

TEST REPORT

Test report no.: 1-8152/14-01-02-B



Testing laboratory

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Accredited Testing Laboratory:

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS). The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01
Area of Testing: Radio/Satellite Communications

Applicant

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Rosemount Tank Radar AB
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402 14 Göteborg / Sweden
Phone: + 46 31 3370000
Fax: + 46 31 253022
Contact: Dajana Prastalo
e-mail: dajana.prastalo@emerson.com
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Manufacturer

Same as Applicant

Test standard/s

47 CFR Part 15 Title 47 of the Code of Federal Regulations; Chapter I;
Part 15 - Radio frequency devices
RSS-211 DRAFT Issue 1 Level Probing Radar equipment
For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item: Radar Level Gauge
Model name: Rosemount 5400
FCC ID: K8C5402
IC: 2827A-5402

Frequency: 26 GHz
Antenna: Integrated metallic horn antenna
Power Supply: 16 - 36 V DC by external DC
Temperature Range: -40 °C to +85 °C



Test report authorised:

Karsten Gerald
Professional



Test performed:

Meheza Walla
Specialist

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2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item.

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This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

2.2 Application details

Date of receipt of order:	2014-07-14
Date of receipt of test item:	2014-07-21
Start of test:	2014-07-21
End of test:	2014-08-01
Person(s) present during the test:	-/-

3 Test standard/s

Test standard	Date	Test standard description
47 CFR Part 15	2013-10	Title 47 of the Code of Federal Regulations; Chapter I; Part 15 - Radio frequency devices
FCC-14-2 Docket no. 10-23	2014-04	Measurement Procedure for Level Probing Radars
RSS-211 DRAFT Issue 1	2014-09	Level Probing Radar equipment

4 Test environment

Temperature:	T_{nom}	+20 °C during room temperature tests
	T_{min}	-40 °C during low temperature test
	T_{max}	+85 °C during high temperature test
Relative humidity content:		45 %
Barometric pressure:		not relevant for this kind of testing
Power supply:	V_{nom}	24 V DC
	V_{min}	16 V DC
	V_{max}	36 V DC

5 Test item

5.1 Technical parameters

Kind of test item	:	Radar Level Gauge
Type identification	:	Rosemount 5400
S/N serial number	:	31943
HW hardware status	:	5402AH2I14SPVCA
SW software status	:	2A0
Frequency band	:	26 GHz
Type of radio transmission	:	P0N (Pulsed radar ~ 1 ns pulse length, PRF 1.6 MHz)
Use of frequency spectrum	:	
Number of channels	:	1
Antenna	:	Integrated metallic horn antenna
Power supply	:	16 - 36 V DC by external DC
Temperature range	:	-40 °C to +85 °C

5.2 Additional information

Test setup- and EUT-photos are included in test report: 1-8152/14-01-02-B_AnnexA
1-8152/14-01-02-B_AnnexB
1-8152/14-01-02-B_AnnexD

6 Test laboratories sub-contracted

None

7 Summary of measurement results

☒	No deviations from the technical specifications were ascertained
☐	There were deviations from the technical specifications ascertained

TC Identifier	Description	Verdict	Date	Remark
RF-Testing	CFR 47 Part 15.256 RSS-211 DRAFT Issue 1	Passed	2014-11-07	-/-

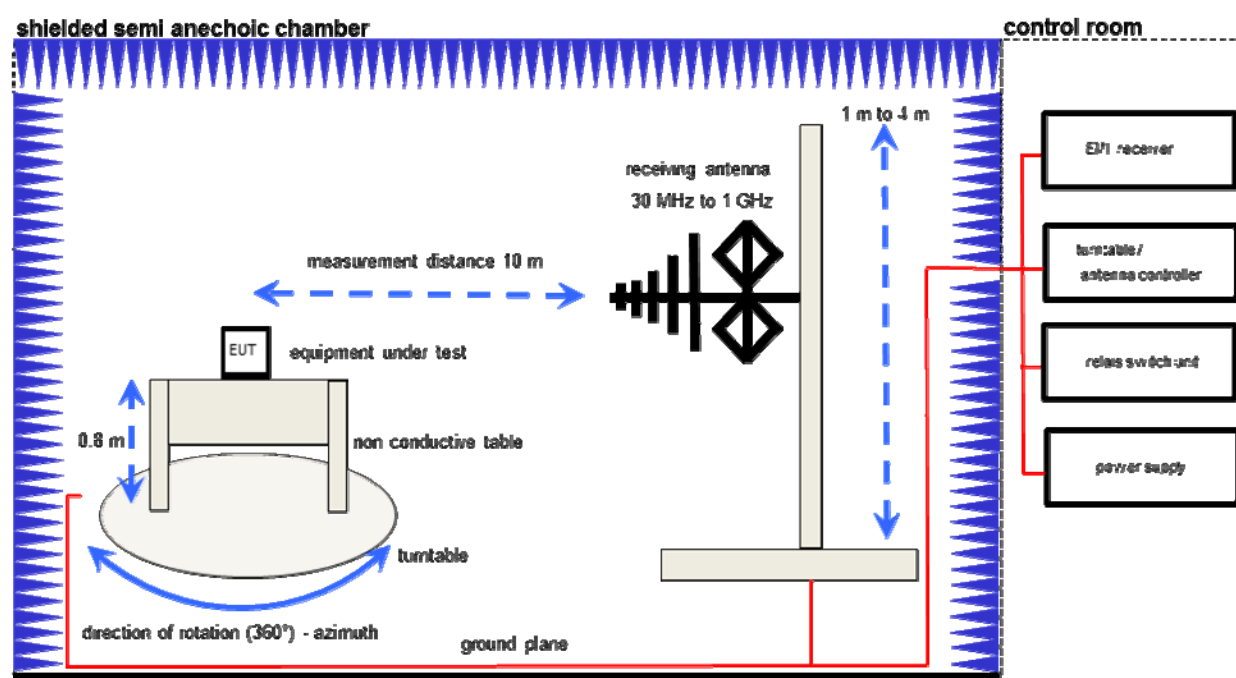
Test specification clause	Test case	Temperature conditions	Power source voltages	Pass	Fail	NA	NP	Results
§15.256 (f)(1)(2) §15.256 (g) RSS-Gen 4.6.4 RSS-211 DRAFT Issue 1 / Chapter 5	Fundamental emission bandwidth	Nominal and Extreme	Nominal and Extreme	☒	☐	☐	☐	complies
§15.256 (g)(1)(2)(3) RSS-211 DRAFT Issue 1 Chapter 5.2	EIRP	Nominal and Extreme	Nominal and Extreme	☒	☐	☐	☐	complies
§15.256 (h) §15.209 RSS-Gen	Unwanted emissions	Nominal	Nominal	☒	☐	☐	☐	complies
§15.207 (a) IES-003, Issue 4	AC Conducted	Nominal	Nominal	☒	☐	☐	☐	complies
§15.256 (f)(2) §15.215 (c)	Frequency stability	Nominal and Extreme	Nominal and Extreme	☒	☐	☐	☐	complies
§15.256 (i) §15.256 (j) RSS-211 DRAFT Issue 1 Chapter 5.2 (c)	Antenna beamwidth, Antenna side lobe gain	Nominal	Nominal	☒	☐	☐	☐	complies

Note: NA = Not Applicable; NP = Not Performed

8 RF measurement testing

8.1 Radiated measurements chamber F

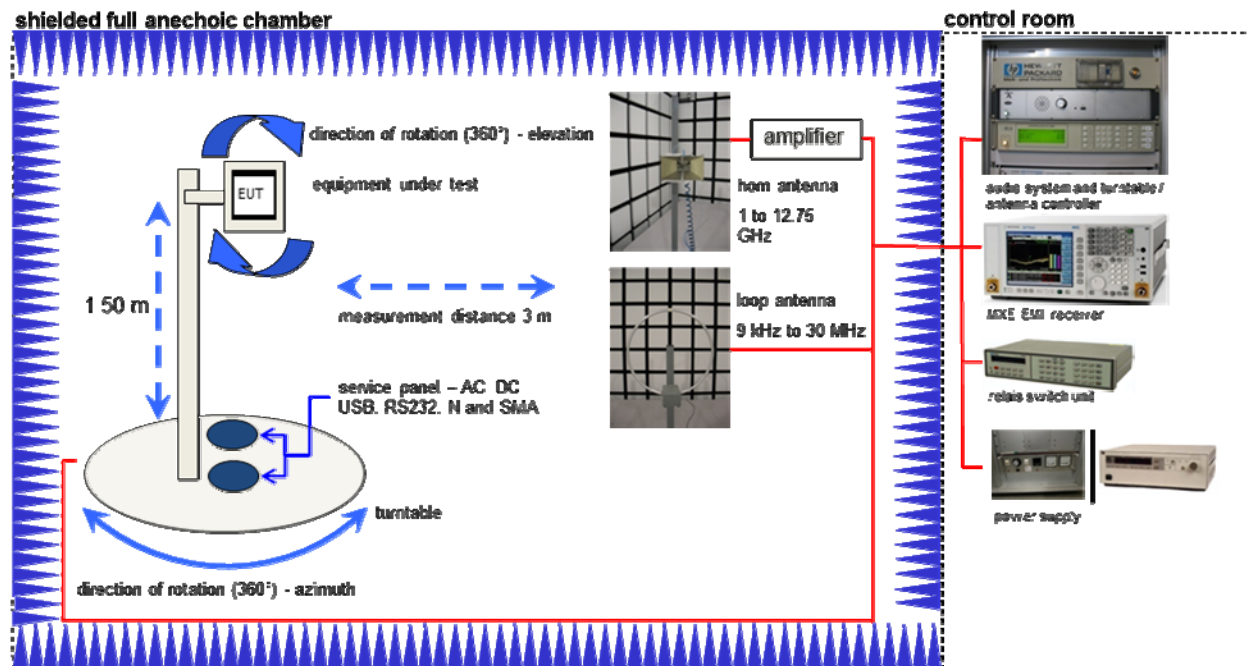
The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 1 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63.



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368
DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580
EMI Test Receiver	ESCI 3	R&S	100083	300003312
Amplifier	JS42-00502650-28-5A	MITEQ	1084532	300003379
Antenna Tower	Model 2175	ETS-LINDGREN	64762	300003745
Positioning Controller	Model 2090	ETS-LINDGREN	64672	300003746
Turntable Interface-Box	Model 105637	ETS-LINDGREN	44583	300003747
TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787
Test Receiver	ESH2	R&S	871921/095	300002505
Loop Antenna 9 KHz - 30 MHz	HFH2-Z2	R&S	872096/61	300001824
EMI Test Receiver 9 kHz - 3 GHz incl. Preselector	ESPI3	R&S	101713	300004059

8.2 Radiated measurements chamber C

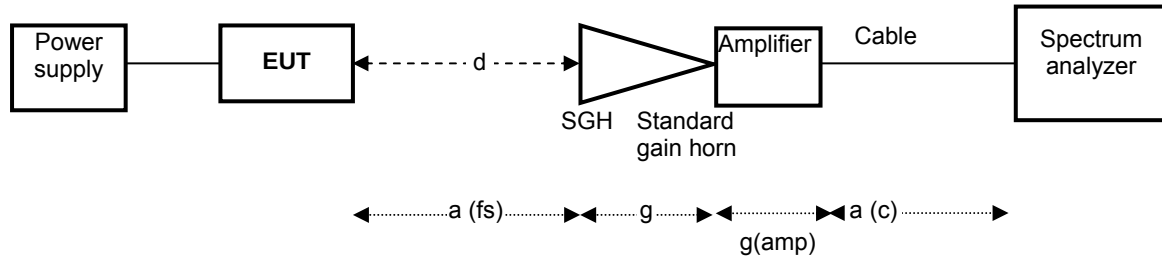


Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405
Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789
Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032
Active Loop Antenna	6502	EMCO	8905-2342	300000256
Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996
Switch / Control Unit	3488A	HP Meßtechnik	*	300000199
Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156
Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erft	91350	300001155
Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997
Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143

8.3 Radiated measurements 12 GHz to 50 GHz

Test set-up for the measurement of spurious radiation in the frequency range 12 GHz to 50 GHz:

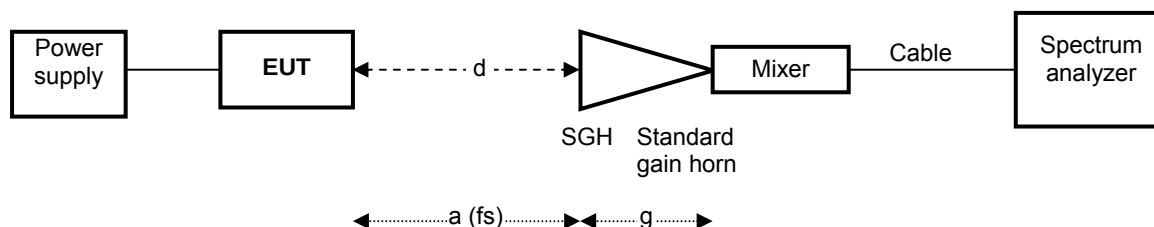


Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787
Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442
Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751
Std. Gain Horn Antenna 39.3-59.7 GHz	2424-20	Flann	75	300001979
Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268
Broadband Low Noise Amplifier 18-50 GHz	CBL19503070-XX	CERNEX	19338	300004273
Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443

8.4 Radiated measurements above 50 GHz

Test set-up for the measurement of spurious radiation and EIRP in the frequency range 50 GHz to 325 GHz:



Equipment table:

Equipment	Type	Manufacturer	Serial No.	INV. No Cetecom
Std. Gain Horn Antenna 49.9-75.8 GHz	2524-20	Flann	*	300001983
Std. Gain Horn Antenna 60-90 GHz	COR 60_90	Thomson CSF	*	300000814
Std. Gain Horn Antenna 73.8-112 GHz	2724-20	Flann	*	300001991
Harmonic mixer 50 - 75 GHz for spectrum analyzers	FS-Z75	R&S	100099	300003949
Harmonic mixer 60 - 90 GHz for spectrum analyzers	FS-Z90	R&S	101555	300004691
Spectrum Analyzer Mixer 2-Port, 75-110 GHz	SAM-110-7	Radiometer Physics GmbH	002	300004155
Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443

8.5 Conducted measurements

Not applicable!

