 1   CR.1.1 FDD   Dedicated Coreset   Config 3   CR.1.1 TDD   Dedicated Coreset   Config 1   CR.1.1 FDD   Dedicated Coreset   Config 3   CR.1.1 TDD   CR.1.1 TDD   Config 3   CR.1.1 TDD	comiguration			-	ULBW	/P.0.1		NA
BWP   Dedicated UL BWP   Dedic		BWP		Config 1, 2,				
Dedicated UL BWP				3	DLBW	/P.1.1		NA
BWP								
Config 1					ULBW	/P.1.1		NA
Config 2   TRS.1.1 TDD	TRS configura			Config 1	TRS.1.	.1 FDD		NA
Config 1,2,3	J			Config 2	TRS.1.	.1 TDD		
Description								
Config 2   SR.1.1 TDD	OCNG Pattern	ıs		Config 1,2,3	OF	P.1	(	OP.1
Config 2   SR.1.1 TDD	PDSCH Refere	ence		Config 1	SR 1 <sup>-</sup>	1 FDD		_
Config 3							1	
RMSI CORESET Reference								
Channel         Config 2         CR.1.1 TDD           Config 3         CR 2.1 TDD           Pedicated CORESET         Config 1         CCR.1.1 FDD           Reference Channel         Config 2         CCR.1.1 FDD           Config 3         CCR.2.1 TDD         Config 3           SSB parameters         Config 1         SSB.1 FR1         SSB.5 FR1           Config 2         SSB.1 FR1         SSB.5 FR1           Config 3         SSB.2 FR1         SSB.6 FR1           SMTC configuration         Config 1         SMTC.2         SMTC.5           Config 1         SMTC.2         SMTC.4         SMTC.4           PDSCH/PDCCH subcarrier spacing         kHz         Config 1.2         15           EPRE ratio of PSS to SSS         EPRE ratio of PSS to SSS         EPRE ratio of PBCH DMRS to SSS         30           EPRE ratio of PBCH to PBCH DMRS to SSS         Config 1,2,3         0         0           EPRE ratio of PDCCH DMRS to SSS         Config 1,2,3         0         0           EPRE ratio of PDSCH to PBCH DMRS to SSS         Config 1,2,3         0         0           EPRE ratio of PDSCH DMRS to SSS(Note 1)         Config 1,2,3         0         0           EPRE ratio of OCNG DMRS to SSS(Note 1)         CONG DMRS (Note 1)	RMSI CORES	ET Reference						-
Dedicated CORESET   Reference Channel   Config 1   CCR.1.1 FDD   Config 2   CCR.1.1 TDD   Config 3   CCR.2.1 TDD	Channel			Config 2				
Config 2   CCR.1.1 TDD								
Config 3   CCR.2.1 TDD								-
Config 1   SSB.1 FR1   SSB.5 FR1	Reference Cha	Reference Channel					-	
Config 2   SSB.1 FR1   SSB.5 FR1	SSB paramete	ers					SSI	3.5 FR1
Config 1   SMTC.2   SMTC.5	TOTAL PROMINENT						SSB.5 FR1	
Config 1   SMTC.2   SMTC.5				SSI	3.6 FR1			
PDSCH/PDCCH subcarrier	SMTC configu	ration		Config 1	SMT	TC.2	SI	MTC.5
Config 3   30				Config 2, 3	SMTC.1 SMTC		MTC.4	
EPRE ratio of PSS to SSS  EPRE ratio of PBCH DMRS to SSS  EPRE ratio of PBCH to PBCH DMRS  EPRE ratio of PDCCH DMRS to SSS  EPRE ratio of PDCCH to PDCCH DMRS  EPRE ratio of PDSCH DMRS to SSS  EPRE ratio of PDSCH DMRS to SSS  EPRE ratio of PDSCH to PDSCH EPRE ratio of OCNG DMRS to SSS(Note 1)  EPRE ratio of OCNG to OCNG DMRS (Note 1)  Nocc    Note2		CH subcarrier	kHz					
EPRE ratio of PBCH DMRS to SSS  EPRE ratio of PBCH to PBCH DMRS  EPRE ratio of PDCCH DMRS to SSS  EPRE ratio of PDCCH to PDCCH DMRS  EPRE ratio of PDSCH DMRS to SSS  EPRE ratio of PDSCH DMRS to SSS  EPRE ratio of PDSCH to PDSCH EPRE ratio of OCNG DMRS to SSS(Note 1)  EPRE ratio of OCNG to OCNG DMRS (Note 1)  Note2  dBm/15 kHz  Adam/15 kHz		D00 to 000		Config 3			30	
EPRE ratio of PBCH to PBCH DMRS         EPRE ratio of PDCCH DMRS to SSS           EPRE ratio of PDCCH to PDCCH DMRS         Config 1,2,3           EPRE ratio of PDSCH DMRS to SSS         Config 1,2,3           EPRE ratio of PDSCH DMRS to SSS         EPRE ratio of PDSCH to PDSCH           EPRE ratio of OCNG DMRS to SSS(Note 1)         EPRE ratio of OCNG to OCNG DMRS (Note 1)           EPRE ratio of OCNG DMRS (Note 1)         -98								
DMRS         EPRE ratio of PDCCH DMRS to SSS         Config 1,2,3         0         0           EPRE ratio of PDCCH to PDCCH DMRS to SSS         Config 1,2,3         0         0           EPRE ratio of PDSCH DMRS to SSS         EPRE ratio of PDSCH to PDSCH         PDSCH         EPRE ratio of OCNG DMRS to SSS(Note 1)           EPRE ratio of OCNG to OCNG DMRS (Note 1)         Amonths of Documents of Do	to SSS							
EPRE ratio of PDCCH DMRS to SSS  EPRE ratio of PDCCH to PDCCH DMRS  EPRE ratio of PDSCH DMRS to SSS  EPRE ratio of PDSCH DMRS to SSS  EPRE ratio of PDSCH to PDSCH  EPRE ratio of OCNG DMRS to SSS(Note 1)  EPRE ratio of OCNG to OCNG DMRS (Note 1)  Noce Note2  dBm/15 kHz  Config 1,2,3  0  0  -98  -98		PBCH to PBCH						
EPRE ratio of PDCCH to PDCCH DMRS         Config 1,2,3         0         0           EPRE ratio of PDSCH DMRS to SSS         EPRE ratio of PDSCH to PDSCH         PDSCH         EPRE ratio of OCNG DMRS to SSS(Note 1)           EPRE ratio of OCNG to OCNG DMRS (Note 1)         FOR CONG DMRS (Note 1)         -98         -98           Noce Note2         dBm/15 kHz         -98         -98	_							
PDCCH DMRS         Config 1,2,3         0           EPRE ratio of PDSCH DMRS to SSS         6         0           EPRE ratio of PDSCH to PDSCH         0         0           EPRE ratio of OCNG DMRS to SSS(Note 1)         0         0           EPRE ratio of OCNG to OCNG DMRS (Note 1)         0         0           Avore Note2         dBm/15 kHz         -98         -98								
to SSS  EPRE ratio of PDSCH to PDSCH  EPRE ratio of OCNG DMRS to SSS(Note 1)  EPRE ratio of OCNG to OCNG DMRS (Note 1)  Noce   dBm/15 kHz   -98   -98				Config 1,2,3	(	)		0
EPRE ratio of PDSCH to PDSCH  EPRE ratio of OCNG DMRS to SSS(Note 1)  EPRE ratio of OCNG to OCNG DMRS (Note 1)  Noce   Absolute	EPRE ratio of PDSCH DMRS							
EPRE ratio of OCNG DMRS to SSS(Note 1)         EPRE ratio of OCNG to OCNG DMRS (Note 1)           Image: Company of the properties of	EPRE ratio of	EPRE ratio of PDSCH to						
to SSS(Note 1)  EPRE ratio of OCNG to OCNG DMRS (Note 1)  Noc Note2								
EPRE ratio of OCNG to         OCNG DMRS (Note 1)           Note2         dBm/15 kHz								
N <sub>oc</sub> Note2 dBm/15 -98 -98 -98	EPRE ratio of OCNG DMRS	OCNG to						
	11 . 0	·			-9	98		-98
			KΠZ	Config 1.2	<b>-</b> Q	98		-98

$N_{oc}^{ m Note2}$	dBm/S CS	Config 3	-9	95		-95
SS-RSRP Note 3	dBm/S	Config 1,2	-94	-94	-Infinity	-91
	CS	Config 3	-91	-91	-Infinity	-88
$\hat{E}_{s}/I_{ot}$	dB	Config 1,2,3	4	4	-Infinity	7
$\hat{E}_s/N_{oc}$	dB	Config 1,2,3	4	4	-Infinity	7
Io <sup>Note3</sup>	dBm/9.3 6MHz	Config 1,2	-64.59	-64.59	-70.05	-62.2
	dBm/38. 16MHz	Config 3	-58.4	-58.49	-63.94	-56.15
Propagation Condition		Config 1,2,3	AW	GN	A۱	WGN

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be
- Note 3: SS-RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1040 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 2 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 880 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1 and 2 UE is required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.2.6 NR SA FR1-FR1 event-triggered reporting in DRX with SSB time index detection

## 6.6.2.6.1 Test purpose

To verify that the UE makes correct reporting of an event in DRX within inter-frequency NR cell search requirements with SSB time index detection in TS 38.133 [6] clause 9.3.4.

## 6.6.2.6.2 Test applicability

This test applies to all types of NR UE Release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle. Test 1 and Test 2 are applicable to UEs not supporting per-FR gap (IndependentGapConfig, as defined in TS 38.306 [11]) and Test 3 and Test 4 are applicable only to UEs supporting per-FR gap and Gap Pattern Id 4.

## 6.6.2.6.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.2.0.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.2.6.

6.6.2.6.4 Test description

6.6.2.6.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.2.6.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.2.6.4.1-2. Test environment parameters are given in Table 6.6.2.6.4.1-3.

Table 6.6.2.6.4.1-1: SA FR1-FR1 event triggered reporting tests in DRX with SSB time index detection supported test configurations

Test Case ID	Description				
6.6.2.6-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode				
6.6.2.64-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode				
6.6.2.6-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode				
Note 1: The UE is only required to be tested in one of the supported test configurations					
Note 2: target N	Note 2: target NR cell has the same SCS, BW and duplex mode as NR serving cell				

Table 6.6.2.6.4.1-2: General test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection

Parameter	Unit	Test		Va	lue		Comment
		configurati	Test	Test	Test	Test	
		on	1	2	3	4	
NR RF Channel Number		Config 1,2,3		1,	, 2		Two FR1 NR carrier frequencies are used
Active cell		Config 1,2,3	NR ce	II 1 (Pce	ell)		NR Cell 1 is on NR RF channel number 1
Neighbour cell		Config 1,2,3	NR ce	II2			NR cell 2 is on NR RF channel number 2
Gap Pattern Id		Config 1,2,3	0		4		As specified in TS 38.133 clause 9.1.2-1
Measurement gap offset		Config 1,2,3	9		9		
A3-Offset	dB	Config 1,2,3	-6				
Hysteresis	dB	Config 1,2,3	0				
CP length		Config 1,2,3	Norma	al			
TimeToTrigger	S	Config 1,2,3	0				
Filter coefficient		Config 1,2,3	0				L3 filtering is not used
DRX		Config 1,2,3	DRX .1	DRX .7	DRX .1	DRX .7	As specified in clause A.5
Time offset between serving and neighbour cells		Config 1	3ms				Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		Config 2,3	3µs				Synchronous cells
T1	S	Config 1,2,3	5				
T2	S	Config 1,2,3	1.3	13.5	1.3	13.5	

Table 6.6.2.6.4.1-3: Test Environment parameters for SA inter-frequency event triggered reporting for FR1 without SSB time index detection in DRX

Parameter		Value	Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	l in Annex E, Table E.4-1 and TS 38	3.508-1 [14] clause 4.3.1 and 4.4.2.
Channel bandwidth	As specified	by the test configuration selected f	rom Table 6.6.2.6.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to connection diagram		apable UEs without any 2Rx RF A.3.2.5.1 for DUT part and	

- 1. Message contents are defined in clause 6.6.2.6.4.3.
- 2. There are two NR cells on two carriers specified in the test. Cell 1 is the cell used for connection setup and Cell 2 is a target cell on a different carrier than Cell 1. The power levels and settings for Cell 2 are set according to Table Annex C.1.2.

## 6.6.2.6.4.2 Test procedure

In this test, there are two cells: NR cell 1 as PCell in FR1 on NR RF channel 1 and NR cell 2 as neighbour cell in FR1 on NR RF channel 2.

In test 1&2 measurement gap pattern configuration # 0 as defined in Table 6.6.2.6.4.1-2 is provided for UE that does not support per-FR gap and in test 3&4 measurement gap pattern configuration #4 as defined in Table 6.6.2.6.4.1-2 is provided for UE that supports per-FR gap.

In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of NR cell 2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.2.6.4.1-2 and Table 6.6.2.6.5-1.
- 3. The SS shall transmit an *RRCReconfiguration* message.
- 4. The UE shall transmit *RRCReconfigurationComplete* message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.2.6.5-1. T2 Starts.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event A3. If the overall delays measured from the beginning of time period T2 is less than 1280 ms for Test 1, 13440 ms for Test 2, 1280 ms for Test 3 and 13440 ms for Test 4, then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receives the MeasurementReport message in step 6 or when T2 expires, the SS shall:
  - transmit RRCRelease message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 3 physical cell identity = ((current cell 3 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:

- if the RRC Connection Release has been sent, transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.), OR
- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.
- 11. Repeat step 1-10 for each sub-test in Table 6.6.2.6.4.1-2 as appropriate.

## 6.6.2.6.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.2.6.4.3-1: Common Exception messages SA inter frequency event triggered reporting without SSB time index detection in non-DRX

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-FREQ Table H.3.1-4 with A3-offset = -6dB and Condition SSB Index Table H.3.1-5 Table H.3.1-6 with Conditions gapUE, Pattern #0 and gap offset = 9 for Test 1 and Test 2 Table H.3.1-6 with Conditions gapFR1 and Pattern #4 and gap offset = 9 for Test 3 and Test 4 Table H.3.1-7 with Conditions INTER-FREQ and SSB Index Table H.3.7-1 with Condition DRX.1 and Gap and INTER-FREQ for Test 1 and Test 3 Table H.3.7-1 with Condition DRX.7 and Gap and INTER-FREQ for Test 2 and Test 4
Specific message contents exceptions for Test Configuration 6.6.2.6-1	Table H.3.1-3 with Conditions INTER-FREQ MO Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.5
Specific message contents exceptions for Test Configuration 6.6.2.6-2	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4
Specific message contents exceptions for Test Configuration 6.6.2.6-3	Table H.3.1-3 with Conditions INTER-FREQ MO and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.4

## 6.6.2.6.5 Test requirement

Table 6.6.2.6.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.2.6.5-1: Cell specific test parameters for SA inter-frequency event triggered reporting for FR1 with SSB time index detection

Pa	rameter	Unit Test		Cell 1		Cell 2	
			configuratio n	T1	T2	T1	T2
NR RF Chai	nnel Number		Config 1,2,3	,			2
Duplex mod	е		Config 1			FDD	
•			Config 2,3		-	TDD	
TDD configu	uration		Config 1			pplicable	
			Config 2			Conf.1.1	
			Config 3			Conf.2.1	
BW <sub>channel</sub>		MHz	Config 1,2			I <sub>RB,c</sub> = 52	
BWP BW		MHz	Config 3 Config 1,2			<sub>RB,c</sub> = 106 I <sub>RB,c</sub> = 52	
DVVP DVV		IVITZ	Config 1,2		10. N	$_{RB,c} = 52$ $_{RB,c} = 106$	
BWP	Initial DL BWP		Coming 5	DLBW		KB,C = 100	NA
configurati	Initial UL BWP			ULBW			NA
on	Dedicated DL BWP		Config 1, 2, 3	DLBW	/P.1.1		NA
	Dedicated UL BWP			ULBW	/P.1.1		NA
TRS configu	ıration		Config 1	TRS.1.			NA
•			Config 2	TRS.1.			NA
			Config 3	TRS.1.			NA
OCNG Patte	erns		Config 1,2,3	OF	P.1	'	OP.1
PDSCH Ref	erence		Config 1	SR.1.	1 FDD		-
measureme	nt channel		Config 2	SR.1.			
			Config 3	SR 2.			
RMSI CORE	SET Reference		Config 1	CR.1.			-
Channel			Config 2	CR.1.			
			Config 3	CR 2.			
Dedicated C			Config 1	CCR.1			-
Reference C	Channel		Config 2	CCR.1			
SSB parame	otore		Config 3 Config 1	CCR.2		99	B.5 FR1
SSB parame	31615		Config 2				B.5 FR1
			Config 3	SSB.2			B.6 FR1
SMTC confi	guration		Config 1	SMT			MTC.5
			Config 2, 3	SM	C.1	S	MTC.4
PDSCH/PD	CCH subcarrier	kHz	Config 1,2			15	
spacing	CONTRADCAMEN	KI IZ	Config 3			30	
	of PSS to SSS		- comig c				
EPRE ratio to SSS	of PBCH DMRS						
EPRE ratio	of PBCH to PBCH						
	of PDCCH DMRS						
to SSS	of PDCCH to						
PDCCH DM			Config 1,2,3	(	)		0
EPRE ratio of PDSCH DMRS to SSS			3 , , -				· ·
	of PDSCH to						
EPRE ratio	PRE ratio of OCNG DMRS  o SSS(Note 1)						
EPRE ratio	of OCNG to						
$N_{oc}$ Note2	(10010 1)	dBm/15 kHz		- <u>G</u>	18		-98
$N_{oc}$ Note2		dBm/S	Config 1,2	-6	18		-98
		CS	Config 3		5		-95
SS-RSRP No	ote 3		Config 1,2	-94	-94	-Infinity	-91

	dBm/S CS	Config 3	-91	-91	-Infinity	-88
$\hat{E}_{s}/I_{ot}$	dB	Config 1,2,3,4,5,6	4	4	-Infinity	7
$\hat{E}_s/N_{oc}$	dB	Config 1,2,3	4	4	-Infinity	7
Io <sup>Note3</sup>	dBm/9.3 6MHz	Config 1,2	-64.59	-64.59	-70.05	-62.26
	dBm/38. 16MHz	Config 3	-58.49	-58.49	-63.94	-56.15
Propagation Condition		Config 1,2,3	AW	GN	A۱	NGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

In test 1 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1280 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 2 with per-UE gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 13440 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 3 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 1280 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 4 with per-FR gap, the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 13440 ms from the beginning of time period T2. The UE shall not send event triggered measurement reports, as long as the reporting criteria are not fulfilled. The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

In test 1, 2, 3 and 4 UE is required to report SSB time index.

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

6.6.2.7 Void

6.6.2.8 Void

# 6.6.3 Inter-RAT Measurements

6.6.3.0 Minimum conformance requirements

6.6.3.0.1 Minimum conformance requirements for inter-RAT event triggered reporting to E-UTRAN FDD

The requirements are applicable for NR-E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements.

In the requirements, an E-UTRAN FDD cell is considered to be detectable when:

- RSRP related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.2 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RSRQ related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.3 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RS-SINR related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.5 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.19 of TS 36.133 [23].

## 6.6.3.0.1.1 Requirements when no DRX is used

When the UE requires measurement gaps to identify and measure inter-RAT cells and an appropriate measurement gap pattern is scheduled, the UE shall be able to identify a new detectable FDD cell within  $T_{Identify, E-UTRAN \, FDD}$  according to the following expression:

$$T_{Identify,E-UTRAN\ FDD} = T_{BasicIdentify} * \frac{480}{T_{Inter1}} * CSSF_{interRAT} \quad ms,$$

where:

 $T_{\text{BasicIdentify}} = 480 \text{ ms},$ 

T<sub>Inter1</sub> is defined in TS 38.133 [6] section 9.4.1,

 $CSSF_{interRAT} = CSSF_{within\_gap\_i\_}$  is the scaling factor for the measured inter-RAT E-UTRA carrier i which is calculated as specified in TS 38.133 [6] section 9.1.5.2.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of  $T_{\text{Measure, E-UTRAN FDD}}$  defined in Table 6.6.3.0.1.1-1.

Table 6.6.3.0.1.1-1: Measurement period and measurement bandwidth

Configuration	Physical Layer Measurement period: T <sub>Measure</sub> , E-UTRAN FDD [ms]	Measurement bandwidth [RB]			
0	480 x CSSF <sub>interRAT</sub>	6			
1 (note 1)	240 x CSSFinterRAT	50			
NOTE 1: This configuration is optional.					

The UE shall be capable of identifying and performing NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements of at least 4 E-UTRAN FDD cells per E-UTRA FDD carrier frequency layer for up to 7 E-UTRA FDD carrier frequency layers.

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN FDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.2. The NR – E-UTRAN FDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.3. The NR – E-UTRAN FDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.5.

# 6.6.3.0.1.2 Requirements when DRX is used

When DRX is in use and measurement gaps are configured, the UE shall be able to identify a new detectable E-UTRAN FDD cell within  $T_{Identify, E-UTRAN \, FDD}$  specified in Table 6.6.3.0.1.2-1. When RRM enhancement for high speed is configured the UE shall be able to identify a new detectable E-UTRAN FDD cell within  $T_{Identify, E-UTRAN \, FDD}$  specified in Table 6.6.3.0.1.2-2.

Table 6.6.3.0.1.2-1: Requirement to identify a newly detectable E-UTRAN FDD cell

DRX cycle length (s)	Tidentify, E-UTRAN FDD (s) (DRX cycles)						
	Gap period = 40 ms, 20 ms	Gap period = 80 ms					
≤0.16	Non-DRX requirements in	Non-DRX requirements in					
	Section 6.6.3.0.1.1 apply	Section 6.6.3.0.1.1 apply					
0.256	5.12*K (20*CSSFinterRAT)	7.68*K (30*CSSF <sub>interRAT</sub> )					
0.32	6.4*K (20*CSSFinterRAT)	7.68*K (24*CSSF <sub>interRAT</sub> )					
0.32< DRX-cycle	Note1 (20*CSSFinterRAT)	Note1 (20*CSSFinterRAT)					
≤10.24							
NOTE 1: The time depends on the DRX cycle length.							
NOTE 2: CSSFinterRAT is	as defined in Section 6.6.3.0.1.1.						

Table 6.6.3.0.1.2-2: Requirement to identify a newly detectable E-UTRAN FDD cell for UE configured with RRM enhancement for high speed

DRX cycle length (s)	T <sub>Identify, E-UTRAN FDD</sub> (s) (DRX cycles)						
	Gap period = 40 ms, 20 ms	Gap period = 80 ms					
≤0.16	Non-DRX requirements in	Non-DRX requirements in					
	clause 9.4.2.2 apply	clause 9.4.2.2 apply					
0.16 <drx cycle<="0.32&lt;/td"><td>Note 1(15*CSSFinterRAT)</td><td></td></drx>	Note 1(15*CSSFinterRAT)						
0.32 <drx <="&lt;/td" cycle=""><td>Note 1(10*CSSFinterRAT)</td><td></td></drx>	Note 1(10*CSSFinterRAT)						
0.64							
DRx cycle = 1.024	Note 1(10*CSSFinterRAT)	Note 1(10*CSSFinterRAT)					
DRx cycle = 1.28	Note 1(8*CSSF <sub>interRAT</sub> )	Note 1(8*CSSF <sub>interRAT</sub> )					
1.28< DRX-cycle	Note1 (20*CSSFinterRAT)	Note1 (20*CSSFinterRAT)					
≤10.24							
NOTE 1: The time depends on the DRX cycle length.							
NOTE 2: CSSFinterRAT is	as defined in clause 9.4.2.2.						

When DRX is in use, the UE shall be capable of performing NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements of at least 4 identified E-UTRAN FDD cells per E-UTRA FDD frequency layer during each layer 1 measurement period, for up to 7 E-UTRA FDD carrier frequency layers, and the UE physical layer shall be capable of reporting NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period  $T_{\text{measure}, E-UTRAN FDD}$  specified in Table 6.6.3.0.1.2-3.

Table 6.6.3.0.1.2-3: Requirement to measure E-UTRAN FDD cells

DRX cycle length (s)	Tmeasure, E-UTRAN FDD (s) (DRX cycles)			
≤0.08	Non-DRX requirements in Section 6.6.3.0.1.1 apply			
0< DRX-cycle ≤10.24	Note1 (5* CSSF <sub>interRAT</sub> )			
NOTE 1: The time depends on the DRX cycle length.				
NOTE 2: CSSF <sub>interRAT</sub> is as defined in Section 6.6.3.0.1.1.				

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN FDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.2. The NR – E-UTRAN FDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.3. The NR – E-UTRAN FDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.5.

## 6.6.3.0.1.3 Measurement reporting requirements for Event-Triggered Reporting

The reported NR – E-UTRAN FDD RSRP, RSRQ, and RS-SINR measurements contained in event-triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.2.2, 10.2.3, and 10.2.5, respectively.

The UE shall not send any event-triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI<sub>DCCH</sub> where TTI<sub>DCCH</sub> is the duration of subframe or slot or subslot when the measurement report is

transmitted on the PUSCH with subframe or slot or subslot duration. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T  $_{\text{Identify, E-UTRAN FDD}}$  defined in clauses 6.6.3.0.1.1 and 6.6.3.0.1.2 without DRX and with DRX, respectively. When L3 filtering is used, an additional delay can be expected.

If a cell which has been detectable at least for the time period  $T_{Identify, E-UTRAN\,FDD}$  becomes undetectable for a period  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event as per TS 38.331 [13], the event triggered measurement reporting delay shall be less than  $T_{Measure,\,E-UTRAN\,FDD}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 38.133 [6] clause 9.4.2.

# 6.6.3.0.2 Minimum conformance requirements for inter-RAT event triggered reporting to E-UTRAN TDD

The requirements are applicable for NR-E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements.

In the requirements, an E-UTRAN TDD cell is considered to be detectable when:

- RSRP related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.2 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RSRQ related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.3 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.3 of TS 36.133 [23],
- RS-SINR related conditions in the accuracy requirements in TS 38.133 [6] Section 10.2.5 are fulfilled for a corresponding Band, together with the corresponding side conditions in Annex B.2.3 and Annex B.3.19 of TS 36.133 [23].

## 6.6.3.0.2.1 Requirements when no DRX is used

When the UE requires measurement gaps to identify and measure inter-RAT cells and an appropriate measurement gap pattern is scheduled, the UE shall be able to identify a new detectable TDD cell within  $T_{Identify, E-UTRAN \, TDD}$  according to the following expression:

- When configuration 0 or configuration 1 in Table 6.6.3.0.2-1 is applied,

$$T_{Identify,E-UTRAN\,TDD} = T_{BasicIdentify} * \frac{480}{T_{Inter1}} * CSSF_{interRAT} \quad ms$$
 ,

- When configuration 2 or configuration 3 in Table 6.6.3.0.2-1 is applied,

$$T_{Identify,E-UTRAN\,TDD} = (T_{BasicIdentify} * \frac{480}{T_{Inter1}} + 240) * CSSF_{interRAT} ms,$$

where:

 $T_{BasicIdentify} = 480 \text{ ms},$ 

T<sub>Inter1</sub> is defined in TS 38.133 [6] section 9.4.1,

 $CSSF_{interRAT} = CSSF_{within\_gap\_i\_}$  is the scaling factor for the measured inter-RAT E-UTRA carrier i which is calculated as specified in TS 38.133 [6] section 9.1.5.2.

Identification of a cell shall include detection of the cell and additionally performing a single measurement with measurement period of  $T_{\text{Measure, E-UTRAN TDD}}$  defined in Table 6.6.3.0.2.1-1.

Table 6.6.3.0.2.1-1: T<sub>Measure, E-UTRAN TDD</sub> for different configurations

Configuration	Measurement bandwidth		Number of UL/DL sub- frames per half frame (5 ms)		T <sub>Measure</sub> , E-UTRAN TDD [ <b>ms</b> ]	
	[RB]	DL	UL	Normal CP	Extende d CP	

0	6	2	2	19760 · T <sub>s</sub>	$20480 \cdot T_{\rm s}$	480 x	
						CSSFinterRAT	
1 (note 1)	50	2	2	$19760 \cdot T_{s}$	$20480 \cdot T_{\rm s}$	240 x	
				5	8	CSSFinterRAT	
2	6	1	3	$19760 \cdot T_{s}$	$20480 \cdot T_{\rm s}$	720 x	
				3	3	CSSFinterRAT	
3 (Note 1)	50	1	3	19760 · T <sub>s</sub>	$20480 \cdot T_{c}$	480 x	
·				5	8	CSSFinterRAT	
NOTE 1: This o	NOTE 1: This configuration is optional						

NOTE 1: This configuration is optional.

NOTE 2: Void

The UE shall be capable of identifying and performing NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements of at least 4 E-UTRAN TDD cells per E-UTRA TDD carrier frequency layer for up to 7 E-UTRA TDD carrier frequency layers.

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN TDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.2. The NR – E-UTRAN TDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.3. The NR – E-UTRAN TDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] section 10.2.5.

## 6.6.3.0.2.1 Requirements when DRX is used

When DRX is in use and measurement gaps are configured, the UE shall be able to identify a new detectable E-UTRAN TDD cell within  $T_{Identify, E-UTRAN \, TDD}$  specified in Table 6.6.3.0.2.1-1. When RRM enhancement for high speed is configured the UE shall be able to identify a new detectable E-UTRAN TDD cell within  $T_{Identify, E-UTRAN \, TDD}$  specified in Table 6.6.3.0.2.1-2.

Table 6.6.3.0.2.1-1: Requirement to identify a newly detectable E-UTRAN TDD cell

DRX cycle length (s)	T <sub>Identify, E-UTRAN TDD</sub> (s) (DRX cycles)						
	Gap period = 40 ms, 20 ms	Gap period = 80 ms					
≤0.16	Non-DRX requirements in	Non-DRX requirements in					
	Section 6.6.3.0.2.1 apply	Section 6.6.3.0.2.1 apply					
0.256	5.12*K (20*CSSFinterRAT)	7.68*K (30*CSSFinterRAT)					
0.32	6.4*K (20*CSSFinterRAT)	7.68*K (24*CSSFinterRAT)					
0.32< DRX-cycle ≤10.24 Note1 (20*CSSF <sub>interRAT</sub> ) Note1 (20*CSSF <sub>interRAT</sub> )							
NOTE 1: The time depends on the DRX cycle length.							
NOTE 2: CSSF <sub>interRAT</sub> is as	NOTE 2: CSSF <sub>interRAT</sub> is as defined in Section 6.6.3.0.2.1.						

Table 6.6.3.0.2.1-2: Requirement to identify a newly detectable E-UTRAN TDD cell for UE configured with RRM enhancement for high speed

DRX cycle length (s)	Tidentify, E-UTRAN TDD (s) (DRX cycles)			
	Gap period = 40 ms, 20 ms	Gap period = 80 ms		
≤0.16	Non-DRX requirements in	Non-DRX requirements in		
	clause 9.4.3.2 apply	clause 9.4.3.2 apply		
0.16 <drx cycle<="0.32&lt;/td"><td>Note 1(15*CSSF<sub>interRAT</sub>)</td><td></td></drx>	Note 1(15*CSSF <sub>interRAT</sub> )			
0.32 <drx <="&lt;/td" cycle=""><td>Note 1(10*CSSFinterRAT)</td><td></td></drx>	Note 1(10*CSSFinterRAT)			
0.64				
DRx cycle = 1.024	Note 1(10*CSSFinterRAT)	Note 1(10*CSSFinterRAT)		
DRx cycle = 1.28	Note 1(8*CSSFinterRAT)	Note 1(8*CSSFinterRAT)		
1.28< DRX-cycle	Note1 (20*CSSF <sub>interRAT</sub> )	Note1 (20*CSSF <sub>interRAT</sub> )		
≤10.24				
NOTE 1: The time depends on the DRX cycle length.				

NOTE 1: The time depends on the DRX cycle length. NOTE 2: CSSF<sub>interRAT</sub> is as defined in clause 9.4.3.2.

When DRX is in use, the UE shall be capable of performing NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements of at least 4 identified E-UTRAN TDD cells per E-UTRA TDD frequency layer during each layer 1 measurement period, for up to 7 E-UTRA TDD carrier frequency layers, and the UE physical layer shall be capable of reporting NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements to higher layers with the measurement period  $T_{\text{measure}, E-UTRAN TDD}$  specified in Table 6.6.3.0.2.1-3.

Table 6.6.3.0.2.1-3: Requirement to measure E-UTRAN TDD cells

DRX cycle length (s)	Tmeasure, E-UTRAN TDD (S) (DRX cycles)		
≤0.08	Non-DRX Requirements in Section 6.6.3.0.2.1		
	apply		
0.128	For configuration 2, non-DRX requirements in		
	section 6.6.3.0.2.1 apply,		
	Otherwise: Note1 (5*CSSF <sub>interRAT</sub> )		
0.128 <drx-cycle≤10.24< td=""><td>Note1 (5*CSSF<sub>interRAT</sub>)</td></drx-cycle≤10.24<>	Note1 (5*CSSF <sub>interRAT</sub> )		
NOTE 1: The time depends on the DRX cycle length.			
NOTE 2: CSSF <sub>interRAT</sub> is as defined in Section 6.6.3.0.2.1.			

If higher layer filtering is used, an additional cell identification delay can be expected.

The NR – E-UTRAN TDD RSRP measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.2. The NR – E-UTRAN TDD RSRQ measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.3. The NR – E-UTRAN TDD RS-SINR measurement accuracy for all measured cells shall be as specified in TS 38.133 [6] Section 10.2.5.

## 6.6.3.0.2.3 Measurement reporting requirements for Event-Triggered Reporting

The reported NR – E-UTRAN TDD RSRP, RSRQ, and RS-SINR measurements contained in event-triggered measurement reports shall meet the requirements in TS 38.133 [6] clauses 10.2.2, 10.2.3, and 10.2.5, respectively.

The UE shall not send any event-triggered measurement reports, as long as no reporting criteria are fulfilled.

The measurement reporting delay is defined as the time between an event that will trigger a measurement report and the point when the UE starts to transmit the measurement report over the air interface. This requirement assumes that that the measurement report is not delayed by other RRC signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is: 2 x TTI<sub>DCCH</sub> where TTI<sub>DCCH</sub> is the duration of subframe or slot or subslot when the measurement report is transmitted on the PUSCH with subframe or slot or subslot duration. This measurement reporting delay excludes a delay which caused by no UL resources for UE to send the measurement report.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than T  $_{\text{Identify, E-UTRAN TDD}}$  defined in clauses 6.6.3.0.2.1 and 6.6.3.0.2.2 without DRX and with DRX, respectively. When L3 filtering is used, an additional delay can be expected.

If a cell which has been detectable at least for the time period  $T_{Identify,\,E\text{-}UTRAN\,TDD}$  becomes undetectable for a period  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event as per TS 38.331 [13], the event triggered measurement reporting delay shall be less than  $T_{Measure,\,E\text{-}UTRAN\,TDD}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts while measurement gap has not been available and the L3 filter has not been used.

The normative reference for this requirement is TS 38.133 [6] clause 9.4.3.

# 6.6.3.1 NR SA FR1 – E-UTRAN event-triggered reporting in non-DRX

## 6.6.3.1.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 under the cell search and measurement requirements.

## 6.6.3.1.2 Test applicability

This test applies to all types of NR UE supporting SA FR1 from Release 15 onwards.

# 6.6.3.1.3 Minimum conformance requirements

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.3.1.

## 6.6.3.1.3.1 NR – E-UTRAN FDD requirement

The minimum conformance requirements are specified in clause 6.6.3.0.1.

6.6.3.1.3.2 NR – E-UTRAN TDD requirement

The minimum conformance requirements are specified in clause 6.6.3.0.2.

6.6.3.1.4 Test description

6.6.3.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.3.1.4.1-1.

Table 6.6.3.1.4.1-1: supported test configurations

Test Case ID	Description	
6.6.3.1-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE FDD	
6.6.3.1-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE FDD	
6.6.3.1-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE FDD	
6.6.3.1-4	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE TDD	
6.6.3.1-5	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE TDD	
6.6.3.1-6	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE TDD	
NOTE: The UE is only required to be tested in one of the supported test configurations		

Configure the test equipment and the DUT according to the parameters in Table 6.6.3.1.4.1-2 and Table 6.6.3.1.4.1-3.

Table 6.6.3.1.4.1-2: Initial conditions for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Annex E, Table E.4-2 and TS 38.508-1 [14] sclause 4.3.1.			
Channel bandwidth	As specified by the test configuration selected from Table 6.6.3.1.5-1 and Table 6.6.3.1.5-2			
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection Diagram	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.	
	DUT Part	A.3.2.3.2		
Exceptions to connection diagram	N/A			

Table 6.6.3.1.4.1-3: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

Parameter	Unit	Value	Comment
NR RF Channel Number		1	1 NR carrier frequency is used in the test
LTE RF Channel Number		1	1 LTE carrier frequency is used in the test
Channel Bandwidth	MHz	As specified in Tables	
		6.6.3.1.5-1 and	
		6.6.3.1.5-2.	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in Clause TS 38.133 [6] Table
			9.1.2-1. Per-UE gap pattern.
NR measurement quantity		SS-RSRP	Measurement quantity for Cell 1
Inter-RAT E-UTRAN		RSRP	Measurement quantity for Cell 2
measurement quantity			
b2-Threshold1	dBm	Note 1	SS-RSRP threshold for SS-RSRP
			measurement on cell1 for event B2
b2-Threshold2EUTRA	dBm	-97	E-UTRAN RSRP threshold for SS-RSRP
			measurement on cell1 for event B2
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
T1	S	5	
T2	S	5	
NOTE 1: Values are define	ed in Table 6	5.6.3.1.5-1	

- 1. Message contents are defined in clause 6.6.3.1.4.3.
- 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

#### 6.6.3.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.3.1.5-1 and 6.6.3.1.5-2. Propagation conditions are set according to Annex C clause C.2.2.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.3.1.5-1 and 6.6.3.1.5-2.
- 6. UE shall transmit a MeasurementReport message triggered by Event B2. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6 or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

#### OR

- switch the UE off.

- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14 + 2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED according to TS 38.508-1 [14] clause 4.5.4 (if the paging fails, switches off and on the UE and ensures the UE is in the state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5,
  - if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

## 6.6.3.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.3.1.4.3-1: Common Exception messages NR SA FR1 – E-UTRAN event-triggered reporting in non-DRX

D	efault Message Contents
Common contents of system information	
blocks exceptions	
Default RRC messages and information	Table H.3.1-1
elements contents exceptions	Table H.3.1-2 with Conditions GAP NEEDED and INTER-RAT Table H.3.1-3A Table H.3.1-4A Table H.3.1-5 with Condition INTER-RAT Table H.3.1-6 with Condition Pattern #0 Table H.3.1-7 with Condition INTER-RAT
Specific message content exceptions for Test Configurations 6.6.3.1-1 and 6.6.3.1-4	Table H.3.1-3 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message content exceptions for Test Configurations 6.6.3.1-2, 6.6.3.1-3, 6.6.3.1-5 and 6.6.3.1-6	Table H.3.1-3 with Condition Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

## 6.6.3.1.5 Test requirement

Table 6.6.3.1.5-1 and Table 6.6.3.1.5-2 define the primary level settings including test tolerances for all tests.

Table 6.6.3.1.5-1: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in non-DRX with PCell in FR1

Parameter		Unit	Configuration		Cell 1
				T1	T2
RF channel number	er		1, 2, 3, 4, 5, 6		1
Duplex mode			1, 2, 3		FDD
			4, 5, 6		TDD
TDD Configuration	TDD Configuration SCS=15 KHz		2, 5		Conf.1.1
	SCS=30 KHz		3, 6		Conf.2.1
BW <sub>channel</sub>		MHz	1, 4		c = 52 (FDD)
			2, 5		c = 52 (TDD)
DD0011 (	,		3, 6		= 106 (TDD)
PDSCH reference	measurement		1, 4		1.1 FDD
channel			2, 5		1.1 TDD
CORESET referer	an ahannal		3, 6		2.1 TDD
CORESETTETETET	ice channel		1, 4 2, 5		1.1 FDD 1.1 TDD
			3, 6		2.1 TDD
Dedicated CORSE	T reference channel		1, 4		2.1 100 2.1.1 FDD
Dedicated CONSE	T reference charmer		2, 5		2.1.1 TDD
			3, 6		1.2.1 TDD
BWP	Initial DL BWP		1, 2, 3, 4, 5, 6		3WP.0.1
configurations	Dedicated DL BWP		1, 2, 3, 4, 5, 6		BWP.1.1
2090.00.10	Initial UL BWP		1, 2, 3, 4, 5, 6		BWP.0.1
	UL BWP		1, 2, 3, 4, 5, 6		BWP.1.1
OCNG pattern note			1, 2, 3, 4, 5, 6		OP.1
SMTC configuration			1, 2, 3, 4, 5, 6		MTC.1
SSB configuration			1, 2, 4, 5		B.1 FR1
			3, 6	SS	B.2 FR1
CSI-RS for trackin	g		1, 4	TRS	.1.1 FDD
			2, 5	TRS	.1.1 TDD
			3, 6	TRS	.1.2 TDD
b2-Threshold1		dBm	1, 2, 4, 5		-98
		ubiii	3, 6		-95
EPRE ratio of PSS to SSS			1, 2, 3, 4, 5, 6		
EPRE ratio of PBC					
	CH to PBCH_DMRS				
	EPRE ratio of PDCCH_DMRS to SSS				
EPRE ratio of PDCCH to		dB			0
PDCCH_DMRS		UD.			U
EPRE ratio of PDSCH_DMRS to SSS EPRE ratio of PDSCH to		-			
PDSCH_DMRS					
EPRE ratio of OCI	NG DMRS to SSS	-			
	NG to OCNG DMRS	1			
Noc note2		dBm/15 KHz	1, 2, 3, 4, 5, 6		-106
		dBm/SCS	1, 2, 4, 5		-106
N <sub>oc</sub> note2		, , , , , ,	3, 6		-103
Ês/Noc		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
Ê <sub>s</sub> /I <sub>ot</sub> note3		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
SS-RSRP note3		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
			3, 6	-83.35	-106.65
SSB_RP note3		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
			3, 6	-83.35	-106.65
		dBm/9.36	1, 2, 4, 5	-58.35	-76.49
Io note3		MHz			<b>7</b> 6
		dBm/38.16	3, 6	-52.25	-70.39
Dana	4:	MHz	400450	TDI C	200== 4001  -
Propagation condi			1, 2, 3, 4, 5, 6		300ns 100Hz
	ation and Correlation		1, 2, 3, 4, 5, 6	13	k2 Low
Matrix		<u> </u>			

- NOTE 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- NOTE 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.
- NOTE 3: Ê<sub>s</sub>/I<sub>ot</sub>, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.6.3.1.5-2: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in non-DRX with PCell in FR1

Parameter	Unit	Configuration	Cell 2	
			T1	T2
RF channel number		1, 2, 3, 4, 5, 6	2	
Duplex mode		1, 2, 3	FDD	
		4, 5, 6	TDD	
TDD special subframe configuration note1		4, 5, 6	6	
TDD uplink-downlink configuration note1		4, 5, 6	1	
BWchannel	MHz	1, 2, 3, 4, 5, 6	5MHz: N <sub>RB,</sub> 10MHz: N <sub>RB,</sub> 20MHz: N <sub>RB,</sub>	$_{,c} = 50$
PDSCH parameters: DL Reference Measurement Channel note2		1, 2, 3	5MHz: R.7 10MHz: R.3 20MHz: R.6	FDD FDD
		4, 5, 6	5MHz: R.4 10MHz: R.0 20MHz: R.3	TDD TDD
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement		1, 2, 3	5MHz: R.11 10MHz: R.6 20MHz: R.10	FDD FDD
Channel note2		4, 5, 6	5MHz: R.11 10MHz: R.6 20MHz: R.10	TDD TDD
OCNG Patterns note2		1, 2, 3	5MHz: OP.2 10MHz: OP.1 20MHz: OP.1	0 FDD 0 FDD
		4, 5, 6	5MHz: OP.9 10MHz: OP. 20MHz: OP.	1 TDD
PBCH_RA		1, 2, 3, 4, 5, 6		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB		0	
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA note3				
OCNG_RB note3				
Noc note4	dBm/15kHz	1, 2, 3, 4, 5, 6	-106	
Ê <sub>s</sub> /N <sub>oc</sub>	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65
Ê <sub>s</sub> /I <sub>ot</sub> note5	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65
RSRP note5	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35
SCH_RP note5	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35
lo <sup>note5</sup>	dBm/9MHz	1, 2, 3, 4, 5, 6	-78.22+10log (N <sub>RB,c</sub> /50)	-57.53+10log (N <sub>RB,c</sub> /50)
Propagation Condition not 6		1, 2, 3, 4, 5, 6	ETU70	)
Antenna Configuration and Correlation Matrix note6		1, 2, 3, 4, 5, 6		

NOTE 1: NOTE 2: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].

DL RMCs and OCNG patterns are specified in sections A 3.1 and A 3.2 of TS 36.133 [23] respectively.

NOTE 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

NOTE 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{\text{oc}}$  to be fulfilled.

NOTE 5: Ês/lot, RSRP, SCH\_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

NOTE 6: Propagation condition and correlation matrix are defined in section B.2 in TS 36.101 [27].

The UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 3842ms from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The overall delays measured test requirement is expressed as:

 $T_{identify,E-UTRAN\;FDD} = T_{BasicIdentify} * 480 / T_{Inter1} * CSSF_{interRAT} \; ms$ 

Which:

 $T_{BasicIdentify} = 480,$ 

 $T_{Inter1} = 60$ ,

 $CSSF_{interRAT} = 1$ 

TTI insertion uncertainty =  $TTI_{DCCH} = 1$  ms;  $2xTTI_{DCCH} = 2$  ms

The overall delays measured shall be less than a total of 3842 ms in this test case (note: this gives a total of 3840 ms for measurement reporting delay plus 2 ms for TTI insertion uncertainty).

The rate of correct events observed during repeated tests shall be at least 90% with confidence level of 95%.

# 6.6.3.2 NR SA FR1 – E-UTRAN event-triggered reporting in DRX

## 6.6.3.2.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 when DRX is used under the cell search and measurement requirements.

#### 6.6.3.2.2 Test applicability

This test applies to all types of NR UE Release 15 and forward supporting 5GS NR SA FR1, E-UTRAN and long DRX cycle.

### 6.6.3.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clauses 6.6.3.0.1 and 6.6.3.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.3.2.

6.6.3.2.4 Test description

6.6.3.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.3.2.4.1-1.

Table 6.6.3.2.4.1-1: Supported test configurations in SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Test Case ID	Description
6.6.3.2-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE FDD
6.6.3.2-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE FDD
6.6.3.2-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE FDD
6.6.3.2-4	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE TDD
6.6.3.2-5	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE TDD
6.6.3.2-6	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE TDD
NOTE: The U	JE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.6.3.2.4.1-2 and Table 6.6.3.2.4.1-3.

Table 6.6.3.2.4.1-2: Initial conditions for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	I in Annex E, Table E.4-2 and TS 38	3.508-1 [14] sclause 4.3.1.	
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.3.2.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.2		
Exceptions to connection diagram	N/A			

Table 6.6.3.2.4.1-3: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Parameter	Unit	V	/alue	Comment
NR RF Channel Number		1		1 NR carrier frequency is used in the test
LTE RF Channel Number		2		1 LTE carrier frequency is used in the test
Channel Bandwidth	MHz	As specifie	ed in Tables	
		6.6.3.2.5-1	I and	
		6.6.3.2.5-2	2.	
Active cell		Cell 1		Cell 1 is on RF channel number 1
Neighbour cell		Cell 2		Cell 2 is on RF channel number 2
Gap Pattern Id		0		As specified in Clause TS 38.133 [6] Table
				9.1.2-1. Per-UE gap pattern.
NR measurement quantity		SS-RSRP		Measurement quantity for Cell 1
Inter-RAT E-UTRAN		RSRP		Measurement quantity for Cell 2
measurement quantity				
b2-Threshold1	dBm	note 1		SS-RSRP threshold for SS-RSRP
				measurement on cell1 for event B2
b2-Threshold2EUTRA	dBm	-97		E-UTRAN RSRP threshold for SS-RSRP
				measurement on cell1 for event B2
Hysteresis	dB	0		
TimeToTrigger	S	0		
Filter coefficient		0		L3 filtering is not used
DRX		DRX.1	DRX.7	DRX cycle configurations DRX.1 and
				DRX.7 are defined in Table A.3.3.1-1 and
				Table A.3.3.2-1 respectively.
T1	S	5		
T2	S	5	15	
NOTE 1: Values are defined in Table 6.6.3.2.5-1				

- 1. Message contents are defined in clause 6.6.3.2.4.3.
- 2. There are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. Cell 1 is configured according to Annex C.1.1 and C.1.2, Cell 2 is configured according to TS 36.521-3 [26] Annex C.1.0 and C.1.1.

