



11.4 DTS bandwidth

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r02 cl. 8.1
- Internal procedure PM001
- See clause 4 of this test report
- Test date: 23 December 2014
- Technician: A. Bertezolo

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

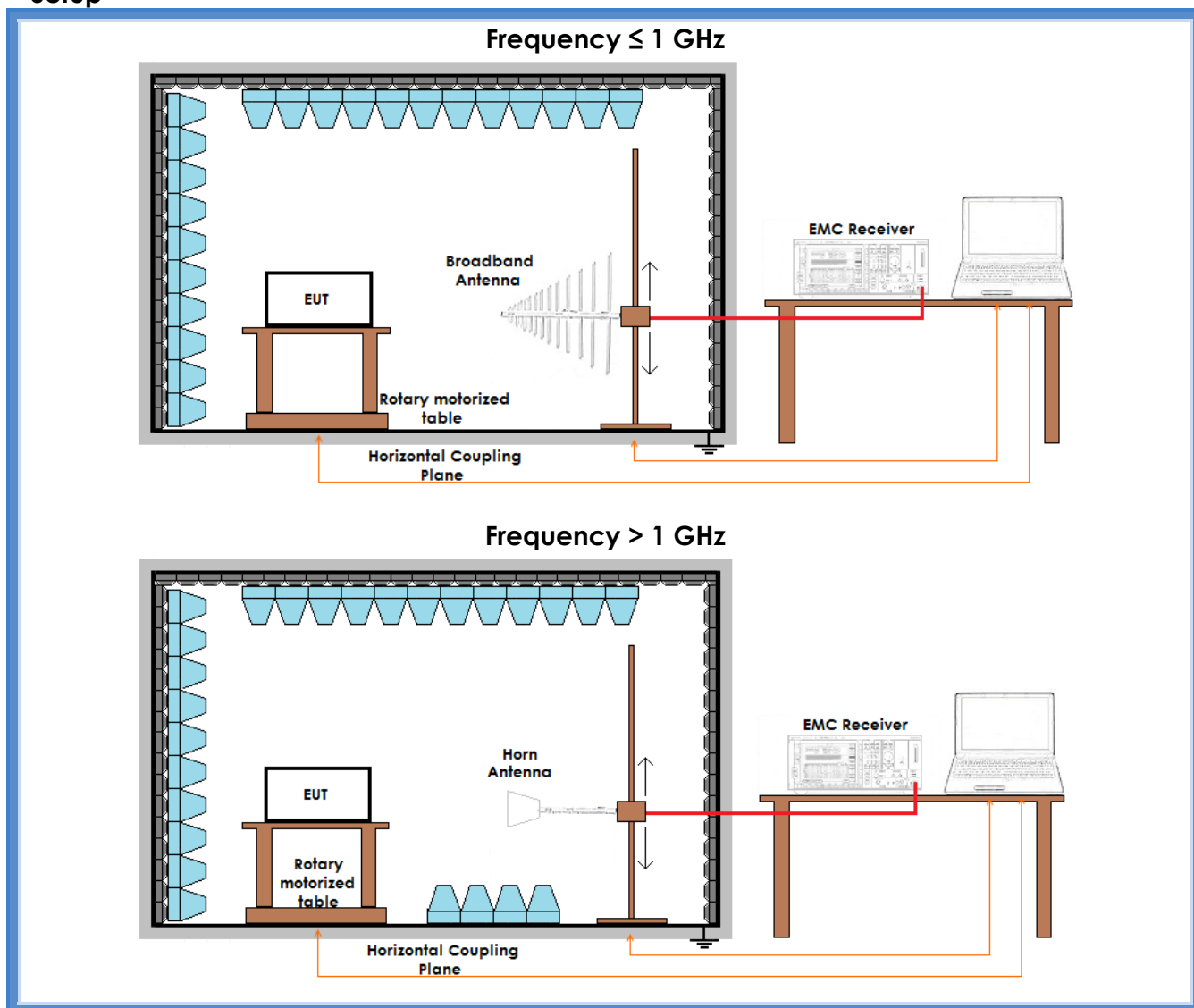
Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz

Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
21	99	50



Setup



Result

Channel	Graphs	6 dB bandwidth (kHz)	Limits (kHz)	Results
Lowest	G14221255	692,3	At least 500	Complies
Medium	G14221261	717,9	At least 500	Complies
Highest	G14221265	766,0	At least 500	Complies



