RADIO TEST REPORT

No. 1709224STO-002, Ed. 1

RF Performance

EQUIPMENT UNDER TEST

Equipment:	Gateway
Type/Model:	ACE Gateway
Manufacturer:	SiteTel Sweden AB
Tested by request of:	SiteTel Sweden AB

SUMMARY

Referring to the emission limits, and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards:

47 CFR Part 15 (2016): Subpart C: Intentional radiators. Section 15.247

47 CFR Part 15 (2016): Subpart B: Unintentional radiators

RSS-GEN Issue 4 (2014): General requirements of compliance of radio apparatus (2014)

RSS-247 Issue 2 (2017): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

For details, see clause 2 – 4.

Date of issue: 2017-06-13

Tested by: Robert Hietala

Approved by: Matti Virkki

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S 114 17-04 Strömberg 252725

Revision History

Edition	Date	Description	Changes
1	2017-06-13	First release	

S 114 10-06 Strömberg 164234

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1 CLIENT INFORMATION

The EUT has been tested by request of

Company	SiteTel Sweden AB Haukadalsgatan 8A 164 40 Kista Sweden
Name of contact	Karin Ögren Phone +46 8 410 102 09

2 EQUIPMENT UNDER TEST (EUT)

2.1 Identification of the EUT

Equipment:	Gateway	
Type/Model:	ACE Gateway	
Brand name:	ACE Gateway	
Serial number:	XZ9100000024 and XZ9000000407	
Manufacturer:	SiteTel Sweden AB	
Transmitter frequency range:	2402 – 2480 MHz	
Receiver frequency range:	2402 – 2480 MHz	
Frequency agile or hopping:	☐ Yes	☒ No
Antenna:	☒ Internal antenna	☐ External antenna
Antenna connector:	☒ None, internal antenna	☐ Yes
Antenna gain:	2.0 dBi	
Rating RF output power:	6.2 dBm (measured conducted)	
Type of modulation:	GFSK	
Temperature range:	☐ Category I (General): -20°C to +55°C ☐ Category II (Portable equipment): -10°C to +55°C ☐ Category III (Equipment for normal indoor use): +5°C to +35°C ☒ Other: -40°C to +70°C	
Transmitter standby mode supported:	☒ Yes	☐ No

2.2 Additional information about the EUT

The EUT consists of the following units:

Unit	Type	Serial number
Radiated testing	ACE Gateway	XZ9000000407
Conducted testing	ACE Gateway	XZ9100000024

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2.3 Peripheral equipment

Peripheral equipment is equipment needed for correct operation of the EUT, but not included as part of the testing and evaluation of the EUT.

Equipment	Type / Model	Manufacturer	Serial no.
Communication tester	CMW 500	Rohde & Schwarz	1201.002K50-107965-cA

2.4 Test signals and operation modes

Continuous signal with a payload of 37 bytes.

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3 TEST SPECIFICATIONS

3.1 Standards

Requirements:

47 CFR Part 15 (2015): Subpart C: Intentional radiators. Section 15.247

47 CFR Part 15 (2015): Subpart B: Unintentional radiators

RSS-GEN Issue 4 (2014): General requirements of compliance of radio apparatus (2014).

RSS-247 Issue 2 (2017): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Test methods:
ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

3.2 Additions, deviations and exclusions from standards and accreditation

RSS-247 Issue 2 (2017) is not within Intertek's scope of accreditation.

No other additions, deviations or exclusions have been made from standards and accreditation.

3.3 Test site

Measurements were performed at:

Intertek Semko AB.
Torshamnsgatan 43,
Box 1103
SE-164 22 Kista

Intertek Semko AB is a FCC listed test site with site registration number 90913
Intertek Semko AB is a FCC accredited conformity assessment body with designation number SE0002
Intertek Semko AB is an Industry Canada listed test facility with IC assigned code 2042G

Measurement chambers

Measurement Chamber	Type of chamber	IC Site filing #
STORA HALLEN	Semi-anechoic 10 m and 3 m	2042G-2

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4 TEST SUMMARY

The results in this report apply only to sample tested:

Requirement	Description	Result
FCC §15.203 **RSS-GEN 8.3**	**Antenna requirement** The EUT has integrated non detachable antenna which can't be removed without breaking the EUT.	**PASS**
FCC §15.207, 15.107 **RSS-GEN 8.8 table 3**	**Conducted continuous emission in the frequency range 150 kHz to 30 MHz, AC Power input port** Equipment intended for 48 volt environment.	**NA**
FCC §15.247 (b)(4) **RSS-247 5.4(4), 5.4(5)**	**Field strength of fundamental and antenna gain** Antenna gain is less than 6 dBi.	**NA**
FCC §15.247 (d), 15.209(a) **RSS-GEN 8.9** **RSS-247 5.5**	**Radiated emission of electromagnetic fields in the frequency range 30 – 1000 MHz** The EUT complies with the limits. The margin to the limit was at least 3.1 dB at 263.973 MHz. See clause 5.4 – 5.5.	**PASS**
FCC §15.247(d), 15.209(a) **RSS-GEN 8.9** **RSS-247 5.5**	**Radiated emission of electromagnetic fields in the frequency range above 1 GHz** The EUT complies with the limits. The margin to the limit was at least 8.4 dB at 3898.5 MHz. See clause 5.6 – 5.7.	**PASS**
FCC §15.247(a)(2) **RSS-GEN 6.6** **RSS-247 5.2(1)**	**Occupied bandwidth** The EUT complies with the limits. The margin to the limit is at least 218.9 kHz See clause 8.4.	**PASS**
FCC §15.247(b) **RSS-247 5.4(4)**	**Conducted output power** The EUT complies with the limits. The margin to the limit was at least 23.8 dB at 2440.0 MHz. See clause 7.4.	**PASS**
FCC §15.247(e) **RSS-247 5.2(2)**	**Peak power spectral density** The EUT complies with the limits. The margin to the limit was at least 17.9 dB at 2402.0 MHz. See clause 9.4.	**PASS**
FCC §15.247(e) **RSS-247 5.5**	**Band edge** The EUT complies with the limits. The margin to the limit was at least 50.2 dB at 2400.0 MHz. See clause 6.4.	**PASS**

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5 RADIATED RF EMISSION IN THE FREQUENCY-RANGE 30 MHZ TO 26 GHZ

Date of test:	2017-06-05	**Test location:**	Stora Hallen
EUT Serial:	XZ9000000407	**Ambient temp:**	20 °C
Tested by:	Robert Hietala	**Relative humidity:**	52 %
Test result:	Pass	**Margin:**	3.1 dB

5.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013.
The EUT was set up in order to emit maximum disturbances.

The EUT was placed on an insulating support 0.8 and 1.5 m above the turntable which is part of the reference ground plane.

Overview sweeps were performed with the measurement receiver in max-hold mode and the peak detector activated in the frequency-range 30 – 1000 MHz. Above 1 GHz additionally the average detector was activated.

Portable device: Pre scan was made in three orthogonal EUT orientations, worst-case is presented.

Device contains a UMTS/3G module that is considered to be co-located. During TX tests the UMTS/3G module transmitted a continuous signal at maximum output power, this signal was attenuated using a tuneable band pass filter. The UMTS/3G module was transmitting with the following settings:

UTRA Band	Downlink frequency [MHz]	Downlink channel	Uplink frequency [MHz]	Uplink channel
1	2140,0	10700	1950,0	9750

Carrier frequencies shown on pre-sweep were not measured in final measurement.

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5.2 Test conditions

Test set-up:	**30 MHz to 1000 MHz**		
Test receiver set-up:			
Preview test:	Peak,	RBW 120 kHz	VBW 1 MHz
Final test:	Quasi-Peak,	RBW 120 kHz	VBW 1 MHz
EUT height above ground plane:	0.8 m		
Measuring distance:	3 m		
Measuring angle:	0 – 359°		
Antenna			
Height above ground plane:	1 – 4 m		
Polarisation:	Vertical and Horizontal		
Type:	Bilog		

Test set-up:	**1 GHz – 26.5 GHz**		
Test receiver set-up:			
Preview test:	Peak,	RBW 1 MHz	VBW 3 MHz
	Average,	RBW 1 MHz	VBW 3 MHz
Final test:	Peak,	RBW 1 MHz	VBW 3 MHz
	Average	RBW 1 MHz	VBW 3 MHz
EUT height above ground plane:	1.5 m		
Measuring distance:	3 m		
Measuring angle:	0 – 359°		
Antenna			
Height above ground plane:	1 – 4 m		
Polarisation:	Vertical and Horizontal		
Type:	Horn		
Antenna tilt:	Activated		

5.3 Requirements

Within restricted bands and receive mode:
Reference: CFR 47 §15.209, §15.109, RSS-Gen section 8.9

Field strength of emissions must comply with limits shown in table below

Frequency range [MHz]	Field strength at 3 m (dBµV/m)	Field strength at 10 m (dBµV/m)	Detector (dBµV/m)
30 – 88	40.0	29.5	Quasi Peak
88 – 216	43.5	33.0	Quasi Peak
216 – 960	46.0	35.5	Quasi Peak
960 – 1000	54.0	43.5	Quasi Peak
Above 1000	54.0 / 74.0	43.5 / 63.5	Average / Peak

The values for 10 m measuring distance are calculated by subtracting 10.5 dB from the 3 m limit.
(i.e. an extrapolation factor of 20 dB/decade according to CFR 47 §15.31(f)(1))

Outside the restricted bands:
Reference: CFR 47 §15.247(d), RSS-247 5.5,

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

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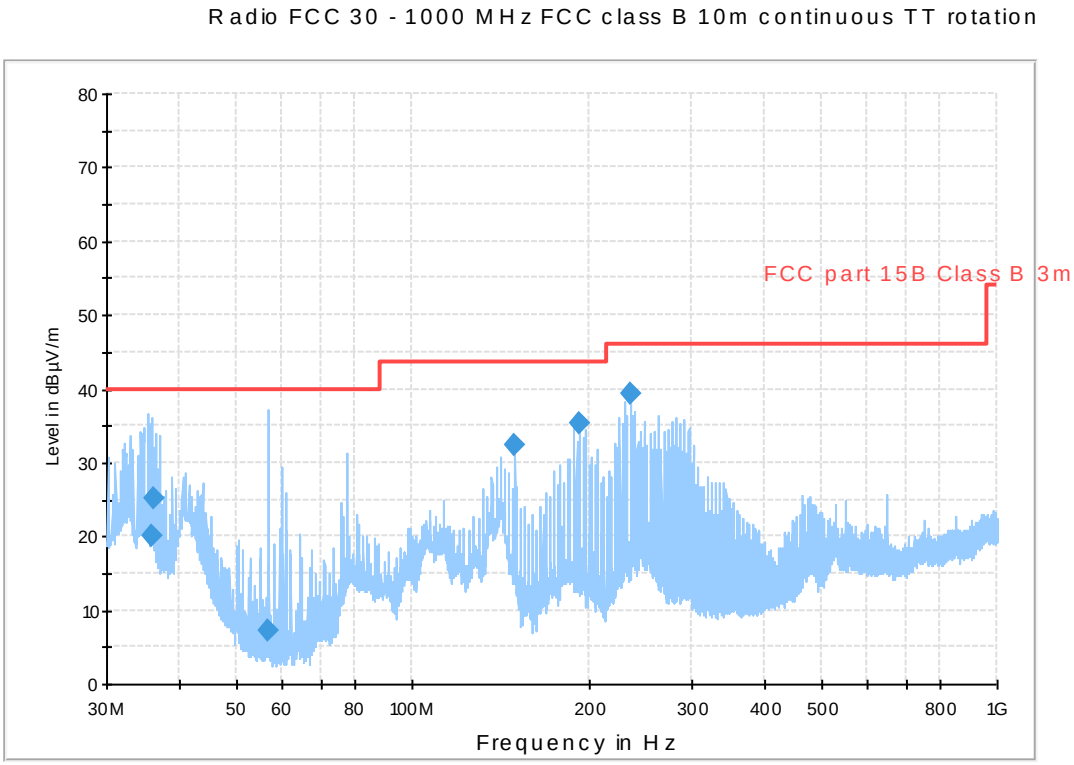
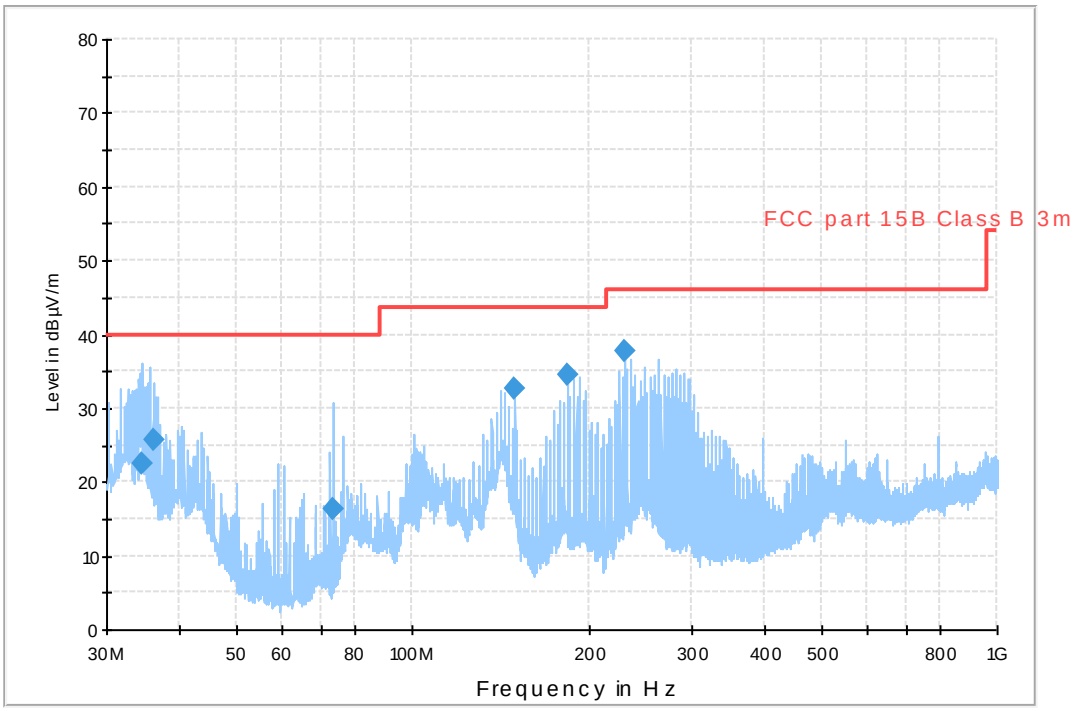
5.4 Test results 30 MHz – 1000 MHz, TX



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX low channel, EUT orientation X.