## 6.6.3.2.4.2 Test procedure

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. In the measurement control information from the PCell it is indictated to the UE that event-triggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

In each test the UE shall be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore the UE shall be allocated with PUSCH resource at every DRX cycle.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.3.2.5-1 and 6.6.3.2.5-2.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 6.6.3.2.5-1 and 6.6.3.2.5-2. T2 starts.
- 6. UE shall transmit a MeasurementReport message triggered by Event B2. If the overall delays measured from the beginning of time period T2 is less than 3.48 s for Test 1 or less than 12.8 s for Test 2 then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14+2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.3.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 4.6 with the following exceptions:

Table 6.6.3.2.4.3-1: Common Exception messages NR SA FR1 – E-UTRAN event-triggered reporting in DRX

De	efault Message Contents
Common contents of system information	
blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-RAT Table H.3.1-3A Table H.3.1-4A Table H.3.1-5 with Condition INTER-RAT Table H.3.1-6 with Condition Pattern #0 Table H.3.1-7 with Condition INTER-RAT Table H.3.7-1 with Condition DRX.1 and Gap for Test 1 Table H.3.7-1 with Condition DRX.7 and OFFSET for Test 2
Specific message content exceptions for Test Configurations 6.6.3.2-1 and 6.6.3.2-4	Table H.3.1-3 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message content exceptions for Test Configurations 6.6.3.2-2, 6.6.3.2-3, 6.6.3.2-5 and 6.6.3.2-6	Table H.3.1-3 with Condition Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

# 6.6.3.2.5 Test requirement

Table 6.6.3.2.5-1 and Table 6.6.3.2.5-2 defines the primary level settings including test tolerances for all tests.

Table 6.6.3.2.5-1: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in DRX with PCell in FR1

Parameter	Unit	Configuration	Cell 1	
			T1	T2

RF channel number			1, 2, 3, 4, 5, 6		1
	l				FDD
Duplex mode	Duplex mode		1, 2, 3		
			4, 5, 6		TDD
TDD Configuration	SCS=15 KHz		2, 5		Conf.1.1
	SCS=30 KHz		3, 6		Conf.2.1
BW <sub>channel</sub>		MHz	1, 4	10: N <sub>RB,</sub>	c = 52 (FDD)
			2, 5	10: N <sub>RB</sub> ,	$_{c} = 52 \text{ (TDD)}$
			3, 6	40: N <sub>RB.c</sub>	= 106 (TDD)
PDSCH reference i	measurement		1, 4		1.1 FDD
channel			2, 5		1.1 TDD
			3, 6		2.1 TDD
RMSI CORESET re	eference channel		1, 4		1.1 FDD
TAMOI CORLECT IN	oronoo onannoi		2, 5		1.1 TDD
			3, 6		2.1 TDD
Dadicated COBSE	T reference channel		1, 4		.1.1 FDD
Dedicated CORSE	r reference channel				
			2, 5		.1.1 TDD
			3, 6		.2.1 TDD
BWP	Initial DL BWP		1, 2, 3, 4, 5, 6		3WP.0.1
configurations	Dedicated DL BWP		1, 2, 3, 4, 5, 6		3WP.1.1
	Initial UL BWP		1, 2, 3, 4, 5, 6		3WP.0.1
	Dedicated UL BWP		1, 2, 3, 4, 5, 6	ULE	3WP.1.1
OCNG pattern <sup>Note1</sup>			1, 2, 3, 4, 5, 6	(	OP.1
SMTC configuration	n		1, 2, 3, 4, 5, 6	SI	MTC.1
SSB configuration			1, 2, 4, 5		B.1 FR1
002 001gu.a			3, 6		B.2 FR1
CSI-RS for tracking	i		1, 4		.1.1 FDD
OOI-ING IOI tracking	OOI-ING IOI tracking		2, 5		.1.1 TDD
			3, 6		.1.2 TDD
b2-Threshold1				INO	
DZ-THIESHOIDT		dBm	1, 2, 4, 5		-98
EDDE (: ( DOO			3, 6		-95
EPRE ratio of PSS		_	1, 2, 3, 4, 5, 6		
EPRE ratio of PBC					
EPRE ratio of PBC					
EPRE ratio of PDC					
EPRE ratio of PDC	CH to				
PDCCH_DMRS		dB			0
EPRE ratio of PDS	CH_DMRS to SSS				
EPRE ratio of PDS	CH to				
PDSCH_DMRS					
EPRE ratio of OCN	G DMRS to SSS	1			
EPRE ratio of OCN	G to OCNG DMRS	1			
N <sub>oc</sub> Note2		dBm/15 KHz	1, 2, 3, 4, 5, 6		-106
		dBm/SCS	1, 2, 4, 5		-106
Noc <sup>Note2</sup>		35, 300	3, 6		-103
Ê <sub>s</sub> /N <sub>oc</sub>		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
Ê <sub>s</sub> /I <sub>ot</sub> Note3		dB	1, 2, 3, 4, 5, 6	19.65	-3.65
SS-RSRP <sup>Note3</sup>					
33-K3KP''		dBm/SCS	1, 2, 4, 5	-86.35	-109.65
OOD DDNotos		dBm/SCS	3, 6	-83.35	-106.65
22R Khunga	SSB_RP <sup>Note3</sup>		1, 2, 4, 5	-86.35	-109.65
		ļ	3, 6	-83.35	-106.65
		dBm/9.36 MHz	1, 2, 4, 5	-58.35	-76.49
Io <sup>Note3</sup>	IoNote3				
10		dBm/38.16	3, 6	-52.25	-70.39
		MHz			
Propagation conditi	on		1, 2, 3, 4, 5, 6	TDL-C 3	300ns 100Hz
	tion and Correlation		1, 2, 3, 4, 5, 6		2 Low
Matrix					
			·		

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: Ê<sub>s</sub>/I<sub>ot</sub>, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.6.3.2.5-2: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1

Parameter	Unit	Configuration	Cell 2	
			T1	T2
RF channel number		1, 2, 3, 4, 5, 6	2	
Duplex mode		1, 2, 3	FDD	
		4, 5, 6	TDD	
TDD special subframe configuration <sup>Note1</sup>		4, 5, 6	6	
TDD uplink-downlink configuration <sup>Note1</sup>		4, 5, 6	1	
BW <sub>channel</sub>	MHz	1, 2, 3, 4, 5, 6	5MHz: N <sub>RB,c</sub> = 25 10MHz: N <sub>RB,c</sub> = 50 20MHz: N <sub>RB,c</sub> = 100	
PDSCH parameters: DL Reference Measurement Channel <sup>Note2</sup>		1, 2, 3	5MHz: R.7 10MHz: R.3 20MHz: R.6	FDD FDD
		4, 5, 6	5MHz: R.4 <sup>-</sup> 10MHz: R.0 20MHz: R.3	TDD TDD
PCFICH/PDCCH/PHICH parameters: DL Reference Measurement		1, 2, 3	5MHz: R.11 10MHz: R.6 20MHz: R.10	FDD
Channel <sup>Note2</sup>		4, 5, 6	5MHz: R.11 TDD 10MHz: R.6 TDD 20MHz: R.10 TDD	
OCNG Patterns <sup>Note2</sup>		1, 2, 3	5MHz: OP.20 10MHz: OP.1 20MHz: OP.1	0 FDD
		4, 5, 6	5MHz: OP.9 10MHz: OP.1 20MHz: OP.7	TDD
PBCH_RA		1, 2, 3, 4, 5, 6		
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB	dB		0	
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA <sup>Note3</sup>				
OCNG_RB <sup>Note3</sup>	1			
N <sub>oc</sub> Note4	dBm/15kHz	1, 2, 3, 4, 5, 6	-106	
Ês/Noc	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65
Ê <sub>s</sub> /I <sub>ot</sub> Note5	dB	1, 2, 3, 4, 5, 6	-Infinity	20.65
RSRP <sup>Note5</sup>	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35
SCH_RPNote5	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity	-85.35
lo <sup>Note5</sup>	dBm/9MHz	1, 2, 3, 4, 5, 6	-78.22+10log (N <sub>RB,c</sub> /50)	-57.53+10log (N <sub>RB,c</sub> /50)
Propagation Condition Note6		1, 2, 3, 4, 5, 6	ETU70	
Antenna Configuration and Correlation Matrix Note6		1, 2, 3, 4, 5, 6	1x2 Low	

Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211.

Note 2: DL RMCs and OCNG patterns are specified in sections A 3.1 and A 3.2 of TS 36.133 respectively.

Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.

Note 5: Ê<sub>s</sub>/I<sub>ot</sub>, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 6: Propagation condition and correlation matrix are defined in section B.2 in TS 36.101 [27].

In test 1, the UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 3.84s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

In test 2, the UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 12.8s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

# 6.6.3.3 NR SA FR1 – E-UTRAN event-triggered reporting in DRX for UE configured with highSpeedMeasFlag-r16

#### 6.6.3.3.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT E-UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 when DRX is used under the cell search and measurement requirements for UE configured with RRM enhancement for high speed.

#### 6.6.3.3.2 Test applicability

This test applies to all types of NR UE supporting SA FR1 configured with RRM enhancement for high speed from Release 16 onwards.

## 6.6.3.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clauses 6.6.3.0.1 and 6.6.3.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.3.3.

6.6.3.3.4 Test description

6.6.3.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.3.3.4.1-1.

Table 6.6.3.3.4.1-1: Supported test configurations in SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Test Case ID	Description
6.6.3.3-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE FDD
6.6.3.3-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE FDD
6.6.3.3-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE FDD
6.6.3.3-4	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, LTE TDD
6.6.3.3-5	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, LTE TDD
6.6.3.3-6	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, LTE TDD
NOTE: The U	JE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.6.3.3.4.1-2 and Table 6.6.3.3.4.1-3.

Table 6.6.3.3.4.1-2: Initial conditions for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter		Value	Comment			
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.			
Test frequencies	As specified	in Annex E, Table E.4-2 and TS 38	.508-1 [14] clause 4.3.1.			
Channel	As specified	As specified by the test configuration selected from Table 6.6.3.3.4.1-1.				
bandwidth						
Propagation conditions	AWGN		As specified in Annex C.2.2.			
Connection	TE Part	A.3.1.8.3	As specified in TS 38.508-1 [14] Annex A.			
Diagram	DUT Part	A.3.2.3.2				

Exceptions to	N/A	
connection		
diagram		

Table 6.6.3.3.4.1-3: General test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Value	Comment
NR RF Channel Number		1	1 NR carrier frequency is used in the test
LTE RF Channel Number		2	1 LTE carrier frequency is used in the test
Channel Bandwidth	MHz	As specified in Tables	
		A.6.6.3.3.1-2 and	
		A.6.6.3.3.1-3.	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in Clause Table 9.1.2-1. Per-UE
			gap pattern.
NR measurement quantity		SS-RSRP	Measurement quantity for Cell 1
Inter-RAT E-UTRAN		RSRP	Measurement quantity for Cell 2
measurement quantity			
b2-Threshold1	dBm	Note 1	SS-RSRP threshold for SS-RSRP
			measurement on cell1 for event B2
b2-Threshold2EUTRA	dBm	-97	E-UTRAN RSRP threshold for SS-RSRP
			measurement on cell1 for event B2
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		DRX.6	DRX cycle configurations DRX.6 is defined in
			Table A.3.3.1-6.
T1	S	5	
T2	S	5	
Note 1: Values are define	ed in TS 38	3.133 Table 6.6.3.3.5-1	

- 1. Message contents are defined in clause 6.6.3.3.4.3.
- 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.
- 3. UE is configured with highSpeedMeasFlag-r16

#### 6.6.3.3.4.2 Test procedure

In each test there are two cells: Cell 1 and Cell 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT E-UTRAN inter-RAT neighbour cell. In the measurement control information from the PCell it is indictated to the UE that event-triggered reporting with Event B2 (PCell becomes worse than threshold1 and inter RAT neighbour becomes better than threshold2) is to be used. Each test consists of two consecutive time periods, with durations T1 and T2, respectively. Prior to the start of time duration T1, the UE shall be fully synchronized to Cell 1. During T1, the UE shall not have any information on Cell 2.

In each test the UE shall be provided at least once every 500ms with new Timing Advance Command MAC control element to restart the Time alignment timer to keep UE uplink time alignment. Furthermore the UE shall be allocated with PUSCH resource at every DRX cycle.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.3.3.5-1 and 6.6.3.3.5-2.
- 3. SS shall transmit an RRCReconfiguration message.
- 4. The UE shall transmit RRCReconfigurationComplete message. T1 starts.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Tables 6.6.3.3.5-1 and 6.6.3.3.5-2. T2 starts.

- 6. UE shall transmit a MeasurementReport message triggered by Event B2. If the overall delays measured from the beginning of time period T2 is less than 4.8s then the number of successful tests is increased by one. If the UE fails to report the event within the overall delays measured requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6) or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

OR

- switch the UE off.
- 8. Set Cell 2 physical cell identity = ((current cell 2 physical cell identity + 1) mod 14+2) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with ue-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5 (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5),

OR

- if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR, Connected without release On according to TS 38.508-1 [14] clause 4.5.
- 10. Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

# 6.6.3.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.3.3.4.3-1: Common Exception messages

Defaul	Default Message Contents					
Common contents of system information blocks on condition of HighSpeedMeas with exceptions	Table H.2.1-3 with Condition HighSpeedMeas					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with Conditions GAP NEEDED and INTER-RAT Table H.3.1-3 with Condition SSB.1 FR1 for configuration 6.6.3.3-1, 6.6.3.3-2, 6.6.3.3-4, 6.6.3.3-5 Table H.3.1-3 with Condition SSB.2 FR1 for configuration 6.6.3.3-3, 6.6.3.3-6 Table H.3.1-3A Table H.3.1-4A Table H.3.1-5 with Condition INTER-RAT Table H.3.1-6 with Condition Pattern #0 Table H.3.1-7 with Condition INTER-RAT Table H.3.7-1 with Condition DRX.6 and Gap					

## 6.6.3.3.5 Test requirement

Table 6.6.3.3.5-1 and Table 6.6.3.3.5-2 defines the primary level settings including test tolerances for all tests.

Table 6.6.3.3.5-1: PCell specific test parameters for SA inter-RAT E-UTRA event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter		Unit	Configuration	Cell 1	
				T1	T2
	channel number		1, 2, 3, 4, 5, 6		1
Duplex mode			1, 2, 3		DD
			4, 5, 6		DD
ΓDD Configuration			2, 5		Conf.1.1
	SCS=30 KHz		3, 6		Conf.2.1
3W <sub>channel</sub>		MHz	1, 4		= 52 (FDD)
			2, 5		= 52 (TDD)
			3, 6	40: N <sub>RB,c</sub> =	= 106 (TDD)
DSCH reference	e measurement		1, 4	SR.1	.1 FDD
hannel				00.4	
			2, 5		.1 TDD
			3, 6		.1 TDD
CORSET referen	ce channel		1, 4		.1 FDD
			2, 5		.1 TDD
NA/D	Transport		3, 6		.1 TDD
BWP	Initial DL BWP		1, 2, 3, 4, 5, 6		NP.0.1
onfigurations	Dedicated DL BWP		1, 2, 3, 4, 5, 6		WP.1.1
	Initial UL BWP		1, 2, 3, 4, 5, 6		WP.0.1
NONO No.	Dedicated UL BWP		1, 2, 3, 4, 5, 6		<u>WP.1.1</u>
OCNG pattern <sup>Not</sup>			1, 2, 3, 4, 5, 6		P.1
MTC configurat			1, 2, 3, 4, 5, 6		TC.1
SSB configuration	n		1, 2, 4, 5		.1 FR1
· · · · · ·			3, 6		.2 FR1
2-Threshold1		dBm	1, 2, 4, 5		98
	20.1000	ID.	3, 6		95
EPRE ratio of PS		dB	1, 2, 3, 4, 5, 6		0
	SCH_DMRS to SSS				
	CH to PBCH_DMRS CCH_DMRS to SSS				
EPRE ratio of PC	ICCH to				
PDCCH_DMRS	NOCH DMDC to CCC				
EPRE ratio of PC	SCH_DMRS to SSS				
PDSCH_DMRS	SCH to				
	CNG DMRS to SSS				
	CNG to OCNG DMRS				
	NAC 10 OCIAO DIVINO	dBm/15 KHz	1, 2, 3, 4, 5, 6		106
V <sub>oc</sub> Note2		dBm/SCS	1, 2, 3, 4, 5, 6		106
<b>♥</b> UC		dDi11/000	3, 6		103
E <sub>s</sub> /N <sub>oc</sub>		dB	1, 2, 3, 4, 5, 6	18	-2
s/IotNote3		dB	1, 2, 3, 4, 5, 6	18	- <u>-</u> 2
SS-RSRP <sup>Note3</sup>		dBm/SCS	1, 2, 4, 5	-88	-108
20 10101		dD::://000	3, 6	-85	-105
SSB_RPNote3		dBm/SCS	1, 2, 4, 5	-88	-108
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		GDIII/000	3, 6	-85	-105
O <sup>Note3</sup>		dBm/9.36	1, 2, 4, 5	-59.98	-75.92
10		MHz	1, 4, 4, 5	-53.30	-10.32
		dBm/38.16	3, 6	-53.88	-69.82
		MHz	3, 0	55.00	-03.02
Propagation cond	dition	IVII IZ	1, 2, 3, 4, 5, 6	I Δ\/	VGN
Propagation condition  Antenna Configuration and Correlation			1, 2, 3, 4, 5, 6	AWGN 1x2 Low	
Matrix	Tallott and Corrolation		1, 2, 0, 7, 0, 0	172	0,,
	shall be used such that	both colle are fu	lly allocated and a co	anatant total tra	nomitted nowe

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3:  $\hat{E}_s/I_{ot}$ , SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.6.3.3.5-2: E-UTRAN neighbour cell specific test parameters for SA inter-RAT E-UTRAN event triggered reporting in DRX with PCell in FR1 for UE configured with highSpeedMeasFlag-r16

Parameter	Unit	Configuration	Cell 2	
			T1	T2
RF channel number		1, 2, 3, 4, 5, 6	2	
Duplex mode		1, 2, 3	FDD	
		4, 5, 6	TDD	
TDD special subframe configuration <sup>Note1</sup>		4, 5, 6	6	
TDD uplink-downlink		4, 5, 6	1	
configuration <sup>Note1</sup>				
BW <sub>channel</sub>	MHz	1, 2, 3, 4, 5, 6	5 MHz: N <sub>RB</sub> ,	c = 25
			10 MHz: N <sub>RB</sub>	
			20 MHz: N <sub>RB,</sub>	
PDSCH parameters:		1, 2, 3	5 MHz: R.7	
DL Reference Measurement			10 MHz: R.3	
Channel <sup>Note2</sup>			20 MHz: R.6	
		4, 5, 6	5 MHz: R.4	
			10 MHz: R.(	
DOELCH/DDOCH/DHICH		4.0.0	20 MHz: R.3	
PCFICH/PDCCH/PHICH		1, 2, 3	5 MHz: R.11 10 MHz: R.6	
parameters: DL Reference Measurement			20 MHz: R.1	
Channel <sup>Note2</sup>			20 WII IZ. N. I	0 FDD
Chamici		4, 5, 6	5 MHz: R.11	TDD
		4, 5, 6	10 MHz: R.6	
			20 MHz: R.10 TDD	
OCNG Patterns <sup>Note2</sup>		1, 2, 3	5 MHz: OP.20 FDD	
		, _, _	10 MHz: OP.10 FDD	
			20 MHz: OP.	
		4, 5, 6	5 MHz: OP.9	
		, ,	10 MHz: OP.1 TDD	
			20 MHz: OP.	7 TDD
PBCH_RA	dB	1, 2, 3, 4, 5, 6	0	
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA				
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RA <sup>Note3</sup> OCNG_RB <sup>Note3</sup>				
N <sub>oc</sub> Note4	dDres/4.Cld.le	400456	100	
	dBm/15kHz	1, 2, 3, 4, 5, 6		
Ê <sub>s</sub> /N <sub>oc</sub> Ê <sub>s</sub> /I <sub>ot</sub> <sup>Note5</sup>	dB dB	1, 2, 3, 4, 5, 6	-Infinity	19 19
RSRP <sup>Note5</sup>	dBm/15kHz	1, 2, 3, 4, 5, 6	-Infinity -Infinity	-87
SCH RPNote5	dBm/15kHz	1, 2, 3, 4, 5, 6	-infinity -Infinity	-87 -87
lo <sup>Note5</sup>	dBm/9MHz	1, 2, 3, 4, 5, 6		-87 -59.16+10log (N <sub>RB</sub>
	UDITI/9IVIHZ	1, 2, 3, 4, 5, 6	-78.22+10log (N <sub>RB,c</sub> /50)	-59.16+10log (NRB /50)
Propagation Condition Note6		1, 2, 3, 4, 5, 6	AWGN19	)44
Antenna Configuration and		1, 2, 3, 4, 5, 6	1x2 Lov	
Correlation Matrix Note6				

Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [23].

Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [15] respectively.

Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.

Note 5: Ê<sub>s</sub>/I<sub>ot</sub>, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 6: Propagation condition and correlation matrix are defined in clause B.2 in TS 36.101 [25].

The UE shall send one Event B2 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 4.8s from the start of period T2. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

# 6.6.4 L1-RSRP measurement for beam reporting

## 6.6.4.0 Minimum conformance requirements

6.6.4.0.1 Minimum conformance requirements for SSB-based L1-RSRP measurement for beam reporting

Same as clause 4.6.4.0.1

The normative reference for this requirement is TS 38.133 [6] clause 9.5.3.1, 9.5.4.1 and 9.5.5.1.

6.6.4.0.2 Minimum conformance requirements for CSI-RS-based L1-RSRP measurement for beam reporting

Same as clause 4.6.4.0.2

The normative reference for this requirement is TS 38.133 [6] clauses 9.5.3.1, 9.5.4.2 and 9.5.5.2.

#### 6.6.4.1 NR SA FR1 SSB-based L1-RSRP measurement in non-DRX

### 6.6.4.1.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in non-DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

# 6.6.4.1.2 Test applicability

This test applies to all types of NR UE release 15 and forward.

## 6.6.4.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.1.

## 6.6.4.1.4 Test description

## 6.6.4.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.1.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.1.4.1-2. Test environment parameters are given in Table 6.6.4.1.4.1-3.

Table 6.6.4.1.4.1-1: NR SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description
6.6.4.1-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
6.6.4.1-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
6.6.4.1-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note: The UE is only re	equired to be tested in one of the supported test configurations

Table 6.6.4.1.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD

	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52
BWchannel	2	MHz	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
Granici	3		SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD
Channel	2		CR.1.1 TDD
Chamor	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
Charmer	3		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
	3		SSB.4 FR1
OCNG Patterns	1~3		OP.1
Initial BWP Configuration	1~3		DLBWP.0.1 ULBWP.0.1
			DLBWP.1.1
Dedicated BWP configuration	1~3		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
9	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
	3		TRS.1.2 TDD
DRX configuration	1~3		Off
reportConfigType	1~3		periodic
reportQuantity	1~3		ssb-Index-RSRP
Number of reported RS	1~3		2
L1-RSRP reporting period	1~3	slot	80
T1	1~3	s	5
T2	1~3	s	1
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH	]		
DMRS	1~3	dB	0
EPRE ratio of PDSCH DMRS to	1~3	ub	
SSS	]		
EPRE ratio of PDSCH to PDSCH			
DMRS	]		
EPRE ratio of OCNG DMRS to			
SSS <sup>Note 1</sup>			
EPRE ratio of OCNG to OCNG DMRS Note 1			
Propagation condition	1~3		AWGN
Note 1: OCNG shall be used such t		o ara fully allogo	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	I in Annex E, Table E.2-1 and TS 38	3.508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified by the test configuration selected from Table 4.6.3.1.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4	1	
Exceptions to connection diagram		pable UEs without any 2 Rx RF A.3.2.5.2 for DUT part and TF Part		

Table 6.6.4.1.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

- 1. Message contents are defined in clause 6.6.4.1.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.1.4.1-2 and 6.6.4.1.5-1. UE is configured to perform RLM and BFD based on the SSBs.

#### 6.6.4.1.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 4.6.4.1.4.1-2. Before the test, UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.6.4.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.6.4.1.5-1. T1 starts.
- 3. The UE shall be transmitting CSI on PUCCH with a periodicity of 80 slots.
- 4. When T1 expires, the SS shall set the parameters according to T2 in 6.6.4.1.5-1. T2 starts.
- 5. The UE shall start sending valid L1-RSRP reports. The SS shall check following requirements:
  - R1: the UE shall start to transmit valid reports no later than 720 ms for configuration 1, 2, 4 and 5 and no later than 680 ms for configuration 3 and 6 from the beginning of time period T2. A valid report shall meet the absolute L1-RSRP requirement for SSB#1 (Table 6.6.4.1.5-2 for test configurations 1, 2, 4 and 5 and Table 6.6.4.1.5-3 for test configurations 3 and 6) and the relative L1-RSRP requirement for SSB#0 in Table 6.6.4.1.5-4. If the first valid report is received earlier than the specified time, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
  - R2: the UE shall transmit reports every 80 slots until the end of time period T2. If the reports are received accordingly, the number of passed iterations for R2 is increased by one. Otherwise, the number of failed iterations for R2 is increased by one.
  - R3: The L1-RSRP value of SSB#1 reported by the UE is compared to the expected L1-RSRP value for SSB#1. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table 6.6.4.1.5-2 for test configurations 1, 2, 4 and 5 and in Table 6.6.4.1.5-3 for test configurations 3 and 6 or the UE fails to report the measurement value for SSB#1, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.
  - -R4: The DIFF RSRP value of SSB#0 reported by the UE is compared to the expected DIFF RSRP value. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table 6.6.4.1.5-4 or the UE fails to report the measurement value for SSB#0, the number of failed iterations for R4 is increased by one. Otherwise, the number of passed iterations for R4 is increased by one.
- 6. The SS waits until T2 expires.
- 7. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.

- 8. After the RRC connection release, the SS:
  - transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:
  - switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.4.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.4.1.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and SS-RSRP			
elements contents exceptions	Table H.3.6-3 with conditions SSB and PERIODIC			

Table 6.6.4.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

## 6.6.4.1.5 Test requirement

Table 6.6.4.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.1.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config Unit	SSB#0		SSB#1		
raiailletei	Coming	Coming	T1	T2	T1	T2
$N_{oc}^{}$ Note2	1~3	dBm/15kHz	-94.65			
$N_{oc}$ Note2	1,2	dBm/SSB SCS		-94.6	55	
TV <sub>oc</sub>	3	UDIII/33D 3C3	-91.65			
$\hat{ ext{E}}_{ ext{s}}/ ext{I}_{ ext{ot}}$	1~3	dB	0	0	-Infinity	3.5
SSB RSRP Note3	1,2	dBm/SSB SCS	-94.65	-94.65	-Infinity	-91.15
	3	UDIII/33D 3C3	-91.65	-91.65	-Infinity	-88.14
lo Note3	1,2	dBm/9.36 MHz	-63.69	-63.69	-66.70	-61.59

		3	dBm/38.16 MHz	-57.59	-57.59	-60.61	-55.49
$\hat{E}_{s}$	$N_{oc}$	1~3	dB	0	0	-Infinity	3.5

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes.

They are not settable parameters themselves.

The UE shall send L1-RSRP report every 80 slots. No later than 640ms plus 80 slots from the beginning of time period T2, UE shall send L1-RSRP report including results of both SSB0 and SSB1. Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 4.6.4.1.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 4.6.4.1.5-3 for test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 4.6.4.1.5-4 for all test configurations.

Table 6.6.4.1.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	55
Highest reported value (SSB#1)	-	75

Table 6.6.4.1.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	58
Highest reported value (SSB#1)	-	78

Table 6.6.4.1.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF RSRP reported (SSB#0)	-	0
Highest DIFF RSRP reported (SSB#0)	-	3

For the test to pass, the ratio of successful reported values for each requirement (R1 to R4) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others.NOTE:

The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.4.2 NR SA FR1 SSB-based L1-RSRP measurement in DRX

#### 6.6.4.2.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

#### 6.6.4.2.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle.

#### 6.6.4.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.2.

6.6.4.2.4 Test description

6.6.4.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.2.4.1-2. Test environment parameters are given in Table 6.6.4.2.4.1-3.

Table 6.6.4.2.4.1-1: SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description			
6.6.4.2-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode			
6.6.4.2-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode			
6.6.4.2-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode			
Note: The UE is only required to be tested in one of the supported test configurations				

Table 6.6.4.2.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52
BWchannel	2	MHz	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
Channel	3		SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD
Channel	2		CR.1.1 TDD
Channel	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
Channel	3		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
	3		SSB.4 FR1
OCNG Patterns	1~3		OP.1
Initial BWP Configuration	1~3		DLBWP.0.1
Illitial BVVF Collingulation	1~3		ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1
	1~3		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
	3		TRS.1.2 TDD

DRX configuration	1~3		DRX.3
reportConfigType	1~3		periodic
reportQuantity	1~3		ssb-Index-RSRP
Number of reported RS	1~3		2
L1-RSRP reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	S	1
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS	1~3	dB	0
EPRE ratio of PDSCH DMRS to	1~3	uБ	U
SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSS <sup>Note 1</sup>			
EPRE ratio of OCNG to OCNG			
DMRS Note 1			
Propagation condition	1~3		AWGN
Note 1: OCNG shall be used such t	hat both cell	s are fully alloca	ted and a constant

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table 6.6.4.2.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified in Annex E, Table E.2-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.				
Channel bandwidth	As specified	by the test configuration selected from Table 4.6.3.1.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4	1		
Exceptions to connection diagram		pable UEs without any 2 Rx RF A.3.2.5.2 for DUT part and r TE Part			

- 1. Message contents are defined in clause 6.6.4.2.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.2.4.1-2 and 6.6.4.2.5-1. UE is configured to perform RLM and BFD based on the SSBs. DRX is configured as specified in Table 6.6.4.2.4.1-2.

# 6.6.4.2.4.2 Test procedure

Same test procedure as in subclause 6.6.4.1.4.2 with tables 6.6.4.1.4.1-2 and 6.6.4.1.5-1 replaced by tables 6.6.4.2.4.1-2 and 6.6.4.2.5-1.

## 6.6.4.2.4.3 Message contents

Same message content as in subclause 6.6.4.1.4.3 with the following exception:

Table 6.6.4.2.4.3-1: Common Exception messages EN-DC SSB based L1-RSRP measurement in DRX

Default Message Contents					
Table H.3.7-1 with condition DRX.3					

#### 6.6.4.2.5 Test requirement

Table 6.6.4.2.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.2.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	l lmit	SSI	SSB#0		SSB#1	
	Config	Unit	T1	T2	T1	T2	
$N_{oc}^{}$ Note2	1~3	dBm/15kHz		-94.65			
N Note2	1,2	dBm/SSB SCS	-94.65				
$N_{oc}^{}$ Note2	3	GBIII/33B 3C3		-91.6	35		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0	0	-Infinity	3.5	
SSB RSRP Note3	1,2	dBm/SSB SCS	-94.65	-94.65	-Infinity	-91.15	
	3		-91.65	-91.65	-Infinity	-88.14	
lo <sup>Note3</sup>	1,2	dBm/9.36 MHz	-63.69	-63.69	-66.70	-61.59	
	3	dBm/38.16 MHz	-57.59	-57.59	-60.61	-55.49	
$\hat{E}_s/N_{oc}$	1~3	dB	0	0	-Infinity	3.5	

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send L1-RSRP report every 80 slots. No later than 640ms plus 80 slots from the beginning of time period T2, UE shall send L1-RSRP report including results of both SSB0 and SSB1. Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.2.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 6.6.4.2.5-3 for test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 6.6.4.2.5-4 for all test configurations.

Table 6.6.4.2.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	55
Highest reported value (SSB#1)	-	75

Table 6.6.4.2.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	ı	58
Highest reported value (SSB#1)	•	78

Table 6.6.4.2.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF RSRP reported (SSB#0)	1	0
Highest DIFF RSRP reported (SSB#0)	-	3

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

## 6.6.4.3 NR SA FR1 CSI-RS-based L1-RSRP measurement in non-DRX

#### 6.6.4.3.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in non-DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

#### 6.6.4.3.2 Test applicability

This test applies to all types of NR UE release 15 and forward.

#### 6.6.4.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.3.

# 6.6.4.3.4 Test description

#### 6.6.4.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.3.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.3.4.1-2. Test environment parameters are given in Table 6.6.4.3.4.1-3.

Table 6.6.4.3.4.1-1:NR SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description
6.6.4.3-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
6.6.4.3-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
6.6.4.3-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note: The UE is only re	equired to be tested in one of the supported test configurations

Table 6.6.4.3.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
	3		TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52
BWchannel	2	MHz	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
Charline	3		SR.2.1 TDD

	1		CR.1.1 FDD	
RMSI CORESET Reference Channel	2		CR.1.1 TDD	
	3		CR.2.1 TDD	
Dedicated CODECET Defenses	1		CCR.1.1 FDD	
Dedicated CORESET Reference	2		CCR.1.1 TDD	
Channel	3		CCR.2.1 TDD	
	1		SSB.3 FR1	
SSB configuration	2		SSB.3 FR1	
_	3		SSB.4 FR1	
	1		CSI-RS 1.3 FDD	
CSI-RS configuration	2		CSI-RS 1.3 TDD	
	3		CSI-RS 2.3 TDD	
OCNG Patterns	1~3		OP.1	
	1		TRS.1.1 FDD	
TRS Configuration	2		TRS.1.1 TDD	
	3		TRS.1.2 TDD	
Leidel DWD Ocerticus	4.0		DLBWP.0.1	
Initial BWP Configuration	1~3		ULBWP.0.1	
Dadicated DMD configuration	4.0		DLBWP.1.1	
Dedicated BWP configuration	1~3		ULBWP.1.1	
SMTC configuration	1~3		SMTC.1	
DRX configuration	1~3		Off	
reportConfigType	1~3		aperiodic	
reportQuantity	1~3		cri-RSRP	
Number of reported RS	1~3		2	
gol lafo	4.2		SSB#0 for resource#0	
qcl-Info	1~3		SSB#1 for resource#1	
reportSlotOffsetList	1~3	slots	8	
T1	1~3	S	5	
EPRE ratio of PSS to SSS				
EPRE ratio of PBCH DMRS to SSS	1			
EPRE ratio of PBCH to PBCH DMRS	1			
EPRE ratio of PDCCH DMRS to SSS				
EPRE ratio of PDCCH to PDCCH	1			
DMRS				
EPRE ratio of PDSCH DMRS to SSS	1~3	dB	0	
EPRE ratio of PDSCH to PDSCH	1			
DMRS				
EPRE ratio of OCNG DMRS to				
SSSNote 1				
EPRE ratio of OCNG to OCNG DMRS	1			
Note 1				
Propagation condition	1~3		AWGN	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant				

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table 6.6.4.3.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

Parameter	Value		Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 3	in Annex E, Table E.2-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.		
Channel bandwidth	As specified	by the test configuration selected from Table 4.6.3.1.4.1-1.			
Propagation conditions	AWGN		As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	A.3.2.3.4			
Exceptions to connection diagram		pable UEs without any 2 Rx RF A.3.2.5.2 for DUT part and r TE Part			

- 1. Message contents are defined in clause 6.6.4.3.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.3.4.1-2 and 6.6.4.3.5-1. UE is configured to perform RLM and BFD based on the SSBs.

## 6.6.4.3.4.2 Test procedure

The test consists of a single time period T1, during which the UE is triggered via DCI to report L1-RSRP on aperiodic CSI-RS resources. Prior to the start of the time duration T1, the UE shall be fully synchronized to PCell. UE is also configured to measure L1-RSRP based on SSB. Upon receiving the DCI trigger, UE provides the report back based on the reporting configuration as defined in table 6.6.4.3.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.4.3.5-1. T1 starts.
- 3. After 80ms from the start of the test the SS transmits the DCI trigger in slot 0 for configuration 1,2 and slot 8 for configuration 3. The corresponding CSI-RS set is transmitted with the offset of 4 slots after the DCI trigger.
- 4. The SS shall check following requirements:
  - R1: the UE shall send L1-RSRP report at slot 8 from the reception of DCI trigger. If the report is received at slot 8 from the reception of DCI trigger, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
  - R2: The L1-RSRP value of CSI-RS#1 reported by the UE is compared to the expected L1-RSRP value for CSI-RS #1. If the resulting value is outside the limits in Table 4.6.4.3.5-2 for test configurations 1, 2, 4 and 5 and in Table 4.6.4.3.5-3 for test configurations 3 and 6 or the UE fails to report the measurement value for CSI-RS #1, the number of failed iterations for R2 is increased by one. Otherwise, the number of passed iterations for R2 is increased by one.
  - -R3: The DIFF RSRP value of CSI-RS #0 reported by the UE is compared to the expected DIFF RSRP value. If the resulting value is outside the limits in Table 4.6.4.3.5-4 or the UE fails to report the measurement value for CSI-RS #0, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.
- 5. Void.
- 6. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 7. After the RRC connection release, the SS:
  - transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:
  - switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

## 6.6.4.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.4.3.4.3-1: Common Exception messages NR SA CSI-RS-based L1-RSRP measurement

Default Message Contents			
Common contents of system information blocks exceptions			
Default RRC messages and information elements contents exceptions	Table H.3.6-2 with conditions APERIODIC and CSI-RSRP Table H.3.6-3 with conditions CSI-RS and APERIODIC		

Table 6.6.4.3.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133					
Information Element	Value/remark	Comment	Condition		
RadioLinkMonitoringConfig ::= SEQUENCE {					
failureDetectionResourcesToAddModList	1 entry				
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.			
}					
}					

#### 6.6.4.3.5 Test requirement

Table 6.6.4.3.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.3.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1
$N_{oc}^{}$ Note1	1~3	dBm/15kHz	-94.65	
λ/ Note1	1,2	dDm/CCD CCC	-94	.65
$N_{oc}^{}$ Note1	3	dBm/SSB SCS	-91	.65
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0	3.5
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.15
Note2	3	dbiii/33b 303	-91.65	-88.14
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.59
10	3	dBm/38.16 MHz	-57.59	-55.49
$\hat{E}_s/N_{oc}$	1~3	dB	0	3.5
Note 1: Void		•	-	

Note 1: Void

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 $N_{oc}$  to be fulfilled.

Note 3: CSI-RS RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

After 80ms from the beginning of the test, the UE shall send L1-RSRP report at slot 8 from the reception of DCI triggering the L1-RSRP measurement. The L1-RSRP report shall include the results for both CSI-RS#0 and CSI-RS#1.

Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.3.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 6.6.4.3.5-3 for

test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 6.6.4.3.5-4 for all test configurations.

Table 6.6.4.3.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	55
Highest reported value (CSI-RS#1)	75

Table 6.6.4.3.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	58
Highest reported value (CSI-RS#1)	78

Table 6.6.4.3.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF RSRP reported (CSI-RS#0)	0
Highest DIFF RSRP reported (CSI-RS#0)	3

For the test to pass, the ratio of successful reported values for each requirement (R1 to R3) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others.NOTE:

The actual overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

## 6.6.4.4 NR SA FR1 CSI-RS-based L1-RSRP measurement in DRX

#### 6.6.4.4.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in DRX within L1-RSRP measurement requirements in TS 38.133 [6] clause 9.5.4.1.

#### 6.6.4.4.2 Test applicability

This test applies to all types of NR UE release 15 and forward supporting 5GS NR SA FR1 and long DRX cycle.

## 6.6.4.4.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.4.

#### 6.6.4.4.4 Test description

## 6.6.4.4.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.4.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.4.1-2. Test environment parameters are given in Table 6.6.4.4.1-3.

Table 6.6.4.4.4.1-1: NR SA SSB based L1-RSRP measurement supported test configurations

Test Case ID	Description	
6.6.4.4-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode	
6.6.4.4-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode	
6.6.4.4-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode	
Note: The UE is only required to be tested in one of the supported test configurations		

Table 6.6.4.4.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
Duplex mode	1		FDD
	2		TDD
	3		TDD
TDD Configuration	1		N/A
ŭ	2		TDDConf.1.1
	3		TDDConf.2.1
BWchannel	1	MHz	10: N <sub>RB,c</sub> = 52
2 T Chamer	2	101112	10: N <sub>RB,c</sub> = 52
	3	1	40: N <sub>RB,c</sub> = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2		SR.1.1 TDD
Glamici	3	1	SR.2.1 TDD
RMSI CORESET Reference Channel			
RMSI CORESET Reference Channel	1		CR.1.1 FDD
	2	4	CR.1.1 TDD
D. II. / 100DE0ET D. /	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
	3		CCR.2.1 TDD
SSB configuration	1		SSB.3 FR1
	2		SSB.3 FR1
	3		SSB.4 FR1
CSI-RS configuration	1		CSI-RS 1.3 FDD
	2		CSI-RS 1.3 TDD
	3		CSI-RS 2.3 TDD
OCNG Patterns	1~3		OP.1
TRS Configuration	1		TRS.1.1 FDD
5 1 1 <b>3</b> 1 1 1	2		TRS.1.1 TDD
	3		TRS.1.2 TDD
Initial BWP Configuration	1~3		DLBWP.0.1
miliai 2777 Comigaration			ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1
Dedicated DVVI Cornigaration	10		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
DRX configuration	1~3		DRX.3
reportConfigType	1~3		aperiodic
reportQuantity	1~3		cri-RSRP
Number of reported RS	1~3		2
•			
qcl-Info	1~3		SSB#0 for resource#0
101 1011 11:1	4.0		SSB#1 for resource#1
reportSlotOffsetList	1~3	slots	8
T1	1~3	S	5
EPRE ratio of PSS to SSS	1~3	dB	0
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH DMRS			
EPRE ratio of PDCCH DMRS to SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS			
EPRE ratio of PDSCH DMRS to SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSS <sup>Note 1</sup>			
EPRE ratio of OCNG to OCNG DMRS			
Note 1			
Propagation condition	1~3		AWGN
			cated and a constant

Table 6.6.4.4.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1	
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 3	8.508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified	from Table 4.6.3.1.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.7.1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram	For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 for TE Part			

- 1. Message contents are defined in clause 6.6.4.4.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.4.4.1-2 and 6.6.4.4.5-1. UE is configured to perform RLM and BFD based on the SSBs.

#### 6.6.4.4.4.2 Test procedure

Same test procedure as in subclause 6.6.4.3.4.2 with tables 6.6.4.3.4.1-2 and 6.6.4.3.5-1 replaced by tables 6.6.4.4.4.1-2 and 6.6.4.4.5-1.

#### 6.6.4.4.4.3 Message contents

Same message content as in subclause 6.6.4.3.4.3 with the following exception:

Table 6.6.4.4.4.3-1: Common Exception messages NR SA CSI-RS-based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.7-1 with condition DRX.3		
elements contents exceptions			

#### 6.6.4.4.5 Test requirement

Table 6.6.4.4.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.4.4.5-1: SSB specific test parameters for NR SA SSB based L1-RSRP measurement

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1
$N_{oc}^{ m Note1}$	1~3	dBm/15kHz	-94	.65
$N_{oc}^{ m Note1}$	1,2	dBm/SSB SCS	-94	.65
1 oc	3		-91	.65
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0	3.5
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.15
Note2	3		-91.65	-88.14
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.59
	3	dBm/38.16 MHz	-57.59	-55.49

$\hat{E}_s/N_{o}$	c	1~3	dB	0	3.5
Note 1:	Void				
Note 2:			ells and noise sources no s and time and shall be m		
	$N_{oc}$ t	o be fulfilled.			
Note 3:			vels have been derived frosettable parameters thems		or information

After 80ms from the beginning of the test, the UE shall send L1-RSRP report at slot 8 from the reception of DCI triggering the L1-RSRP measurement. The L1-RSRP report shall include the results for both CSI-RS#0 and CSI-RS#1.

Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.4.5-2 for for test configurations 1, 2, 4 and 5 and the corresponding absolute accuracy requirements in Table 6.6.4.4.5-3 for test configurations 3 and 6 and the corresponding relative accuracy requirements in Table 6.6.4.4.5-4 for all test configurations.

Table 6.6.4.4.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	55
Highest reported value (CSI-RS#1)	75

Table 6.6.4.4.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	58
Highest reported value (CSI-RS#1)	78

Table 6.6.4.4.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF RSRP reported (CSI-RS#0)	0
Highest DIFF RSRP reported (CSI-RS#0)	3

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.4.5 NR SA FR1 SSB-based L1-RSRP measurement in DRX for UE configured with highSpeedMeasFlag-r16

# 6.6.4.5.1 Test purpose

To verify that the UE makes correct reporting of L1-RSRP measurement in DRX within L1-RSRP measurement requirements for UE configured with highSpeedMeasFlag-r16 in TS 38.133 clause 9.5.4.1

#### 6.6.4.5.2 Test applicability

This test applies to all types of NR UE release 16 and forward supporting 5GS NR SA FR1, measurement enhancements in high speed scenario and long DRX cycle

## 6.6.4.5.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.4.5.

6.6.4.5.4 Test description

6.6.4.5.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.4.5.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.4.5.4.1-2. Test environment parameters are given in Table 6.6.4.5.4.1-3.

Table 6.6.4.5.4.1-1: SA SSB based L1-RSRP measurement supported test configurations for UE configured with highSpeedMeasFlag-r16

Test Case ID	Description	
6.6.4.5-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode	
6.6.4.5-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode	
6.6.4.5-3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode	
Note: The UE is only required to be tested in one of the supported test configurations		

Table 6.6.4.5.4.1-2: General test parameters for NR SA SSB based L1-RSRP measurement for UE configured with highSpeedMeasFlag-r16

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
Duplex mode	1		FDD
·	2	]	TDD
	3		TDD
TDD Configuration	1		N/A
	2	]	TDDConf.1.1
	3		TDDConf.2.1
BW <sub>channel</sub>	1	MHz	10: N <sub>RB,c</sub> = 52
	2		10: N <sub>RB,c</sub> = 52
	3	1	40: N <sub>RB,c</sub> = 106
PDSCH Reference measurement	1		SR.1.1 FDD
channel	2	1	SR.1.1 TDD
	3		SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD
Channel	2	1	CR.1.1 TDD
	3	1	CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
	3		CCR.2.1 TDD
SSB configuration	1		SSB.3 FR1
guranon	2		SSB.3 FR1
	3		SSB.4 FR1
OCNG Patterns	1~3		OP.1
Initial BWP Configuration	1~3		DLBWP.0.1
Initial BVVI Configuration	' 0		ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1
Douisated Bill configuration	. 0		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
TRS Configuration	1		TRS.1.1 FDD
<b>3</b>	2		TRS.1.1 TDD
	3		TRS.1.2 TDD
DRX configuration	1~3		DRX.3
reportConfigType	1~3		periodic
reportQuantity	1~3		ssb-Index-RSRP
Number of reported RS	1~3		2
L1-RSRP reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	S	2
EPRE ratio of PSS to SSS			
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH			
DMRS			
EPRE ratio of PDCCH DMRS to			
SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS	4.0	-ID	0
EPRE ratio of PDSCH DMRS to	1~3	dB	0
SSS			
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSS <sup>Note 1</sup>			
EPRE ratio of OCNG to OCNG			
DMRS Note 1			
Propagation condition	1~2		AWGN 1944 Hz
	3		AWGN 3334 Hz
Note 1: OCNG shall be used such	hat both cell	s are fully alloca	ted and a constant

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Parameter	Value		Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified	I in Annex E, Table E.4-1 and TS 38	3.508-1 [14] clause 4.3.1 and 4.4.2.	
Channel bandwidth	As specified	As specified by the test configuration selected from Table 6.6.4.5.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.	
Connection	TE Part	A.3.1.8.2 with n=1	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	A.3.2.3.4		
Exceptions to connection diagram	- Without LTE link - For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.4 with n=1 for TE Part			

Table 6.6.4.5.4.1-3: Test Environment parameters for NR SA SSB based L1-RSRP measurement

- 1. Message contents are defined in clause 6.6.4.5.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in Table 6.6.4.5.4.1-2 and 6.6.4.5.5-1. UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs. DRX is configured as specified in Table 6.6.4.5.4.1-2.