Graphs

Meas Type

Equipment under Test

Manufacturer

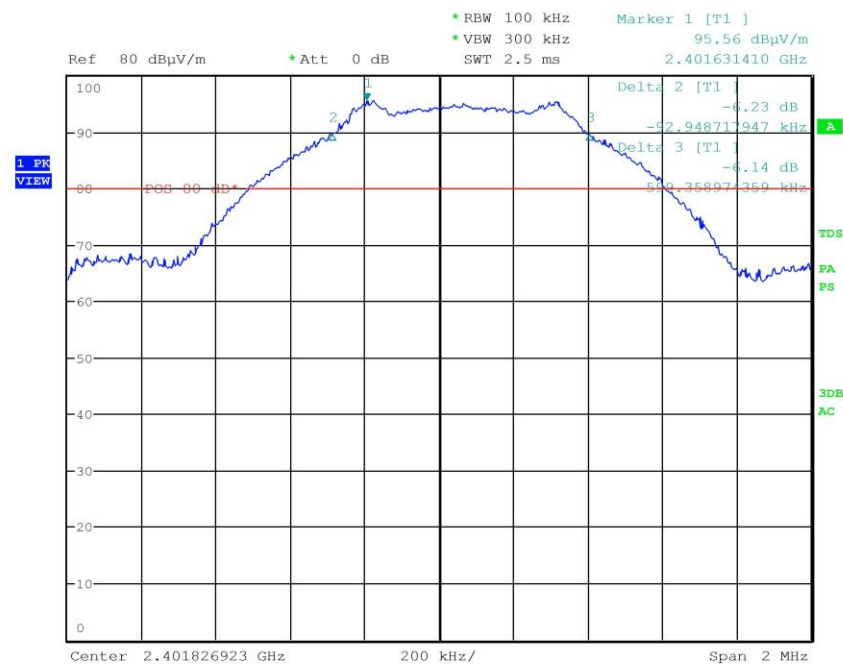
OP Condition

Fmin

Operator

Bertezzo 14221255

Test Spec





Meas Type

Equipment under Test

Manufacturer

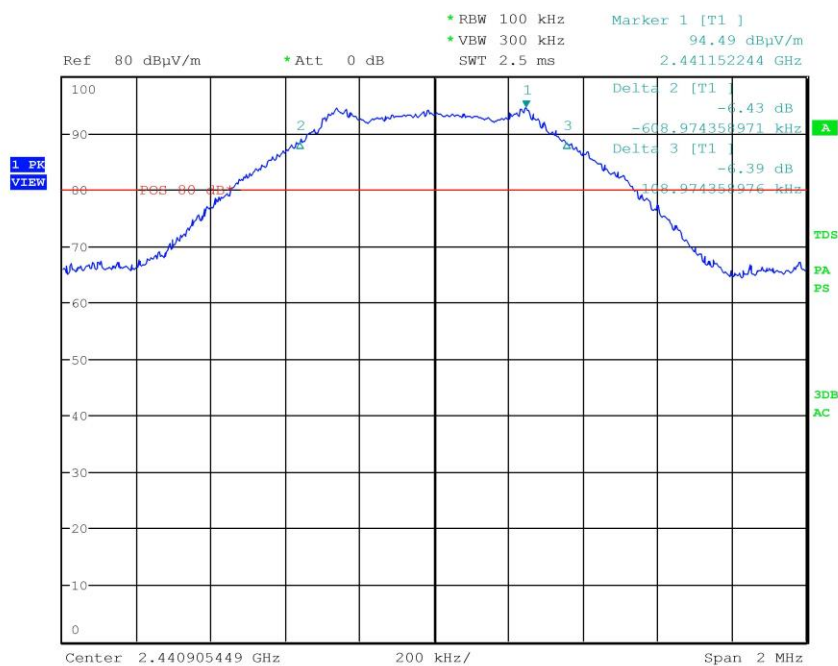
OP Condition

Fmed

Operator

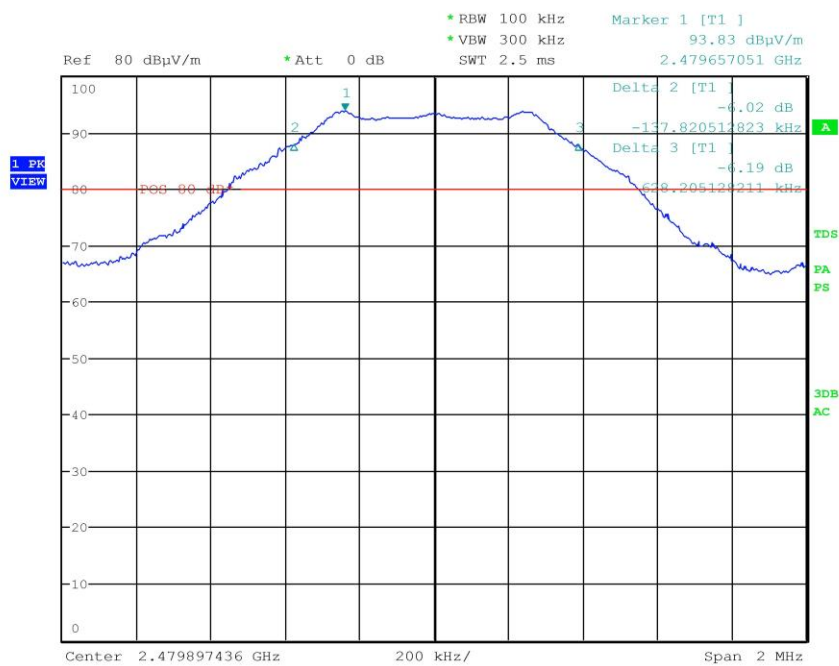
Bertezolo 14221261

Test Spec





Meas Type
Equipment under Test
Manufacturer
OP Condition Fmax
Operator Bertezolo 14221265
Test Spec



Result: The requirements are met



11.5 Band edge

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247 (d)
- KDB 558074 D01 DTS Meas Guidance v03r02 cl. 11.1(a) and 12.1
- Internal procedure PM001
- See clause 4 of this test report
- Test date: 23 December 2014
- Technician: A. Bertezolo