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX mid channel, EUT orientation X.

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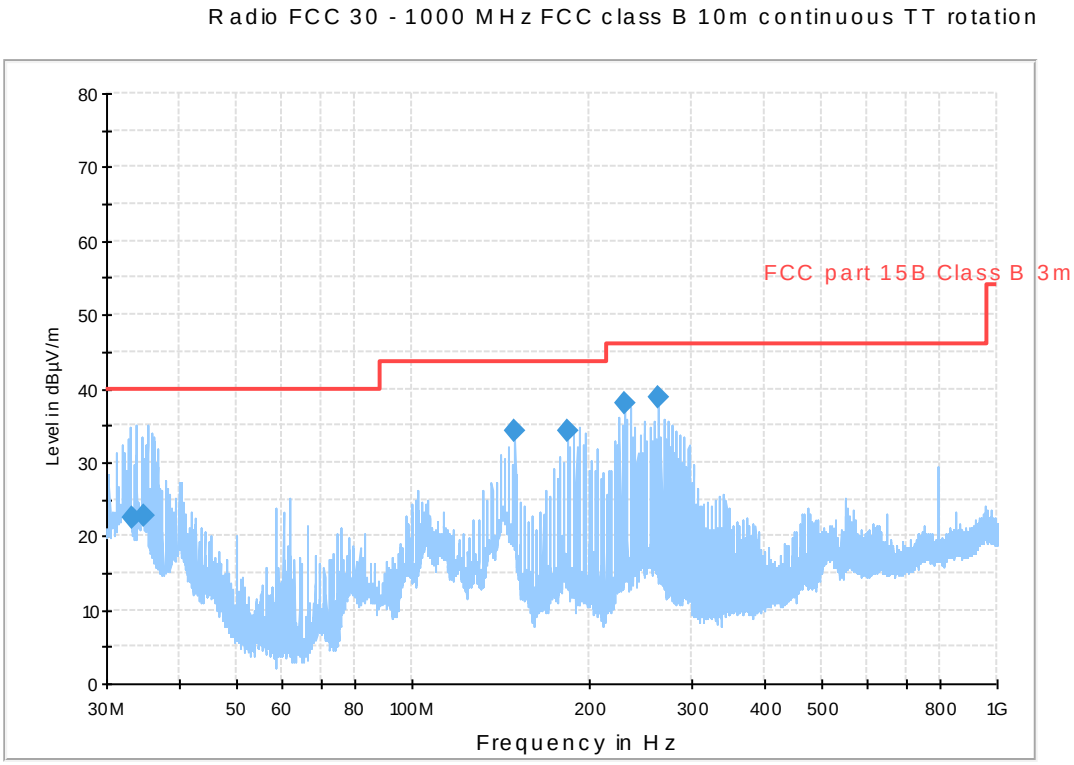
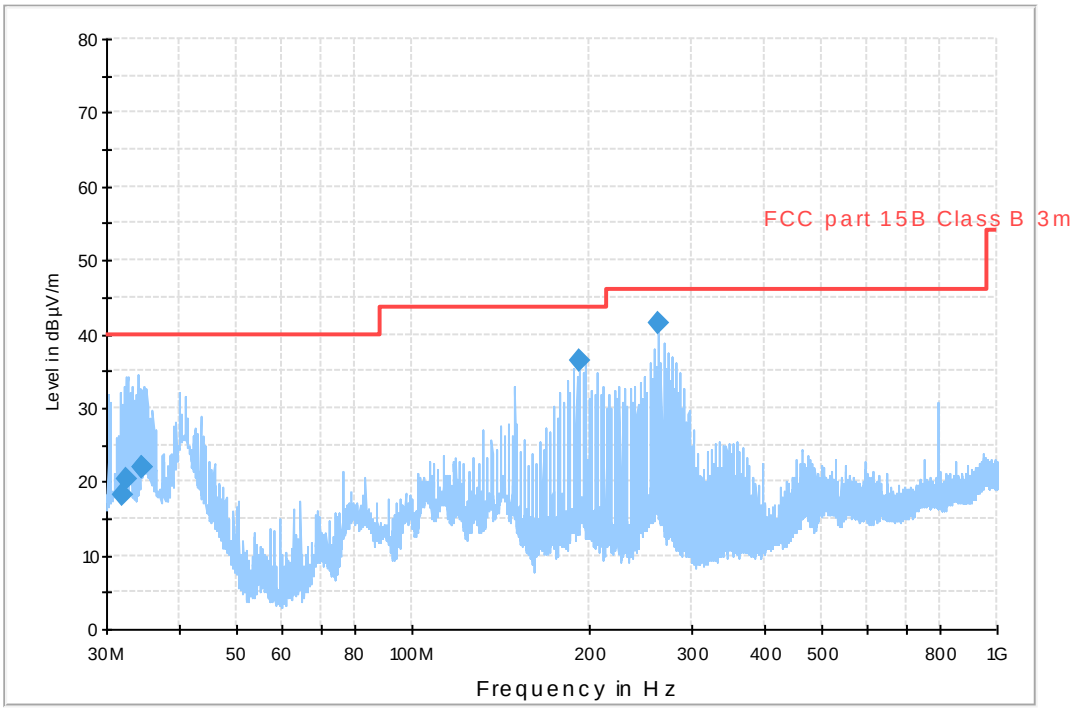


Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX high channel, EUT orientation X.



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX high channel, EUT orientation Y.

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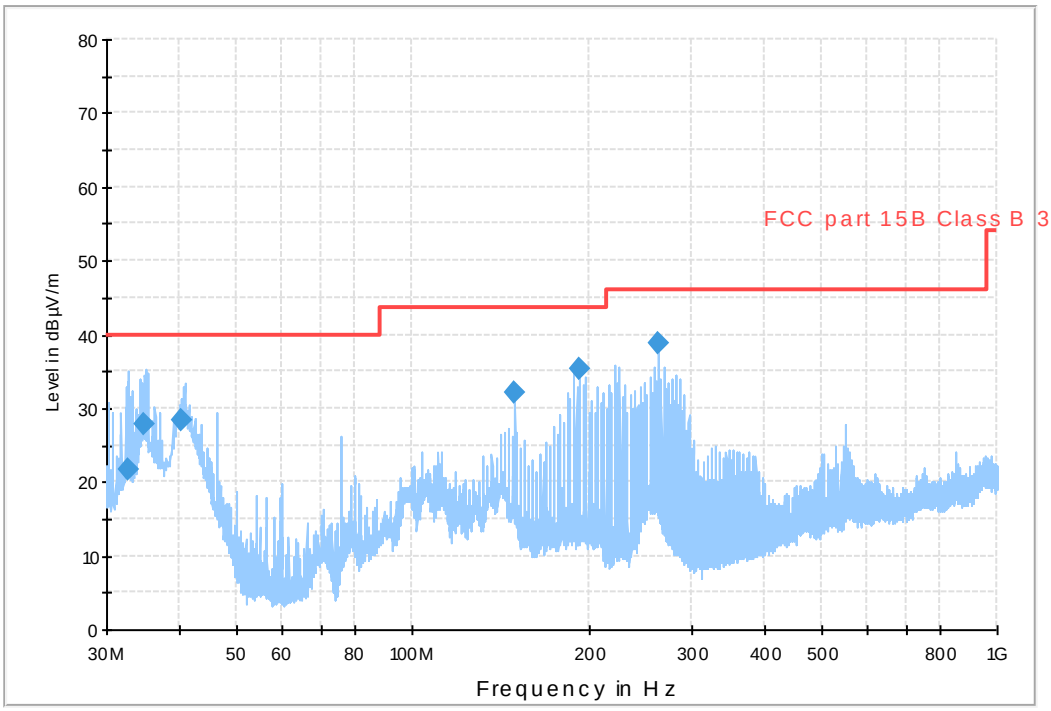
Radio FCC 30 - 1000 MHz FCC class B 10m continuous TT rotation



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. TX high channel, EUT orientation Z.

Measurement results, Quasi Peak, TX low channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
35.935	20.2	40.0	X	V	19.8
36.020	25.2	40.0	X	V	14.8
56.572	7.1	40.0	X	V	32.9
149.989	32.4	44.0	X	H	11.6
193.260	35.2	44.0	X	H	8.8
235.689	39.2	46.0	X	H	6.8

Measurement results, Quasi Peak, TX mid channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
34.551	22.6	40.0	X	V	17.4
36.009	25.7	40.0	X	V	14.3
73.077	16.3	40.0	X	V	23.7
149.989	32.6	44.0	X	H	11.4
183.842	34.6	44.0	X	H	9.4
230.984	37.8	46.0	X	H	8.2

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Measurement results, Quasi Peak, TX high channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
32.011	18.2	40.0	Y	V	21.8
32.528	20.2	40.0	Y	V	19.8
32.596	21.7	40.0	Z	V	18.3
33.086	22.4	40.0	X	V	17.6
34.529	21.8	40.0	Y	V	18.2
34.638	22.8	40.0	X	V	17.2
34.638	27.8	40.0	Z	V	12.2
34.553	21.9	40.0	Y	V	18.1
40.167	28.5	40.0	Z	V	11.5
149.989	34.3	44.0	X	H	9.7
149.989	32.1	44.0	Z	H	11.9
183.842	34.4	44.0	X	H	9.6
193.291	36.4	44.0	Y	H	7.6
193.291	35.3	44.0	Z	H	8.7
230.984	37.9	46.0	X	H	8.1
264.004	38.8	46.0	X	H	7.2
264.004	41.6	46.0	Y	H	4.4
264.004	38.8	46.0	Z	H	7.2

Result [dBµV/m] = Analyser reading [dBµV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

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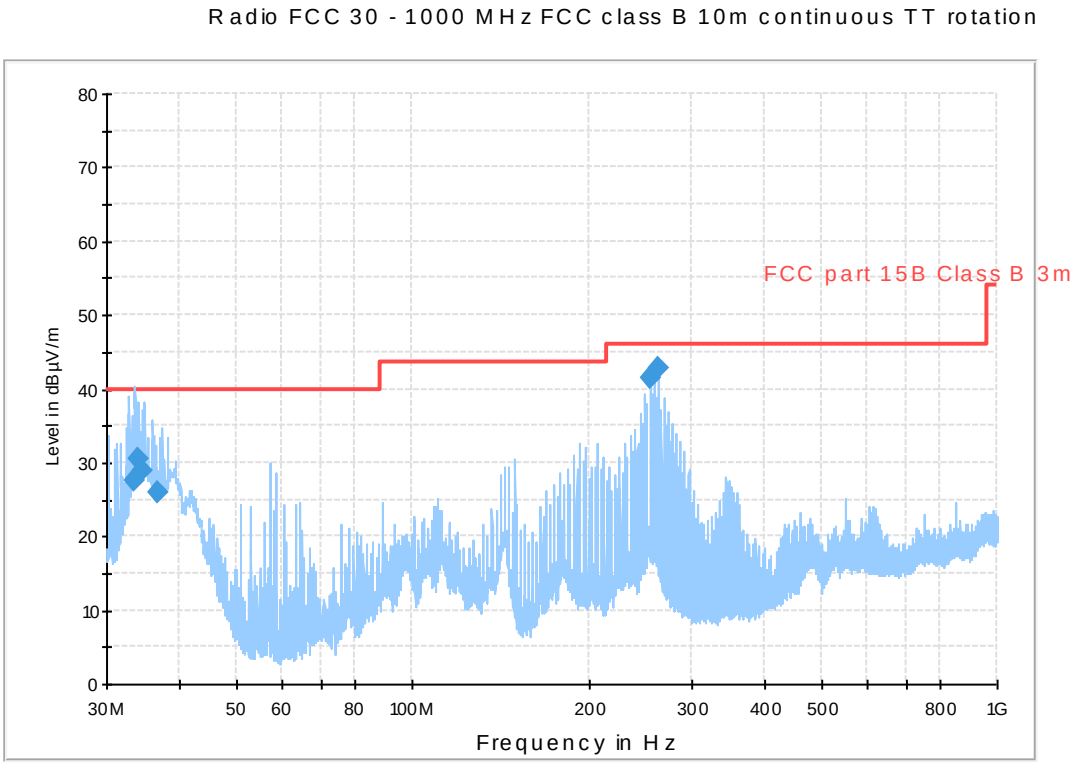
5.5 Test results 30 MHz – 1000 MHz, RX



Diagram, Peak overview sweep, 30 – 1000 MHz at 3 m distance. RX low channel, EUT orientation X.

