


Test Report

Product	UPCS handset with Bluetooth and WLAN	
Name and address of the applicant	Panasonic Corporation of North America	
Name and address of the manufacturer	Panasonic System Networks Co., Ltd. 1-62, 4-chome, Minoshima, Hakata-ku Fukuoka 812-8531, Japan	
Model	KX-PRXA10	
Rating	3.7V DC (Li-Ion Secondary Battery)	
Trademark	Panasonic	
Serial number	/	
Additional information	Bluetooth 3.0 +HS, Class 3	
Tested according to	FCC Part 15.247 Frequency Hopping Transmitters / Digital Transmission Systems Industry Canada RSS-210, Issue 8 Low Power Licence-Exempt Radiocommunications Devices	
Order number	247284	
Tested in period	2013.11.05 to 2013.11.28 and 2013.11.20	
Issue date	2013.12.20	
Name and address of the testing laboratory	 Instituttveien 6 Kjeller, Norway	FCC No: 994405 IC OATS: 2040D-1 TEL: (+47) 22 96 03 30 FAX: (+47) 22 96 05 50
	 Prepared by [G.Suhanthakumar]	 Approved by [Frode Sveinsen]
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1 INFORMATION

1.1 Test Item

Name :	Panasonic
FCC ID :	ACJ96NKX-PRXA10
Industry Canada ID :	216A-KXPRXA10
Model name :	KX-PRXA10
Serial number :	/
Hardware identity and/or version:	KX-PRXA10xxR-UM
Software identity and/or version :	US_SW2316
Tested to IC Radio Standard (RSS) :	RSS-210 Issue 8, RSS-GEN Issue 3
Test Site IC Reg. Number :	IC 2040D-1
Frequency Range :	2402 – 2480 MHz
Number of Channels :	79 RF Channels
Operating Modes :	FHSS
Type of Modulation :	Digital (GFSK)
User Frequency Adjustment :	None
Conducted Output Power :	0.0010 Watts (Peak)
Type of Power Supply :	Secondary Battery (3.7V Li-Ion)
Desktop Charger :	Desktop Charger PNLC1049 with AC Adaptor PNLV226
Antenna Connector :	None (integral)
Antenna Diversity Supported :	No
Number of Antennas :	1

Description of Test Item

The EUT is a Bluetooth transceiver integrated into a UPCS and WLAN Handset. This report covers only the Bluetooth part, UPCS and WLAN parts are covered by separate test reports.

The BT transceiver supports BT 3.0 +HS and BT Power Class 3. BT 2.0 EDR is not supported.

Exposure Evaluation

FCC stand alone SAR evaluation for Bluetooth transmitter is not required according to KDB 447498 D01 General RF Exposure Guidance clause 4.3.2 even when transmitting simultaneously with the UPCS transmitter. BT and WLAN use the same antenna and can never be active at the same time.

Industry Canada RSS-102 Issue 4, clause 3.1.3 states that FCC procedures KDB 648474 shall be used for devices with multiple transmitters.

1.2 Test Environment

1.2.1 *Normal test condition*

Temperature:	20.2 – 23.3 °C
Relative humidity:	20 - 43 %
Normal test voltage:	3.7 V DC (secondary battery)

The values are the limit registered during the test period.

1.3 Test Engineer(s)

G.Suhanthakumar

1.4 Test Equipment

See list of test equipment in clause 4.

2 TEST REPORT SUMMARY

2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15, paragraph 15.247 and Industry Canada RSS-210 Issue 8.

Tests were performed in accordance with ANSI C63.4-2003 and DA 00-705 Filing and Guidelines for Frequency Hopping Spread Spectrum Systems.

Radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

A description of the test facility is on file with the FCC and Industry Canada.