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

See FCC Part 15.247

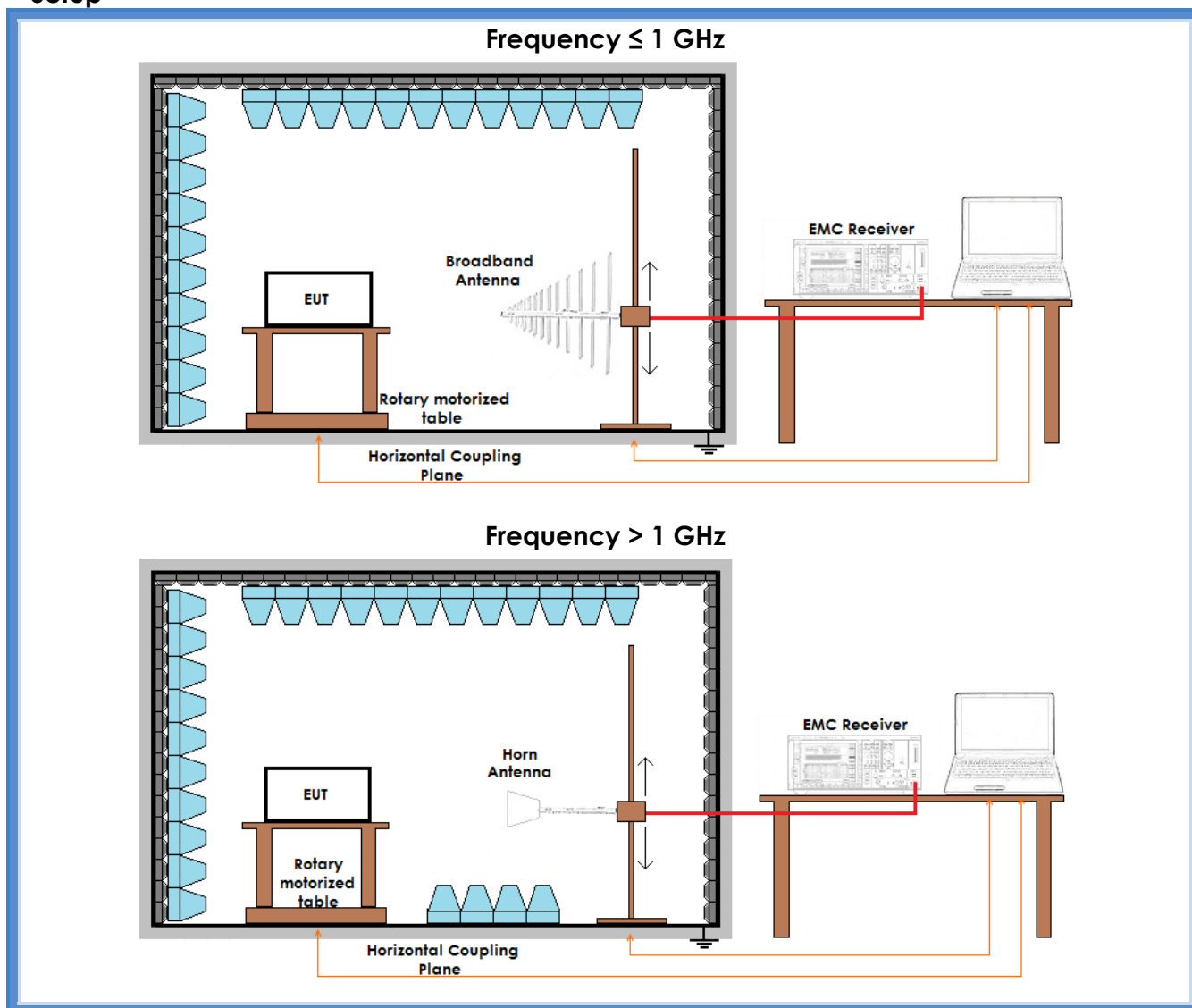
Environmental conditions

Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
21	98	49

Acceptance limits: operation within the band 2400 – 2483,5 MHz



Setup



Result

Channel	Detector	Graph(s)	Results	
Lowest	Peak	G14221259	F_L : 2401,242 MHz *	Complies
		G14221260		
Highest	Peak	G14221269	F_H : < 2483,5 MHz	Complies
Highest	Average	G14221269	F_H : < 2483,5 MHz	Complies