Measurement results, Quasi Peak, RX low channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	Polarization H/V	Margin [dB]
33.365	27.5	40.0	V	12.5
34.061	30.4	40.0	V	9.6
34.539	28.8	40.0	V	11.2
36.821	25.9	40.0	V	14.1
254.547	41.5	46.0	H	4.5
263.973	42.9	46.0	H	3.1

Result [dBµV/m] = Analyser reading [dBµV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

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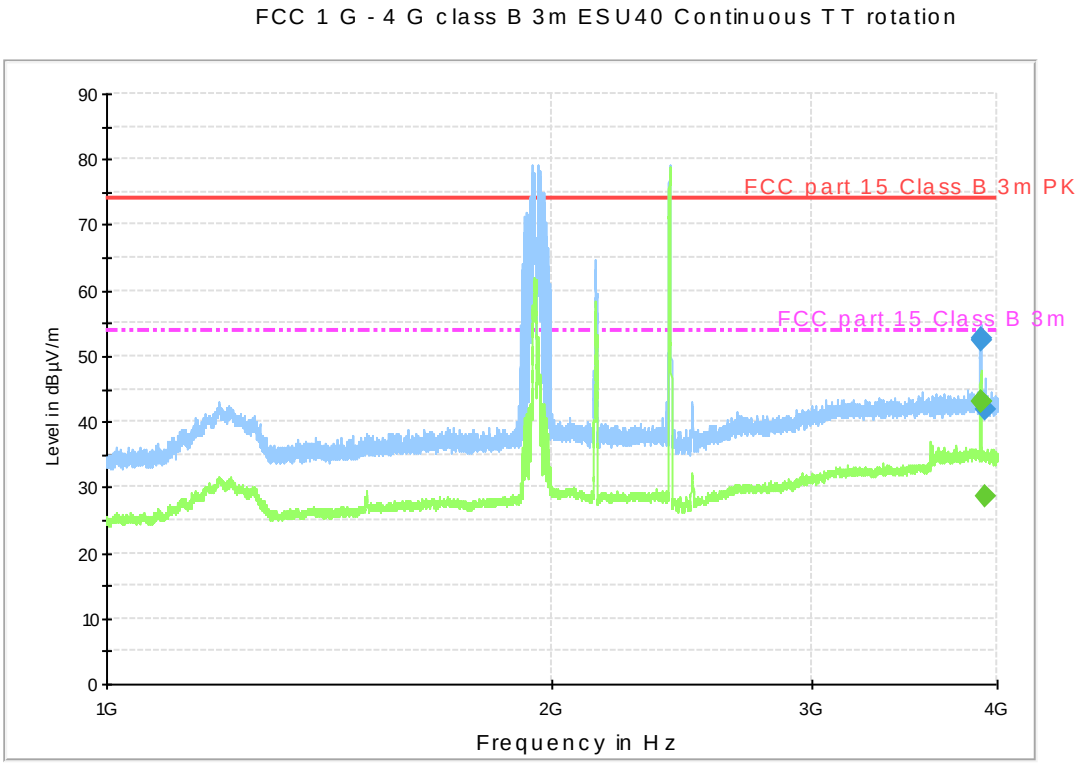
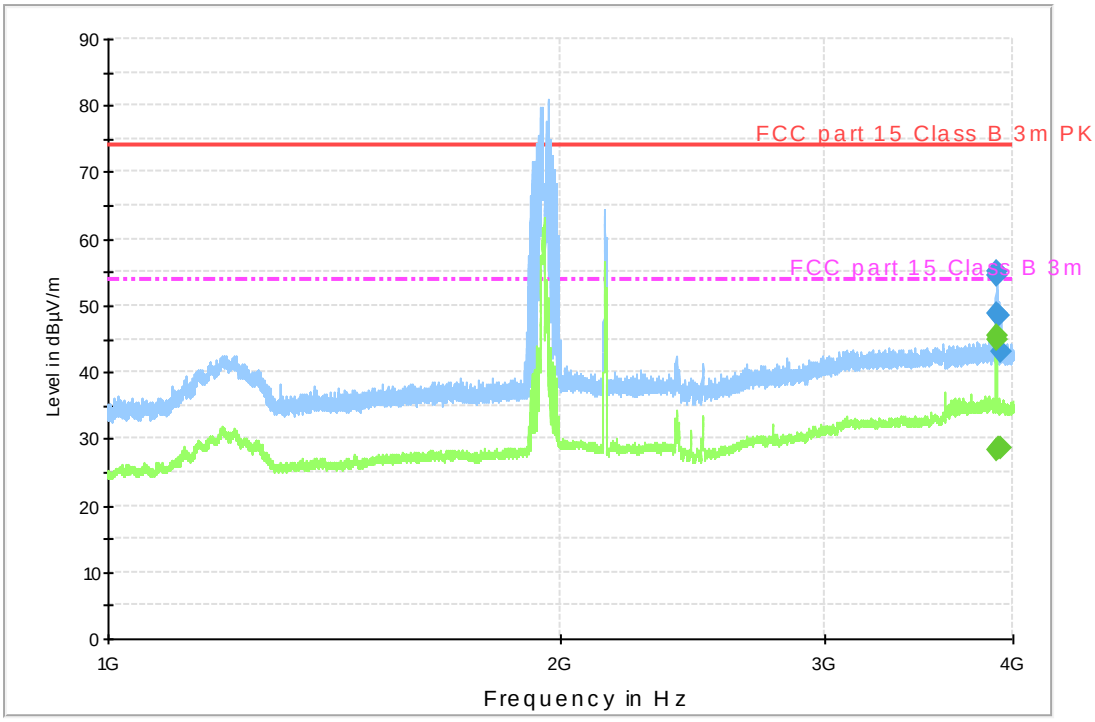
5.6 Test results 1 GHz – 26.5 GHz, TX



Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX low channel, EUT orientation X. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.



Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX mid channel, EUT orientation X. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.

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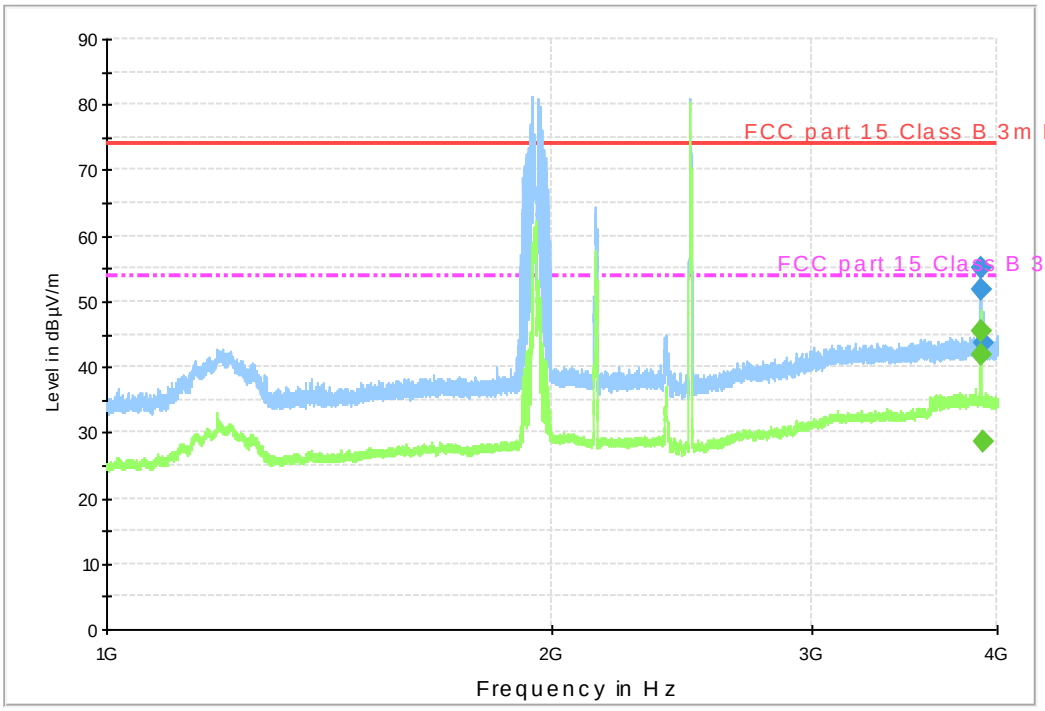
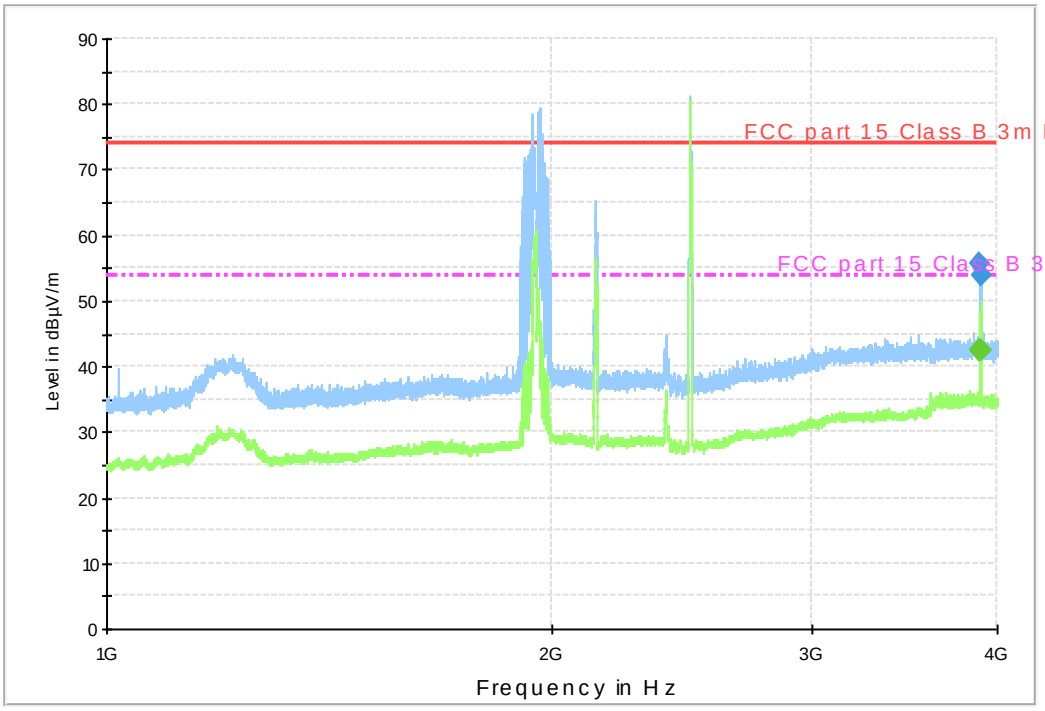


Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX high channel, EUT orientation X. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.



Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX high channel, EUT orientation Y. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.

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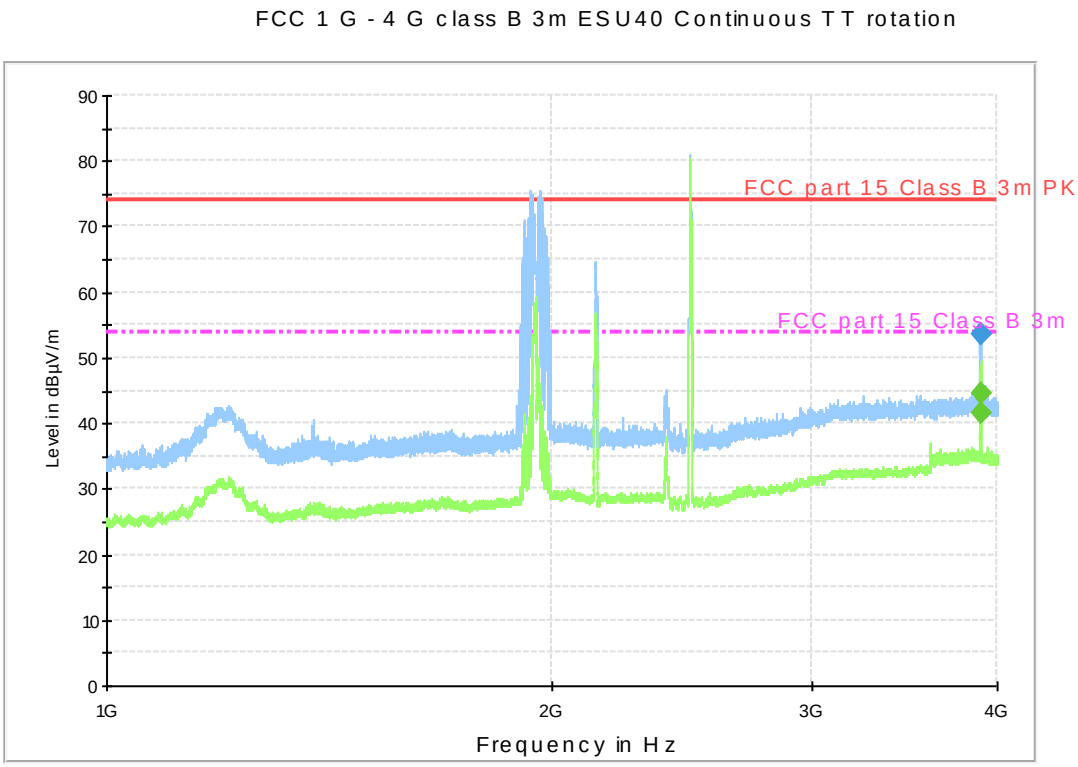
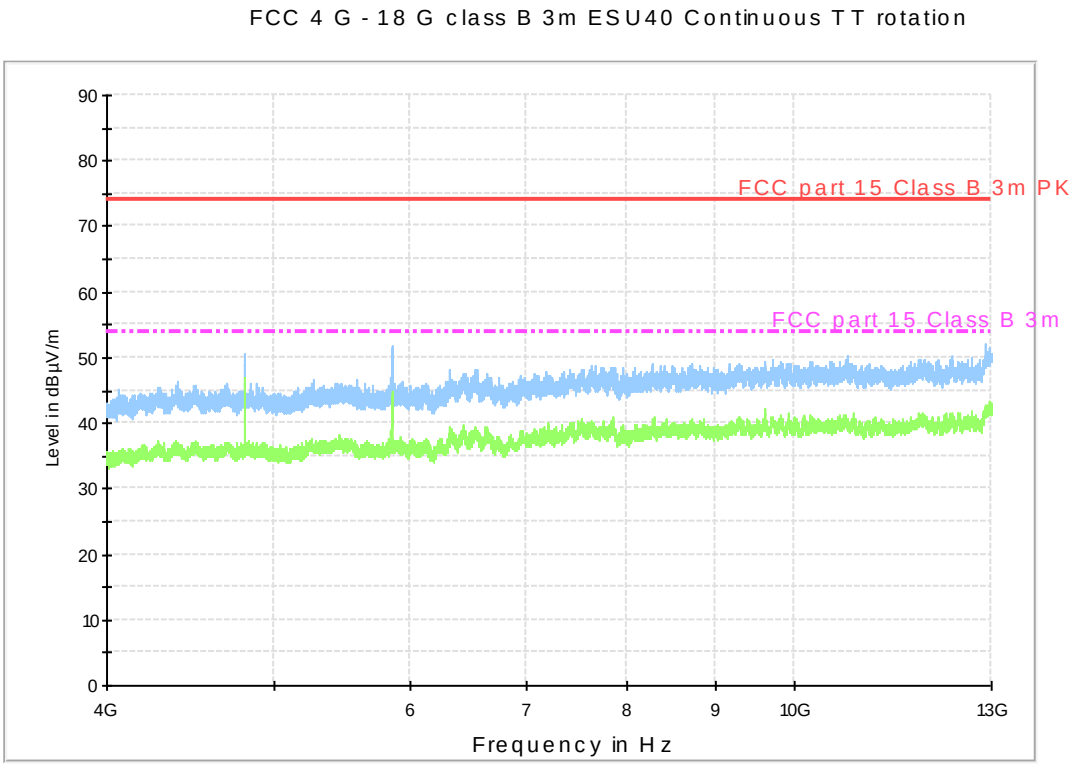


Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX high channel, EUT orientation Z. Carrier is attenuated by band rejection filter K&L 6N45-2450/T 100-0/0.



Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX low channel, EUT orientation X.

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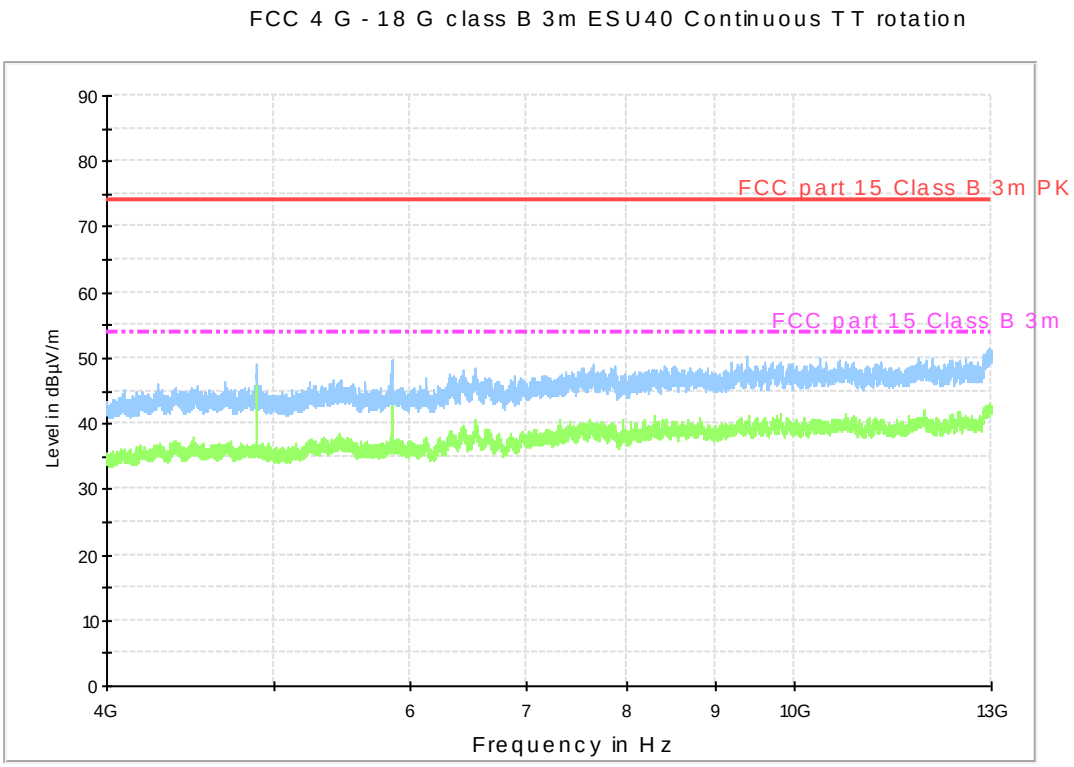
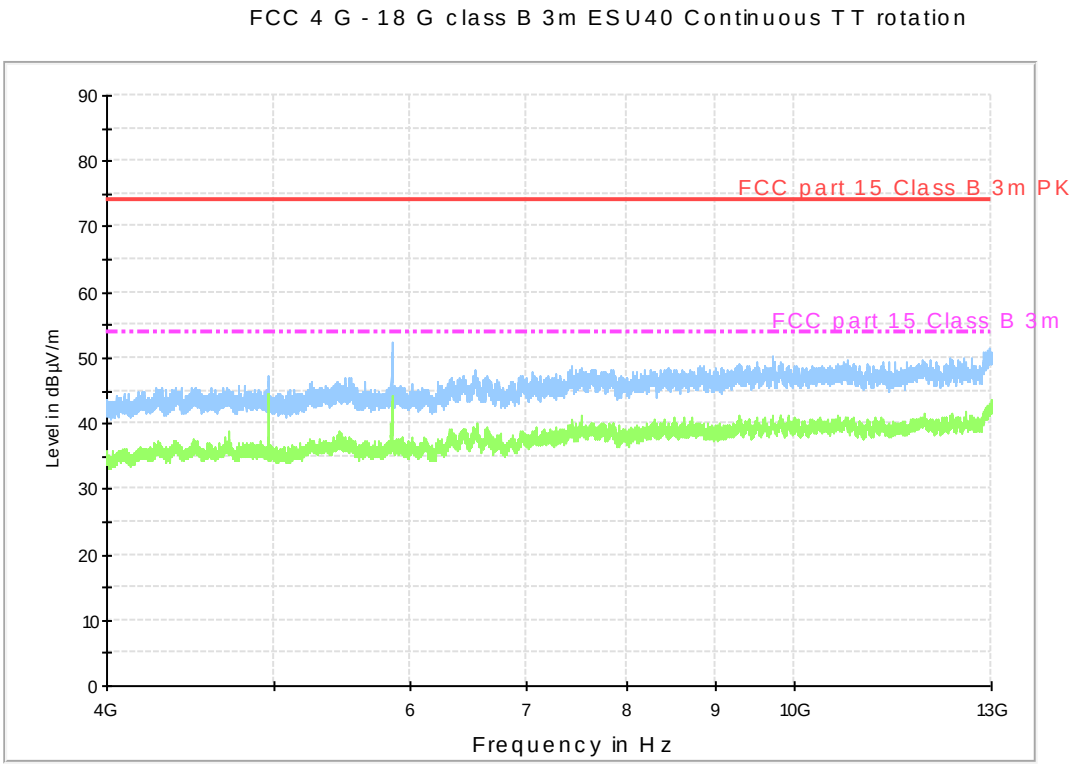


Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX mid channel, EUT orientation X.



Diagram, Peak overview sweep, 1– 4 GHz at 3 m distance. TX high channel, EUT orientation X.

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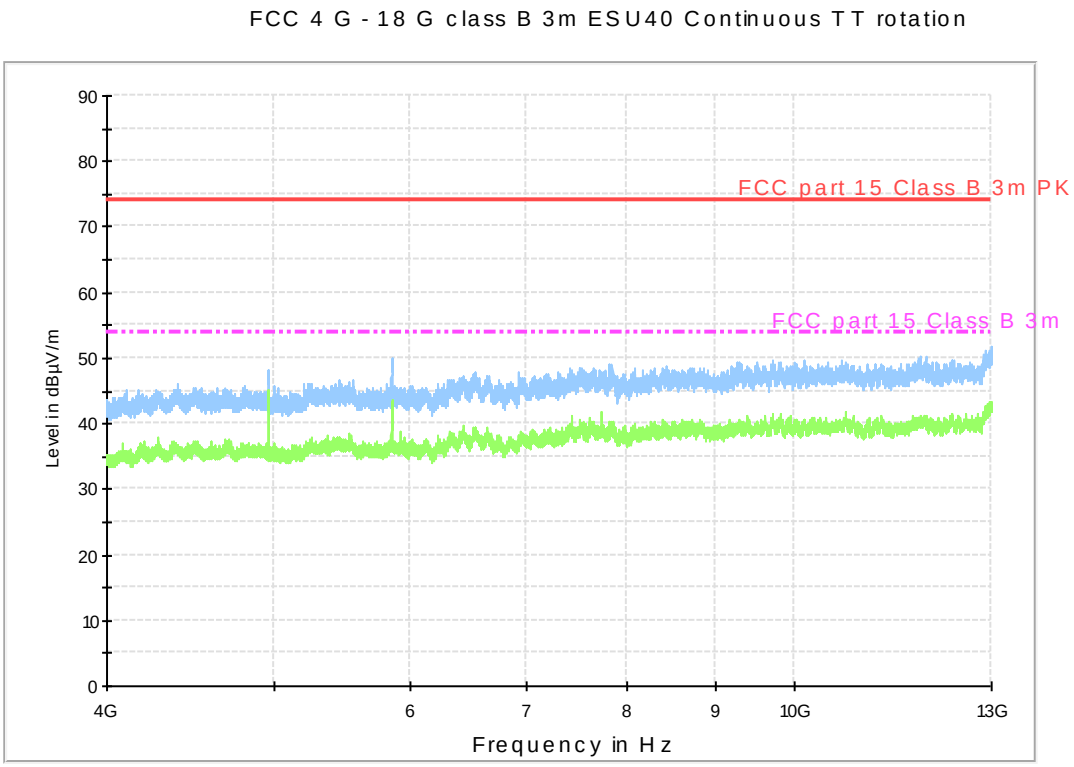
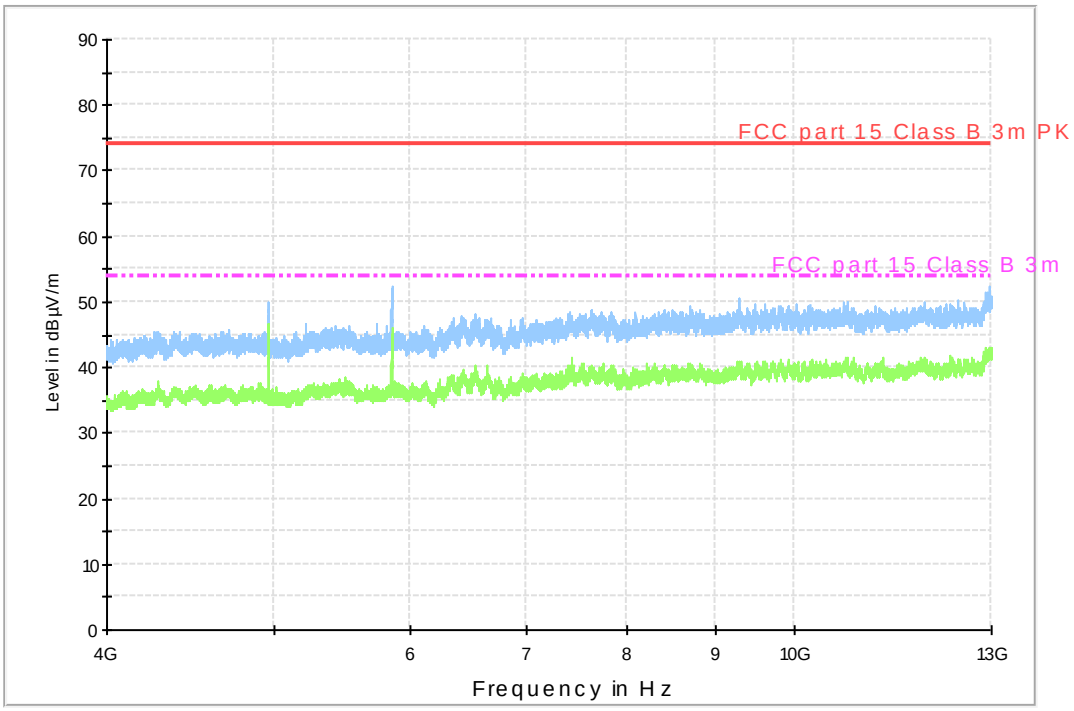


Diagram, Peak overview sweep, 4– 13 GHz at 3 m distance. TX high channel, EUT orientation Y.



Diagram, Peak overview sweep, 4– 13 GHz at 3 m distance. TX high channel, EUT orientation Z.