New Submission

Production Unit

Class II Permissive Change

Pre-production Unit

DSS Equipment Code

Family Listing



THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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2.2 Test Summary

Name of test	FCC Part 15 reference	RSS-210 Issue 8 reference	Result
Supply Voltage Variations	15.31(e)	8 (RSS-GEN)	Complies
Number of Operating Frequencies	15.31(m)	A8.1	Complies
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	Complies
Power Line Conducted Emission	15.107(a) 15.207(a)	7.2.2 (RSS-GEN)	Complies
Channel Separation and 20 dB Bandwidth	15.247(a)(1)	A8.1	Complies
Pseudorandom Hopping Algorithm	15.247(a)(1)	A8.1	Complies
Time of Occupancy	15.247(a)(1)(iii)	A8.1	Complies
Occupied Bandwidth	15.247(a)(1)	A8.1	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	A8.2	N/A
Peak Power Output	15.247(b)	A8.4	Complies
Power Spectral Density	15.247(d)	A8.2	N/A
Spurious Emissions (Antenna Conducted)	15.247(c)	A8.5	Complies
Spurious Emissions (Radiated)	15.247(c) 15.109(a) 15.209(a)	A8.5	Complies

2.3 Description of modification for Modification Filing

Not applicable.

2.4 Comments

All ports were populated during spurious emission measurements.

2.5 Family List Rational

Not Applicable.

3 TEST RESULTS

3.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)

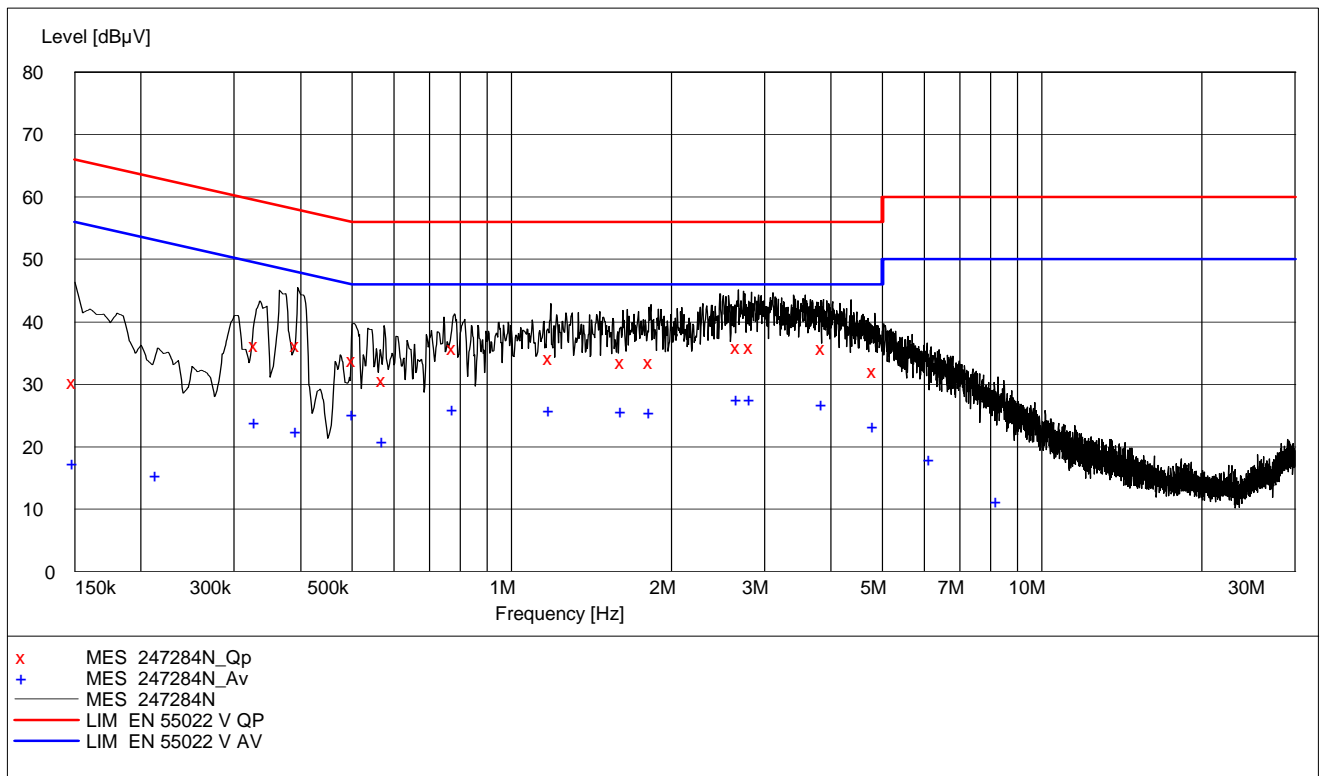
Test Performed By: G.Suhandhakumar	Date of Test: 12 Nov 2013
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Measurement procedure: ANSI C63.4-2003 using 50 µH/50 ohms LISN.