#### 6.6.4.5.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.6.4.5.4.1-2. Before the test, UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.6.4.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.6.4.1.5-1. T1 starts.
- 3. The UE shall be transmitting CSI on PUCCH with a periodicity of 80 slots.
- 4. When T1 expires, the SS shall set the parameters according to T2 in 6.6.4.1.5-1. T2 starts.
- 5. If the UE sends L1-RSRP reports meeting the corresponding absolute accuracy requirements in Table 6.6.4.5.5-2 for test configurations 1 and 2 the corresponding absolute accuracy requirements in Table 6.6.4.5.5-3 for test configurations 3 and the corresponding relative accuracy requirements in Table 6.6.4.5.5-4 for all test configurations every 80 slots from no later than 1920 ms plus 80 slots for all configurations from the beginning of time period T2 until the end of time period T2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 6. The SS waits until T2 expires.
- 7. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 8. After the RRC connection release, the SS:
  - transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:
  - switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.4.5.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.4.5.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

Default Message Contents		
Common contents of system information	Table H.2.1-3 with Condition HighSpeedMeas	
blocks exceptions		
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and SS-RSRP	
elements contents exceptions	Table H.3.6-3 with conditions SSB	
	Table H.3.7-1 with condition DRX.3	

# Table 6.6.4.5.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

#### 6.6.4.5.5 Test requirement

Table 6.6.4.5.5-1: SSB specific test parameters for UE configured with highSpeedMeasFlag-r16

Parameter	Config	Unit	SS	SSB#0		SSB#1	
			T1	T2	T1	T2	
$N_{oc}^{}$ Note2	1~3	dBm/15kHz		-9	4.6		
$N_{oc}$ Note2	1,2	dBm/SSB SCS	-94.65				
	3	=		-91	.65		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0	0	-Infinity	3.53	
SSB RSRP Note3	1,2	dBm/SSB SCS	-94.65 -94.65 -Infinity -91.15		-91.15		
	3	1	-91.65	-91.65	-Infinity	-88.14	
lo Note3	1,2	dBm/9.36 MHz	-63.69	-63.69	-66.70	-61.59	
	3	dBm/38.16 MHz	-57.59	-57.59	-60.61	-55.49	
$\hat{E}_s/N_{oc}$	1~3	dB	0	0	-Infinity	3.5	

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for

 $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send L1-RSRP report every 80 slots. No later than 1920ms plus 80 slots from the beginning of time period T2, UE shall send L1-RSRP report including results of both SSB0 and SSB1. Each L1-RSRP measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.4.5.5-2 for for test configurations 1 and 2 and the

corresponding absolute accuracy requirements in Table 6.6.4.5.5-3 for test configurations 3 and the corresponding relative accuracy requirements in Table 6.6.4.5.5-4 for all test configurations.

Table 6.6.4.5.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	55
Highest reported value (SSB#1)	-	75

Table 6.6.4.5.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configurations 3

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	58
Highest reported value (SSB#1)	-	78

Table 6.6.4.5.5-4: L1-RSRP relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF RSRP reported (SSB#0)	-	0
Highest DIFF RSRP reported (SSB#0)	-	3

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

## 6.6.5 UTRAN inter-RAT measurement

## 6.6.5.1 NR SA FR1 – UTRAN event-triggered reporting in non-DRX

## 6.6.5.1.1 Test purpose

This test is to verify that the UE makes correct event-triggered reporting of inter-RAT UTRAN measurements when operating in standalone (SA) operation with PCell in FR1 under the cell search and measurement requirements.

#### 6.6.5.1.2 Test applicability

This test applies to all types of NR UE supporting SA FR1 from Release 16 onwards and support UTRA FDD.

#### 6.6.5.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.3.1.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.5.1.

#### 6.6.5.1.4 Test description

#### 6.6.5.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.5.1.4.1-1.

Table 6.6.5.1.4.1-1: supported test configurations

Test Case ID	Description
6.6.5.1-1	NR 15 kHz SSB SCS, 10MHz bandwidth, FDD duplex mode, UTRAN FDD
6.6.5.1-2	NR 15 kHz SSB SCS, 10MHz bandwidth, TDD duplex mode, UTRAN FDD
6.6.5.1-3	NR 30 kHz SSB SCS, 40MHz bandwidth, TDD duplex mode, UTRAN FDD
NOTE: The U	JE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.6.5.1.4.1-2 and Table 6.6.5.1.4.1-3.

Table 6.6.5.1.4.1-2: Initial conditions for SA inter-RAT UTRAN event triggered reporting in non-DRX with PCell in FR1

Parameter		Value	Comment	
Test environment	NC As specified in TS 38.508-1 [14] clause 4.1			
Test frequencies	As specified	in Annex E, Table E.4-3 and TS 3	38.508-1 [14] sclause 4.3.1.	
Channel bandwidth	As specified	by the test configuration selected	from Table 6.6.5.1.5-1 and Table 6.6.5.1.5-2.	
Propagation conditions	AWGN	As specified in Annex C.2.2.		
Connection	TE Part	A.3.1.8.2	As specified in TS 38.508-1 [14] Annex A.	
Diagram	UE Part	A.3.2.3.2		
Exceptions to connection diagram	SS LTE in Figure A.3.1.8.2 is replaced by SS UTRA LTE TX/RX in Figure A.3.2.3.2 is replaced by UTRA TX/RX			

Table 6.6.5.1.4.1-3: General test parameters for SA inter-RAT UTRAN FDD event triggered reporting in non-DRX with PCell in FR1

Parameter	Unit	Value	Comment
NR RF Channel Number		1	1 NR carrier frequency is used in the test
UTRA RF Channel		2	1 UTRA carrier frequency is used in the test
Number			
Channel Bandwidth	MHz	As specified in Table	
		6.6.5.1.5-1 and Table	
		6.6.5.1.5-2	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbour cell		Cell 2	Cell 2 is on RF channel number 2
Gap Pattern Id		0	As specified in Clause Table FFS Per-UE
			gap pattern.
Inter-RAT UTRA		CPICH Ec/Io	Measurement quantity for Cell 2
measurement quantity			
b1-ThresholdUTRA-FDD	dB	-16.5	CPICH Ec/lo threshold for SS-RSRP
			measurement on cell1 for event B1
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
T1	S	5	
T2	S	5	
Note 1: Values are defin	ed in Table A	A.6.6.5.1.1-3	

- 1. Message contents are defined in clause 6.6.5.1.4.3.
- 2. Cell 1 is the NR PCell and Cell 2 is an inter-RAT UTRAN inter-RAT neighbour cell. Cell 1 is configured according to Annex C.1.1 and C.1.2, Cell 2 is configured according to TS 36.521-3 Annex C.0 and C.1.

#### 6.6.5.1.4.2 Test procedure

The test consists of two successive time periods, with time durations of T1 and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2. Gap pattern configuration is configured before T2 begins to enable inter-frequency monitoring.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.5.1.5-1 and 6.6.5.1.5-2. Propagation conditions are set according to Annex C clause C.2.2.T1 starts.
- 3. SS shall transmit an RRCReconfiguration message to confogure Event B1 measurement reporting.

- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. When T1 expires, the SS shall switch the power setting from T1 to T2 as specified in Table 6.6.5.1.5-1 and 6.6.5.1.5-2.
- 6. UE shall transmit a *MeasurementReport* message triggered by Event B1. If the measurement reporting delay from the beginning of time period T2 is less than 3842ms the number of successful tests is increased by one. If the UE fails to report the event within the measurement reporting delay requirement then the number of failure tests is increased by one.
- 7. After the SS receive the MeasurementReport message in step 6 or when T2 expires, the SS shall:
  - transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources

#### OR

- switch the UE off.
- 8. Set Cell 2 primary scrambling code = ((current cell 2 primary scrambling code 50) mod 200 + 100) for next iteration of the test procedure loop.
- 9. Depending on the choice in Step 7, the SS:
  - if the RRC Connection Release has been sent, transmits in Cell 1 a Paging message (including PagingRecord with UE-Identity) for the UE and ensures the UE is in state RRC\_CONNECTED according to TS 38.508-1 [14] clause 4.5.4 (if the paging fails, switches off and on the UE and ensures the UE is in the state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5,
  - if the device has been switched off, switches on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* according to TS 38.508-1 [14] clause 4.5.

10.Repeat step 2-9 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.5.1.4.3 Message contents

Table 6.6.5.1.4.3-1: RRCReconfiguration (Step 3)

Derivation Path: TS 38.508-1 [14] Table 4.6.1-13 with condition NR_MEAS				
Information Element	Value/remark	Comment	Condition	
RRCReconfiguration ::= SEQUENCE {				
criticalExtensions CHOICE {				
rrcReconfiguration SEQUENCE {				
measConfig	MeasConfig	Table 6.6.5.1.4.3-		
		2		
}				
}				
}				

# Table 6.6.5.1.4.3-2: MeasConfig (Table 6.6.5.1.4.3-1)

Derivation Path: Table H.3.1-2 with condition INTER-RA	AT and GAP NEEDED		
Information Element	Value/remark	Comment	Condition
MeasConfig ::= SEQUENCE {			
measObjectToAddModList SEQUENCE (SIZE	2 entries		
(1maxNrofMeasId)) OF MeasObjectToAddMod {			
MeasObjectToAddMod[1] SEQUENCE {		entry 1	
measObjectId	1		
measObject CHOICE {			
measObjectNR	MeasObjectNR- DEFAULT specified in Table H.3.1-3 with condition INTRA-FREQ MO		
}			
}			
MeasObjectToAddMod[2] SEQUENCE {		entry 2	
measObjectId	2		
measObject CHOICE {			
measObjectUTRA-FDD-r16	MeasObjectUTRA-FDD	Table 6.6.5.1.4.3-	
}			
}			
}			
reportConfigToAddModList SEQUENCE (SIZE (1maxReportConfigId)) OF ReportConfigToAddMod {	1 entry		
ReportConfigToAddMod[1] SEQUENCE {		entry 1	
reportConfigId	1		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT(16 ) specified in 38.508-1 [14] Table 4.6.3-141 with condition EVENT_B1_UTRA	Actual value of UTRA threshold = (16-49)/2 = - 16.5dB	
}			
}			
}			
measGapConfig	MeasGapConfig specified in Table H.3.1-6 with condition gapUE and Pattern #0		
[ }			

# Table 6.6.5.1.4.3-3: MeasObjectUTRA-FDD (Table 6.6.5.1.4.3-2)

Derivation Path: TS 38.508-1 [14], Table 4.6.3-77A			
Information Element	Value/remark	Comment	Condition
MeasObjectUTRA-FDD-r16 ::= SEQUENCE {			
carrierFreq-r16	ARFCN-ValueUTRA-		
	FDD-r16 for UTRA Cell 2		
}			

# Table 6.6.5.1.4.3-4: MeasurementReport (Step 6)

Derivation Path: TS 38.508-1 [14], Table 4.6.1-5	A		
Information Element	Value/remark	Comment	Condition
MeasurementReport ::= SEQUENCE {			
criticalExtensions CHOICE {			
measurementReport SEQUENCE {			
measResults	MeasResults	Table 6.6.5.1.4.3-	
		5	
}			
}			
}			

# Table 6.6.5.1.4.3-5: MeasResults (Table 6.6.5.1.4.3-4)

Derivation Path: TS 38.508-1 [14] Table 4.6.3-79 with condition B1_UTRA				
Information Element	Value/remark	Comment	Condition	
MeasResults ::= SEQUENCE {				
measResultNeighCells CHOICE {				
measResultListUTRA-FDD-r16 SEQUENCE (SIZE	1 entry			
(1maxCellReport)) OF MeasResultUTRA-FDD-r16 {				
MeasResultUTRA-FDD-r16[1] SEQUENCE {		entry 1		
physCellId-r16	PhysCellIdUTRA-FDD-			
	r16 of UTRA Cell 2			
measResult-r16 SEQUENCE {				
utra-FDD-EcN0-r16	INTEGER (049)			
}				
}				
}				
}				
}				

# 6.6.5.1.5 Test requirement

Table 6.6.5.1.5-1 and Table 6.6.5.1.5-2 define the primary level settings including test tolerances for all tests.

Table 6.6.5.1.5-1: PCell specific test parameters for SA inter-RAT UTRA FDD event triggered reporting in non-DRX with PCell in FR1

Parameter		Unit	Configuration	C	Sell 1
			-	T1	T2
RF channel number			1, 2, 3	•	1
Duplex mode			1, 2, 3	!	FDD
TDD Configuration	SCS=15 KHz		2	TDD	Conf.1.1
	SCS=30 KHz		3		Conf.1.2
BW <sub>channel</sub>		MHz	1		= 52 (FDD)
			2		= 52 (TDD)
			3	40: N <sub>RB,c</sub>	= 106 (TDD)
PDSCH reference m	easurement		1	SR.	1.1 FDD
0.10.11.01			2	SR.	1.1 TDD
			3		2.1 TDD
CORSET reference	channel		1		1.1 FDD
			2	CR.	1.1 TDD
			3	CR.	2.1 TDD
BWP configurations	Initial DL BWP		1, 2, 3	DLE	WP.0.1
Cornigurations	Dedicated DL BWP		1, 2, 3	DLE	WP.1.1
	Initial UL BWP		1, 2, 3	ULE	WP.0.1
	Dedicated UL BWP		1, 2, 3	ULE	WP.1.1
OCNG pattern <sup>Note1</sup>			1, 2, 3	OP.1	
SMTC configuration			1, 2, 3	SMTC.1	
SSB configuration			1, 2		3.1 FR1
J			3		3.2 FR1
CSI-RS for tracking			1		1.1 FDD
			2	TRS.	1.1 TDD
			3	TRS.	1.2 TDD
EPRE ratio of PSS to SSS		dB	1, 2, 3		0
EPRE ratio of PBCH					
EPRE ratio of PBCH					
EPRE ratio of PDCC					
EPRE ratio of PDCC	CH to				
PDCCH_DMRS	U DMD0 +- 000				
EPRE ratio of PDSC					
PDSCH_DMRS	H to				
EPRE ratio of OCNO	DMPS to SSS				
EPRE ratio of OCNO					
N <sub>oc</sub> Note2	o to corre binite	dBm/15 KHz	1, 2, 3		106
N <sub>oc</sub> Note2		dBm/SCS	1, 2		106
30			3		103
Ês/Noc		dB	1, 2, 3	18	-2
Ê <sub>s</sub> /I <sub>ot</sub> Note3		dB	1, 2, 3	18	-2
SS-RSRP <sup>Note3</sup>		dBm/SCS	1, 2	-88	-108
			3	-85	-105
SSB_RP <sup>Note3</sup>		dBm/SCS	1, 2	-88	-108
. Neteo		dBm/9.36 MHz	3	-85	-105
IO <sup>Note3</sup>	Io <sup>Note3</sup>		1, 2	-59.98	-75.92
		dBm/38.16 MHz	3	-53.88	-69.82
Propagation condition			1, 2, 3	ET	DLA30
Antenna Configuration			1, 2, 3 1, 2, 3		2 Low
Matrix	Matrix				20. 1

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3:  $\hat{E}_s/I_{ot}$ , SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.6.5.1.5-2: UTRAN neighbour cell specific test parameters for SA inter-RAT UTRAN FDD event triggered reporting in non-DRX with PCell in FR1

Parameter	Unit	Cell 2		
		T1	T2	
UTRA RF Channel Number		2		
CPICH_Ec/lor	dB	-10		
PCCPCH_Ec/lor	dB	-12		
SCH_Ec/lor	dB	-12		
PICH_Ec/lor	dB	-15		
DPCH_Ec/lor	dB	N/A		
OCNS		-0.94	1	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity -1.8		
$I_{oc}$	dBm/3.84 MHz	-70		
CPICH_Ec/lo	dB	-Infinity -14		
Propagation Condition		AWGN		

Note 1: The DPCH level is controlled by the power control loop.

Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to  $I_{or}$ .

The UE shall send one Event B1 triggered measurement report for Cell 2 to the PCell, with a measurement reporting delay less than 2.4s from the start of period T2, i.e. when Cell 2 becomes detectable. The measurement reporting delay is defined as the time from the beginning of time period T2 to the moment when the UE sends the measurement report on PUSCH.

The UE shall not send event-triggered measurement reports as long as the reporting criteria is not fulfilled.

The rate of correct events observed during repeated tests shall be at least 90%.

#### 6.6.6 to 6.6.7

# 6.6.8 L1-SINR measurement for beam reporting

## 6.6.8.0 Minimum conformance requirements

6.6.8.0.1 L1-SINR reporting with CSI-RS based CMR and no dedicated IMR configured

Same as clause 4.6.7.0.1

The normative reference for this requirement is TS 38.133 [6] clause 9.8.3, 9.8.4.1 and 9.8.5.2.

# 6.6.8.0.2 L1-SINR reporting with SSB based CMR and dedicated IMR configured

Same as clause 4.6.7.0.2

The normative reference for this requirement is TS 38.133 [6] clause 9.8.3, 9.8.4.2 and 9.8.5.

#### 6.6.8.0.3 L1-SINR reporting with CSI-RS based CMR and dedicated IMR configured

Same as clause 4.6.7.0.3

The normative reference for this requirement is TS 38.133 [6] clause 9.8.3, 9.8.4.3 and 9.8.5.

# 6.6.8.1 NR SA FR1 CSI-RS based CMR and no dedicated IMR L1-SINR measurement in DRX

#### 6.6.8.1.1 Test purpose

To verify that the UE makes correct reporting of L1-SINR measurement in DRX within L1-SINR measurement requirements in TS 38.133 [6] clause 9.8.4.1.

## 6.6.8.1.2 Test applicability

This test applies to all types of NR UE release 16 and forward, supporting L1-SINR measurement and long DRX cycle.

#### 6.6.8.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.8.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.8.1.

6.6.8.1.4 Test description

6.6.8.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.8.1.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.8.1.4.1-2. Test environment parameters are given in Table 6.6.8.1.4.1-3.

Table 6.6.8.1.4.1-1: NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement supported test configurations

	Config	Description
	1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
	2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
	3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is only r	equired to be tested in one of the supported test configurations

Table 6.6.8.1.4.1-2: General test parameters for NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3		freq1
	1		FDD
Duplex mode	2		TDD
•	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
Ç	3		TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52
BW <sub>channel</sub>	2	MHz	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106
	1		SR.1.1 FDD
PDSCH Reference measurement	2		SR.1.1 TDD
channel	3		SR.2.1 TDD
	1		
DMCLCODECET Deference Channel	2		CR.1.1 FDD
RMSI CORESET Reference Channel			CR.1.1 TDD
	3		CR.2.1 TDD
Dedicated CORESET Reference	1		CCR.1.1 FDD
Channel	2		CCR.1.1 TDD
	3		CCR.2.1 TDD
	1		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
	3		SSB.4 FR1
	1		CSI-RS 1.3 FDD
CSI-RS configuration	2		CSI-RS 1.3 TDD
	3		CSI-RS 2.3 TDD
OCNG Patterns	1~3		OP.1
	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
<b>G</b>	3		TRS.1.2 TDD
LEST BANDO S	4.0		DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1
Dedicated DMD configuration	4.0		DLBWP.1.1
Dedicated BWP configuration	1~3		ULBWP.1.1
SMTC configuration	1~3		SMTC.1
DRX configuration	1~3		DRX.3
reportConfigType	1~3		aperiodic
reportQuantity-r16	1~3		cri-SINR-r16
Number of reported RS	1~3		2
			SSB#0 for resource#0
qcl-Info	1~3		SSB#1 for resource#1
reportSlotOffsetList	1~3	slots	26
T1	1~3	S	5
EPRE ratio of PSS to SSS	1.5	3	<u> </u>
EPRE ratio of PBCH DMRS to SSS			
EPRE ratio of PBCH to PBCH DMRS			
EPRE ratio of PDCCH DMRS to SSS			
EPRE ratio of PDCCH to PDCCH			
DMRS	1.2	٩D	
EPRE ratio of PDSCH DMRS to SSS	1~3	dB	0
EPRE ratio of PDSCH to PDSCH			
DMRS			
EPRE ratio of OCNG DMRS to			
SSSNote 1			
EPRE ratio of OCNG to OCNG DMRS Note 1			
Propagation condition	1~3		AWGN
Note 1: OCNG shall be used such that		are fully allo	

As specified in TS 38.508-1 [14] Annex A.

Connection

Exceptions to

connection

diagram

Diagram

	mint ET Office medication	none		
Parameter	Value	Comment		
Test environment	NC	As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified in Annex E, Table E.2-1 and TS 38.508-1 [14] clause 4.3.1 and 4.4.2.			
Channel	As specified by the test configuration selected from Table 6.6.8.1.4.1-1.			
bandwidth				
Propagation	AWGN As specified in Annex C.2.2.			
conditions		·		

A.3.1.8.2 with n = 1

A.3.2.3.4

For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and

Table 6.6.8.1.4.1-3: Test Environment parameters for NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

1. Message contents are defined in clause 6.6.8.1.4.3.

A.3.1.8.5 for TE Part

TE Part

**DUT Part** 

2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.8.1.4.1-2 and 6.6.8.1.5-1. UE is configured to perform RLM and BFD based on the SSBs.

#### 6.6.8.1.4.2 Test procedure

The test consists of a single time period T1, during which the UE is triggered via DCI to report L1-SINR on aperiodic CSI-RS resources. Prior to the start of the time duration T1, the UE shall be fully synchronized to PCell. UE is also configured to measure L1-SINR based on SSB. Upon receiving the DCI trigger, UE provides the report back based on the reporting configuration as defined in Table 6.6.8.1.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.8.1.5-1. T1 starts.
- 3. After 80ms from the start of the test the SS transmits the DCI trigger in slot 1 for configuration 1, 2 and slot 8 for configuration 3. The corresponding CSI-RS set is transmitted with the offset of 4 slots after the DCI trigger.
- 4. The SS shall check following requirements:
  - R1: the UE shall send L1-SINR report at slot 26 from the reception of DCI trigger. If the report is received at slot 26 from the reception of DCI trigger, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
  - R2: The L1-SINR value of CSI-RS#1 reported by the UE is compared to the expected L1-SINR value for CSI-RS#1. If the resulting value is outside the limits in Table 6.6.8.1.5-2 for all test configurations or the UE fails to report the measurement value for CSI-RS #1, the number of failed iterations for R2 is increased by one. Otherwise, the number of passed iterations for R2 is increased by one.
  - R3: The DIFF SINR value of CSI-RS #0 reported by the UE is compared to the expected DIFF SINR value. If the resulting value is outside the limits in Table 6.6.8.1.5-4 or the UE fails to report the measurement value for CSI-RS#0, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.
- 5. If after T1 expiry no report is received or received report did not contain L1-SINR of both CSI-RS#0 and CSI-RS#1 or UE sent the L1-SINR report at different slot than 26 from the reception of DCI trigger, the number of 'failed' iterations is increased by one, otherwise, the number of 'passed' iterations is increased by one.
- 6. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 7. After the RRC connection release, the SS:
  - transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on

the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

## 6.6.8.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.8.1.4.3-1: Common Exception messages NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.6A-1 with conditions APERIODIC and CSI-SINR		
elements contents exceptions	Table H.3.6A-2 with conditions CSI-RS and APERIODIC		
	Table H.3.7-1 with condition DRX.3		

## Table 6.6.8.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133				
Information Element	Value/remark	Comment	Condition	
RadioLinkMonitoringConfig ::= SEQUENCE {				
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF	1 entry			
SEQUENCE {				
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.		
}				
}				

#### 6.6.8.1.5 Test requirement

Table 6.6.8.1.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.8.1.5-1: CSI-RS specific test parameters for NR SA CSI-RS based CMR and no dedicated IMR L1-SINR measurement

Parameter	Config	Unit	CSI-RS#0	CSI-RS#1
$N_{oc}$ Note1	1~3	dBm/15kHz	-94	.65
Ŋ Note1	1,2	dBm/SSB SCS	-94	.65
$N_{oc}$ Note1	3	UDIII/33B 3C3	-91	.65
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0	3
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.65
Note3	3	dbiii/00b 000	-91.65	-88.65
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.93
10	3	dBm/38.16 MHz	-57.59	-55.84
$\hat{E}_s/N_{oc}$	1~3	dB	0	3

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: CSI-RS RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

After 80ms from the beginning of the test, the UE shall send L1-SINR report at slot 26 from the reception of DCI triggering the L1-SINR measurement. The L1-SINR report shall include the results for both CSI-RS#0 and CSI-RS#1.

Each L1-SINR measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.8.1.5-2 for all test configurations and the corresponding relative accuracy requirements in Table 6.6.8.1.5-4 for all test configurations.

Table 6.6.8.1.5-2: L1-SINR absolute accuracy requirements for the reported values for all test configurations

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	41
Highest reported value (CSI-RS#1)	64

Table 6.6.8.1.5-3: Void

Table 6.6.8.1.5-4: L1-SINR relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF SINR reported (CSI-RS#0)	0
Highest DIFF SINR reported (CSI-RS#0)	7

For the test to pass, the ratio of successful reported values for each requirement (R1 to R3) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others..

NOTE: The actual overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.8.2 NR SA FR1 SSB based CMR and dedicated IMR L1-SINR measurement in non-DRX

6.6.8.2.1 Test purpose

To verify that the UE makes correct reporting of L1-SINR measurement in non-DRX within L1-SINR measurement requirements in TS 38.133 [6] clause 9.8.4.2.

6.6.8.2.2 Test applicability

This test applies to all types of NR UE release 16 and forward, supporting L1-SINR measurement.

6.6.8.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.8.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.8.2.

6.6.8.2.4 Test description

6.6.8.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.8.2.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.8.2.4.1-2. Test environment parameters are given in Table 6.6.8.2.4.1-3.

Table 6.6.8.2.4.1-1: NR SA SSB based CMR and dedicated IMR L1-SINR measurement supported test configurations

Config	Description	
1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode	
2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode	
3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode	
Note: The UE is only required to be tested in one of the supported test configurations		

Table 6.6.8.2.4.1-2: General test parameters for NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit	Value
SSB GSCN	1~3	O I II C	freq1
000 00011	1		FDD
Duplex mode	2		TDD
E aprox mode	3		TDD
	1		N/A
TDD Configuration	2		TDDConf.1.1
. 22 coga.ao	3		TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52
BW <sub>channel</sub>	2	MHz	10: $N_{RB,c} = 52$
	3		40: N <sub>RB,c</sub> = 106
BB00HB (	1		SR.1.1 FDD
PDSCH Reference measurement	2		SR.1.1 TDD
channel	3		SR.2.1 TDD
DMOLOODEOET D. (	1		CR.1.1 FDD
RMSI CORESET Reference	2		CR.1.1 TDD
Channel	3		CR.2.1 TDD
Dadia dad CODECET Dataman	1		CCR.1.1 FDD
Dedicated CORESET Reference Channel	2		CCR.1.1 TDD
Channel	3		CCR.2.1 TDD
	С		SSB.3 FR1
SSB configuration	2		SSB.3 FR1
	3		SSB.4 FR1
	1		CSI-RS 1.1A FDD
CSI-RS configuration	2		CSI-RS 1.1A TDD
g	3		CSI-RS 2.1A TDD
OCNG Patterns	1~3		OP.1
			DLBWP.0.1
Initial BWP Configuration	1~3		ULBWP.0.1
Dedicated BWP configuration	1~3		DLBWP.1.1 ULBWP.1.1
SMTC configuration	1~3		SMTC.1
- Citi C Colingaration	1		TRS.1.1 FDD
TRS Configuration	2		TRS.1.1 TDD
3	3		TRS.1.2 TDD
DRX configuration	1~3		off
reportConfigType	1~3		periodic
reportQuantity-r16	1~3		ssb-Index-SINR- r16
Number of reported RS	1~3		2
L1-SINR reporting period	1~3	slot	80
T1	1~3	S	5
T2	1~3	S	1
EPRE ratio of PSS to SSS			·
EPRE ratio of PBCH DMRS to SSS	†		
EPRE ratio of PBCH to PBCH	†		
DMRS			
EPRE ratio of PDCCH DMRS to	1		
SSS			
EPRE ratio of PDCCH to PDCCH	1		
DMRS	4.0	٦D	0
EPRE ratio of PDSCH DMRS to SSS	1~3	dB	U
EPRE ratio of PDSCH to PDSCH	1		
DMRS			
EPRE ratio of OCNG DMRS to	1		
SSSNote 1			
EPRE ratio of OCNG to OCNG DMRS Note 1	1		
Propagation condition	1~3		AWGN
Note 1: OCNC shall be used such t			10 d and a constant

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table 6.6.8.2.4.1-3: Test Environment parameters for NR SA SSB based CMR and dedicated IMR L1-
SINR measurement

Parameter		Value	Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.
Channel	As specified	by the test configuration selected fr	om Table 6.6.8.2.4.1-1.
bandwidth			
Propagation	AWGN		As specified in Annex C.2.2.
conditions			
Connection	TE Part	A.3.1.8.2 with n = 1TBD	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4TBD	
Exceptions to	For 4Rx capable UEs without any 2 Rx RF		
connection	bands use A	.3.2.5.2 for DUT part and	
diagram	A.3.1.8.5 for	TE Part	

- 1. Message contents are defined in clause 6.6.8.2.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.8.2.4.1-2, 6.6.8.2.5-1 and 6.6.8.2.5-2. UE is configured to perform RLM and BFD based on the SSBs.

#### 6.6.8.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above Table 6.6.8.2.4.1-2. Before the test, UE is configured to perform RLM, BFD and L1-SINR measurement based on the SSBs.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.6.8.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.6.8.2.5-1 and Table 6.6.8.2.5-2. T1 starts. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 3. The UE shall be transmitting CSI on PUCCH with a periodicity of 80 slots.
- 4. When T1 expires, the SS shall set the parameters according to T2 in Table 6.6.8.2.5-1 and Table 6.6.8.2.5-2. T2 starts. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 5. If the UE sends L1-SINR reports meeting the corresponding absolute accuracy requirements in Table 6.6.8.2.5-3 for test configurations 1 and 2 the corresponding absolute accuracy requirements in Table 6.6.8.2.5-4 for test configurations 3 and the corresponding relative accuracy requirements in Table 6.6.8.2.5-5 for all test configurations every 80 slots from no later than 720 ms for configuration 1 and 2 and no later than 680 ms for configuration 3 from the beginning of time period T2 until the end of time period T2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one. The UE shall start sending valid L1-SINR reports. The SS shall check following requirements:
  - R1: the UE shall start to transmit valid reports no later than 720 ms for configuration 1,2 and no later than 680 ms for configuration 3 from the beginning of time period T2. A valid report shall meet the absolute L1-SINR requirement for SSB#1 (Table 6.6.8.2.5-3 for all configurations) and the relative L1-SINR requirement for SSB#0 in Table 6.6.8.2.5-5. If the first valid report is received earlier than the specified time, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
  - R2: the UE shall transmit reports every 80 slots until the end of time period T2. If the reports are received accordingly, the number of passed iterations for R2 is increased by one. Otherwise, the number of failed iterations for R2 is increased by one.
  - R3: The L1-SINR value of SSB#1 reported by the UE is compared to the expected L1-SINR value for SSB#1. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table 6.6.8.2.5-3 for all configurations or the UE fails to report the measurement value for SSB#1, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.

- -R4: The DIFF SINR value of SSB#0 reported by the UE is compared to the expected DIFF SINR value. In all consecutive reports after the first valid value is received, if the resulting value is outside the limits in Table6.6.8.2.5-5 for all configurations or the UE fails to report the measurement value for SSB#0, the number of failed iterations for R4 is increased by one. Otherwise, the number of passed iterations for R4 is increased by one.
- 6. The SS waits until T2 expires.
- 7. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 8. After the RRC connection release, the SS:
  - transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:
  - switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 9. Repeat steps 2-8 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

#### 6.6.8.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.8.2.4.3-1: Common Exception messages NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Default Message Contents				
Common contents of system information blocks exceptions				
Default RRC messages and information elements contents exceptions	Table H.3.6A-1 with conditions PERIODIC and SS-SINR and CSI-RS_IMR Table H.3.6A-2 with conditions SSB and PERIODIC Table H.3.6A-3 with condition PERIODIC			

#### Table 6.6.8.2.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

#### 6.6.8.2.5 Test requirement

Table 6.6.8.2.5-1 and Table 6.6.8.2.5-2 define the primary level settings including test tolerances for all tests.

Table 6.6.8.2.5-1: SSB specific test parameters for NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit	SS	B#0	SSI	B#1
Parameter Config Unit		T1	T2	T1	T2	
$N_{oc}^{$	1~3	dBm/15kHz	-94.65			
λ/ Note2	1,2 -94.65					
$N_{oc}^{}$ Note2	3	dBm/SSB SCS	-91.65			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0.5	0.5	-Infinity	3
SSB RSRP Note3	1,2	dBm/SSB SCS	-94.15	-94.15	-Infinity	-91.65
OOD NON	3	ubiii/00b 000	-91.14	-91.14	-Infinity	-88.65
lo Note3	1,2	dBm/9.36 MHz	-63.43	-63.43	-66.70	-61.93
10	3	dBm/38.16 MHz	-57.33	-57.33	-60.61	-55.84
$\hat{E}_s/N_{oc}$	1~3	dB	0.5	0.5	-Infinity	3

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.6.8.2.5-2: CSI-RS specific test parameters for NR SA SSB based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit	CSI-	RS#0	CSI-I	RS#1
Parameter	Config	Unit	T1	T2	T1	T2
$N_{oc}^{}$ Note2	1~3	dBm/15kHz	-94.65			
M Note2	1,2	dBm/CSI-RS SCS		-94	.65	
$N_{oc}^{}$ Note2	3	ubili/CSI-RS SCS	-91.65			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	1~3	dB	0.5	0.5	-Infinity	3
CSI-RS RSRP	1,2	dBm/CSI-RS SCS	-94.15	-94.15	-Infinity	-91.65
Note3	3	dbiii/ooi-iko ooo	-91.14	-91.14	-Infinity	-88.65
lo Note3	1,2	dBm/9.36 MHz	-63.43	-63.43	-66.70	-61.93
10	3	dBm/38.16 MHz	-57.33	-57.33	-60.61	-55.84
$\hat{E}_s/N_{oc}$	1~3	dB	0.5	0.5	-Infinity	3

Note 1: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

The UE shall send L1-SINR report every 80 slots. No later than 640ms plus 80 slots from the beginning of time period T2, UE shall send L1-SINR report including results of both SSB#0+CSI-RS#0 and SSB#1+CSI-RS#1. Each L1-SINR measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.8.2.5-3 for all test configurations and the corresponding relative accuracy requirements in Table 6.6.8.2.5-4 for all test configurations.

Table 6.6.8.2.5-3: L1-SINR absolute accuracy requirements for the reported values for all test configurations

Normal Conditions	T1	T2
Lowest reported value (SSB#1)	-	44
Highest reported value (SSB#1)	-	61

Table 6.6.8.2.5-4: Void

Table 6.6.8.2.5-5: L1-SINR relative accuracy requirements for the reported values for all test configurations

	T1	T2
Lowest DIFF SINR reported (SSB#0)	-	0
Highest DIFF SINR reported (SSB#0)	-	5

For the test to pass, the ratio of successful reported values for each requirement (R1 to R4) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others..

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.8.3 NR SA FR1 CSI-RS based CMR and dedicated IMR L1-SINR measurement in non-DRX

# 6.6.8.3.1 Test purpose

To verify that the UE makes correct reporting of L1-SINR measurement in non-DRX within L1-SINR measurement requirements in TS 38.133 [6] clause 9.8.4.3.

#### 6.6.8.3.2 Test applicability

This test applies to all types of NR UE release 16 and forward, supporting L1-SINR measurement.

#### 6.6.8.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.6.8.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.6.8.3.

6.6.8.3.4 Test description

6.6.8.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.8.3.4.1-1. Configure the test equipment and the DUT according to the parameters in Table 6.6.8.3.4.1-2. Test environment parameters are given in Table 6.6.8.3.4.1-3.

Table 6.6.8.3.4.1-1: NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement supported test configurations

	Config	Description
	1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
	2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
	3	NR 30 kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is on	v required to be tested in one of the supported test configurations

Table 6.6.8.3.4.1-2: General test parameters for NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit	Value		
SSB GSCN	1~3	Onic	freq1		
002 00011	1		FDD		
Duplex mode	2	1	TDD		
Buplex mode	3		TDD		
	1		N/A		
TDD Configuration	2	1	TDDConf.1.1		
122 comgaration	3		TDDConf.2.1		
	1		10: N <sub>RB,c</sub> = 52		
BWchannel	2	MHz	10: N <sub>RB,c</sub> = 52		
	3		40: N <sub>RB,c</sub> = 106		
PDSCH Reference measurement	1		SR.1.1 FDD		
channel	2		SR.1.1 TDD		
onarii o	3		SR.2.1 TDD		
	1		CR.1.1 FDD		
RMSI CORESET Reference Channel	2		CR.1.1 TDD		
	3		CR.2.1 TDD		
Dedicated CORESET Reference	1		CCR.1.1 FDD		
Channel	2		CCR.1.1 TDD		
Chamer	3		CCR.2.1 TDD		
	1		SSB.3 FR1		
SSB configuration	2		SSB.3 FR1		
	3		SSB.4 FR1		
	1		CSI-RS 1.3 FDD		
CSI-RS configuration	2		CSI-RS 1.3 TDD		
	3		CSI-RS 2.3 TDD		
	1		CSI-IM.1.2 FDD		
CSI-IM configuration	2		CSI-IM.1.2 TDD		
_	3		CSI-IM.2.2 TDD		
OCNG Patterns	1~3		OP.1		
	1		TRS.1.1 FDD		
TRS Configuration	2		TRS.1.1 TDD		
	3		TRS.1.2 TDD		
Initial BWP Configuration	1~3		DLBWP.0.1 ULBWP.0.1		
Dedicated BWP configuration	1~3		DLBWP.1.1		
CMTC configuration	4.2		ULBWP.1.1		
SMTC configuration	1~3 1~3		SMTC.1		
DRX configuration			Off		
reportConfigType	1~3		aperiodic		
reportQuantity-r16	1~3		cri-SINR-r16		
Number of reported RS	1~3		2		
qcl-Info	1~3		SSB#0 for resource#0 SSB#1 for resource#1		
reportSlotOffsetList	1~3	slots	26		
T1	1~3	S	5		
EPRE ratio of PSS to SSS					
EPRE ratio of PBCH DMRS to SSS					
EPRE ratio of PBCH to PBCH DMRS					
EPRE ratio of PDCCH DMRS to SSS	1				
EPRE ratio of PDCCH to PDCCH DMRS					
EPRE ratio of PDSCH DMRS to SSS	1~3	dB	0		
EPRE ratio of PDSCH to PDSCH	1 . Ŭ	35			
DMRS					
EPRE ratio of OCNG DMRS to					
SSSNote 1					
EPRE ratio of OCNG to OCNG DMRS					
Propagation condition	1~3		AWGN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Table 6.6.6.3.4.1-	L1-SINR measurement			
Parameter	Value	Comment		

Table 6.6.9.2.4.1.2. Tast Environment parameters for ND SA CSI DS based CMD and dedicated IMD

Parameter	Value		Comment
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified	in Annex E, Table E.2-1 and TS 38	.508-1 [14] clause 4.3.1 and 4.4.2.
Channel bandwidth	As specified by the test configuration selected from Table 6.6.8.3.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
Diagram	DUT Part	A.3.2.3.4	
Exceptions to connection diagram	For 4Rx capable UEs without any 2 Rx RF bands use A.3.2.5.2 for DUT part and A.3.1.8.5 for TE Part		

- 1. Message contents are defined in clause 6.6.8.3.4.3.
- 2. Single Cell is used, which is NR FR1 Pcell. The connection setup is done according to the settings in Annex C.1.2 and C.1.3. The test parameters are given in tables 6.6.8.3.4.1-2 and 6.6.8.3.5-1. UE is configured to perform RLM and BFD based on the SSBs.

#### 6.6.8.3.4.2 Test procedure

The test consists of a single time period T1, during which the UE is triggered via DCI to report L1-SINR on aperiodic CSI-RS resources. Prior to the start of the time duration T1, the UE shall be fully synchronized to PCell. UE is also configured to measure L1-SINR based on SSB. Upon receiving the DCI trigger, UE provides the report back based on the reporting configuration as defined in table 6.6.8.3.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to T1 in Table 6.6.8.3.5-1. T1 starts.
- 3. After 80ms from the start of the test the SS transmits the DCI trigger in slot 1 for configuration 1, 2 and slot 8 for configuration 3. The corresponding CSI-RS set is transmitted with the offset of 4 slots after the DCI trigger.
- 4. The SS shall check following requirements:
  - R1: the UE shall send L1-SINR report at slot 26 from the reception of DCI trigger. If the report is received at slot 26 from the reception of DCI trigger, the number of passed iterations for R1 is increased by one. Otherwise, the number of failed iterations for R1 is increased by one.
  - R2: The L1-SINR value of CSI-RS#1 reported by the UE is compared to the expected L1-SINR value for CSI-RS#1. If the resulting value is outside the limits in Table 6.6.8.3.5-2 for all test configurations or the UE fails to report the measurement value for CSI-RS #1, the number of failed iterations for R2 is increased by one. Otherwise, the number of passed iterations for R2 is increased by one.
- R3: The DIFF SINR value of CSI-RS #0 reported by the UE is compared to the expected DIFF SINR value. If the resulting value is outside the limits in Table 6.6.8.3.5-4 or the UE fails to report the measurement value for CSI-RS#0, the number of failed iterations for R3 is increased by one. Otherwise, the number of passed iterations for R3 is increased by one.5. If after T1 expiry no report is received or received report did not contain L1-SINR of both CSI-RS#0 as CMR + CSI-IM#0 as IMR and CSI-RS#1 as CMR + CSI-IM#1 as IMR or UE sent the L1-SINR report at different slot than 26 from the reception of DCI trigger, the number of 'failed' iterations is increased by one, otherwise, the number of 'passed' iterations is increased by one.
- 6. The SS shall transmit *RRCRelease* message to release the RRC connection which includes the release of the established radio bearers as well as all radio resources.
- 7. After the RRC connection release, the SS:
  - transmits in Cell 1 a *Paging* message (including PagingRecord with ue-Identity) for the UE and ensures the UE in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5. (if the paging fails, switches off and on

the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.), or:

- switches off and on the UE and ensures the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 8. Repeat steps 2-7 until the confidence level according to Tables G.2.3-1 in Annex G clause G.2 is achieved.

## 6.6.8.3.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.8.3.4.3-1: Common Exception messages NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

Default Message Contents		
Common contents of system information blocks exceptions		
Default RRC messages and information elements contents exceptions	Table H.3.6A-1 with conditions APERIODIC and CSI-SINR and CSI-IM_IMR Table H.3.6A-2 with conditions CSI-RS and APERIODIC	
	Table H.3.6A-4 with condition APERIODIC	

# Table 6.6.8.3.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133				
Information Element	Value/remark	Comment	Condition	
RadioLinkMonitoringConfig ::= SEQUENCE {				
failureDetectionResourcesToAddModList	1 entry			
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.		
}				
}				

## 6.6.8.3.5 Test requirement

Table 6.6.8.3.5-1 defines the primary level settings including test tolerances for all tests.

Table 6.6.8.3.5-1: CSI-RS specific test parameters for NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

Parameter	Config	Unit CSI-RS#0 CSI-RS#1		CSI-RS#1
$N_{oc}^{ m Note1}$	1~3	dBm/15kHz	-94	.65
$N_{oc}^{}$ Note1	1,2	dBm/SSB SCS	-94.65	
TV <sub>oc</sub>	3	UBIII/33B 3C3	-91.65	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	1~3	dB	0 3	
CSI-RS RSRP	1,2	dBm/SSB SCS	-94.65	-91.65
Note2	3	ubili/oob ooo	-91.65	-88.65
lo Note2	1,2	dBm/9.36 MHz	-63.69	-61.93
10	3	dBm/38.16 MHz	-57.59	-55.84
$\hat{E}_s/N_{oc}$	1~3	dB	0 3	

Note 1: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 2: CSI-RS RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

After 80ms from the beginning of the test, the UE shall send L1-SINR report at slot 26 from the reception of DCI triggering the L1-SINR measurement. The L1-SINR report shall include the results for both CSI-RS#0 as CMR + CSI-IM#0 as IMR and CSI-RS#1 as CMR + CSI-IM#1 as IMR.

Each L1-SINR measurement report shall meet the corresponding absolute accuracy requirements in Table 6.6.8.3.5-2 for all test configurations and the corresponding relative accuracy requirements in Table 6.6.8.3.5-4 for all test configurations.

Table 6.6.8.3.5-2: L1-SINR absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	T1
Lowest reported value (CSI-RS#1)	43
Highest reported value (CSI-RS#1)	62

Table 6.6.8.3.5-3: Void

Table 6.6.8.3.5-4: L1-SINR relative accuracy requirements for the reported values for all test configurations

	T1
Lowest DIFF SINR reported (CSI-RS#0)	0
Highest DIFF SINR reported (CSI-RS#0)	6

For the test to pass, the ratio of successful reported values for each requirement (R1 to R3) shall be more than 90% with a confidence level of 95%. Each requirement is evaluated independently of the others.

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# 6.6.9 Idle Mode CA/DC Measurements

6.6.9.0 Minimum conformance requirements

**TBD** 

#### 6.6.9.1 NR SA FR1 SA Idle mode CA/DC measurement for FR1

Editor's note: This test case is incomplete. The following aspects are either missing or TBD

- Minimum conformance requirement is TBD
- Test case applicability is missing
- Cell configuration in Annex E is missing
- Test procedure
- Message contents
- TT analysis is missing
- Initial conditions and test requirements are contain []

#### 6.6.9.1.1 Test purpose

The purpose of this test is to verify the TBD

6.6.9.1.2 Test applicability

This test applies to all types of NR UE release TBD onwards, configured with TBD

6.6.9.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause TBD.

The normative reference for this requirement is TS 38.133 [6] clause TBD and A.6.6.9.1

6.6.9.1.4 Test description

6.6.9.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.9.1.4.1-1.

Table 6.6.9.1.4.1-1: Supported test configurations

Test Case ID	Description	
6.6.15.1-1	NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode	
6.6.15.1-2	NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode	
6.6.15.1-3	NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode	
Note 1: The UE i	Note 1: The UE is only required to be tested in one of the supported test configurations	
Note 2: Target N	ote 2: Target NR cell has the same SCS, BW and duplex mode as NR serving cell	

Test environment parameters are given in Table 6.6.9.1.4.1-2.

Table 6.6.9.1.4.1-2: Initial conditions for SA Idle mode CA/DC measurement for FR1

Parameter		Value	Comment	
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Annex E, Table E.4-1 and TS 38.508-1 [14] clause 4.3.1.			
Channel	As specified by the test configuration selected from Table 6.6.9.1.4.1-1.			
bandwidth				
Propagation	AWGN		As specified in Annex C.2.2	
conditions				
Connection	TE Part	TBD	As specified in TS 38.508-1 [14] Annex A.	
Diagram	DUT Part	TBD		

Exceptions to	
connection	
diagram	

- 1. The general test parameter settings are set up according to Table 6.6.9.1.4.1-3.
- 2. Message contents are defined in clause 6.6.9.1.4.3.
- 3. The test scenario comprises of two NR Cells. NR Cell 1 is the cell used for connection setup with the power level set according to Annex C.1.1 and C.1.2 for this test.

