LTE band 26(Part22), 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
836.5	1.30	1.28
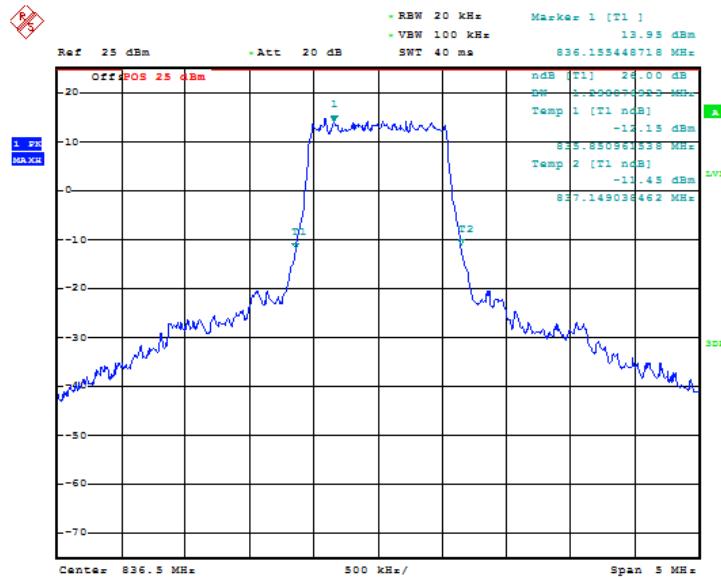
Date: 9.SEP.2019 11:46:41

Fig.167 LTE band 26, 1.4MHz Bandwidth, QPSK (-26dBc BW)
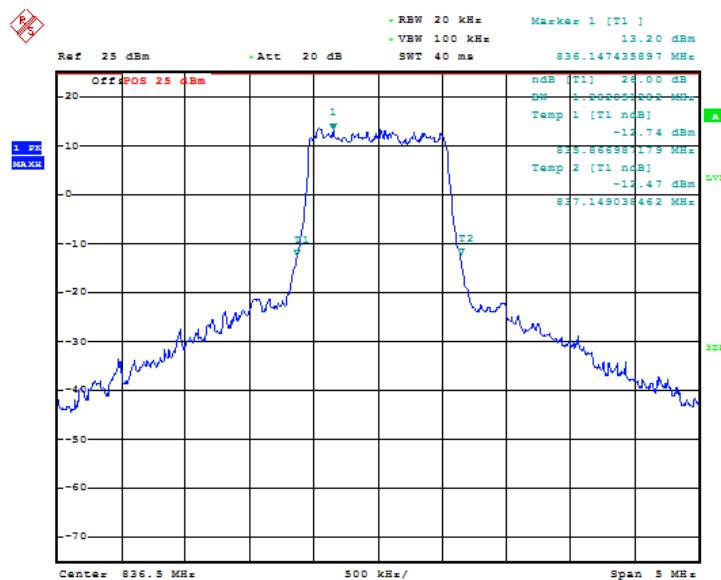
Date: 9.SEP.2019 11:47:45

Fig.168 LTE band 26, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part22), 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
836.5	2.98	2.96
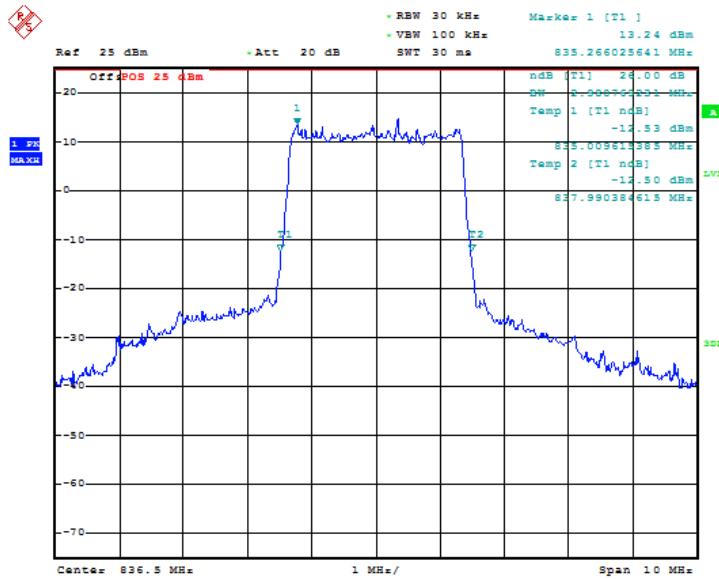
Date: 9.SEP.2019 11:48:56

Fig.169 LTE band 26, 3MHz Bandwidth, QPSK (-26dBc BW)
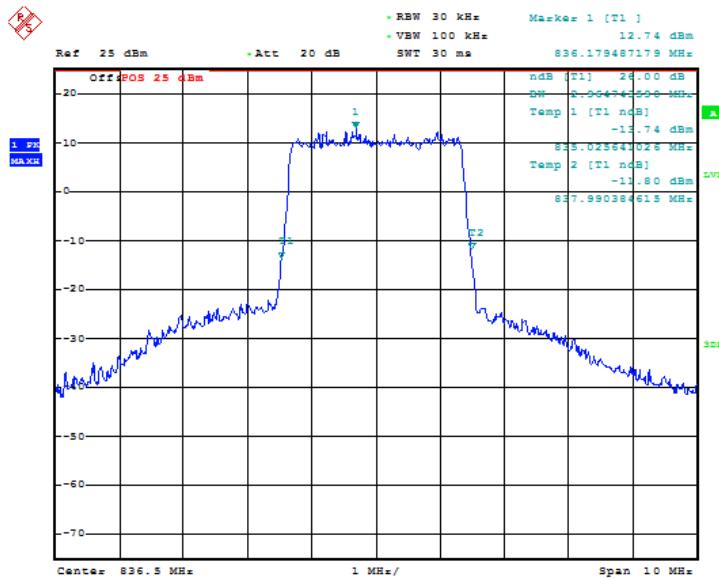
Date: 9.SEP.2019 11:50:00

Fig.170 LTE band 26, 3MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part22), 5MHz (-26dBc)

| Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
836.5	5.00	4.95
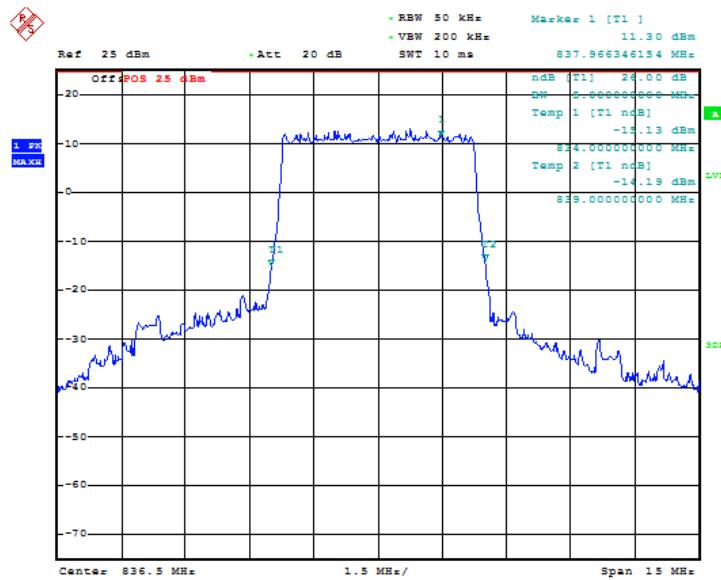
Fig.171 LTE band 26, 5MHz Bandwidth, QPSK (-26dBc BW)
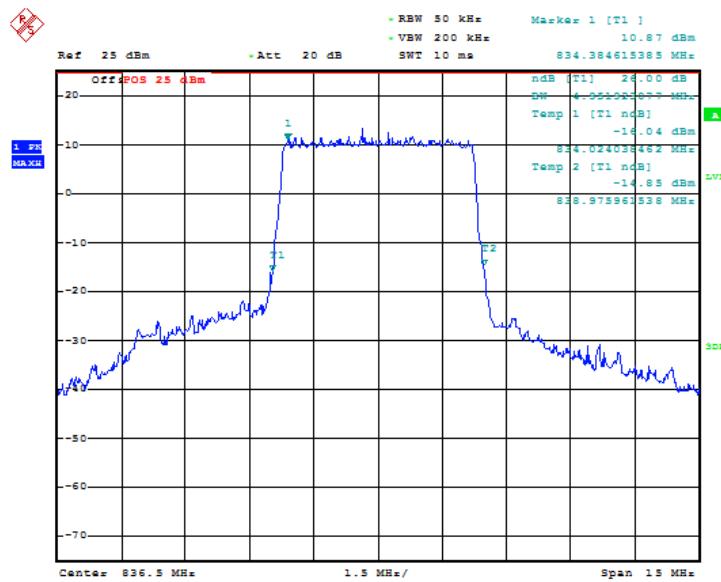
Fig.172 LTE band 26, 5MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part22), 10MHz (-26dBc)
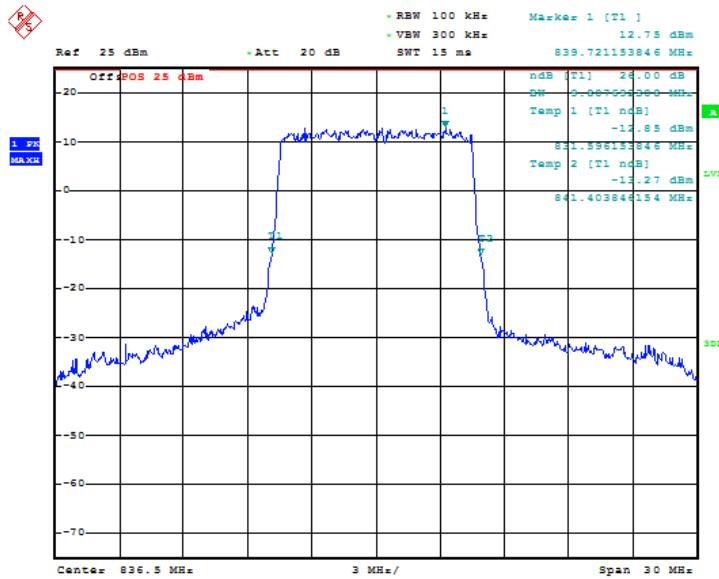
Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
836.5	9.81	9.66

Fig.173 LTE band 26, 10MHz Bandwidth, QPSK (-26dBc BW)
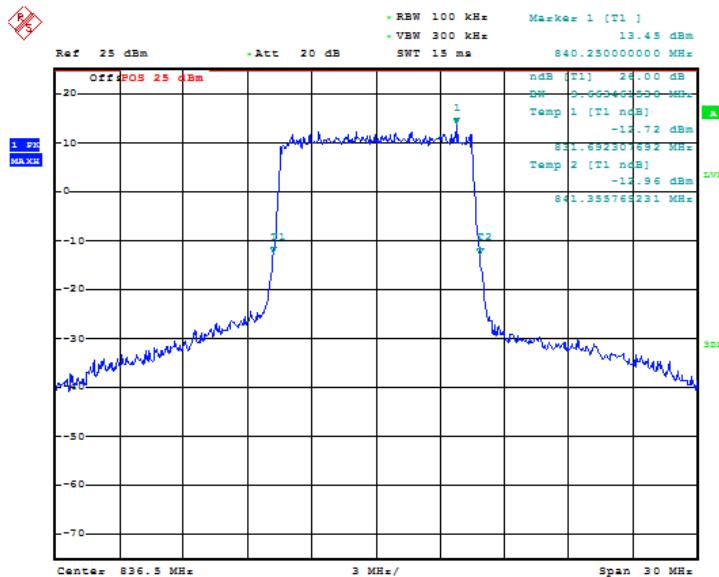
Fig.174 LTE band 26, 10MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part22), 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
836.5	14.64	14.71
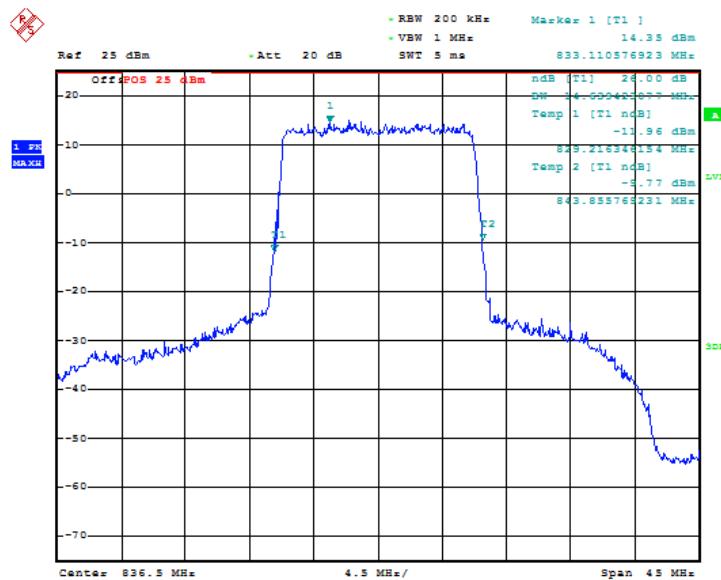
Date: 9.SEP.2019 11:55:41

Fig.175 LTE band 26, 15MHz Bandwidth, QPSK (-26dBc BW)
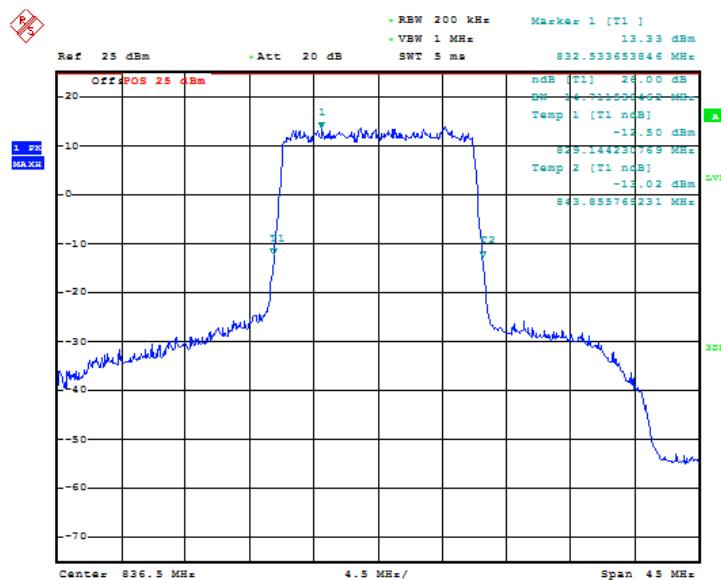
Date: 9.SEP.2019 11:56:45

Fig.176 LTE band 26, 15MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part90), 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
819.0	1.28	1.29
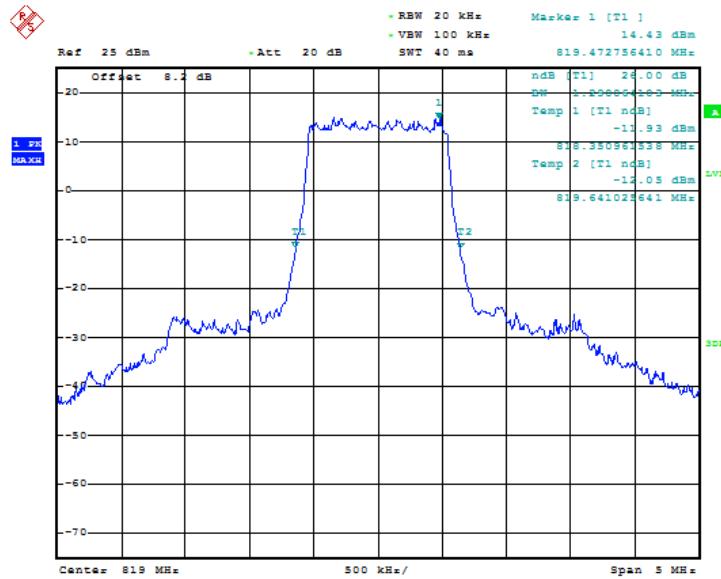
Fig.177 LTE band 26, 1.4MHz Bandwidth, QPSK (-26dBc BW)
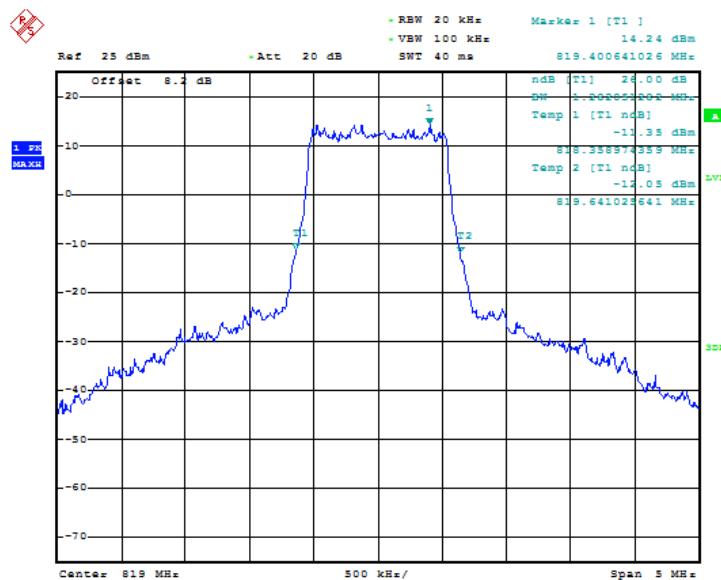

Fig.178 LTE band 26, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part90), 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
819.0	2.95	2.98
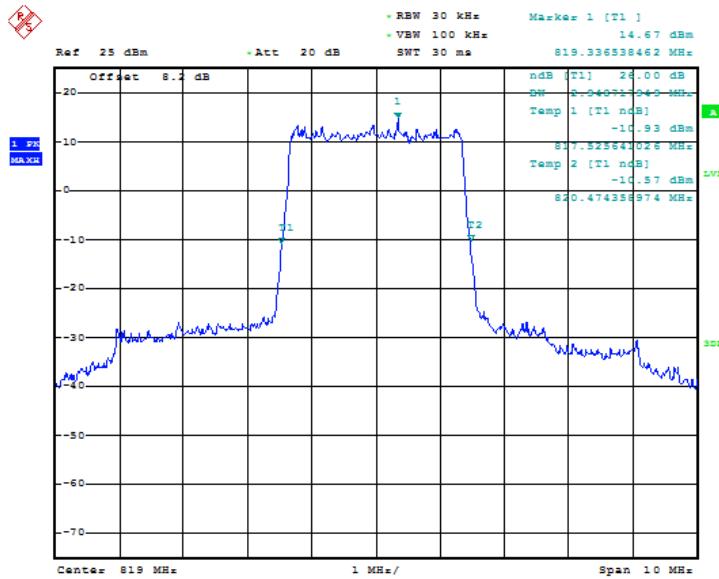
Fig.179 LTE band 26, 3MHz Bandwidth, QPSK (-26dBc BW)
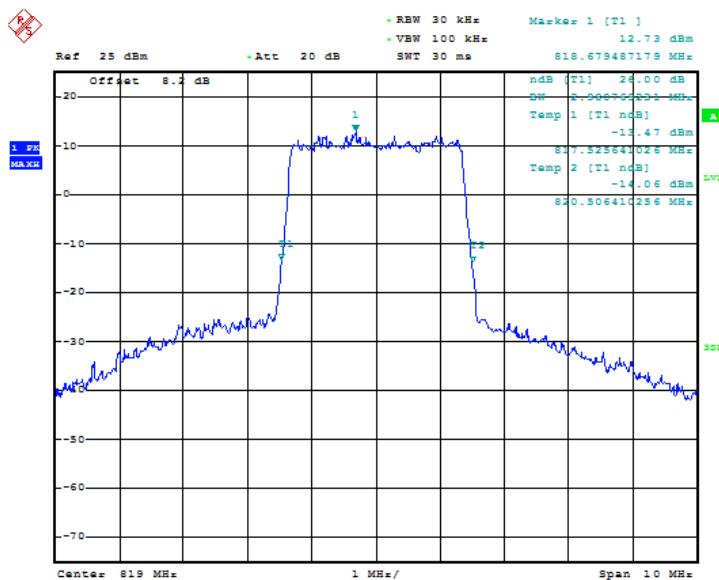
Fig.180 LTE band 26, 3MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part90), 5MHz (-26dBc)

| Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
819.0	4.95	4.90
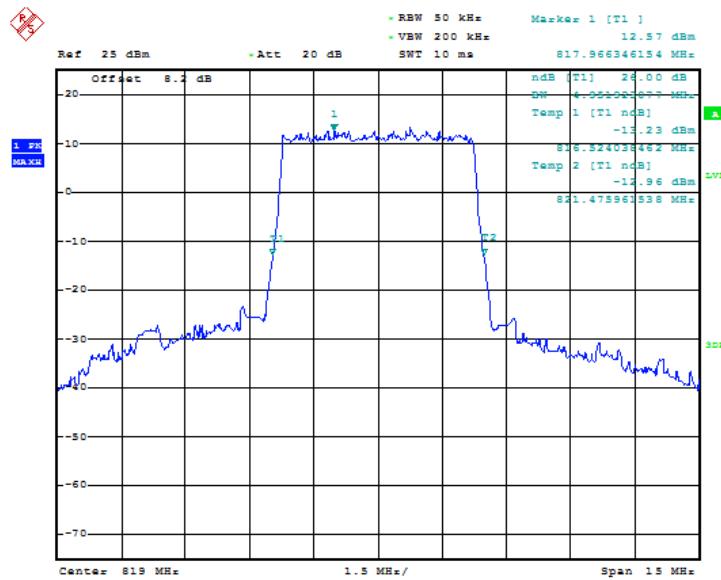
Fig.181 LTE band 26, 5MHz Bandwidth, QPSK (-26dBc BW)
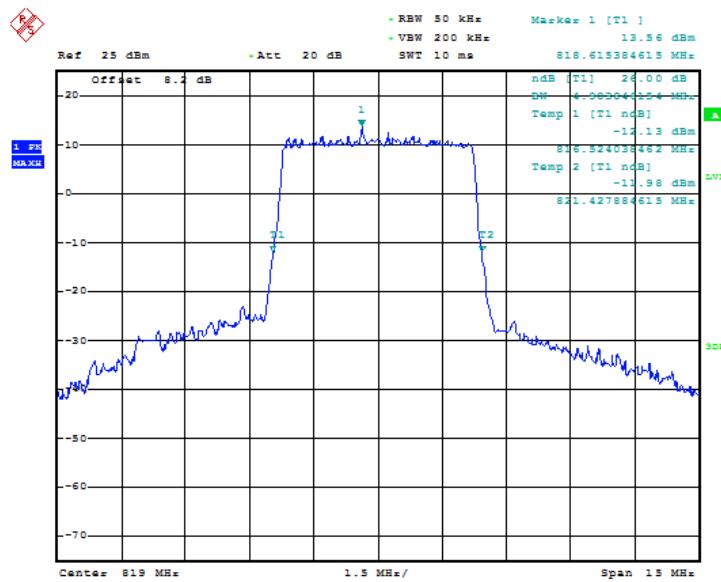
Fig.182 LTE band 26, 5MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 26(Part90), 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
819.0	9.81	9.71
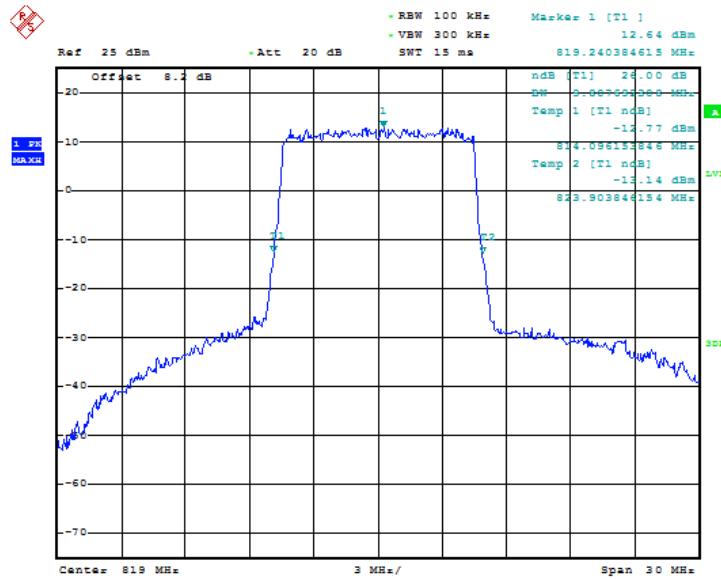
Fig.183 LTE band 26, 10MHz Bandwidth, QPSK (-26dBc BW)
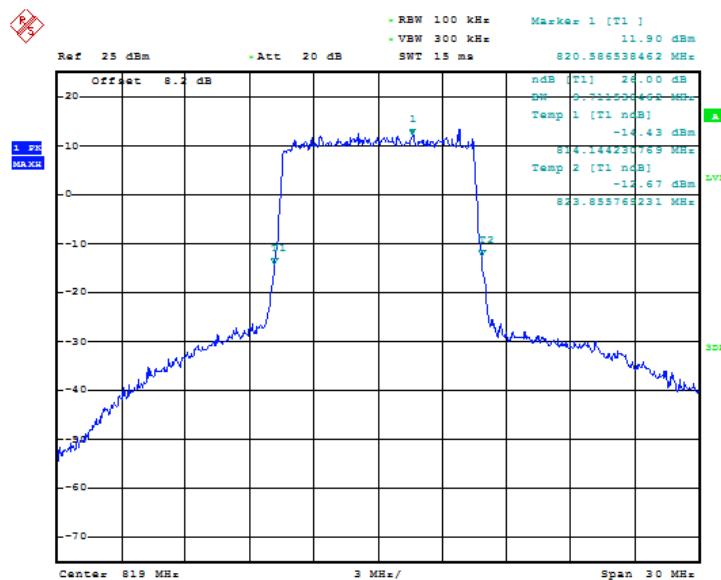
Fig.184 LTE band 26, 10MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 41, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
2595.0	4.95	4.93
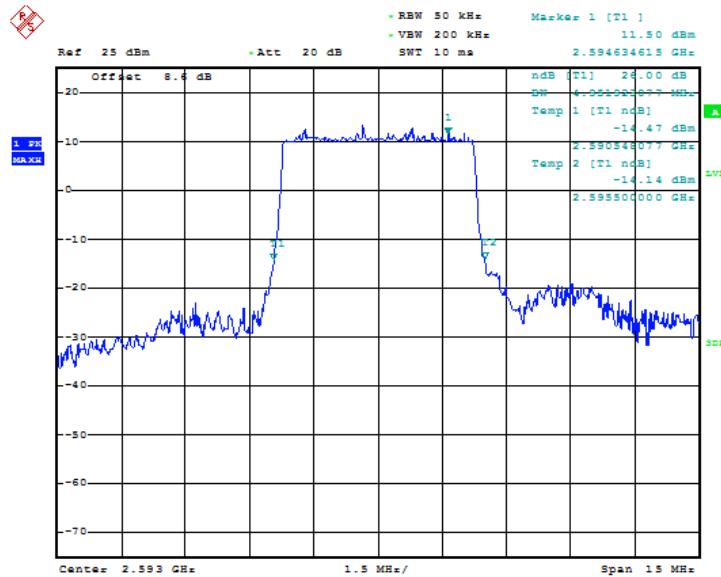
Date: 26.AUG.2019 07:16:49

Fig.185 LTE band 41, 5MHz Bandwidth, QPSK (-26dBc BW)
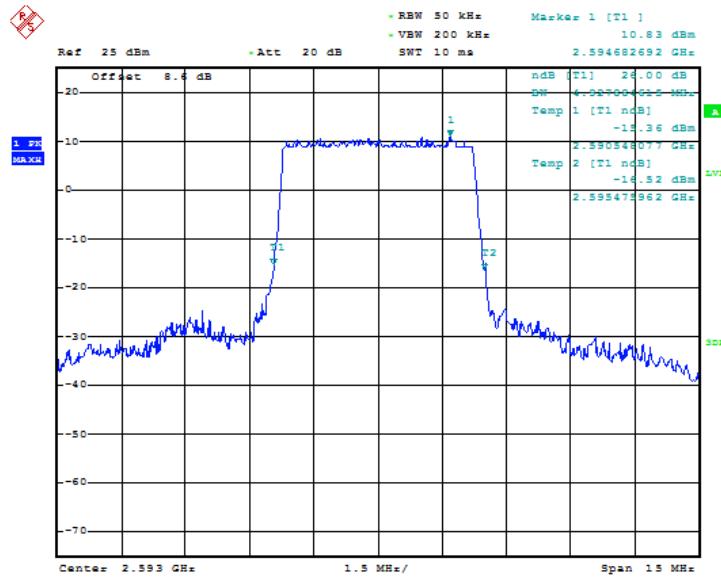
Date: 26.AUG.2019 07:17:53

Fig.186 LTE band 41, 5MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 41, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
2595.0	10.43	9.62
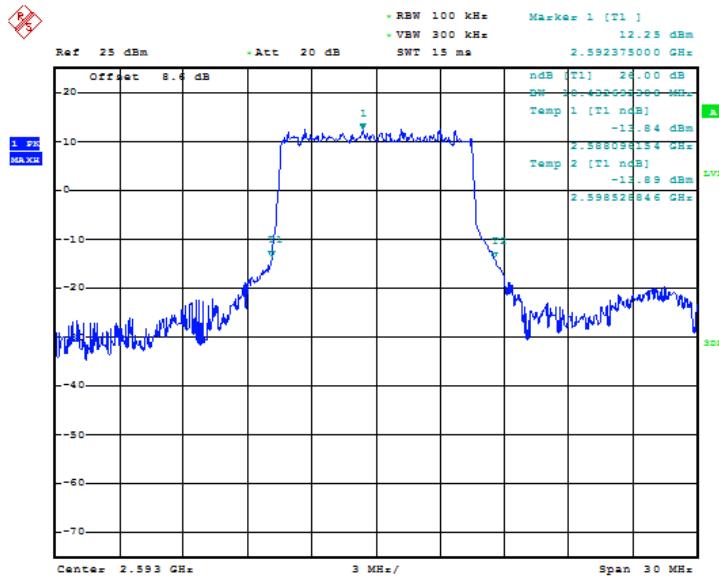
Fig.187 LTE band 41, 10MHz Bandwidth, QPSK (-26dBc BW)
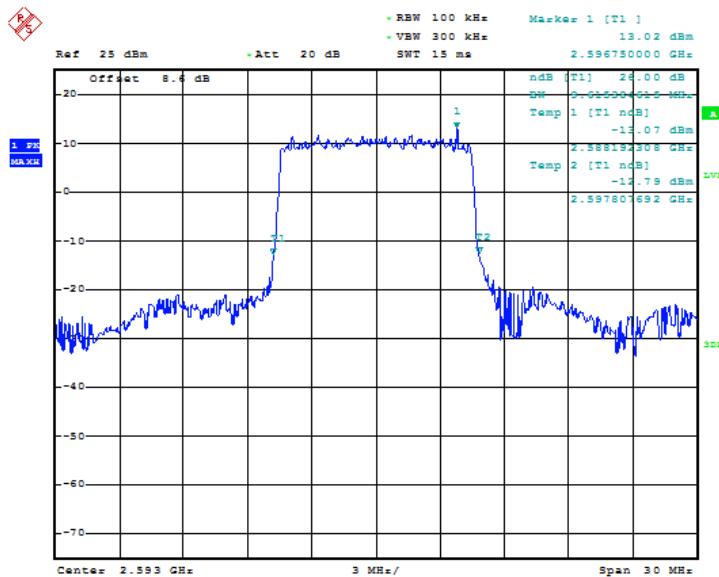
Fig.188 LTE band 41, 10MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 41, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
2595.0	15.72	15.36
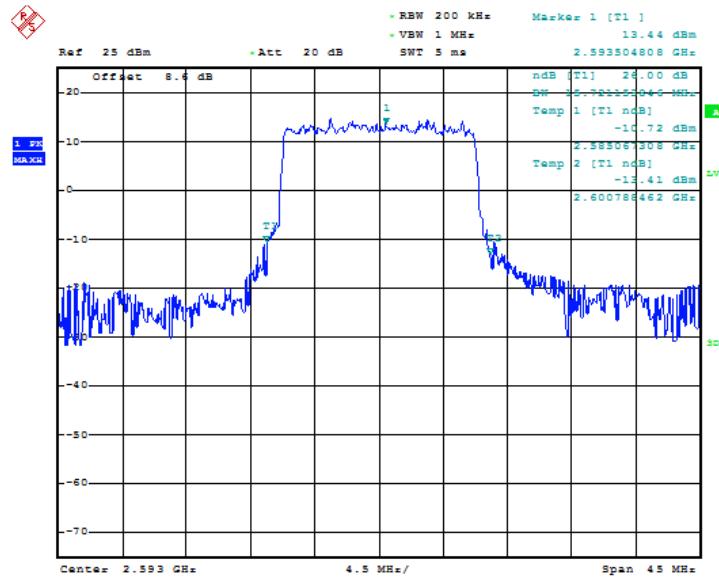
Date: 26.AUG.2019 07:21:21

Fig.189 LTE band 41, 15MHz Bandwidth, QPSK (-26dBc BW)
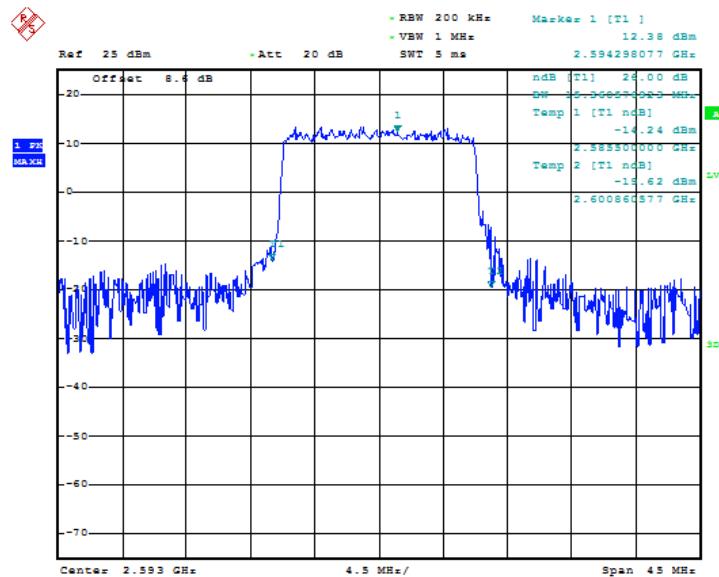
Date: 26.AUG.2019 07:22:25

Fig.190 LTE band 41, 15MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 41, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
2595.0	19.23	19.32
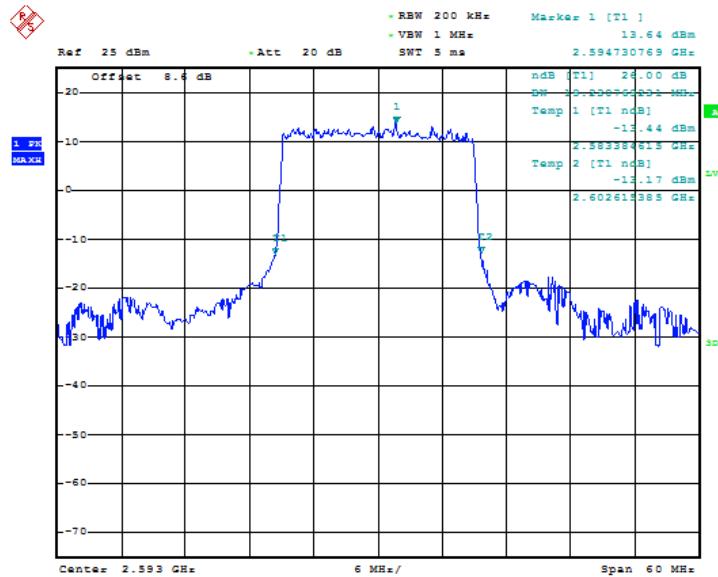
Fig.191 LTE band 41, 20MHz Bandwidth, QPSK (-26dBc BW)
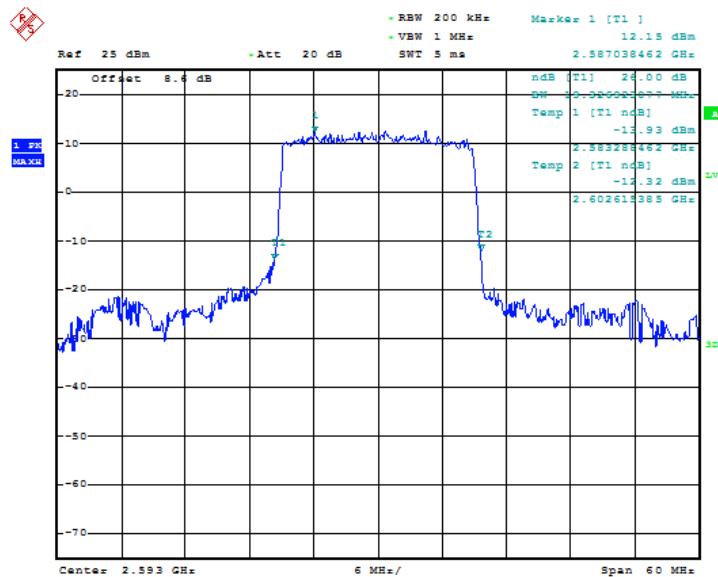

Fig.192 LTE band 41, 20MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 66, 1.4MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1882.5	1.41	1.34
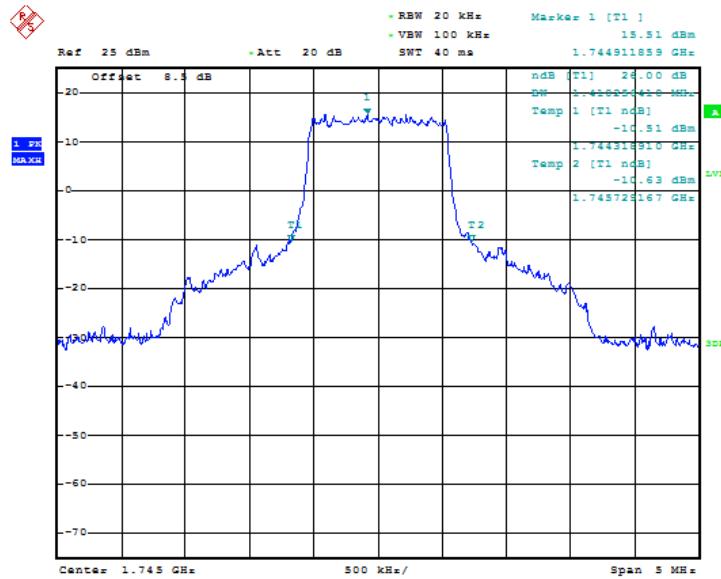
Date: 9.SEP.2019 10:29:35

Fig.185 LTE band 66, 1.4MHz Bandwidth, QPSK (-26dBc BW)
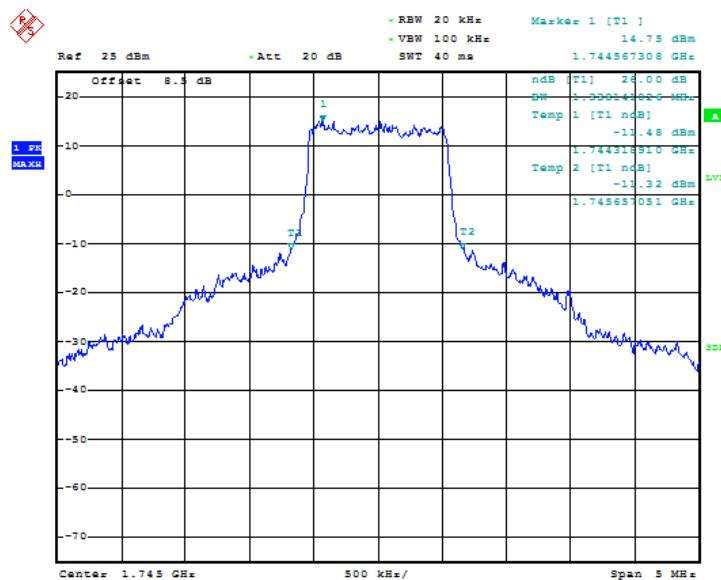
Date: 9.SEP.2019 10:30:39

Fig.186 LTE band 66, 1.4MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 66, 3MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1882.5	3.04	3.00
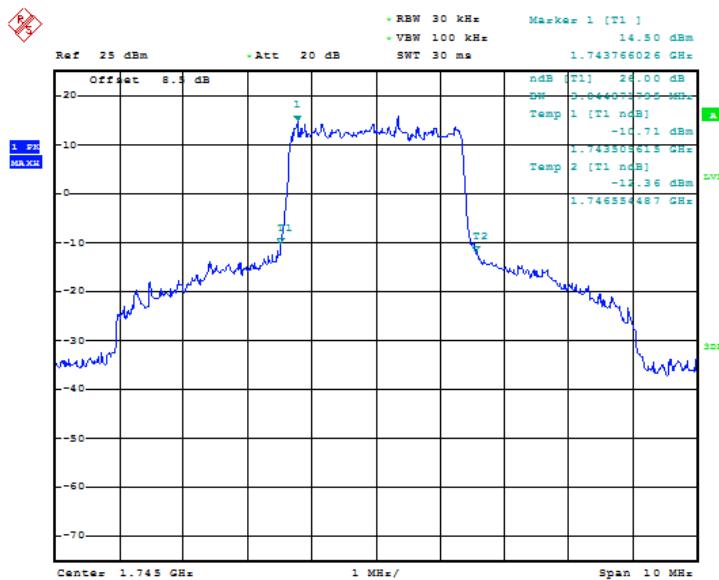
Fig.187 LTE band 66, 3MHz Bandwidth, QPSK (-26dBc BW)
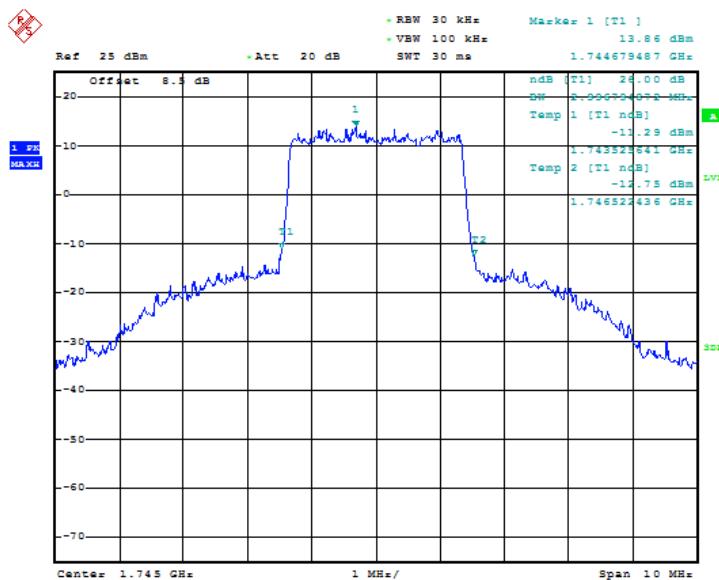
Fig.188 LTE band 66, 3MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 66, 5MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1882.5	5.07	5.05
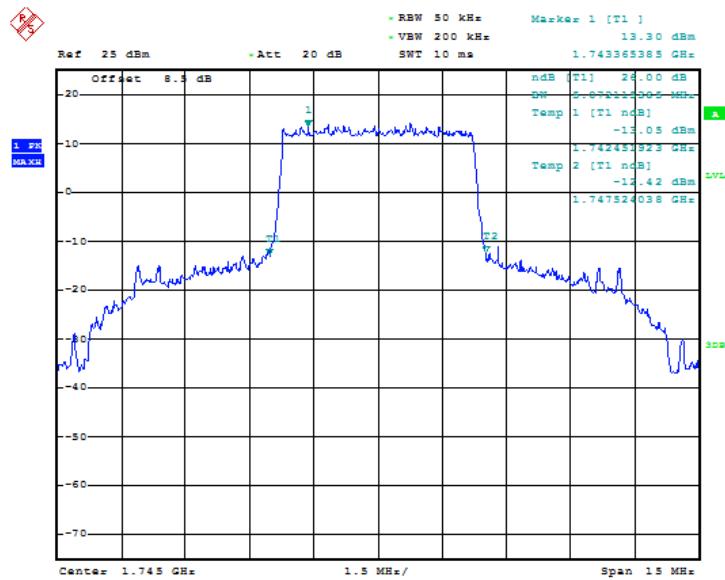
Date: 9.SEP.2019 10:34:07