8.6 The fundamental emission bandwidth

Description:

The fundamental bandwidth of an LPR emission is defined as the width of the signal between two points, one below and one above the center frequency, outside of which all emissions are attenuated by at least 10 dB relative to the maximum transmitter output power when measured in an equivalent resolution bandwidth.

Measurement:

Measurement parameter	
Detector:	Peak
Sweep time:	Auto
Video bandwidth:	3 MHz
Resolution bandwidth:	1 MHz
Frequency range:	24.05 GHz to 29.00 GHz
Trace-Mode:	Max Hold

Results:

TEST CONDITIONS	10 dB fundamental emission bandwidth [GHz]
T_{nom} / V_{nom}	1.51
$T_{min} / V_{min} - V_{max}$	1.14
$T_{max} / V_{min} - V_{max}$	1.64

Limits:

RSS-211 DRAFT Issue 1, Chapter 5.1

The minimum fundamental emission bandwidth shall be 50 MHz

Limits:

RSS-Gen 4.6.4 / RSS-211 DRAFT Issue 1, Chapter 5

The operating frequency range shall be totally contained in the frequency band 24.05-27 GHz.

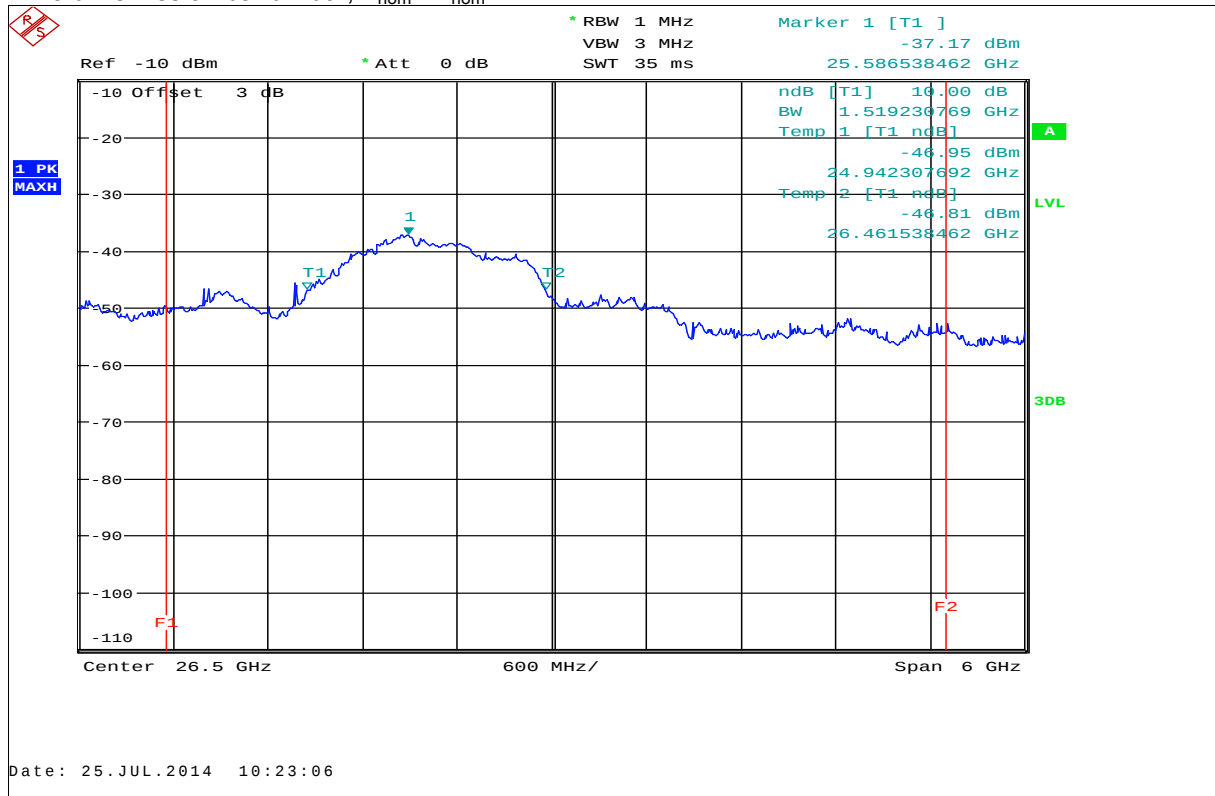
Limits:

FCC-14-2, docket no.10-23 (D) / FCC §15.256 (f) (1) (2) + (g)

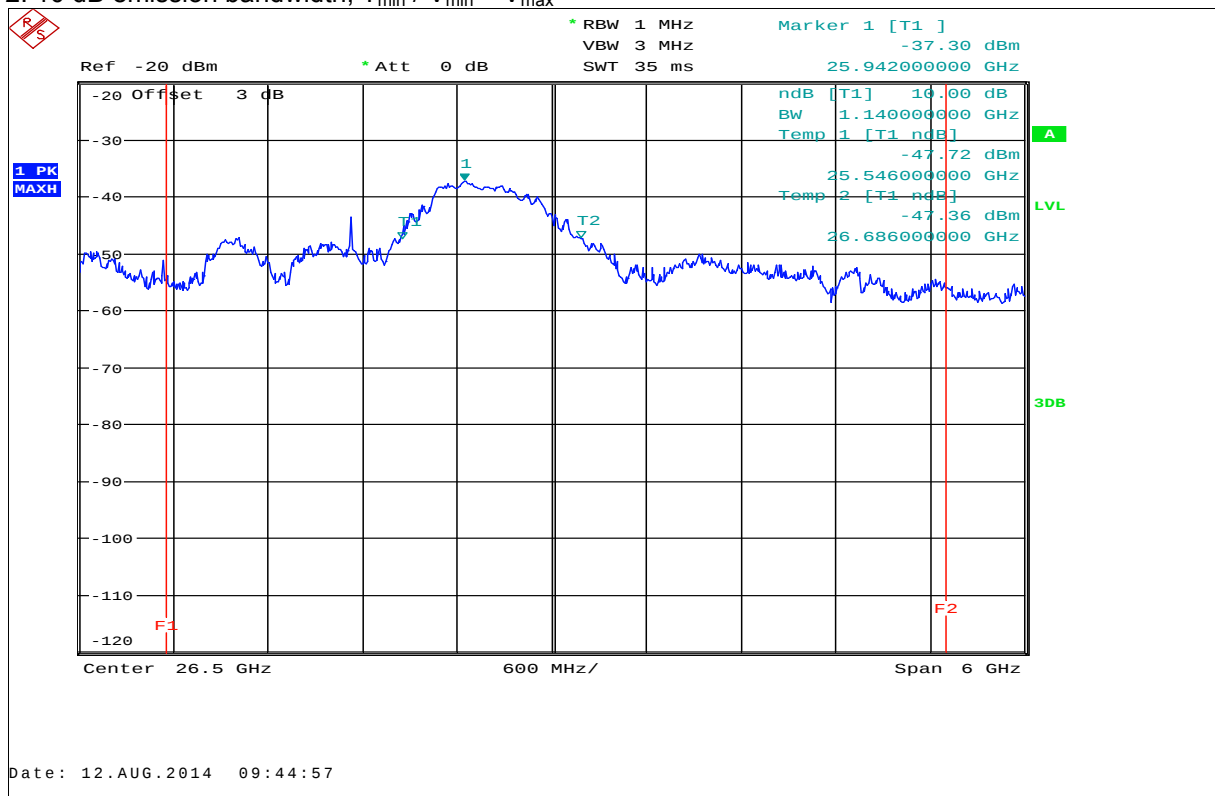
- (f)(1) The minimum fundamental emission bandwidth shall be 50 MHz for LPR operation under the provisions of this section.
- (f)(2) LPR devices operating under this section must confine their fundamental emission bandwidth within the 24.05-29.00 GHz bands under all conditions of operation.
- (g) Fundamental emissions limits. (1) All emission limits provided in this section are expressed in terms of Equivalent Isotropic Radiated Power (EIRP).

Result: The measurement is passed.

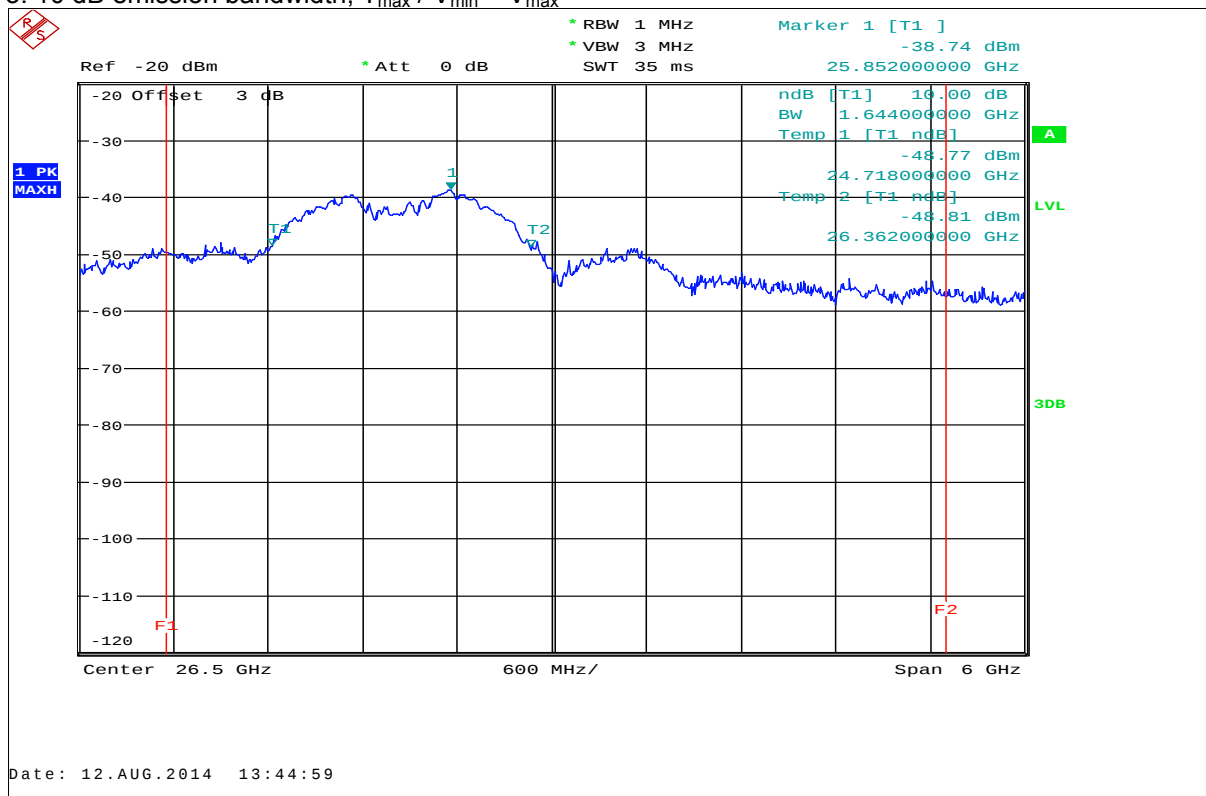
Plot 1: 10 dB emission bandwidth, $T_{\text{nom}} / V_{\text{nom}}$



Plot 2: 10 dB emission bandwidth, $T_{\text{min}} / V_{\text{min}} - V_{\text{max}}$



Plot 3: 10 dB emission bandwidth, $T_{\max} / V_{\min} - V_{\max}$



8.7 EIRP - fundamental emission

Description:

- (2) The EIRP level is to be determined from the maximum measured power within a specified bandwidth.
- (i) The EIRP in 1 MHz is computed from the maximum power level measured within any 1-MHz bandwidth using a power averaging detector;
- (ii) The EIRP in 50 MHz is computed from the maximum power level measured with a peak detector in a 50 MHz bandwidth centered on the frequency at which the maximum average power level is realized and this 50 MHz bandwidth must be contained within the authorized operating bandwidth. For a RBW less than 50 MHz, the peak EIRP limit (in dBm) is reduced by $20 \log (RBW/50)$ dB where RBW is the resolution bandwidth in megahertz. The RBW shall not be lower than 1 MHz or greater than 50 MHz the video bandwidth of the measurement instrument shall not be less than the RBW. If the RBW is greater than 3 MHz, the application for certification filed shall contain a detailed description of the test procedure, calibration of the test setup, and the instrumentation employed in the testing.