Test Results: Complies.

Measurement Data for battery charger (cradle): See plot, (Peak detector).

Charger PNLC109 with Power Adaptor PNLV226



Phase L1 and N, 120V 60Hz (Plot shows maximum of Phase L1 and N)

Frequency [MHz]	Level [dBuV]	Af [dB]	Limit [dBuV]	Margin [dB]	Det	Position	Verdict [Pass/Fail]
0.150000	30.40	10.10	66.00	35.60	QP	N	Pass
0.330000	36.30	10.20	59.50	23.20	QP	L1	Pass
0.395000	36.30	10.20	58.00	21.70	QP	L1	Pass
0.505000	33.90	10.20	56.00	22.10	QP	L1	Pass
0.575000	30.70	10.20	56.00	25.30	QP	L1	Pass
0.780000	35.80	10.20	56.00	20.20	QP	L1	Pass
1.185000	34.10	10.20	56.00	21.90	QP	L1	Pass
1.620000	33.60	10.30	56.00	22.40	QP	L1	Pass
1.830000	33.50	10.20	56.00	22.50	QP	L1	Pass
2.675000	35.90	10.30	56.00	20.10	QP	L1	Pass
2.830000	36.00	10.30	56.00	20.00	QP	L1	Pass
3.870000	35.80	10.30	56.00	20.20	QP	L1	Pass
4.835000	32.20	10.40	56.00	23.80	QP	L1	Pass
0.150000	17.40	10.10	56.00	38.60	AV	N	Pass
0.215000	15.40	10.10	53.00	37.60	AV	N	Pass
0.330000	24.00	10.20	49.50	25.50	AV	L1	Pass
0.395000	22.50	10.20	48.00	25.50	AV	L1	Pass
0.505000	25.20	10.20	46.00	20.80	AV	L1	Pass
0.575000	21.00	10.20	46.00	25.00	AV	L1	Pass
0.780000	26.10	10.20	46.00	19.90	AV	L1	Pass
1.185000	25.90	10.20	46.00	20.10	AV	L1	Pass
1.620000	25.70	10.30	46.00	20.30	AV	L1	Pass
1.830000	25.50	10.20	46.00	20.50	AV	L1	Pass
2.675000	27.60	10.30	46.00	18.40	AV	L1	Pass
2.830000	27.60	10.30	46.00	18.40	AV	L1	Pass
3.870000	26.90	10.30	46.00	19.10	AV	L1	Pass
4.835000	23.30	10.40	46.00	22.70	AV	L1	Pass
6.185000	18.10	10.50	50.00	31.90	AV	L1	Pass
8.255000	11.30	10.60	50.00	38.70	AV	N	Pass

3.2 Channel Separation and 20dB Bandwidth

Para. No.: 15.247 (a)(1)

Test Performed By: G.Suwanthakumar	Date of Test: 5.11.2013 & 13.11.2013
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Test Results: **Complies**

Measurement Data: Channel Separation: 1.000 MHz

20 dB Bandwidth (kHz)			
Modulation	2402 MHz	2442 MHz	2480 MHz
GFSK (DH5)	879	879	879
2-EDR (2-DH5)	1099	1099	1099
3-EDR (3-DH5)	1099	1097	1097