Fig.189 LTE band 66, 5MHz Bandwidth, QPSK (-26dBc BW)
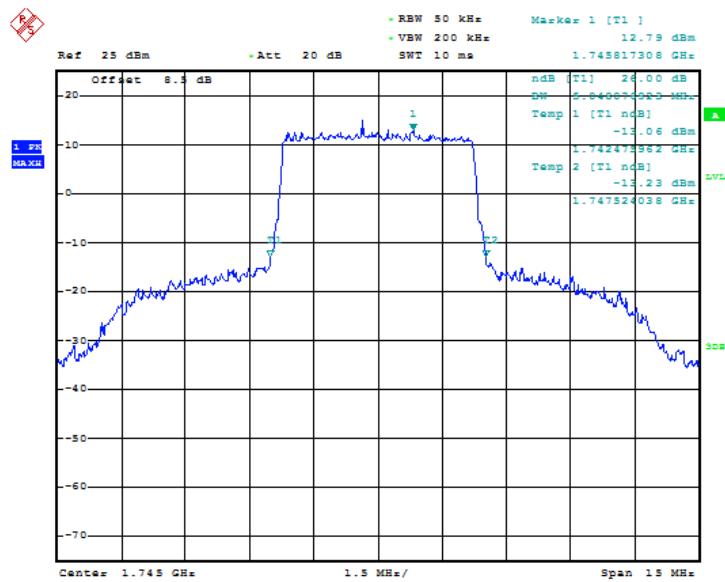
Date: 9.SEP.2019 10:35:11

Fig.190 LTE band 66, 5MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 66, 10MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1882.5	10.34	9.90
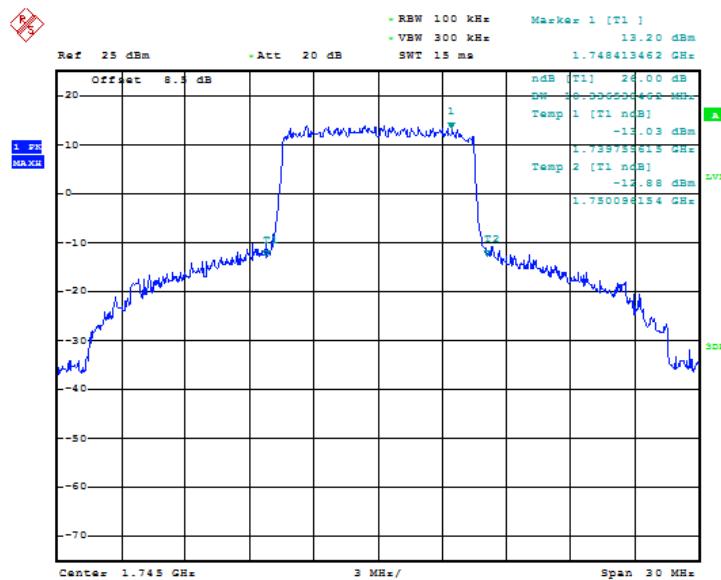
Fig.191 LTE band 66, 10MHz Bandwidth, QPSK (-26dBc BW)
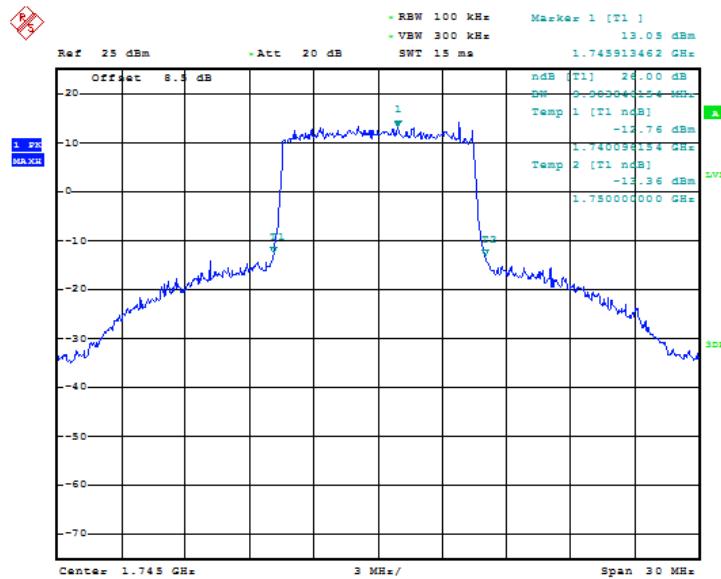
Fig.192 LTE band 66, 10MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 66, 15MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1882.5	16.51	16.07
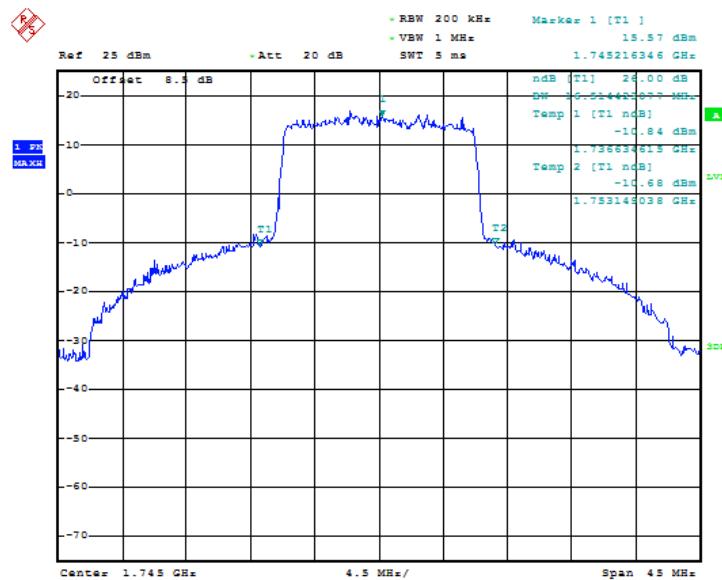
Date: 9.SEP.2019 10:38:40

Fig.193 LTE band 66, 15MHz Bandwidth, QPSK (-26dBc BW)
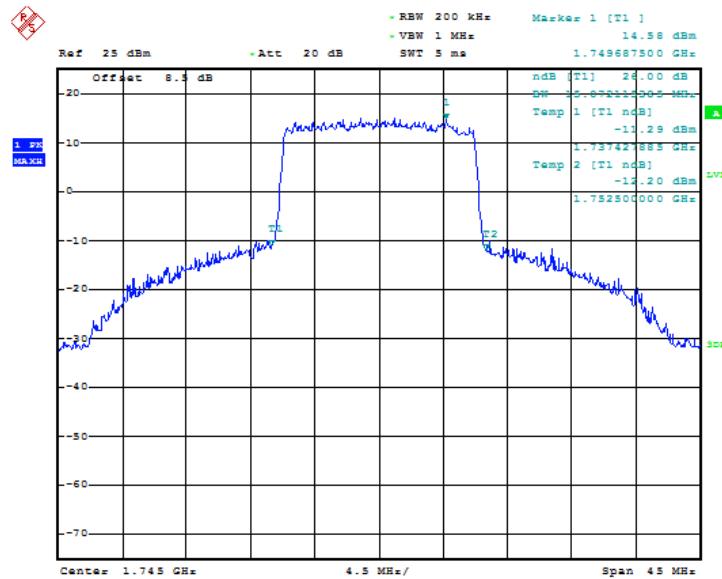
Date: 9.SEP.2019 10:39:44

Fig.194 LTE band 66, 15MHz Bandwidth, 16QAM (-26dBc BW)

LTE band 66, 20MHz (-26dBc)

Frequency(MHz)	Occupied Bandwidth (-26dBc)(MHz)	
	QPSK	16QAM
1882.5	19.81	20.38
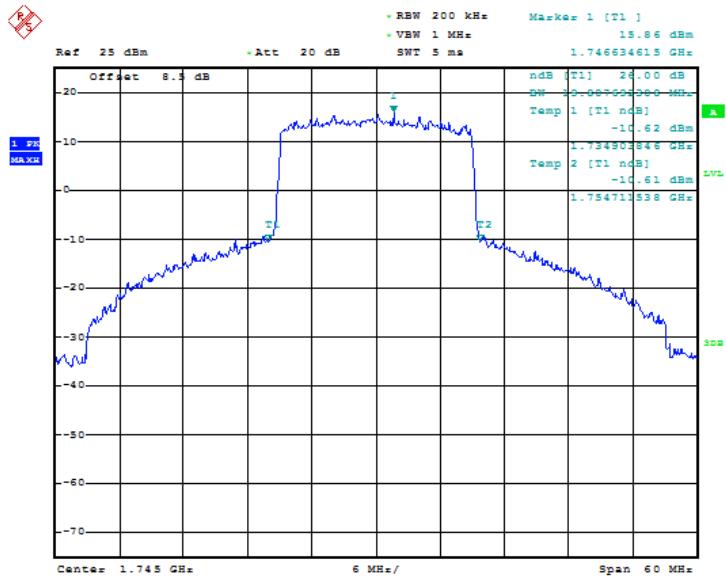
Date: 9.SEP.2019 10:40:56

Fig.195 LTE band 66, 20MHz Bandwidth, QPSK (-26dBc BW)
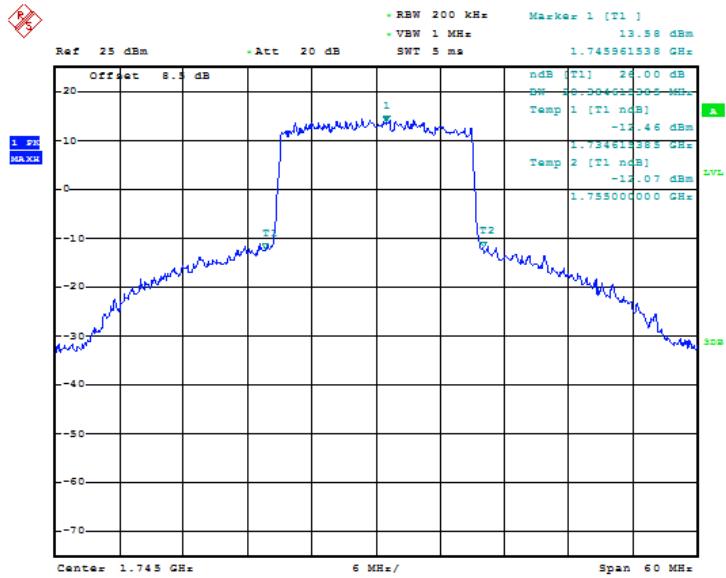
Date: 9.SEP.2019 10:42:00

Fig.196 LTE band 66, 20MHz Bandwidth, 16QAM (-26dBc BW)

ANNEX A.6.   BAND EDGE COMPLIANCE

Reference

FCC: CFR Part 22.917(b),24.238(a), 27.53(g),27.53(h), 27.53(m), 90.691

A.6.1 Measurement limit

Part 22.917(b),24.238(a), 27.53(g),27.53(h), 27.53(m), 90.691 state that on any frequency outside frequency band of the US Cellular/PCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log (P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

According to KDB 971168 6, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

Part 27.53(m) states that for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

**A.6.2 Measurement result**

Only worst case result is given below

LTE band 2
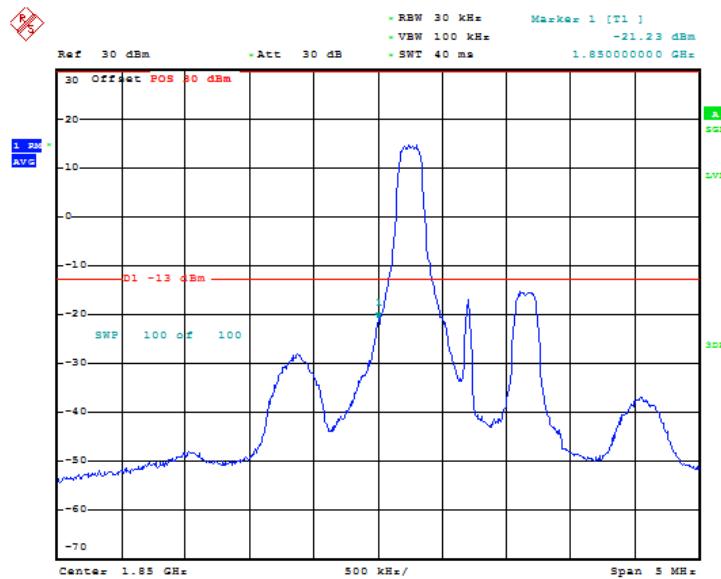
Fig.193 LOW BAND EDGE BLOCK-1RB-low_offset
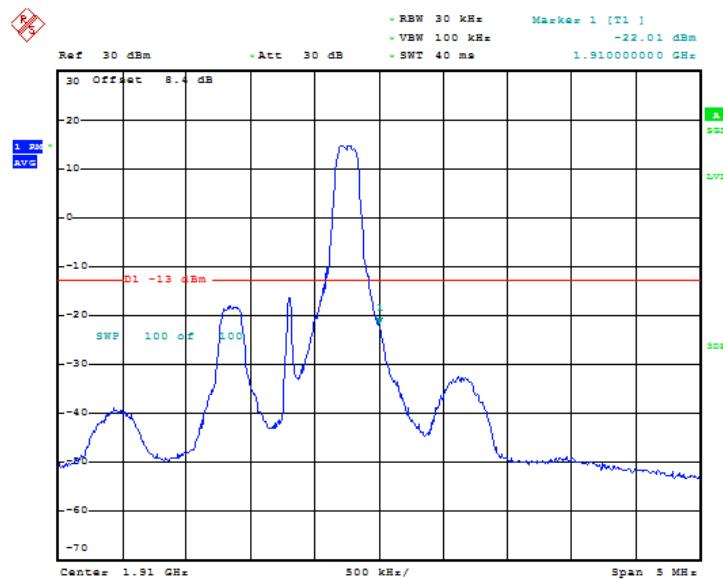
Fig.194 HIGH BAND EDGE BLOCK-1RB-high_offset
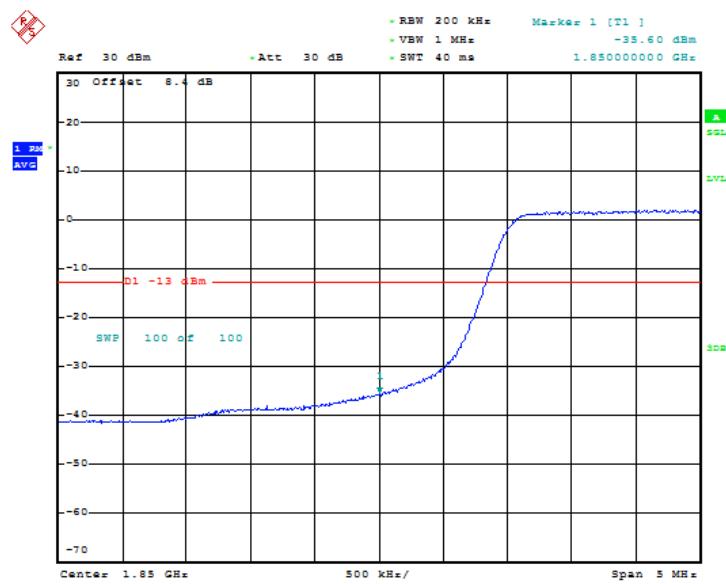
Date: 22.AUG.2019 09:06:53

Fig.195 LOW BAND EDGE BLOCK-20MHz-100%RB
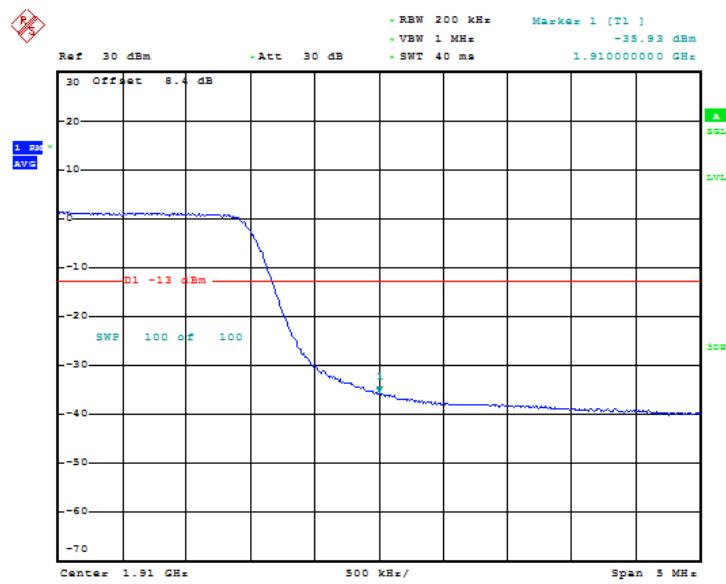
Date: 22.AUG.2019 09:07:29

Fig.196 HIGH BAND EDGE BLOCK-20MHz-100%RB

LTE band 4
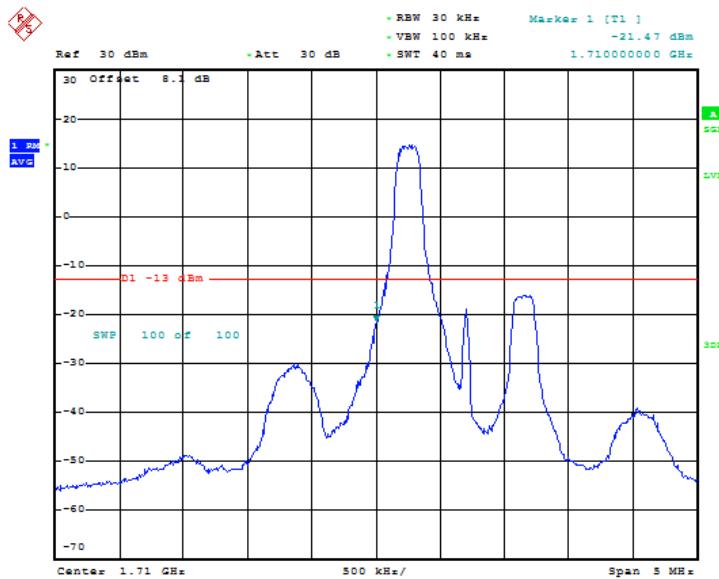
Fig.197 LOW BAND EDGE BLOCK-1RB-low_offset
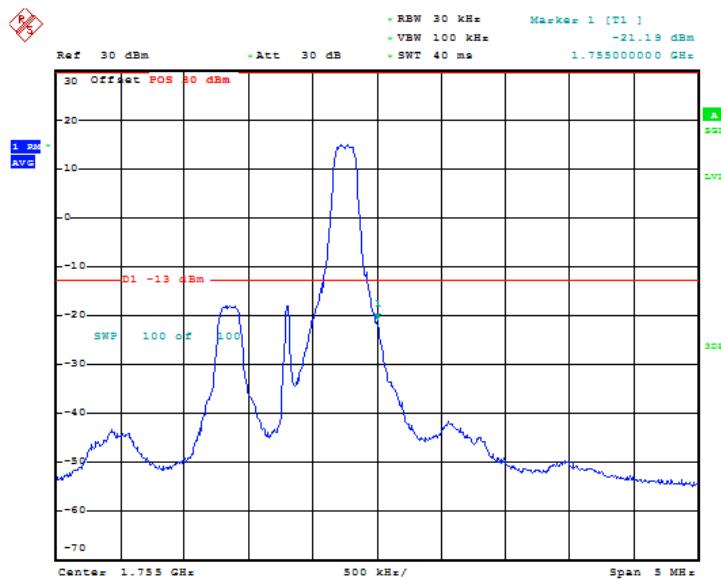

Fig.198 HIGH BAND EDGE BLOCK-1RB-high_offset
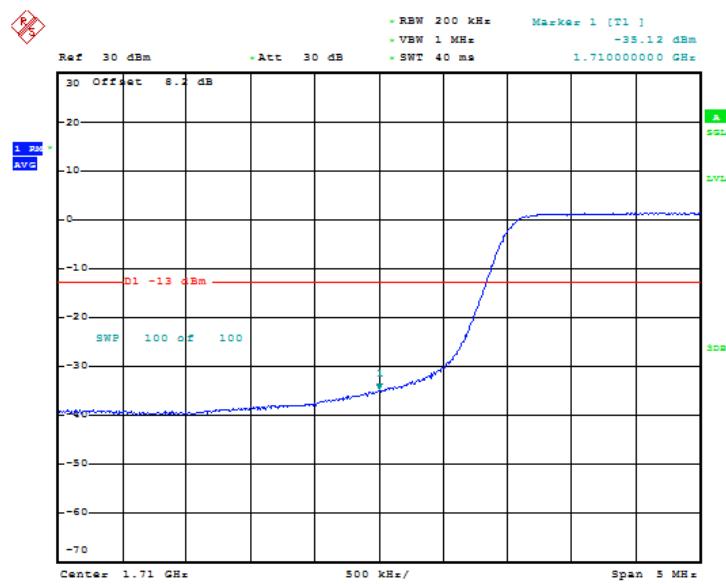
Date: 22.AUG.2019 09:08:40