Measurement:

Measurement parameter	
Detector:	RMS / Peak
Sweep time:	Auto
Video bandwidth:	3 MHz / 10 MHz
Resolution bandwidth:	1 MHz / 10 MHz
Frequency range:	24.05 GHz to 29.00 GHz
Trace-Mode:	Max Hold

Results:

TEST CONDITIONS	Average emission limit EIRP in dBm measured in 1 MHz	Transmitter output average power conducted in dBm calculated
T_{nom} / V_{nom}	-40.99	-64.99 (*)
$T_{min} / V_{min} - V_{max}$	-40.87	-64.87 (*)
$T_{max} / V_{min} - V_{max}$	-41.95	-65.95 (*)

Note: (*) The manufacturer declared an antenna gain of 24 dBi

TEST CONDITIONS	Peak emission limit EIRP in dBm measured in 10 MHz	Peak emission limit EIRP in dBm calculated in 50 MHz
T_{nom} / V_{nom}	-25.77	-11.79
$T_{min} / V_{min} - V_{max}$	-25.58	-11.60
$T_{max} / V_{min} - V_{max}$	-26.87	-12.89

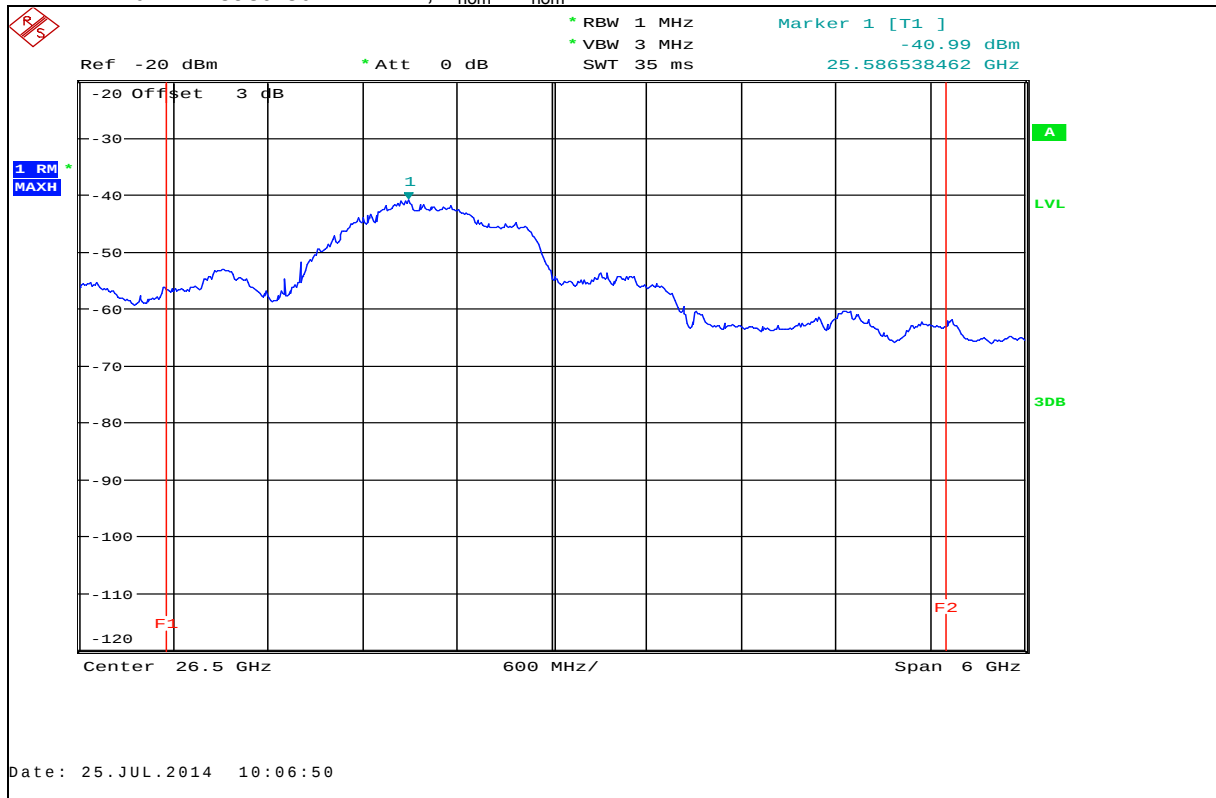
Note: $20 \log (RBW/50)$ dB = -13.98

Limits: RSS-211 DRAFT Issue 1, Chapter 5.2 / FCC-14-2, docket no.10-23 (E) / FCC §15.256 (g) (1) (2) (3)

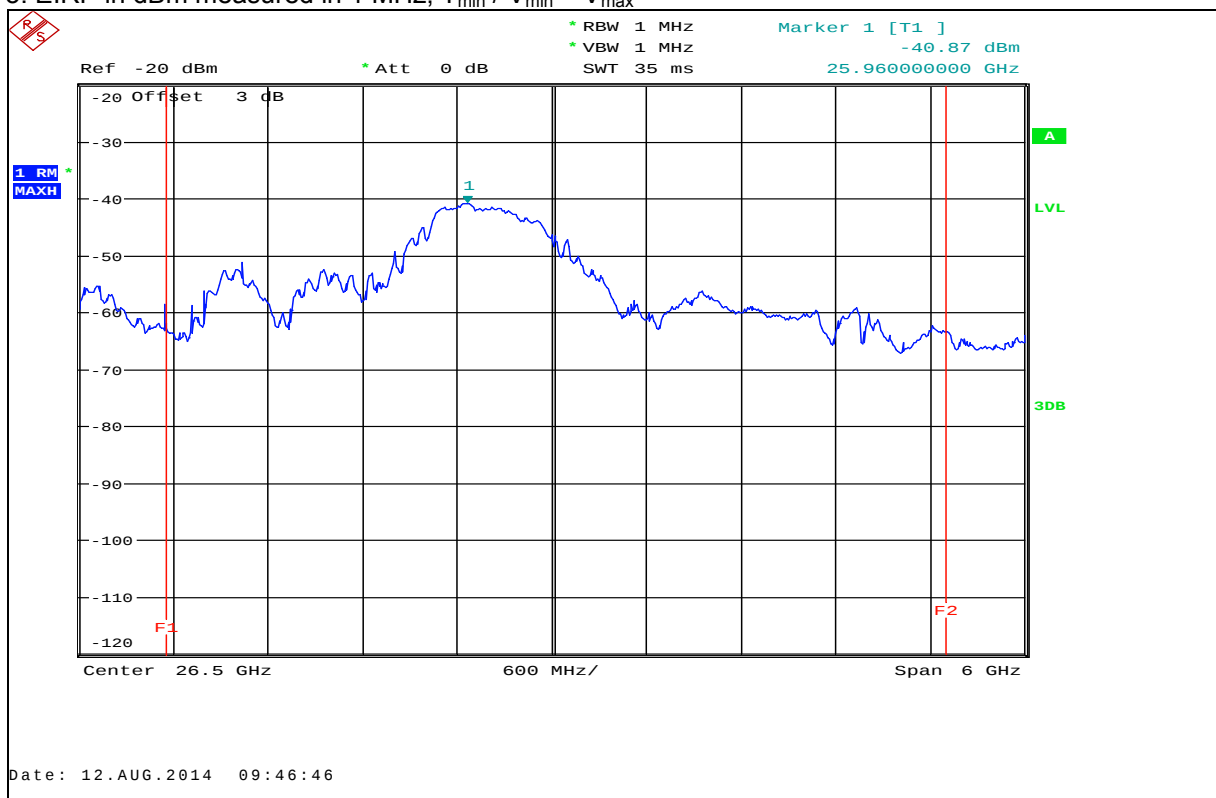
Frequency band of operation (GHz)	Average emission limit (EIRP in dBm measured in 1 MHz)	Peak emission limit (EIRP in dBm measured in 50 MHz)
24.05-29.00	-14	26

Result: The measurement is passed.

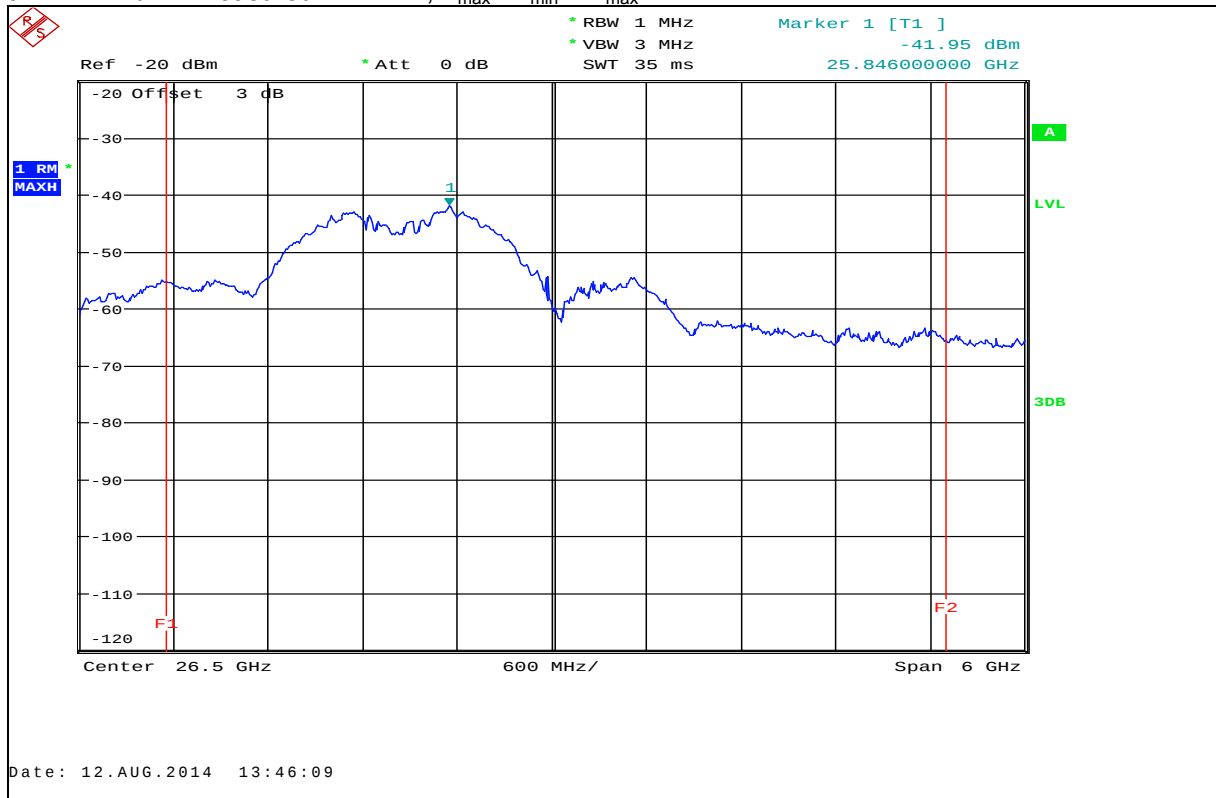
Plot 4: EIRP in dBm measured in 1 MHz, T_{nom} / V_{nom}