Table 6.6.9.1.4.1-3: General test parameters for SA Idle mode CA/DC measurement for FR1

Parameter	Unit	Test configurati on	Value	Comment
NR RF Channel Number		Config 1,2,3	1, 2	Two FR1 NR carrier frequencies is used
Active cell		Config 1,2,3	NR cell 1 (Pcell)	NR Cell 1 is on NR RF channel number 1.
Neighbour cell		Config 1,2,3	NR cell2	NR cell 2 is on NR RF channel number 2.
SMTC-SSB parameters		Config 1	SSB.1 FR1	As specified in clause A.3.10.1
		Config 2	SSB.1 FR1	As specified in clause A.3.10.1
		Config 3	SSB.2 FR1	As specified in clause A.3.10.1
Hysteresis	dB	Config 1,2,3	0	
PRACH configuration index		Config 1,2,3	102	The detailed configuration is specified in TS 38.211 clause 6.3.3.2
CP length		Config 1,2,3	Normal	
TimeToTrigger	S	Config 1,2,3	0	
Filter coefficient		Config 1,2,3	0	L3 filtering is not used
DRX in connected mode		Config 1,2,3	OFF	DRX is not used
DRX in idle mode	S	Config 1,2,3	[0.32]	The value shall be used for all cells in the test.
T331	S		300	
Time offset between serving and neighbour cells		Config 1	3ms	Asynchronous cells. The timing of Cell 2 is 3ms later than the timing of Cell 1.
		Config 2,3	3µs	Synchronous cells
T1	s	Config 1,2,3	10	
T2	S	Config 1,2,3	[11.52]	
T3	S	Config 1,2,3	10	

6.6.9.1.4.2 Test procedure

**TBD** 

6.6.9.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

# Table 6.6.9.1.4.3-1: Common Exception messages for SA Idle mode CA/DC measurement for FR1

Default Message Contents		
Common contents of system information		
blocks exceptions		

6.6.9.1.5 Test requirements

Table 6.6.9.1.5-1 defines the primary level settings including test tolerances for SA Idle mode CA/DC measurement for FR1

Table 6.6.9.1.5-1: Cell specific test parameters for connected mode for SA Idle mode CA/DC measurement for FR1

Parameter		Unit	Test configuration		Cell 1		Cell 2			
				T1	T2	T3	T1	T2		T3
NR RF Channel Number Duplex mode			Config 1,2,3		11		.DD	2		
Duplex mod	е		Config 1 Config 2,3		FDD TDD					
TDD configu	ıration		Config 1	Not Applicable						
1 D D cormige	aration		Config 2	TDDConf.1.1						
			Config 3				Conf.2.1			
BW <sub>channel</sub>		MHz	Config 1,2				$_{RB,c} = 52$			
			Config 3	40: N <sub>RB,c</sub> = 106						
BWP BW		MHz	Config 1,2			10: N	RB,c = 52			
BWP	Initial DL BWP		Config 3 Config 1, 2, 3		DLBWP.(		$_{\rm B,c} = 106$	NA		
configurati	Initial DL BWP		Comig 1, 2, 3	L	JLDWP.	J. I		INA		
on										
	Initial UL BWP				JLBWP.			NA		
	Dedicated DL BWP			L	DLBWP.	1.1		NA		
	Dedicated UL BWP			U	JLBWP.	1.1		NA		
TRS configu			Config 1	Т	RS.1.1 F	DD		NA		
			Config 2	T	RS.1.1 T	DD		NA		
			Config 3	T	RS.1.2 T	DD		NA		
A.3.2.1.1 (O			Config 1,2,3		OP.1			OP.1		
PDSCH Ref measureme			Config 1	S	R.1.1 FI	DD	5	SR.1.1 FDD		
			Config 2	S	R.1.1 TI	OD	5	SR.1.1 T	DD	
			Config 3		SR2.1 TE			SR2.1 TDD		
CORESET I	CORESET Reference Channel		Config 1	C	R.1.1 FI	DD		CR.1.1 F	DD	
			Config 2		R.1.1 TI			CR.1.1 T		
			Config 3		CR2.1 TDD			CR2.1 TDD		
SSB parame	eters		Config 1		SSB.1 FI	<del>2</del> 1		SSB.5 F	R1	
			Config 2		SSB.1 FI			SSB.5 F SSB.6 F		
SMTC confi	guration defined		Config 3 Config 1	,	SMTC.		,	SMTC.		
in A.3.11	SMTC configuration defined in A.3.11		, and the second							
			Config 2, 3		SMTC.			SMTC.	4	
PDSCH/PD0 spacing	CCH subcarrier	kHz	Config 1,2				15			
			Config 3				30			
	of PSS to SSS of PBCH DMRS		Config 1,2,3		0			0		
to SSS	OT PBCH DIVIRS									
EPRE ratio										
EPRE ratio	of PDCCH									
EPRE ratio	DMRS to SSS EPRE ratio of PDCCH to									
PDCCH DMRS EPRE ratio of PDSCH										
DMRS to SSS										
EPRE ratio of PDSCH to PDSCH										
EPRE ratio of OCNG DMRS to SSS(Note 1)										
EPRE ratio of OCNG to OCNG DMRS (Note 1)										
$N_{oc}^{ m Note2}$	(11010 1)	dBm/15 kHz			-98			-98		
$N_{oc}^{ m Note2}$		dBm/S CS	Config 1,2		-98			-98		
			Config 3		-95		<del>                                     </del>	-95		
		1	Corning 3		-90		<u> </u>	-30		

SS-RSRP Note 3	dBm/S CS	Config 1,2	-91	-91	-91	- infinit	-98	-98
						у		
		Config 3	-88	-88	-88	-	-95	-95
						infinit		
						У		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	Config	7	7	7	-	0	0
		1,2,3,4,5,6				infinit		
						У		
$\hat{E}_s/N_{oc}$	dB	Config 1,2,3	7	7	7	infinit	0	0
						у		
Io <sup>Note3</sup>	dBm/9.	Config 1,2	-	-	-	-70.5	-	-
	36MHz		62.2	62.2	62.26		67.04	67.04
			6	6				
	dBm/38	Config 3	-	-	-	-	-	-
	.16MHz		56.1	56.1	56.15	63.94	60.93	60.93
			5	5				
Propagation Condition		Config 1,2,3		AWGN			AWGN	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Table 6.6.9.1.5-2: Cell specific test parameters for idle mode for SA Idle mode CA/DC measurement for FR1

Parameter	Unit	Test	Cell 1		Cell 2			
		configuration	T1	T2	T3	T1	T2	T3

NR RF Channel		1,2,3	1 2					
Number				N1/A			<b></b>	
TDD configuration		1	N/A TDDConf.1.1		4	N/A TDDConf.1.1		
		2						
DDCCH DMC		3	TDDConf.2.1		TDDConf.2.1			
PDSCH RMC		1	SR.1.1 FDD		SR.1.1 FDD			
configuration		2		SR.1.1 TDE		SR.1.1 TDD		
DI IOLOGO DE CET		3		R.2.1 TDD			SR.2.1 TDD	
RMSI CORESET		1		R.1.1 FDE			CR.1.1 FDE	
RMC configuration		2		CR.1.1 TDE			CR.1.1 TDE	
		3		CR.2.1 TDE		CR.2.1 TDD		
Dedicated CORESET		1		CR.1.1 FD		CCR.1.1 FDD		
RMC configuration		2		CR.1.1 TD			CR.1.1 TD	
		3		CR.2.1 TD			CR.2.1 TD	
OCNG Pattern		1, 2, 3		defined in A			defined in A	
Initial DL BWP		1, 2, 3	[	DLBWP.0.1			DLBWP.0.1	
configuration								
Initial UL BWP		1, 2, 3	l (	JLBWP.0.1		l	JLBWP.0.1	
configuration								
RLM-RS		1, 2, 3		SSB			SSB	
Qrxlevmin	dBm/SCS	1, 2		-140			-140	
		3	-137 -137					
Pcompensation	dB	1, 2, 3	0 0					
Cell_selection_and_		1, 2, 3	SS-RSRP SS-RSR		SS-RSRP			
reselection_quality_								
measurement					T			
$\hat{ ext{E}}_{ ext{s}}/ ext{I}_{ ext{ot}}$	dB	1	[14]	[14]	[14]	-infinity	[12]	[12]
		2						
		3						
$N_{oc}$ Note2	dBm/SCS	1	[-98]					
		2	[-98]					
		3	[-95]					
$N_{_{OC}}$ Note2	dBm/15 kHz	1			[-98]	]		
		2						
		3						
$\hat{E}_s/N_{oc}$	dB	1	[7]	[7]	[7]	-infinity	[0]	[0]
3, 00		2				-		
		3	1					
SS-RSRP Note3	dBm/SCS	1	[-91]	[-91]	[-91]	-infinity	[-98]	[-98]
00 1.01.11	GB111/CCC	2	[-91]	[-91]	[-91]	-infinity	[-98]	[-98]
		3	[-88]	[-88]	[-88]	-infinity	[-95]	[-95]
lo	dBm/9.36 MHz	1	[-62.26]	[-62.26]	[-62.26]	[-70.5]	[-67.04]	[-
10	GBITI/ 0.00 WIT 12	'	[ 02.20]	[ 02.20]	[ 02.20]	[ 1 0.0]	[ 07.01]	67.04]
	dBm/9.36 MHz	2	[-62.26]	[-62.26]	[-62.26]	[-70.5]	[-67.04]	[-
	32 3.00 mm 12	_	[ 02.20]	[ 52.20]	[ 52.20]	[ . 5.5]	[ [ [ ]	67.04]
	dBm/38.16 MHz	3	[-56.15]	[-56.15]	[-56.15]	[-	[-60.93]	[-
Treselection		1, 2, 3	0	0	0	63.94] 0	0	60.93] 0
SnonintrasearchP	s dB		0	Not sent	l U	U	Not sent	l U
SnonintrasearchP         dB         1, 2, 3         Not sent           Propagation         1, 2, 3         AWGN		NI	INOL SCIIL					
Condition		1, 2, 3			AVVG	IN		
CONTUNION			1					

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers

and time and shall be modelled as AWGN of appropriate power for  $rac{N_{oc}}{}$  to be fulfilled.

Note 3: SS-RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

During the time period T2 the UE is in Idle mode and the signal level of cell 2 is changed. The UE shall not perform reselection. The UE shall perform Idle Mode CA measurement according to Section 4.4.

At the start of T3 the UE is paged for connection setup. During the connection setup the UE is requested to transmit early measurement report for cell 2. The UE shall send early measurement report to the PCell.

After receiving the requested early measurement report, the test equipment verifies the accuracy of measurement reported for Cell 2 meets the requirements in Section 10.X and test ends.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

6.6.10 to 6.6.14

## 6.6.15 Idle Mode inter-RAT CA/DC Measurements

6.6.15.0 Minimum conformance requirements

**TBD** 

6.6.15.1 NR SA FR1 Idle Mode measurements of inter-RAT CA candidate cells for early reporting

Editor's note: This test case is incomplete. The following aspects are either missing or TBD

- Minimum conformance requirement is TBD
- Test case applicability is missing
- Cell configuration in Annex E is missing
- Test procedure
- Message contents
- TT analysis is missing
- Initial conditions and test requirements are contain []

# 6.6.15.1.1 Test purpose

The purpose of this test is to verify the TBD

6.6.15.1.2 Test applicability

This test applies to all types of NR UE release TBD, configured with TBD.

6.6.15.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.5.15.0.

The normative reference for this requirement is TS 38.133 [6] clause TBD and A.6.6.15

6.6.15.1.4 Test description

6.6.15.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.6.15.1.4.1-1.

Table 6.6.15.1.4.1-1: Supported test configurations

Test Case ID	Description			
6.6.15.1-1	FR1 FDD SSB SCS 15kHz BW 10MHz – LTE FDD 10MHz			
6.6.15.1-2	FR1 FDD SSB SCS 15kHz BW 10MHz – LTE TDD 10MHz			
6.6.15.1-3	FR1 TDD SSB SCS 30kHz BW 40MHz – LTE FDD 10MHz			
6.6.15.1-4	FR1 TDD SSB SCS 30kHz BW 40MHz – LTE TDD 10MHz			
Note 1: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.6.15.1.4.1-2.

Table 6.6.15.1.4.1-2: Initial conditions for DL interruptions at switching between two uplink carriers in FDD-TDD CA

Parameter		Value	Comment		
Test environment	NC		As specified in TS 38.508-1 [14] clause 4.1.		
Test frequencies	As specified	in Annex E, Table E.4-1 and TS 38	8.508-1 [14] clause 4.3.1.		
Channel	As specified	by the test configuration selected fr	rom Table 6.6.15.1.4.1-1.		
bandwidth					
Propagation	AWGN		As specified in Annex C.2.2		
conditions					
Connection	TE Part	TBD	As specified in TS 38.508-1 [14] Annex A.		
Diagram	DUT Part	TBD			
Exceptions to					
connection					
diagram					

- 1. The general test parameter settings are set up according to Table 6.6.15.1.4.1-3.
- 2. Message contents are defined in clause 6.6.15.1.4.3.
- 3. The test scenario comprises of two NR Cells. (Cell 1 and Cell 2). Cell 1 is configured according to Annex C.1.2 and C.1.3.

Table 6.6.15.1.4.1-3: General test parameters for Idle Mode measurements of inter-frequency CA candidate cells for early reporting

Parameter	Unit	Value	Comment
RF Channel Number		1, 2	Two radio channels are used for this test
Active PCell		Cell 1	PCell on RF channel number 1 in FR1
PSCell		Cell 2	PSCell on RF channel number 2 in LTE
DRX		OFF	For both PCell and PSCell once configured
PRACH configuration in Cell 2		[PRACH_2CE]	PRACH configuration as specified in Clause A.3.16 in TS 36.133
CSI reporting periodicity and offset configuration for Cell 2	ms	2	
T1	S	[0.5]	During this time the PCell is known and PSCell is configured.
T2	S	[0.5]	PSCell access.
T3 + T4	S	[66]	During this time the UE is configured to perform inter-frequency measurements in idle mode on the PSCell carrier.
T5	s	[0.5]	UE is paged and connection is setup.  Network requests measurement report from the UE.

6.6.15.1.4.2 Test procedure

TBD

6.6.15.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.6.15.1.4.3-1: Common Exception messages for

Default Message Contents					
Common contents of system information					
blocks exceptions					

6.6.15.1.5 Test requirements

Table 6.6.15.1.5-1 defines the primary level settings including test tolerances for

Table 6.6.15.1.5-1: Cell specific test parameters for NR cell for Idle Mode measurements of interfrequency CA candidate cells for early reporting

Parameter	Unit	Config			Test 1		
		J			Cell 1		
			T1	T2	T3	T4	T5
AoA setup		1,2,3,4		ı	N/A	1	1
Assumption for UE beams Note 5 R: Rough		1,2,3,4	N/A	N/A	R	R	N/A
Frequency Range		1,2,3,4			FR1		
Duplex mode		1, 2			FDD		
		3, 4			TDD		
TDD Configuration		1,2		ı	-	1	1
1: TDDConf.1.1 2: TDDConf.2.1		3,4	1	1	2	2	1
BWchannel	MHz	1, 2	1	1	-	-	1
1: 10: N <sub>RB,c</sub> = 52		3, 4	2	2	-	-	2
2: 40: N <sub>RB,c</sub> = 106		4004					
Initial Downlink BWP configuration		1,2,3,4			DLBWP.0.1		
Initial Uplink BWP configuration  Dedicated Downlink BWP		1,2,3,4	4		JLBWP.0.1	1	
configuration 1: DLBWP.1.1		1,2,3,4	1	1	-	-	1
Dedicated Uplink BWP		1,2,3,4	1	1	_	_	1
configuration 1: ULBWP.1.1		1,2,0,4	'	'			'
PDSCH Reference Measurement	FDD	1,2	1	1	1	1	1
Channel	TDD	3,4	2	2	2	2	2
1: SR.1.1 FDD 2: SR.2.1 TDD		σ, .	_	_	_	_	_
TRS configuration		1,2,3,4		l .	-	l	
TCI state		1,2,3,4			-		
RMSI CORESET parameters	FDD	1,2		(	CR.1.1 FDD		
·	TDD	3,4		(	CR.2.1 TDD		
Dedicated CORESET parameters	FDD	1,2			CR.1.1 FDI		
	TDD	3,4			CR.2.1 TDI		
OCNG Patterns <sup>Note1</sup>		1,2,3,4		OP.1 (	defined in A	.3.2.1	
SSB configuration		1,2			1		
1: SSB.1 FR1 2: SSB.2 FR1		3,4			2		
SMTC configuration		1,2,3,4			SMTC.2		
Correlation Matrix and Antenna config		1,2,3,4			1x2 Low		
EPRE ratio of PSS to SSS	dB	1,2,3,4	0	0	-	-	0
EPRE ratio of PBCH DMRS to SSS			0	0	-	-	0
EPRE ratio of PBCH to PBCH DMRS			0	0	-	-	0
EPRE ratio of PDCCH DMRS to SSS			0	0	-	-	0
EPRE ratio of PDCCH to PDCCH DMRS			0	0	-	-	0
EPRE ratio of PDSCH DMRS to SSS			0	0	-	-	0
EPRE ratio of PDSCH to PDSCH	]		0	0	-	-	0
EPRE ratio of OCNG DMRS to SSS			0	0	-	-	0
Noc Note2	dBm/ 15kHz	1,2 3,4	[-98]	[-98]	[-98]	[-98]	[-98]
N <sub>oc</sub> Note2	dBm/SCS	1,2 3,4	[-98] [-95]	[-98] [-95]	[-98] [-95]	[ -98] [-95]	[-98] [-95]
Ê <sub>s</sub> /I <sub>ot</sub>	dB	1,2,3,4	[5]	[5]	[5]	[5]	[5]
Ê <sub>s</sub> /N <sub>oc</sub>	dB	1,2,3,4	[5]	[5]	[5]	[5]	[5]
SS-RSRP <sup>Note3,4</sup>	dBm/SCS	1,2	[-93] [-90]	[-93]	[-93] [-90]	[-93]	[-93]
	dBm/	3,4 1,2		[-63.85]		[-90] -[-	
Io <sup>Note3,4</sup>	9.36 MHz	1,4	[-63.85]	[-00.00]	-[-63.85]	- <sub>[</sub> - 63.85]	[-63.85]

	dBm/ 38.16 MHz	3,4	[-57.76]	[-57.76]	-[-57.76]	-[- 57.76]	[-57.76]
	dBm/SCS	1	-	-	[-14	40]	-
Qrxlevmin		2	1	-	[-13	37]	-
Qixieviiiii		3	ı	-	[TBD]	[TBD]	-
		4	-	-	[TBD]	[TBD]	-
Pcompensation	dB	1,2,3,4	-	-	0	0	-
Qhysts	dB	1,2,3,4	-	-	0	0	-
Qoffset <sub>s, n</sub>	dB	1,2,3,4	-	-	0	0	-
Cell_selection_and_ reselection_quality_measurement		1,2,3,4			SS-RSRP		
Treselection	s	1,2,3,4	,	-	(	)	-
SnonintrasearchP	dB	1,2,3,4	,	-	[TE	3D]	-
SnonintrasearchQ	dB	1,2,3,4	,	-	[TE	3D]	-
Thresh <sub>x, high</sub>	dB	1,2,3,4	,	-	[4	8]	-
Thresh <sub>serving, low</sub>	dB	1,2,3,4		-	[4	4]	-
Thresh <sub>x, low</sub>	dB	1,2,3,4		-	[5	0]	-
Propagation Condition	dB	1,2,3,4		-	AW	GN	-

Table 6.6.15.1.5-2: Cell specific test parameters for LTE cell for Idle Mode measurements of interfrequency CA candidate cells for early reporting

Parameter	Unit	Config			Test 1		
					Cell 2		1
Francisco Donne		4004	T1	T2	T3	T4	T5
Frequency Range  Duplex mode		1,2,3,4 1, 3			LTE FDD		
Duplex mode		2, 4			TDD		
BW <sub>channel</sub>	MHz	1,2,3,4	10	10	-	-	10
Measurement bandwidth	$n_{PRB}$	1,2,3,4	-	-	22-27	22-27	-
PDSCH Reference Measurement	FDD	1,3	1	1	-	_	1
Channel	TDD	2,4	2	2	_	_	2
1: R.1 FDD		_, .	_	_			_
2: R.1 TDD							
PDCCH/PCFICH/PHICH		1,3	1	1	-	-	1
Reference measurement channel defined in A.3.1.2.1 and A.3.1.2.2		2,4	2	2	-	-	2
in 36.133							
1: R.6 FDD							
2: R.6 TDD							
OCNG Patterns defined in		1,3			1		
A.3.2.1.1 (OP.2 FDD) and		2,4			2		
A.3.2.1.2 (OP.2 TDD) in 36.133 1: OP.2 FDD							
2: OP.2 TDD							
Correlation Matrix and Antenna		1,2,3,4			1x2 Low		
config						T	
PBCH_RA	dB	1,2,3,4	N/A	N/A	0	0	N/A
PBCH_RB	1		N/A	N/A	0	0	N/A
PSS_RA SSS_RA	-		N/A N/A	N/A N/A	0	0	N/A N/A
PCFICH_RB	-		N/A	N/A	0	0	N/A
PHICH_RA	†		N/A	N/A	0	0	N/A
PHICH_RB	1		N/A	N/A	0	0	N/A
PDCCH_RA			N/A	N/A	0	0	N/A
PDCCH_RB			N/A	N/A	0	0	N/A
PDSCH_RA	1		N/A	N/A	0	0	N/A
PDSCH_RB OCNG RA <sup>Note 1</sup>	-		N/A N/A	N/A N/A	0	0	N/A N/A
OCNG_RB <sup>Note 1</sup>	-		N/A	N/A	0	0	N/A
	dBm/	1,2	[-98]	[-98]	[-98]	[-98]	[-98]
Noc Note2	15kHz	3,4					
Ês/lot	dB	1,2,3,4	[5]	[5]	[-3]	[8]	[5]
Ês/Noc	dB	1,2,3,4	[5]	[5]	[-3]	[8]	[5]
SS-RSRP <sup>Note3,4</sup>	dBm/SCS	1,2,3,4	[-93]	[-93]	[-101]	[-90]	[-93]
	dBm/	1,2, 3,	FFS	FFS	[FFS]	[FFS]	FFS
	9.36 MHz	4	110	110	[110]	[110]	110
IoNote3,4		-					
	dBm/SCS	1	-	-	[-1	40]	-
		2	-	-		37]	-
Qrxlevmin		3	-	-	[TBD]	[TBD]	-
		4	_	_	[TBD]	[TBD]	_
Pcompensation	dB	1,2,3,4		_	0	0	_
	dB	1,2,3,4		_	0	0	_
Qhysts Qattact				_		0	_
Qoffsets, n	dB	1,2,3,4	-	- DC	0	_	-
Cell_selection_and_ reselection_quality_measurement		1,2,3,4		RS	RP and RS	KŲ	
Treselection_quality_measurement	S	1,2,3,4		<u> </u>		0	l -
	dB	1,2,3,4		-		3 BD]	_
SnonintrasearchP	dВ	1,2,3,4			_	3D]	-
SnonintrasearchQ				-			
Thresh <sub>x, high</sub>	dB	1,2,3,4	•	-	[4	8]	-

Thresh <sub>serving, low</sub>	dB	1,2,3,4	-	[44]	-
Thresh <sub>x, low</sub>	dB	1,2,3,4	-	[50]	-
Propagation Condition	dB	1,2,3,4	-	AWGN	-

During time durations T1 the UE shall start transmitting preamble on PSCell. During T2 the UE perform intrafrequency measurements on the PCell and the PSCell.

During the time-period T3 the connection is released, and UE enters idle mode. During the time period T3 and T4 the UE is camped in Idle mode and at T4 the signal level of cell 2 is changed. The UE shall not perform reselection. The UE shall perform Idle Mode CA measurement according to Section 4.4.

At the start of T5 the UE is paged for connection setup. During the connection setup the UE is requested to transmit early measurement report. The UE shall send early measurement report to the PCell including idle mode CA/DC measurement from cell 2.

After receiving the requested early measurement report, the test equipment verifies that the accuracy of measurement reported for serving Cell 1 and Cell 2 meets the requirements in Sections 10.1.2B and 10.1.7B and Sections 10.2.4 and 10.2.5, respectively and test ends.

The rate of correct events observed during repeated tests shall be at least 90% with a confidence level of 95%.

# 6.7 Measurement performance requirements

# 6.7.1 SS-RSRP

- 6.7.1.0 Minimum conformance requirements
- 6.7.1.0.1 Intra-frequency absolute SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.1.

6.7.1.0.2 Intra-frequency relative SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.2.

6.7.1.0.3 Inter-frequency absolute SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.3.

6.7.1.0.4 Inter-frequency relative SS-RSRP measurement accuracy requirements

Same as in clause 4.7.1.0.4.

- 6.7.1.1 Intra-frequency measurements
- 6.7.1.1.1 NR SA FR1 SS-RSRP absolute measurement accuracy
- 6.7.1.1.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.1.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.1.

6.7.1.1.4 Test description

6.7.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.1.4.1-1.

Table 6.7.1.1.1.4.1-1: NR SA FR1 SS-RSRP measurement accuracy supported test configurations

Test Case ID	Description
6.7.1.1.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.1.1.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.1.1.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note	The UE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.1.1.4.1-2.

Table 6.7.1.1.4.1-2: Initial conditions for SS-RSRP intra frequency absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	As specified by the test configuration	n selected from Table 6.7.1.1.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx	A.3.1.8.2 with n = 2 and $\phi_1$ = 5 Hz A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5 Hz, $\phi_{1,2}$ = 10 Hz, $\phi_{1,3}$ = 15 Hz A.3.2.3.4	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without LT	E link	

- 1. Message contents are defined in clause 6.7.1.1.1.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in the same frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

### 6.7.1.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.1.1.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRP reported values in the periodic MeasurementReport. The SS-RSRP value of Cell 2 reported by the UE is compared to the expected SS-RSRP. If the value is outside the limits in Table 6.7.1.1.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.1.1.1.5-1 as appropriate and repeat steps 5-7.

# 6.7.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.1.1.4.3-1: Common Exception messages for NR SA FR1 SS-RSRP absolute measurement accuracy

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 Table H.3.1-5 Table H.3.1-7
Specific message contents exceptions for Test Configuration 6.7.1.1.1-1	Table H.3.1-3 with Condition SSB.1 FR1 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
Specific message contents exceptions for Test Configuration 6.7.1.1.1-2	Table H.3.1-3 with Condition SSB.1 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message contents exceptions for Test Configuration 6.7.1.1.1-3	Table H.3.1-3 with Condition SSB.2 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

Table 6.7.1.1.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRP Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142	with condition PERIODICAL		
Information Element	Value/remark	Comment	Condition
ReportConfigNR::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			PERIODICAL
reportQuantityCell SEQUENCE {			
rsrq	false		
sinr	false		
}			
maxReportCells	2		
}			
}			
}			

# 6.7.1.1.5 Test requirement

Table 6.7.1.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.1.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.1.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.1.1.1.5-3 for test configuration 3.

Table 6.7.1.1.5-1: NR SA FR1 SS-RSRP measurement accuracy test parameters

Para	meter	Unit	Tes	st 1 Cell 2	Te:	st 2 Cell 2	Tes Cell 1	st 3 Cell 2
Physical cell ID			489	0	489	0	489	0
SSB ARFCN	T		fre		fre	q1	fre	
Duplex mode	Config 1 Config 2,3					DD DD		
	Config 2,3					סכ plicable		
TDD configuration	Config 2	_				onf.1.1		
1 DD corniguration	Config 3	_				onf.2.1		
	Config 1					B,c = 52		
BWchannel	Config 2	_ MHz				B,c = 52		
DVVchannel	Config 3	1711 12				$_{\rm s,c} = 32$ $_{\rm s,c} = 106$		
	Config 1					$_{B,c} = 100$		
BWP BW		_				$_{B,c} = 52$ $_{B,c} = 52$		
DVVP DVV	Config 2	_						
Deventing initial DWD a	Config 3					$a_{\rm c} = 106$		
Downlink initial BWP of	-					VP.0.1		
Downlink dedicated B\	<u>-</u>		1			VP.1.1		
Uplink initial BWP con						VP.0.1		
Uplink dedicated BWP	configuration					VP.1.1		
DRx Cycle	1	ms		Ī		plicable	T	Ι
	Config 1		TRS.1.1 FDD		TRS.1. 1 FDD		TRS.1. 1 FDD	
TRS Configuration	Config 2		TRS.1.1 TDD	-	TRS.1. 1 TDD	-	TRS.1. 1 TDD	-
	Config 3		TRS.1.2 TDD		TRS.1. 2 TDD		TRS.1. 2 TDD	
DD00UD (	Config 1		SR.1.1 FDD		SR.1.1 FDD		SR.1.1 FDD	
PDSCH Reference measurement channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-	SR.1.1 TDD	-
	Config 3		SR2.1 TDD		SR2.1 TDD		SR2.1 TDD	
	Config 1		CR.1.1 FDD		CR.1.1 FDD		CR.1.1 FDD	
RMSI CORESET Reference Channel	Config 2		CR.1.1 TDD	-	CR.1.1 TDD	-	CR.1.1 TDD	-
	Config 3		CR2.1 TDD		CR2.1 TDD		CR2.1 TDD	
	Config 1		CCR.1. 1 FDD		CCR.1. 1 FDD		CCR.1. 1 FDD	
Control Channel RMC	Config 2		CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	CCR.1. 1 TDD	-
	Config 3		CR2.1 TDD		CCR2. 1 TDD		CCR2.1 TDD	
	Config 1		SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1
SSB configuration	Config 2		SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1	SSB 1.FR1	SSB.1 FR1
	Config 3		SSB 2.FR1	SSB.2 FR1	SSB 2.FR1	SSB.2 FR1	SSB 2.FR1	SSB.2 FR1
Time offset with Cell	Config 1	ms	-	3	-	3	-	3
2	Config 2,3	μS	-	3	-	3	-	3
SMTC Configuration	Config 1				SM	ГС.2		

		Config 2,3				SMT	ΓC.1		
OCNG Pat	terns					OF	P.1		
PDSCH/PI	DCCH	Config 1,2	LI I=			15 I	kHz		
subcarrier	spacing	Config 3	kHz			30k	кHz		
EPRE ratio EPRE ratio EPRE ratio EPRE ratio EPRE ratio	of PSS to SSS of PBCH DMR of PBCH to PI of PDCCH DM of PDCCH to of PDSCH DM of PDSCH DM of PDSCH to	RS to SSS BCH DMRS MRS to SSS PDCCH DMRS MRS to SSS	dB	0	0	0	0	0	0
		RS to SSS(Note 1) CNG DMRS (Note 1)							
$N_{oc}^{ m Note2}$	Config 1,2	Depending on band group	dBm/15Kh	-10	7.5	-{	38	-116 + /	$\Delta_{BG\_offset}$
OC.	Config 3	Depending on band group	Z	N/A <sup>t</sup>	Note 6	-6	94	-116 + /	$\Delta$ BG_offset
$N_{oc}^{$	Config 1,2		dBm/SCS	-10	7.4	-{	38		ie as I 5kHz
1 oc	Config 3	Depending on band group	ubili/000	N/A <sup>t</sup>	Note 6	-(	91	-113 + /	$\Delta_{BG\_offset}$
$\mathbf{\hat{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$			dB	1.88	-5.57	1.88	-5.57	0.09	-5.56
$\hat{E}_s/N_{oc}$			dB	6	1.4	6	1.4	3	-0.8
SS- RSRP <sup>Not</sup>	Config 1,2	Depending on band group	dBm/SCS	-101.5	 106.1	-82	-86.6	-113 + Δ <sub>BG_off</sub> set	-116.8 + Δ <sub>BG_offs</sub> et
e3	Config 3	Depending on band group	dbiii/000	N/A <sup>Note</sup>	N/A <sup>Not</sup> e 6	-85	-89.6	-110+ Δ <sub>BG_off</sub> set	- 113.8+ Δ <sub>BG_offs</sub> et
Io <sup>Note3</sup>	Config 1,2	Depending on band group	dBm/ 9.36MHz	-71	.68	-52	2.18		$\Delta_{BG\_offset}$
	Config 3	Depending on band group	dBm/ 38.16MHz	N/A <sup>t</sup>	Note 6	-51	.91		12 + _offset
	n condition		-			AW			
Antenna co	onfiguration					1)	κ2		

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.
- Note 3: SS-RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5:  $\Delta_{BG\_offset}$  is defined in clause 3A.4, Table 3A.4.1-2.
- Note 6: Subtest 1 is not used when testing with 30kHz SSB SCS.

Table 6.7.1.1.1.5-2: SS-RSRP Intra frequency absolute accuracy requirements for the reported values for test configurations 1 and 2

Normal Conditions	Test 1	Test 2	Test 3	
	All bands	All bands	Danda ND EDD ED4 A	24
			Bands NR_FDD_FR1_A,	34
			NR_TDD_FR1_A	24
			Bands NR_FDD_FR1_B	34 35
			Bands NR_TDD_FR1_C	
Lowest reported value (Cell 2)	44	60	Bands NR_FDD_FR1_D,	35
. , ,			NR_TDD_FR1_D	00
			Bands NR_FDD_FR1_E,	36
			Bands NR_TDD_FR1_E	07
			Bands NR_FDD_FR1_G	37
			Bands NR_FDD_FR1_H	37
			NR_FDD_FR1_A,	46
			NR_TDD_FR1_A	40
			NR_FDD_FR1_B	46
			NR_TDD_FR1_C	47
Highest reported value (Cell 2)	56	79	NR_FDD_FR1_D,	47
			NR_TDD_FR1_D	
			NR_FDD_FR1_E,	48
			NR_TDD_FR1_E	
			NR_FDD_FR1_G	49
			NR_FDD_FR1_H	49
Extreme Conditions	Test 1 All bands	Test 2 All bands	Test 3	
	All bulluo	All Ballao	Bands NR_FDD_FR1_A,	29
			NR_TDD_FR1_A	25
1				
				30
			Bands NR_FDD_FR1_B	30
			Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	30
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	30 31
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E	30 31 31
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G	30 31 31 33
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	30 31 31 33 33
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	30 31 31 33
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	30 31 31 33 34 50
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	30 31 31 33 34 50
Lowest reported value (Cell 2)	40	57	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	30 31 31 33 34 50 51
Lowest reported value (Cell 2)  Highest reported value (Cell 2)	40	57 82	Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C	30 31 31 33 34 50
			Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	30 31 31 33 34 50 51 51 52
			Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 31 31 33 34 50 51
			Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E, Bands NR_TDD_FR1_E	30 31 31 33 34 50 51 51 52
			Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	30 31 31 33 34 50 51 51 52

Table 6.7.1.1.1.5-3: SS-RSRP Intra frequency absolute accuracy requirements for the reported values for test configuration 3

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3	
	All ballus	All ballus	Bands NR_FDD_FR1_A,	37
			NR_TDD_FR1_A Bands NR_FDD_FR1_B	37
			Bands NR TDD FR1 C	38
			Bands NR_FDD_FR1_D,	38
Lowest reported value (Cell 2)	N/A	57	NR_TDD_FR1_D	30
			Bands NR_FDD_FR1_E,	39
			Bands NR_TDD_FR1_E	00
			Bands NR_FDD_FR1_G	40
			Bands NR_FDD_FR1_H	40
			Bands NR_FDD_FR1_A,	49
			NR_TDD_FR1_A	
			Bands NR_FDD_FR1_B	49
			Bands NR_TDD_FR1_C	50
lighest reported value (Cell 2)	N/A	76	Bands NR_FDD_FR1_D,	50
	IN/A	76	NR_TDD_FR1_D	
			Bands NR_FDD_FR1_E,	51
			Bands NR_TDD_FR1_E	
			Bands NR_FDD_FR1_G	52
			Bands NR_FDD_FR1_H	52
	Test 1	Test 2		
Extreme Conditions	All bands	All bands	Test 3	
Extreme Conditions			Test 3 Bands NR_FDD_FR1_A,	32
Extreme Conditions				32
Extreme Conditions			Bands NR_FDD_FR1_A,	32 33
Extreme Conditions			Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33
Extreme Conditions  Lowest reported value (Cell 2)			Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 33
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 33
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E	33 33 34
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G	33 33 34
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	33 33 34 34 35 36
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	33 33 34 34 35
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	33 33 34 34 35 36 53
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 33 34 34 35 36
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	33 33 34 34 35 36 53 54 54
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C	33 33 34 34 35 36 53
	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 33 34 34 35 36 53 54 54 55
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_B Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 33 34 34 35 36 53 54 54
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_TDD_FR1_E	33 33 34 34 35 36 53 54 54 55
Lowest reported value (Cell 2)	All bands	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_B Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	33 33 34 34 35 36 53 54 54 55 55
Lowest reported value (Cell 2)	N/A	All bands 54	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_B Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E, Bands NR_FDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G Bands NR_FDD_FR1_G	33 33 34 34 35 36 53 54 54 55

# 6.7.1.1.2 NR SA FR1 SS-RSRP relative measurement accuracy

### 6.7.1.1.2.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-RSRP relative measurement accuracy is within the specified limits for all bands.

### 6.7.1.1.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

# 6.7.1.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.1.

6.7.1.1.2.4 Test description

6.7.1.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.1.2.4.1-1.

Table 6.7.1.1.2.4.1-1: NR SA FR1 SS-RSRP measurement accuracy supported test configurations

Test Case ID	Description
6.7.1.1.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.1.1.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.1.1.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note	The UE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.1.2.4.1-2.

Table 6.7.1.1.2.4.1-2: Initial conditions for SS-RSRP intra frequency relative accuracy in FR1

Parameter	Value		Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	As specified by the test configuration	n selected from Table 6.7.1.1.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx	A.3.1.8.2 with n = 2 and $\phi_1$ = 5 Hz A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5 Hz, $\phi_{1,2}$ = 10 Hz, $\phi_{1,3}$ = 15 Hz A.3.2.3.4	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without LT	E link	

- 1. Message contents are defined in clause 6.7.1.1.2.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in the same frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

### 6.7.1.1.2.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR* Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.1.1.2.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRP reported values of Cell 1 and Cell 2 in the periodic MeasurementReport. The SS-RSRP value of Cell 2 reported by the UE is compared to the reported SS-RSRP of Cell 1. If the resulting value is outside the limits in Table 6.7.1.1.2.5-2 or the UE fails to report the measurement value for Cell 1 or Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.

8. Set the parameters according to each sub-test in Table 6.7.1.1.2.5-1 as appropriate and repeat steps 5-7.

#### 6.7.1.1.2.4.3 Message contents

Message contents are same as in clause 6.7.1.1.4.3.

# 6.7.1.1.2.5 Test requirement

Table 6.7.1.1.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.1.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.1.2.5-2.

Table 6.7.1.1.2.5-1: Same as Table 6.7.1.1.1.5-1 with the following exceptions:

	Parar	notor	Unit	Test 1		Test 2		Test 3	
	Parai	iletei	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
$N_{oc}^{ m Note2}$	Config 1,2	Depending on band group	dBm/15Kh	-10	06	-8	38	-116 + /	$\Delta_{BG\_offset}$
TV <sub>oc</sub>	Config 3	Depending on band group	Z	N/A <sup>t</sup>	Note 6	-6	94	-116 + /	$\Delta_{BG\_offset}$
$N_{oc}^{ m Note2}$	Config 1,2		dBm/SCS		e as 5kHz		ne as I5kHz		ne as I 5kHz
1 voc	Config 3,6	Depending on band group	ubili/SCS	N/A <sup>t</sup>	Note 6	)۔	91	-113 +	$\Delta_{BG\_offset}$
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	·		dB	1.88	-4.97	1.88	-4.97	-0.01	-4.76
$\hat{E}_s/N_{oc}$			dB	6	2	6	2	3	0
SS-	Config 1,2	Depending on band group	dDm/900	-100	-104	-82	-86	-113 + Δ <sub>BG_off</sub>	-116 + Δ <sub>BG_offs</sub> et
RSRP <sup>Not</sup> e3	Config 3	Depending on band group	dBm/SCS	N/A <sup>Note</sup>	N/A <sup>Not</sup> e 6	-85	-89	-110 + Δ <sub>BG_off</sub>	-113 + Δ <sub>BG_offs</sub> et
Io <sup>Note3</sup>	Config 1,2	Depending on band group	dBm/ 9.36MHz	-70	.05	-52	2.05	-82.20+	$\Delta$ BG_offset
	Config 3	Depending on band group	dBm/ 38.16MHz	N/A <sup>t</sup>	Note 6	-51	.77	_	93 + _offset

Table 6.7.1.1.2.5-2: SS-RSRP Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	RSRP_x - 8	RSRP_x - 8	RSRP_x - 7
Highest reported value (Cell 2)	RSRP_x - 1	RSRP_x - 1	RSRP_x + 1
Extreme Conditions			
Lowest reported value (Cell 2)	RSRP_x - 8	RSRP_x - 8	RSRP_x - 7
Highest reported value (Cell 2)	RSRP_x - 1	RSRP_x - 1	RSRP_x + 1
RSRP_x is the reported value of	Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.1.2 Inter-frequency measurements

# 6.7.1.2.1 NR SA FR1-FR1 SS-RSRP absolute measurement accuracy

### 6.7.1.2.1.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRP absolute measurement accuracy is within the specified limits for all bands.

### 6.7.1.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

### 6.7.1.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.2.

6.7.1.2.1.4 Test description

6.7.1.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.2.1.4.1-1.

Table 6.7.1.2.1.4.1-1: NR SA FR1-FR1 SS-RSRP measurement accuracy supported test configurations

Test Case ID	Description
6.7.1.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.1.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.1.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note	: The UE is only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.2.1.4.1-2.

Table 6.7.1.2.1.4.1-2: Initial conditions for SS-RSRP inter frequency absolute accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	Д	s specified in Annex E, Table E.4-1	and TS 38.508-1 [14] sclause 4.3.1.
Channel bandwidth	Δ	s specified by the test configuration	n selected from Table 6.7.1.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and $\phi_1$ = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5	
	4Rx	Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to	- Without the	LTE link	
connection			
diagram			

- 1. Message contents are defined in clause 6.7.1.2.1.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in a different FR1 frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

### 6.7.1.2.1.4.2 Test procedure

Same as in clause 6.7.1.1.1.4.2 but replacing Table 6.7.1.1.1.5-1 and 6.7.1.1.1.5-2 with 6.7.1.2.1.5-1 and 6.7.1.2.1.5-2, respectively.

# 6.7.1.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.1.2.1.4.3-1: Common Exception messages for NR SA FR1-FR1 SS-RSRP absolute measurement accuracy

	Default Message Contents
Common contents of system information blocks exceptions	
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-FREQ and GAP NEEDED Table H.3.1-5 Table H.3.1-7 with condition INTER-FREQ Table H.3.1-6 with condition Pattern #0
Specific message contents exceptions for Test Configuration 6.7.1.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
Specific message contents exceptions for Test Configuration 6.7.1.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
Specific message contents exceptions for Test Configuration 6.7.1.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.2 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1

Table 6.7.1.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRP Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142	with condition PERIODICAL		
Information Element	Value/remark	Comment	Condition
ReportConfigNR::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			PERIODICAL
reportQuantityCell SEQUENCE {			
rsrq	false		
sinr	false		
}			
maxReportCells	2		
}			
}			
}			

### 6.7.1.2.1.5 Test requirement

Table 6.7.1.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.2.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.1.2.1.5-3 for test configuration 3.

Table 6.7.1.2.1.5-1: SS-RSRP inter-frequency test parameters

Parameter	Config	Unit	Test	1	Tes	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2
SSB ARFCN	1~3		freq1	freq2	freq1	freq2
BWchannel	2	MHz	10: N <sub>RB,c</sub> 10: N <sub>RB,c</sub>		10: N <sub>RB</sub> 10: N <sub>RB</sub>	
VVChanner	3	1011 12	40: N <sub>RB,c</sub>		40: N <sub>RB</sub> ,	
Gap pattern ID			0		0	
	1		FDD		FD	
Duplex mode	2		TDD		TD	
	<u>3</u>		TDD N/A		TD N//	
TDD configuration	2		TDDCon		TDDCo	
9	3		TDDCon		TDDCo	
	1		SR.1.1 FDD		SR.1.1 FDD	
PDSCH Reference measurement channel	2		SR.1.1 TDD	-	SR.1.1 TDD	-
	3		SR.2.1 TDD		SR.2.1 TDD	
	1		CR.1.1 FDD	-	CR.1.1 FDD	-
RMSI CORESET Reference Channel	2		CR.1.1 TDD	-	CR.1.1 TDD	-
	3		CR.2.1 TDD	-	CR.2.1 TDD	-
Dedicated CORESET	1		CCR.1.1 FDD	-	CCR.1.1 FDD CCR.1.1	-
Reference Channel	2		CCR.1.1 TDD	-	TDD CCR.2.1	-
	3		CCR.2.1 TDD	-	TDD	-
SSB configuration	2		SSB.1 FR1 SSB.1 FR1		SSB.1 FR1	
33B Configuration	3		SSB.11		SSB.1 FR1 SSB.2 FR1	
OCNG Patterns	1~3		OP.		OP.	
	1		TRS.1.1 FDD		TRS.1.1 FD	D
TRS configuration	2		TRS.1.1 TDD		TRS.1.1 TDD -	
	3		TRS.1.2 TDD DLBWP		TRS.1.2 TD DLBW	
Initial BWP Configuration	1~3		ULBWP		ULBW	
Dedicated BWP configuration	1~3		DLBWP ULBWP	<sup>2</sup> .1.1	DLBW ULBW	P.1.1
	1		SMTC		SMT	
SMTC configuration	2,3		SMTC		SMT	
Time offeet between Cell C	1	ms	3		3	
Time offset between Cell 2 and Cell 3			3		3	
	2,3	μS	3		3	
EPRE ratio of PSS to SSS  EPRE ratio of PBCH DMRS to						
SSS EPRE ratio of PBCH to PBCH	$\dashv$					
DMRS						
EPRE ratio of PDCCH DMRS to SSS						
EPRE ratio of PDCCH to PDCCH			_	_		_
DMRS EPRE ratio of PDSCH DMRS to	1~3	dB	0	0	0	0
SSS						
EPRE ratio of PDSCH to PDSCH	7					
DMRS EPRE ratio of OCNG DMRS to SSS <sup>Note 1</sup>						
EPRE ratio of OCNG to OCNG DMRS Note 1						
	1,2	dBm/15 kHz	-94.65	-94.65	( $N_{oc}$ for Cell 2 +8dB) + $\Delta_{\mathrm{BG\_offset}}$	-115+ Δ <sub>BG_offset</sub>

$N_{oc}$ Note2	Depending on band group	3	dBm/15 kHz	-96	-96	$(N_{oc}  ext{ for } Cell 2 + 8dB) + \Delta_{BG\_offset}$	-115+ $\Delta_{BG\_offset}$
$N_{oc}$ Note2	Depending on band group	1,2	dBm/SS	-94.65	-94.65	$(N_{oc}  ext{ for } Cell 2 + 8dB) + \Delta_{BG\_offset}$	-115+ Δ <sub>BG_offset</sub>
	Depending on band group	3	B SCS	-93	-93	$(N_{oc} \  ext{for} \  ext{Cell 2} \ +8 ext{dB)} + \Delta_{ ext{BG\_offset}}$	- 112.00+ Δ <sub>BG_offset</sub>
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		1~3	dB	10	10	13	-3
SS-	Depending on band group	1,2,	dBm/SC	-84.65	-84.65	(RSRP for Cell 2 +25dB) + Δ <sub>BG</sub> offset	- 118.00+ Δ <sub>BG_offset</sub>
RSRP <sup>Note3</sup>	Depending on band group	3	S	-83	-83	(RSRP for Cell 2 +25dB) + Δ <sub>BG_offset</sub>	- 115.00+ Δ <sub>BG_offset</sub>
Io <sup>Note3</sup>	Depending on band group	1,2	dBm/ 9.36MH z	56.28	56.28	(lo for Channel 2 +19.75dB) + ∆ <sub>BG_offset</sub>	-85.28+ Δ <sub>BG_offset</sub>
10	Depending on band group	3	dBm/ 38.16M Hz	-51.53	-51.53	(lo for Channel 2 +19.75dB) + ∆ <sub>BG_offset</sub>	-79.19+ Δ <sub>BG_offset</sub>
1	$\hat{E}_s/N_{oc}$	1~3	dB	10	10	13	-3
	ation condition a configuration	1~3	-	AWG 1x2		AW(	

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Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power

for  $N_{oc}$  to be fulfilled.

Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5 The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification.

Note 6:  $\Delta_{BG\_offset}$  is defined in clause 3A.4, Table 3A.4.1-2.