*: 20 dBc limit, $F_L > 2400$ MHz



Graphs

Meas Type

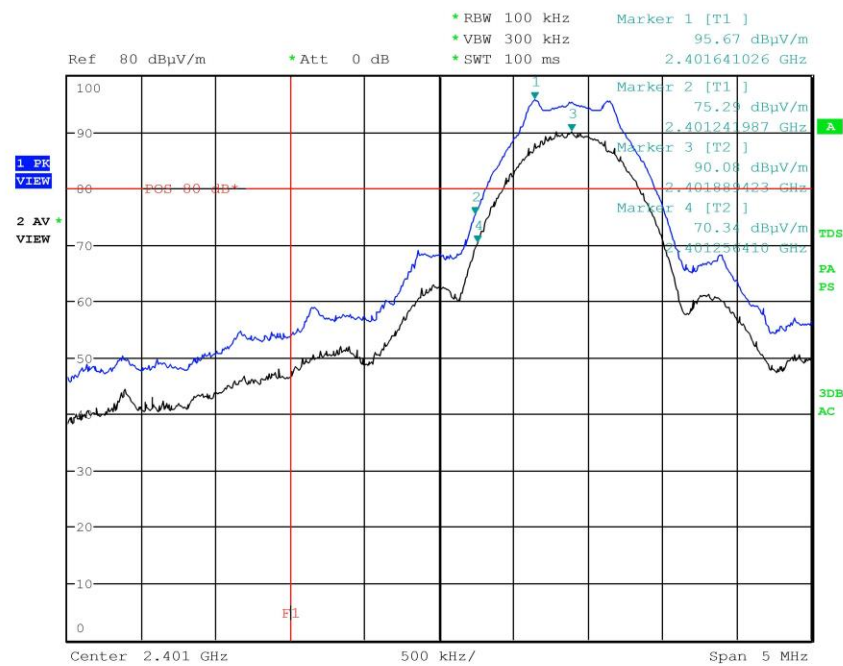
Equipment under Test

Manufacturer

OP Condition Fmin

Operator Bertezolo 14221259

Test Spec





Meas Type

Equipment under Test

Manufacturer

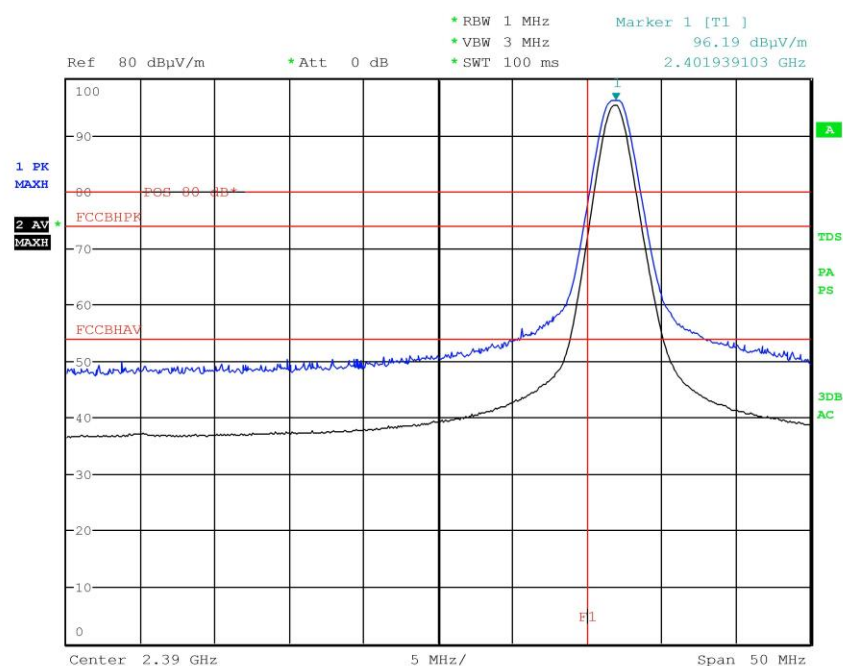
OP Condition

Fmin

Operator

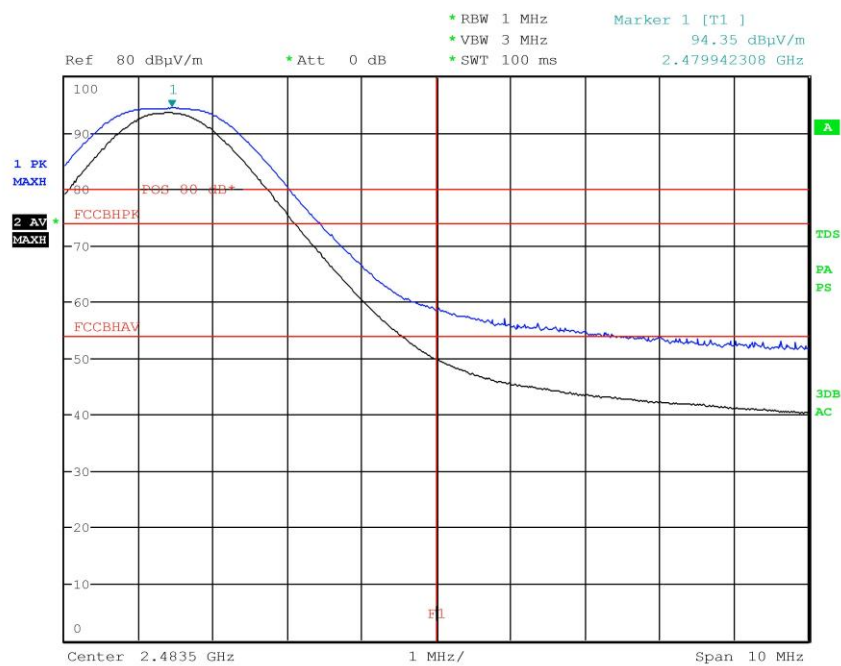
Bertezzo 14221260

Test Spec





Meas Type
Equipment under Test
Manufacturer
OP Condition Fmax
Operator Bertezolo 14221269
Test Spec



Result: The requirements are met



11.6 Fundamental emission output power

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r02 cl. 3.0 and 9
- Internal procedure PM001
- See clause 4 of this test report
- Test date: 23 December 2014
- Technician: A. Bertezzo

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure (conducted measurements are not applicable because the antenna connector is not available, see also cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r02)
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 3 m
EUT height about the floor: 80 cm

Environmental conditions

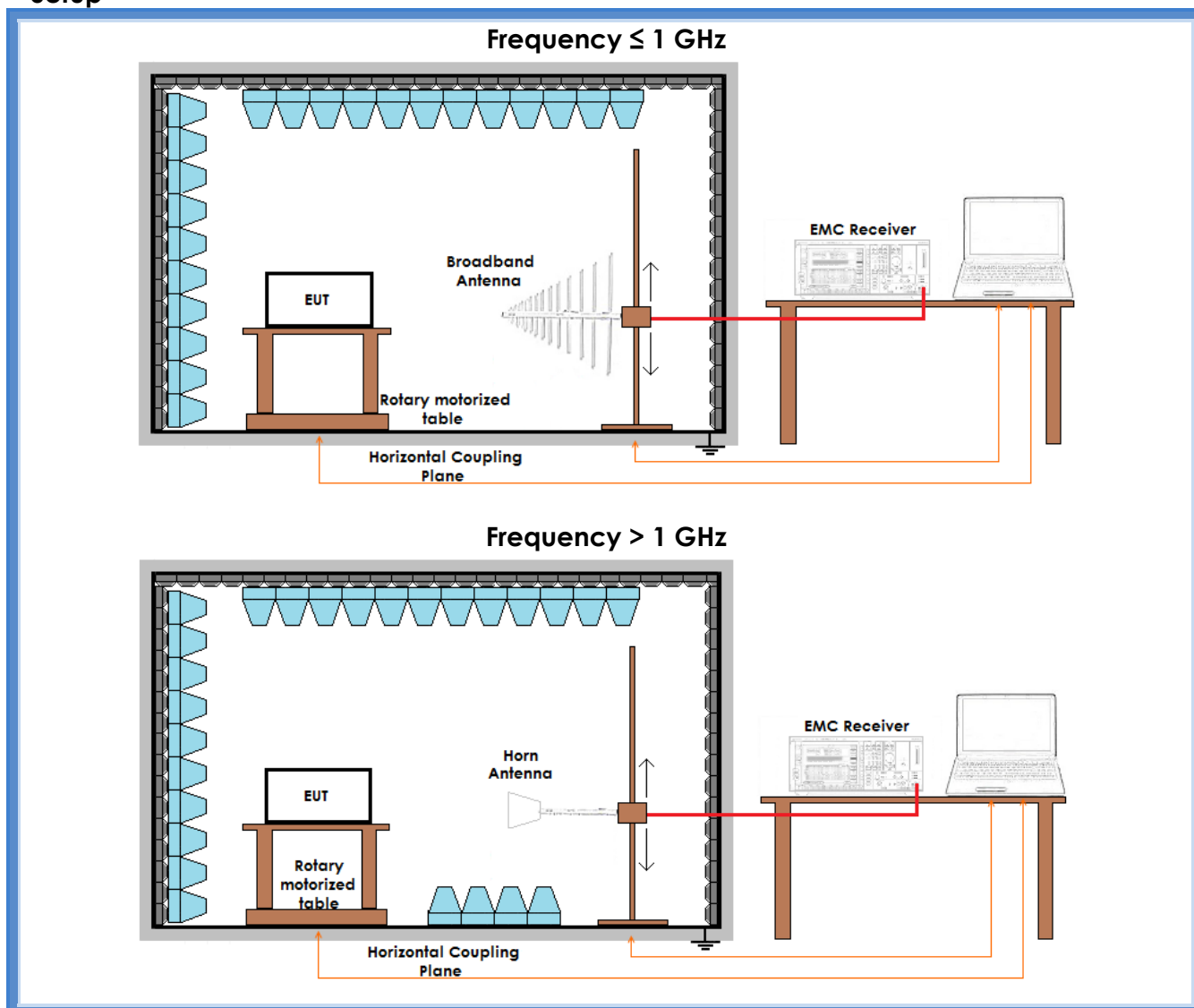
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	98	50