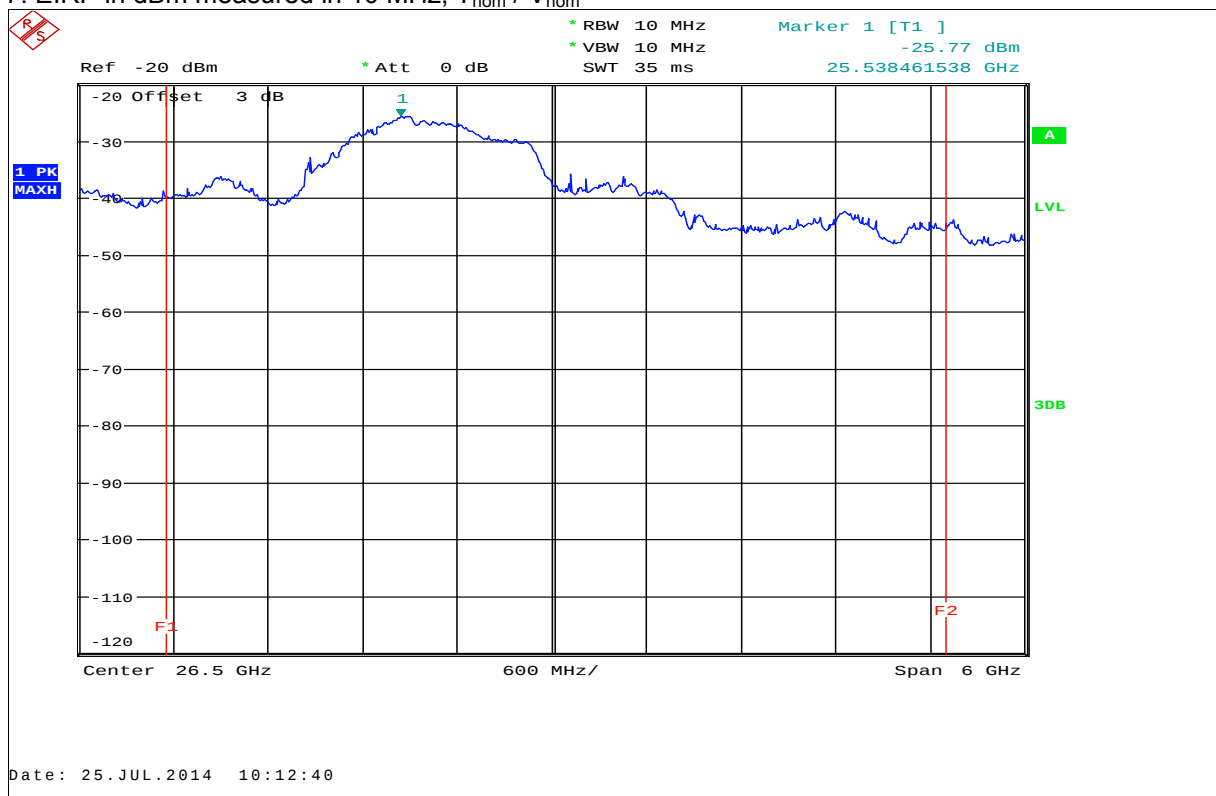
Plot 5: EIRP in dBm measured in 1 MHz, $T_{min} / V_{min} - V_{max}$



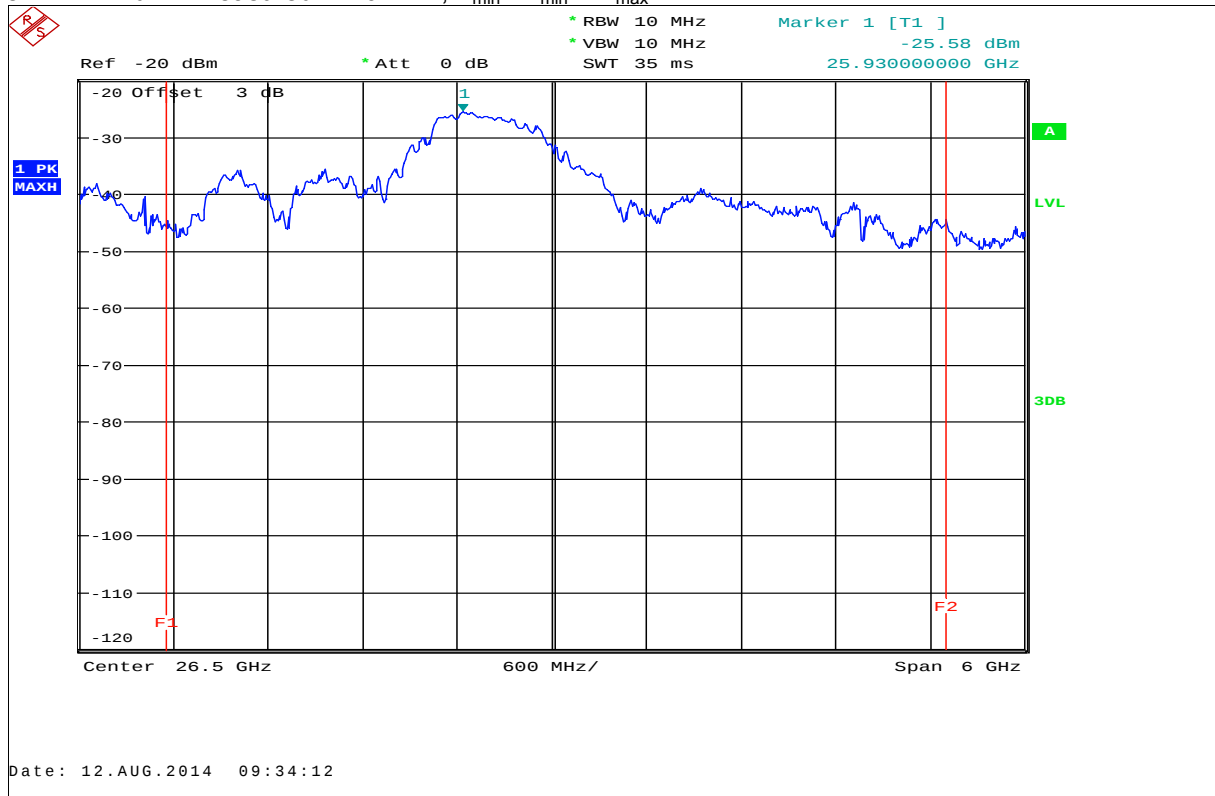
Plot 6: EIRP in dBm measured in 1 MHz, $T_{\max} / V_{\min} - V_{\max}$



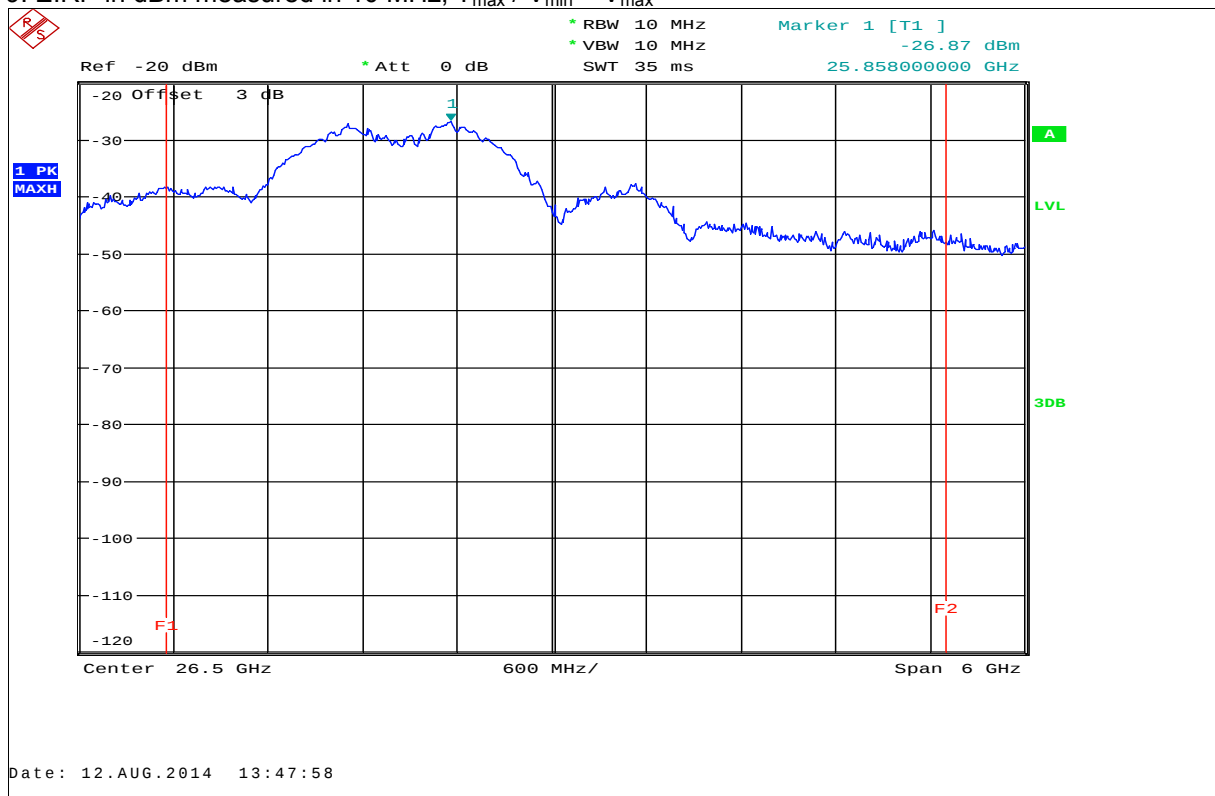
Plot 7: EIRP in dBm measured in 10 MHz, $T_{\text{nom}} / V_{\text{nom}}$



Plot 8: EIRP in dBm measured in 10 MHz, $T_{\min} / V_{\min} - V_{\max}$



Plot 9: EIRP in dBm measured in 10 MHz, $T_{\max} / V_{\min} - V_{\max}$



8.8 Unwanted emissions

Description:

§15.256(k) Emissions from digital circuitry used to enable the operation of the transmitter may comply with the limits in §15.209 of this chapter provided it can be clearly demonstrated that those emissions are due solely to emissions from digital circuitry contained within the transmitter and the emissions are not intended to be radiated from the transmitter's antenna. Emissions from associated digital devices, as defined in §15.3(k) of this part, e.g., emissions from digital circuitry used to control additional functions or capabilities other than the operation of the transmitter, are subject to the limits contained in subpart B, part 15 of this chapter. Emissions from these digital circuits shall not be employed in determining the -10 dB bandwidth of the fundamental emission or the frequency at which the highest emission level occurs.

Measurement:

Measurement parameter	
Detector:	Quasi Peak / Average (RMS)
Sweep time:	Auto
Resolution bandwidth:	F < 1 GHz: 100 kHz F > 1 GHz: 1 MHz
Video bandwidth:	Auto
Trace-Mode:	Max-Hold

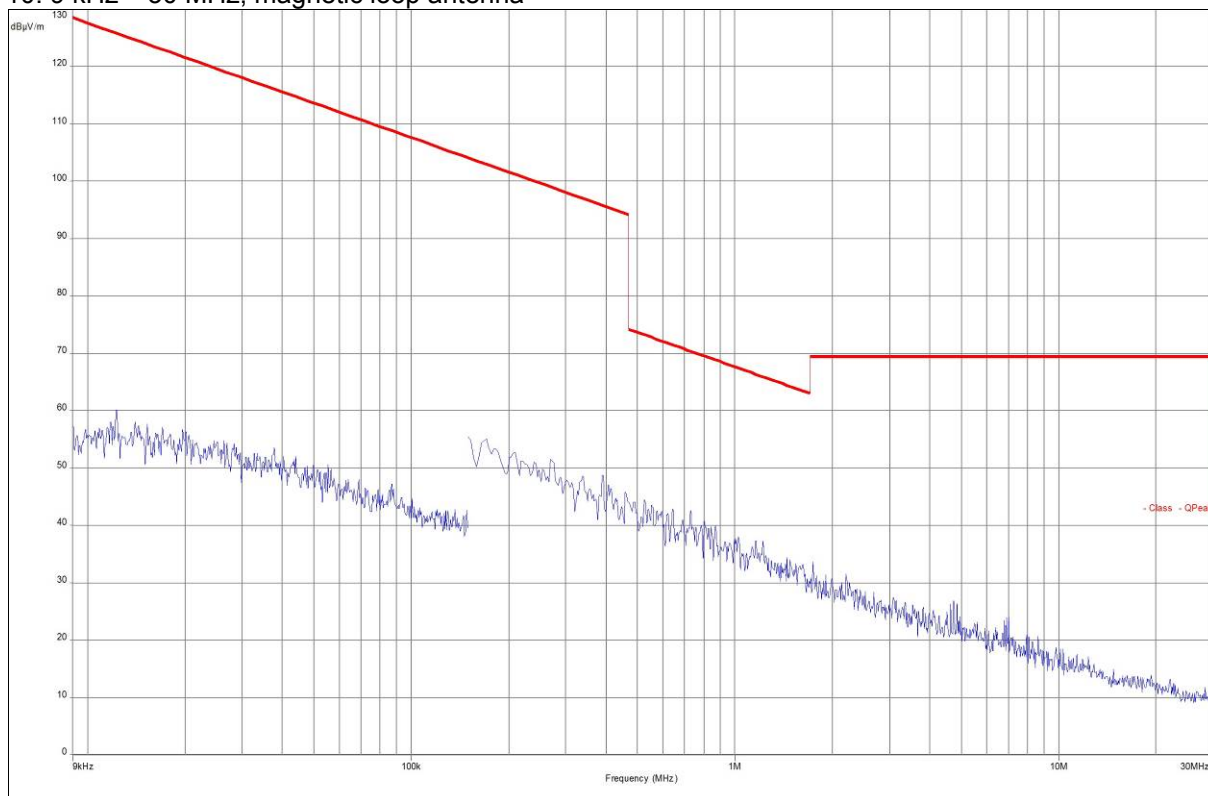
Limits:

RSS-Gen / FCC-14-2, docket no.10-23 (F), FCC §15.209

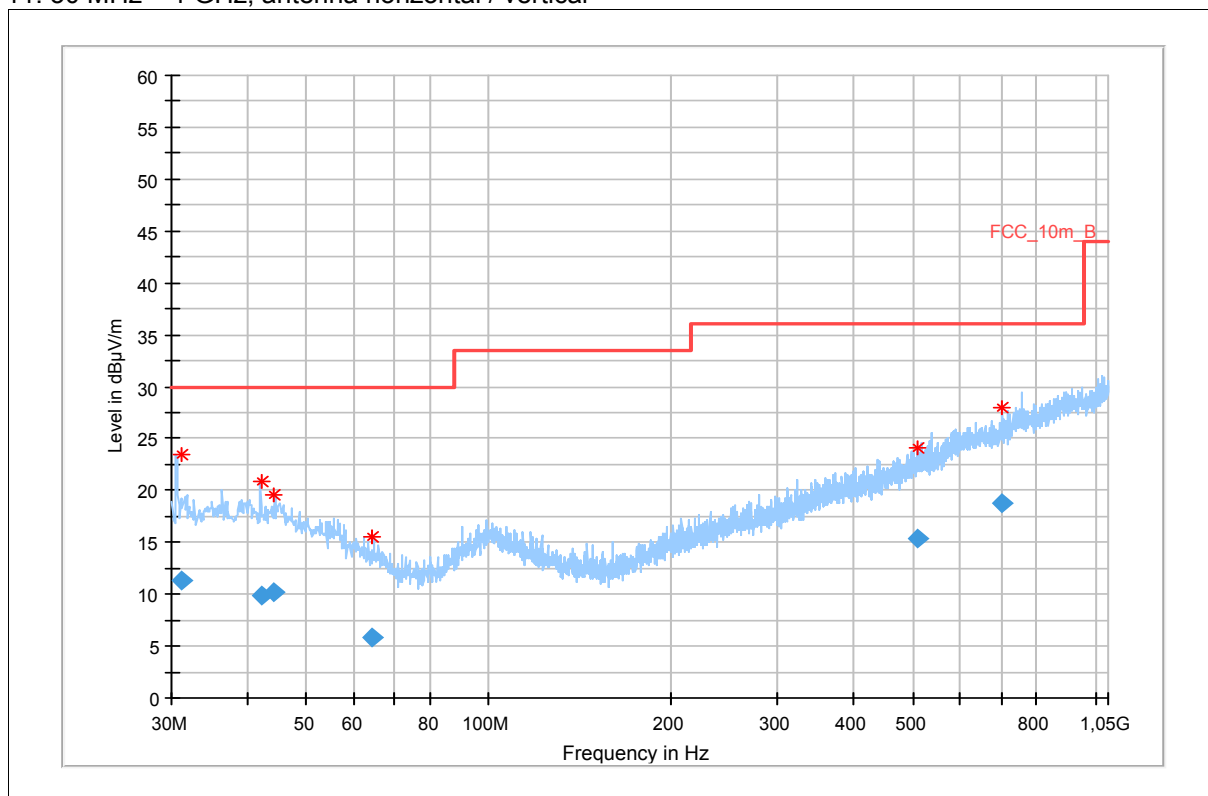
CFR Part 15.209 / RSS-Gen		
Radiated Spurious Emissions		
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.		
Frequency [MHz]	Field Strength [dBμV/m]	Measurement distance
0.009 – 0.490	2400/F[kHz]	300
0.490 – 1.705	24000/F[kHz]	30
1.705 – 30.0	30	30
30 – 88	30.0	10
88 – 216	33.5	10
216 – 960	36.0	10
960 – 110 000	54.0	3

Result: The measurement is passed.

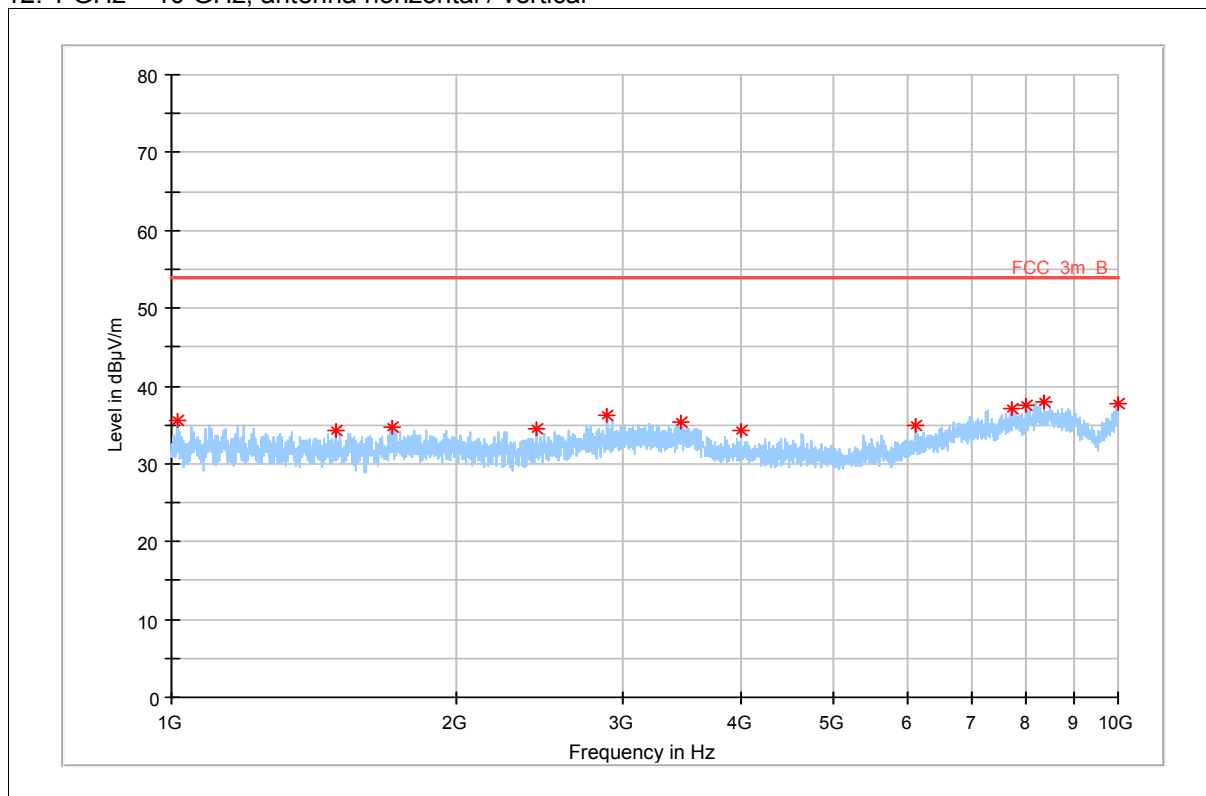
Plot 10: 9 kHz – 30 MHz, magnetic loop antenna



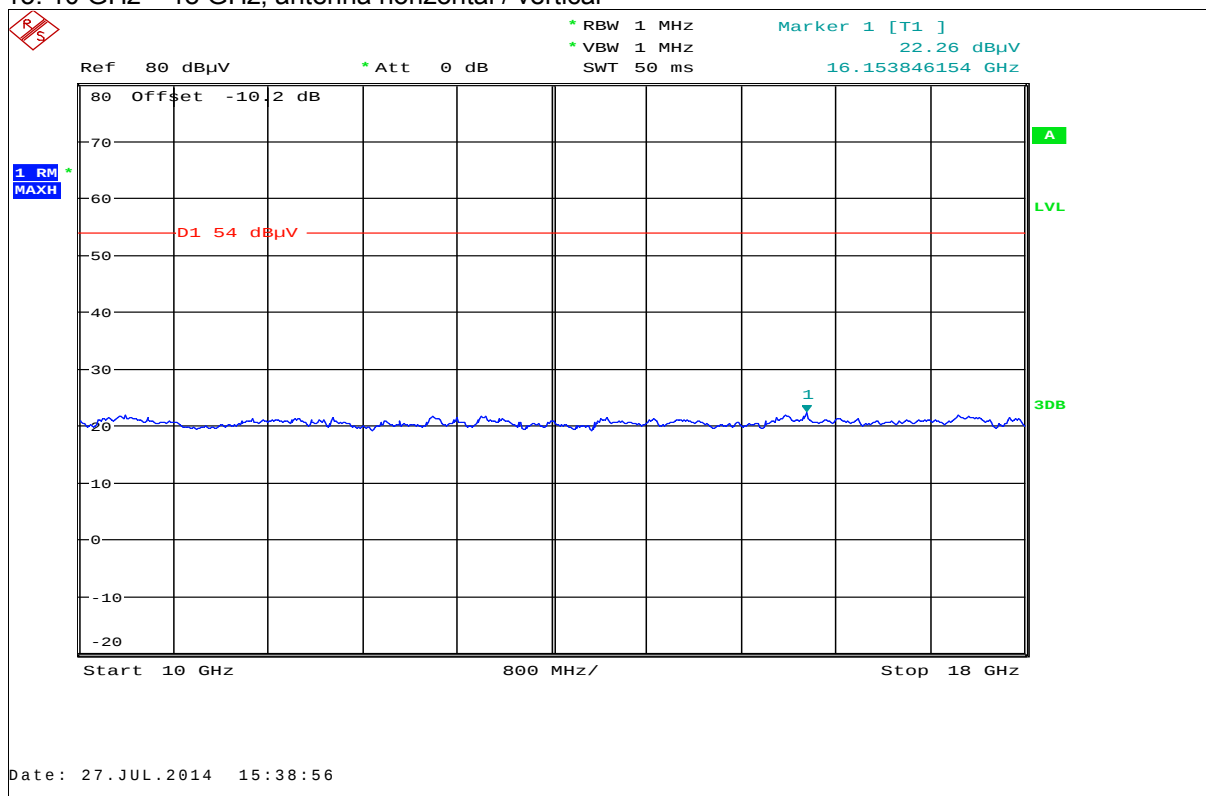
Plot 11: 30 MHz – 1 GHz, antenna horizontal / vertical



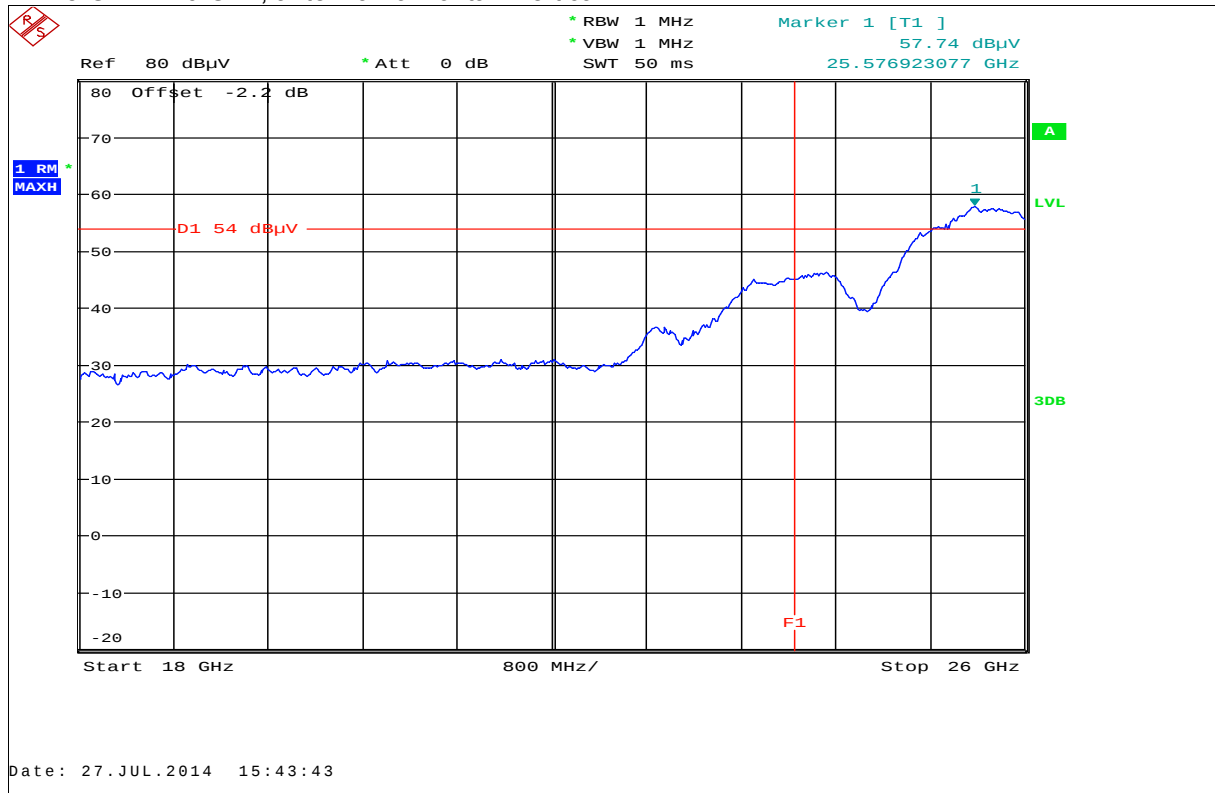
Plot 12: 1 GHz – 10 GHz, antenna horizontal / vertical