See attached plots

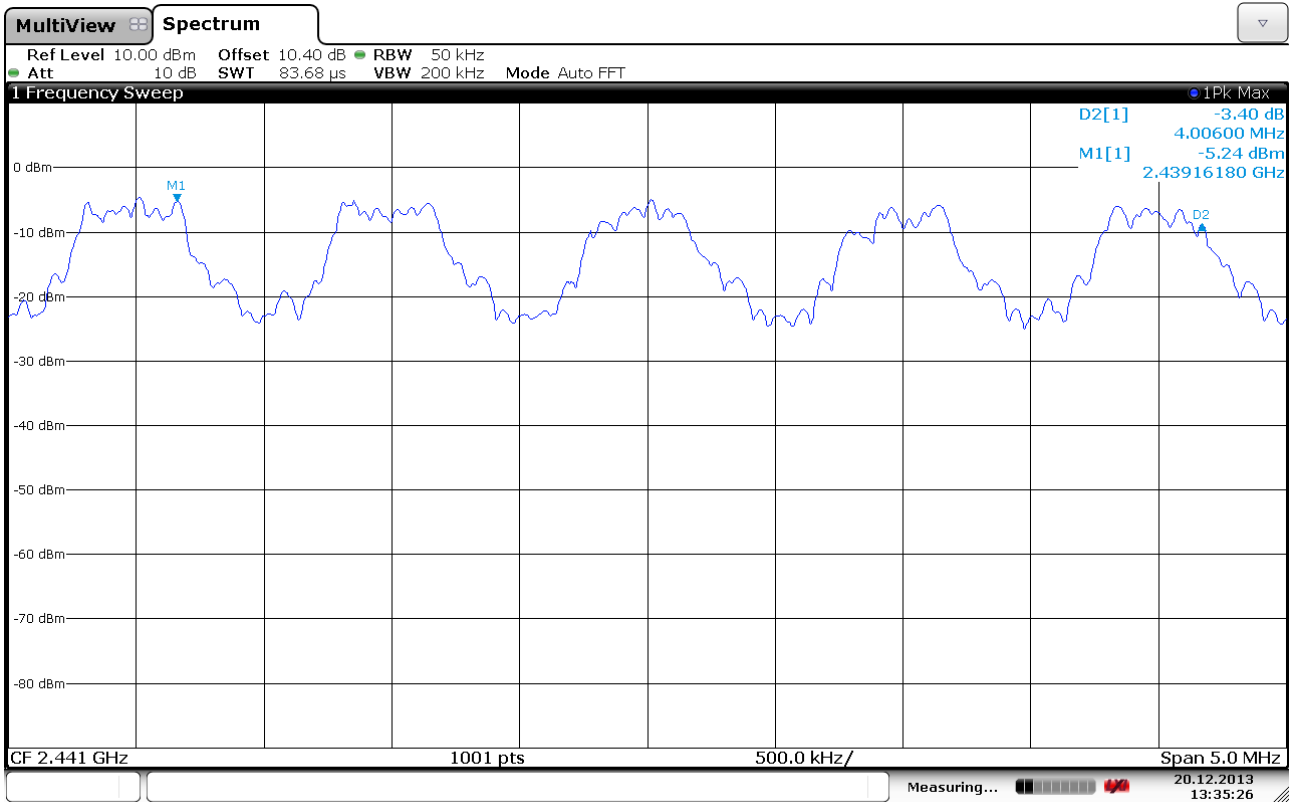
Channel Separation nominal value: 1.000 MHz

Requirement:

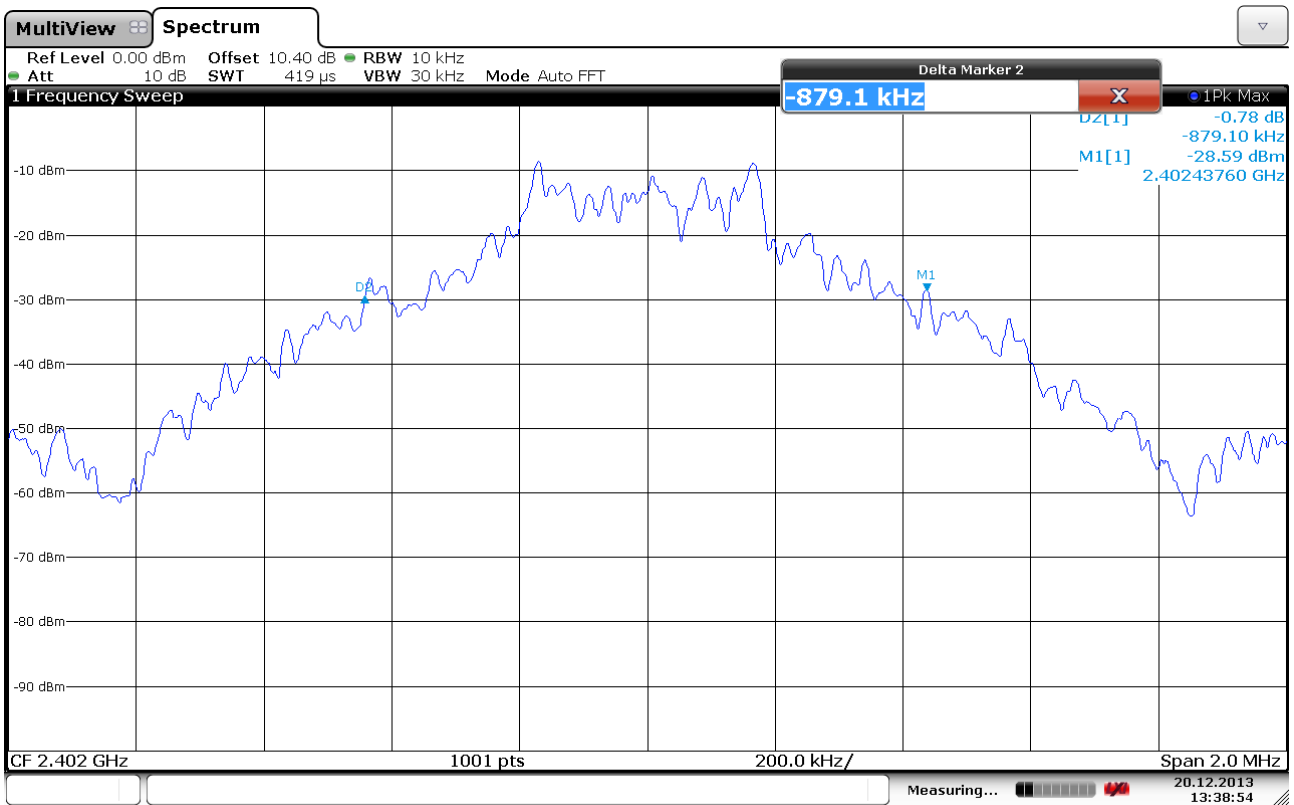
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

or:

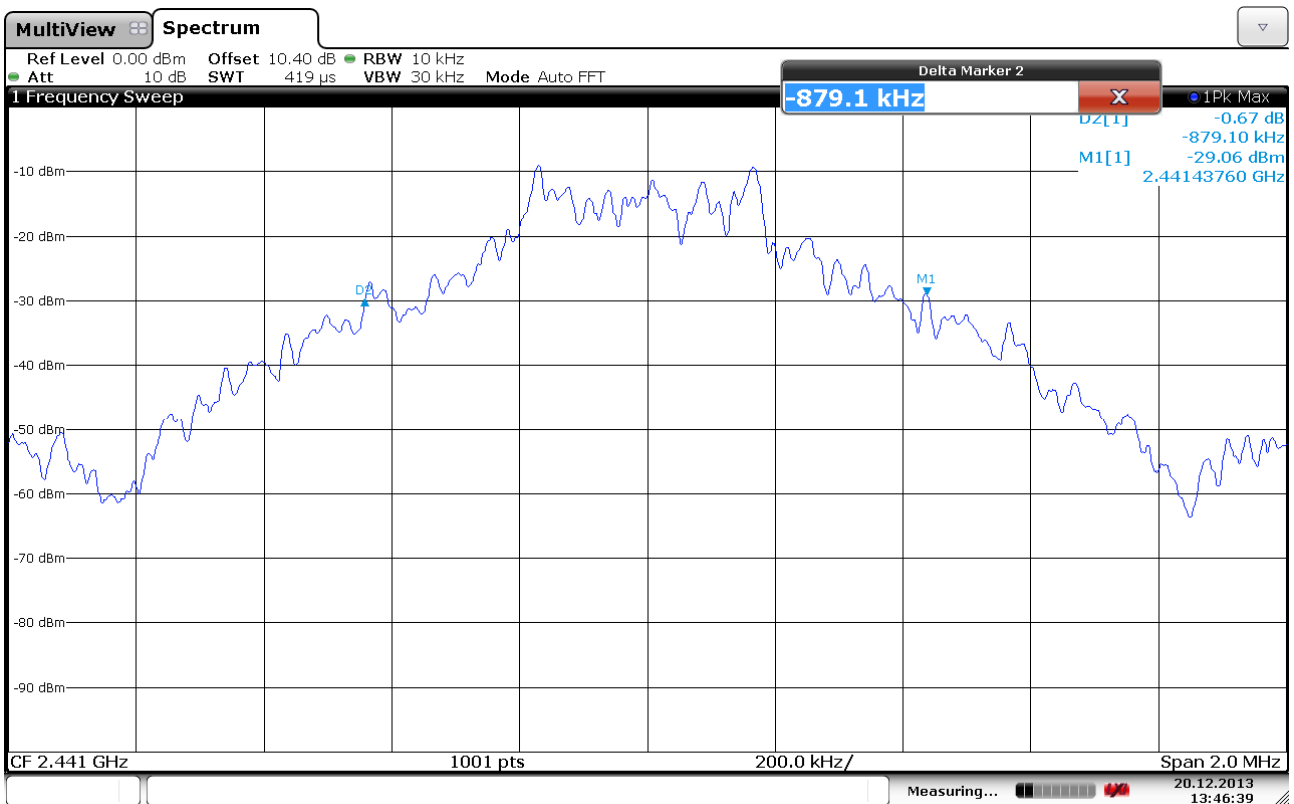
Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the system operates with an output power no greater than 125 mW.