Acceptance limits:

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt



Setup





Result

Channel	Polarization	Graphs	Measured PK level (dBμV/m)	Peak Output Conducted Power (mW)	Remarks
Lowest	Worst case	G14221256	96,2	0,267	--
Medium	Worst case	G14221262	95,1	0,208	--
Highest	Worst case	G14221266	94,4	0,177	--

Remarks: the above table shows the results of radiated measurements, in agreement with cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r02.

Conducted measurements are not applicable because the antenna connector is not available.

The following formula, provided in document DA 00-705, has been used for the conversion between radiated to conducted values:

$$\text{Conducted value} = (E \times d)^2 / (30 \times G)$$

Where:

$E = (10^{(\text{dB}\mu\text{V/m})/20})/1000000$, the maximum measured fundamental field strength in V/m

$G = 10^{\text{dBi}/10}$, the numeric gain of the transmitting antenna: 4,68 (6,7 dBi)

d = the distance in meters from which the field strength was measured (3 m)

P = the power in watts



Graphs

Meas Type

Equipment under Test

Manufacturer

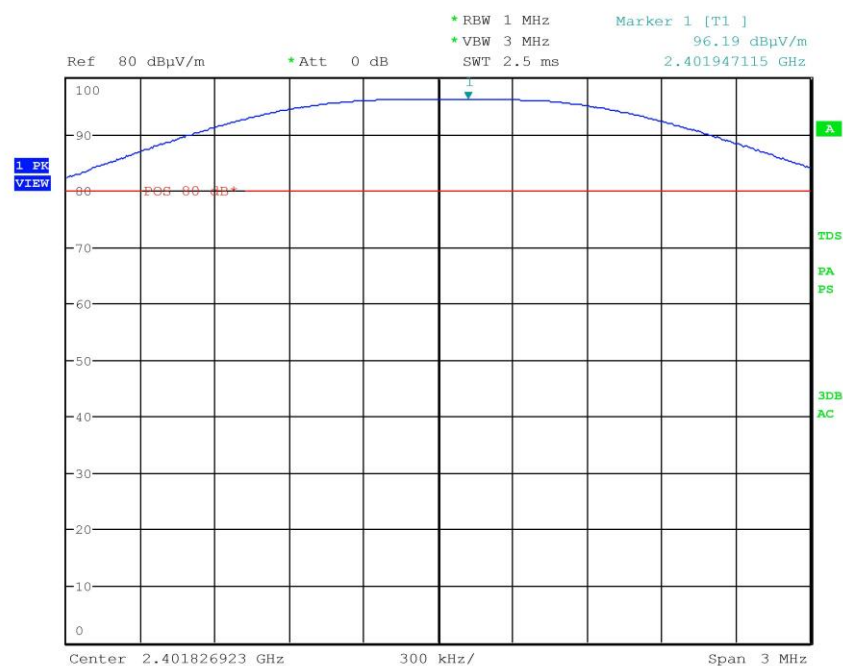
OP Condition

Fmin

Operator

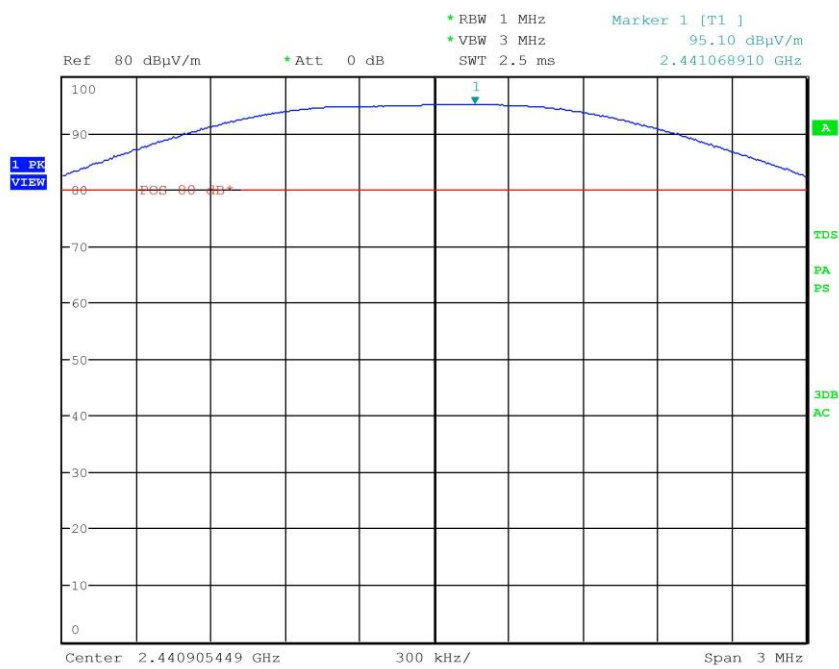
Bertezzo 14221256

Test Spec





Meas Type
Equipment under Test
Manufacturer
OP Condition Fmed
Operator Bertezolo 14221262
Test Spec