Plot 13: 10 GHz – 18 GHz, antenna horizontal / vertical

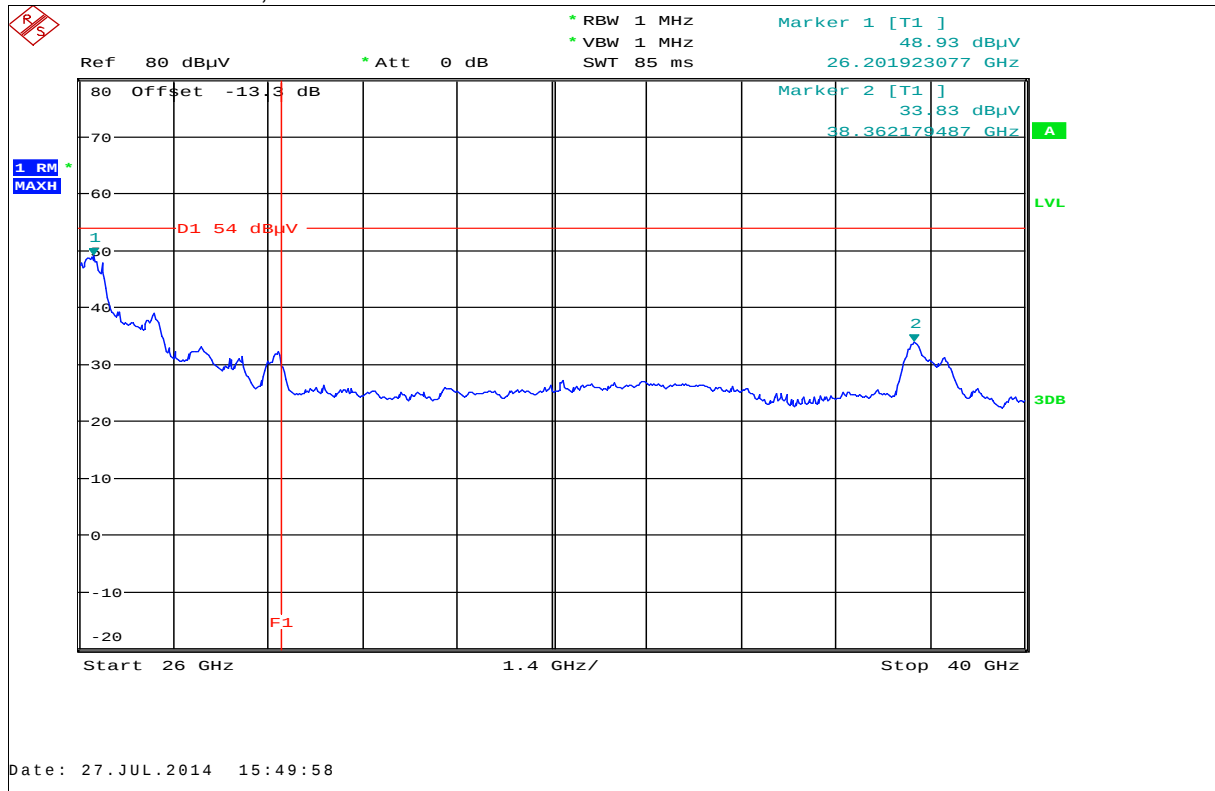


Plot 14: 18 GHz – 26 GHz, antenna horizontal / vertical



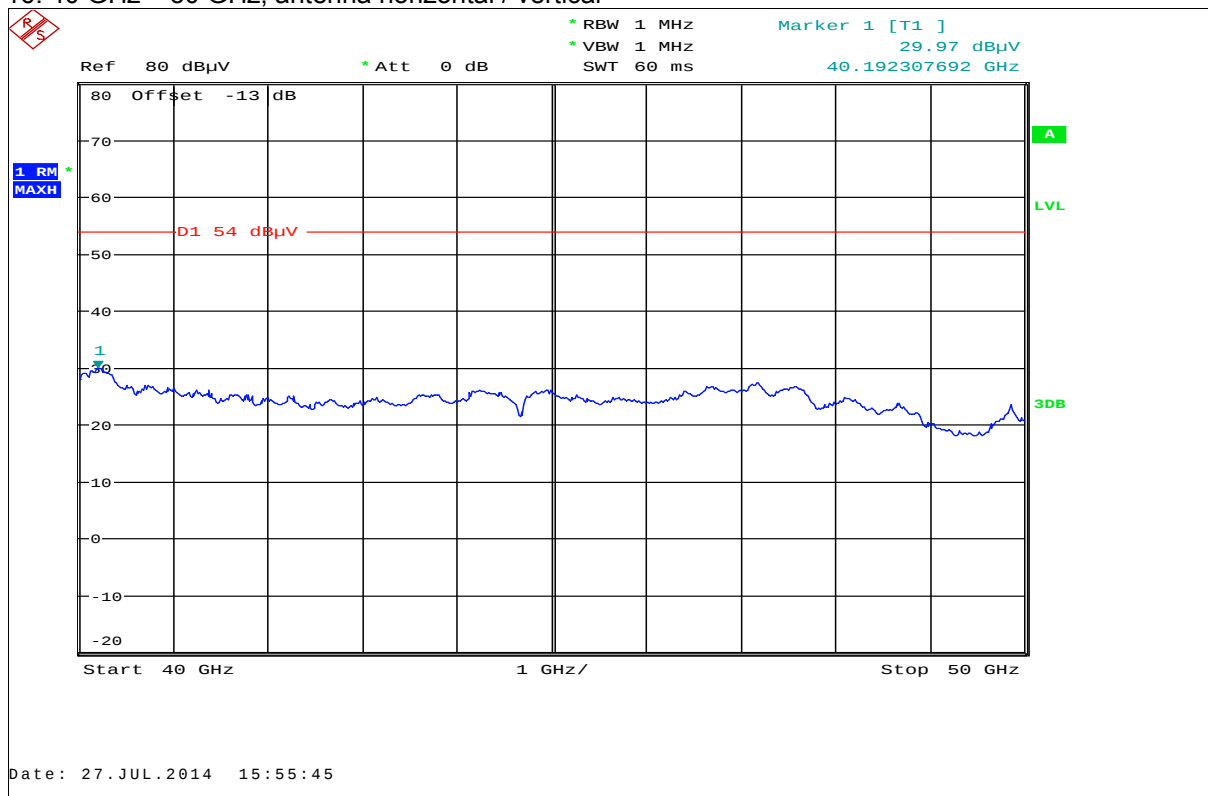
Note: Plot shows Fundamental emission bandwidth is completely enclosed in the 24.05 GHz – 27.00 GHz band (Required by RSS-211)

Plot 15: 26 GHz – 40 GHz, antenna horizontal / vertical

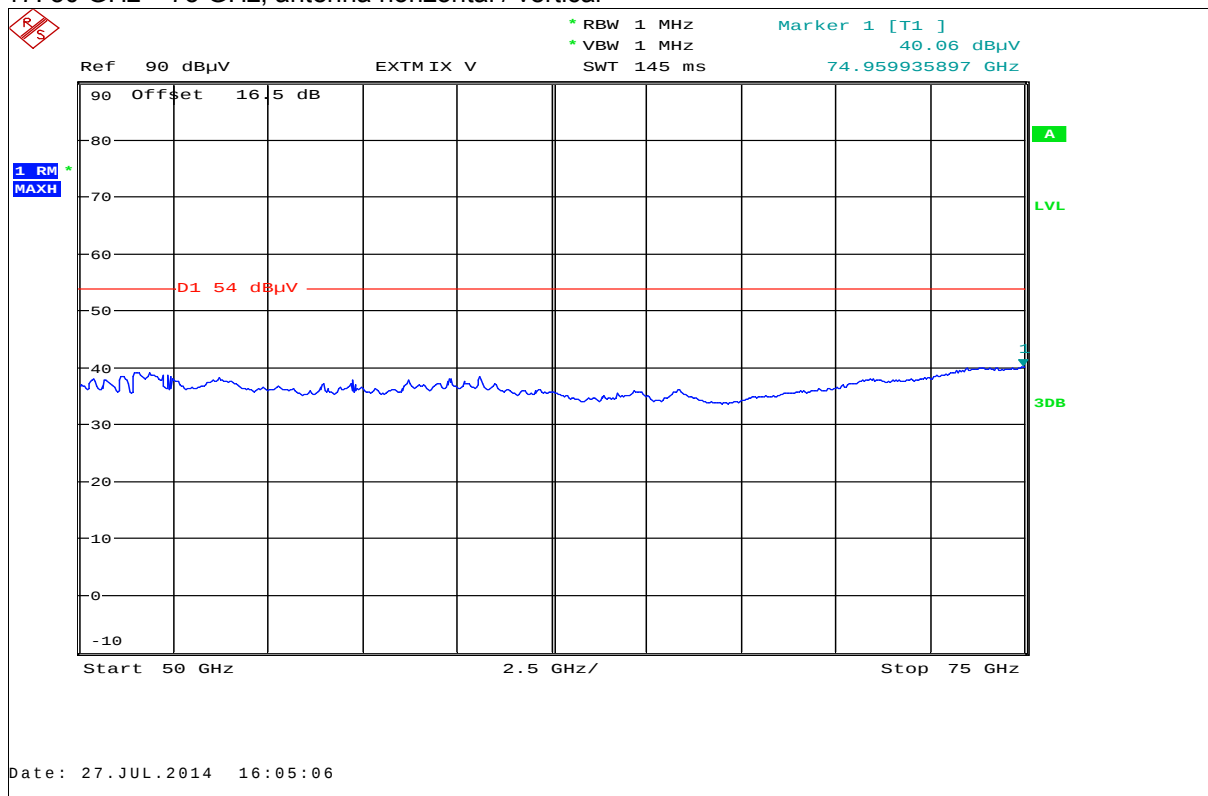


Note: Plot shows Fundamental emission bandwidth is completely enclosed in the 24.05 GHz – 27.00 GHz band (Required by RSS-211)