Fig.199 LOW BAND EDGE BLOCK-20MHz-100%RB
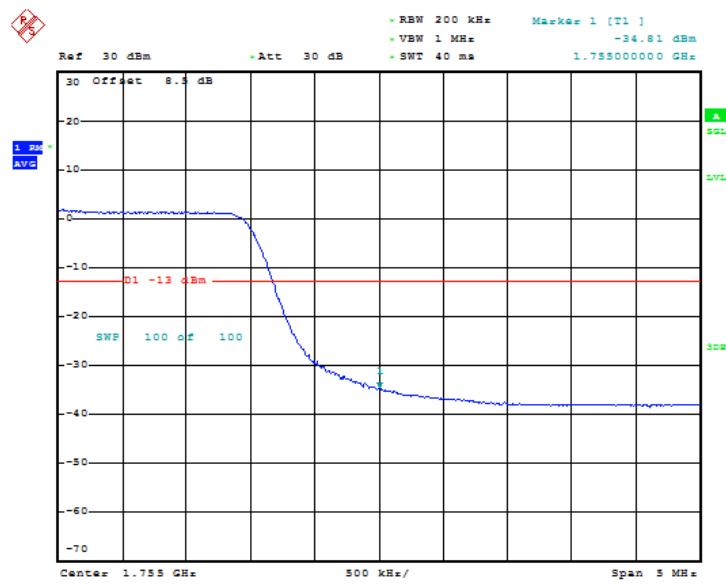
Date: 22.AUG.2019 09:09:17

Fig.200 HIGH BAND EDGE BLOCK-20MHz-100%RB

LTE band 5

Date: 22.AUG.2019 08:57:51
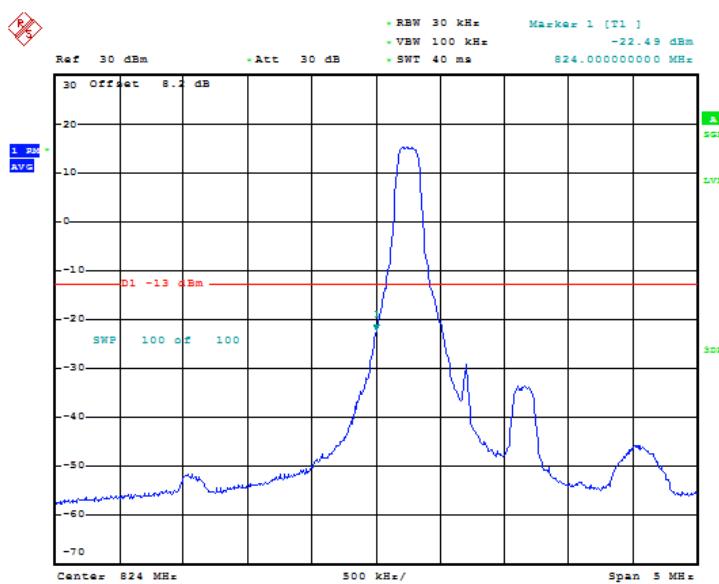
Fig.201 LOW BAND EDGE BLOCK-1RB-low_offset


Date: 22.AUG.2019 08:58:27
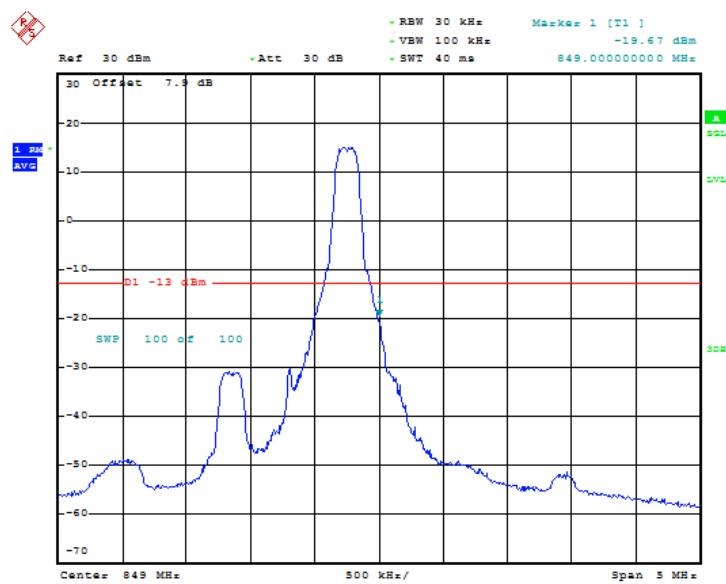
Fig.202 HIGH BAND EDGE BLOCK-1RB-high_offset
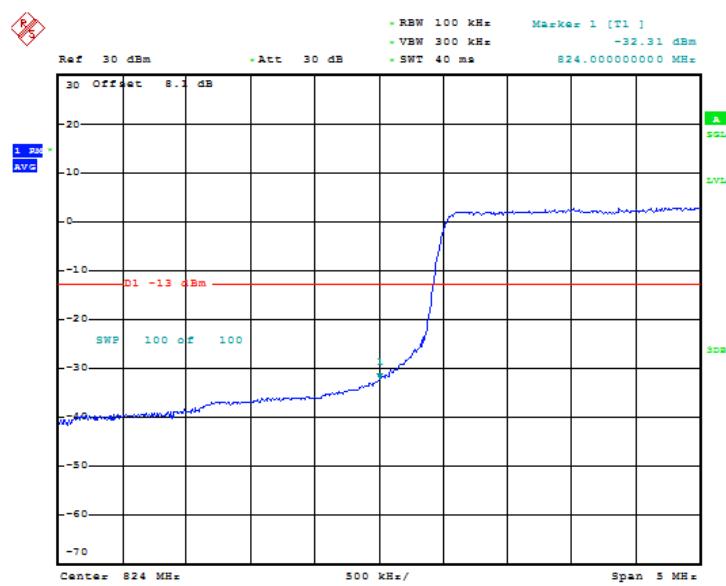
Date: 9.SEP.2019 10:01:27

Fig.203 LOW BAND EDGE BLOCK-10MHz-100%RB
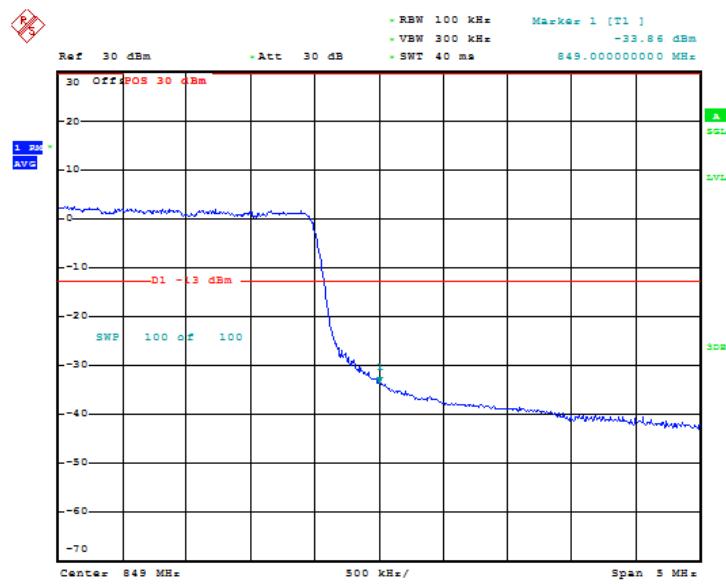
Date: 9.SEP.2019 10:02:01

Fig.204 HIGH BAND EDGE BLOCK-10MHz-100%RB

## LTE band 7
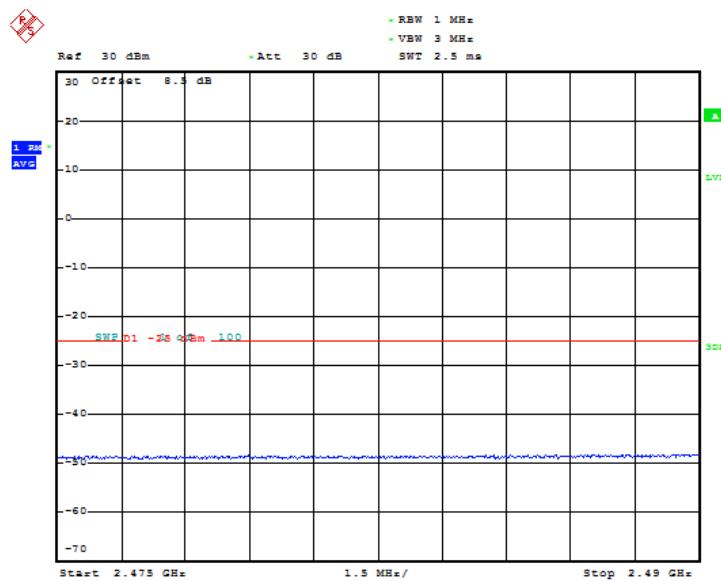
Date: 26.AUG.2019 07:46:40
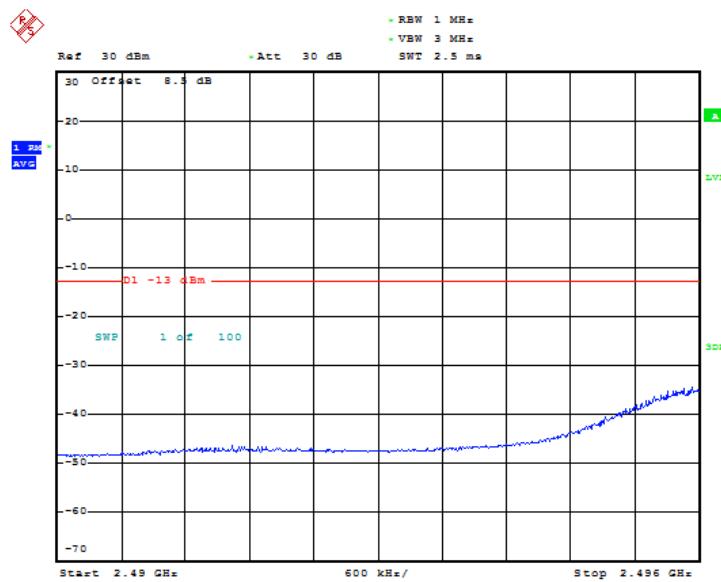
Date: 26.AUG.2019 07:47:06
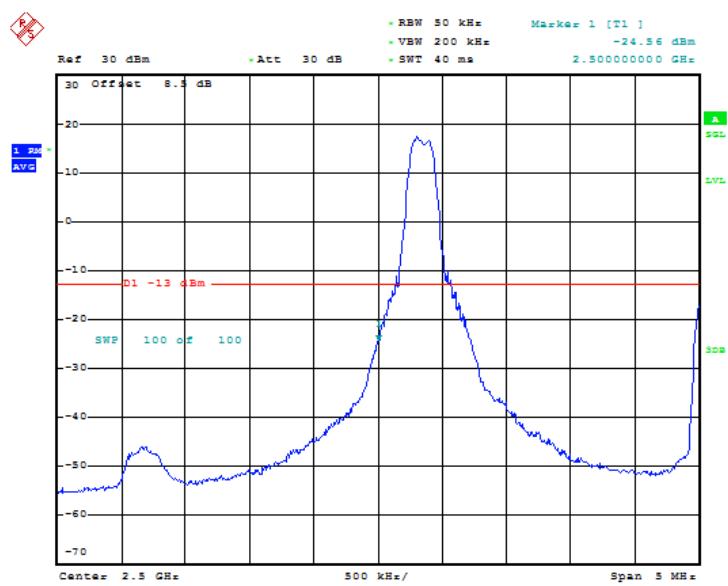
Date: 26.AUG.2019 07:46:15

Fig.205 LOW BAND EDGE BLOCK-1RB-low_offset
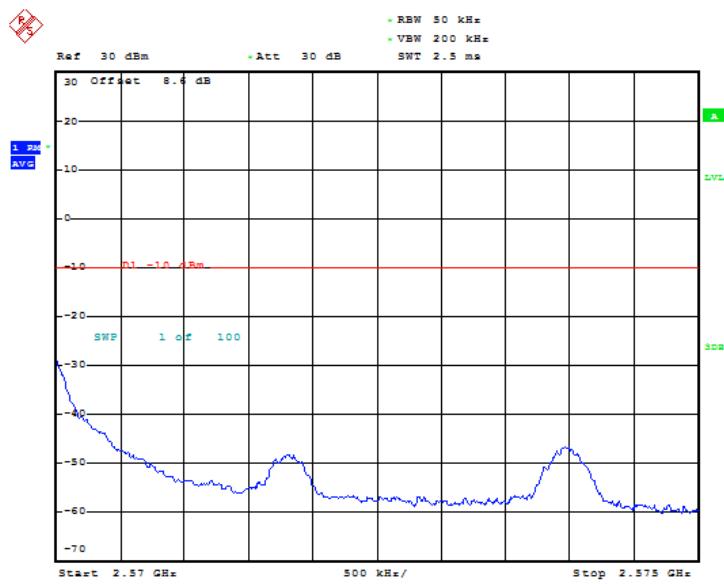
Date: 26.AUG.2019 07:48:08
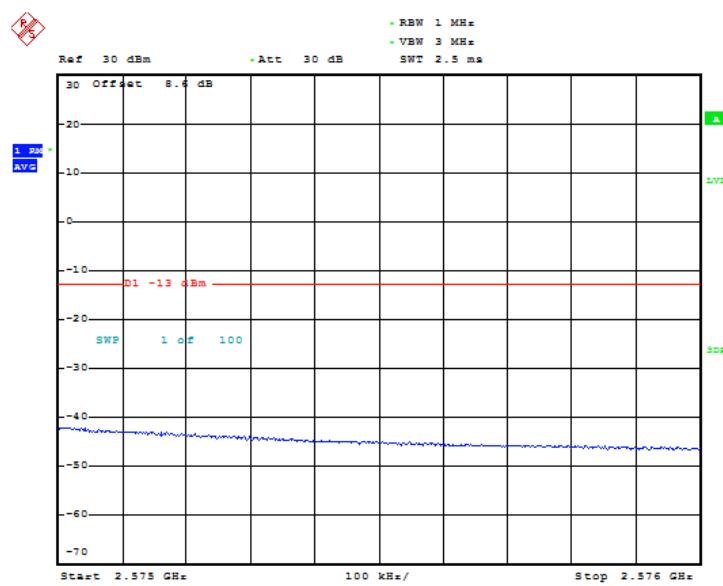
Date: 26.AUG.2019 07:48:34
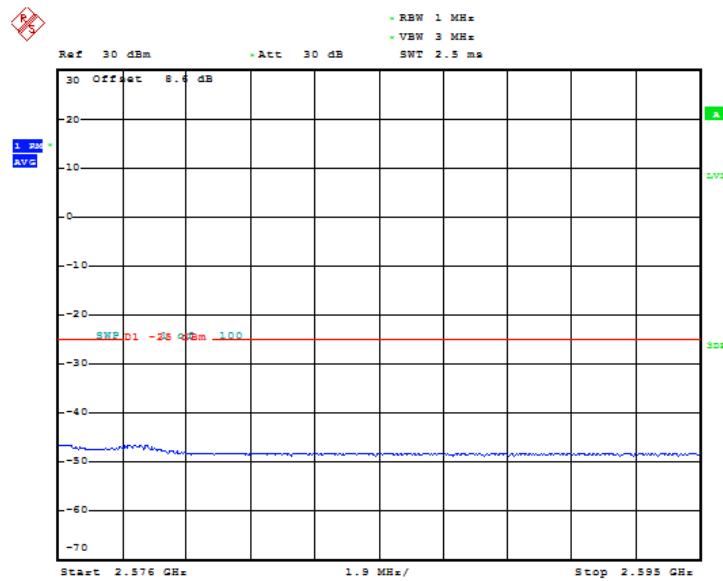
Date: 26.AUG.2019 07:49:00
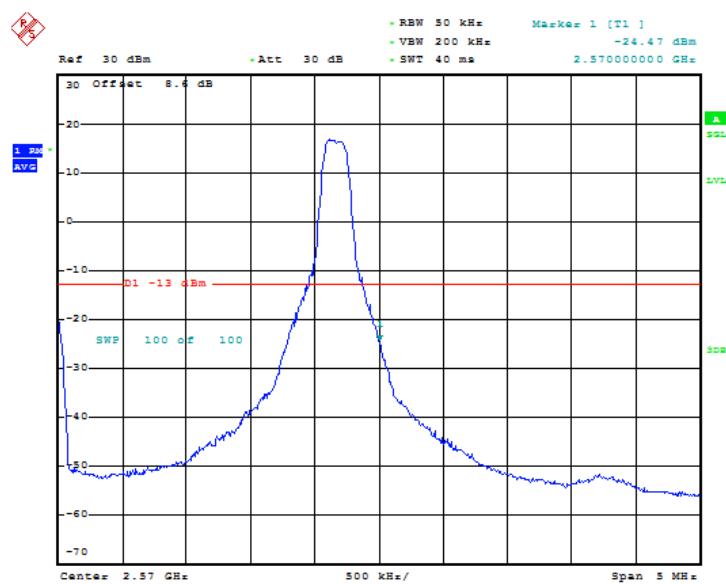
Date: 26.AUG.2019 07:47:42