Table 6.7.1.2.1.5-2: SS-RSRP Inter frequency absolute accuracy requirements for the reported values for test configurations 1, 2, 4 and 5

Name at Caralletana	Test 1	T40	
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	32
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	33
		Bands NR_TDD_FR1_C	33
Lowest reported value (Cell 2)	62	Bands NR_FDD_FR1_D,	34
Cell 2)	02	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	34
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	35
		Bands NR_FDD_FR1_H	36
		Bands NR_FDD_FR1_A,	45
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	45
		Bands NR_TDD_FR1_C	46
Highest reported value (Cell 2)	81	Bands NR_FDD_FR1_D,	46
l ingriodi roportod valdo (e oli 2)	01	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	47
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	48
		Bands NR_FDD_FR1_H	48
	Test 1		
Extreme Conditions		Test 2	
Extreme Conditions	All bands		28
Extreme Conditions		Bands NR_FDD_FR1_A,	28
Extreme Conditions		Bands NR_FDD_FR1_A, NR_TDD_FR1_A	_
Extreme Conditions		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	28
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	_
Extreme Conditions  Lowest reported value (Cell 2)		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	28 29
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	28 29
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	28 29 29
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	28 29 29
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	28 29 29 30
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	28 29 29 30 31
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	28 29 29 30 31 31
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	28 29 29 30 31 31
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B	28 29 29 30 31 31 49
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_C	28 29 29 30 31 31 49
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B	28 29 29 30 31 31 49 50 50
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	28 29 29 30 31 31 49 50
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	28 29 29 30 31 31 49 50 50
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	28 29 29 30 31 31 49 50 50 51
Lowest reported value (Cell 2)  Highest reported value (Cell 2)	All bands 59	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	28 29 29 30 31 31 49 50 50 51 51 52

Table 6.7.1.2.1.5-3: SS-RSRP Inter frequency absolute accuracy requirements for the reported values for test configurations 3 and 6

N	Test 1	T10	
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	35
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	36
		Bands NR_TDD_FR1_C	36
Lowest reported value (Cell 2)	64	Bands NR_FDD_FR1_D,	37
Cell 2)	04	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	37
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	38
		Bands NR_FDD_FR1_H	39
		Bands NR_FDD_FR1_A,	48
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	48
		Bands NR_TDD_FR1_C	49
Highest reported value (Cell 2)	83	Bands NR_FDD_FR1_D,	49
l ingriodi roportod valdo (e oli 2)		NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	50
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	51
		Bands NR_FDD_FR1_H	51
	Test 1		
Extreme Conditions		Test 2	
Extreme Conditions	All bands		31
Extreme Conditions		Bands NR_FDD_FR1_A,	31
Extreme Conditions		Bands NR_FDD_FR1_A, NR_TDD_FR1_A	_
Extreme Conditions		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	31
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	31 32
Extreme Conditions  Lowest reported value (Cell 2)		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	31
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	31 32
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	31 32 32
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	31 32 32
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	31 32 32 33
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	31 32 32 33 33
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	31 32 32 33 33 34 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	31 32 32 33 33 34 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	31 32 32 33 34 34 52
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	31 32 32 33 34 34 52 53
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	31 32 32 33 34 34 52 53
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	31 32 32 33 34 34 52 53
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	31 32 32 33 34 34 52 53 53 54
Lowest reported value (Cell 2)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	31 32 32 33 34 34 52 53 53 54
Lowest reported value (Cell 2)	All bands 61 86	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	31 32 32 33 33 34 34 52 53 53 54 54 55 56

# 6.7.1.2.2 NR SA FR1-FR1 SS-RSRP relative measurement accuracy

### 6.7.1.2.2.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRP absolute measurement accuracy is within the specified limits for all bands.

### 6.7.1.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

# 6.7.1.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.1.0.4.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.1.2.

6.7.1.2.2.4 Test description

6.7.1.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.1.2.2.4.1-1.

Table 6.7.1.2.2.4.1-1: NR SA FR1-FR1 SS-RSRP relative measurement accuracy supported test configurations

Test Case ID	Description		
6.7.1.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD		
6.7.1.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD		
6.7.1.2.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD		
Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.1.2.2.4.1-2.

Table 6.7.1.2.2.4.1-2: Initial conditions for SS-RSRP inter frequency relative accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	Δ	s specified by the test configuration	n selected from Table 6.7.1.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx ARX	A.3.1.8.2 with n = 2 and $\phi_1$ = 5 Hz A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5 Hz, $\phi_{1,2}$ = 10 Hz, $\phi_{1,3}$ = 15 Hz A.3.2.3.4	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without the LTE link		

- 1. Message contents are defined in clause 6.7.1.2.2.4.3.
- 2. Cell 1 is the NR FR1 serving cell (PCell) and Cell 2 is the NR neighbour in a different FR1 frequency and the target cell for SS-RSRP measurements. The connection setup is done according to the settings in Annex C.1.1 and C.1.2.

# 6.7.1.2.2.4.2 Test procedure

Same as in clause 6.7.1.1.2.4.2 but replacing Table 6.7.1.1.2.5-1 and 6.7.1.1.2.5-2 with 6.7.1.2.2.5-1 and 6.7.1.2.2.5-2, respectively.

# 6.7.1.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.1.2.1.4.3.

# 6.7.1.2.2.5 Test requirement

Table 6.7.1.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.1.2.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.1.2.2.5-2.

Table 6.7.1.2.2.5-1: same as Table 6.7.1.2.1.5-1

Table 6.7.1.2.2.5-2: SS-RSRP Intra frequency relative accuracy requirements for the reported values

	Test 1	Test 2		
	All bands	All bands		
Normal Conditions				
Lowest reported value (Cell 2)	SS-RSRP_x - 7	SS-RSRP_x - 31		
Highest reported value (Cell 2)	SS-RSRP_x + 7	SS-RSRP_x - 18		
Extreme Conditions				
Lowest reported value (Cell 2)	SS-RSRP_x - 9	SS-RSRP_x - 33		
Highest reported value (Cell 2)	SS-RSRP_x + 9	SS-RSRP_x - 17		
SS-RSRP_x is the reported value of Cell 1				

# 6.7.2 SS-RSRQ

# 6.7.2.0 Minimum conformance requirements

# 6.7.2.0.1 Intra-frequency SS-RSRQ measurement accuracy requirements

Same as in clause 4.7.2.0.1.

# 6.7.2.0.2 Inter-frequency SS-RSRQ absolute measurement accuracy requirements

Same as in clause 4.7.2.0.2.

# 6.7.2.0.3 Inter-frequency SS-RSRQ relative measurement accuracy requirements

Same as in clause 4.7.2.0.3.

# 6.7.2.1 NR SA FR1 SS-RSRQ measurement accuracy

# 6.7.2.1.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-RSRQ measurement accuracy is within the specified limits for all bands.

# 6.7.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

### 6.7.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.2.1.

#### 6.7.2.1.4 Test description

#### 6.7.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.2.1.4.1-1.

Table 6.7.2.1.4.1-1: NR SA FR1 SS-RSRQ measurement accuracy supported test configurations

Test Case ID	Description			
6.7.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD			
6.7.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD			
6.7.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note	Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.2.1.4.1-2.

**Parameter** Value Comment Test environment NC, TL/VL, TL/VH, TH/VL, TH/VH As specified in TS 38.508-1 [14] clause 4.1. Test frequencies As specified in Annex E, Table E.4-1 and TS 38.508-1 [14] clause 4.3.1. Channel As specified by the test configuration selected from Table 6.7.2.1.4.1-1. bandwidth AWGN Propagation As specified in Annex C.2.2. conditions TE Part A.3.1.8.2 with n = 2 and  $\phi_1 = 5$ As specified in TS 38.508-1 [14] Annex A. Connection Diagram 2Rx Hz A.3.1.8.5 with n = 2 and  $\varphi_{1,1}$  = 5 TE Part 4Rx Hz,  $\phi_{1,2} = 10$  Hz,  $\phi_{1,3} = 15$  Hz **DUT** Part A.3.2.3.4 2Rx **DUT Part** A.3.2.5.2 4Rx - Without the LTE link Exceptions to connection diagram

Table 6.7.2.1.4.1-2: Initial conditions for SS-RSRQ intra frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.2.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-RSRQ measurements. The connection setup is done according to the settings in Annex C.1.3.

#### 6.7.2.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.2.1.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRQ reported values in the periodic MeasurementReport. The SS-RSRQ value of Cell 2 reported by the UE is compared to the expected SS-RSRQ. If the value is outside the limits in Table 6.7.2.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.2.1.5-1 as appropriate and repeat steps 5-7.

### 6.7.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.2.1.4.3-1: Common Exception messages for NR SA FR1 SS-RSRQ measurement accuracy

Defaul	It Message Contents
non contents of system information sexceptions	
The state of the s	ole H.3.1-1
nts contents exceptions Tab	ole H.3.1-2
Tab	ole H.3.1-5
Tab	ble H.3.1-7
	ole H.3.1-3 with Condition SSB.1 FR1
Configuration 6.7.2.1-1 Tab	ole 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2
ic message contents exceptions for Tab	ole H.3.1-3 with Condition SSB.1 FR1 and Synchronous cells
Configuration 6.7.2.1-2 Tab	ole 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
ic message contents exceptions for Tab	ole H.3.1-3 with Condition SSB.2 FR1 and Synchronous cells
Configuration 6.7.2.1-3 Tab	ole 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1
	,

Table 6.7.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRQ Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142	with condition PERIODICAL		
Information Element	Value/remark	Comment	Condition
ReportConfigNR::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			PERIODICAL
reportQuantityCell SEQUENCE {			
rsrp	false		
sinr	false		
}			
maxReportCells	2		
}			
}			
}			

# 6.7.2.1.5 Test requirement

Table 6.7.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRQ measurement report for each of the tests in Table 6.7.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.2.1.5-2.

Table 6.7.2.1.5-1: SS-RSRQ Intra frequency test parameters

Parameter		Unit	Te	st 1	Tes	st 2	Tes	st 3
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
SSB ARFCN			fre	eq1	fre	q1	freq1	
Dupley mode	Config 1				F	DD		
Duplex mode	Config 2,3				T	DD		
	Config 1				Not Ap	plicable		
TDD configuration	Config 2				TDDC	onf.1.1		
	Config 3				TDDC	onf.2.1		
	Config 1				10: N <sub>R</sub>	<sub>B,c</sub> = 52		
BW <sub>channel</sub>	Config 2	MHz	MHz 10: N <sub>RB,c</sub> = 52					
	Config 3				40: N <sub>RB</sub>	,c = 106		
	Initial DL BWP				DLBV	VP.0.1		
BWP configuration	Dedicated DL BWP				DLBV	VP.1.1		
BVVF Configuration	Initial UL BWP		ULBWP.0.1					
	Dedicated UL BWP		ULBWP.1.1					
DRX Cycle		ms	Not Applicable					
	Config 1		SR.1.1 FDD	-	SR.1.1 FDD	-	SR.1.1 FDD	-

Read	PDSCH Reference	ce	Config 2		SR.1.1 TDD		SR.1.1 TDD		SR.1.1 TDD			
RMSI   CORESET   Reference   Config 2   Config 3   Config 3   Config 4   Config 5   Config 6   Config 7   Config 7   Config 7   Config 7   Config 8   Config 8   Config 9   Config 1	measure		Config 3									
Config 2			Config 1									
Control Channel   Config 3	Referen	ce	Config 2		CR.1.1	-	CR.1.1	-	CR.1.1			
Control Channel RMC	Channel		Config 3		CR.2.1		CR.2.1		CR.2.1			
Config 3			Config 1						CCR.1.			
Configuration   Config 2   TRS.1.		Channel	Config 2			-		-		-		
TRS   Config   Config   Config   Config   TRS			Config 3		1 TDD		1 TDD		1 TDD			
Config 2			Config 1		1 FDD		FDD		1 FDD			
Config 2   Config 3   Config 2   Config 3   Config 4   Config 4   Config 4   Config 5   Config 6   Config 7   Config 1   Config 3   Config 6   Config 6   Config 6   Config 6   Config 6   Config 7	TRS Co	nfiguration	Config 2		1 TDD	-	TDD	-	1 TDD	-		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	00110	<u> </u>	Config 3				TDD					
Time offset with Config 2, 3			nent									
Config 1				118	_	3	- INOLAP		_	3		
Config 1		moct with			-		-		-			
SSB configuration	SMTC						SM	ГС.1				
Config 3   Config	configura	ation	Config 1				SM	ΓC.2				
Config 3	SSR cor	oficuration										
Subcarrier spacing   Config 3												
Subcarrier spacing   Config 3   EPRE ratio of PBCH DMRS to SSS   EPRE ratio of PDCCH bMRS to SSS   EPRE ratio of PDCCH to PBCH DMRS to SSS   EPRE ratio of PDCCH to PBCH DMRS to SSS   EPRE ratio of PDCCH to PDCCH DMRS to SSS   EPRE ratio of PDSCH to PDSCH DMRS to SSS   EPRE ratio of PDSCH to PDSCH DMRS to SSS   EPRE ratio of PDSCH to PDSCH DMRS to SSS   EPRE ratio of PDSCH to PDSCH DMRS to SSS   EPRE ratio of OCNG DMRS to SSS   Config 2 Depending on band group   EPRE ratio of OCNG DMRS to SSS   EPRE ratio of OCNG DMRS (Note 1)   EPRE ratio o				kH7								
						1	30kHz			1		
$ EPRE ratio \ of \ PDCCH \ DMRS to \ SSS \ EPRE ratio \ of \ PDCCH \ DMRS \ to \ SSS \ EPRE ratio \ of \ PDSCH \ to \ PDSCH \ to \ PDSCH \ to \ PDSCH \ EPRE ratio \ of \ PDSCH \ to \ PDSCH \ \mathsf$												
				dB	0	0	0	0	0	0		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $												
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$												
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	LITTETAL							•				
$ \frac{N_{oc}}{N_{ote2}} = \frac{Config}{N_{ote2}} = \frac{Config}{N_{ote2}}$			group		-8	6.5	-1	01	-114+ /	∆BG_offset		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Note2		group	П2	-9	2.6		•	-114+ /	∆BG_offset		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$N_{oc}$	_	group		-8	6.5	-1	01	-114+ 4	∆BG_offset		
$ \frac{\hat{E}_{s}/N_{oc}}{SS_{RSRP}} = \frac{Config}{1,2} \frac{Depending on band group} Depending on band group}{Depending on band group} = \frac{ABM/SC}{S} = \frac{-83.5}{-83.5} = \frac{-103.9}{-103.9} = \frac{-103.9}{118+\Delta} = \frac{-118+\Delta}{\Delta BG_{offset}} = \frac{-115+\Delta}{\Delta BG_{offset}} = \frac{-115+\Delta}$	Note2	Config 3	_	S	-8	-89.6		-89.6		-	-111+ /	∆BG_offset
$ \frac{\text{SS-RSRP}}{\text{Note3}} \\ \frac{\text{Config}}{1,2} \\ \frac{\text{Depending on band group}}{\text{Depending on band group}} \\ \frac{\text{dBm/SC}}{\text{S}} \\ \frac{\text{-83.5}}{100000000000000000000000000000000000$				dB	-1.76		-4	.7	-5.46	-5.46		
SS-RSRP   Note3   Config 3   Group   Config 3   Pass	$\hat{E}_s/N_c$	) <i>c</i>		dB	3	3	-2.9	-2.9	-4			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			_	dBm/SC	-83.5	-83.5	-103.9	-103.9		$\Delta_{\text{BG\_offse}}$		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		Config 3			-86.6	-86.6	-	-	-115+ Δ <sub>BG_offs</sub>	-115+ Δ <sub>BG_offse</sub>		
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	SS-RSR	Q Note3		dB	-14.77	-14.77	-16.76	-16.76				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		Config		dBm/								
	Io <sup>Note3</sup>	Config 3		38.16M	-5′	1.56		-	-76.67+	$\Delta_{BG\_offset}$		
	Propaga	tion condition	on		AWGN	AWGN	AWGN	AWGN	AWGN	AWGN		

Antenna	configuration		1x2	1x2	1x2	1x2	1x2	1x2
Note 1:	OCNG shall be used such that be spectral density is achieved for a			cated and	a constant	total trans	mitted pov	wer
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\perp}$ to be fulfilled.							
Note 3:	SS-RSRQ, SS-RSRP, and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							
Note 4:	SS-RSRQ, SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.							
Note 5:	Δ <sub>BG_offset</sub> is defined in clause 3A.4, Table 3A.4.1-2.							
Note 6:	Subtest 2 is not used when testing with 30kHz SSB SCS.							
Note 7:	The test configuration excludes in this release of the specification		pand n51	and it is no	t required	to run this	test on ba	ınd n51

Table 6.7.2.1.5-2: SS-RSRQ Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
	Normal Condit	ions	
Lowest reported value (Cell 2)	SS-RSRQ_52	SS-RSRQ_46	SS-RSRQ_44
Highest reported value (Cell 2)	SS-RSRQ_62	SS-RSRQ_60	SS-RSRQ_59
	Extreme Condi	tions	
Lowest reported value (Cell 2)	SS-RSRQ_49	SS-RSRQ_45	SS-RSRQ_43
Highest reported value (Cell 2)	SS-RSRQ_65	SS-RSRQ_61	SS-RSRQ_60

# 6.7.2.2 Inter-Frequency SS-RSRQ measurement accuracy

# 6.7.2.2.1 NR SA FR1-FR1 SS-RSRQ absolute measurement accuracy

# 6.7.2.2.1.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRQ absolute measurement accuracy is within the specified limits for all bands.

#### 6.7.2.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

### 6.7.2.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.2.2.1.

6.7.2.2.1.4 Test description

6.7.2.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.2.2.1.4.1-1.

Table 6.7.2.2.1.4.1-1: NR SA FR1-FR1 SS-RSRQ measurement accuracy supported test configurations

Test Case ID	Description		
6.7.2.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD		
6.7.2.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD		
6.7.2.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD		
Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.2.2.1.4.1-2.

Table 6.7.2.2.1.4.1-2: Initial conditions for SS-RSRQ interfrequency accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	Δ	s specified by the test configuration	n selected from Table 6.7.2.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part	A.3.1.8.2 with n = 2 and $\phi_1$ = 5 Hz A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5 Hz, $\phi_{1,2}$ = 10 Hz, $\phi_{1,3}$ = 15 Hz A.3.2.3.4	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without the LTE link		

- 1. Message contents are defined in clause 6.7.2.2.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the different frequency as Cell 1. Cell 2 is the target cell for SS-RSRQ measurements. The connection setup is done according to the settings in Annex C.1.1.

# 6.7.2.2.1.4.2 Test procedure

Same as in clause 6.7.2.1.1.4.2 but replacing Table 6.7.2.1.1.5-1 and 6.7.2.1.1.5-2 with 6.7.2.2.1.5-1 and 6.7.2.2.1.5-2, respectively.

# 6.7.2.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.2.2.1.4.3-1: Common Exception messages for NR SA FR1-FR1 SS-RSRQ absolute measurement accuracy

	Default Message Contents				
Common contents of system information blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-FREQ and GAP NEEDED Table H.3.1-5 Table H.3.1-7 with condition INTER-FREQ Table H.3.1-6 with condition Pattern #0				
Specific message contents exceptions for Test Configuration 6.7.2.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2				
Specific message contents exceptions for Test Configuration 6.7.2.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.1 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				
Specific message contents exceptions for Test Configuration 6.7.2.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO, SSB.2 FR1 and Synchronous cells Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				

Table 6.7.2.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-RSRQ Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL					
Information Element	Value/remark	Comment	Condition		
ReportConfigNR::= SEQUENCE {					
reportType CHOICE {					
periodical SEQUENCE {			PERIODICAL		
reportQuantityCell SEQUENCE {					
rsrp	false				
sinr	false				
}					
maxReportCells	2				
}					
}					
}					

# 6.7.2.2.1.5 Test requirement

Table 6.7.2.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Table 6.7.2.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.2.2.1.5-2.

Table 6.7.2.2.1.5-1: SS-RSRQ Inter frequency test parameters

Parameter		Unit	Test 1		Test 2		Test 3	
		Offic	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
SSB ARFCN	Config 1		freq1	freq2	freq1 FD	freq2	freq1	freq2
Duplex mode	Config 2,3	-			TD			
	Config 1		Not Applicable					
TDD configuration	Config 2		TDDConf.1.1					
	Config 3				TDDC	onf.2.1		
	Config 1				10: N <sub>RE</sub>	s,c = 52		
BW <sub>channel</sub>	Config 2	MHz			10: N <sub>RE</sub>	s,c = 52		
	Config 3				40: N <sub>RB</sub>	c = 106		
Gap pattern ID					C	)		
	Initial DL BWP				DLBW	/P.0.1		
BWP configuration	Dedicated DL BWP				DLBW	/P.1.1		
DVVI Configuration	Initial UL BWP	_			ULBW	/P.0.1		
	Dedicated UL BWP				ULBW	/P.1.1		
DRX Cycle		ms			Not App	olicable		
	Config 1		SR.1.1 FDD		SR.1.1 FDD		SR.1.1 FDD	
PDSCH Reference measurement channel	Config 2		SR.1.1 TDD	_	SR.1.1 TDD	-	SR.1.1 TDD	-
	Config 3		SR2.1 TDD		SR2.1 TDD		SR2.1 TDD	
	Config 1		CR.1.1 FDD	-	R.1.1 FDD	-	CR.1.1 FDD	
RMSI CORESET Reference Channel	Config 2		CR.1.1 TDD		CR.1.1 TDD		CR.1.1 TDD	
	Config 3		CR2.1 TDD		CR2.1 TDD		CR2.1 TDD	
	Config 1		CCR.1. 1 FDD		CCR.1. 1 FDD		CCR.1. 1 FDD	
Dedicated CORESET Reference Channel	Config 2		CCR.1. 1 TDD	_	CCR.1. 1 TDD	-	CCR.1. 1 TDD	-
	Config 3		CCR2.1 TDD		CCR2.1 TDD		CCR2. 1 TDD	
	Config 1		TRS.1. 1 FDD		TRS.1.1 FDD		TRS.1. 1 FDD	
TRS Configuration	Config 2		TRS.1. 1 TDD	_	TRS.1.1 TDD	-	TRS.1. 1 TDD	-
	Config 3		TRS.1. 2 TDD		TRS.1.2 TDD		TRS.1. 2 TDD	

00110.5									
OCNG Pa	tterns	T				OF			
Time offse	Time offset with Cell 1		μS	3					
Config 1		ms	3						
SMTC cor	figuration	Config 2, 3				SMT			
OWITO COI	inguration	Config 1				SMT			
SSB conf	iguration	Config 1,2				SSB.1			
OOD COIII	igaration	Config 3				SSB.2	in FR1		
PDSCH/P	DCCH	Config 1,2	1.11-			15 k	κHz		
subcarrier	spacing	Config 3	kHz			30 k	(Hz		
FPRF ratio	of PSS to SSS	J - 3 -							
	of PBCH DMRS	to SSS							
	of PBCH to PBC								
	of PDCCH DMR								
	of PDCCH to PD		dB	0	0	0	0	0	0
	of PDSCH DMR		_						
	of PDSCH to PD of OCNG DMRS		-						
		NG DMRS (Note 1)	-						
		Depending on							-116
$N_{oc}^{ m Note2}$	Config 1,2	band group	dBm/15kHz	-81.68	-81.68	-106	-106	-116 + Δ <sub>BG_off</sub>	+ ΔBG_off
		Depending on						-116+	-116+
$N_{oc}^{$	Config 3	band group	dBm/15kHz	-87.80	-87.80	-113	-113	$\Delta_{BG\_off}$	$\Delta_{BG\_off}$
								set	set
	Config 1,2	Depending on				-106	-106		-116
		band group		-81.68	-81.68			-116 +	+
- Note2			dBm/SCS					$\Delta_{BG\_off}$	$\Delta_{BG\_off}$
$N_{oc}^{$		<u> </u>						set	set
	0 " 0	Depending on		04.0	040	440	440	-113+	-113+
	Config 3	band group		-84.8	-84.8	-110	-110	$\Delta_{BG\_off}$	$\Delta_{BG\_off}$
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$		dB	-1.75	-1.75	-1.75	-1.75	set 3	set -1.75	
$\hat{E}_s/N_{oc}$			dB	-1.75	-1.75	-1.75	-1.75	3	-1.75
$\mathbf{L}_{s}/\mathbf{W}_{oc}$			иь	-1.73	-1.73	-1.75	-1.75	3	-1.75
SS- RSRP <sup>Not</sup>	Config 1,2	Depending on band group	- dBm/SCS	-83.43	-83.43	- 107.75	- 107.75	-113+ Δ <sub>BG_off</sub> set	- 117.7 5+ Δ <sub>BG_off</sub> set
e3	Config 3	Depending on band group	- ubiii/303	-86.54	-86.54	- 111.75	- 111.75	-110+ Δ <sub>BG_off</sub> set	- 114.7 5+ Δ <sub>BG_off</sub> set
SS-RSRQ	Note3		dB	-14.76	-14.76	-14.76	-14.76	-12.56	-14.76
		Depending on band group						- 83.28	- 85.83
	Config 1,2	-a.i.a g. oup		-51.51	-51.51	-75.83	-75.83	+	+
	.,_							$\Delta_{BG\_off}$	$\Delta_{BG\_off}$
La Note3			dDm/Ch D\\					set	set
IO <sup>Note3</sup>		Depending on	dBm/Ch BW					-	-
		band group						77.19	79.73
	Config 3			-51.52	-51.52	52 -76.73	-76.73	+	+
	1							$\Delta_{BG\_off}$	$\Delta_{BG\_off}$
								set	set
Propagation	on condition		-	AWGN	AWG	AWGN	AWGN	AWG	AWG
					N			N	N
Antenna configuration			1x2	1x2	1x2	1x2	1x2	1x2	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral
	density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and poice courses not execified in the test is assumed to be constant over

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.

Note 3: SS-RSRQ, SS-RSRP, and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 4: SS-RSRQ, SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Note 5: Δ<sub>BG\_offset</sub> is defined in clause 3A.4, Table 3A.4.1-2

Note 6: The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification.

Table 6.7.2.2.1.5-2: SS-RSRQ Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
	Normal Condit	ions	
Lowest reported value (Cell 2)	SS-RSRQ_52	SS-RSRQ_52	SS-RSRQ_52
Highest reported value (Cell 2)	SS-RSRQ_62	SS-RSRQ_62	SS-RSRQ_62
	Extreme Condi	tions	
Lowest reported value (Cell 2)	SS-RSRQ_49	SS-RSRQ_49	SS-RSRQ_49
Highest reported value (Cell 2)	SS-RSRQ_65	SS-RSRQ_65	SS-RSRQ_65

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.2.2.2 NR SA FR1-FR1 SS-RSRQ relative measurement accuracy

### 6.7.2.2.2.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-RSRQ relative measurement accuracy is within the specified limits for all bands.

#### 6.7.2.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

# 6.7.2.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.2.2.2.

6.7.2.2.2.4 Test description

6.7.2.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.2.2.2.4.1-1.

Table 6.7.2.2.2.4.1-1: NR SA FR1-FR1 SS-RSRQ measurement accuracy supported test configurations

Test Case ID	Description		
6.7.2.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD		
6.7.2.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD		
6.7.2.2.2-3 NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note: The UE is	only required to be tested in one of the supported test configurations		

Configure the test equipment and the DUT according to the parameters in Table 6.7.2.2.2.4.1-2.

Parameter	Value		Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	Δ	s specified by the test configuration	n selected from Table 6.7.2.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and $\phi_1$ = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5	
	4Rx	Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to connection diagram	- Without the	LTE link	

Table 6.7.2.2.2.4.1-2: Initial conditions for SS-RSRQ inter frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.2.2.2.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-RSRQ measurements. The connection setup is done according to the settings in Annex C.1.1.

#### 6.7.2.2.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.2.2.2.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-RSRQ reported values in the periodic MeasurementReport. The SS-RSRQ value of Cell 2 reported by the UE is compared to the SS-RSRQ value of Cell 1 reported by the UE. If the difference between both values is outside the limits in Table 6.7.2.2.2.5-2 or the UE fails to report the measurement value for Cell 2 or Cell 1, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.2.2.2.5-1 as appropriate and repeat steps 5-7.

# 6.7.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.2.2.1.4.3.

#### 6.7.2.2.2.5 Test requirement

Table 6.7.2.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRQ measurement report for each of the tests in Table 6.7.2.2.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.2.2.2.5-2.

Table 6.7.2.2.2.5-1: same as Table 6.7.2.2.1.5-1

Table 6.7.2.2.2.5-2: SS-RSRQ Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	SS-RSRQ_x - 7	SS-RSRQ_x - 7	SS-RSRQ_x - 11
Highest reported value (Cell 2)	SS-RSRQ_x + 7	SS-RSRQ_x + 7	SS-RSRQ_x + 2
Extreme Conditions			
Lowest reported value (Cell 2)	SS-RSRQ_x - 9	SS-RSRQ_x - 9	SS-RSRQ_x – 13
Highest reported value (Cell 2) SS-RSRQ_x + 9 SS-RSRQ_x + 9 SS-RSRQ_x + 4			
RSRQ_x is the reported value of	Cell 1		

# 6.7.3 SS-SINR

# 6.7.3.0 Minimum conformance requirements

# 6.7.3.0.1 Intra-frequency SS-SINR measurement accuracy requirements

Same as in clause 4.7.3.0.1.

# 6.7.3.0.2 Inter-frequency absolute SS-SINR measurement accuracy requirements

Same as in clause 4.7.3.0.2.

# 6.7.3.0.3 Inter-frequency relative SS-SINR measurement accuracy requirements

Same as in clause 4.7.3.0.3.

# 6.7.3.1 NR SA FR1 SS-SINR measurement accuracy

# 6.7.3.1.1 Test purpose

The purpose of this test is to verify that the intra-frequency SS-SINR measurement accuracy is within the specified limits for all bands.

# 6.7.3.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards, which support ss-SINR-Meas.

### 6.7.3.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.3.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.3.1.

#### 6.7.3.1.4 Test description

#### 6.7.3.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.3.1.4.1-1.

Table 6.7.3.1.4.1-1: NR SA FR1 SS-SINR measurement accuracy supported test configurations

Test Case ID	Description		
6.7.3.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD		
6.7.3.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD		
6.7.3.1-3 NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note: The UE is	Note: The UE is only required to be tested in one of the supported test configurations		

Configure the test equipment and the DUT according to the parameters in Table 6.7.3.1.4.1-2.

Parameter		Value	Comment
Test environment	NC, T	L/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth		As specified by the test configuration	on selected from Table 6.7.3.1.4.1-1.
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx TE Part 4Rx DUT Part 2Rx DUT Part 4Rx	A.3.1.8.2 with n = 2 and $\phi_1$ = 5 Hz A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5 Hz, $\phi_{1,2}$ = 10 Hz, $\phi_{1,3}$ = 15 Hz A.3.2.3.4	As specified in TS 38.508-1 [14] Annex A.
Exceptions to connection diagram	- Without the	LTE link	

Table 6.7.3.1.4.1-2: Initial conditions for SS-SINR intra frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.3.1.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-SINR measurements. The connection setup is done according to the settings in Annex C.1.1.

#### 6.7.3.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.3.1.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-SINR reported values in the periodic MeasurementReport. The SS-SINR value of Cell 2 reported by the UE is compared to the expected SS-SINR. If the value is outside the limits in Table 6.7.3.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.3.1.5-1 as appropriate and repeat steps 5-7.

### 6.7.3.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.3.1.4.3-1: Common Exception messages for NR SA FR1 SS-SINR measurement accuracy

	Default Message Contents				
Common contents of system information blocks exceptions					
Default RRC messages and information	Table H.3.1-1				
elements contents exceptions	Table H.3.1-2				
	Table H.3.1-5				
	Table H.3.1-7				
Specific message contents exceptions for	Table H.3.1-3 with Condition SS-SINR				
Test Configuration 6.7.3.1-1	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2				
Specific message contents exceptions for	Table H.3.1-3 with Condition Synchronous cells and SS-SINR				
Test Configuration 6.7.3.1-2	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				
Specific message contents exceptions for	Table H.3.1-3 with Condition Synchronous cells and SS-SINR				
Test Configuration 6.7.3.1-3	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				

Table 6.7.3.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-SINR Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL							
Information Element	Value/remark	Comment	Condition				
ReportConfigNR::= SEQUENCE {							
reportType CHOICE {							
periodical SEQUENCE {			PERIODICAL				
reportQuantityCell SEQUENCE {							
rsrp	false						
rsrq	false						
sinr	true						
}							
maxReportCells	2						
}							
}							
}							

# 6.7.3.1.5 Test requirements

Table 6.7.3.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-SINR measurement report for each of the tests in Table 6.7.3.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.3.1.5-2

Table 6.7.3.1.5-1: SS-SINR Intra frequency test parameters

Parameter		Unit	Test 1		Test 2		
			Cell 1	Cell 2	Cell 1	Cell 2	
SSB ARFCN			freq1		freq1		
Duplex mode	Config 1		FDD				
	Config 2,3		TDD				
TDD configuration	Config 1		Not Applicable				
	Config 2		TDDConf.1.1				
	Config 3		TDDConf.2.1				
Downlink initial BWP configuration			DLBWP.0.1				
Downlink dedicated BWP configuration			DLBWP.1.1				
Uplink initial BWP configuration			ULBWP.0.1				
Uplink dedicated BWP configuration			ULBWP.1.1				
DRX Cycle configuration		ms	Not Applicable				

			1	1		ı	1	
		Config 1		TRS.1.1 FDD		TRS.1.1 FDD		
TRS config	guration	Config 2		TRS.1.1 TDD	-	TRS.1.1 TDD	-	
		Config 3		TRS.1.2 TDD		TRS.1.2 TDD		
		Config 1		SR.1.1 FDD		SR.1.1 FDD		
	Reference nent channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-	
mododron	ioni onamio	Config 3		SR.2.1 TDD		SR2.1 TDD		
		Config 1		CR.1.1 FDD		CR.1.1 FDD		
RMSI COF		Config 2		CR.1.1 TDD	-	CR.1.1 TDD		
Reference	Onamo	Config 3		CR.2.1 TDD		CR.2.1 TDD		
		Config 1		CCR.1. 1 FDD		CCR.1.1 FDD		
Dedicated Reference	CORESET Channel	Config 2		CCR.1. 1 TDD	-	CCR.1.1 TDD	-	
Reference	Onamici	Config 3		CCR.2. 1 TDD		CCR.2.1 TDD		
OCNG Pat	terns	1			0	P.1	<u> </u>	
	Measurement					plicable		
Time offse	t with Cell 1	Config 2, 3	μS	-	3	-	3	
THIS OHSE	t with Oell 1	Config 1	ms	-	3	-	3	
SMTC con	figuration	Config 2, 3				TC.1		
CIVITO COLL	mgaration	Config 1				TC.2		
SSB config	guration	Config 1,2				1 FR1		
		Config 3		SSB.2 FR1				
PDSCH/PI		Config 1,2	kHz		15			
subcarrier		Config 3			3	30	1	
	of PSS to SSS	) ( - 000						
	of PBCH DMRS		_					
	of PBCH to PBO of PDCCH DMF							
	of PDCCH to PI		dB	0	0	0	0	
	of PDSCH DMF						Ū	
EPRE ratio	of PDSCH to PI	DSCH						
		S to SSS(Note 1)						
	of OCNG to OC	NG DMRS (Note 1)						
$N_{oc}^{ m Note2}$		Depending on band group	dBm/15kH z	-93		-116+ ∆ <sub>BG_offset</sub>		
$N_{oc}$	Config 1,2		dBm/SCS	-93	3.2	Same as 15k		
Note2	Config 3	Depending on band group	dBm/SCS	-90	0.2	-113+ ∆	BG_offset	
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		· · · · ·	dB	0	-3.19	-5.46	-5.46	
$\hat{E}_s/N_{oc}$			dB	4.54	2.66	-3.5	-3.5	
SS- RSRP <sup>Not</sup>	Config 1,2	Depending on band group	dBm/SCS	-88.46	-90.34	-119.5+ Δ <sub>BG_offset</sub>	$\begin{array}{c} \text{-} \\ \text{119.5+} \\ \Delta_{BG\_offs} \\ \text{et} \end{array}$	
e3	Config 3	Depending on band group		-85.65	-87.53	-116.5+ Δ <sub>BG_offset</sub>	- 116.5+ Δ <sub>BG_offs</sub> et	
SS-SINR Note3			dB	0	-3.19	-5.1	-5.1	
lo <sup>Note3</sup>	Config 1,2	Depending on band group	dBm/ 9.36MHz	-5	7.5	-85.28+		
	Config 3	Depending on band group	dBm/ 38.16MHz	-51.59 -79.17+ Δ <sub>B</sub>		$\Delta_{BG\_offset}$		
Propagation	on condition		-		A۷	VGN		
	onfiguration		-			x2		
		•	•					

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.
Note 3:	SS-SINR, SS-RSRP, and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	SS-SINR, SS-RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	Δ <sub>BG offset</sub> is defined in clause 3A.4, Table 3A.4.1-2
Note 6:	The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification

Table 6.7.3.1.5-3: SS-SINR Intra frequency absolute accuracy requirements for the reported values

	Test 1	Test 2
	All bands	All bands
Normal Conditions		
Lowest reported value (Cell 2)	SS-SINR_31	SS-SINR_28
Highest reported value (Cell 2)	SS-SINR_49	SS-SINR_45
Extreme Conditions		
Lowest reported value (Cell 2)	SS-SINR_30	SS-SINR_27
Highest reported value (Cell 2)	SS-SINR_50	SS-SINR_46

# 6.7.3.2 Inter-Frequency SS-SINR measurement accuracy

### 6.7.3.2.1 NR SA FR1-FR1 SS-SINR absolute measurement accuracy

# 6.7.3.2.1.1 Test purpose

The purpose of this test is to verify that the inter-frequency SS-SINR absolute measurement accuracy is within the specified limits for all bands.

## 6.7.3.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards, which support ss-SINR-Meas.

## 6.7.3.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.3.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.3.2.1.

6.7.3.2.1.4 Test description

6.7.3.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.3.2.1.4.1-1.

Table 6.7.3.2.1.4.1-1: NR SA FR1-FR1 SS-SINR measurement accuracy supported test configurations

Test Case ID	Description				
6.7.3.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD				
6.7.3.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD				
6.7.3.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD				
Note	Note: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.7.3.2.1.4.1-2.

Exceptions to

connection diagram

**Parameter** Value Comment NC, TL/VL, TL/VH, TH/VL, TH/VH As specified in TS 38.508-1 [14] clause 4.1. Test environment As specified in Annex E, Table E.4-1 and TS 38.508-1 [14] clause 4.3.1. Test frequencies Channel As specified by the test configuration selected from Table 6.7.3.2.1.4.1-1. bandwidth AWGN As specified in Annex C.2.2. Propagation conditions Connection TE Part A.3.1.8.2 with n = 2 and  $\phi_1 = 5$ As specified in TS 38.508-1 [14] Annex A. Diagram 2Rx Hz TE Part A.3.1.8.5 with n = 2 and  $\varphi_{1,1} = 5$ 4Rx Hz,  $\phi_{1,2} = 10$  Hz,  $\phi_{1,3} = 15$  Hz **DUT Part** A.3.2.3.4

A.3.2.5.2

Table 6.7.3.2.1.4.1-2: Initial conditions for SS-SINR inter frequency accuracy in FR1

1. Message contents are defined in clause 6.7.3.2.1.4.3.

- Without the LTE link

2Rx

DUT Part 4Rx

2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-SINR measurements. The connection setup is done according to the settings in Annex C.1.1.

#### 6.7.3.2.1.4.2 Test procedure

Same as in clause 6.7.3.1.4.2 but replacing Table 6.7.3.1.5-1 and 6.7.3.1.5-2 with 6.7.3.2.1.5-1 and 6.7.3.2.1.5-2, respectively.

## 6.7.3.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.3.2.1.4.3-1: Common Exception messages for NR SA FR1-FR1 SS-SINR absolute measurement accuracy

Default Message Contents					
Common contents of system information blocks exceptions					
Default RRC messages and information elements contents exceptions	Table H.3.1-1 Table H.3.1-2 with condition INTER-FREQ and GAP NEEDED Table H.3.1-5 Table H.3.1-7 with condition INTER-FREQ Table H.3.1-6 with condition Pattern #0				
Specific message contents exceptions for Test Configuration 6.7.3.2.1-1	Table H.3.1-3 with Conditions INTER-FREQ MO and SS-SINR Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.2				
Specific message contents exceptions for Test Configuration 6.7.3.2.1-2	Table H.3.1-3 with Conditions INTER-FREQ MO, and Synchronous cells and SS-SINR Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				
Specific message contents exceptions for Test Configuration 6.7.3.2.1-3	Table H.3.1-3 with Conditions INTER-FREQ MO, and Synchronous cells and SS-SINR Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1				

Table 6.7.3.2.1.4.3-2: ReportConfigNR-DEFAULT(Periodical) for NR SA FR1 SS-SINR Accuracy

Derivation Path: 38.508-1 [14] Table 4.6.3-142 with condition PERIODICAL						
Information Element	Value/remark	Comment	Condition			
ReportConfigNR::= SEQUENCE {						
reportType CHOICE {						
periodical SEQUENCE {			PERIODICAL			
reportQuantityCell SEQUENCE {						
rsrp	false					
rsrq	false					
sinr	true					
}						
maxReportCells	2					
}						
}						
}						

# 6.7.3.2.1.5 Test requirements

Table 6.7.3.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-SINR measurement report for each of the tests in Table 6.7.3.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.3.2.1.5-2.

Table 6.7.3.2.1.5-1: SS-SINR Inter frequency test parameters

Parameter			Tes	st 1	Tes	st 2	Te	st 3
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
SSB ARFCN			freq1	freq2	freq1	freq2	freq1	freq2
Duplex mode	Config 1					DD DD		
•	Config 2,3 Config 1							
TDDfire						plicable onf.1.1		
TDD configuration	Config 2							
	Config 3					onf.2.1		
Downlink initial BWP cor						VP.0.1		
Downlink dedicated BWI	•					VP.1.1		
Uplink initial BWP config	uration				ULBV	VP.0.1		
Uplink dedicated BWP c	onfiguration				ULBV	VP.1.1		
DRX Cycle configuration	ı	ms			Not Ap	plicable		
Gap pattern ID			0	-	0	-	0	-
	Config 1		TRS.1.1 FDD		TRS.1.1 FDD		TRS.1.1 FDD	
TRS configuration	Config 2		TRS.1.1 TDD	-	TRS.1.1 TDD	-	TRS.1.1 TDD	-
	Config 3		TRS.1.2 TDD		TRS.1.2 TDD		TRS.1.2 TDD	
	Config 1		SR.1.1 FDD		SR.1.1 FDD		SR.1.1 FDD	
PDSCH Reference measurement channel	Config 2		SR.1.1 TDD	-	SR.1.1 TDD	-	SR.1.1 TDD	-
	Config 3		SR.2.1 TDD		SR.2.1 TDD		SR.2.1 TDD	
	Config 1		CR.1.1 FDD		CR.1.1 FDD		CR.1.1 FDD	
RMSI CORESET Reference Channel	Config 2		CR.1.1 TDD	-	CR.1.1 TDD	-	CR.1.1 TDD	-
	Config 3		CR.2.1 TDD		CR.2.1 TDD		CR.2.1 TDD	

		Config 1		CCR.1. 1 FDD		CCR.1. 1 FDD		CCR.1. 1 FDD	
Dedicated CORESET Reference Channel		Config 2		CCR.1. 1 TDD	-	CCR.1. 1 TDD	-	CCR.1. 1 TDD	-
		Config 3	_	CCR.2. 1 TDD		CCR.2. 1 TDD		CCR.2. 1 TDD	
OCNG Pat	tterns	1				0	P.1	l l	
SS-RSSI-N	Measurement					Not Ap	plicable		
T: "	0 11.4	Config 2, 3	μS	-	3	-	3	-	3
I ime offse	t with Cell 1	Config 1	ms	-	3	-	3	-	3
		Config 2, 3			•	SM	TC.1	•	
SMTC con	ifiguration	Config 1				SM	TC.2		
		Config 1,2				SSB.	1 FR1		
SSB config	guration	Config 3	-				2 FR1		
PDSCH/PI	DCCH	Config 1,2					15		
subcarrier		Config 3	kHz				30		
	of PSS to SSS								
	of PBCH DMRS								
	of PBCH to PBC		_	0	0	0	0	0	0
	of PDCCH DMF of PDCCH to P		dB						
	of PDSCH DMF		1 "2		Ŭ				
EPRE ratio	of PDSCH to P	DSCH							
		S to SSS(Note 1)	4						
EPRE ratio	of OCNG to OC	NG DMRS (Note 1)  Depending on						-119.5+	-119.5+
$N_{oc}$ Note2	Config 1,2	band group	dBm/15k Hz	-88	-88	-108.5	-108.5	$\Delta_{BG\_offse}$	ΔBG_offse
$N_{_{oc}}$ Note2	(	Config 1,2	dBm/SC	-88	-88	-108.5	-108.5	Same as Noc for 15kHz	Same as Noc for 15kHz
Notez	Config 3	Depending on band group	3	-85	-85	-105.5	-105.5	-116.5+ Δ <sub>BG_offse</sub> t	$116.5+$ $\Delta_{BG\_offse}$ t
$\hat{\mathbf{E}}_{_{\mathrm{s}}}/\mathbf{I}_{_{\mathrm{ot}}}$			dB	-1.75	-1.75	20	20	-3.2	-3.2
$\hat{E}_s/N_{oc}$	$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	20	20	-3.2	-3.2
SS-	Config 1,2	Depending on band group	dBm/SC	-89.75	-89.75	-88.5	-88.5	-122.7+ Δ <sub>BG_offse</sub>	-122.7+ Δ <sub>BG_offse</sub>
RSRP <sup>Not</sup> e3	Config 3	Depending on band group	S	-86.75	-86.75	-85.5	-85.5	-119.7+ Δ <sub>BG_offse</sub>	-119.7+ Δ <sub>BG_offse</sub>
SS-SINR Note3		dB	-1.75	-1.75	-1.75	-1.75	-3.2	-3.2	
Io <sup>Note3</sup>	Config 1,2	Depending on band group	dBm/ 9.36MHz	-57.83	-57.83	-60.5	-60.5	-89.85+ Δ <sub>BG_offse</sub> t	-89.85+ Δ <sub>BG_offse</sub> t
10.13.00	Config 3	Depending on band group	dBm/ 38.16MH z	-51.73	-51.73	-54.41	-54.41	-83.75+ Δ <sub>BG_offse</sub> t	$\begin{array}{c} \text{-83.75+} \\ \Delta_{\text{BG\_offse}} \\ \text{t} \end{array}$

Propagation condition	-	AWGN		
Antenna configuration	-	1x2		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectr density is achieved for all OFDM symbols.				
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{co}$ to be fulfilled.				
	te 3: SS-SINR, SS-RSRP, and lo levels have been derived from other parameters for information purposes. The are not settable parameters themselves.			
Note 4: SS-SINR, SS-RSRP minimum requeach receiver antenna port.	· · · · · · · · · · · · · · · · · · ·			
Note 6: The test configuration excludes sup	6: The test configuration excludes support for band n51 and it is not required to run this test on band n51 in t			

Table 6.7.3.2.1.5-2: SS-SINR Inter frequency absolute accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
	Normal Condit	ons	
Lowest reported value (Cell 2)	SS-SINR_35	SS-SINR_79	SS-SINR_32
Highest reported value (Cell 2)	SS-SINR_51	SS-SINR_94	SS-SINR_49
	Extreme Condi	ions	
Lowest reported value (Cell 2)	SS-SINR_33	SS-SINR_77	SS-SINR_31
Highest reported value (Cell 2)	SS-SINR_53	SS-SINR_96	SS-SINR_50

## 6.7.3.2.2 NR SA FR1-FR1 SS-SINR relative measurement accuracy

### 6.7.3.2.2.1 Test purpose

release of the specification

The purpose of this test is to verify that the inter-frequency SS-SINR relative measurement accuracy is within the specified limits for all bands.

### 6.7.3.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards, which support ss-SINR-Meas.

#### 6.7.3.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.2.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.3.2.2.

6.7.3.2.2.4 Test description

6.7.3.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.3.2.2.4.1-1.

Table 6.7.3.2.2.4.1-1: NR SA FR1-FR1 SS-SINR measurement accuracy supported test configurations

Test Case ID	Description				
6.7.3.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD				
6.7.3.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD				
6.7.3.2.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD				
Note	Note: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.7.3.2.2.4.1-2.

Parameter		Value	Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies		As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	Δ	s specified by the test configuration	n selected from Table 6.7.3.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 2 and $\phi_1$ = 5	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx	Hz	
	TE Part	A.3.1.8.5 with n = 2 and $\phi_{1,1}$ = 5	
	4Rx	Hz, $\varphi_{1,2}$ = 10 Hz, $\varphi_{1,3}$ = 15 Hz	
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to	- Without the	LTE link	
connection			
diagram			

Table 6.7.3.2.2.4.1-2: Initial conditions for SS-SINR inter frequency accuracy in FR1

- 1. Message contents are defined in clause 6.7.3.2.2.4.3.
- 2. Cell 1 is the NR serving cell (PCell). The power levels and settings for Cell 1 are set according to Annex A.6. Cell 2 is an NR FR1 cell in the same frequency as Cell 1. Cell 2 is the target cell for SS-SINR measurements. The connection setup is done according to the settings in Annex C.1.1.