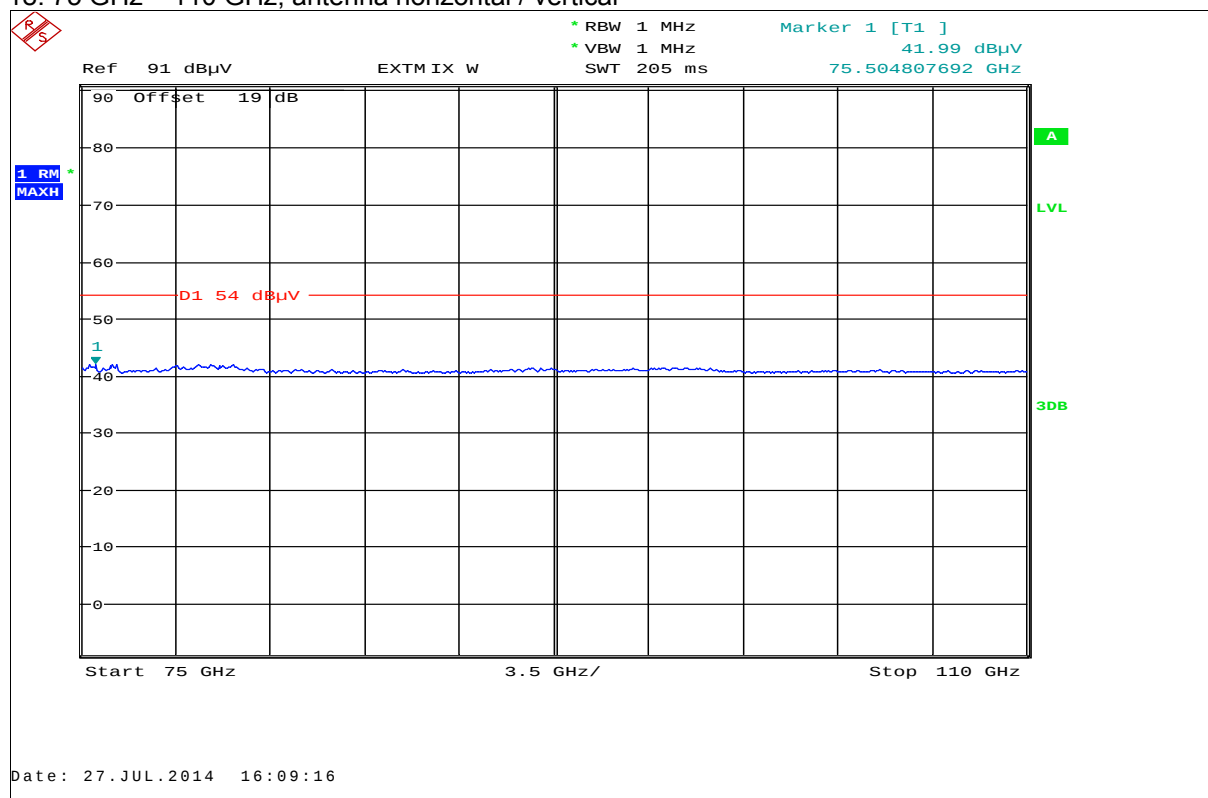
Plot 16: 40 GHz – 50 GHz, antenna horizontal / vertical



Plot 17: 50 GHz – 75 GHz, antenna horizontal / vertical



Plot 18: 75 GHz – 110 GHz, antenna horizontal / vertical



8.9 AC Conducted

Description:

Measurement of the conducted spurious emissions in transmit mode below 30 MHz. Both power lines, phase and neutral line, are measured. Found peaks are re-measured with average and quasi peak detection to show compliance to the limits.

Measurement:

Measurement parameter	
Detector:	Peak - Quasi Peak / Average
Sweep time:	Auto
Video bandwidth:	F < 150 kHz: 200 Hz F > 150 kHz: 9 kHz
Resolution bandwidth:	F < 150 kHz: 1 kHz F > 150 kHz: 100 kHz
Span:	9 kHz to 30 MHz
Trace-Mode:	Max Hold

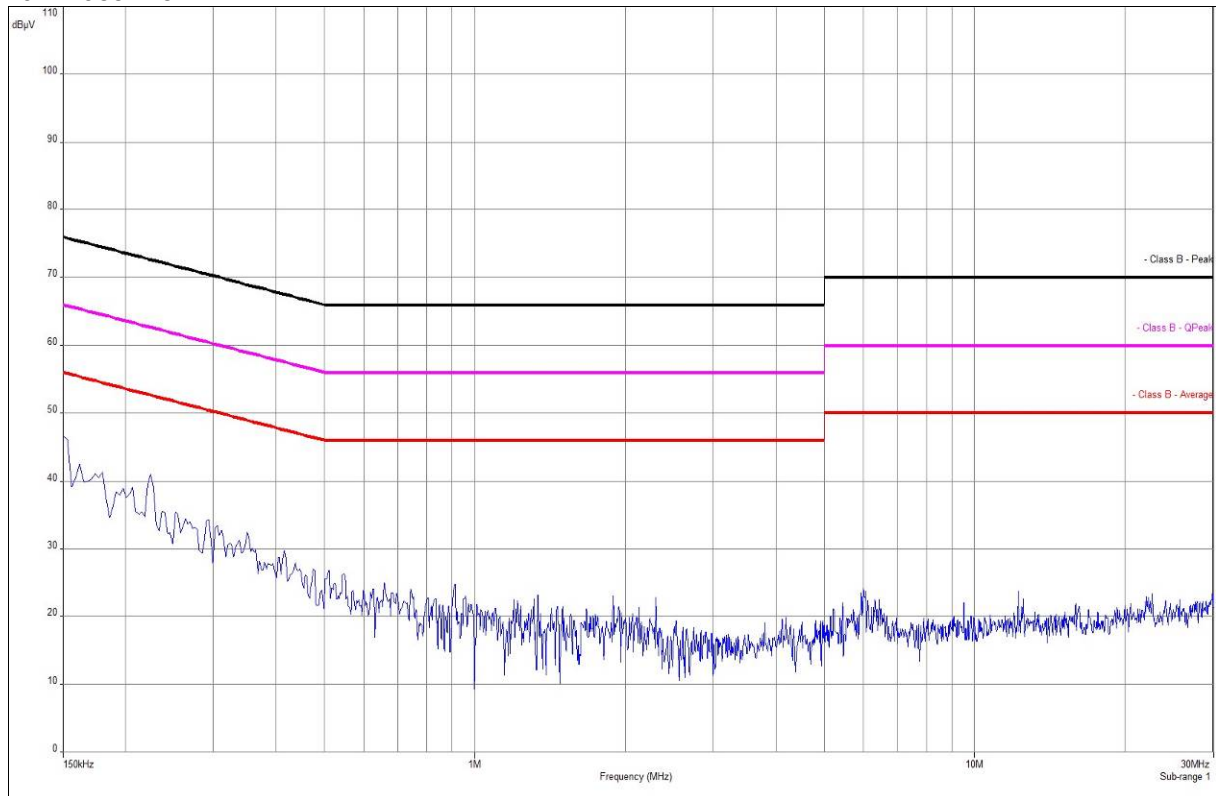
Limits:

CFR Part 15.207(a) / ICES-003, Issue 4		
Conducted Spurious Emissions < 30 MHz		
Frequency (MHz)	Quasi-Peak (dBμV/m)	Average (dBμV/m)
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30.0	60	50

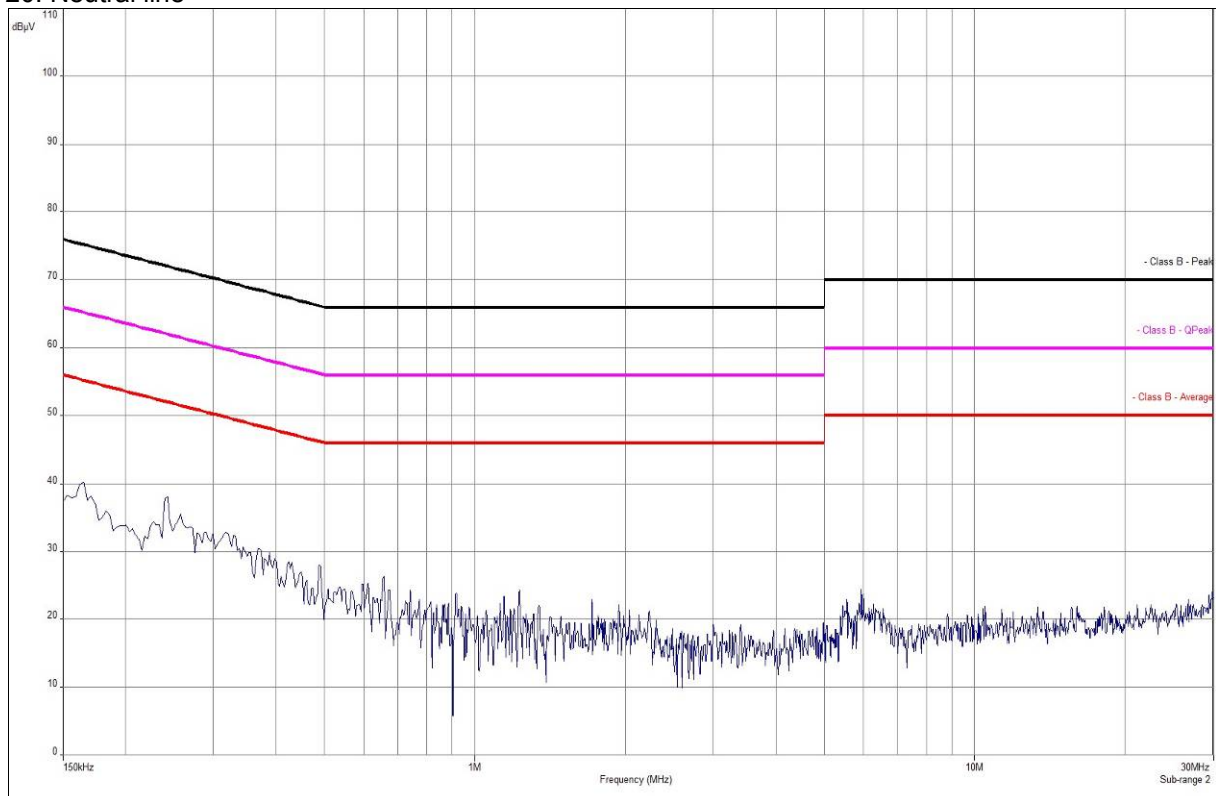
*Decreases with the logarithm of the frequency

Result: The measurement is passed.

Plot 19: Phase line



Plot 20: Neutral line



8.10 Frequency Stability

As specified in Section 15.215(c), the bandwidth of the fundamental emission must be contained within the frequency band over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage. Frequency stability is to be measured according to Section 2.1055 at the highest and lowest frequency of operation and with the modulation that produces the widest emission bandwidth

Results:

TEST CONDITIONS	Carrier Frequency
(T _{nom} / V _{nom})	25.586538 GHz
(T _{min} / V _{min-max})	25.942000 GHz
(T _{max} / V _{min-max})	25.852000 GHz

Limits:

RSS-Gen 4.7 / FCC §15.256 (f) (2) / FCC §15.215 (c)

Frequency range	f(lowest) > 24.05 GHz	f(highest) < 29.00 GHz
-----------------	-----------------------	------------------------

Result: The measurement is passed.

8.11 Antenna beamwidth and antenna side lobe gain**Description:**

§15.256(i) Antenna beamwidth

(A) LPR devices operating under the provisions of this section within the 5.925-7.250 GHz and 24.05-29.00 GHz bands must use an antenna with a -3 dB beamwidth no greater than 12 degrees.

(B) LPR devices operating under the provisions of this section within the 75-85 GHz band must use an antenna with a -3 dB beamwidth no greater than 8 degrees.

(j) Antenna side lobe gain. LPR devices operating under the provisions of this section must limit the side lobe antenna gain relative to the main beam gain for off-axis angles from the main beam of greater than 60 degrees to the levels provided in Table below.