Fig.206 HIGH BAND EDGE BLOCK-1RB-high_offset
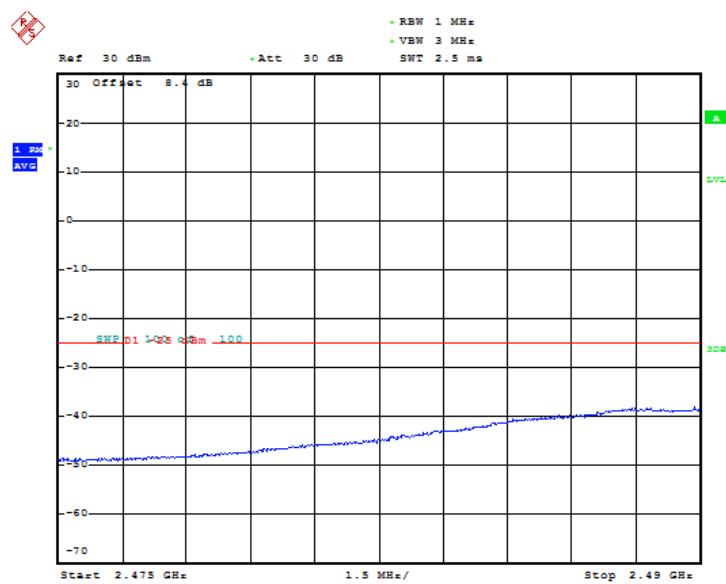
Date: 9.SEP.2019 10:04:31
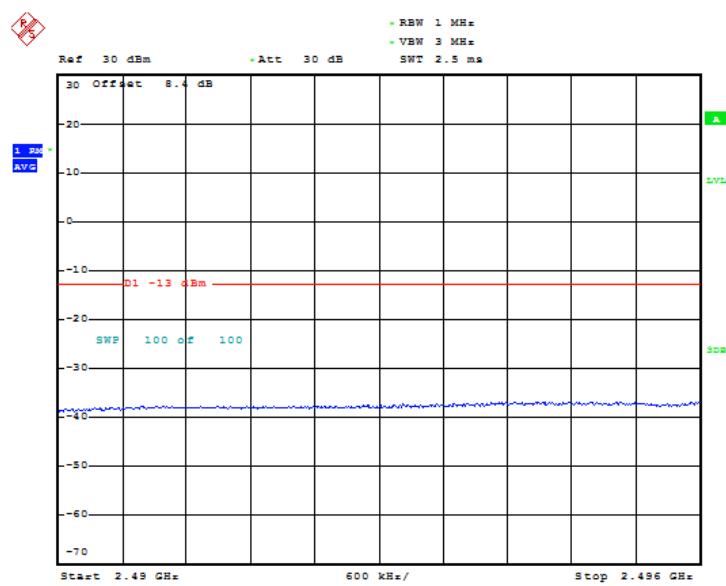
Date: 9.SEP.2019 10:04:55
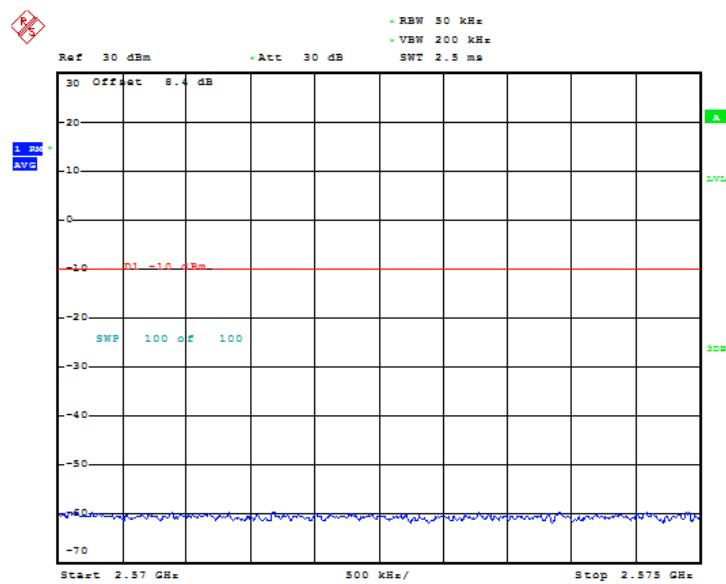
Date: 9.SEP.2019 10:05:18
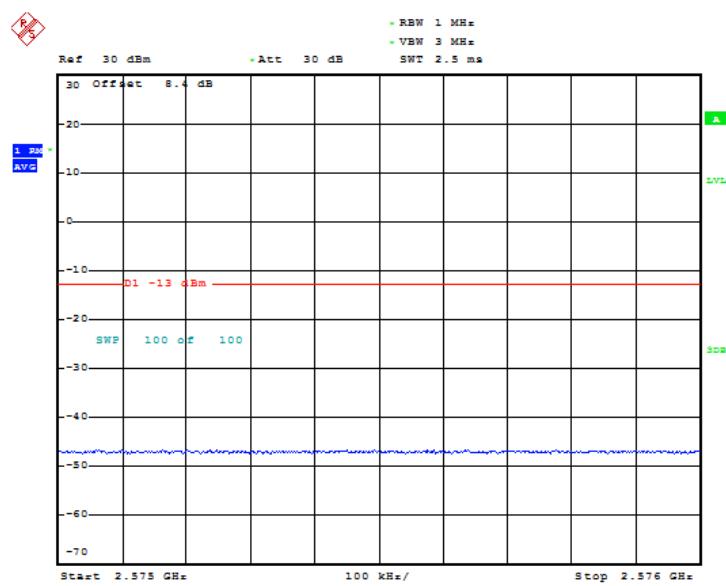
Date: 9.SEP.2019 10:05:42
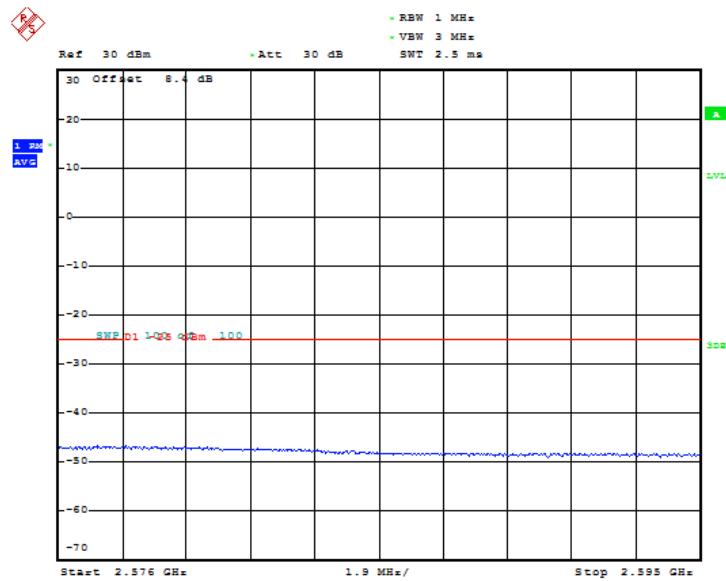
Date: 9.SEP.2019 10:06:05
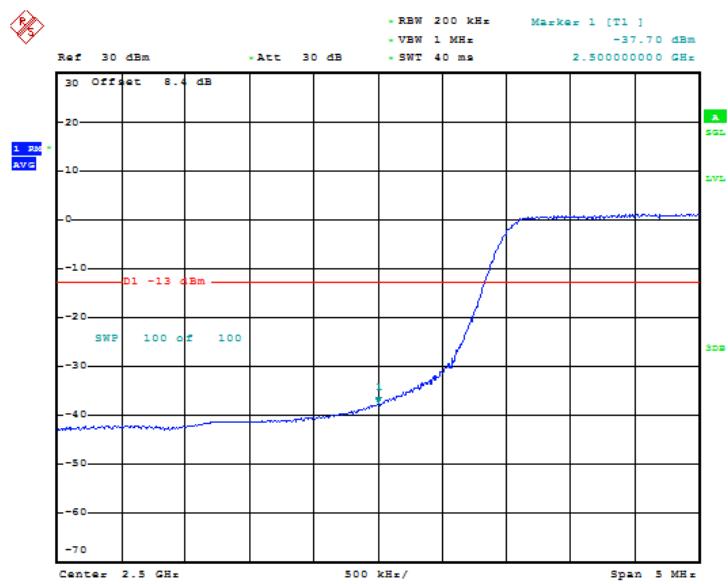
Date: 9.SEP.2019 10:04:08

Fig.207 LOW BAND EDGE BLOCK-20MHz-100%RB
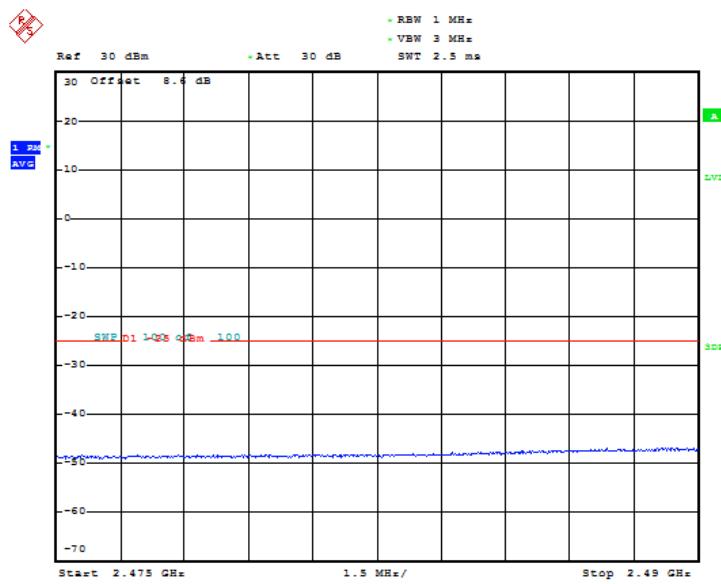
Date: 9.SEP.2019 10:07:03
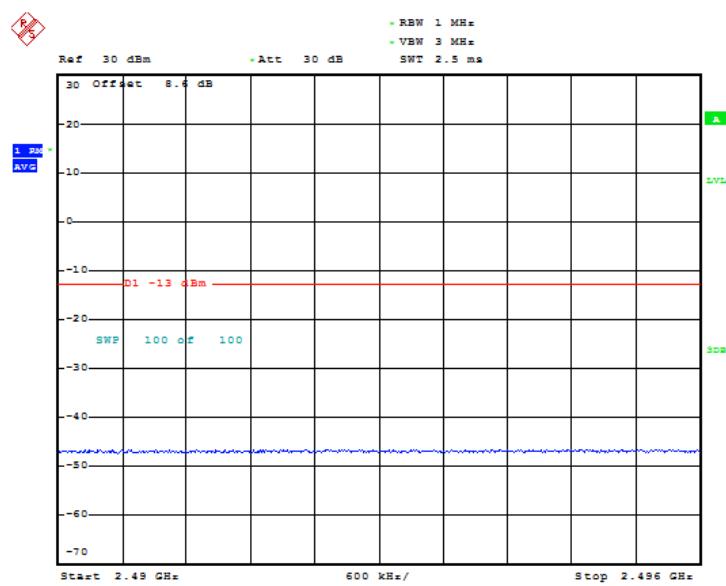
Date: 9.SEP.2019 10:07:26
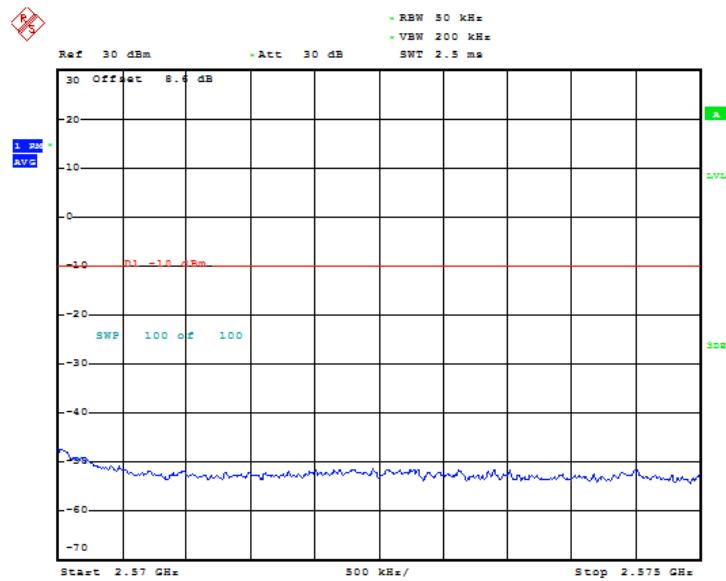
Date: 9.SEP.2019 10:07:50
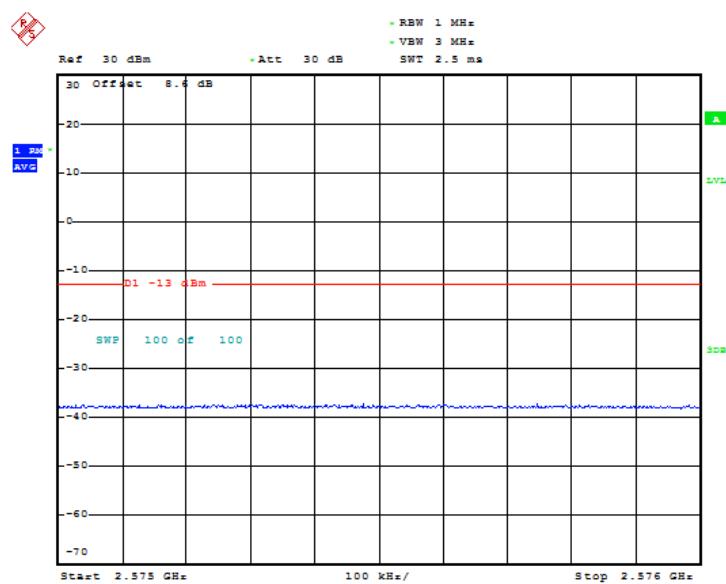
Date: 9.SEP.2019 10:08:14
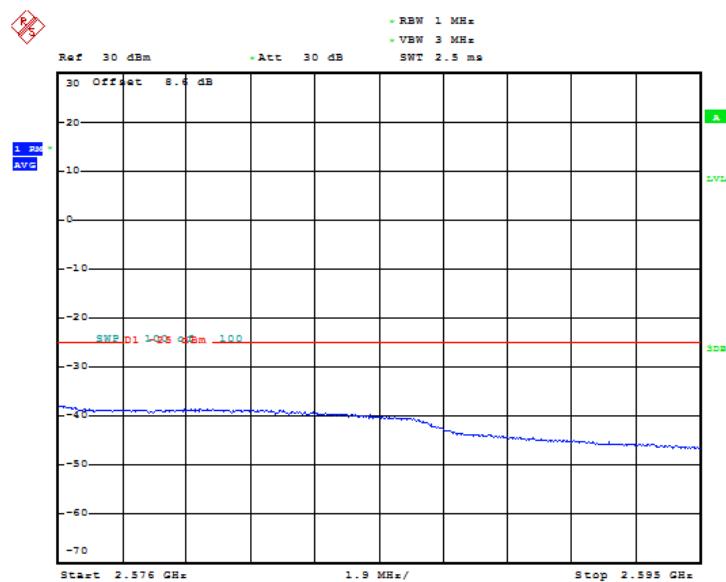
Date: 9.SEP.2019 10:08:37
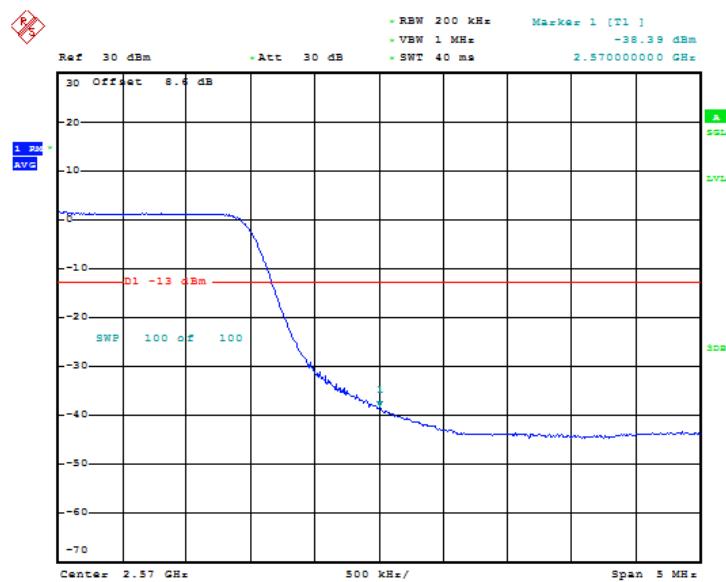
Date: 9.SEP.2019 10:06:39

Fig.208 HIGH BAND EDGE BLOCK-20MHz-100%RB

LTE band 12
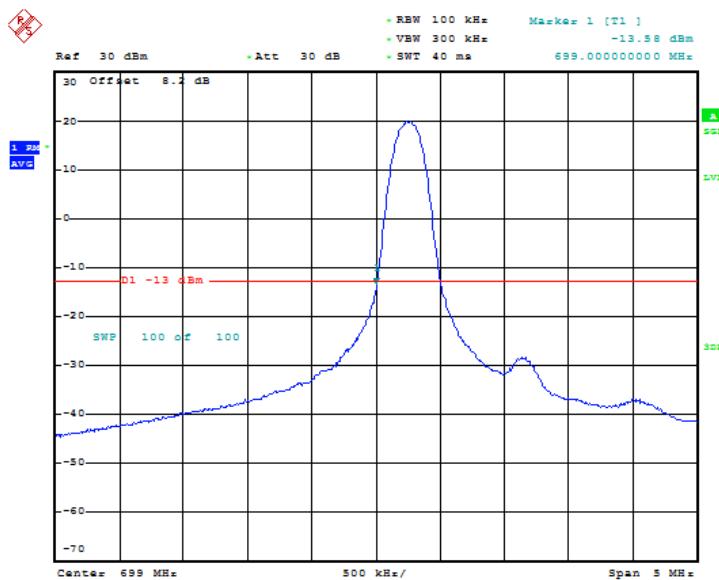
Date: 26.AUG.2019 08:02:19

Fig.209 LOW BAND EDGE BLOCK-1RB-low_offset
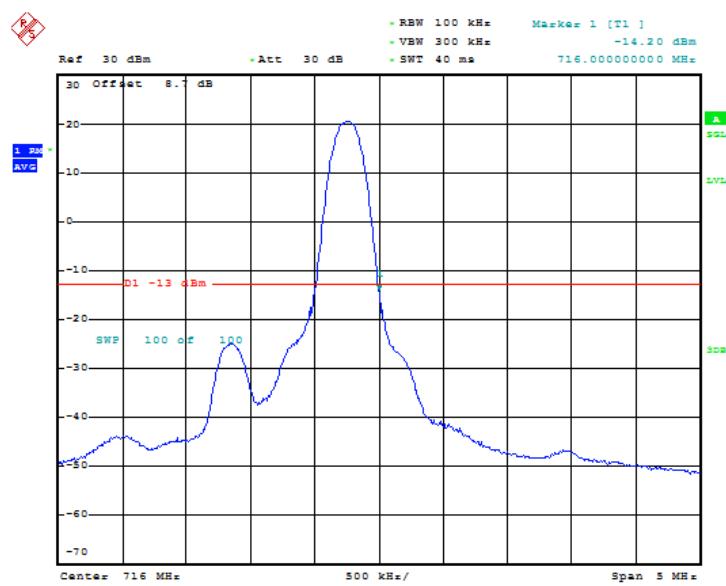
Date: 26.AUG.2019 08:02:55

Fig.210 HIGH BAND EDGE BLOCK-1RB-high_offset
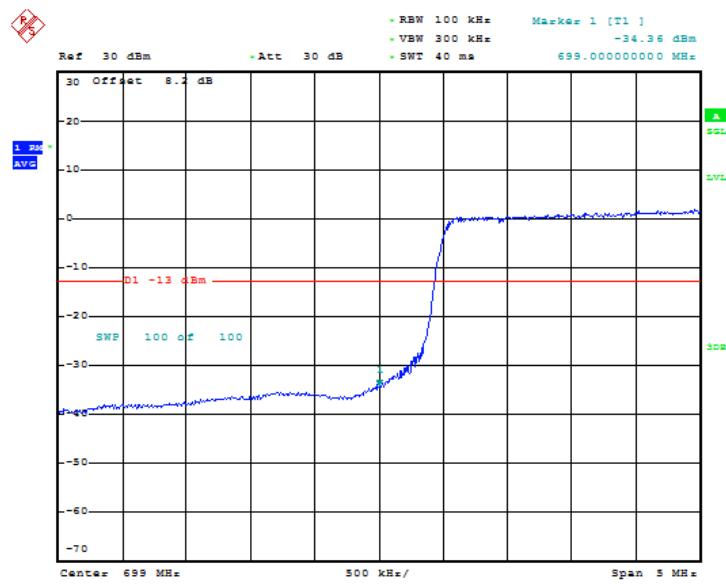
Date: 22.AUG.2019 09:19:09

Fig.211 LOW BAND EDGE BLOCK-10MHz-100%RB
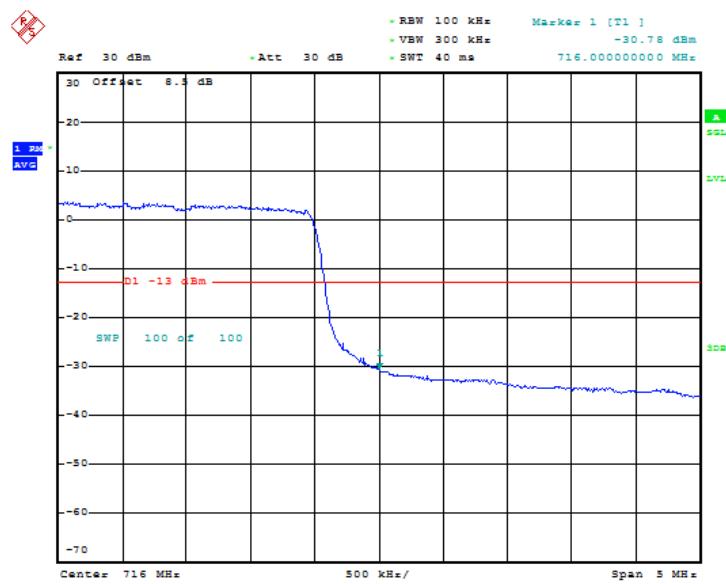
Date: 22.AUG.2019 09:19:45

Fig.212 HIGH BAND EDGE BLOCK-10MHz-100%RB

LTE band 17
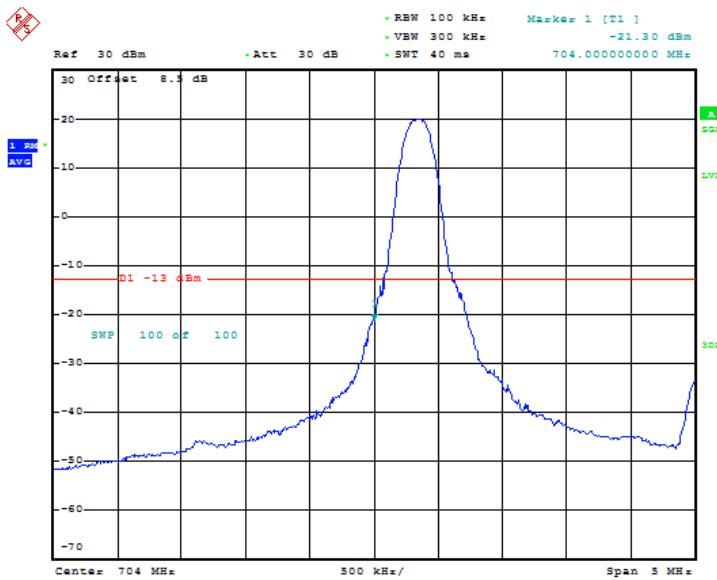
Date: 26.AUG.2019 07:58:01

Fig.213 LOW BAND EDGE BLOCK-1RB-low_offset
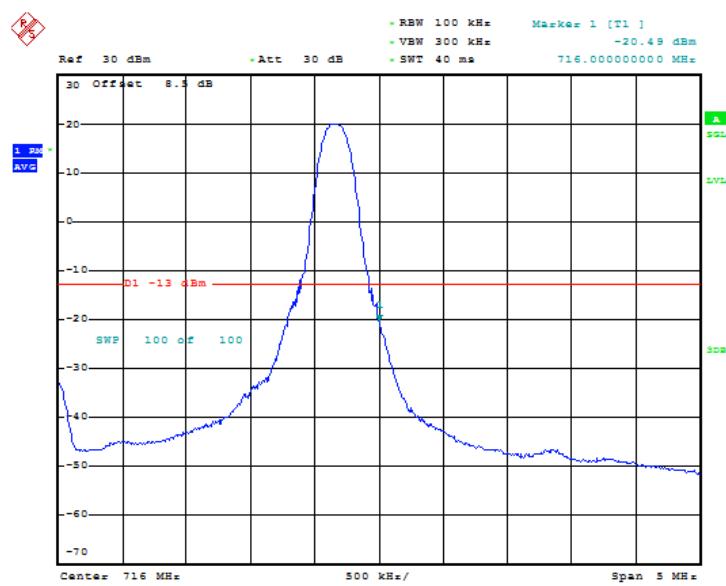
Date: 26.AUG.2019 07:58:37