Meas Type

Equipment under Test

Manufacturer

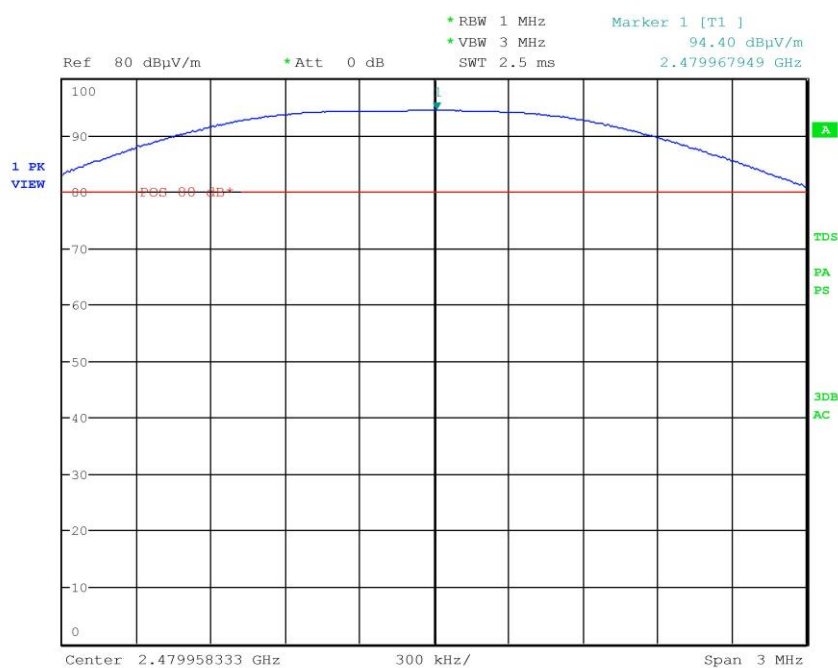
OP Condition

Fmax

Operator

Bertezolo 14221266

Test Spec



Result: The requirements are met



11.7 Maximum power spectral density level in the fundamental emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.247
- KDB 558074 D01 DTS Meas Guidance v03r02 cl. 10.2
- Internal procedure PM001
- See clause 4 of this test report
- Test date: 23 December 2014
- Technician: A. Bertezolo

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 3 m

Environmental conditions

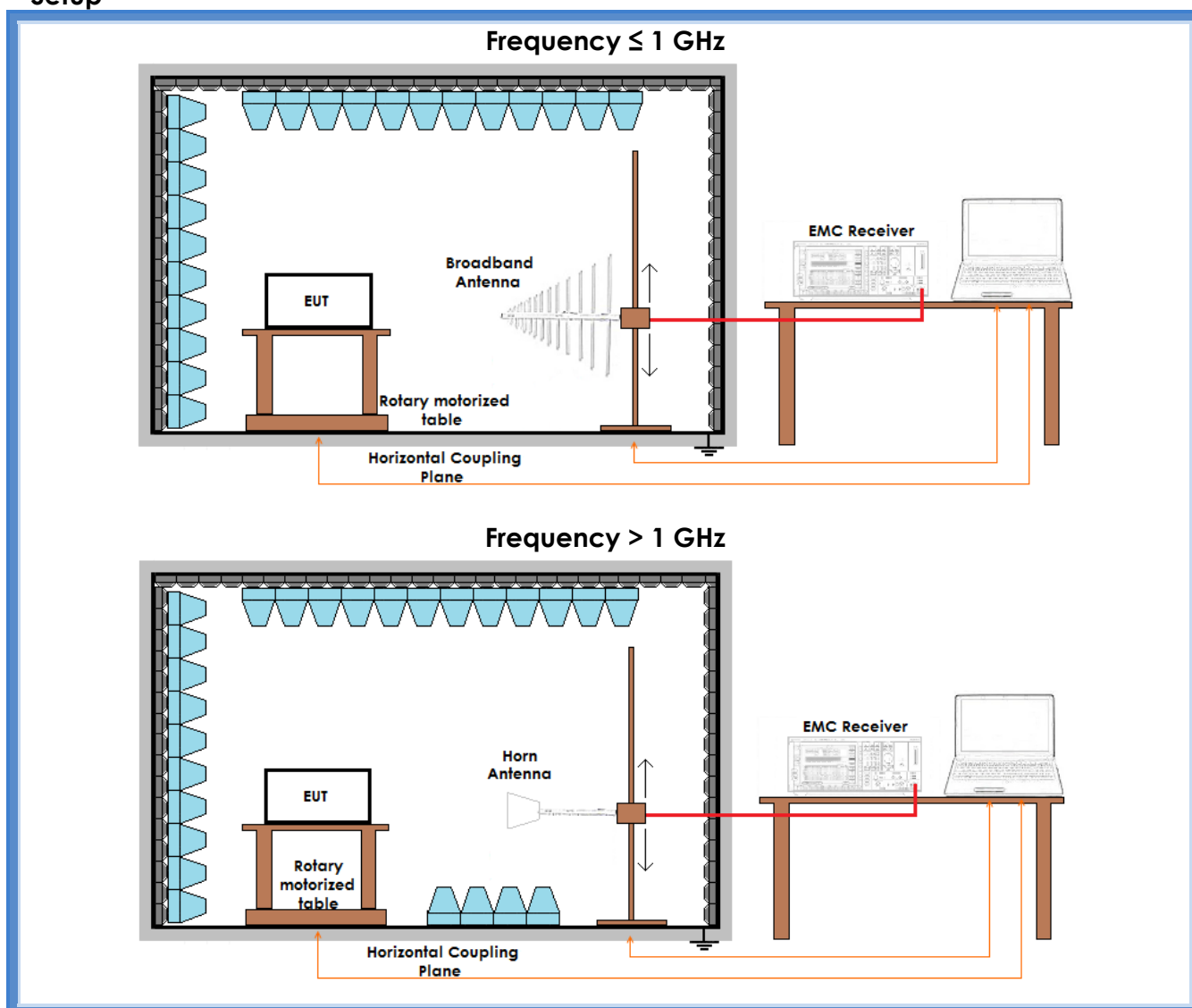
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
22	98	50

Acceptance limits:

Frequency Range	Power Spectral Density
2400 – 2483,5 MHz	8 dBm / 6,31 mW



Setup





Result

Channel	Polarization	Graphs	Measured PK level (dB μ V/m)	Power Spectral Density (mW)	Remarks
Lowest	Worst case	G14221258	95,5	0,228	--
Medium	Worst case	G14221264	94,5	0,181	--
Highest	Worst case	G14221268	93,8	0,154	--

Remarks: the above table shows the results of radiated measurements, in agreement with cl. 3.0 of KDB 558074 D01 DTS Meas Guidance v03r02.