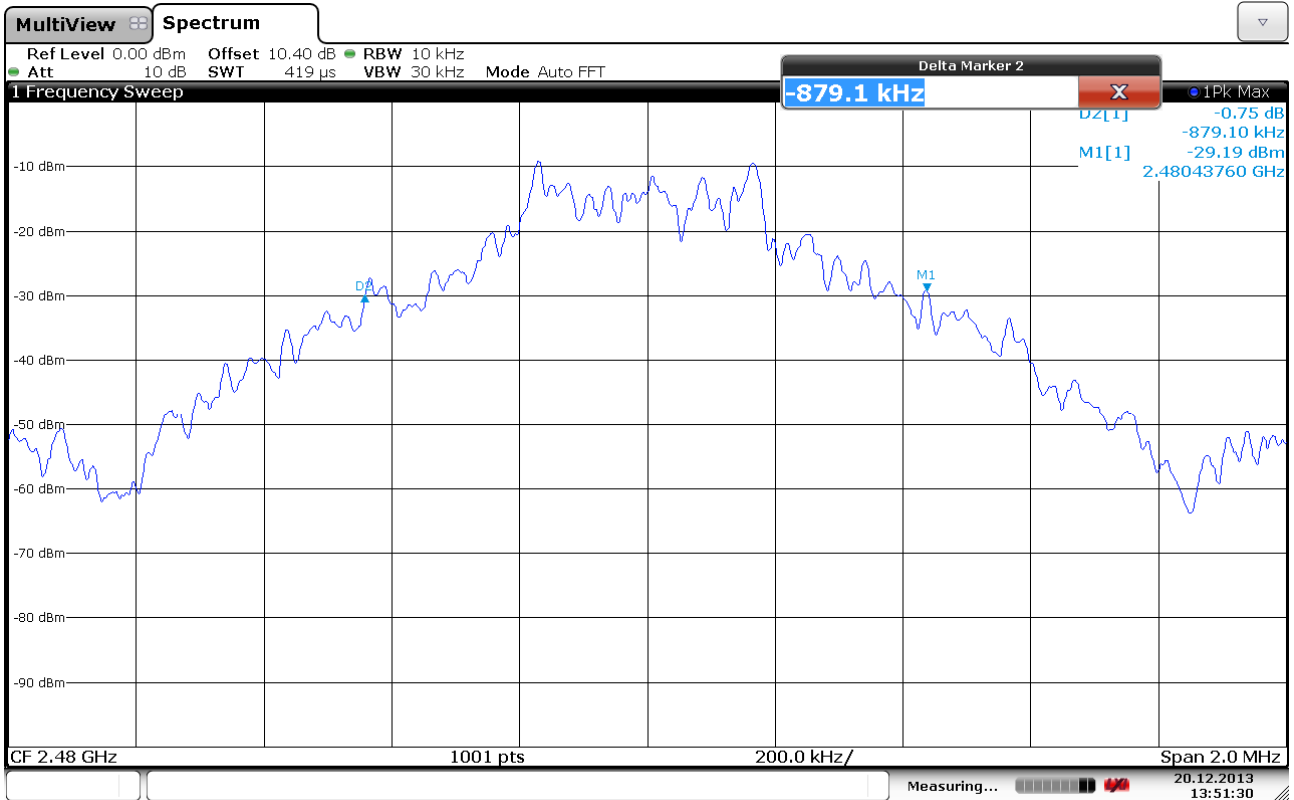
Channel Separation