Fig.214 HIGH BAND EDGE BLOCK-1RB-high_offset
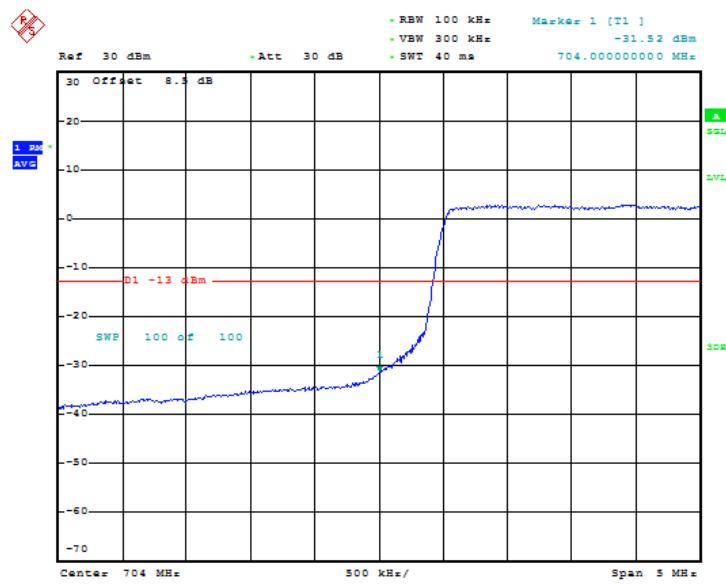

Date: 22.AUG.2019 09:21:39

Fig.215 LOW BAND EDGE BLOCK-10MHz-100%RB
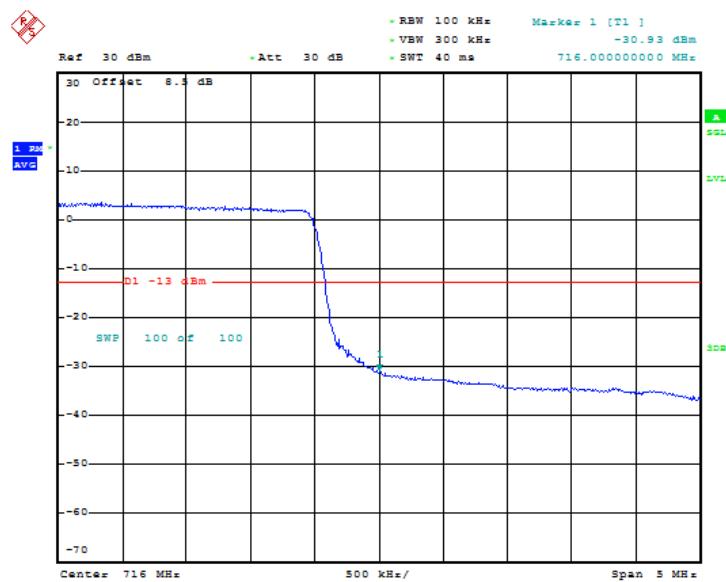
Date: 22.AUG.2019 09:22:16

Fig.216 HIGH BAND EDGE BLOCK-10MHz-100%RB

LTE band 26(part22)
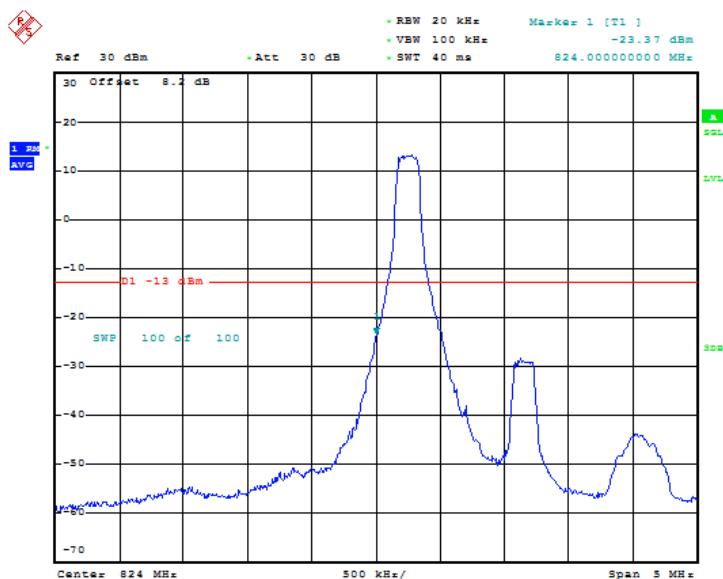
Date: 9.SEP.2019 11:58:27

Fig.217 LOW BAND EDGE BLOCK-1RB-low_offset
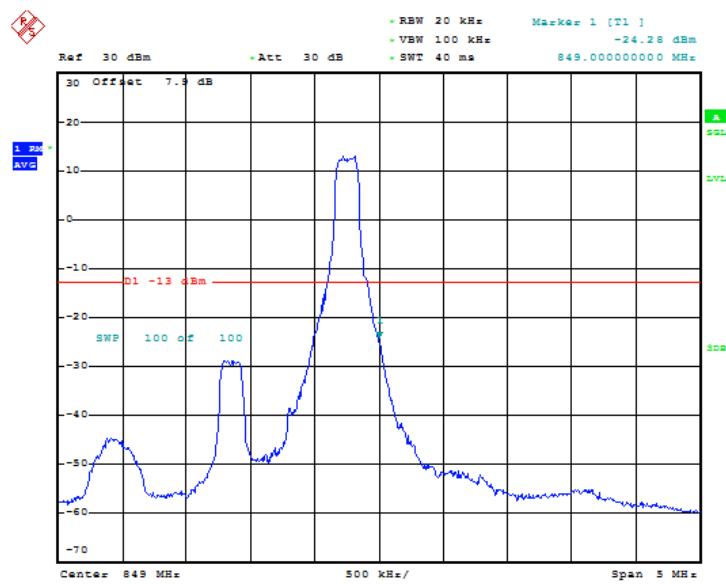
Date: 9.SEP.2019 11:59:00

Fig.218 HIGH BAND EDGE BLOCK-1RB-high_offset
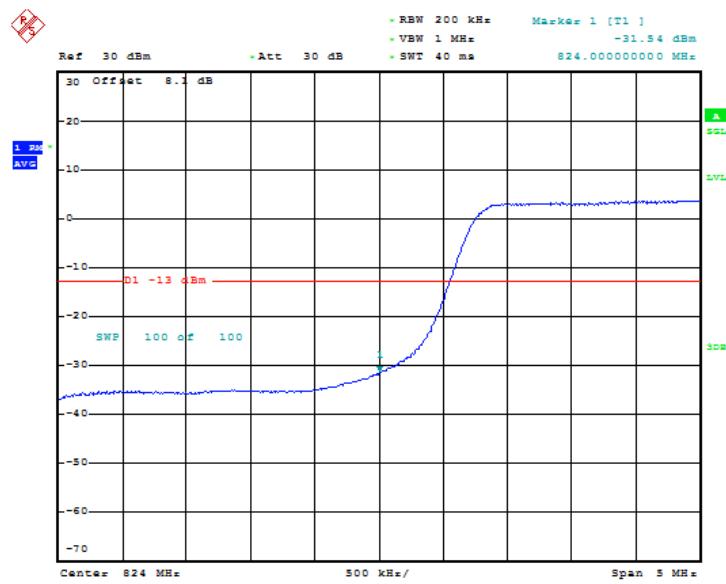
Date: 9.SEP.2019 12:11:43

Fig.219 LOW BAND EDGE BLOCK-15MHz-100%RB
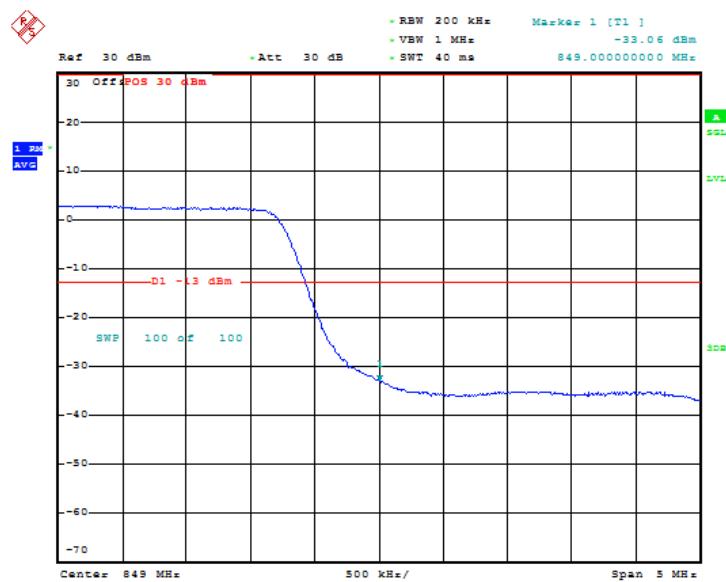
Fig.220 HIGH BAND EDGE BLOCK-15MHz-100%RB

LTE band 26(part90)
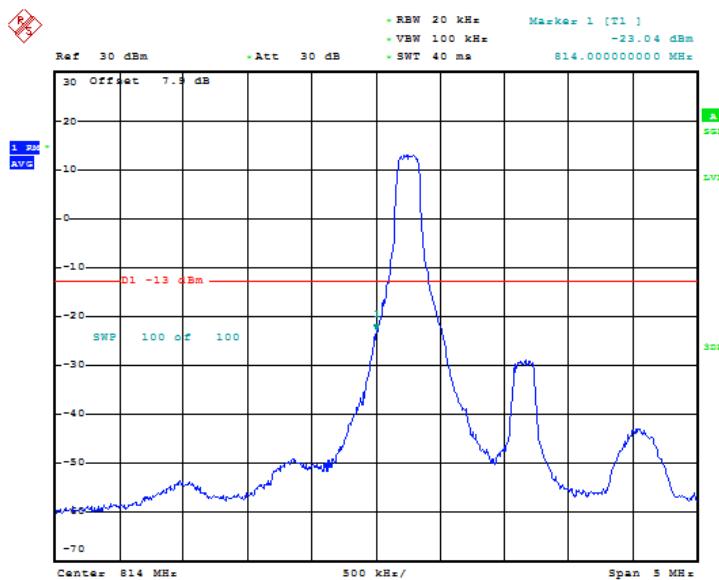
Fig.221 LOW BAND EDGE BLOCK-1RB-low_offset
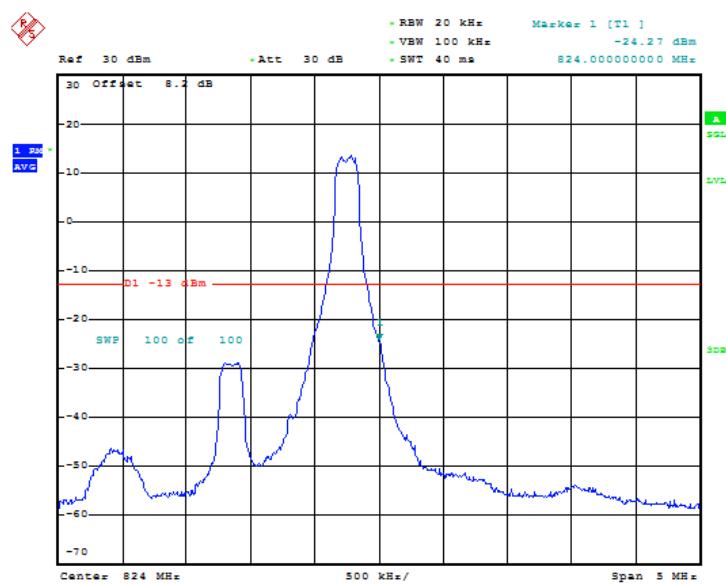
Fig.222 HIGH BAND EDGE BLOCK-1RB-high_offset
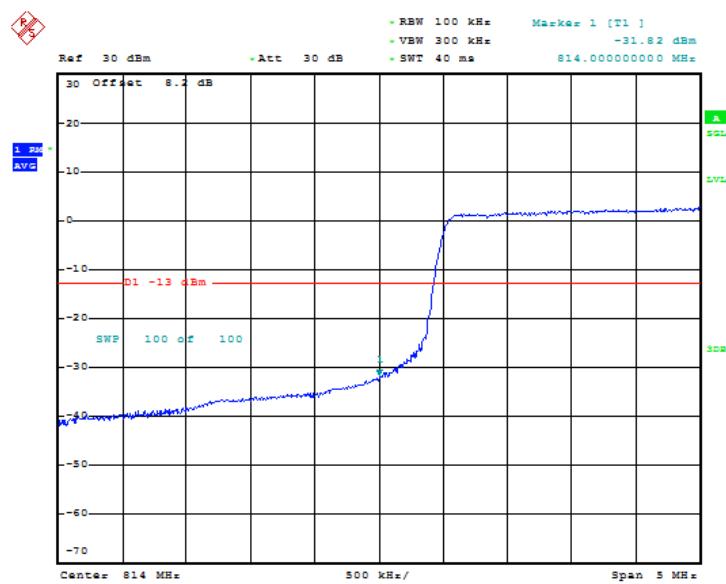
Fig.223 LOW BAND EDGE BLOCK-10MHz-100%RB
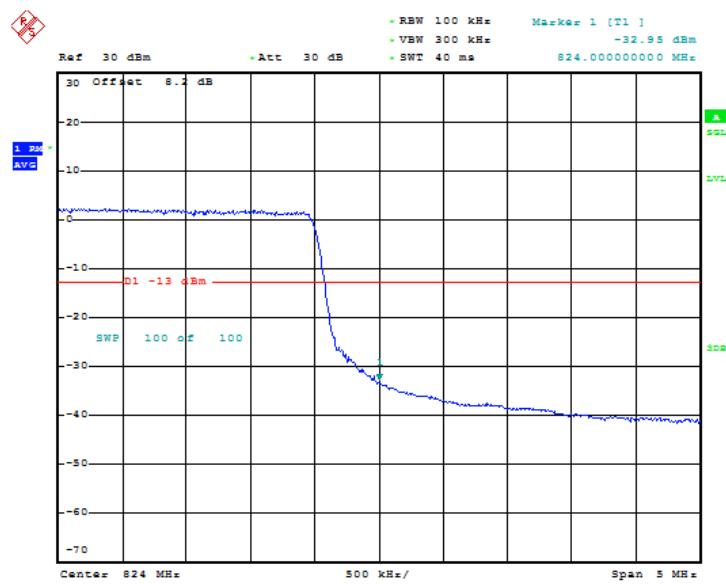
Fig.224 HIGH BAND EDGE BLOCK-10MHz-100%RB

LTE band 41
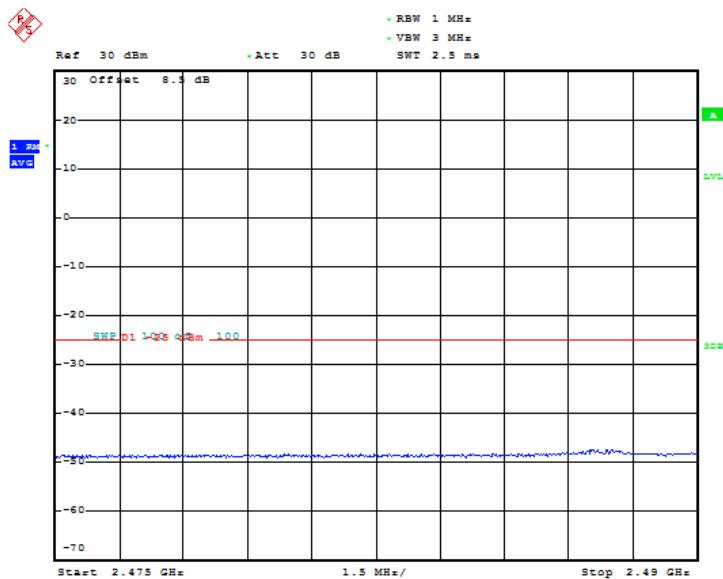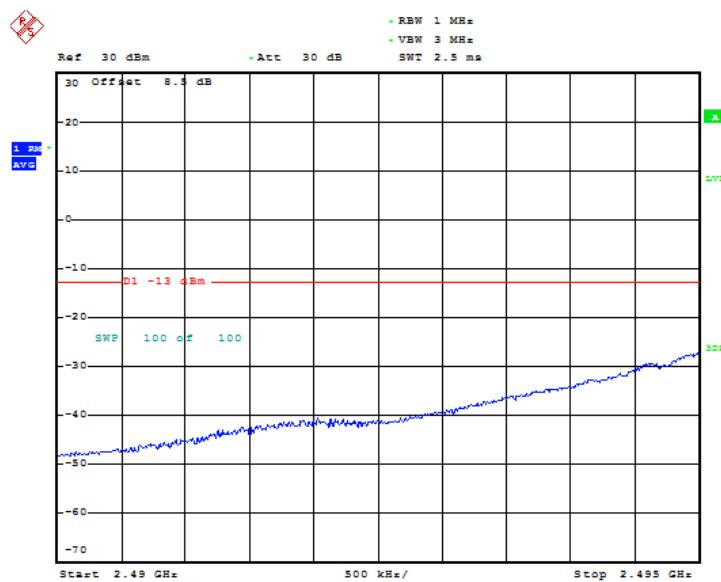
Date: 9.SEP.2019 09:18:07
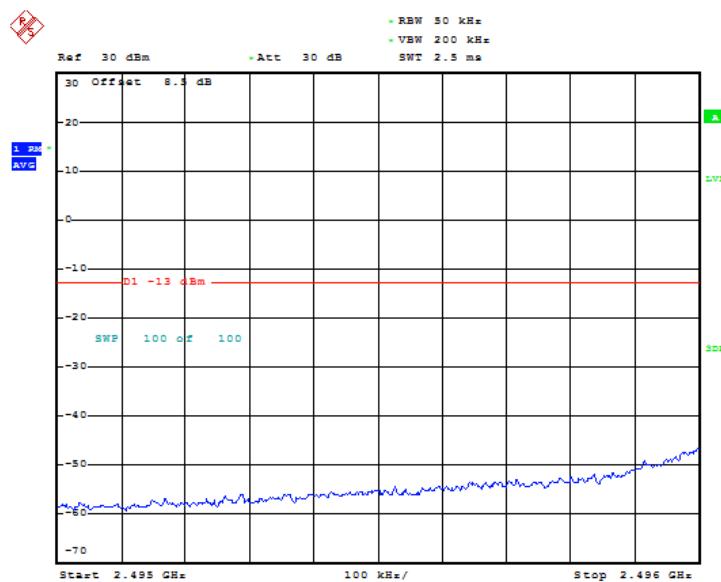
Date: 9.SEP.2019 09:18:39
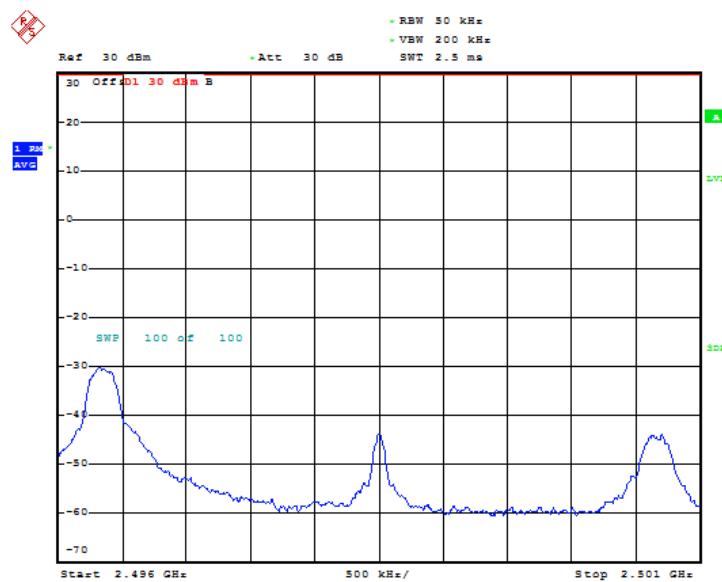
Date: 9.SEP.2019 09:19:11