Conducted measurements are not applicable because the antenna connector is not available.

The following formula, provided in document DA 00-705, has been used for the conversion between radiated to conducted values:

$$\text{Conducted value} = (E \times d)^2 / (30 \times G)$$

Where:

$E = (10^{(\text{dB}\mu\text{V/m})/20})/1000000$, the maximum measured fundamental field strength in V/m

$G = 10^{\text{dBi}/10}$, the numeric gain of the transmitting antenna: 4,68 (6,7 dBi)

d = the distance in meters from which the field strength was measured (3 m)

P = the power in watts



Graphs

Meas Type

Equipment under Test

Manufacturer

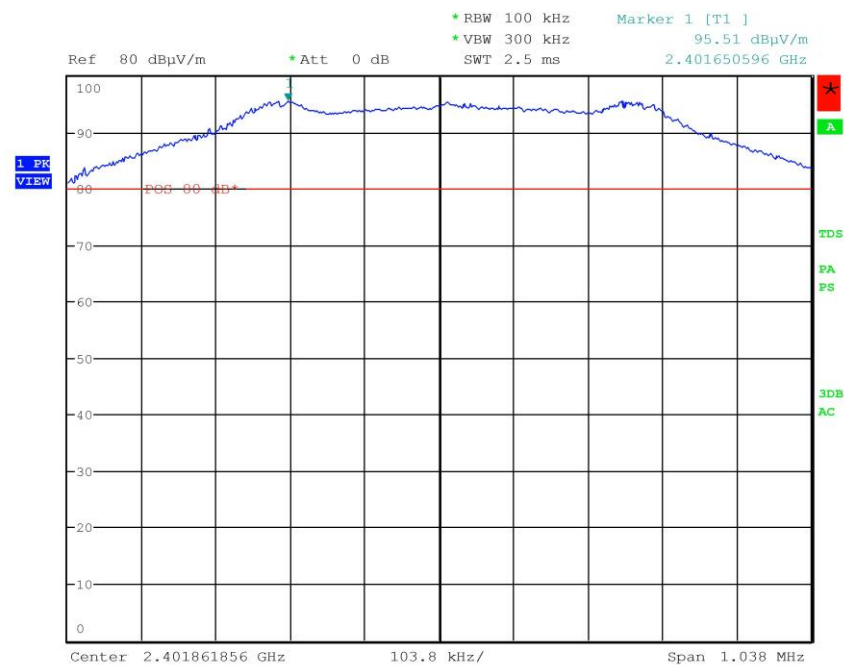
OP Condition

Fmin

Operator

Bertezzo 14221258

Test Spec





Meas Type

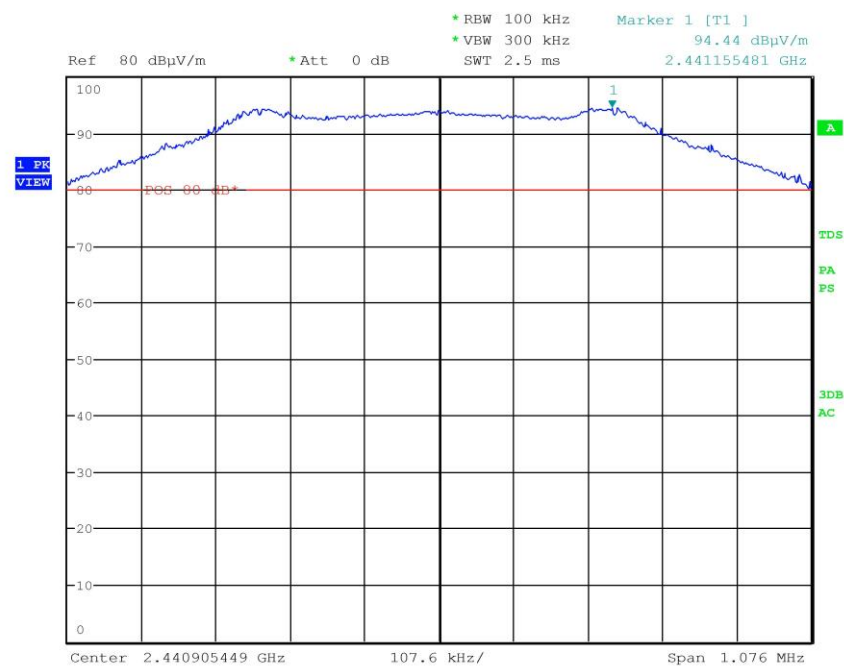
Equipment under Test

Manufacturer

OP Condition Fmed

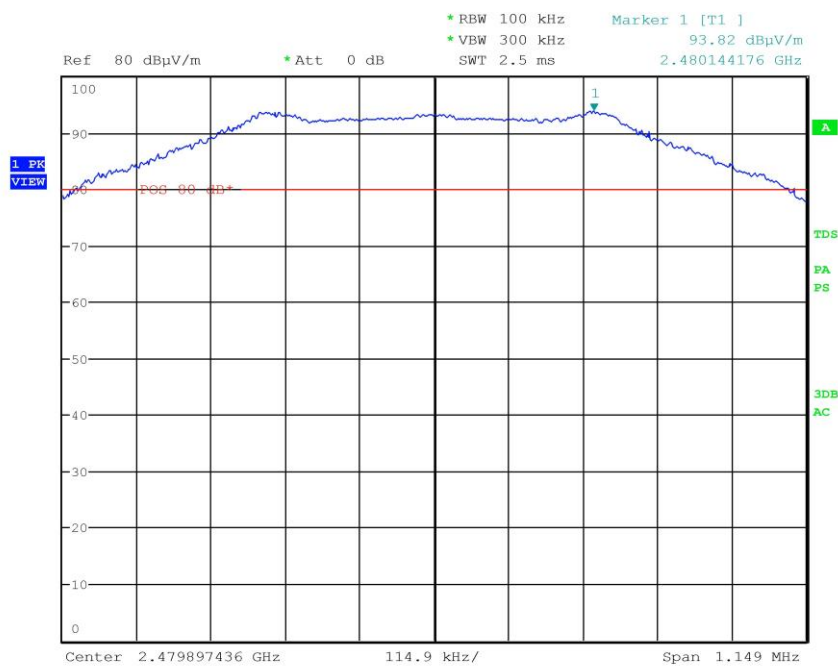
Operator Bertezolo 14221264

Test Spec





Meas Type
Equipment under Test
Manufacturer
OP Condition Fmax
Operator Bertezolo 14221268
Test Spec