#### 6.7.3.2.2.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.3.2.2.5-1 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the SS-SINR reported values in the periodic MeasurementReport. The SS- SINR value of Cell 2 reported by the UE is compared to the SS- SINR value of Cell 1 reported by the UE. If the difference between both values is outside the limits in Table 6.7.3.2.2.5-2 or the UE fails to report the measurement value for Cell 2 or Cell 1, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.3.2.2.5-1 as appropriate and repeat steps 5-7.

## 6.7.3.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.3.2.1.4.3.

#### 6.7.3.2.2.5 Test requirements

Table 6.7.3.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-SINR measurement report for each of the tests in Table 6.7.3.2.2.5-1 shall meet the corresponding relative accuracy requirements in Table 6.7.3.2.2.5-2

#### Table 6.7.3.2.2.2.5-1: same as Table 6.7.3.2.2.1.5-1

#### Table 6.7.3.2.2.5-2: SS-SINR Inter frequency relative accuracy requirements for the reported values

	Test 1	Test 2	Test 3
	All bands	All bands	All bands
Normal Conditions			
Lowest reported value (Cell 2)	SS-SINR_x - 10	SS-SINR_x - 10	SS-SINR_x - 11
Highest reported value (Cell 2)	SS-SINR_x + 10	SS-SINR_x + 10	SS-SINR_x + 11
Extreme Conditions			
Lowest reported value (Cell 2)	SS-SINR_x - 12	SS-SINR_x - 12	SS-SINR_x - 12
Highest reported value (Cell 2)	SS-SINR_x + 12	SS-SINR_x + 12	SS-SINR_x + 12
RSRQ_x is the reported value of	Cell 1		

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.4 L1-RSRP

6.7.4.0 Minimum conformance requirements

6.7.4.0.1 SSB based absolute L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.1.

6.7.4.0.2 SSB based relative L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.2.

6.7.4.0.3 CSI-RS based absolute L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.3.

6.7.4.0.4 CSI-RS based relative L1-RSRP measurement accuracy requirements

Same as 4.7.4.0.4.

6.7.4.1 SSB based L1-RSRP measurements

6.7.4.1.1 NR SA FR1 SSB based L1-RSRP absolute measurement accuracy

6.7.4.1.1.1 Test purpose

The purpose of this test is to verify that the SSB based L1-RSRP absolute measurement accuracy is within the specified limits for all bands.

6.7.4.1.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

6.7.4.1.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.1.

6.7.4.1.1.4 Test description

6.7.4.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.1.1.4.1-1.

Table 6.7.4.1.1.4.1-1: NR SA FR1 SSB based L1-RSRP absolute measurement accuracy supported test configurations

Test Case ID	Description
6.7.4.1.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.4.1.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.4.1.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note: The UE is	only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.1.1.4.1-2.

Table 6.7.4.1.1.4.1-2: Initial conditions for SSB based L1-RSRP absolute accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	l A	As specified in Annex E, Table E.4	4-1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuration	on selected from Table 6.7.4.1.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx		
	TE Part	A.3.1.8.5 with n = 1	
	4Rx		
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to		N/A	
connection			
diagram			

- 1. Message contents are defined in clause 6.7.4.1.1.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for SSB-based L1-RSRP measurements. The UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs. The connection setup is done according to the settings in Annex C.1.1.

### 6.7.4.1.1.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.1.1.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.1.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.1.1.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of SSB#0 and SSB#1 in the periodic L1-RSRP reports. If the value for both SSBs is within the limits in Table 6.7.4.1.1.5-2 or Table 6.7.4.1.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.1.1.5-1 as appropriate and repeat steps 3-5.

#### 6.7.4.1.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.4.1.1.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and SS-RSRP			
elements contents exceptions	Table H.3.6-3 with conditions SSB and PERIODIC			
	Table H.3.5-8			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.4.1.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList SEQUENCE (SIZE(1maxNrofFailureDetectionResources)) OF SEQUENCE {	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

## 6.7.4.1.1.5 Test requirement

Table 6.7.4.1.1.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.1.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.1.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.4.1.1.5-3 for test configuration 3.

Table 6.7.4.1.1.5-1: L1-RSRP test parameters

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
	3		TDDConf.2.1	TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
BWchannel	2	MHz	10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106	40: N <sub>RB,c</sub> = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
measurement channel	3		SR.2.1 TDD	SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD	CR.1.1 FDD
Channel	2		CR.1.1 TDD	CR.1.1 TDD
Chamie	3		CR.2.1 TDD	CR.2.1 TDD
Dedicated CORESET	1		CCR.1.1 FDD	CCR.1.1 FDD
Reference Channel	2		CCR.1.1 TDD	CCR.1.1 TDD
Neierence Chainei	3		CCR.2.1 TDD	CCR.2.1 TDD
SSB configuration	1		SSB.3 FR1	SSB.3 FR1
SSB configuration	2		SSB.3 FR1	SSB.3 FR1

		3		SSB.4 FR1	SSB.4 FR1
OCNG P	atterns	1~3		OP.1	OP.1
20.101	JOHO I attorno			TRS.1.1 FDD	TRS.1.1 FDD
TRS con	TRS configuration		1	TRS.1.1 TDD	TRS.1.1 TDD
5 0011			1	TRS.1.2 TDD	TRS.1.2 TDD
		3		DLBWP.0.1	DLBWP.0.1
Initial BV	VP Configuration	1~3		ULBWP.0.1	ULBWP.0.1
				DLBWP.1.1	DLBWP.1.1
Dedicate	ed BWP configuration	1~3		ULBWP.1.1	ULBWP.1.1
SMTC or	onfiguration	1~3		SMTC.1	SMTC.1
	•			periodic	
	nfigType	1~3			periodic
reportQu	-	1~3		ssb-Index-RSRP	ssb-Index-RSRP
	of reported RS	1~3		2	2
	P reporting period	1~3		slot80	slot80
	o of PSS to SSS				
	o of PBCH DMRS to SSS				
	o of PBCH to PBCH DMRS o of PDCCH DMRS to SSS				
	o of PDCCH to PDCCH				
DMRS	J GIT DOGIT TO F DOGIT				
	o of PDSCH DMRS to SSS	1~3	dB	0	0
	o of PDSCH to PDSCH				
DMRS					
EPRE ratio	o of OCNG DMRS to				
SSS <sup>Note 1</sup>	(00)1000110				
DMRS Note	o of OCNG to OCNG				
<b>λ</b> .7					
$N_{oc}$		1,2		-94.65	-117+ $\Delta_{\mathrm{BG\_offset}}$
Note2			dBm/15kHz		_
	Depending on	3		-96.00	117+ $\Delta_{\mathrm{BG\_offset}}$
	band group				- Bo_onset
<b>3</b> 7	bana group	1,2	dBm/SSB	-94.65	-117+ $\Delta_{\mathrm{BG\_offset}}$
$N_{oc}$		1,2	SCS	J-1.00	-117 \ \(\Delta\)BG_offset
Note2					
		3		-93.00	-114+ $\Delta_{\mathrm{BG\_offset}}$
$\hat{\mathrm{E}}_{\scriptscriptstyle \mathrm{s}}/\mathrm{I}_{\scriptscriptstyle \mathrm{ot}}$		1~3	dB	10	-2.2
					440.0
CCD		1,2		-84.65	-119.2 +
SSB	Depending on	- ,	dBm/SSB	500	$\Delta_{BG\_offset}$
RSRP Note3	band group		SCS		4400
.10100	3 - 1	3		-83.00	-116.2 +
		•		22.00	$\Delta$ BG_offset
	Depending on		dDm/0.00		97.00 +
	band group	1,2	dBm/9.36	-56.28	-87.00 +
I Notes	23113 9104P	•	MHz		$\Delta$ BG_offset
lo Note3			JD /05 /5		00.00
		3	dBm/38.16	-51.53	-80.90 +
		•	MHz	000	$\Delta$ BG_offset
$\hat{E}_s/N_o$		1~3	dB	10	-2.2
			UD		
1	tion condition	1~3	<u> </u>	AWGN	AWGN
Antenn	a configuration	1~3		1x2	1x2
_					

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power
	for $N_{oc}$ to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
Note 5:	The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification

Table 6.7.4.1.1.5-2: L1-RSRP absolute accuracy requirements for the reported values for test configurations 1 and 2

Name of Conditions	Test 1	Too! 0	
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	31
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	31
		Bands NR_TDD_FR1_C	32
Lowest reported value (Cell 1)	62	Bands NR_FDD_FR1_D,	32
Lowest reported value (Cell 1)	02	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	33
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	34
		Bands NR_FDD_FR1_H	34
		Bands NR_FDD_FR1_A,	44
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	45
		Bands NR_TDD_FR1_C	45
Highest reported value (Cell 1)	82	Bands NR_FDD_FR1_D,	46
l lighest reported value (een 1)	02	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	46
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	47
		Bands NR_FDD_FR1_H	48
Extreme Conditions	Test 1	Test 2	
	All bands	Devide ND EDD ED4 A	00
		Bands NR_FDD_FR1_A,	30
		NR_TDD_FR1_A	00
		Bands NR_FDD_FR1_B	30
		Bands NR_TDD_FR1_C	31
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	31 31
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	31
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	31 31 32
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	31 31 32 33
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	31 31 32 33 33
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	31 31 32 33
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	31 31 32 33 33 45
Lowest reported value (Cell 1)	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	31 31 32 33 33 45 46
	61	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	31 31 32 33 33 45 46 46
Lowest reported value (Cell 1)  Highest reported value (Cell 1)	61 83	Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	31 31 32 33 33 45 46
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	31 31 32 33 33 45 46 46 47
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	31 31 32 33 33 45 46 46
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	31 31 32 33 33 45 46 46 47 47
		Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	31 31 32 33 33 45 46 46 46 47

Table 6.7.4.1.1.5-3: L1-RSRP absolute accuracy requirements for the reported values for test configuration 3

Names I Canadidana	Test 1	T10	
Normal Conditions	All bands	Test 2	
		Bands NR_FDD_FR1_A,	34
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	34
		Bands NR_TDD_FR1_C	35
Lowest reported value (Cell 1)	63	Bands NR_FDD_FR1_D,	35
Lowest reported value (Cell 1)	03	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	36
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	37
		Bands NR_FDD_FR1_H	37
		Bands NR_FDD_FR1_A,	47
		NR_TDD_FR1_A	
		Bands NR_FDD_FR1_B	48
		Bands NR_TDD_FR1_C	48
Highest reported value (Cell 1)	84	Bands NR_FDD_FR1_D,	49
	04	NR_TDD_FR1_D	
		Bands NR_FDD_FR1_E,	49
		NR_TDD_FR1_E	
		Bands NR_FDD_FR1_G	50
		Bands NR_FDD_FR1_H	51
	Test 1		
Extreme Conditions		Test 2	
Extreme Conditions	All bands		33
Extreme Conditions		Bands NR_FDD_FR1_A,	33
Extreme Conditions		Bands NR_FDD_FR1_A, NR_TDD_FR1_A	
Extreme Conditions		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C	33 34
Extreme Conditions  Lowest reported value (Cell 1)		Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D,	33
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D	33 34 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	33 34 34
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 34 34 35
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H	33 34 34 35 36
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G	33 34 34 35 36 36
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A,	33 34 34 35 36 36
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A	33 34 34 35 36 36 48
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B	33 34 34 35 36 36 48
	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	33 34 34 35 36 36 48 49
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 34 34 35 36 36 48 49
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E	33 34 34 35 36 36 48 49 49 50
Lowest reported value (Cell 1)	All bands	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_H Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E,	33 34 34 35 36 36 48 49 49 50 50
Lowest reported value (Cell 1)	All bands 62 85	Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_TDD_FR1_C Bands NR_FDD_FR1_D, NR_TDD_FR1_D Bands NR_FDD_FR1_E, NR_TDD_FR1_E Bands NR_FDD_FR1_G Bands NR_FDD_FR1_A, NR_TDD_FR1_A Bands NR_FDD_FR1_B Bands NR_FDD_FR1_B Bands NR_FDD_FR1_C	33 34 34 35 36 36 48 49 49 50 50

# 6.7.4.1.2 NR SA FR1 SSB based L1-RSRP relative measurement accuracy

### 6.7.4.1.2.1 Test purpose

The purpose of this test is to verify that the SSB based L1-RSRP relative measurement accuracy is within the specified limits for all bands.

### 6.7.4.1.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

# 6.7.4.1.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.1.

6.7.4.1.2.4 Test description

6.7.4.1.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.1.2.4.1-1.

Table 6.7.4.1.2.4.1-1: NR SA FR1 SSB based L1-RSRP relative measurement accuracy supported test configurations

Test Case ID	Description
6.7.4.1.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD
6.7.4.1.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD
6.7.4.1.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD
Note: The UE is	only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.1.2.4.1-2.

Table 6.7.4.1.2.4.1-2: Initial conditions for SSB based L1-RSRP relative accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	A	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	A	s specified by the test configuration	n selected from Table 6.7.4.1.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with $n = 1$	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.4.1.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for SSB-based L1-RSRP measurements. The UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs. The connection setup is done according to the settings in Annex C.1.1.

### 6.7.4.1.2.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.1.2.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.1.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.1.2.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of SSB#0 and SSB#1 in the periodic L1-RSRP reports. The L1-RSRP value for SSB#1 is compared to the L1-RSRP value for SSB#0. If the difference is within the limits in Table 6.7.4.1.2.5-2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.

- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.1.2.5-1 as appropriate and repeat steps 3-5.

#### 6.7.4.1.2.4.3 Message contents

Message contents are same as in Clause 6.7.4.1.1.4.3.

#### 6.7.4.1.2.5 Test requirement

Table 6.7.4.1.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.1.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.1.2.5-2.

Table 6.7.4.1.2.5-1: Same as Table 6.7.4.1.1.5-1

Table 6.7.4.1.2.5-2: L1-RSRP relative accuracy requirements for the reported values

	Test 1	Test 2			
	All bands	All bands			
Normal Conditions					
Lowest reported value (Cell 1 SSB resource 1)	RSRP_x - 3	RSRP_x - 3			
Highest reported value (Cell 1 SSB resource 1)	RSRP_x + 3	RSRP_x + 3			
Extreme Conditions					
Lowest reported value (Cell 1 SSB resource 1))	RSRP_x - 4	RSRP_x - 4			
Highest reported value (Cell 1 SSB resource 1)	RSRP_x + 4	RSRP_x + 4			
RSRP_x is the reported value of Cell 1 SSB resource 0					

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.4.2 CSI-RS based L1-RSRP measurements

# 6.7.4.2.1 NR SA FR1 CSI-RS based L1-RSRP absolute measurement accuracy

### 6.7.4.2.1.1 Test purpose

The purpose of this test is to verify that the CSI-RS based L1-RSRP absolute measurement accuracy is within the specified limits for all bands.

## 6.7.4.2.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

### 6.7.4.2.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.2.

6.7.4.2.1.4 Test description

## 6.7.4.2.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.2.1.4.1-1.

Table 6.7.4.2.1.4.1-1: NR SA FR1 CSI-RS based L1-RSRP absolute measurement accuracy supported test configurations

Test Case ID	Description				
6.7.4.2.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD				
6.7.4.2.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD				
6.7.4.2.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD				
Note: The UE is only required to be tested in one of the supported test configurations					

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.2.1.4.1-2.

Table 6.7.4.2.1.4.1-2: Initial conditions for CSI-RS based L1-RSRP absolute accuracy in FR1

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4	-1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	А	As specified by the test configuration	on selected from Table 6.7.4.2.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection	TE Part	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
Diagram	2Rx		
	TE Part	A.3.1.8.5 with n = 1	
	4Rx		
	DUT Part	A.3.2.3.4	
	2Rx		
	DUT Part	A.3.2.5.2	
	4Rx		
Exceptions to		N/A	
connection			
diagram			

- 1. Message contents are defined in clause 6.7.4.2.1.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-RSRP measurements. The UE is configured to perform RLM and BFD measurement based on the SSB. The connection setup is done according to the settings in Annex C.1.1.

### 6.7.4.2.1.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.2.1.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.2.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.2.1.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both CSI-RS#0 and CSI-RS#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. If the value for both CSI-RSs is within the limits in Table 6.7.4.2.1.5-2 or Table 6.7.4.2.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.2.1.5-1 as appropriate and repeat steps 3-5.

### 6.7.4.2.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.4.2.1.4.3-1: Common Exception messages EN-DC CSI-RS-based L1-RSRP measurement

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.6-2 with conditions PERIODIC and CSI-RSRP			
elements contents exceptions	Table H.3.6-3 with conditions CSI-RS and PERIODIC			
·	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.4.2.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSB.	
detectionResource CHOICE {			
ssb-Index	0		
}			
}			
}			

## 6.7.4.2.1.5 Test requirement

Table 6.7.4.2.1.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.2.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.2.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.4.2.1.5-3 for test configuration 3.

Table 6.7.4.2.1.5-1: L1-RSRP test parameters

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
	3		TDDConf.2.1	TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
BW <sub>channel</sub>	2	MHz	10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106	40: N <sub>RB,c</sub> = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
measurement channel	3		SR.2.1 TDD	SR.2.1 TDD
RMSI CORESET Reference	1		CR.1.1 FDD	CR.1.1 FDD
Channel	2		CR.1.1 TDD	CR.1.1 TDD
Chamie	3		CR.2.1 TDD	CR.2.1 TDD
Dedicated CORESET	1		CCR.1.1 FDD	CCR.1.1 FDD
Reference Channel	2		CCR.1.1 TDD	CCR.1.1 TDD
Neierence Chairnei	3		CCR.2.1 TDD	CCR.2.1 TDD
	1		SSB.3 FR1	SSB.3 FR1
SSB configuration	2		SSB.3 FR1	SSB.3 FR1
	3		SSB.4 FR1	SSB.4 FR1

OCNG Pa	atterns	1~3		OP.1	OP.1	
		1		TRS.1.1 FDD	TRS.1.1 FDD	
TRS conf	RS configuration			TRS.1.1 TDD	TRS.1.1 TDD	
				TRS.1.2 TDD	TRS.1.2 TDD	
Initial DM	/D Configuration	4.0		DLBWP.0.1	DLBWP.0.1	
Initial Byv	P Configuration	1~3		ULBWP.0.1	ULBWP.0.1	
D !! (	LDMD C C	4.0		DLBWP.1.1	DLBWP.1.1	
Dedicated	d BWP configuration	1~3		ULBWP.1.1	ULBWP.1.1	
SMTC co	nfiguration	1~3		SMTC.1	SMTC.1	
	<b>3</b> · · · · ·	1,4		CSI-RS 1.2 FDD	CSI-RS 1.2 FDD	
CSI-RS		2,5		CSI-RS 1.2 TDD	CSI-RS 1.2 TDD	
001110		3,6		CSI-RS 2.2 TDD	CSI-RS 2.2 FDD	
reportCor	ofiaType	1~3		periodic	periodic	
reportQua		1~3		cri-RSRP	cri-RSRP	
	of reported RS			2	2	
	•	1~3				
	reporting period	1~3		slot80	slot80	
	of PSS to SSS of PBCH DMRS to SSS					
	of PBCH to PBCH DMRS					
	of PDCCH DMRS to SSS					
	of PDCCH to PDCCH					
DMRS						
	of PDSCH DMRS to SSS	1~3	dB	0	0	
EPRE ratio	of PDSCH to PDSCH					
	of OCNG DMRS to					
SSS <sup>Note 1</sup>	OF OCING DIVING TO					
EPRE ratio of OCNG to OCNG DMRS						
Note 1	Т					
$N_{oc}$		1,2		04.65	447   4	
Note2			dBm/15kHz	-94.65	-117+ $\Delta_{\mathrm{BG\_offset}}$	
140162						
	Depending on			-96.00	117+ $\Delta_{\text{BG\_offset}}$	
	band group					
$N_{oc}$		1,2	dBm/CSI-	-94.65	-117+ $\Delta_{\mathrm{BG\_offset}}$	
Note2			RS SCS			
Notez		3		-93.00	-114+ $\Delta_{\mathrm{BG\_offset}}$	
-						
$\hat{\mathbf{E}}_{\scriptscriptstyle \mathrm{s}}/\mathbf{I}_{\scriptscriptstyle \mathrm{ot}}$		1~3	dB	10	-2.2	
					-119.2 +	
CSI-		1,2		-84.65		
RSRP	Depending on		dBm/CSI-		$\Delta_{BG\_offset}$	
Note3	band group		RS SCS		-116.2 +	
		3		-83.00		
					$\Delta_{BG\_offset}$	
	Depending on		dBm/9.36		-87.00 +	
	band group	1,2	MHz	-56.28	$\Delta_{BG\_offset}$	
lo Note3					→DG_0llSet	
.~			dBm/38.16		-80.90 +	
		3	MHz	-51.53	$\Delta_{BG\_offset}$	
			.711 12		₽BG_OIISEI	
$\hat{E}_s/N_{od}$	$\hat{E}_s/N_{ac}$		dB	10	-2.2	
		1~3		AWGN	AWGN	
Propagation condition		1~3				
	Antenna configuration		1	1x2	1x2	

Note 1:	OCNG shall be used such that both cells are fully allocated and a constant total transmitted
	power spectral density is achieved for all OFDM symbols.
Note 2:	Interference from other cells and noise sources not specified in the test is assumed to be
	constant over subcarriers and time and shall be modelled as AWGN of appropriate power
	for $N_{oc}$ to be fulfilled.
Note 3:	RSRP and lo levels have been derived from other parameters for information purposes.
	They are not settable parameters themselves.
Note 4:	RSRP minimum requirements are specified assuming independent interference and noise at
	each receiver antenna port.
Note 5:	The test configuration excludes support for band n51 and it is not required to run this test on
INOLE J.	11
ĺ	band n51 in this release of the specification

Table 6.7.4.2.1.5-2: Same as Table 6.7.4.1.1.5-2

Table 6.7.4.2.1.5-3: Same as Table 6.7.4.1.1.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.4.2.2 NR SA FR1 CSI-RS based L1-RSRP relative measurement accuracy

### 6.7.4.2.2.1 Test purpose

The purpose of this test is to verify that the CSI-RS based L1-RSRP relative measurement accuracy is within the specified limits for all bands.

### 6.7.4.2.2.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards.

## 6.7.4.2.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.4.0.4.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.4.2.

6.7.4.2.2.4 Test description

6.7.4.2.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.4.2.2.4.1-1.

Table 6.7.4.2.2.4.1-1: NR SA FR1 CSI-RS based L1-RSRP relative measurement accuracy supported test configurations

Test Case ID	Description			
6.7.4.2.2-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD			
6.7.4.2.2-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD			
6.7.4.2.2-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD			
Note: The UE is only required to be tested in one of the supported test configurations				

Configure the test equipment and the DUT according to the parameters in Table 6.7.4.2.2.4.1-2.

Parameter	Value		Comment
Test environment	NC, TL/VL, TL/VH, TH/VL, TH/VH		As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4	-1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	Д	s specified by the test configuration	on selected from Table 6.7.4.2.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
·	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

Table 6.7.4.2.2.4.1-2: Initial conditions for CSI-RS based L1-RSRP relative accuracy in FR1

- 1. Message contents are defined in clause 6.7.4.2.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-RSRP measurements. The UE is configured to perform RLM and BFD measurement based on the SSB. The connection setup is done according to the settings in Annex C.1.1.

#### 6.7.4.2.2.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.4.2.2.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.4.2.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.4.2.2.5-1.
- 3. The UE shall start sending L1-RSRP report including results of both CSI-RS#0 and CSI-RS#1 every 80 slots.
- 4. The SS shall check the L1-RSRP reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. The L1-RSRP value for CSI-RS #1 is compared to the L1-RSRP value for CSI-RS #0. If the difference is within the limits in Table 6.7.4.2.2.5-2, the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-RSRP report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.2.2.5-1 as appropriate and repeat steps 3-5.

### 6.7.4.2.2.4.3 Message contents

Message contents are same as in Clause 6.7.4.2.1.4.3.

### 6.7.4.2.2.5 Test requirement

Table 6.7.4.2.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.2.2.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.2.2.5-2.

Table 6.7.4.2.2.5-1: Same as Table 6.7.4.2.1.5-1

Table 6.7.4.2.2.5-2: Same as Table 6.7.4.1.2.5-2

## 6.7.5 E-UTRAN RSRP

# 6.7.5.0 Minimum conformance requirements

### 6.7.5.0.1 E-UTRAN RSRP absolute accuracy

The measurement period of E-UTRA RSRP in RRC\_CONNECTED state is specified in clause 9.4.2 and 9.4.3 of TS 38.133 [6].

The accuracy requirements of E-UTRA RSRP measurements in RRC\_CONNECTED state and the corresponding side conditions shall be the same as the inter-frequency RSRP Accuracy Requirements in clause 9.1.3 of TS 36.133 [23]:

The requirements for absolute accuracy of RSRP in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 6.7.5.0.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [27] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 of TS 36.133 [23] for a corresponding Band.

Table 6.7.5.0.1-1: RSRP Inter frequency absolute accuracy

Accuracy			Conditions				
Normal Extreme		_	Io <sup>Note 1</sup> range				
condition	condition	Ês/lot	E-UTRA operating band groups Note 3	Minim	Minimum Io		
dB	dB	dB		dBm/15kHz Note	dBm/BW <sub>Channel</sub>	dBm/BW <sub>Channel</sub>	
			FDD_A, TDD_A	-121	N/A	-70	
			FDD_B1, FDD_B2	-120.5	N/A	-70	
	±9	±9 ≥-6 dB	FDD_C, TDD_C	-120	N/A	-70	
			FDD_D	-119.5	N/A	-70	
±4.5			FDD_E, TDD_E	-119	N/A	-70	
			FDD_F	-118.5	N/A	-70	
			FDD_G	-118	N/A	-70	
			FDD_H	-117.5	N/A	-70	
			FDD_N	-114.5	N/A	-70	
±8	±11	≥-6 dB	FDD_A, TDD_A, FDD_B1, FDD_B2, FDD_C, TDD_C, FDD_D, FDD_E, TDD_E, FDD_F, FDD_G, FDD_H, FDD_N	N/A	-70	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: The condition level is increased by  $\Delta$ >0, when applicable, as described in Sections B.4.2 and B.4.3 of TS 36.133

NOTE 3: E-UTRA operating band groups are as defined in Section 3.5 of TS 36.133 [23].

The reporting range and mapping specified for RSRP measurements in clause 9.1.4 of TS 36.133 [23] shall apply:

The reporting range of RSRP is defined from -156 dBm to -44 dBm with 1 dB resolution.

The mapping of measured quantity is defined in Table 6.7.5.0.1-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 6.7.5.0.1-2: RSRP measurement report mapping

Reported value	Measured quantity value	Unit
RSRP17	RSRP< -156	dBm
RSRP16	-156 ≤ RSRP< -155	dBm
•••		
RSRP03	-143 ≤ RSRP< -142	dBm
RSRP02	-142 ≤ RSRP< -141	dBm
RSRP01	-141 ≤ RSRP< -140	dBm
RSRP_00	RSRP < -140	dBm
RSRP_01	-140 ≤ RSRP < -139	dBm
RSRP_02	-139 ≤ RSRP < -138	dBm
•••		
RSRP_95	-46 ≤ RSRP < -45	dBm
RSRP_96	-45 ≤ RSRP < -44	dBm
RSRP_97	-44 ≤ RSRP	dBm

# 6.7.5.1 NR SA FR1 – E-UTRAN RSRP absolute measurement accuracy

## 6.7.5.1.1 Test purpose

The purpose of this test is to verify that the inter-RAT E-UTRAN RSRP absolute measurement accuracy is within the specified limits for all bands, when the serving cell is NR FR1 and the target cell is E-UTRA.

## 6.7.5.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards supporting E-UTRA.

### 6.7.5.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.5.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.5.1.

6.7.5.1.4 Test description

6.7.5.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.5.1.4.1-1.

Table 6.7.5.1.4.1-1: test configurations

Test Case ID	Description
6.7.5.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: FDD
6.7.5.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: FDD
6.7.5.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: FDD
6.7.5.1-4	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: TDD
6.7.5.1-5	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: TDD
6.7.5.1-6	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: TDD
Note: The UE is	only required to be tested in one of the supported test configurations

Configure the test equipment and the DUT according to the parameters in Table 6.7.5.1.4.1-2.

Table	675	1 / 1-2-	initial	conditions
i abie	0.7.0	. 1 .4. 1 - 2 .	mitiai	conditions

Parameter		Value	Comment
Test environment	NC, TL/VL, TL/VH	VL, TL/VH, TH/VL, TH/VH  As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Ar	nnex E, Table E.4-2 and TS 38	3.508-1 [14] clause 4.3.1.
Channel bandwidth	As specified by the test configuration selected from Table 6.7.5.1.4.1-1.		
Propagation conditions	AWGN		As specified in Annex C.2.2.
Connection	TE Part 2Rx	A.3.1.7.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	TE Part 4Rx	A.3.1.7.3	
	DUT Part 2Rx	A.3.2.3.4	1
	DUT Part 4Rx	A.3.2.5.2	1
Exceptions to connection diagram	N/A		

- 1. Message contents are defined in clause 6.7.5.1.4.3.
- 2. There are two carriers and two cells specified in the test, where NR Cell 1 is the NR PCell on the NR carrier and Cell 2 is the E-UTRA neighbour cell on the E-UTRA carrier and the target for the measurements.

## 6.7.5.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.5.1.5-1 and Table 6.7.5.1.5-2 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the RSRP reported values in the periodic MeasurementReport. The RSRP value of Cell 2 reported by the UE is compared to the expected RSRP. If the value is outside the limits in Table 6.7.5.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.5.1.5-2 as appropriate and repeat steps 5-7.

### 6.7.5.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.5.1.4.3-1: Common Exception messages

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.1-1		
elements contents exceptions	Table H.3.1-2 with condition INTER-RAT and GAP NEEDED		
	Table H.3.1-3		
	Table H.3.1-3a		
	Table H.3.1-7 with condition INTER-RAT		
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		

Table 6.7.5.1.4.3-1A: MeasConfig (Test procedure step 3)

Derivation path: Table H.3.1-2 with condition INTER-RAT	and GAP NEEDED		
Information Element	Value/Remark	Comment	Condition
measConfig ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE(SIZE	2 entries		
(1maxReportConfigId)) OF ReportConfigToAddMod {			
ReportConfigToAddMod[1] SEQUENCE {		entry 1	
reportConfigld	1		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigE-UTRA- DEFAULT(Periodical)	Table 6.7.5.1.4.3-	
}			
}			
ReportConfigToAddMod[2] SEQUENCE {		entry 2	
reportConfigld	2		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT- EVENT	Table 6.7.5.1.4.3- 1B	
}			
}			
}			
measIdToAddModList SEQUENCE (SIZE	2 entries		
(1maxNrofMeasId)) OF MeasIdToAddMod {			
MeasIdToAddMod[1] SEQUENCE {		entry 1	
measld	1		
measObjectId	2		
reportConfigld	1		
}			
MeasIdToAddMod[2] SEQUENCE {		entry 2	
measld	2		
measObjectId	2		
reportConfigld	2		
}			
}			
}			

# Table 6.7.5.1.4.3-1B: ReportConfigInterRAT-EVENT (Table 6.7.5.1.4.3-1A)

Derivation Path: TS 38.508-1 [14] Table 4.6.3-141 with condition EVENT_B1					
Information Element	Value/remark	Comment	Condition		
ReportConfigInterRAT ::= SEQUENCE {					
reportType CHOICE {					
eventTriggered SEQUENCE {					
eventId CHOICE {					
eventB1 SEQUENCE {					
b1-ThresholdEUTRA CHOICE {					
rsrp	97	Set threshold to - 44dBm to ensure measId 2 will never be triggered			
}					
}					
}					
}	·				
}	·				
}					

# Table 6.7.5.1.4.3-2: ReportConfigE-UTRA-DEFAULT(Periodical)

Derivation Path: 38.508-1 [14] Table 4.6.3-141 with Condition PERIODICAL				
Information Element	Value/remark	Comment	Condition	
ReportConfigInterRAT::= SEQUENCE {				
reportType CHOICE {				
periodical SEQUENCE {				
reportQuantityCell SEQUENCE {				
rsrq	false			
}				
maxReportCells	2			
}				
}				
}				

# 6.7.5.1.5 Test requirement

Table 6.7.5.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Tables 6.7.5.1.5-1 and 6.7.5.1.5-2 shall meet the corresponding absolute accuracy requirements in Table 6.7.5.1.5-3.

Table 6.7.5.1.5-1: NR Cell specific test parameters for SA Inter-RAT E-UTRAN RSRP test parameters

Parameter		Unit	Cell 1
NR RF channel number			1
uplex mode Config 1, 4			FDD
Duplex mode	Config 2, 3, 5, 6		TDD
	Config 1, 4		N/A
TDD Configuration	Config 2, 5		TDDConf.1.1
	Config 3, 6		TDDConf.2.1
	Config 1, 4		10: $N_{RB,c} = 52 \text{ (FDD)}$
BW <sub>channel</sub>	Config 2, 5	MHz	10: N <sub>RB,c</sub> = 52 (TDD)
	Config 3, 6		40: N <sub>RB,c</sub> = 106 (TDD)
Gap pattern Id			0
PDSCH reference measurement	Config 1, 4		SR.1.1 FDD
channel	Config 2, 5		SR.1.1 TDD
channel	Config 3, 6		SR.2.1 TDD
	Config 1, 4		CR.1.1 FDD
RMSI CORSET reference channel	Config 2, 5		CR.1.1 TDD
	Config 3, 6		CR.2.1 TDD
D # 1 100005T 1	Config 1, 4		CCR.1.1 FDD
Dedicated CORSET reference	Config 2, 5	1	CCR.1.1 TDD
channel	Config 3, 6		CCR.2.1 TDD
	Initial DL BWP		DLBWP.0.1
	Dedicated DL BWP		DLBWP.1.1
BWP configurations	Initial UL BWP		ULBWP.0.1
	Dedicated UL BWP		ULBWP.1.1
OCNG pattern <sup>Note1</sup>			OP.1
SMTC configuration			SMTC.1
•	Config 1, 2, 4, 5		SSB.1 FR1
SSB configuration	Config 3, 6		SSB.2 FR1
EPRE ratio of PSS to SSS	, , , , , , , , , , , , , , , , , , ,		
EPRE ratio of PBCH_DMRS to SSS			
EPRE ratio of PBCH to PBCH_DMRS	3		
EPRE ratio of PDCCH_DMRS to SS			
EPRE ratio of PDCCH to PDCCH_DN		dB	0
EPRE ratio of PDSCH_DMRS to SSS			
EPRE ratio of PDSCH to PDSCH_DN			
EPRE ratio of OCNG DMRS to SSS			
EPRE ratio of OCNG to OCNG DMR	S		
N <sub>oc</sub> Note2		dBm/15 kHz	-104
	Config 1, 2, 4, 5		-104
$N_{oc}^{Note2}$	Config 3, 6	dBm/SCS —	-101
Ê <sub>s</sub> /N <sub>oc</sub>	,	dB	17
Ês/lot <sup>Note3</sup>		dB	17
	Config 1, 2, 4, 5		-87
SS-RSRP <sup>Note3</sup>	Config 3, 6	dBm/SCS	-84
OOD DDNIgte2	Config 1, 2, 4, 5	ID (CCC	-87
SSB_RP <sup>Note3</sup>	Config 3, 6	dBm/SCS	-84
. Natao	Config 1, 2, 4, 5	dBm/9.36 MHz	-58.96
Io <sup>Note3</sup>	Config 3, 6	dBm/38.16 MHz	-52.87
Propagation condition		2211, 00. 10 IVII IZ	AWGN
Antenna Configuration and Correlation	n Matrix		1x2
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted nower			

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{\infty}$  to be fulfilled.

Note 3: £s/Iot, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.7.5.1.5-2: E-UTRAN Cell specific test parameters for SA Inter-RAT E-UTRAN RSRP test parameters

Parameter		Unit	Co	ell 2
			Test 1	Test 2
E-UTRA RF channel numb	er			1
Duplex mode	Config 1, 2, 3			DD
	Config 4, 5, 6		Т	DD
TDD special subframe	Config 1, 2, 3		N	N/A
configuration <sup>Note1</sup> Config 4, 5, 6				6
TDD uplink-downlink	Config 1, 2, 3		N	N/A
configuration <sup>Note1</sup>	Config 4, 5, 6		1	
BWchannel	·	MHz	5 MHz:	N <sub>RB,c</sub> = 25
			10 MHz:	$N_{RB,c} = 50$
			20 MHz:	$N_{RB,c} = 100$
PDSCH parameters:				-
<b>DL Reference Measureme</b>				
PCFICH/PDCCH/PHICH	Config 1, 2, 3		5 MHz:	R.11 FDD
parameters:			10 MHz	: R.6 FDD
DL Reference				R.10 FDD
Measurement	Config 4, 5, 6			R.11 TDD
Channel <sup>Note2</sup>				: R.6 TDD
				R.10 TDD
OCNG Patterns <sup>Note2</sup>	Config 1, 2, 3			OP.19 FDD
				OP.6 FDD
				OP.14 FDD
	Config 4, 5, 6		5 MHz: OP.10 TDD	
			10 MHz: OP.2 TDD	
77011 71			20 MHz: OP.8 TDD	
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA		<b>⊣</b>		
PHICH_RB		dB		0
PDCCH_RA				
PDCCH_RB				
PDSCH_RA				
PDSCH_RB				
OCNG_RANote3				
OCNG_RB <sup>Note3</sup>	1			
$N_{\text{oc}}^{\text{Note4}}$	Depending on band group	dBm/15kHz	-91.65	-117 + Δ <sub>BG_offset</sub>
Ê <sub>s</sub> /N <sub>oc</sub>		dB	10	-3.2
Ês/Iot <sup>Note5</sup>		dB	10	-3.2
RSRP <sup>Note5</sup>	Depending on band group	dBm/15kHz	-81.65	-120.2+ Δ <sub>BG_offset</sub>
SCH_RPNote5	Depending on band group	dBm/15kHz	-81.65	-120.2+ Δ <sub>BG_offset</sub>
Io <sup>Note5</sup>	Depending on band group	dBm/Ch BW	-53.45 + 10log(N <sub>RB,c</sub> /50)	-87.52+ Δ <sub>BG_offset</sub> + 10log(N <sub>RB,c</sub> /50)
Propagation Condition			AWGN	
Antenna Configuration and	Correlation Matrix		1	lx2

- Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].
- Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively.
- Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.
- Note 5: Ê<sub>s</sub>/I<sub>ot</sub>, RSRP, SCH\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23].
- Note 7: Void
- Note 8: Void.
- Note 9: Void
- Note 10: Void
- Note 11:  $\Delta_{BG\_offset}$  for LTE band group is defined in TS 36.521-3 [26] clause 3.5.1, Table 3.5.1-1A.

Table 6.7.5.1.5-3: SS-RSRP Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2		
		FDD_A, TDD_A	14	
		FDD_B	15	
		TDD_C	15	
Lowest reported value (Cell 2)	48	FDD_D, TDD_D	16	
		FDD_E, TDD_E	16	
		FDD_G	17	
		FDD_H	18	
		FDD_A, TDD_A	27	
		FDD_B	27	
		TDD_C	28	
Highest reported value (Cell 2)	70	FDD_D, TDD_D	28	
		FDD_E, TDD_E	29	
		FDD_G	30	
		FDD_H	30	
Extreme Conditions	Test 1 All bands	Test 2		
	7111 541146	FDD_A, TDD_A	11	
		FDD B	11	
		TDD C	12	
Lowest reported value (Cell 2)	46	FDD_D, TDD_D	12	
,		FDD E, TDD E	13	
		FDD G	14	
		FDD H	14	
		FDD A, TDD A	30	
		FDD_B	31	
		TDD_C	31	
Highest reported value (Cell 2)	72	FDD_D, TDD_D	32	
		FDD_E, TDD_E	32	
		FDD_G	33	
		FDD_H	34	
Note 1: E-UTRA operating band groups are as defined in TS 36.521-3 [26] clause 3.5.1				

# 6.7.6 E-UTRAN RSRQ

# 6.7.6.0 Minimum conformance requirements

### 6.7.6.0.1 E-UTRAN RSRQ absolute accuracy

The measurement period of E-UTRA RSRQ in RRC\_CONNECTED state is specified in clause 9.4.2 and 9.4.3 on TS 38.133 [6].

The accuracy requirements of E-UTRA RSRQ measurements in RRC\_CONNECTED state and the corresponding side conditions shall be the same as the inter-frequency RSRQ Accuracy Requirements in clause 9.1.6 of TS 36.133 [23]:

The requirements for absolute accuracy of RSRQ in this clause apply to a cell that has different carrier frequency from the serving cell.

The accuracy requirements in Table 6.7.6.0.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [27] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.3 of TS 36.133 [23] for a corresponding Band

Table 6.7.6.0.1-1: RSRQ Inter frequency absolute accuracy

Accuracy			Conditions			
Normal Futuama			lo <sup>Note 1</sup> range			
Normal condition	Extreme condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io	
dB	dB	dB		dBm/15kHz Note 3	dBm/BW <sub>Channel</sub>	
			FDD_A, TDD_A	-121	-50	
			FDD_B1, FDD_B2	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±2.5	±4	≥-3 dB	FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3 of TS 36.133 [23].
- NOTE 4: E-UTRA operating band groups are as defined in Section 3.5 of TS 36.133 [23].

The reporting range and mapping specified for RSRQ measurements in clause 9.1.7 of TS 36.133 [23] shall apply:

The reporting range of RSRQ is defined from -34 dB to 2.5 dB with 0.5 dB resolution.

The mapping of measured quantity is defined in table 6.7.6.0.1-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 6.7.6.0.1-2: RSRQ measurement report mapping

Reported value	Measured quantity value	Unit
RSRQ30	RSRQ < -34	dB
RSRQ29	-34 ≤ RSRQ < -33.5	dB
RSRQ02	-20.5 ≤ RSRQ < -20	dB
RSRQ01	-20 ≤ RSRQ < -19.5	dB
RSRQ_00	RSRQ < -19.5	dB
RSRQ_01	-19.5 ≤ RSRQ < -19	dB
RSRQ_02	-19 ≤ RSRQ < -18.5	dB
RSRQ_32	-4 ≤ RSRQ < -3.5	dB
RSRQ_33	-3.5 ≤ RSRQ < -3	dB
RSRQ_34	-3 ≤ RSRQ	dB
RSRQ_35	-3 ≤ RSRQ < -2.5	dB
RSRQ_36	-2.5 ≤ RSRQ < -2	dB
		•••
RSRQ_45	2 ≤ RSRQ < 2.5	dB
RSRQ_46	2.5 ≤ RSRQ	dB

Note: The ranges from RSRQ\_-30 to RSRQ\_-01 and from RSRQ\_35 to RSRQ\_46 apply for the UE who can support extended RSRQ range.

# 6.7.6.1 NR SA FR1 – E-UTRAN RSRQ absolute measurement accuracy

#### 6.7.6.1.1 Test purpose

The purpose of this test is to verify that the inter-RAT E-UTRAN RSRQ absolute measurement accuracy is within the specified limits for all bands, when the serving cell is NR FR1 and the target cell is E-UTRA.

## 6.7.6.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards supporting E-UTRA.

### 6.7.6.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.6.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.6.1.

6.7.6.1.4 Test description

6.7.6.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.6.1.4.1-1.

Table 6.7.6.1.4.1-1: test configurations

Test Case ID	Description		
6.7.6.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: FDD		
6.7.6.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: FDD		
6.7.6.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: FDD		
6.7.6.1-4	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: TDD		
6.7.6.1-5	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: TDD		
6.7.6.1-6	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: TDD		
Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.6.1.4.1-2.

Table 6.7.6.1.4.1-2: initial conditions

Parameter	Value		Comment	
Test environment	NC, TL/VL, TL/VF	I, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.	
Test frequencies	As specified in Ar	nex E, Table E.4-2 and TS 38	3.508-1 [14] clause 4.3.1.	
Channel bandwidth	As specified by the test configuration selected from Table 6.7.6.1.4.1-1.			
Propagation conditions	AWGN	As specified in Annex C.2.2		
Connection	TE Part 2Rx	A.3.1.7.2	As specified in TS 38.508-1 [14] Annex A.	
Diagram	TE Part 4Rx	A.3.1.7.3	]	
	DUT Part 2Rx	A.3.2.3.4	1	
	DUT Part 4Rx	A.3.2.5.2	]	
Exceptions to connection diagram	N/A	•		

- 1. Message contents are defined in clause 6.7.6.1.4.3.
- 2. There are two carriers and two cells specified in the test, where NR Cell 1 is the NR PCell on the NR carrier and Cell 2 is the E-UTRA neighbour cell on the E-UTRA carrier and the target for the measurements.

#### 6.7.6.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.6.1.5-1 and Table 6.7.6.1.5-2 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.

- 6. After 10s wait from Step 3, the SS shall check the RSRQ reported values in the periodic MeasurementReport. The RSRQ value of Cell 2 reported by the UE is compared to the expected RSRQ. If the value is outside the limits in Table 6.7.6.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.6.1.5-2 as appropriate and repeat steps 5-7.

### 6.7.6.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.6.1.4.3-1: Common Exception messages

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information Table H.3.1-1				
elements contents exceptions	Table H.3.1-2 with condition INTER-RAT and GAP NEEDED			
Table H.3.1-3				
	Table H.3.1-3a			
	Table H.3.1-7 with condition INTER-RAT			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

Table 6.7.6.1.4.3-1A: MeasConfig (Test procedure step 3)

Derivation path: Table H.3.1-2 with condition INTER-RAT and GAP NEEDED						
Information Element	Value/Remark	Comment	Condition			
measConfig ::= SEQUENCE {						
reportConfigToAddModList SEQUENCE(SIZE	2 entries					
(1maxReportConfigId)) OF ReportConfigToAddMod {						
ReportConfigToAddMod[1] SEQUENCE {		entry 1				
reportConfigId	1					
reportConfig CHOICE {						
reportConfigInterRAT	ReportConfigE-UTRA- DEFAULT(Periodical)	Table 6.7.6.1.4.3-				
}	ì					
}						
ReportConfigToAddMod[2] SEQUENCE {		entry 2				
reportConfigld	2					
reportConfig CHOICE {						
reportConfigInterRAT	ReportConfigInterRAT- EVENT	Table 6.7.6.1.4.3- 1B				
}						
}						
}						
measIdToAddModList SEQUENCE (SIZE	2 entries					
(1maxNrofMeasId)) OF MeasIdToAddMod {						
MeasIdToAddMod[1] SEQUENCE {		entry 1				
measld	1					
measObjectId	2					
reportConfigId	1					
}						
MeasIdToAddMod[2] SEQUENCE {		entry 2				
measld	2					
measObjectId	2					
reportConfigId	2					
}						
}						
}						

# Table 6.7.6.1.4.3-1B: ReportConfigInterRAT-EVENT (Table 6.7.6.1.4.3-1A)

Derivation Path: TS 38.508-1 [14] Table 4.6.3-141 with condition EVENT_B1						
Information Element	Value/remark	Comment	Condition			
ReportConfigInterRAT ::= SEQUENCE {						
reportType CHOICE {						
eventTriggered SEQUENCE {						
eventId CHOICE {						
eventB1 SEQUENCE {						
b1-ThresholdEUTRA CHOICE {						
rsrq	34	Set threshold to - 3dB to ensure measld 2 will never be triggered				
}						
}						
}						
}			•			
}			•			
}			•			

# Table 6.7.6.1.4.3-2: ReportConfigE-UTRA-DEFAULT(Periodical)

Derivation Path: 38.508-1 [14] Table 4.6.3-141 with Condition PERIODICAL						
Information Element	Value/remark	Comment	Condition			
ReportConfigInterRAT::= SEQUENCE {						
reportType CHOICE {						
periodical SEQUENCE {						
reportQuantityCell SEQUENCE {						
rsrp	false					
}						
maxReportCells	2					
}						
}						
}						

# 6.7.6.1.5 Test requirement

Table 6.7.6.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Tables 6.7.6.1.5-1 and 6.7.6.1.5-2 shall meet the corresponding absolute accuracy requirements in Table 6.7.6.1.5-3.