Fig.225 LOW BAND EDGE BLOCK-1RB-low_offset
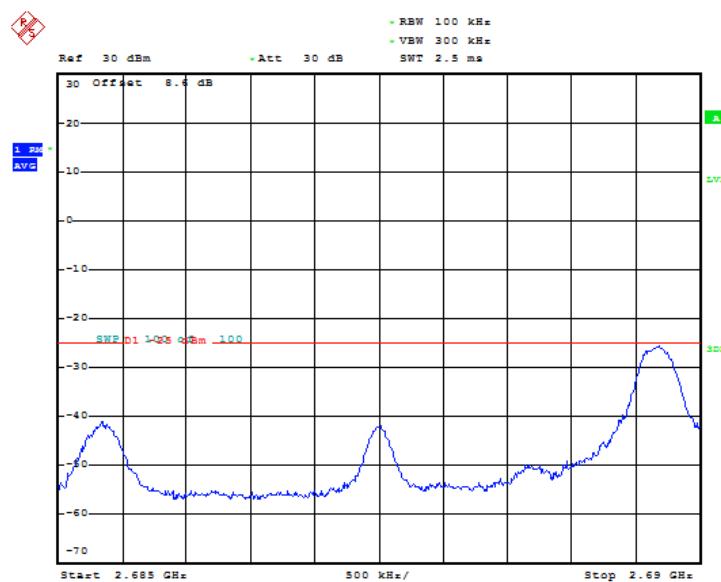
Date: 9.SEP.2019 09:19:43
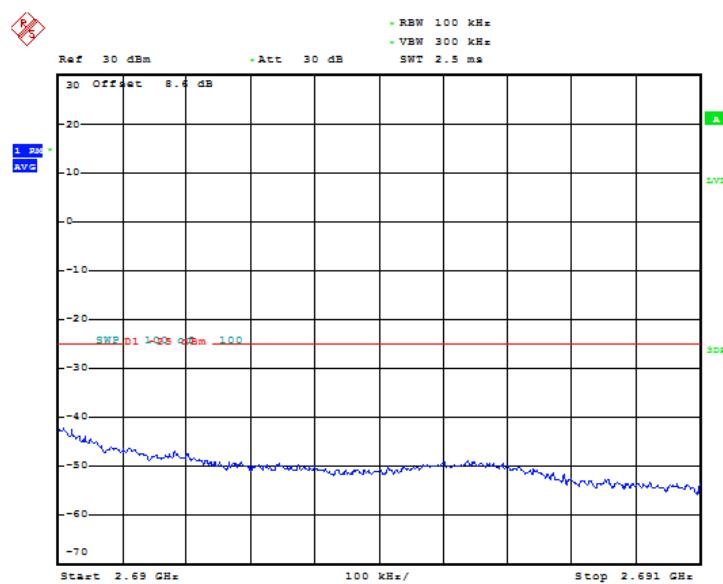
Date: 9.SEP.2019 09:20:15
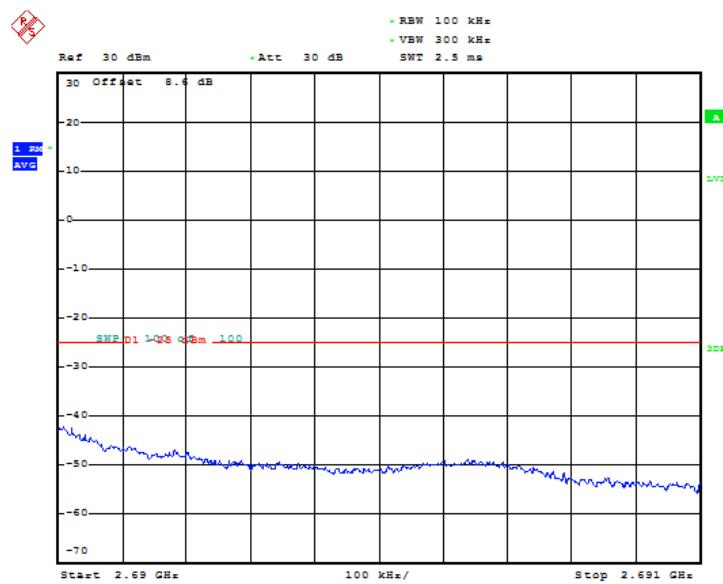
Date: 9.SEP.2019 09:20:15
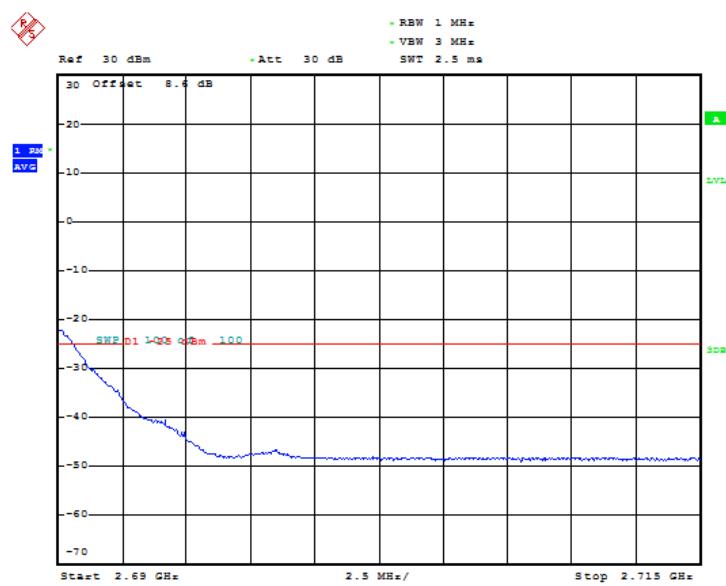
Date: 9.SEP.2019 09:21:51
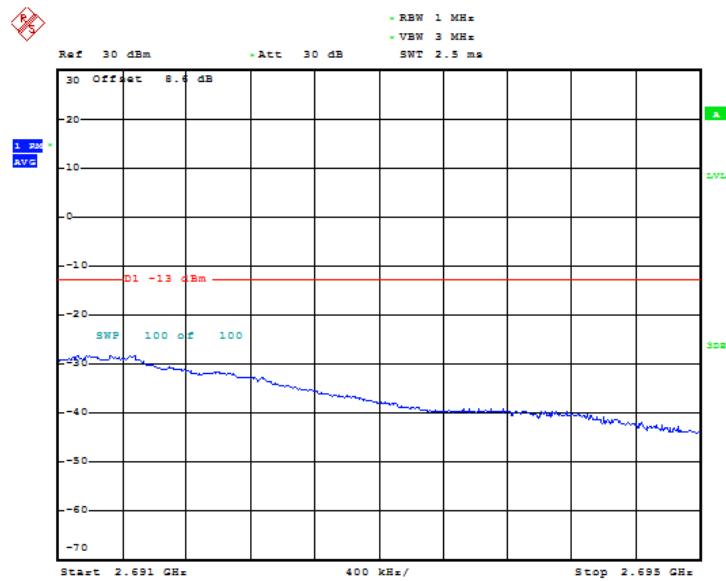
Date: 9.SEP.2019 09:20:47
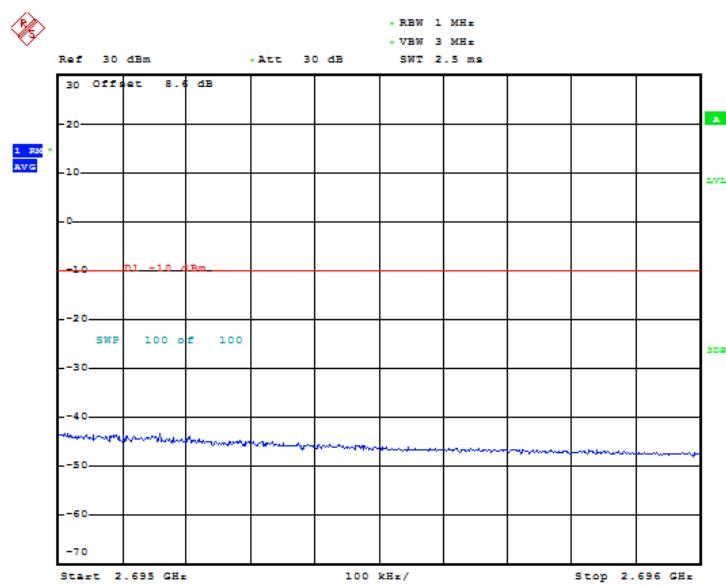
Date: 9.SEP.2019 09:21:19

Fig.226 HIGH BAND EDGE BLOCK-1RB-high_offset
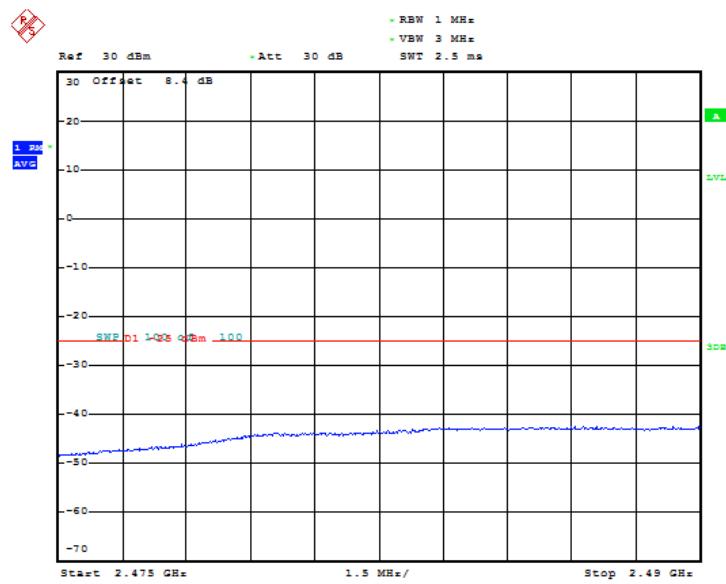
Date: 9.SEP.2019 09:47:45
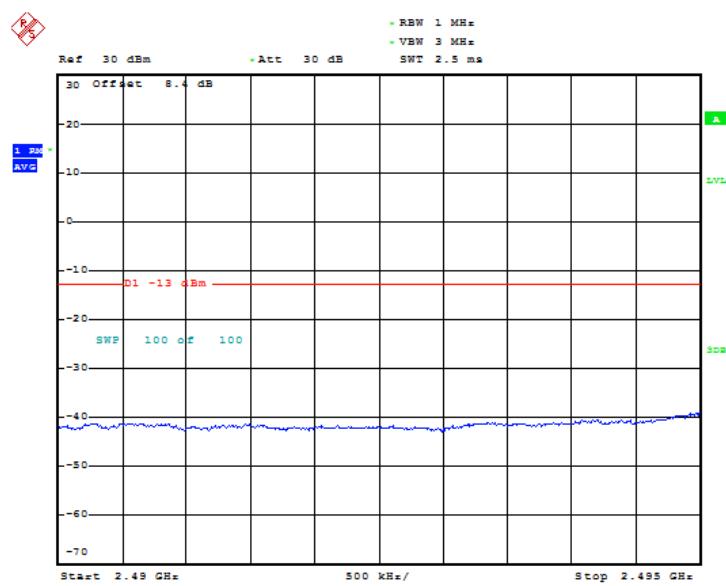
Date: 9.SEP.2019 09:48:17
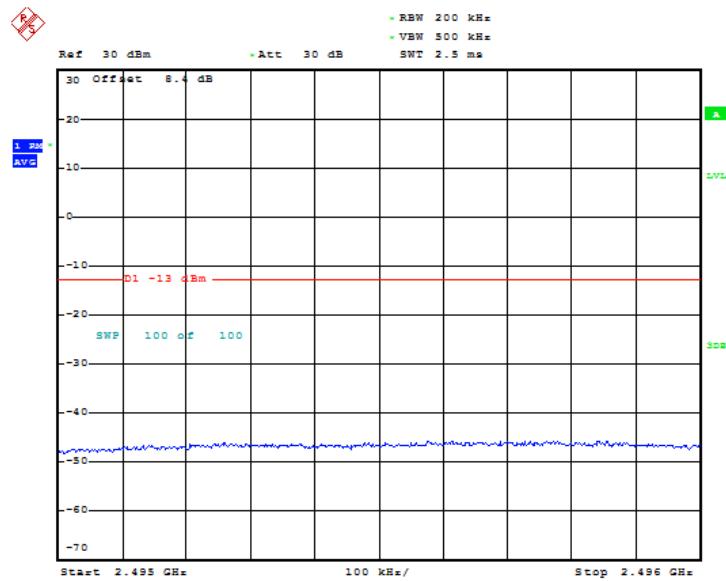
Date: 9.SEP.2019 09:48:49
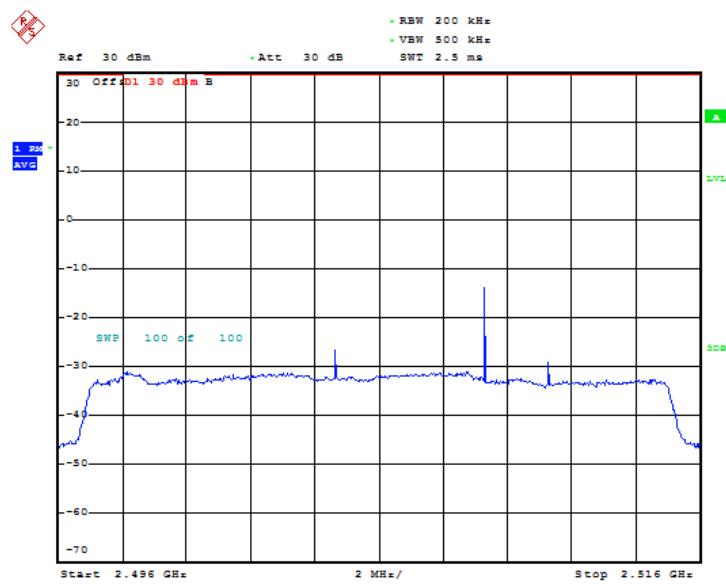
Date: 9.SEP.2019 09:49:22

Fig.227 LOW BAND EDGE BLOCK-20MHz-100%RB
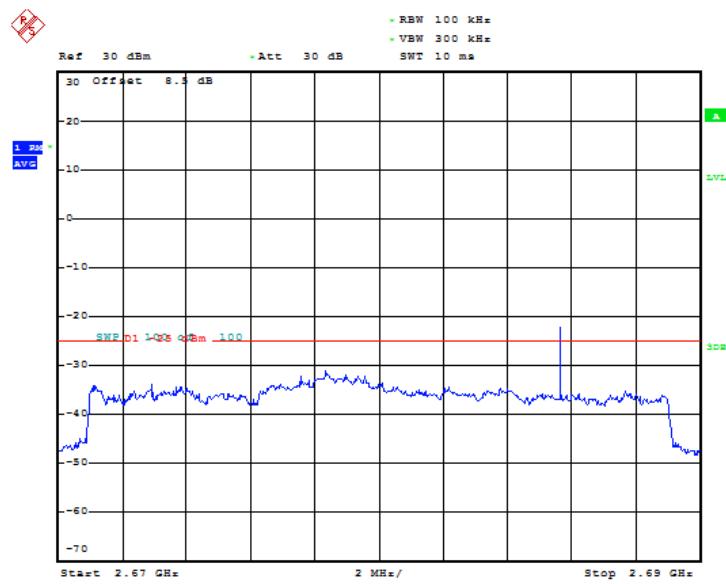
Date: 9.SEP.2019 09:49:54
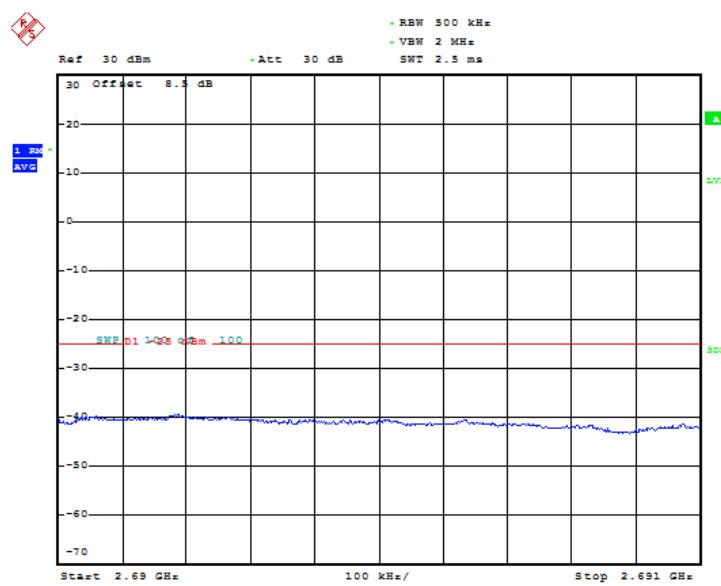
Date: 9.SEP.2019 09:50:27
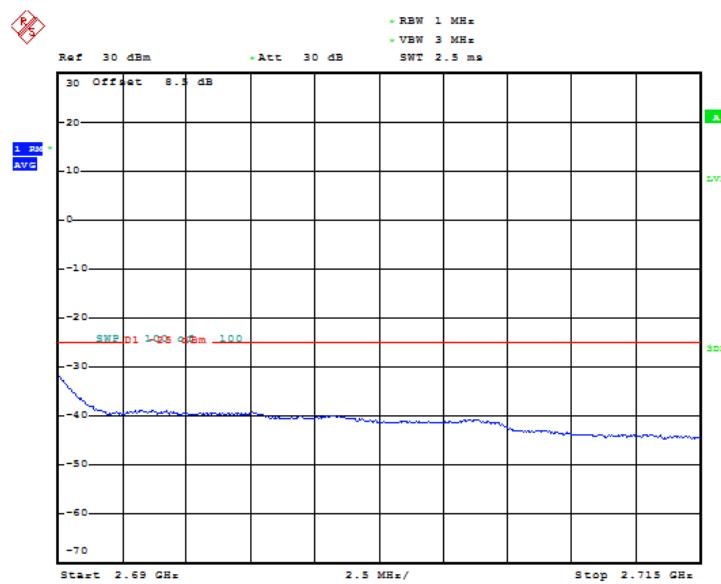
Date: 9.SEP.2019 09:52:03
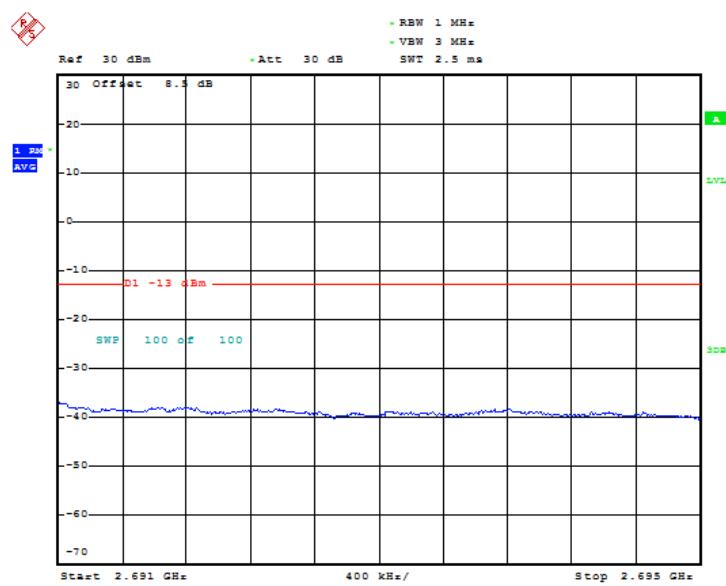
Date: 9.SEP.2019 09:50:59
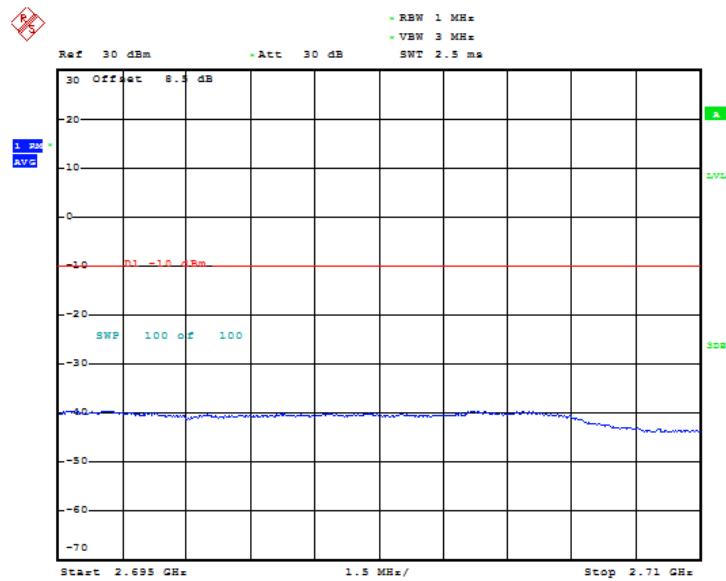
Date: 9.SEP.2019 09:51:31

Fig.228 HIGH BAND EDGE BLOCK-20MHz-100%RB

LTE band 66
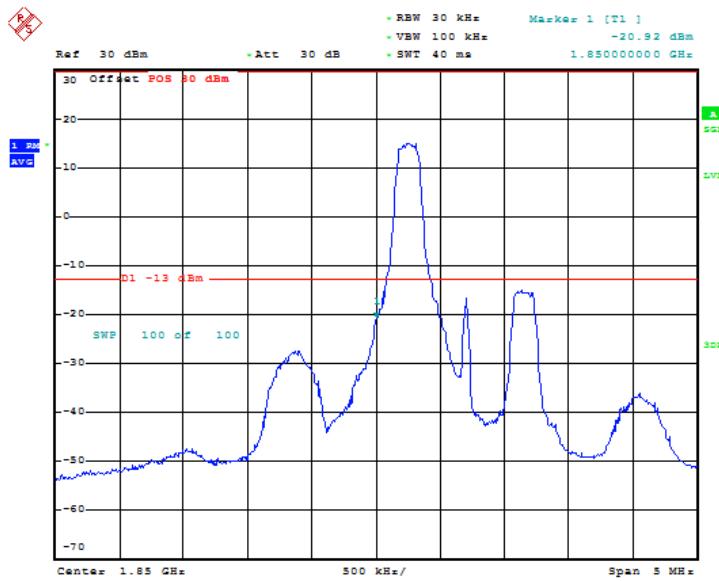
Date: 26.AUG.2019 08:11:08

Fig.229 LOW BAND EDGE BLOCK-1RB-low_offset
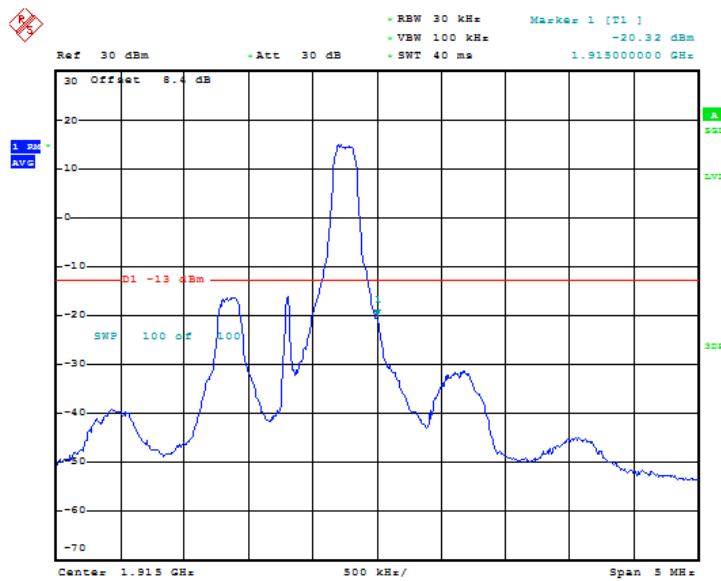
Date: 26.AUG.2019 08:11:43