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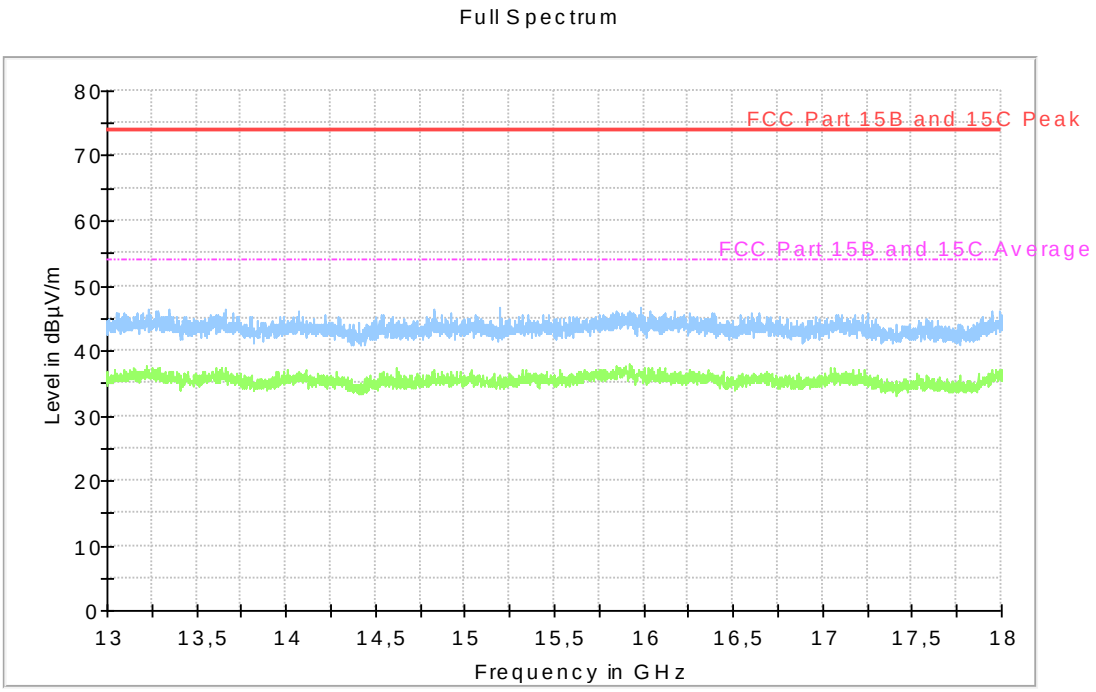
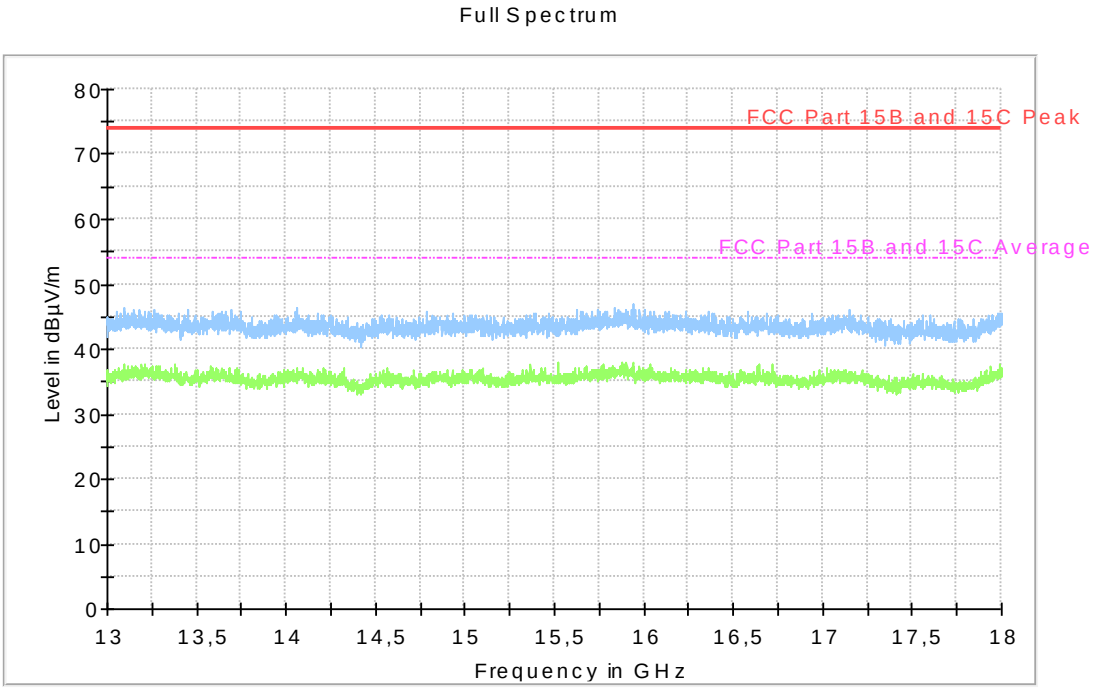


Diagram, Peak overview sweep, 13 – 18 GHz at 3 m distance. TX low channel, EUT orientation X.



Diagram, Peak overview sweep, 13 – 18 GHz at 3 m distance. TX mid channel, EUT orientation X.

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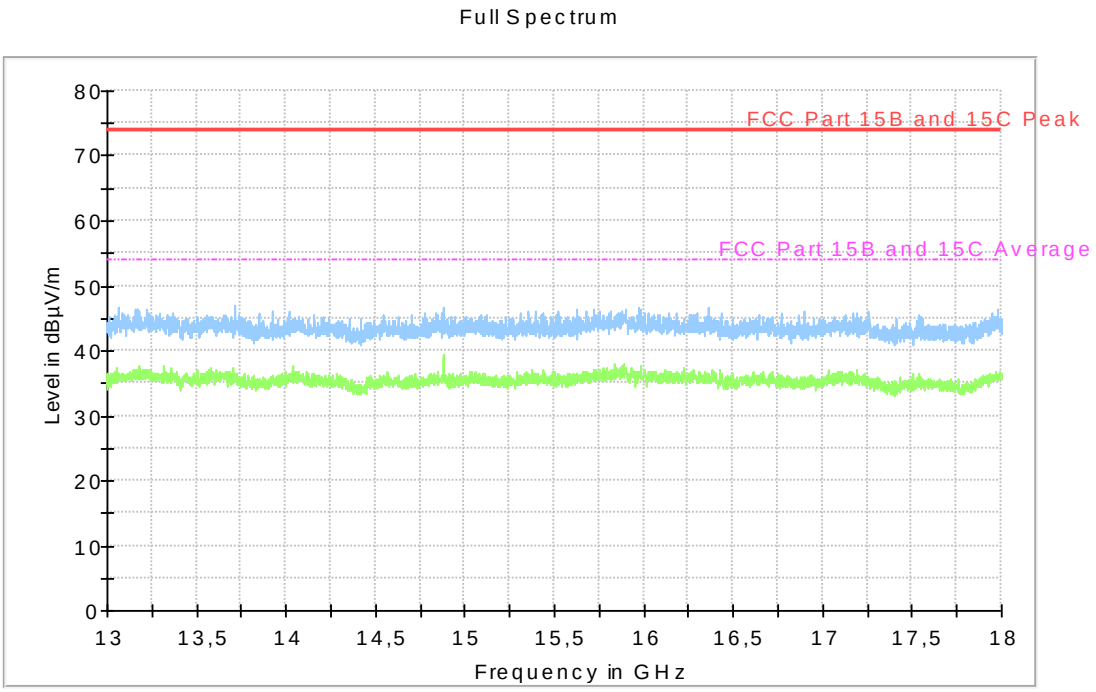
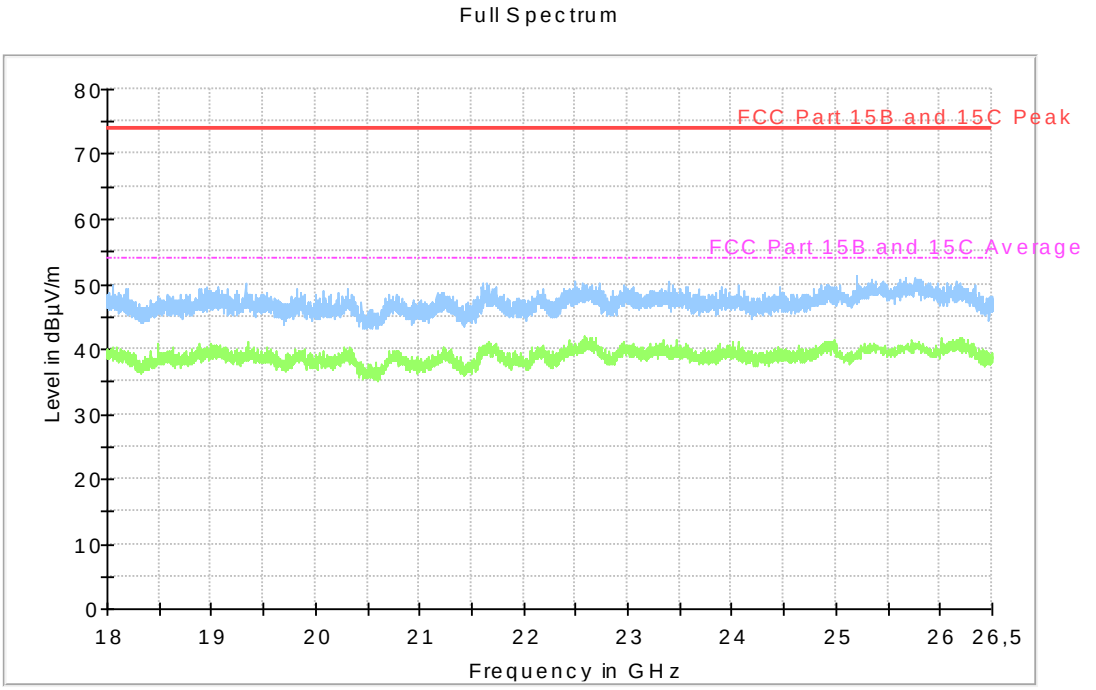


Diagram, Peak overview sweep, 13 – 18 GHz at 3 m distance. TX high channel, EUT orientation X.



Diagram, Peak overview sweep, 18 – 26.5 GHz at 3 m distance. TX low channel, EUT orientation X.

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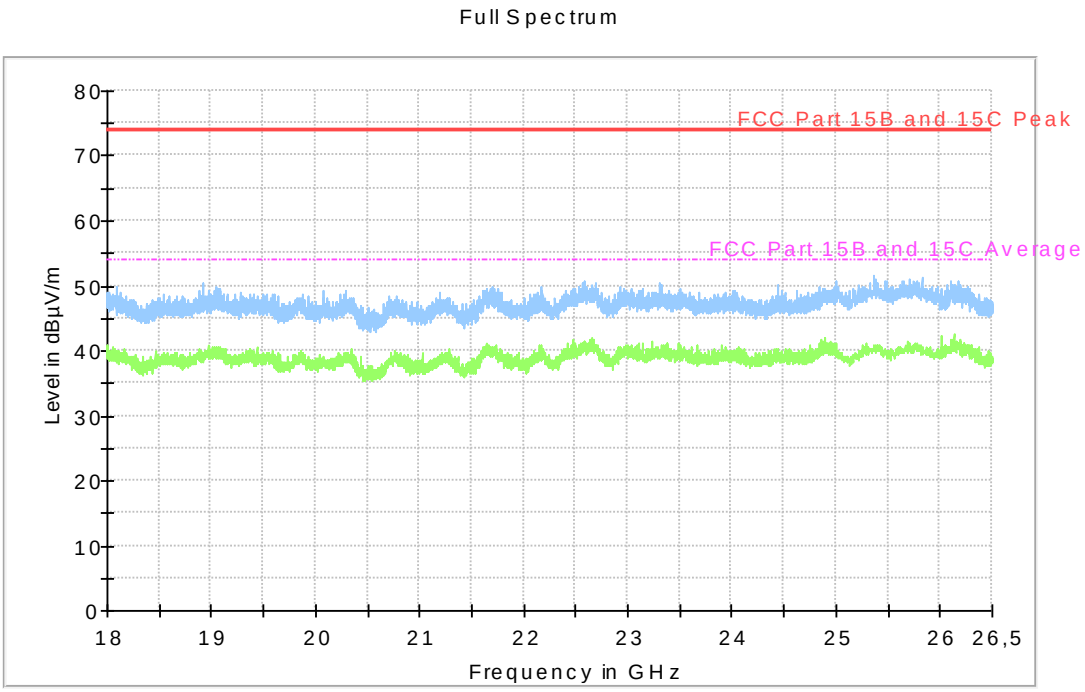
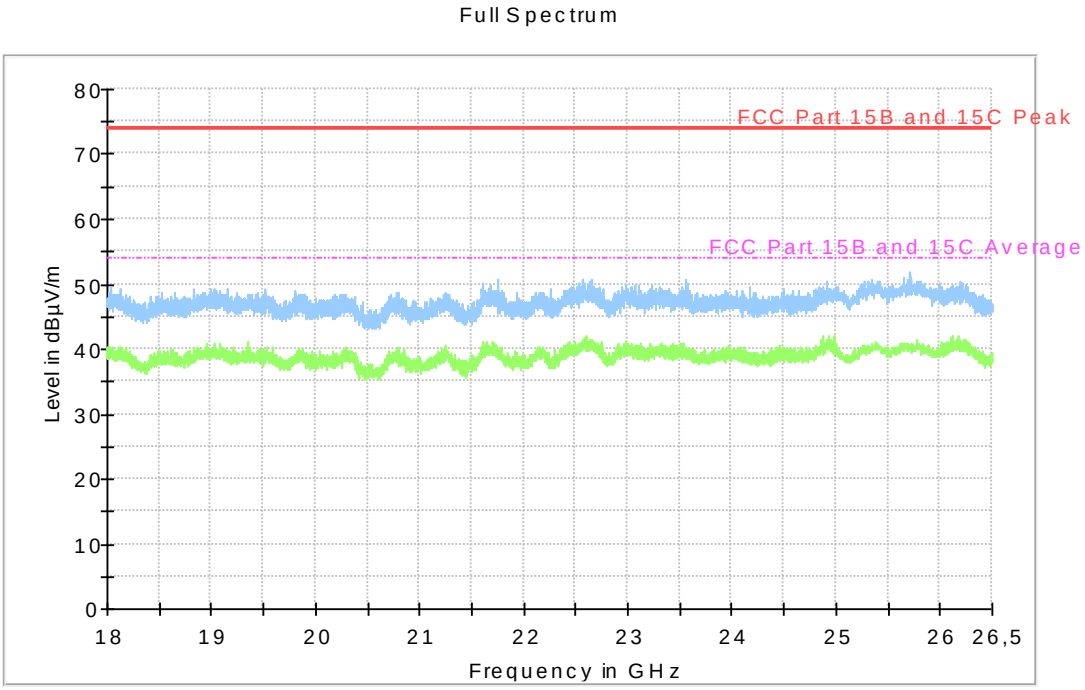


Diagram, Peak overview sweep, 18 – 26.5 GHz at 3 m distance. TX mid channel, EUT orientation X.



Diagram, Peak overview sweep, 18 – 26.5 GHz at 3 m distance. TX high channel, EUT orientation X.