Table 6.7.6.1.5-1: NR Cell specific test parameters for SA Inter-RAT E-UTRAN RSRQ test parameters

Parameter		Unit	Cell 1	
NR RF channel number			1	
Dunlay made	Config 1, 4		FDD	
Duplex mode	Config 2, 3, 5, 6		TDD	
	Config 1, 4		N/A	
TDD Configuration	Config 2, 5		TDDConf.1.1	
· ·	Config 3, 6		TDDConf.2.1	
	Config 1, 4		10: N <sub>RB,c</sub> = 52 (FDD)	
BW <sub>channel</sub>	Config 2, 5	MHz	10: N <sub>RB,c</sub> = 52 (TDD)	
	Config 3, 6		40: N <sub>RB,c</sub> = 106 (TDD)	
Gap pattern Id	<u> </u>		0	
	Config 1, 4		SR.1.1 FDD	
PDSCH reference measurement	Config 2, 5		SR.1.1 TDD	
channel	Config 3, 6		SR.2.1 TDD	
	Config 1, 4		CR.1.1 FDD	
RMSI CORSET reference channel	Config 2, 5		CR.1.1 TDD	
	Config 3, 6		CR.2.1 TDD	
	Config 1, 4		CCR.1.1 FDD	
Dedicated CORSET reference	Config 2, 5	†	CCR.1.1 TDD	
channel	Config 3, 6	†	CCR.2.1 TDD	
	Initial DL BWP		DLBWP.0.1	
	Dedicated DL BWP		DLBWP.1.1	
BWP configurations	Initial UL BWP		ULBWP.0.1	
	Dedicated UL BWP		ULBWP.1.1	
OCNG pattern <sup>Note1</sup>	Dedicated OL DVVI		OP.1	
SMTC configuration			SMTC.1	
SWITC comiguration	Config 1, 2, 4, 5		SSB.1 FR1	
SSB configuration	Config 3, 6	-	SSB.2 FR1	
EPRE ratio of PSS to SSS				
EPRE ratio of PBCH_DMRS to SSS				
EPRE ratio of PBCH to PBCH_DMRS				
EPRE ratio of PDCCH_DMRS to SSS	}			
EPRE ratio of PDCCH to PDCCH_DN	1RS	dB	0	
EPRE ratio of PDSCH_DMRS to SSS				
EPRE ratio of PDSCH to PDSCH_DM	IRS			
EPRE ratio of OCNG DMRS to SSS				
EPRE ratio of OCNG to OCNG DMRS	3			
N <sub>oc</sub> Note2		dBm/15 kHz	-104	
N <sub>oc</sub> Note2	Config 1, 2, 4, 5		-104	
Nocinolez	Config 3, 6	dBm/SCS —	-101	
Ê <sub>s</sub> /N <sub>oc</sub>	<u>, , , , , , , , , , , , , , , , , , , </u>	dB	17	
Ês/Iot <sup>Note3</sup>		dB	17	
	Config 1, 2, 4, 5		-87	
SS-RSRP <sup>Note3</sup>	Config 3, 6	dBm/SCS —	-84	
OOD DENete2	Config 1, 2, 4, 5	<b>ID</b> (C.C.)	-87	
SSB_RP <sup>Note3</sup>	Config 3, 6	dBm/SCS —	-84	
. N	Config 1, 2, 4, 5	dBm/9.36 MHz	-58.96	
Io <sup>Note3</sup>	Config 3, 6	dBm/38.16 MHz	-52.87	
Propagation condition	1 33.mg 0, 0	32.11/00.10 WII IZ	AWGN	
Antenna Configuration and Correlation	n Matrix		1x2	
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power				

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{\infty}$  to be fulfilled.

Note 3: £s/Iot, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.7.6.1.5-2: E-UTRAN Cell specific test parameters for SA Inter-RAT E-UTRAN RSRQ test parameters

Parameter	Unit	Cell 2		
		Test 1	Test 2	Test 3

E-UTRA RF channel numb	per			1		
Duplex mode Config 1, 2, 3				FDD		
·	Config 4, 5, 6			TDD		
TDD special subframe	Config 1, 2, 3		N/A			
configuration <sup>Note1</sup>	Config 4, 5, 6		6			
TDD uplink-downlink	Config 1, 2, 3	N/A				
configuration <sup>Note1</sup>	Config 4, 5, 6			1		
BW <sub>channel</sub>		MHz		5 MHz: N <sub>RB,c</sub> = 25	5	
D V Chamer				$10 \text{ MHz}: N_{RB,c} = 5$		
				0 MHz: $N_{RB,c} = 10$		
PDSCH parameters:				-		
DL Reference Measureme	nt Channel <sup>Note2</sup>					
PCFICH/PDCCH/PHICH	Config 1, 2, 3			5 MHz: R.11 FDE	)	
parameters:	3 sg ., <u>_</u> , s			10 MHz: R.6 FD		
DL Reference				20 MHz: R.10 FD		
Measurement	Config 4, 5, 6			5 MHz: R.11 TDE		
Channel <sup>Note2</sup>	, , , , , , , , , , , , , , , , , , ,			10 MHz: R.6 TD		
				20 MHz: R.10 TD		
OCNG Patterns <sup>Note2</sup>	Config 1, 2, 3			MHz: OP.19 FD		
	, , , ,		1	0 MHz: OP.6 FD	D	
			20	0 MHz: OP.14 FD	D	
	Config 4, 5, 6		5 MHz: OP.10 TDD 10 MHz: OP.2 TDD			
	3 , 1, 1					
			20 MHz: OP.8 TDD			
PBCH_RA	•					
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB		dB	dB 0			
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RA <sup>Note3</sup>						
OCNG_RB <sup>Note3</sup>						
	Depending on band	15 //	<b>a</b> -	40	-119.5+	
Noc <sup>Note4</sup>	group	dBm/15kHz	-83	-104.70	$\Delta_{BG\_offset}$	
Ê <sub>s</sub> /N <sub>oc</sub>	. U	dB	-1.75	-3.2	-3.2	
Ês/Iot <sup>Note5</sup>		dB	-1.75	-3.2	-3.2	
	Depending on band				-122.7+	
RSRP <sup>Note5</sup>	group	dBm/15kHz	-84.75	-107.90	$\Delta_{BG\_offset}$	
RSRQ <sup>Note5</sup>	Depending on band group	dB	-14.76	-15.69	-15.69	
			F0 :	75.00	-90.02+	
Io <sup>Note5</sup>	Depending on band	dBm/Ch	-53 +	-75.22 +	$\Delta_{BG\_offset}$ +	
10.10.00	group	BW	10log(N <sub>RB,c</sub>	10log(N <sub>RB,c</sub>	10log(N <sub>RB,c</sub>	
			/50)	/50)	/50)	
Propagation Condition	•			AWGN	. ,	
Antenna Configuration and	Correlation Matrix			1x2		
	o and unlink downlink co	<i>c</i>	:6: 1: 4 11		4 [0 4]	

Note 1: Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].

Note 2: DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively.

Note 3: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for Noc to be fulfilled.

Note 5:  $\hat{E}_s$ /lot, RSRP, RSRQ and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 6: E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23].

Note 7: Void Note 8: Void Note 9: Void Note 10: Void

Note 11: Δ<sub>BG\_offset</sub> for LTE band group is defined in TS 36.521-3 [26] clause 3.5.1, Table 3.5.1-1A.

Table 6.7.6.1.5-3: SS-RSRQ Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	4	0	0
Highest reported value (Cell 2)	16	16	16
Extreme Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	1	0	0
Highest reported value (Cell 2)	19	17	17

# 6.7.7 E-UTRAN RS-SINR

## 6.7.7.0 Minimum conformance requirements

# 6.7.7.0.1 E-UTRAN RS-SINR absolute accuracy

The measurement period of E-UTRA RS-SINR in RRC\_CONNECTED state is specified in clause 9.4.2 and 9.4.3 of TS 38.133 [6].

The accuracy requirements of E-UTRA RS-SINR measurements in RRC\_CONNECTED state and the corresponding side conditions shall be the same as the inter-frequency RS-SINR Accuracy Requirements in clause 9.1.17.3 of TS 36.133 [23]:

The reporting range and mapping for E-UTRA RS-SINR measurements shall be the same as specified for RS-SINR measurements in clause 9.1.17.1 of TS 36.133 [23]:

The requirements for absolute accuracy of intra-frequency RS-SINR in this clause apply to a cell on the same frequency as that of the serving cell.

The accuracy requirements in Table 6.7.7.0.1-1 are valid under the following conditions:

Cell specific reference signals are transmitted either from one, two or four antenna ports.

Conditions defined in 36.101 [27] Clause 7.3 for reference sensitivity are fulfilled.

RSRP|dBm according to Annex B.3.18 of TS 36.133 [23] for a corresponding Band.

Table 6.7.7.0.1-1: Intra-frequency RS-SINR absolute accuracy

Accuracy		Conditions				
Normal Extreme			Io <sup>Note 1</sup> range			
Normal condition	Extreme condition	Ês/lot	E-UTRA operating band groups Note 4	Minimum Io	Maximum Io	
dB	dB	dB		dBm/15kHz Note 3	dBm/BW <sub>Channel</sub>	
	±4	±4 ≥-3 dB Note 5	FDD_A, TDD_A	-121	-50	
			FDD_B1, FDD_B2	-120.5	-50	
			FDD_C, TDD_C	-120	-50	
			FDD_D	-119.5	-50	
±3.0			FDD_E, TDD_E	-119	-50	
			FDD_F	-118.5	-50	
			FDD_G	-118	-50	
			FDD_H	-117.5	-50	
			FDD_N	-114.5	-50	
±3.5	±4	≥-6 dB	Note 2	Note 2	Note 2	

- NOTE 1: Io is assumed to have constant EPRE across the bandwidth.
- NOTE 2: The same bands and the same lo conditions for each band apply for this requirement as for the corresponding highest accuracy requirement.
- NOTE 3: The condition level is increased by Δ>0, when applicable, as described in Sections B.4.2 and B.4.3 of TS 36.133 [23].
- NOTE 4: E-UTRA operating band groups are as defined in Section 3.5 of TS 36.133 [23].
- NOTE 5: The requirements apply for Ês/lot ≤ 25 dB.

The reporting range of RS-SINR measurement is defined from -23 dB to 40 dB with 0.5 dB resolution.

The mapping of the measured quantity is defined in table 6.7.7.0.1-2. The range in the signalling may be larger than the guaranteed accuracy range.

Table 6.7.7.0.1-2: RS-SINR measurement report mapping

Reported Value	Measured Quantity Value	Unit
RS-SINR_000	RS-SINR < -23	dB
RS-SINR_001	-23 ≤ RS-SINR < -22.5	dB
RS-SINR_126	39.5 ≤ RS-SINR < 40	dB
RS-SINR_127	40 ≤ RS-SINR	dB

## 6.7.7.1 NR SA FR1 – E-UTRAN RS-SINR absolute measurement accuracy

## 6.7.7.1.1 Test purpose

The purpose of this test is to verify that the inter-RAT E-UTRAN RS-SINR absolute measurement accuracy is within the specified limits for all bands, when the serving cell is NR FR1 and the target cell is E-UTRA.

### 6.7.7.1.2 Test applicability

This test applies to all types of NR UE from Release 15 onwards supporting E-UTRA and rs-SINR-MeasEUTRA.

## 6.7.7.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.7.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.7.1.

6.7.7.1.1.4 Test description

6.7.7.1.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.7.1.4.1-1.

Table 6.7.7.1.4.1-1: test configurations

Test Case ID	Description			
6.7.7.1-1	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: FDD			
6.7.7.1-2	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: FDD			
6.7.7.1-3	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: FDD			
6.7.7.1-4	NR: 15 kHz SSB SCS, 10MHz bandwidth, FDD, E-UTRAN: TDD			
6.7.7.1-5	NR: 15 kHz SSB SCS, 10MHz bandwidth, TDD, E-UTRAN: TDD			
6.7.7.1-6	NR: 30 kHz SSB SCS, 40MHz bandwidth, TDD, E-UTRAN: TDD			
Note: The UE is	Note: The UE is only required to be tested in one of the supported test configurations			

Configure the test equipment and the DUT according to the parameters in Table 6.7.7.1.4.1-2.

Table 6.7.7.1.4.1-2: initial conditions

Parameter		Value	Comment
Test environment	NC, TL/VL, TL/VH	I, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	As specified in An	nex E, Table E.4-2 and TS 38	.508-1 [14] clause 4.3.1.
Channel	As specified by the test configuration selected from Table 6.7.7.1.4.1-1.		
bandwidth			
Propagation	AWGN		As specified in Annex C.2.2.
conditions			
Connection	TE Part 2Rx	A.3.1.7.2	As specified in TS 38.508-1 [14] Annex A.
Diagram	TE Part 4Rx	A.3.1.7.3	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to	N/A		
connection			
diagram			

- 1. Message contents are defined in clause 6.7.7.1.4.3.
- 2. There are two carriers and two cells specified in the test, where NR Cell 1 is the NR PCell on the NR carrier and Cell 2 is the E-UTRA neighbour cell on the E-UTRA carrier and the target for the measurements.

### 6.7.7.1.4.2 Test procedure

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity *NR*, Connected without release *On* and Test Mode *On* according to TS 38.508-1 [14] clause 4.5.
- 2. Set the parameters according to Table 6.7.7.1.5-1 and Table 6.7.7.1.5-2 as appropriate.
- 3. The SS shall transmit an RRCReconfiguration message on Cell 1.
- 4. The UE shall transmit an RRCReconfigurationComplete message.
- 5. The UE shall transmit periodically MeasurementReport messages.
- 6. After 10s wait from Step 3, the SS shall check the RS-SINR reported values in the periodic MeasurementReport. The RS-SINR value of Cell 2 reported by the UE is compared to the expected RS-SINR. If the value is outside the limits in Table 6.7.7.1.5-2 or the UE fails to report the measurement value for Cell 2, the number of failed iterations is increased by one. Otherwise, the number of passed iterations is increased by one.
- 7. The SS shall continue checking the MeasurementReport messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 8. Set the parameters according to each sub-test in Table 6.7.7.1.5-2 as appropriate and repeat steps 5-7.

#### 6.7.7.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

# Table 6.7.7.1.4.3-1: Common Exception messages

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.1-1			
elements contents exceptions	Table H.3.1-2 with condition INTER-RAT and GAP NEEDED			
	Table H.3.1-3			
	Table H.3.1-3a			
	Table H.3.1-7 with condition INTER-RAT			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

# Table 6.7.7.1.4.3-1A: MeasConfig (Test procedure step 3)

Derivation path: Table H.3.1-2 with condition INTER-RAT	and GAP NEEDED		
Information Element	Value/Remark	Comment	Condition
measConfig ::= SEQUENCE {			
reportConfigToAddModList SEQUENCE(SIZE	2 entries		
(1maxReportConfigId)) OF ReportConfigToAddMod {			
ReportConfigToAddMod[1] SEQUENCE {		entry 1	
reportConfigld	1		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigE-UTRA- DEFAULT(Periodical)	Table 6.7.7.1.4.3-	
1	DETAGET (Feriodical)		
}			
ReportConfigToAddMod[2] SEQUENCE {		entry 2	
reportConfigld	2		
reportConfig CHOICE {			
reportConfigInterRAT	ReportConfigInterRAT- EVENT	Table 6.7.7.1.4.3-	
}		1.5	
}			
}			
measIdToAddModList SEQUENCE (SIZE	2 entries		
(1maxNrofMeasId)) OF MeasIdToAddMod {		a maternal of	
MeasIdToAddMod[1] SEQUENCE {	1	entry 1	
measld	1		
measObjectId	2		
reportConfigld	1		
} 			
MeasIdToAddMod[2] SEQUENCE {		entry 2	
measId	2		
measObjectId	2		
reportConfigId	2		
}			
}			
}			

# Table 6.7.7.1.4.3-1B: ReportConfigInterRAT-EVENT (Table 6.7.7.1.4.3-1A)

Derivation Path: TS 38.508-1 [14] Table 4.6.3-141 with	condition EVENT_B1		
Information Element	Value/remark	Comment	Condition
ReportConfigInterRAT ::= SEQUENCE {			
reportType CHOICE {			
eventTriggered SEQUENCE {			
eventId CHOICE {			
eventB1 SEQUENCE {			
b1-ThresholdEUTRA CHOICE {			
sinr	127	Set threshold to 40dB to ensure measId 2 will never be triggered	
}			
}			
}			
}			•
}			•
}			•

# Table 6.7.7.1.4.3-2: ReportConfigE-UTRA-DEFAULT(Periodical)

Derivation Path: 38.508-1 [14] Table 4.6.3-141 w	rith Condition PERIODICAL		
Information Element	Value/remark	Comment	Condition
ReportConfigInterRAT::= SEQUENCE {			
reportType CHOICE {			
periodical SEQUENCE {			
reportQuantityCell SEQUENCE {			
rsrp	false		
rsrq	false		
sinr	true		
}			
maxReportCells	2		
}			
}			
}			

# 6.7.7.1.5 Test requirement

Table 6.7.7.1.5-1 defines the primary level settings including test tolerances for all tests.

Each SS-RSRP measurement report for each of the tests in Tables 6.7.7.1.5-1 and 6.7.7.1.5-2 shall meet the corresponding absolute accuracy requirements in Table 6.7.7.1.5-3.

Table 6.7.7.1.5-1: NR Cell specific test parameters for SA Inter-RAT E-UTRAN RS-SINR test parameters

1, 4 2, 3, 5, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6	MHz	1 FDD TDD N/A TDDConf.1.1 TDDConf.2.1 10: N <sub>RB,c</sub> = 52 (FDD) 10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD)	
2, 3, 5, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6	MHz	TDD N/A TDDConf.1.1 TDDConf.2.1 10: N <sub>RB,c</sub> = 52 (FDD) 10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD) 0	
1, 4 2, 5 3, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6	MHz	N/A TDDConf.1.1 TDDConf.2.1 10: N <sub>RB,c</sub> = 52 (FDD) 10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD) 0	
2, 5 3, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6	MHz	TDDConf.1.1 TDDConf.2.1 10: N <sub>RB,c</sub> = 52 (FDD) 10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD)	
3, 6 1, 4 2, 5 3, 6 1, 4 2, 5 3, 6	MHz	TDDConf.2.1 10: N <sub>RB,c</sub> = 52 (FDD) 10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD) 0	
1, 4 2, 5 3, 6 1, 4 2, 5 3, 6 1, 4	MHz	10: N <sub>RB,c</sub> = 52 (FDD) 10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD) 0	
2, 5 3, 6 1, 4 2, 5 3, 6 1, 4	MHz	10: N <sub>RB,c</sub> = 52 (TDD) 40: N <sub>RB,c</sub> = 106 (TDD) 0	
1, 4 2, 5 3, 6 1, 4	MHz	40: N <sub>RB,c</sub> = 106 (TDD)	
1, 4 2, 5 3, 6 1, 4		40: N <sub>RB,c</sub> = 106 (TDD)	
2, 5 3, 6 1, 4			
2, 5 3, 6 1, 4			
2, 5 3, 6 1, 4		SR.1.1 FDD	
3, 6 1, 4		SR.1.1 TDD	
1, 4		SR.2.1 TDD	
		CR.1.1 FDD	
2, 5		CR.1.1 TDD	
3, 6		CR.2.1 TDD	
1, 4		CCR.1.1 FDD	
2, 5	<del> </del>	CCR.1.1 TDD	
3, 6	<del> </del>	CCR.2.1 TDD	
. BWP		DLBWP.0.1	
ed DL BWP		DLBWP.1.1	
.BWP		ULBWP.0.1	
ed UL BWP		ULBWP.1.1	
OCNG pattern <sup>Note1</sup>			
SMTC configuration		OP.1 SMTC.1	
SSR configuration Config 1, 2, 4, 5		SSB.1 FR1	
3. 6	_	SSB.2 FR1	
-, -			
	dB	0	
		-	
	dBm/15 kHz	-104	
1, 2, 4, 5		-104	
	dBm/SCS —	-101	
, -	dB	17	
		17	
1. 2. 4. 5		-87	
	dBm/SCS	-84	
1. 2. 4. 5		-87	
	dBm/SCS —	-84	
SSB_RP <sup>Note3</sup> Config 1, 2, 4, 5  Config 3, 6  Config 1, 2, 4, 5			
1245	0BM/9.36 MHz	-58 96	
1, 2, 4, 5	dBm/9.36 MHz	-58.96 -52.87	
1, 2, 4, 5 3, 6	dBm/9.36 MHz dBm/38.16 MHz	-52.87	
1	1, 2, 4, 5 3, 6 1, 2, 4, 5 3, 6 1, 2, 4, 5 3, 6	dB  dB  dB  dB  dB  dB/15 kHz  dBm/15 kHz  dBm/SCS  dB dB  dB  dB  dB  dB  dB  dB  dB  dB	

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{\infty}$  to be fulfilled.

Note 3: Ê<sub>s</sub>/I<sub>ot</sub>, SS-RSRP, SSB\_RP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Table 6.7.7.1.5-2: E-UTRAN Cell specific test parameters for SA Inter-RAT E-UTRAN RS-SINR test parameters

Parameter		Unit		Cell 2		
			Test 1	Test 2	Test 3	
E-UTRA RF channel numb	oer			1		
Duplex mode	Config 1, 2, 3			FDD		
	Config 4, 5, 6			TDD		
TDD special subframe	Config 1, 2, 3			N/A		
configuration <sup>Note1</sup>	Config 4, 5, 6		6			
TDD uplink-downlink	Config 1, 2, 3			N/A		
configuration <sup>Note1</sup>	Config 4, 5, 6			1		
BWchannel		MHz		MHz: NRB,c = 2		
				0  MHz: NRB,c = 5		
			20 MHz: N <sub>RB,c</sub> = 100			
PDSCH parameters:				-		
DL Reference Measureme				- MII D 44 FDF	<u> </u>	
PCFICH/PDCCH/PHICH	Config 1, 2, 3			5 MHz: R.11 FDD		
parameters: DL Reference				10 MHz: R.6 FDD		
Measurement	Config 4, 5, 6	_		<u>20 MHz: R.10 FDI</u> 5 MHz: R.11 TDD		
Channel <sup>Note2</sup>	Cornig 4, 5, 6			10 MHz: R.6 TDD		
Chamer				10 MHz: R.10 TDI		
OCNG Patterns <sup>Note2</sup>	Config 1, 2, 3			MHz: OP.19 FD		
OCIVOT diterris	Joining 1, 2, 3			0 MHz: OP.6 FD		
				0 MHz: OP.14 FD		
	Config 4, 5, 6			MHz: OP.10 TD		
Coming 1, 0, 0			10 MHz: OP.2 TDD			
			20 MHz: OP.8 TDD			
PBCH_RA						
PBCH_RB						
PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB		dB		0		
PDCCH_RA						
PDCCH_RB						
PDSCH_RA						
PDSCH_RB						
OCNG_RANote3		_				
OCNG_RB <sup>Note3</sup>	15			T	110.5	
N <sub>oc1</sub> Note4	Depending on band	dBm/15kHz	-88	-108.50	-119.5+	
	group		4 75		Δ <sub>BG_offset</sub>	
CRS Ê <sub>s</sub> /N <sub>oc1</sub> CRS Ê <sub>s</sub> /I <sub>ot</sub> <sup>Note5</sup>		dB dB	-1.75 -1.75	20.0 20.0	-3.2 -3.2	
	Depending on band				-3.2 -122.7+	
RSRP <sup>Note5</sup>	group	dBm/15kHz	-89.75	-88.50	$\Delta_{BG\_offset}$	
RS-SINR <sup>Note5</sup>		dB	-1.75	20	-3.2	
			-58.00 +	-60.68 +	-90.02+	
lo <sup>Note5</sup>	Depending on band	dBm/Ch	10log(N <sub>RB,c</sub>	10log(N <sub>RB,c</sub>	∆BG_offset +	
1.5	group	BW	/50)	/50)	10log(N <sub>RB,c</sub>	
			,	*	/50)	
Propagation Condition			AWGN			
Antenna Configuration and Correlation Matrix			1x2			

Note 1:	Special subframe and uplink-downlink configurations are specified in table 4.2-1 in TS 36.211 [24].
Note 2:	DL RMCs and OCNG patterns are specified in clauses A 3.1 and A 3.2 of TS 36.133 [23] respectively.
Note 3:	OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral
	density is achieved for all OFDM symbols.
Note 4:	Interference from other cells and noise sources not specified in the test is assumed to be constant over
	CRS subcarriers and time and shall be modelled as AWGN of appropriate power for N₀c1 to be fulfilled.
Note 4a:	Void
Note 5:	CRS Ê <sub>s</sub> /I <sub>ot</sub> , RSRP, RS-SINR and Io levels have been derived from other parameters for information
	purposes. They are not settable parameters themselves.
Note 6:	E-UTRA operating band groups are as defined in clause 3.5 of TS 36.133 [23].
Note 7:	Void
Note 8:	Void
Note 9:	Void
Note 10:	Void
Note 11:	Arg. offset for LTE band group is defined in TS 36.521-3 [26] clause 3.5.1. Table 3.5.1-1A.

Table 6.7.7.1.5-3: RS-SINR Intra frequency absolute accuracy requirements for the reported values

Normal Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	35	79	32
Highest reported value (Cell 2)	51	94	49
Extreme Conditions	Test 1 All bands	Test 2 All bands	Test 3 All bands
Lowest reported value (Cell 2)	33	77	31
Highest reported value (Cell 2)	53	96	50

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

6.7.8

# 6.7.9 L1-SINR measurement for beam reporting

# 6.7.9.0 Minimum conformance requirements

# 6.7.9.0.1 Minimum conformance requirements for CSI-RS based CMR and no dedicated IMR configured and CSI-RS resource set with repetition off

The UE shall be capable of performing L1-SINR measurements with the CSI-RS configured as CMR and no dedicated resource configured as IMR for L1-SINR computation, and the UE physical layer shall be capable of reporting L1-SINR measured over the measurement period of  $T_{L1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_Only}$ .

The value of T<sub>L1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_Only</sub> is defined in Table 6.7.9.0.1-1 for FR1 and in Table 6.7.9.0.1-2 for FR2, where

For the value of M,

- For periodic and semi-persistent CSI-RS resources as CMR, M=1 if higher layer parameter *timeRestrictionForChannelMeasurement* is configured, and M=3 otherwise;
- For aperiodic CSI-RS resources as CMR, M=1.

For the value of N in FR2

- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply if *qcl-InfoPeriodicCSI-RS* is configured for all the resources in the resource set and for each resource one RS has QCL-TypeD with
  - SSB for L1-RSRP or L1-SINR measurement, or
  - another CSI-RS in resource set configured with repetition ON.
- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=ceil(*maxNumberRxBeam* / N<sub>res\_per\_set</sub>), where N<sub>res\_per\_set</sub> is number of resources in the resource set. The requirements apply provided *qcl-InfoPeriodicCSI-RS* is configured for all resources in the resource set.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set and for each resource has QCL-TypeD with
  - SSB for L1-RSRP or L1-SINR measurement, or
  - another CSI-RS in resource set configured with repetition ON.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=ceil(*maxNumberRxBeam* / N<sub>res\_per\_set</sub>), where N<sub>res\_per\_set</sub> is number of resources in the resource set. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided *qcl-info* is configured for all resources in the resource set and for each resource has QCL-TypeD with
  - SSB for L1-RSRP or L1-SINR measurement, or
  - another CSI-RS in resource set configured with repetition ON.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=1. UE is not required to meet the accuracy requirements in clause 10.1.28.1 and 10.1.28.3 of TS 38.133 [6] if number of resources in the resource set is smaller than *maxNumberRxBeam*. The requirements apply provided *qcl-info* is configured for all resources in the resource set.

For the value of P in FR1,

- $P = \frac{1}{1 \frac{T_{CSI-RS}}{MRGP}}$ , when in the monitored cell there are measurement gaps configured for intra-frequency, interfrequency or inter-RAT measurements, which are overlapping with some but not all occasions of the CSI-RS; and
- P=1 when in the monitored cell there are no measurement gaps overlapping with any occasion of the CSI-RS.

For the value of P in FR2,

- P=1, when CSI-RS is not overlapped with measurement gap and also not overlapped with SMTC occasion.
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{MRGP}}$ , when CSI-RS is partially overlapped with measurement gap and CSI-RS is not overlapped with SMTC occasion ( $T_{CSI-RS} < MGRP$ )
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{T_{SMTCperiod}}}$ , when CSI-RS is not overlapped with measurement gap and CSI-RS is partially overlapped with SMTC occasion ( $T_{CSI-RS} < T_{SMTCperiod}$ ).
- P=3, when CSI-RS is not overlapped with measurement gap and CSI-RS is fully overlapped with SMTC occasion (T<sub>CSI-RS</sub> = T<sub>SMTCperiod</sub>).
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{MRGP} \frac{T_{CSI-RS}}{T_{SMTCperiod}}}, \ \, \text{when CSI-RS is partially overlapped with measurement gap and CSI-RS is partially overlapped with SMTC occasion ($T_{CSI-RS} < T_{SMTCperiod}$) and SMTC occasion is not overlapped with measurement gap and <math display="block">T_{CSI-RS} = \frac{1}{1 \frac{T_{CSI-RS}}{T_{SMTCperiod}}}, \ \, \text{when CSI-RS is partially overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement gap and } \ \, \text{SMTC occasion is not overlapped with measurement g$

- $T_{SMTCperiod} \neq MGRP$  or
- $T_{SMTCperiod} = MGRP$  and  $T_{CSI-RS} < 0.5*T_{SMTCperiod}$
- $-P = \frac{3}{1 \frac{T_{CSI-RS}}{MRGP}}, \ \, \text{when CSI-RS is partially overlapped with measurement gap and CSI-RS is partially overlapped} \\ \, \text{with SMTC occasion } (T_{CSI-RS} < T_{SMTCperiod}) \ \, \text{and SMTC occasion is not overlapped with measurement gap and} \\ \, T_{SMTCperiod} = MGRP \ \, \text{and} \ \, T_{CSI-RS} = 0.5*T_{SMTCperiod}$
- $P = \frac{1}{1 \frac{T_{CSI-RS}}{\min{(T_{SMTCperiod}, MGRP)}}}$ , when CSI-RS is partially overlapped with measurement gap ( $T_{CSI-RS} < MGRP$ ) and

CSI-RS is partially overlapped with SMTC occasion ( $T_{CSI-RS} < T_{SMTCperiod}$ ) and SMTC occasion is partially or fully overlapped with measurement gap.

-  $P = \frac{3}{1 - \frac{T_{CSI-RS}}{MRGP}}$ , when CSI-RS is partially overlapped with measurement gap and CSI-RS is fully overlapped with SMTC occasion ( $T_{CSI-RS} = T_{SMTCperiod}$ ) and SMTC occasion is partially overlapped with measurement gap ( $T_{SMTCperiod} < MGRP$ )

#### Where:

T<sub>SMTCperiod</sub> = the configured SMTC1 period or SMTC2 period if configured.

T<sub>CSI-RS</sub> = the periodicity of CSI-RS configured for L1-SINR measurement

If the high layer in TS 38.331 [2] signalling of smtc2 is configured,  $T_{SMTCperiod}$  corresponds to the value of higher layer parameter smtc2; Otherwise  $T_{SMTCperiod}$  corresponds to the value of higher layer parameter smtc1.

Note: The overlap between CSI-RS for L1-SINR measurement and SMTC means that CSI-RS for L1-SINR measurement is within the SMTC window duration.

Longer evaluation period would be expected if the combination of CSI-RS, SMTC occasion and measurement gap configurations does not meet pervious conditions.

Table 6.7.9.0.1-1: Measurement period TL1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_Only for FR1

Configuration		TL1-SINR_Measurement_Period_CSI-RS_CMR_Only (ms)				
no	n-DRX	max(T <sub>Report</sub> , ceil(M*P)*T <sub>CSI-RS</sub> )				
DRX cy	cle ≤ 320ms	max(T <sub>Report</sub> , ceil(1.5*M*P)*max(T <sub>DRX</sub> ,T <sub>CSI-RS</sub> ))				
DRX cy	cle > 320ms	ceil(M*P)*T <sub>DRX</sub>				
Note 1:	1: T <sub>CSI-RS</sub> is the periodicity of CSI-RS configured for L1-SINR					
	measurement. $T_{DRX}$ is the DRX cycle length. $T_{Report}$ is configured periodicity for reporting.					
Note 2: the requirements are applicable provided that the CSI-RS resource configured for L1-SINR measurement is transmitted with Density = 3.						

Table 6.7.9.0.1-2: Measurement period TL1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_Only for FR2

Conf	iguration	TL1-SINR_Measurement_Period_CSI-RS_CMR_Only (ms)			
no	n-DRX	max(T <sub>Report</sub> , ceil(M*P*N)*T <sub>CSI-RS</sub> )			
DRX cy	cle ≤ 320ms	max(T <sub>Report</sub> , ceil(1.5*M*P*N)*max(T <sub>DRX</sub> ,T <sub>CSI-RS</sub> ))			
DRX cy	cle > 320ms	ceil(M*P*N)*T <sub>DRX</sub>			
Note 1:	Note 1: T <sub>CSI-RS</sub> is the periodicity of CSI-RS configured for L1-SINR				
	measurement. T <sub>DRX</sub> is the DRX cycle length. T <sub>Report</sub> is configured				
	periodicity for				
Note 2: the requirements are applicable provided that the CSI-RS resource					
	configured for	r L1-SINR measurement is transmitted with Density = 3.			

The accuracy requirements in Table 6.7.9.0.1-3 are valid under the following conditions:

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
- Conditions for L1-SINR measurements are fulfilled according to Annex B.2.8.1 for a corresponding Band for each relevant CSI-RS based CMR.

- The bandwidth of CSI-RS as CMR is 48 PRBs and the density is 3.
- AWGN radio propagation conditions.

The performance with larger bandwidth of CSI-RS as CMR is equal to or better than the accuracy requirements in Table 6.7.9.0.1-3.

Table 6.7.9.0.1-3: L1-SINR absolute accuracy for CSI-RS based CMR only in FR1

Accuracy		Conditions							
Normal condition	Extreme condition	CSI-RS CMR Ês/lot	lo <sup>Note 1</sup> range						
			NR operating band groups Note 2		Minim	um lo		Maximum Io	
dB	dB	dB		dB	m / SCS <sub>CSI-R</sub>	ıs	dBm/BW Channel	dBm/BW <sub>Channel</sub>	
				SCS <sub>CSI-RS</sub> = 15 kHz	SCS <sub>CSI-</sub> RS = 30 kHz	SCS <sub>CSI-</sub> RS = 60 kHz			
			NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	-115	N/A	-50	
			NR_FDD_FR1_B	-120.5	-117.5	-114.5	N/A	-50	
			NR_TDD_FR1_C	-120	-117	-114	N/A	-50	
±5.5	±6.5	≥-3	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	-113.5	N/A	-50	
			NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	-113	N/A	-50	
			NR_FDD_FR1_F	-118.5	-115.5	-112.5	N/A	-50	
			NR_FDD_FR1_G	-118	-115	-112	N/A	-50	
			NR_FDD_FR1_H	-117.5	-114.5	-111.5	N/A	-50	

NOTE 1: Io is assumed to have constant EPRE across the bandwidth.

NOTE 2: NR operating band groups in FR1 are as defined in clause 3.5.2.

The normative reference for this requirement is TS 38.133 [6] clauses 9.8.4.1 and 10.1.27.1.

# 6.7.9.0.2 Minimum conformance requirements for SSB based CMR and dedicated IMR

The UE shall be capable of performing L1-SINR measurements with the SSB configured as CMR and dedicated resource configured as IMR for L1-SINR computation, in which the NZP-CSI-RS or CSI-IM resource configured as dedicated IMR shall be 1-to-1 mapped to SSB configured as CMR, with the same periodicity. The UE physical layer shall be capable of reporting L1-SINR measured over the measurement period of  $T_{L1-SINR\_Measurement\_Period\_SSB\_CMR\_IMR}$ .

The requirements in this clause are not applicable if NZP-CSI-RS or CSI-IM resource configured as dedicated IMR is scheduled with different periodicity as SSB configured as CMR.

The value of  $T_{L1\text{-}SINR\_Measurement\_Period\_SSB\_CMR\_IMR}$  is defined in Table 6.7.9.0.2-1 for FR1 and in Table 6.7.9.0.2-2 for FR2, where

#### For the value of M

- For periodic or semi-persistent NZP CSI-RS or CSI-IM resource as dedicated IMR, M=1 if the higher layer parameters *timeRestrictionForChannelMeasurements* and/or *timeRestrictionForInterferenceMeasurements* are configured, and M=3 otherwise;

For the value of N in FR2

- N = 8.

P is defined as the maximum value between  $P_{CMR}$  and  $P_{IMR}$ , i.e.,  $P = max(P_{CMR}, P_{IMR})$ , where

- the value of P<sub>CMR</sub> shall be derived in the same way as the value of P used for SSB based L1-RSRP measurement in clause 9.5.4.1 of TS 38.133 [6], in which the occasions and period of the SSB for CMR shall be used instead.

the value of P<sub>IMR</sub> shall be derived in the same way as the value of P used for CSI-RS based L1-RSRP measurement in clause 9.5.4.2 of TS 38.133 [6], in which the occasions and period of the NZP CSI-RS for NZP-IMR or CSI-IM for ZP-IMR shall be used instead.

Longer evaluation period would be expected if the combination of SSB, SMTC occasion and measurement gap configurations does not meet pervious conditions.

For L1-SINR measurement with SSB as CMR and CSI-RS or CSI-IM as IMR, the requirement shall apply if the CSI-RS is configured as IMR with repetition field as "repetition = OFF" or CSI-IM is configured as IMR.

For L1-SINR measurement with SSB as CMR and CSI-RS/CSI-IM as IMR, no requirement shall apply if SSB occasions for CMR or CSI-RS/CSI-IM occasions for IMR are fully overlapped with the configured measurement gap

Table 6.7.9.0.2-1: Measurement period  $T_{L1\text{-}SINR\_Measurement\_Period\_SSB\_CMR\_IMR}$  for FR1

Conf	iguration	TL1-SINR_Measurement_Period_SSB_CMR_IMR (ms)			
no	n-DRX	max(T <sub>Report</sub> , ceil(M*P)*T <sub>SSB</sub> )			
DRX cy	cle ≤ 320ms	max(T <sub>Report</sub> , ceil(1.5*M*P)*max(T <sub>DRX</sub> ,T <sub>SSB</sub> ))			
DRX cy	cle > 320ms	ceil(M*P)*T <sub>DRX</sub>			
Note 1:	T <sub>SSB</sub> = ssb-periodicityServingCell is the periodicity of the SSB-Index configured for L1-SINR channel measurement. T <sub>DRX</sub> is the DRX cycle length. T <sub>Report</sub> is configured periodicity for reporting.				
Note 2: The requirements are applicable provided that the CSI-RS resource configured for interference measurement shall be 1-to-1 mapped to SSB configured for channel measurement, with the same periodicity					

Table 6.7.9.0.2-2: Measurement period T<sub>L1-SINR</sub> Measurement Period SSB CMR IMR for FR2

Conf	iguration	TL1-SINR_Measurement_Period_SSB_CMR_IMR (ms)			
no	n-DRX	max(T <sub>Report</sub> , ceil(M*P*N)*T <sub>SSB</sub> )			
DRX cy	cle ≤ 320ms	max(T <sub>Report</sub> , ceil(1.5*M*P*N)*max(T <sub>DRX</sub> ,T <sub>SSB</sub> ))			
DRX cy	cle > 320ms	ceil(1.5*M*P*N)*T <sub>DRX</sub>			
Note 1:	T <sub>SSB</sub> = ssb-periodicityServingCell is the periodicity of the SSB-Index				
		r L1-SINR measurement. T <sub>DRX</sub> is the DRX cycle length.			
	T <sub>Report</sub> is configured periodicity for reporting.				
Note 2:	The requirem	ents are applicable provided that the CSI-RS resource			
	configured for	r interference measurement shall be 1-to-1 mapped to			
	SSB configur	ed for channel measurement, with the same periodicity.			

The accuracy requirements in Tables 6.7.9.0.2-3 and 6.7.9.0.2-4 are valid under the following conditions:

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
- Conditions for L1-SINR measurements are fulfilled according to Annex B.2.8.2 for a corresponding Band for each relevant SSB based CMR and IMR.
- The bandwidth of NZP-IMR and ZP-IMR is 48 PRBs and the density is 3.
- AWGN radio propagation conditions.

The performance with larger bandwidth of NZP-IMR and ZP-IMR is equal to or better than the accuracy requirements in Tables 6.7.9.0.2-3 and 6.7.9.0.2-4.

Table 6.7.9.0.2-3: L1-SINR absolute accuracy for SSB based CMR and NZP-IMR in FR1

Accuracy		Conditions								
Normal condition	Extreme condition	SSB- CMR Ês/lot	NZP- IMR Ês/lot	lo Note 1 range	Io Note 1 range  NR operating band groups Note 2 Minimum Io					
dB	dB	dB	dB		dBm / SC	Sssb	dBm/BW <sub>Channel</sub>	dBm/BW <sub>Channel</sub>		
					SCS <sub>SSB</sub> = 15 kHz	SCS <sub>SSB</sub> = 30 kHz				
				NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	N/A	-50		
				NR_FDD_FR1_B	-120.5	-117.5	N/A	-50		
				NR_TDD_FR1_C	-120	-117	N/A	-50		
±4.0	±5.0	≥0	≥0	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	N/A	-50		
				NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	N/A	-50		
				NR_FDD_FR1_F	-118.5	-115.5	N/A	-50		
				NR_FDD_FR1_G	-118	-115	N/A	-50		
				NR_FDD_FR1_H	-117.5	-114.5	N/A	-50		

NOTE 1: To is assumed to have constant EPRE across the bandwidth.

NOTE 2: NR operating band groups in FR1 are as defined in clause 3.5.2.

Table 6.7.9.0.2-4: L1-SINR absolute accuracy for SSB based CMR and ZP-IMR in FR1

Accuracy		Conditi	ons				
Normal condition	Extreme condition	SSB- CMR Ês/lot					
			NR operating band groups Note 2	Minimum Io			Maximum Io
dB	dB	dB		dBm / SCSsss	3	dBm/BW <sub>Channel</sub>	dBm/BW <sub>Channel</sub>
				SCS <sub>SSB</sub> = 15 kHz	SCS <sub>SSB</sub> = 30 kHz		
			NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	N/A	-50
			NR_FDD_FR1_B	-120.5	-117.5	N/A	-50
			NR_TDD_FR1_C	-120	-117	N/A	-50
±4.5	±5.5	≥-3	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	N/A	-50
			NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	N/A	-50
			NR_FDD_FR1_F	-118.5	-115.5	N/A	-50
			NR_FDD_FR1_G	-118	-115	N/A	-50
			NR FDD FR1 H	-117.5	-114.5	N/A	-50

The normative reference for this requirement is TS 38.133 [6] clauses 9.8.4.2 and 10.1.27.2.

# 6.7.9.0.3 Minimum conformance requirements for CSI-RS based CMR and dedicated IMR

The UE shall be capable of performing L1-SINR measurements with the CSI-RS resource configured as CMR and dedicated resource configured as IMR for L1-SINR computation, in which the NZP-CSI-RS or CSI-IM resource configured as dedicated IMR shall be 1-to-1 mapped to CSI-RS resource configured as CMR, with the same periodicity. The UE physical layer shall be capable of reporting L1-SINR measured over the measurement period of  $T_{L1}$ . SINR\_Measurement\_Period\_CSI-RS\_CMR\_IMR.

The requirements in this clause are not applicable if NZP-CSI-RS or CSI-IM resource configured as dedicated IMR is scheduled with different periodicity as CSI-RS resource configured as CMR.

The value of T<sub>L1-SINR\_Measurement\_Period\_CSI-RS\_CMR\_IMR</sub> is defined in Table 6.7.9.0.3-1 for FR1 and in Table 6.7.9.0.3-2 for FR2, where

For the value of M,

- M=1 shall be applied if
  - aperiodic NZP-CSI-RS as CMR or dedicated IMR, or
  - aperiodic CSI-IMR as dedicated IMR, or
  - periodic and semi-persistent NZP-CSI-RS as CMR or dedicated IMR and the higher layer parameters timeRestrictionForChannelMeasurement and/or timeRestrictionForInterferenceMeasurements are configured, or
  - periodic and semi-persistent CSI-IM as dedicated IMR and the higher layer parameters
     timeRestrictionForChannelMeasurement and/or timeRestrictionForInterferenceMeasurements are
     configured;
- M=3 otherwise.

#### For the value of N in FR2

- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply if *qcl-InfoPeriodicCSI-RS* is configured for all the resources in the resource set and for each resource one RS has QCL-TypeD with
  - SSB for L1-RSRP or L1-SINR measurement, or
  - another CSI-RS in resource set configured with repetition ON.
- For periodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=ceil(*maxNumberRxBeam* / N<sub>res\_per\_set</sub>), where N<sub>res\_per\_set</sub> is number of resources in the resource set. The requirements apply provided *qcl-InfoPeriodicCSI-RS* is configured for all resources in the resource set.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set and for each resource has QCL-TypeD with
  - SSB for L1-RSRP or L1-SINR measurement, or
  - another CSI-RS in resource set configured with repetition ON.
- For semi-persistent CSI-RS resources as CMR in a resource set configured with higher layer parameter repetition set to ON, N=ceil(maxNumberRxBeam / Nres\_per\_set), where Nres\_per\_set is number of resources in the resource set. The requirements apply provided TCI state is provided for all resources in the resource set in the MAC CE activating the resource set.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to OFF, N=1. The requirements apply provided *qcl-info* is configured for all resources in the resource set and for each resource has QCL-TypeD with
  - SSB for L1-RSRP or L1-SINR measurement, or
  - another CSI-RS in resource set configured with repetition ON.
- For aperiodic CSI-RS resources as CMR in a resource set configured with higher layer parameter *repetition* set to ON, N=1. UE is not required to meet the accuracy requirements in clause 10.1.28.1 and 10.1.28.3 of TS 38.133 [6] if number of resources in the resource set is smaller than *maxNumberRxBeam*. The requirements apply provided *qcl-info* is configured for all resources in the resource set.

P is defined as the maximum value between  $P_{CMR}$  and  $P_{IMR}$ , i.e.,  $P = max(P_{CMR}, P_{IMR})$ , where

- The value of P<sub>CMR</sub> and P<sub>IMR</sub> shall be derived in the same way as the value of P used for CSI-RS based L1-RSRP measurement in clause 9.5.4.2 of TS 38.133 [6], in which the occasions and period of the CSI-RS for CMR and NZP CSI-RS for NZP-IMR or CSI-IM for ZP-IMR shall be used instead respectively.

Longer evaluation period would be expected if the combination of CSI-RS, SMTC occasion and measurement gap configurations does not meet pervious conditions.

For L1-SINR measurement with CSI-RS as CMR and CSI-RS as IMR, the requirement shall apply only if CSI-RS resources as CMR and IMR are configured with the same repetition field and the number of CSI-RS resources in the resource sets for CMR and IMR are same.

For L1-SINR measurement with CSI-RS as CMR and CSI-IM as IMR, the requirement shall apply only if the number of CSI-RS resources in the resource set for CMR and the number of CSI-IM resources in the resource set for IMR are same.

For L1-SINR measurement with CSI-RS as CMR and CSI-RS/CSI-IM as IMR, no requirement shall apply if CSI-RS occasions for CMR or CSI-RS/CSI-IM occasions for IMR are fully overlapped with the configured measurement gap.

Table 6.7.9.0.3-1: Measurement period T<sub>L1-SINR</sub> Measurement Period CSI-RS CMR IMR for FR1

Conf	iguration	TL1-SINR_Measurement_Period_CSI-RS_CMR_IMR (ms)				
no	n-DRX	max(T <sub>Report</sub> , ceil(M*P)*T <sub>CSI-RS</sub> )				
DRX cy	cle ≤ 320ms	max(T <sub>Report</sub> , ceil(1.5*M*P)*max(T <sub>DRX</sub> ,T <sub>CSI-RS</sub> ))				
DRX cy	cle > 320ms	ceil(M*P)*T <sub>DRX</sub>				
Note 1:	Tcsi-Rs is the	periodicity of CSI-RS configured for L1-SINR				
	measuremen	t. T <sub>DRX</sub> is the DRX cycle length. T <sub>Report</sub> is configured				
	periodicity for	reporting.				
Note 2:	the requireme	ents are applicable provided that the CSI-RS resource				
	configured for	r L1-SINR measurement is transmitted with Density = 3.				
Note 3:	The requirements are applicable provided that the CSI-RS resource					
	configured for interference measurement shall be 1-to-1 mapped to					
	CSI-RS config	gured for channel measurement, with the same				
	periodicity.	·				

Table 6.7.9.0.3-2: Measurement period TL1-SINR Measurement Period\_CSI-RS\_CMR\_IMR for FR2

Configura	ation	TL1-SINR_Measurement_Period_CSI-RS_CMR_IMR (ms)				
non-DF	RΧ	max(T <sub>Report</sub> , ceil(M*P*N)*T <sub>CSI-RS</sub> )				
DRX cycle <	320ms	max(T <sub>Report</sub> , ceil(1.5*M*P*N)*max(T <sub>DRX</sub> ,T <sub>CSI-RS</sub> ))				
DRX cycle >	320ms	ceil(M*P*N)*T <sub>DRX</sub>				
Note 1: Tos	I-RS is the	periodicity of CSI-RS configured for L1-SINR				
me	asuremen	t. T <sub>DRX</sub> is the DRX cycle length. T <sub>Report</sub> is configured				
per	iodicity for	reporting.				
	te 2: the requirements are applicable provided that the CSI-RS resource					
	•	r L1-SINR measurement is transmitted with Density = 3.				
	Note 3: The requirements are applicable provided that the CSI-RS resource					
	configured for interference measurement shall be 1-to-1 mapped to					
		gured for channel measurement, with the same				
per	iodicity.					