Fig.230 HIGH BAND EDGE BLOCK-1RB-high_offset
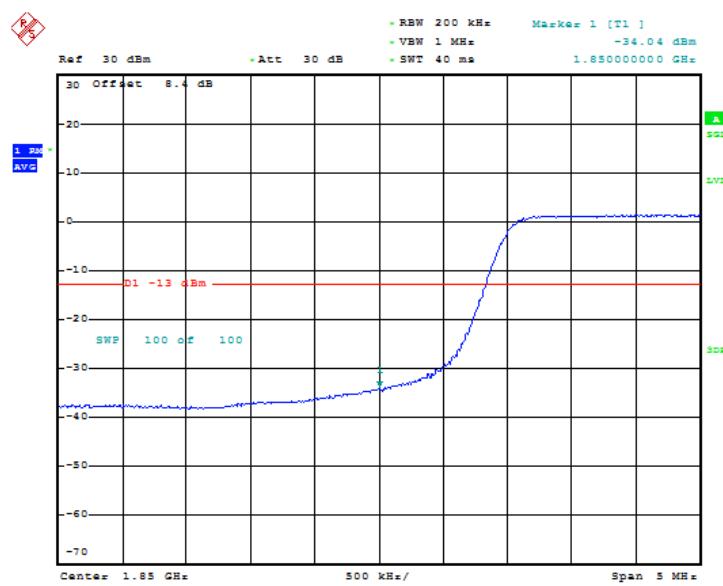
Date: 9.SEP.2019 10:12:12

Fig.231 LOW BAND EDGE BLOCK-20MHz-100%RB
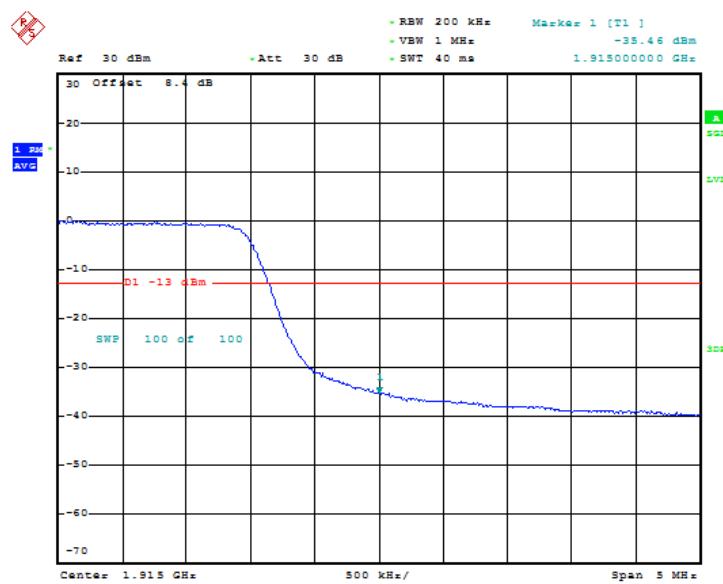
Date: 9.SEP.2019 10:12:46

Fig.232 HIGH BAND EDGE BLOCK-20MHz-100%RB

ANNEX A.7.   CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 22.917(b),24.238(a), 27.53(g),27.53(h), 27.53(m), 90.691

A.7.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

A. 7.2 Measurement Limit

Part 22.917(b),24.238(a), 27.53(g),27.53(h), 27.53(m) , 90.691specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

A. 7.3 Measurement result

Only worst case result is given below

LTE band 2: Spurious emission limit –13dBm.
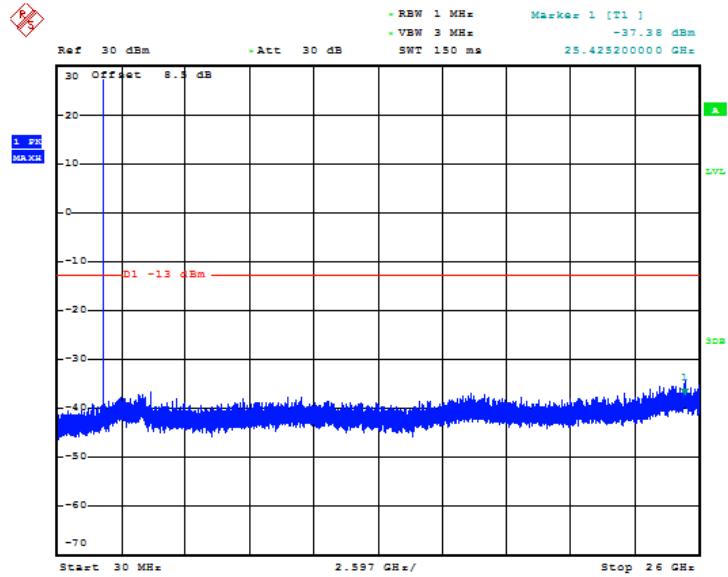
Fig.233 LTE band 2: 30MHz – 26GHz

LTE band 4: Spurious emission limit –13dBm.
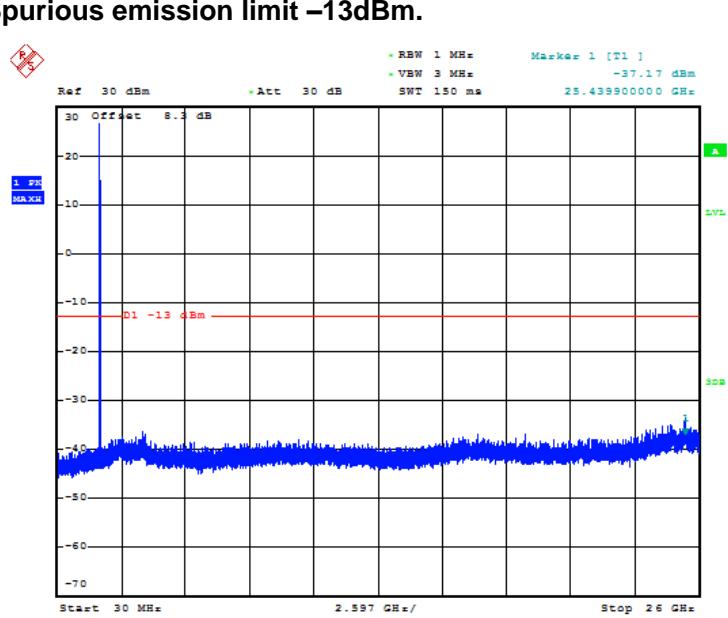
Fig.234 LTE band 4: 30MHz – 26GHz

LTE band 5: Spurious emission limit –13dBm.
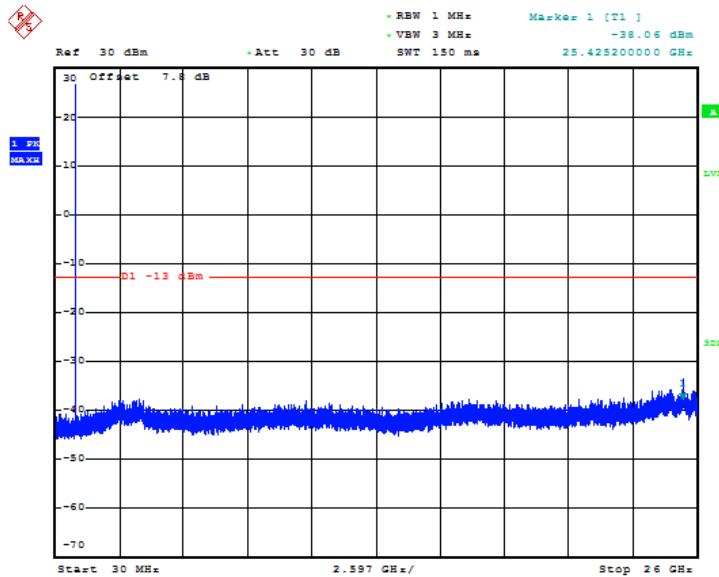
Fig.235 LTE band 5: 30MHz – 26GHz

LTE band 7: Spurious emission limit –25dBm.
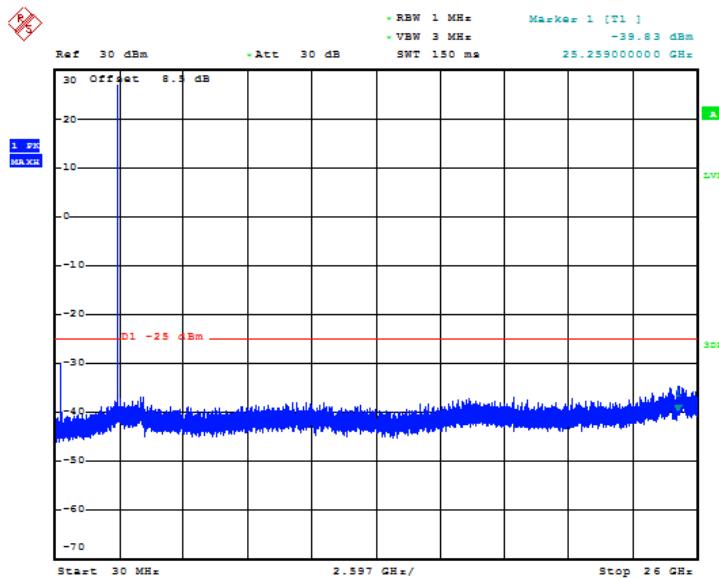
Fig.236 LTE band 7: 30MHz – 26GHz

LTE band 12: Spurious emission limit –13dBm.
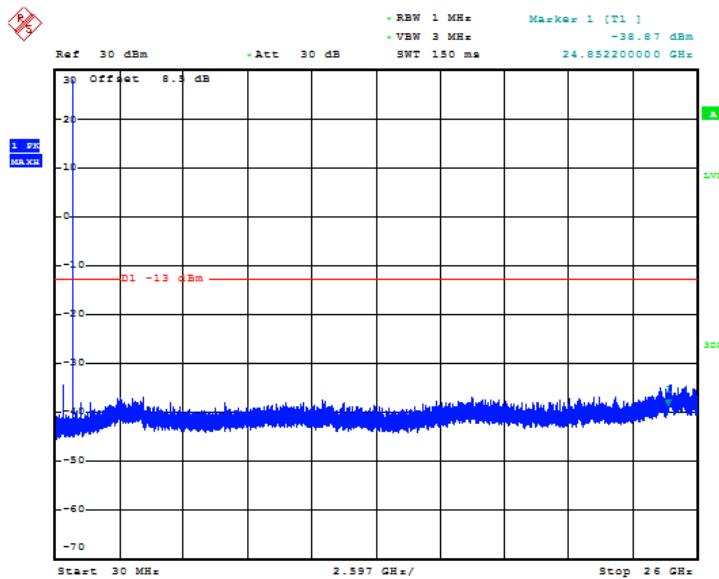
Fig.237 LTE band 12: 30MHz – 26GHz

LTE band 17: Spurious emission limit –13dBm.
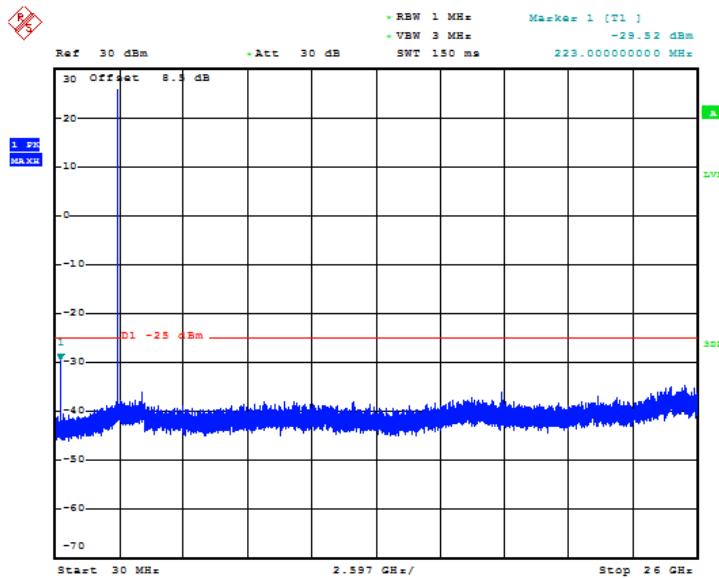
Fig.238 LTE band 17: 30MHz – 26GHz

LTE band 25: Spurious emission limit –13dBm.
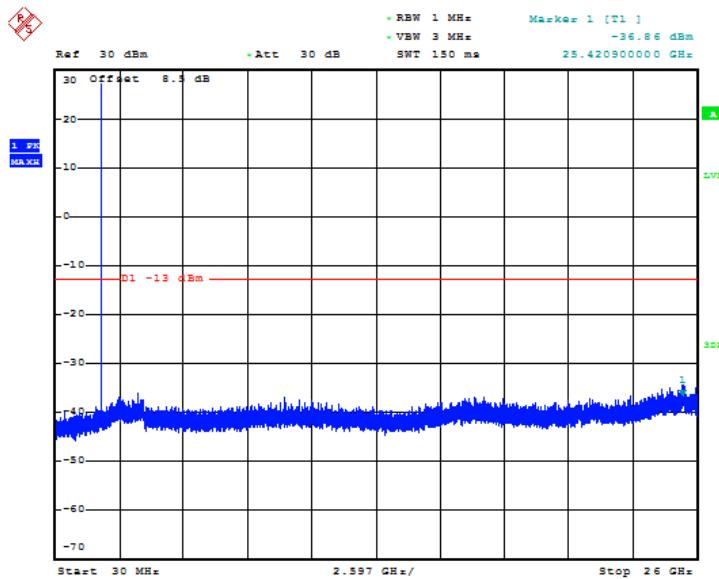
Fig.239 LTE band 25: 30MHz – 26GHz

LTE band 26(part22): Spurious emission limit –13dBm.
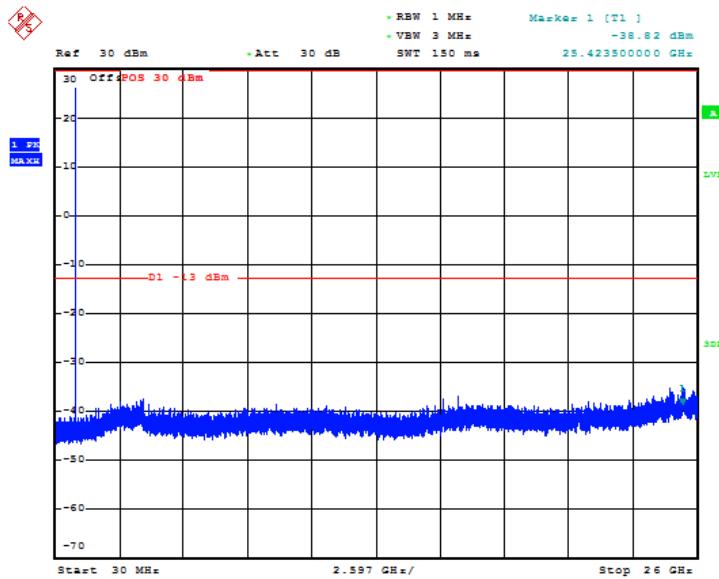
Fig.240 LTE band 26(part22): 30MHz – 26GHz

LTE band 26(part90): Spurious emission limit –13dBm.
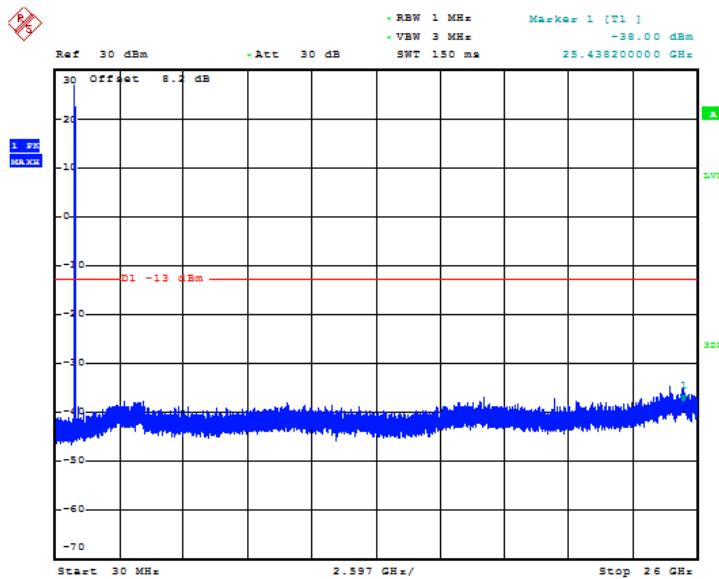
Fig.241 LTE band 26(part90): 30MHz – 26GHz

LTE band 41: Spurious emission limit –25dBm.
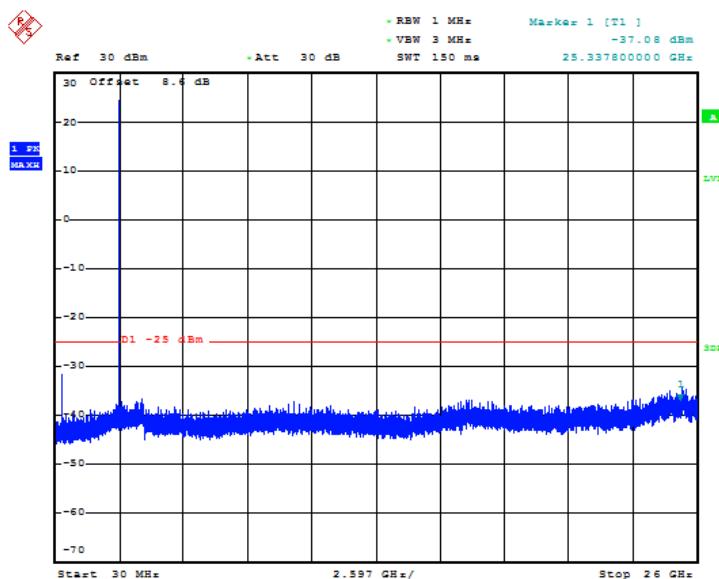
Fig.242 LTE band 41: 30MHz – 26GHz

LTE band 66: Spurious emission limit –13dBm.
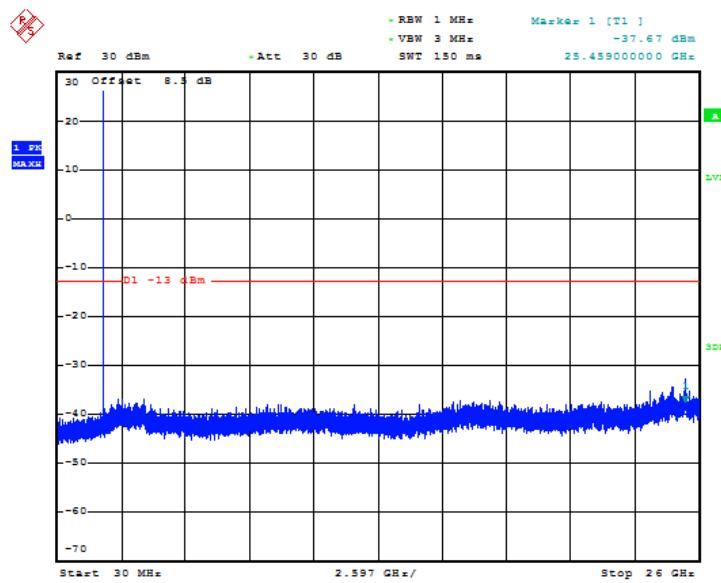
Fig.243 LTE band 66: 30MHz – 26GHz

ANNEX A.8.   PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 24.232 (d), 27.50(a)

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 5.7:

a)Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e)Record the maximum PAPR level associated with a probability of 0.1%

A.8.1 Measurement limit

not exceed 13 dB

A.8.2 Measurement results

LTE band 2, 20MHz

Frequency(MHz)	PAPR(dB)	
1880.0	QPSK	16QAM
	4.94	6.44

LTE band 4, 20MHz

Frequency(MHz)	PAPR(dB)	
1732.5	QPSK	16QAM
	5.00	6.41

LTE band 5, 20MHz

Frequency(MHz)	PAPR(dB)	
836.5	QPSK	16QAM
	5.19	6.09

LTE band 7, 20MHz

Frequency(MHz)	PAPR(dB)	
2535.0	QPSK	16QAM
	4.94	6.28

LTE band 12,10MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
707.5	5.38	6.25

LTE band 17,10MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
710.0	5.51	6.31

LTE band 25, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1882.5	4.94	6.44

LTE band 26(part22), 15MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
836.5	4.55	5.83

LTE band 26(part90), 10MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
819.0	5.00	5.90

LTE band 41, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
2595.0	9.65	10.77

LTE band 66, 20MHz

Frequency(MHz)	PAPR(dB)	
	QPSK	16QAM
1745.0	4.94	6.09

ANNEX B.   Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

ANNEX C.   Detailed Test Results

ANNEX C.1.   Main Terms

Verdict	Verdict of each test cases.
Test cases	Test cases identification number and description in ETSI EN 300 328 test specification and ETSI specification.

ANNEX C.2.   Terms used in Condition column

Tnom	Normal temperature
Tmin	Low temperature
Tmax	High temperature
Vnom	Normal voltage

ANNEX C.3.   Terms used in Verdict column

P	Pass,the EUT complies with the essential requirements in the standard.
NM	Not measure, the test was not measured by ECIT.
NA	Not applicable, the test was not applicable.
F	Fail, the EUT does not comply with the essential requirements in the standard.

ANNEX C.4.   Terms used in Note column

EUT ID	EUT ID (e.g N01, N02…..) is used to identify the EUT tested used for each test cases as specified in section 3 of this test report.
Lab Code	Lab code is used to identify the subcontracted lab if this test cases is performed in the subcontracted lab.

Subcontracted test lab code: N/A

ANNEX D.   Accreditation Certificate

Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS

Shanghai, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Presented this 6th day of May 2019.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

**********END OF REPORT**********