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Measurement results, Peak, TX low channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
2399.5	68.4	74.0	X	V	5.6
3900.8	52.6	74.0	X	V	21.4
3901.0	52.3	74.0	X	V	21.7
3924.6	41.9	74.0	X	H	32.1

Measurement results, Average, TX low channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
3900.8	43.1	54.0	X	V	10.9
3901.0	42.9	54.0	X	V	11.1
3924.6	28.5	54.0	X	H	25.5

Measurement results, Peak, TX middle channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
3898.5	55.1	74.0	X	V	18.9
3898.7	55.4	74.0	X	V	19.6
3906.0	48.7	74.0	X	V	25.3
3917.6	48.5	74.0	X	V	25.5
3932.4	43.0	74.0	X	V	31.0

Measurement results, Average, TX middle channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
3898.5	45.6	54.0	X	V	8.4
3898.7	44.9	54.0	X	V	9.1
3906.0	28.4	54.0	X	V	25.6
3917.6	28.5	54.0	X	V	25.5
3932.4	28.5	54.0	X	V	25.5

Measurement results, Peak, TX high channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
2484.0	66.0	74.0	X	V	8.0
3898.2	55.2	74.0	X	V	18.8
3901.4	51.8	74.0	X	H	22.2
3920.0	43.6	74.0	X	V	30.4
3896.9	55.6	74.0	Y	V	18.4
3897.6	53.7	74.0	Y	V	20.3
3897.3	53.6	74.0	Z	V	20.4
3898.6	53.7	74.0	Z	V	20.3

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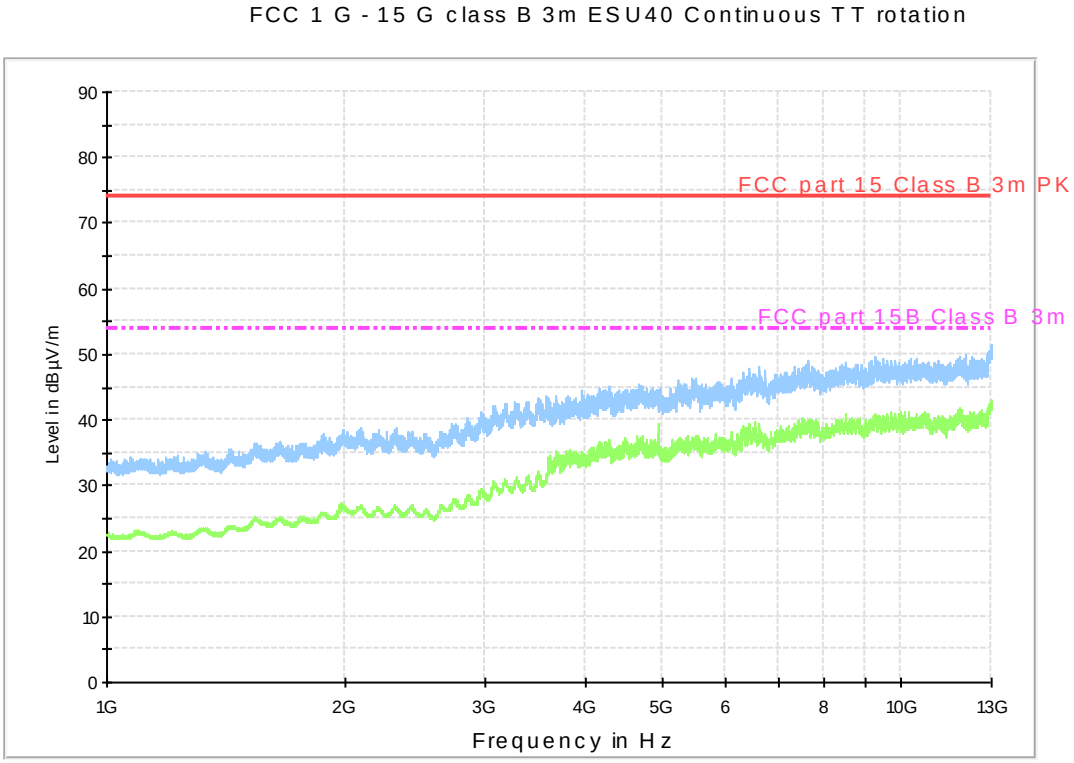
Measurement results, Average, TX high channel

Frequency [MHz]	Level [dBµV/m]	Limit [dBµV/m]	EUT orientation	Polarization H/V	Margin [dB]
3898.2	45.5	54.0	X	V	8.5
3901.4	41.7	54.0	X	H	12.3
3920.0	28.5	54.0	X	V	25.5
3896.9	42.6	54.0	Y	V	11.4
3897.6	42.4	54.0	Y	V	11.6
3897.3	41.6	54.0	Z	V	12.4
3898.6	44.6	54.0	Z	V	9.4

All other measured disturbances have a margin of more than 20 dB to the limits.

Result [dBµV/m] = Analyser reading [dBµV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

5.7 Test results 1 GHz – 13 GHz, RX



Diagram, Peak overview sweep, 1 – 13 GHz at 3 m distance. RX high channel, EUT orientation X.

No emissions are found above noise floor or closer than 20 dB from limit.

Result [dBµV/m] = Analyser reading [dBµV] + Antenna factor [1/m] - Amplifier gain [dB] + Cable loss [dB]

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6 CONDUCTED BAND EDGE MEASUREMENT

Date of test:	2017-05-22	**Test location:**	Wireless Center
EUT Serial:	XZ9100000024	**Ambient temp:**	22 °C
Tested by:	Robert Hietala	**Relative humidity:**	30 %
Test result:	Pass	**Margin:**	> 10 dB

6.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 6.10.4.

The EUT was connected to spectrum analyser via rf-cable and attenuator.

The EUT was set up in order to emit maximum disturbances.

6.2 Test conditions

Detector: Peak
RBW: 100 kHz
VBW: 300 kHz
Span: 30 MHz

6.3 Requirement

Reference: CFR 47 §15.247(d), RSS-247 5.5,

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

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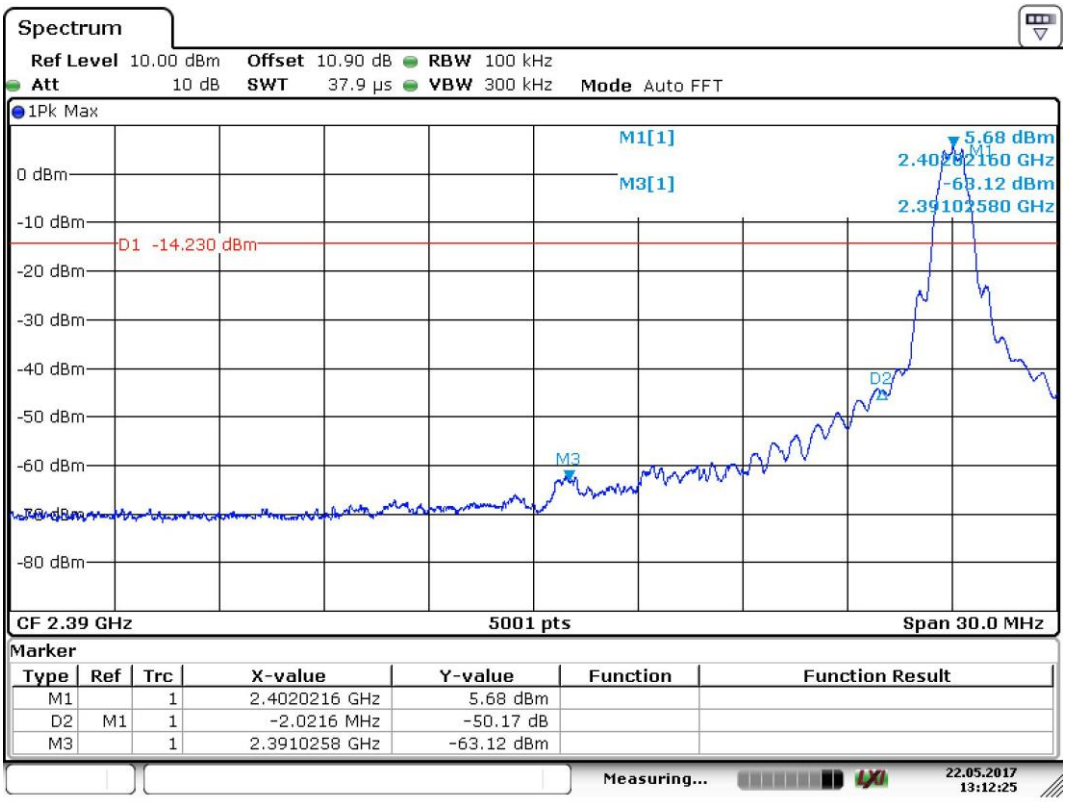
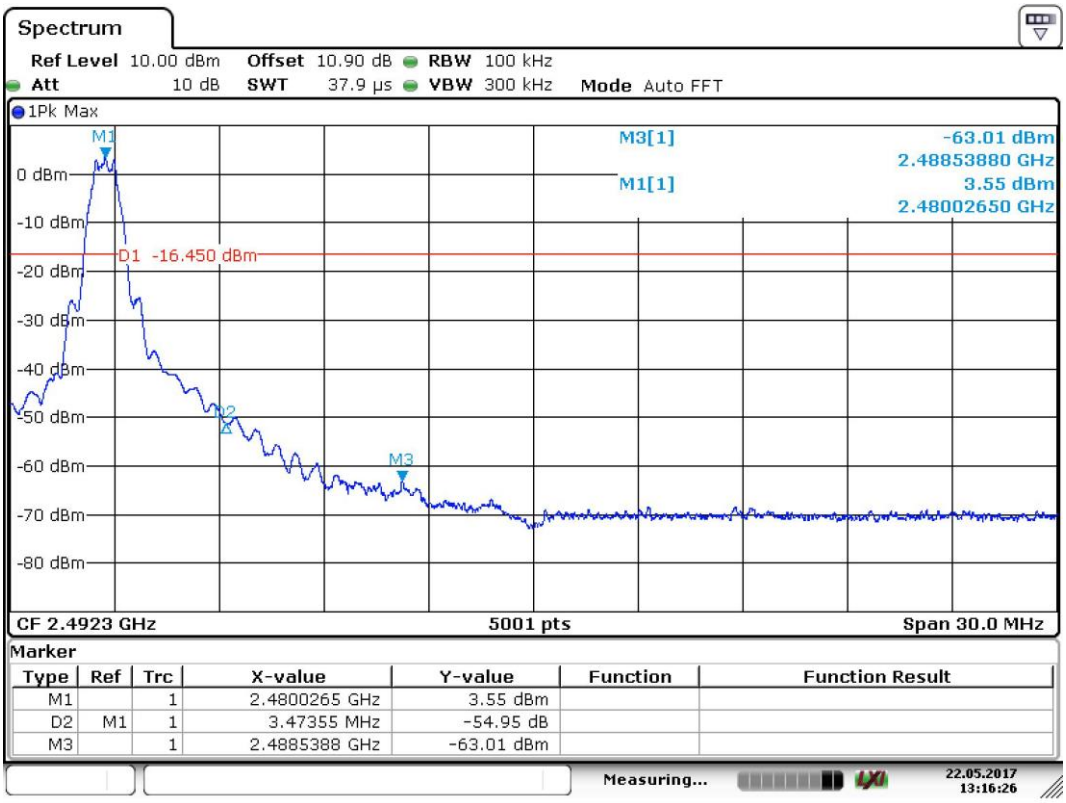
6.4 Test results



Date: 22.MAY.2017 13:12:24

Screenshot: Lower band edge sweep



Date: 22.MAY.2017 13:16:26

Screenshot: Upper band edge sweep

S 114 10-06 Strömberg 164234

Test results

Band edge	Delta [dBc]	Limit [dBc]	Margin [dB]
Lower	50.2	20.0	30.2
Upper	55.0	20.0	35.0

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7 PEAK CONDUCTED OUTPUT POWER

Date of test:	2017-05-22	**Test location:**	Wireless Center
EUT Serial:	XZ9100000024	**Ambient temp:**	22 °C
Tested by:	Robert Hietala	**Relative humidity:**	30 %
Test result:	Pass	**Margin:**	> 10 dB

7.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 11.9.1.1.

The EUT was connected to spectrum analyser via rf-cable and attenuator.

7.2 Test conditions

Detector: Peak,
RBW: >OBW
VBW: 3 x RBW
Span: >3 x OBW

The EUT was set up in order to emit maximum disturbances.

7.3 Requirements

Reference: CFR 47§15.247(b)(3), RSS-247 5.4
For DTSs employing digital modulation techniques operating in the bands 902 – 128 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz, the maximum peak conducted output power shall not exceed 1W.