The accuracy requirements in Tables 6.7.9.0.3-3 and 6.7.9.0.3-4 are valid under the following conditions:

- Conditions defined in clause 7.3 of TS 38.101-1 [18] for reference sensitivity are fulfilled.
- Conditions for L1-SINR measurements are fulfilled according to Annex B.2.8.3 for a corresponding Band for each relevant CSI-RS based CMR and IMR.
- The bandwidth of CSI-RS as CMR, NZP-IMR and ZP-IMR is 48 PRBs and the density is 3.
- AWGN radio propagation conditions.

The performance with larger bandwidth of CSI-RS as CMR, NZP-IMR and ZP-IMR is equal to or better than the accuracy requirements in Tables 6.7.9.0.3-3 and 6.7.9.0.3-4.

Table 6.7.9.0.3-3: L1-SINR absolute accuracy for CSI-RS based CMR and NZP-IMR in FR1

Accuracy		Conditions							
Normal conditio n	Extreme conditio n	CSI- RS CMR Ês/lot	NZP- IMR Ês/lot	lo <sup>Note 1</sup> range					
				NR operating band groups Note 2		Mi	inimum l	0	Maximum lo
dB	dB	dB	dB		dB	m / SCS <sub>CS</sub>	SI-RS	dBm/BW <sub>Channel</sub>	dBm/BW <sub>Channel</sub>
					SCSc si-Rs = 15 kHz	SCS <sub>CSI-</sub> RS = 30 kHz	SCSc si-Rs = 60 kHz		
				NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	-115	N/A	-50
				NR_FDD_FR1_B	- 120.5	-117.5	-114.5	N/A	-50
				NR_TDD_FR1_C	-120	-117	-114	N/A	-50
±4.0	±5.0	≥0	≥0	NR_FDD_FR1_D, NR_TDD_FR1_D	- 119.5	-116.5	-113.5	N/A	-50
				NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	-113	N/A	-50
				NR_FDD_FR1_F	- 118.5	-115.5	-112.5	N/A	-50
				NR_FDD_FR1_G	-118	-115	-112	N/A	-50
NOTE 4: 1		l to bour		NR_FDD_FR1_H  EPRE across the bank	- 117.5	-114.5	-111.5	N/A	-50

NOTE 2: NR operating band groups in FR1 are as defined in clause 3.5.2.

Table 6.7.9.0.3-4: L1-SINR absolute accuracy for CSI-RS based CMR and ZP-IMR in FR1

Accuracy		Conditions							
Normal condition	Extreme condition	CSI-RS CMR Ês/lot	lo <sup>Note 1</sup> range						
			NR operating band groups Note 2	Minimum	lo			Maximum Io	
dB	dB	dB		dBm / SC	Scsi-Rs		dBm/BW <sub>Channel</sub>	dBm/BW <sub>Channel</sub>	
			SCS <sub>CSI-</sub> RS = 15 kHz	SCS <sub>CSI-</sub> RS = 30 kHz	SCS <sub>CSI-</sub> RS = 60 kHz				
			NR_FDD_FR1_A, NR_TDD_FR1_A, NR_SDL_FR1_A	-121	-118	-115	N/A	-50	
ļ			NR_FDD_FR1_B	-120.5	-117.5	-114.5	N/A	-50	
			NR_TDD_FR1_C	-120	-117	-114	N/A	-50	
±4.5	±5.5	≥-3	NR_FDD_FR1_D, NR_TDD_FR1_D	-119.5	-116.5	-113.5	N/A	-50	
			NR_FDD_FR1_E, NR_TDD_FR1_E	-119	-116	-113	N/A	-50	
			NR_FDD_FR1_F	-118.5	-115.5	-112.5	N/A	-50	
			NR_FDD_FR1_G	-118	-115	-112	N/A	-50	
	1	l	NR FDD FR1 H	-117.5	-114.5	-111.5	N/A	-50	

The normative reference for this requirement is TS 38.133 [6] clauses 9.8.4.3 and 10.1.27.3.

# 6.7.9.1 NR SA FR1 CSI-RS based CMR and no dedicated IMR configured and CSI-RS resource set with repetition off L1-SINR measurement accuracy

Editor's note: This test case is incomplete. The following aspects are either missing or not yet determined:

Test Tolerance is FFS

6.7.9.1.1 Test purpose

The purpose of this test is to verify that the L1-SINR measurement accuracy is within the specified limits.

6.7.9.1.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

6.7.9.1.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.9.0.1.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.1.

6.7.9.1.4 Test description

6.7.9.1.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.1.4.1-1.

Table 6.7.9.1.4.1-1: Applicable NR configurations for FR1 L1-SINR test with CSI-RS based CMR and no dedicated IMR configured

	Config	Description
1		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, FDD duplex mode
2		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, TDD duplex mode
3		NR 30kHz CSI-RS SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is only re	quired to be tested in one of the supported test configurations in each supported band

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.1.4.1-2.

Table 6.7.9.1.4.1-2: Initial conditions for CSI-RS based L1-SINR absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TL	./VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	P	as specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	,	As specified by the test configuration	on selected from Table 6.7.9.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with $n = 1$	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with $n = 1$	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

1. Message contents are defined in clause 6.7.9.1.4.3.

2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based L1-SINR measurements. The UE is configured to perform RLM and BFD measurement based on the CSI-RS. The connection setup is done according to the settings in Annex C.1.1.

#### 6.7.9.1.4.2 Test procedure

The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.1.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.1.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.1.5-1.
- 3. The UE shall start sending L1-SINR report including results of both CSI-RS#0 and CSI-RS#1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. If the value for both CSI-RSs is within the limits in Table 6.7.4.2.1.5-2 or Table 6.7.4.2.1.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.4.2.1.5-1 as appropriate and repeat steps 3-5.

## 6.7.9.1.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.9.1.4.3-1: Common Exception messages NR SA CSI-RS-based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information	Table H.3.6A-1 with conditions PERIODIC and CSI-SINR		
elements contents exceptions	Table H.3.6A-2 with conditions CSI-RS and PERIODIC		
·	Table H.3.6A-3 with condition PERIODIC		
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		

Table 6.7.9.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133			
Information Element	Value/remark	Comment	Condition
RadioLinkMonitoringConfig ::= SEQUENCE {			
failureDetectionResourcesToAddModList	1 entry		
purpose	both	UE is configured to perform RLM and BFD based on the SSB.	
}			
}			

## 6.7.9.1.5 Test requirement

Table 6.7.9.1.5-1 defines the primary level settings excluding test tolerances for all tests.

Each L1-SINR measurement report for each of the tests in Table 6.7.9.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.9.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.9.1.5-3 for test configuration 3.

Table 6.7.9.1.5-1: FR1 CSI-RS based L1-SINR test parameters

	Parameter	Config	Unit	Test 1	Test 2
SSB GS		1~3	<b>U</b>	freq1	freq1
		1		FDD	FDD
Duplex n	node	2		TDD	TDD
Варюх п	1000	3	1	TDD	TDD
		1		N/A	N/A
TDD Cor	nfiguration	2	-	TDDConf.1.1	TDDConf.1.1
TDD Col	iliguration	3	-	TDDConf.2.1	TDDConf.2.1
		1		10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
BW <sub>channel</sub>	ı	2	MHz	10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
		3		40: N <sub>RB,c</sub> = 106	40: N <sub>RB,c</sub> = 106
DDCCH	Reference	1		SR.1.1 FDD	SR.1.1 FDD
	ment channel	2		SR.1.1 TDD	SR.1.1 TDD
measure	ment channel	3		SR.2.1 TDD	SR.2.1 TDD
D1401.00		1		CR.1.1 FDD	CR.1.1 FDD
	DRESET Reference	2		CR.1.1 TDD	CR.1.1 TDD
Channel		3	-	CR.2.1 TDD	CR.2.1 TDD
		1		CCR.1.1 FDD	CCR.1.1 FDD
	d CORESET	2	1	CCR.1.1 TDD	CCR.1.1 TDD
Reference	ce Channel	3	1	CCR.1.1 TDD	CCR.1.1 TDD
		1		SSB.1 FR1	SSB.1 FR1
SSB con	figuration	2		SSB.1 FR1	SSB.1 FR1
		3		SSB.2 FR1	SSB.2 FR1
OCNG P	atterns	1~3		OP.1	OP.1
		1		TRS.1.1 FDD	TRS.1.1 FDD
TRS con	figuration	2		TRS.1.1 TDD	TRS.1.1 TDD
	_	3		TRS.1.2 TDD	TRS.1.2 TDD
1 1 514	(D. C	4 6		DLBWP.0.1	DLBWP.0.1
Initial BV	VP Configuration	1~3		ULBWP.0.1	ULBWP.0.1
Dadiasta	d DMD configuration	4.0		DLBWP.1.1	DLBWP.1.1
Dedicate	d BWP configuration	1~3		ULBWP.1.1	ULBWP.1.1
SMTC co	onfiguration	1~3		SMTC.1	SMTC.1
		1		CSI-RS 1.2 FDD	CSI-RS 1.2 FDD
CSI-RS		2	1	CSI-RS 1.2 TDD	CSI-RS 1.2 TDD
		3		CSI-RS 2.2 TDD	CSI-RS 2.2 FDD
reportCo	nfigType	1~3		periodic	periodic
	antity-r16	1~3		cri-SINR-r16	cri-SINR-r16
nrofRepo		1~3		2	2
	reporting period	1~3		slot80	slot80
		1~3		SIULOU	SIOLOU
	tio of PSS to SSS				
	tio of PBCH DMRS to				
SSS	C				
	tio of PBCH to PBCH				
DMRS	· (DD00115::50				
	tio of PDCCH DMRS				
to SSS					
	tio of PDCCH to				
PDCCH		1~3	dB	0	0
	tio of PDSCH DMRS				
to SSS EPRE ratio of PDSCH to					
	PDSCH DMRS				
EPRE ratio of OCNG DMRS to SSS <sup>Note 1</sup>					
	EPRE ratio of OCNG to OCNG				
DMRS No					
	NR_FDD_FR1_A,				
A 7	NR_TDD_FR1_A				-117+TT
$N_{oc}$	NOTE 5	1~3	dBm/15kHz	-94.65+TT	
Note2	NR_FDD_FR1_B				-116.5+TT
	NR_TDD_FR1_C				-116+TT
	DDO		1	l	110111

-115.5+TT
-115+TT
-114.5+TT
-114.5+11 -114+TT
-113.5+TT
-117+TT
-116.5+TT
-116+TT
+TT -115.5+TT
-115+TT
-114.5+TT
-114+TT
-113.5+TT
-114+TT
-113.5+TT
-114+TT
+TT -112.5+TT
440.TT
-112+TT
-111.5+TT
-111+TT -110.5+TT
T -3+TT
-120+TT
-119.5+TT
-119+TT
+TT -118.5+TT
-118+TT
-117.5+TT
-117+TT -116.5+TT
-110.5+11
-117+TT
-116.5+TT
-116+TT
-116+TT +TT -115.5+TT
+TT -115.5+TT
+TT -115.5+TT -115+TT
-115.5+TT -115+TT -114.5+TT
-115.5+TT -115+TT -114.5+TT -114+TT
-115.5+TT -115+TT -114.5+TT
-115.5+TT -115+TT -114.5+TT -114+TT
-115.5+TT -115.5+TT -115.5+TT -114.5+TT -114.5+TT -113.5+TT -87.28+TT -86.78+TT
-115.5+TT -115+TT -114.5+TT -114+TT -113.5+TT -87.28+TT
-115.5+TT -115.5+TT -115.5+TT -114.5+TT -114.5+TT -113.5+TT -87.28+TT -86.28+TT
+TT -115.5+TT -115.5+TT -114.5+TT -114.5+TT -113.5+TT -87.28+TT -86.78+TT -86.28+TT

NR_FDD_FR1_G				-84.28+TT
NR_FDD_FR1_H	1			-83.78+TT
NR_FDD_FR1_A,				
NR_TDD_FR1_A				-81.19+TT
NR_FDD_FR1_B				-80.69+TT
NR_TDD_FR1_C				-80.19+TT
NR_FDD_FR1_D,	3	dBm/38.16	-50.19+TT	-79.69+TT
NR_TDD_FR1_D	3	MHz	-50.19+11	-79.09+11
NR_FDD_FR1_E,				-79.19+TT
NR_TDD_FR1_E				-79.19+11
NR_FDD_FR1_F				-78.69+TT
NR_FDD_FR1_G				-78.19+TT
NR_FDD_FR1_H				-77.69+TT
$\hat{E}_s/N_{oc}$	1~3	dB	10+TT	-3+TT
Propagation condition	1~3		AWGN	AWGN
Antenna configuration	1~3		1x2	1x2

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification.

Table 6.7.9.1.5-2: L1-SINR absolute accuracy requirements for the reported values for test configurations 1 and 2

FFS

Table 6.7.9.1.5-3: L1-SINR absolute accuracy requirements for the reported values for test configuration 3

**FFS** 

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.9.2 NR SA FR1 SSB based CMR and dedicated IMR L1-SINR absolute measurement accuracy

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- MU & TT needs further study

6.7.9.2.1 Test purpose

The purpose of this test is to verify that the L1-SINR measurement accuracy is within the specified limits.

6.7.9.2.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

6.7.9.2.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.9.0.2.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.2.

6.7.9.2.4 Test description

6.7.9.2.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.2.4.1-1.

Table 6.7.9.2.4.1-1: Applicable NR configurations for FR1 L1-SINR measurement test with SSB based CMR and CSI-RS based IMR

	Config	Description
1		NR 15 kHz SSB SCS, 10 MHz bandwidth, FDD duplex mode
2		NR 15 kHz SSB SCS, 10 MHz bandwidth, TDD duplex mode
3		NR 30kHz SSB SCS, 40 MHz bandwidth, TDD duplex mode
Note:	The UE is only re	quired to be tested in one of the supported test configurations in each supported band

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.2.4.1-2.

Table 6.7.9.2.4.1-2: Initial conditions for SSB based and CSI-RS based L1-SINR absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	,	As specified by the test configuration	on selected from Table 6.7.9.2.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.9.2.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for SSB-based L1-RSRP measurements. The UE is configured to perform RLM, BFD and L1-RSRP measurement based on the SSBs and CSI-RSs. The connection setup is done according to the settings in Annex C.1.2 and C.1.3.

## 6.7.9.2.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to PSCell. The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.2.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.2.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.2.5-1. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 3. The UE shall start sending L1-SINR report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS#0 and CSI-RS#1 in the periodic L1-RSRP reports. If the value for both CSI-RSs is within the limits in Table 6.7.9.2.5-2 and Table 6.7.9.2.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.

- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.9.2.5-1 as appropriate and repeat steps 3-5.

#### 6.7.9.2.4.3 Message contents

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.4.1.1.4.3-1: Common Exception messages NR SA SSB based L1-RSRP measurement

Default Message Contents			
Common contents of system information			
blocks exceptions			
Default RRC messages and information elements contents exceptions	Table H.3.6A-1 with conditions PERIODIC and SS-SINR and CSI-RS_IMR		
	Table H.3.6A-2 with conditions SSB and PERIODIC		
	Table H.3.6A-3 with condition PERIODIC		
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1		

Table 6.7.4.1.1.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133					
Information Element	Value/remark	Comment	Condition		
RadioLinkMonitoringConfig ::= SEQUENCE {					
failureDetectionResourcesToAddModList	1 entry				
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.			
detectionResource CHOICE {					
ssb-Index	0				
}					
}					
}					

# 6.7.9.2.5 Test requirement

Table 6.7.9.2.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-RSRP measurement report for each of the tests in Table 6.7.4.1.1.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.4.1.1.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.4.1.1.5-3 for test configuration 3.

Table 6.7.9.2.5-1: FR1 SSB based L1-SINR test parameters

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2		TDDConf.1.1	TDDConf.1.1
	3		TDDConf.2.1	TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
BWchannel	2	MHz	10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106	40: N <sub>RB,c</sub> = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
measurement chainer	3		SR.2.1 TDD	SR.2.1 TDD

			1	1	T
DMCLC	ODECET Deference	1		CR.1.1 FDD	CR.1.1 FDD
	RMSI CORESET Reference			CR.1.1 TDD	CR.1.1 TDD
Channel		3		CR.2.1 TDD	CR.2.1 TDD
Dedicate	Dedicated CORESET			CCR.1.1 FDD	CCR.1.1 FDD
	ce Channel	2		CCR.1.1 TDD	CCR.1.1 TDD
Referen	ce chamer	3		CCR.2.1 TDD	CCR.2.1 TDD
		1		SSB.3 FR1	SSB.3 FR1
CCD cor	oficuration	2		SSB.3 FR1	SSB.3 FR1
335 COI	nfiguration				
		3		SSB.4 FR1	SSB.4 FR1
		1		CSI-RS 1.1A FDD	CSI-RS 1.1A FDD
CSI-RS	configuration	2		CSI-RS 1.1A TDD	CSI-RS 1.1A TDD
		3		CSI-RS 2.1A TDD	CSI-RS 2.1A TDD
OCNG F	Patterns	1~3		OP.1	OP.1
001101	attorno	1 0		DLBWP.0.1	DLBWP.0.1
Initial BV	NP Configuration	1~3			
	garanen	. •		ULBWP.0.1	ULBWP.0.1
		1		TRS.1.1 FDD	TRS.1.1 FDD
TRS cor	nfiguration	2	1	TRS.1.1 TDD	TRS.1.1 TDD
1.10 001	941411011	3	1	TRS.1.2 TDD	TRS.1.2 TDD
		ა			
Dedicate	ed BWP configuration	1~3		DLBWP.1.1	DLBWP.1.1
Dedicate	Ca Davi Comiguration	10		ULBWP.1.1	ULBWP.1.1
SMTC	onfiguration	1~3		SMTC.1	SMTC.1
		1~3			
теропо	onfigType	1~3		periodic	periodic
renort∩ı	uantity-r16	1~3		ssb-Index-SINR-	ssb-Index-SINR-
				r16	r16
Number	of reported RS	1~3		2	2
	R reporting period	1~3		slot80	slot80
	atio of PSS to SSS			0.0.00	2.2.23
	atio of PBCH DMRS to				
SSS					
EPRE ra	atio of PBCH to PBCH				
DMRS					
	tit DDOOLL DMDO				
	atio of PDCCH DMRS				
to SSS					
EPRE ra	atio of PDCCH to				
PDCCH		1~3	dB	0	0
	atio of PDSCH DMRS	. 5	"-		
	2110 01 FD3CH DIVIK3				
to SSS					
EPRE ra	atio of PDSCH to				
PDSCH	DMRS				
	atio of OCNG DMRS to				
SSSNote					
EPRE ra	atio of OCNG to OCNG lote 1				
	NR_FDD_FR1_A,				
	NR_TDD_FR1_A				-117+TT
	NR_FDD_FR1_B				-116.5+TT
	NR_TDD_FR1_C				-116+TT
$N_{oc}$	NR_FDD_FR1_D,	1~3	dBm/15kHz	-94.65+TT	-115.5+TT
Note2	NR_TDD_FR1_D	1~3	UDIII/ IOKEZ	-34.00T11	-110.0+11
	NR_FDD_FR1_E,				
	NR TDD FR1 E				-115+TT
					4445.77
	NR_FDD_FR1_F				-114.5+TT
	NR_FDD_FR1_G				-114+TT
	NR FDD FR1 H				-113.5+TT
	NR_FDD_FR1_A,				-
					117, TT
	NR_TDD_FR1_A				-117+TT
$N_{oc}$			dBm/SSB		
	NR_FDD_FR1_B	1,2		-94.65+TT	-116.5+TT
Note2	NR_TDD_FR1_C	•	SCS		-116+TT
	NR_FDD_FR1_D,				
	-				-115.5+TT
1	NR_TDD_FR1_D				

NR_FDD_FRI_E   1114-TT   1114-TT   1114-TT   1115-TT						
NR FDD FR1 G						-115+TT
NR FDD FR1 A   1114+TT   113.5+TT   114+TT   112.5+TT   114+TT   113.5+TT   114+TT   115.5+TT   114+TT   115.5+TT   114+TT   115.5+TT   114+TT   115.5+TT   115.5+TT   114+TT   113.5+TT   114.5+TT   114.5						-11/ 5+TT
NR FDD FR1 A			1			
NR_FDD_FR1_A   NR_FDD_FR1_B   NR_F						
NR FDD FR1 B   NR FDD FR1 C   NR FDD FR1 B   NR FDD FR1 C   NR F				-		-113.5+11
NR   TDD   FR1   C		NR_TDD_FR1_A				-114+TT
NR   TDD   FR1   C		NR FDD FR1 B				-113.5+TT
NR FDD FR1 D						
NR   TDD   FR1   E   NR   FDD   FR1   E   NR   FD						
NR FDD FR1 E NR FDD FR1 E NR FDD FR1 F NR FDD FR1 H NR FDD FR1 D NR			3		-91.65+11	-112.5+11
NR   FDD   FR1   F		NR_FDD_FR1_E,				-112+TT
NR FDD FR1 G						444 F.TT
NR FDD FR1 H			1			
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			-			
\$\hat{E}_s / N_{oc}	<u> </u>	NR_FDD_FR1_H				
NR_FDD_FR1_A   NR_TDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_A   NR_FDD_FR1_A   NR_FDD_FR1_B   NR_F			1~3	dB	10+TT	0+TT
NR_TDD_FR1_A   NR_FDD_FR1_B   NR_TDD_FR1_C   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_A   NR_FDD_FR1_A   NR_FDD_FR1_B   NR_F	$E_s/N_{ob}$	Ç	1~6	dB	10+TT	0+TT
NR_TDD_FR1_C   NR_FDD_FR1_D   NR_TDD_FR1_D   NR_FDD_FR1_E   NR_FDD_FR1_E   -114.5+TT   -114.5+TT   -113.5+TT   -112.5+TT     NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_E   NR_FDD_FR1_E   -114.5+TT   -112.5+TT   -112.5+TT   -112.5+TT   -113.5+TT   -112.5+TT   -114.5+TT   -113.5+TT   -112.5+TT   -113.5+TT   -112.5+TT   -113.5+TT   -112.5+TT   -112.5+TT   -113.5+TT   -113.5+T		NR_TDD_FR1_A				-117+TT
NR_TDD_FR1_C   NR_FDD_FR1_D   NR_TDD_FR1_D   NR_TDD_FR1_E   NR_TDD_FR1_E   -114.5+TT   -114.5+TT   -114.5+TT   -113.5+TT   -114.5+TT   -115.5+TT   -116.5+TT   -		NR_FDD FR1 B	1			-116.5+TT
NR_FDD_FR1_D, NR_TDD_FR1_E, NR_FDD_FR1_E, NR_FDD_FR1_B,			1			
NR TDD FR1					- ·	445 5 TT
NR_FDD_FR1_E, NR_TDD_FR1_E   NR_FDD_FR1_E     NR_FDD_FR1_G   NR_FDD_FR1_A, NR_FDD_FR1_A, NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_E   NR_FDD_FR1_E     NR_FDD_FR1_E   NR_FDD_FR1_G     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_		/	1,2		-84.65+TT	-115.5+11
NR_IDD_FR1_E   NR_FDD_FR1_G   NR_FDD_FR1_G   NR_FDD_FR1_G     NR_FDD_FR1_B   NR_FDD_FR1_A   NR_FDD_FR1_A   NR_FDD_FR1_B     NR_TDD_FR1_B   NR_TDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_G   NR_FDD_FR1_G     NR_FDD_FR1_G   NR_FDD_FR1_G   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_A   NR_FDD_FR1_A     NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_		NR_FDD_FR1_E,				-115±TT
NR_FDD_FR1_G     NR_FDD_FR1_H     NR_FDD_FR1_A     NR_FDD_FR1_A     NR_FDD_FR1_B     NR_FDD_FR1_D     NR_FDD_FR1_D     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_G     NR_FDD_FR1_G     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_A     NR_FDD_FR1_B     NR_FDD_FR1_A     NR_FDD_FR1_A     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_D     NR_FDD_FR1_D     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_B     NR_F		NR_TDD_FR1_E				-113+11
NR_FDD_FR1_H   NR_FDD_FR1_A     NR_FDD_FR1_A   NR_FDD_FR1_A     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_D   NR_FDD_FR1_E     NR_FDD_FR1_E   NR_FDD_FR1_E     NR_FDD_FR1_E   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_A     NR_FDD_FR1_A   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B		NR_FDD_FR1_F				-114.5+TT
RSRP   NR_FDD_FR1_A   NR_FDD_FR1_A   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_D   NR_FDD_FR1_D     NR_FDD_FR1_E   NR_FDD_FR1_E     NR_FDD_FR1_E   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_A   NR_FDD_FR1_A     NR_FDD_FR1_A   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_D   NR_FDD_FR1_D     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_E   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_E     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_FR1_D   NR_FDD_FR1_B     NR_FDD_FR1_B   NR_FDD_FR1_B     NR_FDD_F	000	NR_FDD_FR1_G				-114+TT
NR   FDD   FR1   A   NR   TDD   FR1   A   NR   TDD   FR1   B     NR   TDD   FR1   B   NR   TDD   FR1   D   NR   FDD   FR1   D     NR   FDD   FR1   E   NR   FDD   FR1   E     NR   FDD   FR1   E   NR   FDD   FR1   A     NR   FDD   FR1   A   NR   FDD   FR1   A     NR   FDD   FR1   A   NR   FDD   FR1   A     NR   FDD   FR1   B   NR   TDD   FR1   D     NR   FDD   FR1   B   NR   TDD   FR1   B     NR   FDD   FR1   B   NR   FDD   FR1   B     NR   FDD   FR1   D   NR   FDD   FR1   D     NR   FDD   FR1   D   NR   FDD   FR1   B     NR   FDD   FR1   D   N		NR_FDD_FR1_H				-113.5+TT
NR_FDD_FR1_B		NR_TDD_FR1_A			-81.65+TT	-114+TT
NR_TDD_FR1_C						112 5 TT
NR_FDD_FR1_D,   NR_TDD_FR1_E,   NR_FDD_FR1_E,   NR_FDD_FR1_B,   NR_FDD_FR1_B,   NR_FDD_FR1_B,   NR_FDD_FR1_B,   NR_FDD_FR1_A,   NR_FDD_FR1_B,   NR_FDD_FR1_A,   NR_FDD_FR1_A,   NR_FDD_FR1_A,   NR_FDD_FR1_A,   NR_FDD_FR1_A,   NR_FDD_FR1_A,   NR_FDD_FR1_B,   NR_FDD_FR1_B			-			
NR_TDD_FR1_E			-			-114+11
NR_FDD_FR1_E,   NR_TDD_FR1_E     -112+TT		. – – – –	3			-112.5+TT
NR_TDD_FR1_E NR_FDD_FR1_F NR_FDD_FR1_G NR_FDD_FR1_H  NR_FDD_FR1_A, NR_TDD_FR1_A, NR_TDD_FR1_B NR_TDD_FR1_D, NR_TDD_FR1_D NR_FDD_FR1_E NR_FDD_FR1_E NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_C NR_FDD_FR1_B NR_FDD_FR1_A, NR_TDD_FR1_A NR_TDD_FR1_A NR_TDD_FR1_A NR_TDD_FR1_A NR_TDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_B NR_FDD_FR1_C NR_FDD_FR1_B NR_FDD_FR1_C NR_FDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_E  NR_FDD_FR1_B			-			
NR_FDD_FR1_F   NR_FDD_FR1_G   NR_FDD_FR1_G     NR_FDD_FR1_H   NR_FDD_FR1_A     NR_FDD_FR1_A     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_D     NR_FDD_FR1_D     NR_FDD_FR1_E     NR_TDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_E     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_B     NR_FDD_FR1_A     NR_FDD_FR1_A     NR_FDD_FR1_A     NR_FDD_FR1_A     NR_FDD_FR1_B     NR_FDD_FR1		NO TOO FOLE				-112+TT
NR_FDD_FR1_G						-111.5+TT
NR_FDD_FR1_H						
NR_FDD_FR1_A,   NR_TDD_FR1_B     -116.5+TT     -116.5+TT       -116.5+TT						
NR_TDD_FR1_A						. 10.0111
NR_TDD_FR1_C		NR_TDD_FR1_A				-117+TT
NR_FDD_FR1_D,   NR_TDD_FR1_E   NR_FDD_FR1_E   NR_FDD_FR1_E   NR_FDD_FR1_E   NR_FDD_FR1_B   NR_FDD_FR1_A, NR_TDD_FR1_A   NR_FDD_FR1_A   NR_FDD_FR1_B   NR_FDD_FR1_B   NR_TDD_FR1_C   NR_FDD_FR1_C   NR_FDD_FR1_D, NR_TDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_E		NR_FDD_FR1_B				-116.5+TT
NR_TDD_FR1_D						-116+TT
NR_IDD_FR1_D		NR_FDD_FR1_D,	4.0		04 65 . TT	-115 5±TT
NR_TDD_FR1_E   NR_FDD_FR1_F   NR_FDD_FR1_G   NR_FDD_FR1_H   NR_FDD_FR1_A   NR_TDD_FR1_A   NR_FDD_FR1_B   NR_TDD_FR1_C   NR_FDD_FR1_C   NR_FDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_D   NR_FDD_FR1_E			1,∠		-04.05+11	-110.0+11
CSI-RS RSRP Note3  NR_FDD_FR1_E NR_FDD_FR1_G NR_FDD_FR1_H NR_FDD_FR1_A NR_TDD_FR1_A NOTE 5  NR_FDD_FR1_B NR_TDD_FR1_C NR_FDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_E  -81.65+TT -112.5+TT -112.5+TT						-115+TT
RSRP Note3 NR_FDD_FR1_G NR_FDD_FR1_H NR_FDD_FR1_A, NR_TDD_FR1_A NOTE5 NR_FDD_FR1_B NR_TDD_FR1_C NR_FDD_FR1_D, NR_TDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_E, -112.5+TT						_
NR_FDD_FR1_G				dBm/CSI-RS		
NR_FDD_FR1_H NR_FDD_FR1_A, NR_TDD_FR1_A NOTE 5  NR_FDD_FR1_B NR_TDD_FR1_C NR_FDD_FR1_D, NR_TDD_FR1_D NR_TDD_FR1_D NR_FDD_FR1_D NR_FDD_FR1_E,  -113.5+TT -114+TT -113.5+TT -113.5+TT -112.5+TT						
NR_TDD_FR1_A       -114+TT         NR_FDD_FR1_B       -113.5+TT         NR_TDD_FR1_C       3         NR_FDD_FR1_D,       -81.65+TT         NR_TDD_FR1_D       -112.5+TT         NR_FDD_FR1_E,       -112+TT	Note3					-113.5+TT
NR_TDD_FR1_C       3         NR_FDD_FR1_D,       -81.65+TT         NR_TDD_FR1_D       -112.5+TT         NR_FDD_FR1_E,       -112+TT		NR_TDD_FR1_A				-114+TT
NR_TDD_FR1_C       3         NR_FDD_FR1_D,       -81.65+TT         NR_TDD_FR1_D       -112.5+TT         NR_FDD_FR1_E,       -112+TT		NR FDD FR1 R				-113.5+TT
NR_FDD_FR1_D, NR_TDD_FR1_D NR_FDD_FR1_E, -112+TT			3		-81.65+TT	
NR_TDD_FR1_D NR_FDD_FR1_E, -112+TT						
	_	NR_TDD_FR1_D				-112.5+TT
						-112+TT

	NR_FDD_FR1_F				-111.5+TT
	NR_FDD_FR1_G				-111+TT
	NR_FDD_FR1_H				-110.5+TT
	NR_FDD_FR1_A,				
	NR_TDD_FR1_A				-86.04+TT
	NOTE 5				
	NR_FDD_FR1_B				-85.54+TT
	NR_TDD_FR1_C				-85.04+TT
	NR_FDD_FR1_D,	1,2	dBm/9.36	-56.28+TT	-84.54+TT
	NR_TDD_FR1_D	1,2	MHz		0.10.1.1.
	NR_FDD_FR1_E,				-84.04+TT
	NR_TDD_FR1_E				00 54 TT
	NR_FDD_FR1_F				-83.54+TT
	NR_FDD_FR1_G				-83.04+TT
lo Note3	NR_FDD_FR1_H				-82.54+TT
	NR_FDD_FR1_A,		dBm/38.16 MHz	-50.19+TT	70.04.TT
	NR_TDD_FR1_A				-79.94+TT
	NR FDD FR1 B				-79.44+TT
					-79.44+11 -78.94+TT
	NR_TDD_FR1_C				-70.94+11
	NR_FDD_FR1_D, NR_TDD_FR1_D	3			-78.44+TT
	NR FDD FR1 E.				
	NR TDD FR1 E				-77.94+TT
	NR FDD FR1 F				-77.44+TT
	NR_FDD_FR1_G				-76.94+TT
	NR FDD FR1 H				-76.44+TT
Propagat		1~3		AWGN	AWGN
Propagation condition  Antenna configuration		1~3		1x2	1x2

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification.

Table 6.7.9.2.5-2: Same as Table 6.7.9.1.5-2

Table 6.7.9.2.5-3: Same as Table 6.7.9.1.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.

# 6.7.9.3 NR SA FR1 CSI-RS based CMR and dedicated IMR L1-SINR measurement accuracy

Editor's note: This clause is incomplete. The following aspects are either missing or not yet determined:

- MU & TT needs further study
- Message content is incomplete

6.7.9.3.1 Test purpose

The purpose of this test is to verify that the L1-SINR measurement accuracy is within the specified limits.

### 6.7.9.3.2 Test applicability

This test applies to all types of NR UE from Release 16 onwards. Applicability requires support of L1-SINR measurements.

## 6.7.9.3.3 Minimum conformance requirements

The minimum conformance requirements are specified in clause 6.7.9.0.3.

The normative reference for this requirement is TS 38.133 [6] clause A.6.7.9.3.

6.7.9.3.4 Test description

6.7.9.3.4.1 Initial conditions

This test shall be tested using any of the test configurations in Table 6.7.9.3.4.1-1.

Table 6.7.9.3.4.1-1: Applicable NR configurations for FR1 L1-SINR measurement test with CSI-RS based CMR and CSI-IM based IMR

Config		Description			
1		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, FDD duplex mode			
2		NR 15 kHz CSI-RS SCS, 10 MHz bandwidth, TDD duplex mode			
3		NR 30kHz CSI-RS SCS, 40 MHz bandwidth, TDD duplex mode			
Note:	The UE is only re	quired to be tested in one of the supported test configurations in each supported band			

Configure the test equipment and the DUT according to the parameters in Table 6.7.9.3.4.1-2.

Table 6.7.9.3.4.1-2: Initial conditions for CSI-RS based CMR and CSI-IM based IMR absolute accuracy in FR1

Parameter		Value	Comment
Test environment	NC, TI	_/VL, TL/VH, TH/VL, TH/VH	As specified in TS 38.508-1 [14] clause 4.1.
Test frequencies	,	As specified in Annex E, Table E.4-	1 and TS 38.508-1 [14] clause 4.3.1.
Channel bandwidth	,	As specified by the test configuration	on selected from Table 6.7.9.1.4.1-1.
Propagation conditions		AWGN	As specified in Annex C.2.2.
Connection Diagram	TE Part 2Rx	A.3.1.8.2 with n = 1	As specified in TS 38.508-1 [14] Annex A.
, and the second	TE Part 4Rx	A.3.1.8.5 with n = 1	
	DUT Part 2Rx	A.3.2.3.4	
	DUT Part 4Rx	A.3.2.5.2	
Exceptions to connection diagram		N/A	

- 1. Message contents are defined in clause 6.7.9.3.4.3.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based CMR and CSI-IM based IMR measurements. The UE is configured to perform RLM and BFD measurement based on the CSI-RS. The connection setup is done according to the settings in Annex C.1.1.
- 2. Cell 1 is the NR FR1 cell. Cell 1 is the target for CSI-RS based CMR and CSI-IM measurements. The UE is configured to perform RLM, BFD and L1-SINR measurement based on the CSI-RSs. The connection setup is done according to the settings in Annex C.1.2 and C.1.3.

# 6.7.9.3.4.2 Test procedure

Prior to the start of the time duration T1, the UE shall be fully synchronized to PSCell. The UE shall be configured for periodic CSI reporting in PUCCH [format 2] with a reporting periodicity as mentioned in the above table 6.7.9.3.4.1-2.

- 1. Ensure the UE is in state RRC\_CONNECTED with generic procedure parameters Connectivity NR SA, Connected without release *On* and Test Mode *On*, according to TS 38.508-1 [14] clause 4.5 and general test parameters set according to Table 6.7.9.3.4.1-2.
- 2. Set the parameters according to T1 in Table 6.7.9.3.5-1. SS transmits CSI-RS as IMR with a periodicity of 20 slots.
- 3. The UE shall start sending L1-SINR report including results of both SSB#0 and SSB#1 every 80 slots.
- 4. The SS shall check the L1-SINR reported values of CSI-RS #0 and CSI-RS #1 in the periodic L1-SINR reports. If the value for both CSI-RSs is within the limits in Table 6.7.9.3.5-2 and Table 6.7.9.3.5-3 (depending on the test configuration), the number of passed iterations is increased by one, otherwise the number of failed iterations is increased by one.
- 5. The SS shall continue checking the L1-SINR report messages transmitted by the UE until the confidence level according to Table G.2.3-1 in Annex G is achieved.
- 6. Set the parameters according to each sub-test in Table 6.7.9.3.5-1 as appropriate and repeat steps 3-5.

#### 6.7.9.3.4.3 Message contents

Same message content as in subclause 6.7.9.1.4.3 with the following exception:

Message contents are according to TS 38.508-1 [14] clause 7.3 with the following exceptions:

Table 6.7.9.3.4.3-1: Common Exception messages NR SA CSI-RS based CMR and dedicated IMR L1-SINR measurement

Default Message Contents				
Common contents of system information				
blocks exceptions				
Default RRC messages and information	Table H.3.6A-1 with conditions PERIODIC and CSI-SINR and CSI-			
elements contents exceptions	IM_IMR			
	Table H.3.6A-2 with conditions CSI-RS and PERIODIC			
	Table H.3.6A-3 with condition PERIODIC			
	Table 7.3.1-3 in TS 38.508-1 [14] with condition SMTC.1			

## Table 6.7.9.3.4.3-2: RadioLinkMonitoringConfig

Derivation Path: TS 38.508-1 [14], Table 4.6.3-133						
Information Element	Value/remark	Comment	Condition			
RadioLinkMonitoringConfig ::= SEQUENCE {						
failureDetectionResourcesToAddModList	1 entry					
purpose	both	UE is configured to perform RLM and BFD based on the SSBs.				
}						
}						

### 6.7.9.3.5 Test requirement

Table 6.7.9.3.5-1 defines the primary level settings including test tolerances for all tests.

Each L1-SINR measurement report for each of the tests in Table 6.7.9.3.5-1 shall meet the corresponding absolute accuracy requirements in Table 6.7.9.3.5-2 for test configurations 1 and 2, and the corresponding absolute accuracy requirements in Table 6.7.9.3.5-3 for test configuration 3.

Table 6.7.9.3.5-1: FR1 CSI-RS based L1-SINR test parameters

Parameter	Config	Unit	Test 1	Test 2
SSB GSCN	1~3		freq1	freq1
	1		FDD	FDD
Duplex mode	2		TDD	TDD
	3		TDD	TDD
	1		N/A	N/A
TDD Configuration	2	1	TDDConf.1.1	TDDConf.1.1
	3	1	TDDConf.2.1	TDDConf.2.1
	1		10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
BW <sub>channel</sub>	2	MHz	10: N <sub>RB,c</sub> = 52	10: N <sub>RB,c</sub> = 52
	3		40: N <sub>RB,c</sub> = 106	40: N <sub>RB,c</sub> = 106
PDSCH Reference	1		SR.1.1 FDD	SR.1.1 FDD
measurement channel	2		SR.1.1 TDD	SR.1.1 TDD
measurement channel	3		SR.2.1 TDD	SR.2.1 TDD
DMCLCODECET Deference	1		CR.1.1 FDD	CR.1.1 FDD
RMSI CORESET Reference	2		CR.1.1 TDD	CR.1.1 TDD
Channel	3	1	CR.2.1 TDD	CR.2.1 TDD
- "	1		CCR.1.1 FDD	CCR.1.1 FDD
Dedicated CORESET	2	1	CCR.1.1 TDD	CCR.1.1 TDD
Reference Channel	3		CCR.2.1 TDD	CCR.2.1 TDD
	1		SSB.1 FR1	SSB.1 FR1
SSB configuration	2	-	SSB.1 FR1	SSB.1 FR1
SSB configuration	3	-		
0010 5 "			SSB.2 FR1	SSB.2 FR1
OCNG Patterns	1~3		OP.1	OP.1
	1		TRS.1.1 FDD	TRS.1.1 FDD
TRS configuration	2		TRS.1.1 TDD	TRS.1.1 TDD
	3		TRS.1.2 TDD	TRS.1.2 TDD
Initial BWP Configuration	1~3		DLBWP.0.1	DLBWP.0.1
Initial BVVF Configuration	1~3		ULBWP.0.1	ULBWP.0.1
Dedicated DMD configuration	4.0		DLBWP.1.1	DLBWP.1.1
Dedicated BWP configuration	1~3		ULBWP.1.1	ULBWP.1.1
SMTC configuration	1~3		SMTC.1	SMTC.1
-	1		CSI-RS 1.2 FDD	CSI-RS 1.2 FDD
CSI-RS	2	1	CSI-RS 1.2 TDD	CSI-RS 1.2 TDD
	3		CSI-RS 2.2 TDD	CSI-RS 2.2 FDD
reportConfigType	1~3		periodic	periodic
reportQuantity-r16	1~3		cri-SINR-r16	cri-SINR-r16
nrofReportedRS	1~3		2	2
L1-SINR reporting period	1~3		_	slot80
	1~3		slot80	510100
EPRE ratio of PSS to SSS				
EPRE ratio of PBCH DMRS to				
SSS EPRE ratio of PBCH to PBCH				
DMRS				
EPRE ratio of PDCCH DMRS to SSS				
EPRE ratio of PDCCH to PDCCH DMRS	1~3	dB	0	0
EPRE ratio of PDSCH DMRS to SSS	1		, and the second	
	4			
EPRE ratio of PDSCH to PDSCH DMRS				
EPRE ratio of OCNG DMRS to SSSNote 1				
EPRE ratio of OCNG to OCNG DMRS Note 1				
NR_FDD_FR1_A,				
$N_{oc}$ $NR_{NOTE 5}$	4.0	dD::-/45!!!	04.05: ***	-117+TT
Note2	1~3	dBm/15kHz	-94.65+TT	110 = ==
NR_FDD_FR1_B				-116.5+TT
NR_TDD_FR1_C				-116+TT

	NR_FDD_FR1_D, NR_TDD_FR1_D				-115.5+TT
	NR_FDD_FR1_E,				-115+TT
	NR_TDD_FR1_E NR_FDD_FR1_F				-114.5+TT
	NR_FDD_FR1_G				-114+TT
	NR_FDD_FR1_H				-113.5+TT
	NR_FDD_FR1_A,				
	NR_TDD_FR1_A				-117+TT
	NR FDD FR1 B				-116.5+TT
	NR_TDD_FR1_C				-116+TT
	NR_FDD_FR1_D,	1,2		-94.65+TT	-115.5+TT
	NR_TDD_FR1_D NR_FDD_FR1_E,	.,_		0.100	
	NR_TDD_FR1_E				-115+TT
	NR_FDD_FR1_F				-114.5+TT
<b>A</b> 7	NR_FDD_FR1_G		dBm/CSI-RS		-114+TT
$N_{oc}$	NR_FDD_FR1_H NR_FDD_FR1_A,		SCS		-113.5+TT
NOIGZ	NR_TDD_FR1_A NR_TDD_FR1_A				-114+TT
	NR_FDD_FR1_B				-113.5+TT
	NR_TDD_FR1_C				-114+TT
	NR_FDD_FR1_D,	3		-91.65+TT	-112.5+TT
	NR_TDD_FR1_D	J		-91.05+11	112.0111
	NR_FDD_FR1_E, NR_TDD_FR1_E				-112+TT
	NR_FDD_FR1_F				-111.5+TT
	NR_FDD_FR1_G				-111+TT
A /	NR_FDD_FR1_H				-110.5+TT
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		1~3	dB	10+TT	-3+TT
	NR_FDD_FR1_A, NR_TDD_FR1_A NOTE 5	1,2			-120+TT
	NR_FDD_FR1_B				-119.5+TT
	NR_TDD_FR1_C			-84.65+TT	-119+TT
	NR_FDD_FR1_D, NR_TDD_FR1_D				-118.5+TT
	NR_FDD_FR1_E, NR_TDD_FR1_E				-118+TT
	NR_FDD_FR1_F				-117.5+TT
CSI-RS	NR_FDD_FR1_G		ID (00) D0		-117+TT
RSRP	NR_FDD_FR1_H NR_FDD_FR1_A,		dBm/CSI-RS SCS		-116.5+TT
Note3	NR_TDD_FR1_A NOTE 5				-117+TT
	NR_FDD_FR1_B				-116.5+TT
	NR_TDD_FR1_C				-116+TT
	NR_FDD_FR1_D, NR_TDD_FR1_D	3		-81.65+TT	-115.5+TT
	NR_FDD_FR1_E,				445
	NR_TDD_FR1_E				-115+TT
	NR_FDD_FR1_F				-114.5+TT
	NR_FDD_FR1_G NR_FDD_FR1_H				-114+TT -113.5+TT
	NR_FDD_FR1_H NR_FDD_FR1_A,				-113.0+11
	NR_TDD_FR1_A	1,2		-56.28 <b>+</b> TT	-87.28+TT
	NR_FDD_FR1_B				-86.78+TT
lo Note3	NR_TDD_FR1_C		dBm/9.36		-86.28+TT
	NR_FDD_FR1_D, NR_TDD_FR1_D		MHz		-85.78+TT
	NR_FDD_FR1_E, NR_TDD_FR1_E				-85.28+TT
	NR_FDD_FR1_F				-84.78+TT

NR_FDD_FR1_G				-84.28+TT
NR_FDD_FR1_H				-83.78+TT
NR_FDD_FR1_A,				
NR_TDD_FR1_A				-81.19+TT
NOTE 5				
NR_FDD_FR1_B				-80.69+TT
NR_TDD_FR1_C				-80.19+TT
NR_FDD_FR1_D,	3	dBm/38.16	-50.19+TT	-79.69+TT
NR_TDD_FR1_D	3	MHz	-50.19+11	-79.09+11
NR_FDD_FR1_E,				-79.19+TT
NR_TDD_FR1_E				-79.19+11
NR_FDD_FR1_F				-78.69+TT
NR_FDD_FR1_G				-78.19+TT
NR_FDD_FR1_H				-77.69+TT
$\hat{E}_s/N_{oc}$	1~3	dB	10+TT	-3+TT
Propagation condition	1~3		AWGN	AWGN
Antenna configuration	1~3		1x2	1x2

- Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
- Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled.
- Note 3: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
- Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.
- Note 5: The test configuration excludes support for band n51 and it is not required to run this test on band n51 in this release of the specification.

Table 6.7.9.3.5-2: Same as Table 6.7.9.1.5-2

Table 6.7.9.3.5-3: Same as Table 6.7.9.1.5-3

For the test to pass, the ratio of successful reported values in each test shall be more than 90% with a confidence level of 95%.