Limits:

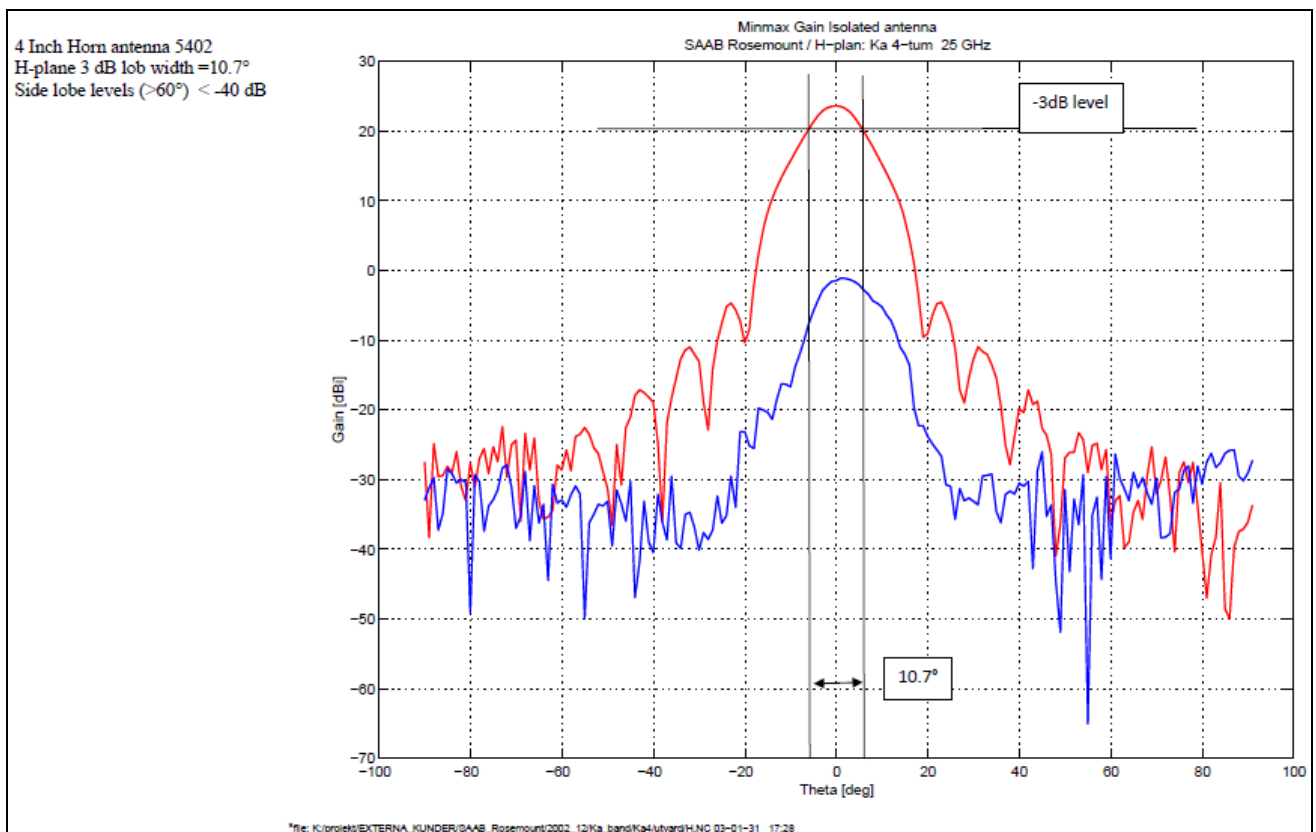
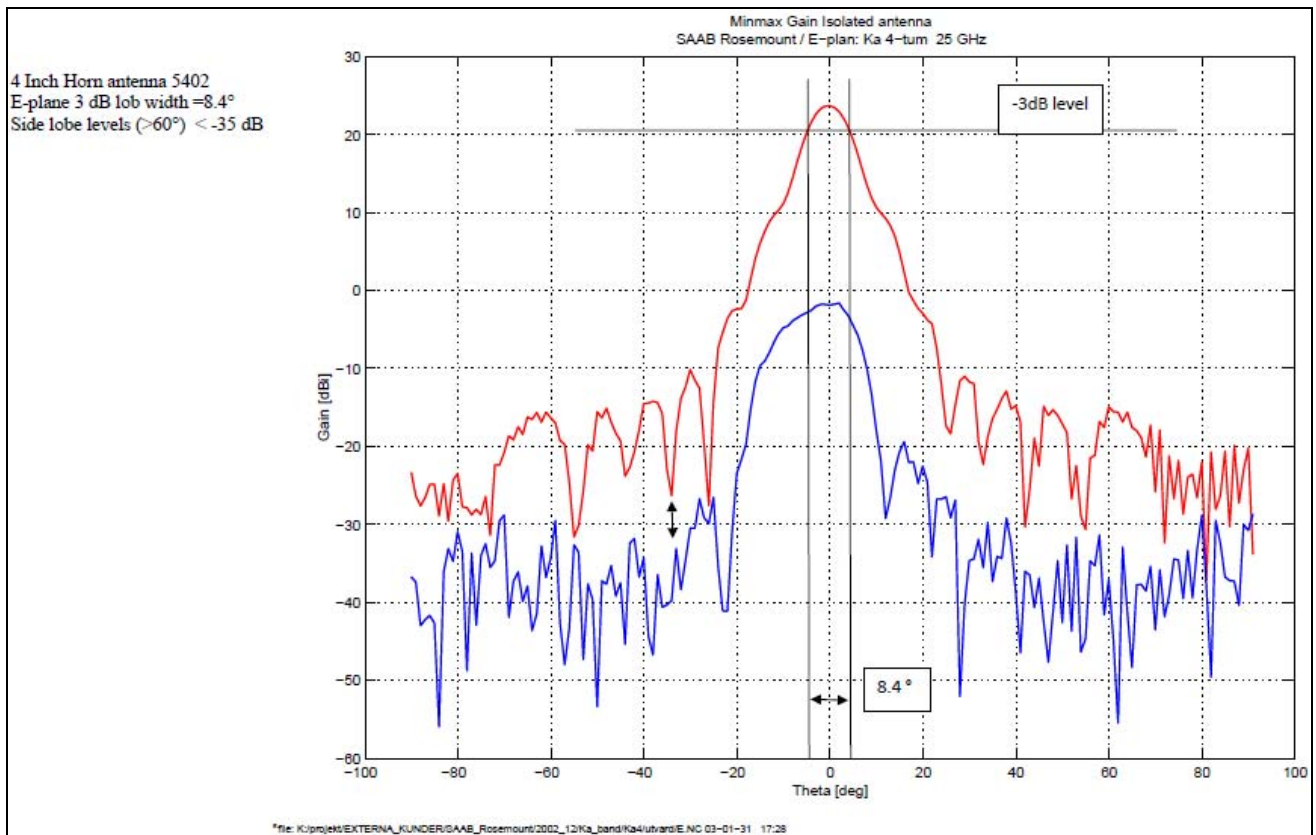
RSS-211 DRAFT Issue 1, Chapter 5.2 (c) / FCC §15.256 (j)

Frequency range (GHz)	Antenna beamwidth in degree (°)	Antenna side lobe gain limit relative to main beam gain (dB)
24.05 to 29.00	12	-27

Note:

See next page and manufacturer's documentation.

Result: The measurement is passed.

Reference document of the customer:


Annex A Test equipment and ancillaries used for tests

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, rf-generating and signalling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Labor/Item).

No.	Lab / Item	Equipment	Type	Manufact.	Serial No.	INV. No Cetecom	Kind of Calibration	Last Calibration	Next Calibration
1	n. a.	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2818A03450	300001040	Ve	12.01.2012	12.01.2015
2	n. a.	Double-Ridged Waveguide Horn Antenna 1-18.0GHz	3115	EMCO	8812-3088	300001032	vKI!	08.05.2013	08.05.2015
3	n. a.	Anechoic chamber	FAC 3/5m	MWB / TDK	87400/02	300000996	ev		
4	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	*	300000199	ne		
5	9	Artificial Mains 9 kHz to 30 MHz	ESH3-Z5	R&S	828576/020	300001210	Ve	30.01.2014	30.01.2016
6	n. a.	Switch / Control Unit	3488A	HP Meßtechnik	2719A15013	300001156	ne		
7	9	Isolating Transformer	MPL IEC625 Bus Regeltrenntravo	Erli	91350	300001155	ne		
8	n. a.	Three-Way Power Splitter, 50 Ohm	11850C	HP Meßtechnik		300000997	ne		
9	90	Active Loop Antenna 10 kHz to 30 MHz	6502	Kontron Psychotech	8905-2342	300000256	k	13.06.2013	13.06.2015
10	n. a.	Amplifier	js42-00502650-28-5a	Parzich GMBH	928979	300003143	ne		
11	n. a.	Band Reject filter	WRCG1855/1910-1835/1925-40/8SS	Wainwright	7	300003350	ev		
12	n. a.	Band Reject filter	WRCG2400/2483-2375/2505-50/10SS	Wainwright	11	300003351	ev		
13	n. a.	Highpass Filter	WHKX7.0/18G-8SS	Wainwright	18	300003789	ne		
14	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	371	300003854	vKI!	14.10.2011	14.10.2014
15	n. a.	MXE EMI Receiver 20 Hz bis 26,5 GHz	N9038A	Agilent Technologies	MY51210197	300004405	k	13.03.2014	13.03.2015
16	CR 79	Std. Gain Horn Antenna 26.5-40.0 GHz	V637	Narda	7911	300001751	ne		
17	11b	Microwave System Amplifier, 0.5-26.5 GHz	83017A	HP Meßtechnik	00419	300002268	ev		
18	n. a.	Broadband Low Noise Amplifier 18-50 GHz	CBL19503070-XX	CERNEX	19338	300004273	ne		
19	A022	Std. Gain Horn Antenna 26.4-40.1 GHz	2224-20	Flann	235	300001976	ne		
20	A023	Std. Gain Horn Antenna 39.3-59.7 GHz	2424-20	Flann	75	300001979	ne		
21	A025	Std. Gain Horn Antenna 49.9-75.8 GHz	2524-20	Flann	*	300001983	ne		
22	A028	Std. Gain Horn Antenna 73.8-112 GHz	2724-20	Flann	*	300001991	ne		
23	A026	Std. Gain Horn Antenna 12.4 to 18.0 GHz	639	Narda	8402	300000787	k	22.07.2013	22.07.2015
24	A029	Std. Gain Horn Antenna 18.0 to 26.5 GHz	638	Narda	8205	300002442	k	19.07.2013	19.07.2015
25	8	DC Power Supply, 60V, 10A	6038A	HP Meßtechnik	3122A11097	300001204	Ve	10.01.2012	10.01.2015

26	n. a.	Spectrum Analyzer 20 Hz - 50 GHz	FSU50	R&S	200012	300003443	Ve	09.10.2012	09.10.2014
27	n. a.	Harmonic mixer 50 - 75 GHz for spectrum analyzers	FS-Z75	R&S	100099	300003949	k	13.03.2014	13.03.2015
28	n. a.	Spectrum Analyzer Mixer 2-Port, 75-110 GHz	SAM-110-7	Radiometer Physics GmbH	002	300004155	k	31.01.2014	31.01.2016
29	n. a.	4U RF Switch Platform	L4491A	Agilent Technologies	MY50000037	300004509	ne		
30	45	Switch-Unit	3488A	HP Meßtechnik	2719A14505	300000368	g		
31	50	DC power supply, 60Vdc, 50A, 1200 W	6032A	HP Meßtechnik	2920A04466	300000580	ne		
32	n. a.	EMI Test Receiver	ESCI 3	R&S	100083	300003312	k	27.01.2014	27.01.2015
33	n. a.	Funkstörmessempfänger 20Hz- 26.5GHz	ESU26	R&S	100037	300003555	k	28.02.2014	28.02.2015
34	n. a.	Antenna Tower	Model 2175	ETS- LINDGREN	64762	300003745	izw		
35	n. a.	Positioning Controller	Model 2090	ETS- LINDGREN	64672	300003746	izw		
36	n. a.	Turntable Interface-Box	Model 105637	ETS- LINDGREN	44583	300003747	izw		
37	n. a.	TRILOG Broadband Test-Antenna 30 MHz - 3 GHz	VULB9163	Schwarzbeck	295	300003787	k	22.04.2014	22.04.2016

Agenda: Kind of Calibration

k	calibration / calibrated		EK	limited calibration
ne	not required (k, ev, izw, zw not required)		zw	cyclical maintenance (external cyclical maintenance)
ev	periodic self-verification		izw	internal cyclical maintenance
Ve	long-term stability recognized		g	blocked for accredited testing
vkI!	Attention: extended calibration interval			
NK!	Attention: not calibrated		*)	next calibration ordered / currently in progress

Annex B Observations

No observations exceeding those reported with the single test cases have been made.

Annex C Document history

Version	Applied changes	Date of release
1.0	Initial release	2014-09-08
-A	Antenna diagram added	2014-10-07
-B	DRAFT RSS-211 added	2014-11-07

Annex D Further information**Glossary**

AVG	-	Average
DUT	-	Device under test
EMC	-	Electromagnetic Compatibility
EN	-	European Standard
EUT	-	Equipment under test
ETSI	-	European Telecommunications Standard Institute
FCC	-	Federal Communication Commission
FCC ID	-	Company Identifier at FCC
HW	-	Hardware
IC	-	Industry Canada
Inv. No.	-	Inventory number
N/A	-	Not applicable
PP	-	Positive peak
QP	-	Quasi peak
S/N	-	Serial number
SW	-	Software

Annex E Accreditation Certificate



Deutsche Akkreditierungsstelle GmbH

Befähigte gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung



Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

CETECOM ICT Services GmbH
Untertürkheimer Straße 6-10, 66117 Saarbrücken

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

Drahtgebundene Kommunikation einschließlich xDSL
VoIP und DECT
Akustik
Funk einschließlich WLAN
Short Range Devices (SRD)
RFID
WiMax und Richtfunk
Mobilfunk (GSM / DCS, Over the Air (OTA) Performance)
Elektromagnetische Verträglichkeit (EMV) einschließlich Automotive
Produktsicherheit
SAR und Hearing Aid Compatibility (HAC)
Umweltsimulation
Smart Card Terminals
Bluetooth
Wi-Fi-Services

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Registrierungsnummer der Urkunde: D-PL-12076-01-01

Frankfurt am Main, 18.01.2013

Siehe Hinweise auf der Rückseite

Im Auftrag
Dirk J. Jäger
Abteilungsleiter

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38116 Braunschweig

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