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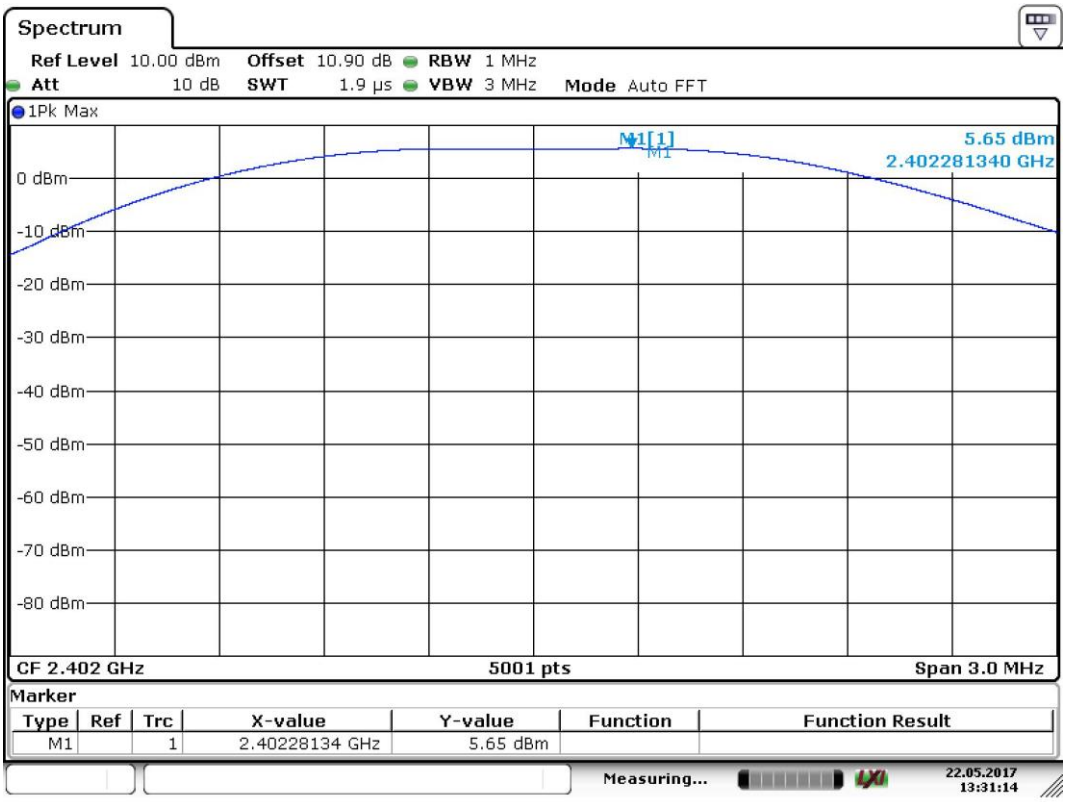
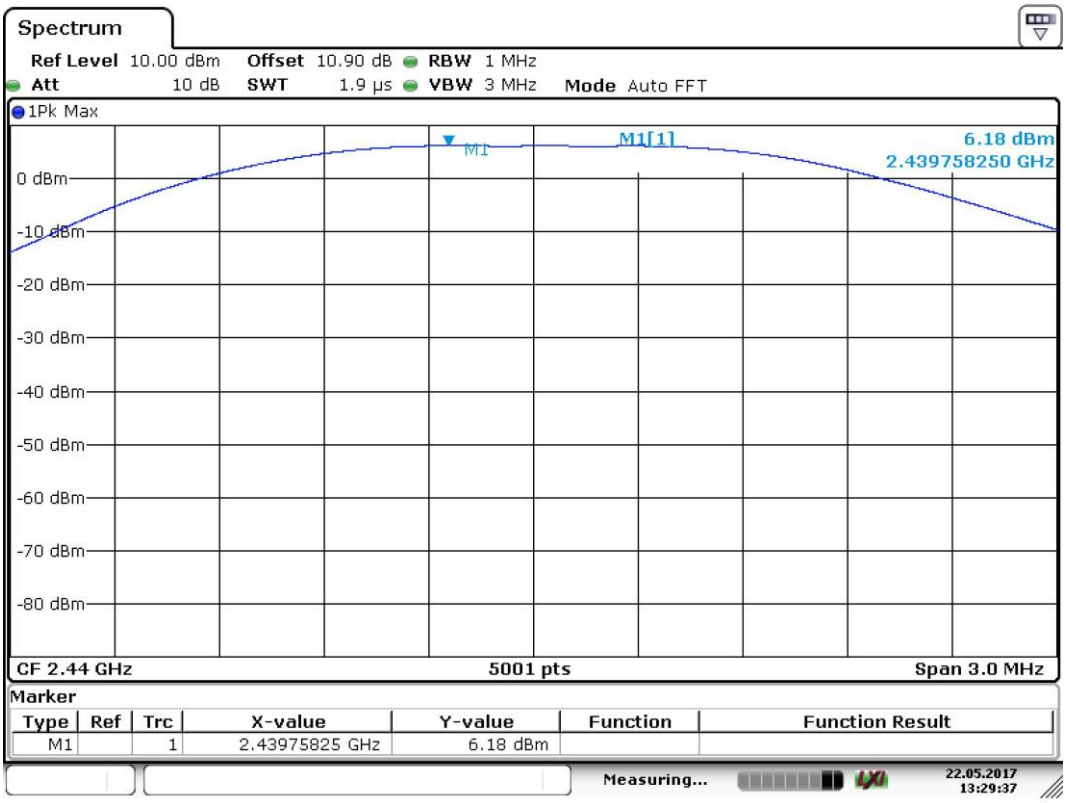
7.4 Test results



Date: 22.MAY.2017 13:31:14

Screenshot: Output power, low channel



Date: 22.MAY.2017 13:29:37

Screenshot: Output power, middle channel

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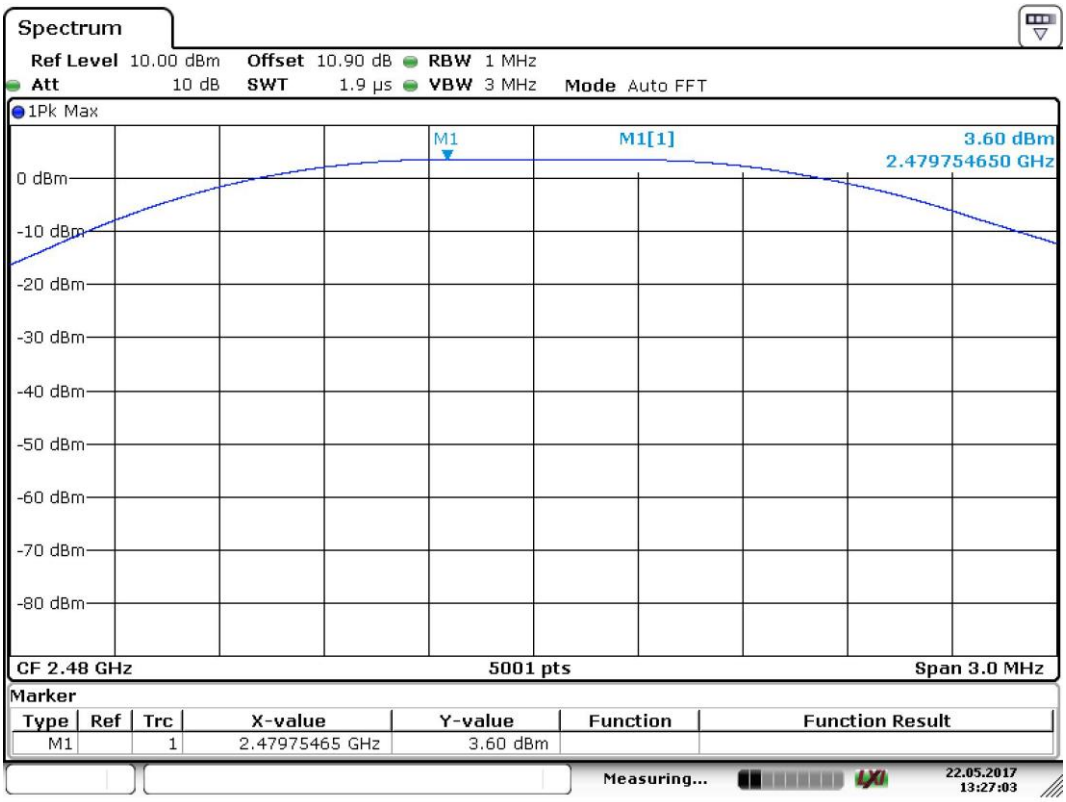

Date: 22.MAY.2017 13:27:03

Screenshot: Output power, high channel

Test result

Channel [MHz]	Output power [dBm]
2402	5.7
2440	6.2
2480	3.6

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8 OCCUPIED 6 DB BANDWIDTH

Date of test:	2017-05-22	**Test location:**	Wireless Center
EUT Serial:	XZ9100000024	**Ambient temp:**	22 °C
Tested by:	Robert Hietala	**Relative humidity:**	30 %
Test result:	Pass	**Margin:**	217.9 kHz

8.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 11.8.1.

The EUT was connected to spectrum analyser via rf-cable and attenuator.

8.2 Test conditions

Detector: Peak,
RBW: 100 kHz
VBW: 3 x RBW
Span: >1,5 x OBW

The EUT was set up in order to emit maximum disturbances.

8.3 Requirements

Reference: CFR 47§15.247(a)(2), RSS-247 5.2(1)
The minimum 6 dB bandwidth shall be 500 kHz.

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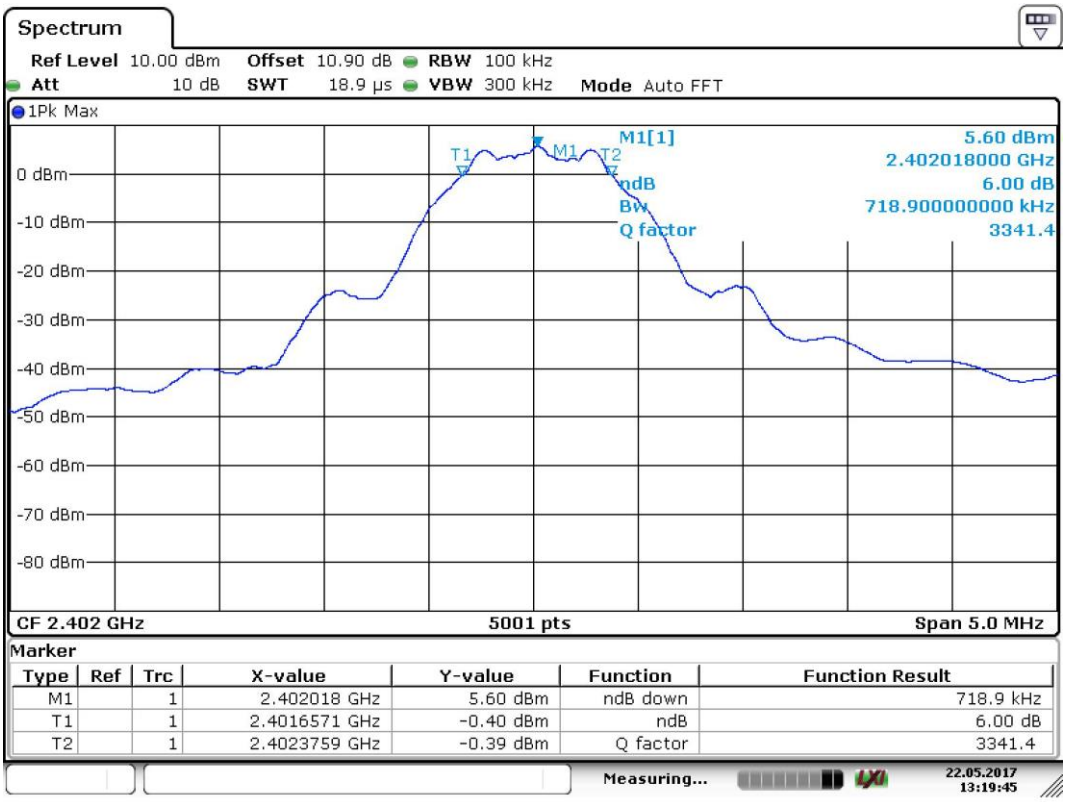
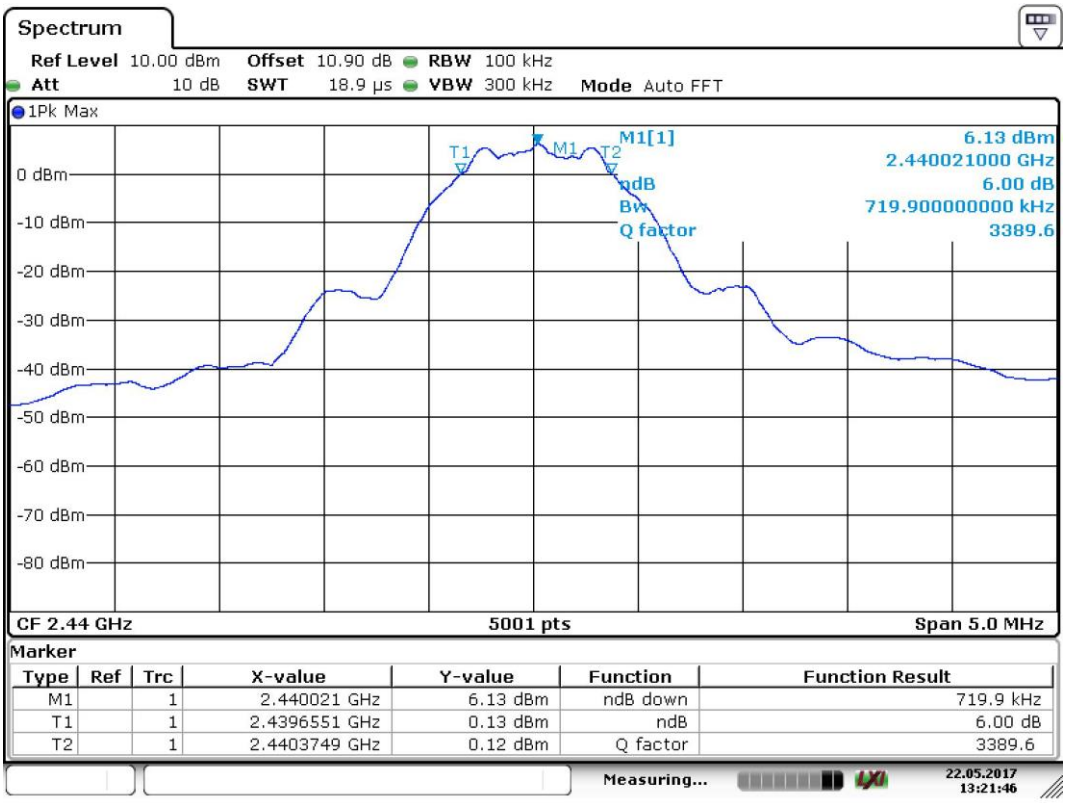
8.4 Test results



Date: 22.MAY.2017 13:19:45

Screenshot: Occupied 6 dB bandwidth Measurement, low channel



Date: 22.MAY.2017 13:21:46

Screenshot: Occupied 6 dB bandwidth Measurement, middle channel

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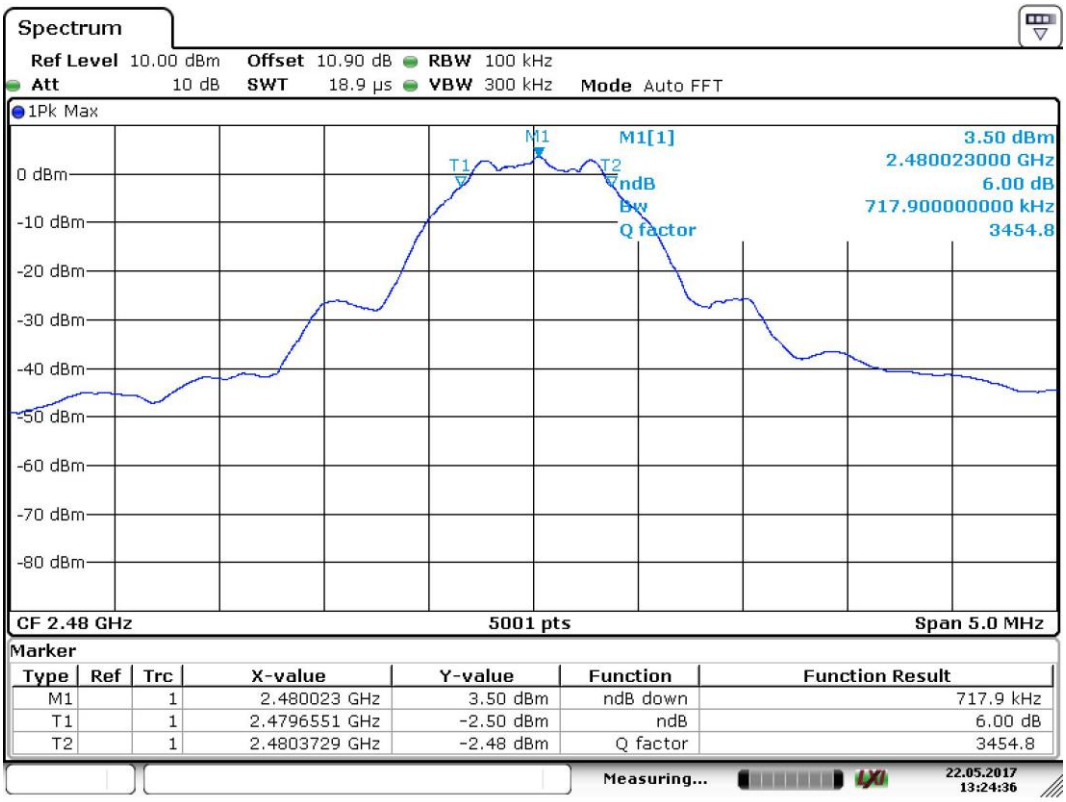

Date: 22.MAY.2017 13:24:35

Screenshot: Occupied 6 dB bandwidth Measurement, high channel

Test result

Channel [MHz]	6 dB BW [kHz]
2402	718.9
2440	719.9
2480	717.9

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9 PEAK POWER SPECTRAL DENSITY

Date of test:	2017-05-22	**Test location:**	Wireless Center
EUT number:	XZ9100000024	**Ambient temp:**	22 °C
Tested by:	Robert Hietala	**Relative humidity:**	30 %
Test result:	Pass	**Margin:**	> 10 dB

9.1 Test set-up and test procedure.

The test method is in accordance with ANSI C63.10-2013 section 11.10.2.