Result: The requirements are met



11.8 Spurious Emission

Test set-up and execution

- FCC Rules and Regulation; Titles 47 Part 15.209
- Internal procedure PM001
- See clause 4 of this test report
- Test date: 28 November 2014
- Technician: A. Bertezolo

Test configuration

Test site:
Semi-anechoic chamber

Auxiliary equipment:
See clause 4 of this test report

EUT exercising

See clause 4 of this test report

Test equipment used

CMC S108, CMC S136, CMC S164
Measurement uncertainty: See clause 7 of this test report

Test specification

Port: Enclosure
Antenna polarization: Horizontal (H) – Vertical (V)
EUT – Antenna distance: 3 m
EUT height about the floor: 80 cm
Detector AV + Peak

Environmental conditions

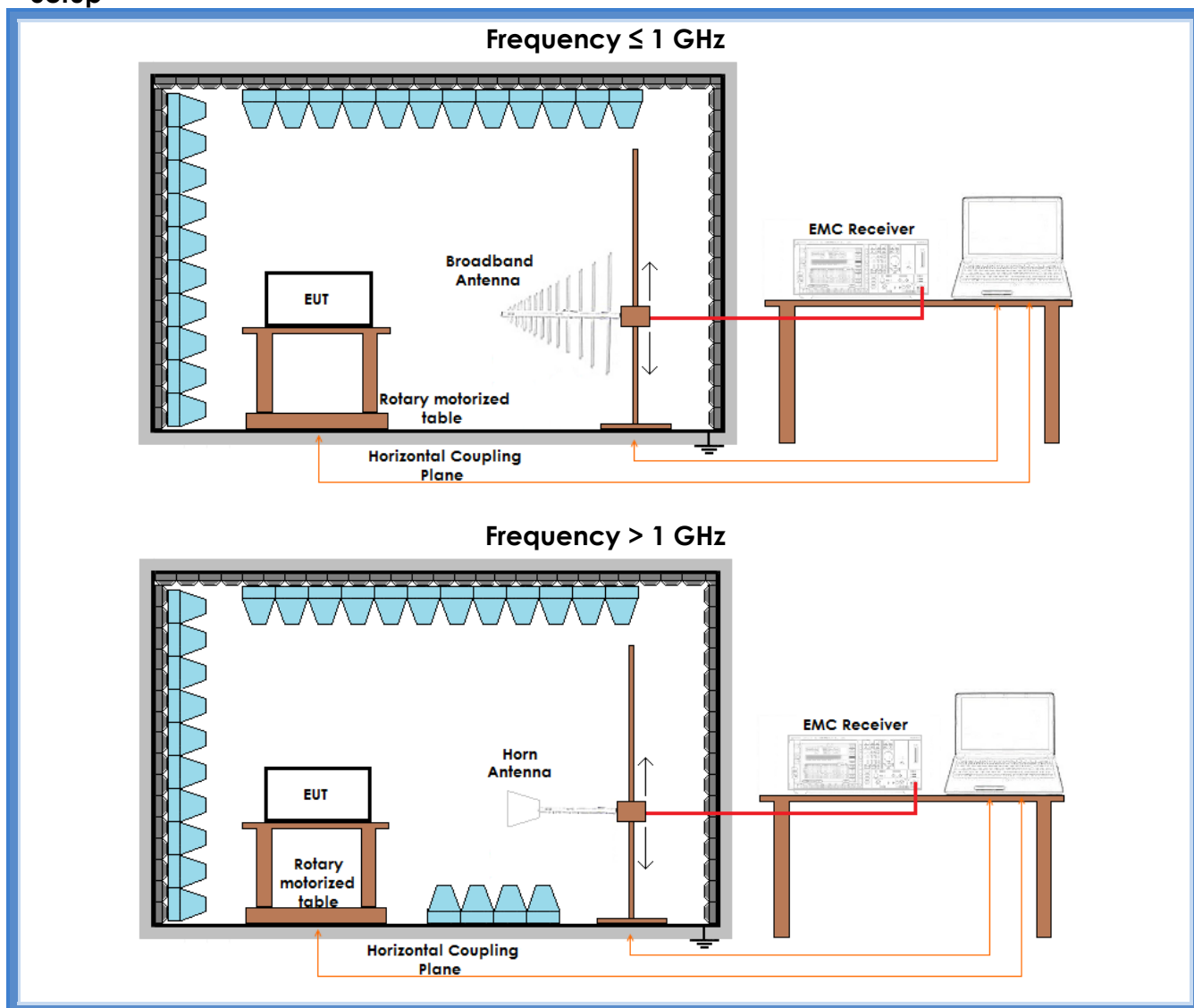
Temperature (°C)	Atmospheric pressure (kPa)	Relative humidity (%)
21	99	59

Acceptance limits

Frequency (MHz)	AV limits [dB(μV/m)]	Peak limits [dB(μV/m)]
> 1000	54	74



Setup





Result – AV detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		Lowest channel	Medium channel	Highest channel	
II	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
III	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IV	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
V	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VI	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VII	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VIII	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IX	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
X	54	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values

Result – Peak detector

Harmonic	Limits (dB μ V/m)	Level (dB μ V/m)			Results
		Lowest channel	Medium channel	Highest channel	
II	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
III	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IV	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
V	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VI	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VII	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
VIII	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
IX	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies
X	74	More than 15 dB below limit	More than 15 dB below limit	More than 15 dB below limit	Complies

Remarks: EUT was tested in 3 orthogonal planes. The results in this table show the highest values

Result: The requirements are met