The EUT was connected to spectrum analyser via rf-cable and attenuator.

9.2 Test conditions

Detector: Peak,
RBW: 3 kHz
VBW: >3 x RBW
Span: 1.5 x 6 dB bandwidth

The EUT was set up in order to emit maximum disturbances.

9.3 Requirements

Reference: CFR 47§15.247(3), RSS-247 5.2(2)
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

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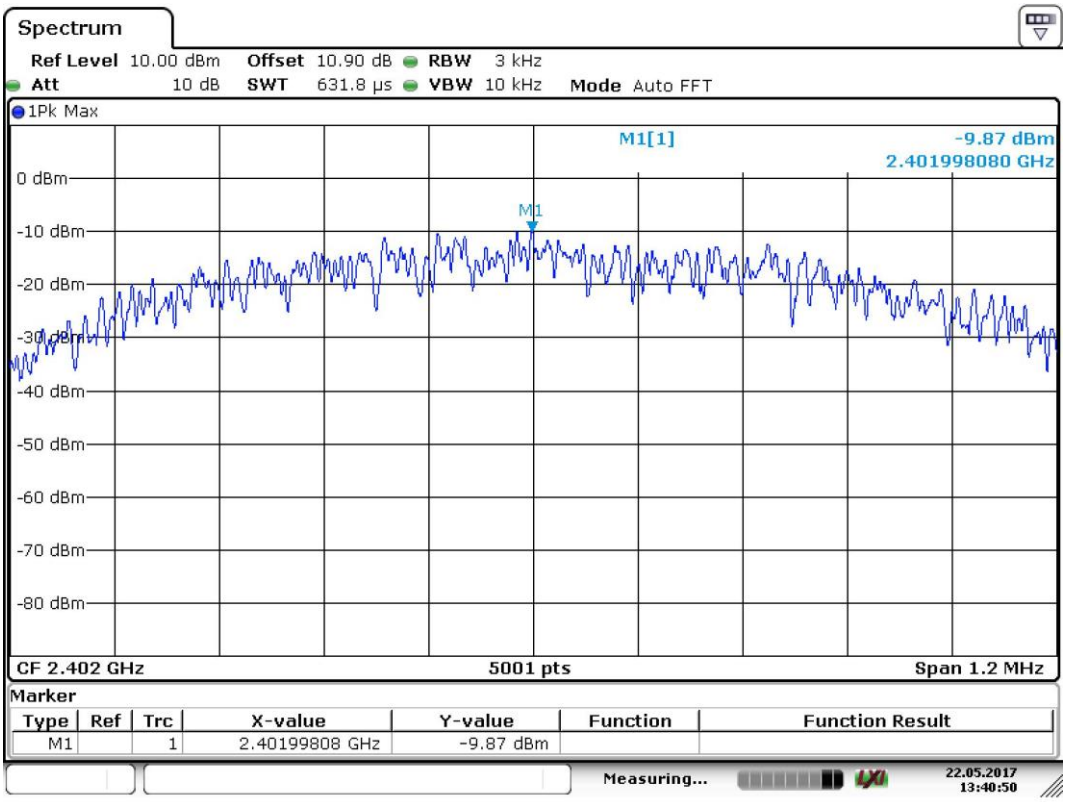
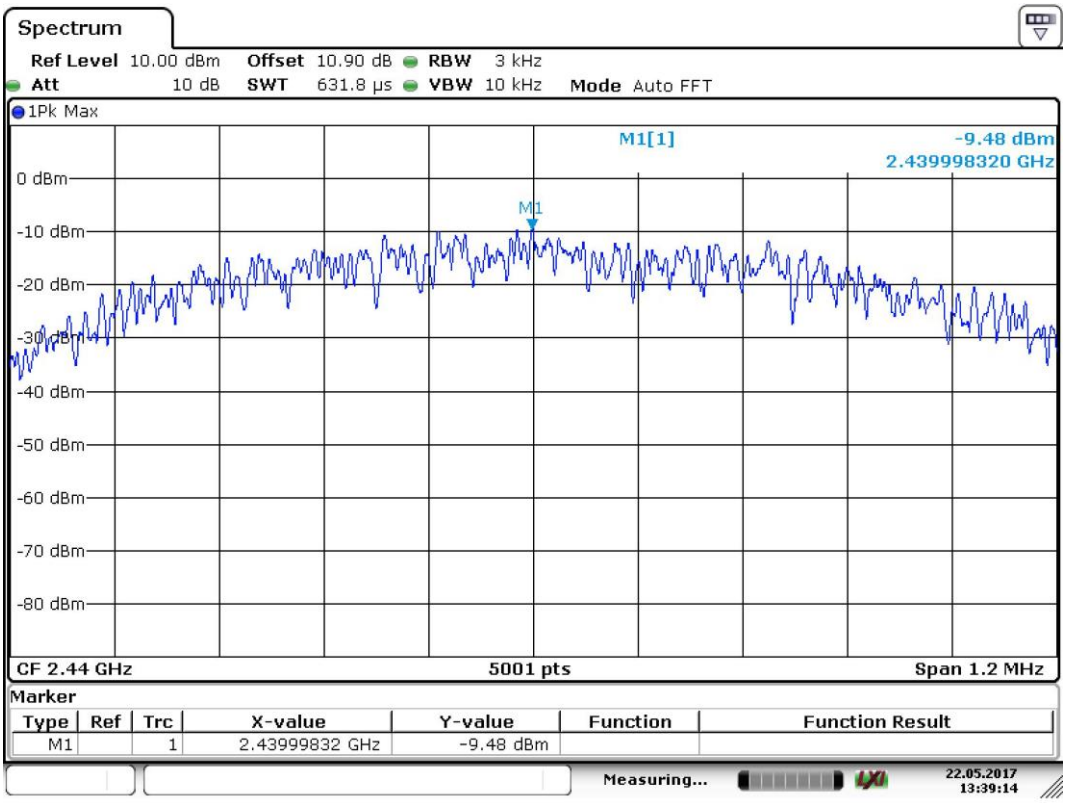
9.4 Test results



Date: 22.MAY.2017 13:40:51

Screenshot: Peak power spectral density, low channel



Date: 22.MAY.2017 13:39:14

Screenshot: Peak power spectral density, middle channel

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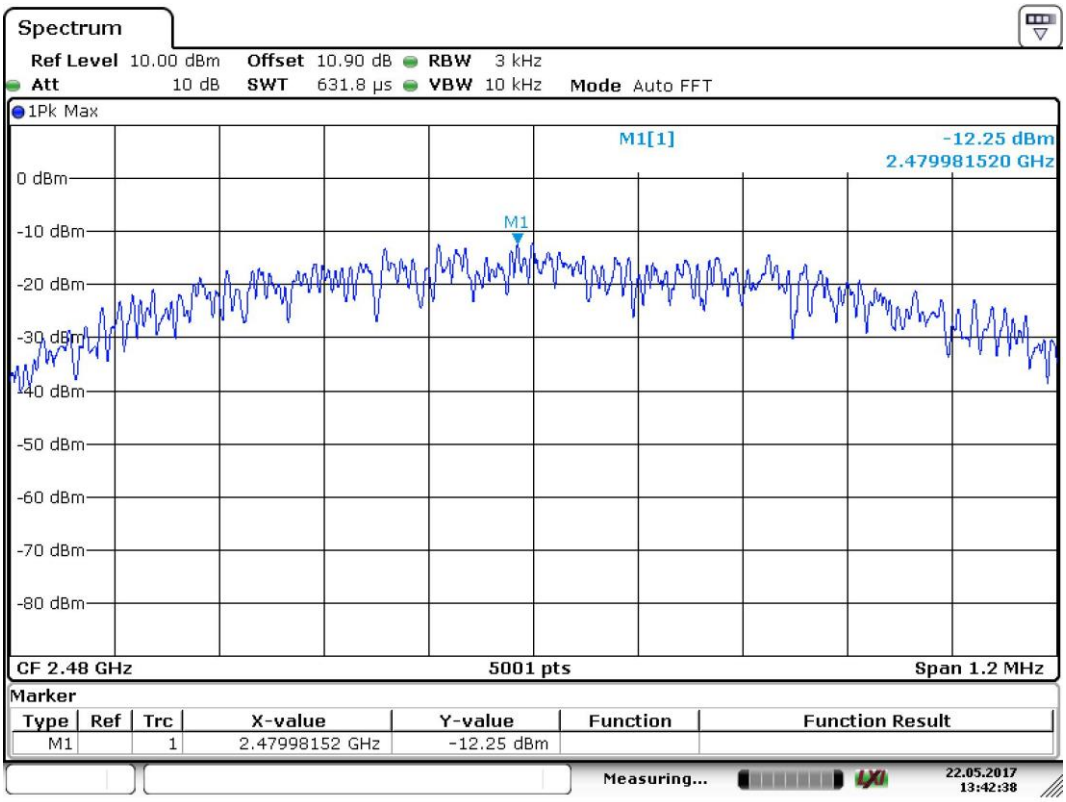

Date: 22.MAY.2017 13:42:37

Screenshot: Peak power spectral density, high channel

Test result

Channel [MHz]	PSD [dBm/3kHz]
2402	-9.9
2440	-9.5
2480	-12.3

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10 TEST EQUIPMENT

Stora Hallen

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - 8.51.0	--	--	--
Receiver	Rohde & Schwarz	ESU 8	12866	07-2016	1 year
Receiver	Rohde & Schwarz	ESU 40	13178	07-2016	1 year
BiLog antenna	Chase	CBL6110A	971	07-2015	3 years
Preamplifier	BONN	BLMA 0118-M	31246	04-2017	1 year
Horn antenna	Rohde & Schwarz	HF907	32296	12-2016	1 year
Attenuator, 20 dB	Huber+Suhner	5920_N-50-010/199_NE	32697	05-2017	1 year
2,4 GHz band reject filter:	K&L MICROWAVE INC	6N45-2450/T100-0/0	12389	03-2017	1 year
4 GHz high pass filter	K&L MICROWAVE INC	4410-X4500/18000-0/0	5133	08-2016	1 year

Wireless Center and 3m FAC

Equipment type	Manufacturer	Model	Inv. No.	Last Cal. date	Cal. interval
Measurement software	Rohde & Schwarz	EMC32 - 9.21.0	--	--	--
Horn antenna	EMCO	3115	4936	04-2014	3 years
Pre amplifier	Sangus	00101400-23-10P -6-S ; AFS44-12002400-32-10P -44	12335	11-2016	1 year
Horn antenna	EMCO	3160-08	30099	10-2016	3 years
Horn antenna	EMCO	3160-09	30101	10-2016	3 years
Signal analyzer:	Rohde & Schwarz	FSV	32594	07-2016	1 year
Signal generator:	Rohde & Schwarz	SMB100A	32592	07-2016	1 year
Signal analyzer	Rohde & Schwarz	FSIQ 40	12793	07-2016	1 year
2,4 GHz band reject filter:	K&L MICROWAVE INC	6N45-2450/T100-0/0	12389	03-2017	1 year
4 GHz high pass filter	K&L MICROWAVE INC	4410-X4500/18000-0/0	5133	08-2016	1 year
Communication tester	Rohde & Scwharz	CMW500	32597	01-2017	1 year
Multimeter	Fluke	179	33105	10-2016	1 year

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11 MEASUREMENT UNCERTAINTY

Continuous conducted disturbances with AMN in the frequency range 9 kHz to 30 MHz ± 3.7 dB

Measurement uncertainty for radiated disturbance

Uncertainty for the frequency range 30 to 1000 MHz at 3 m	± 5.1 dB
Uncertainty for the frequency range 30 to 1000 MHz at 10 m	± 5.0 dB
Uncertainty for the frequency range 1.0 to 18 GHz at 3 m	± 4.7 dB
Uncertainty for the frequency range 18 to 26 GHz at 3 m	± 4.8 dB
Uncertainty for the frequency range 26 to 40 GHz at 3 m	± 5.7 dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2:2011.
The measurement uncertainty is given with a confidence of 95 %.

12 TEST SET UP AND EUT PHOTOS

EUT photos are in separate document 1709224STO-002 Annex 1.
Test set up photos are in separate document 1709224STO-002 Annex 2.

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