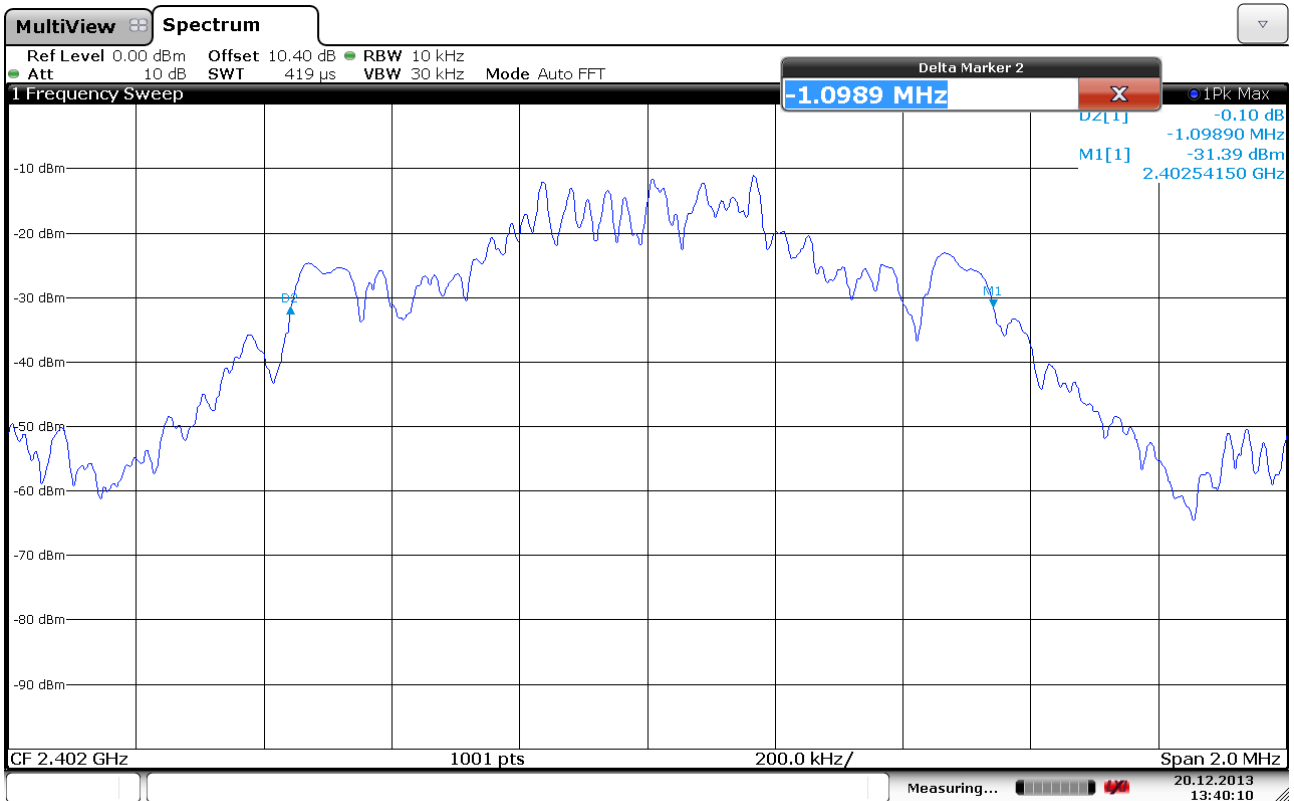
20 dB Bandwidth, 2402 MHz, DH5



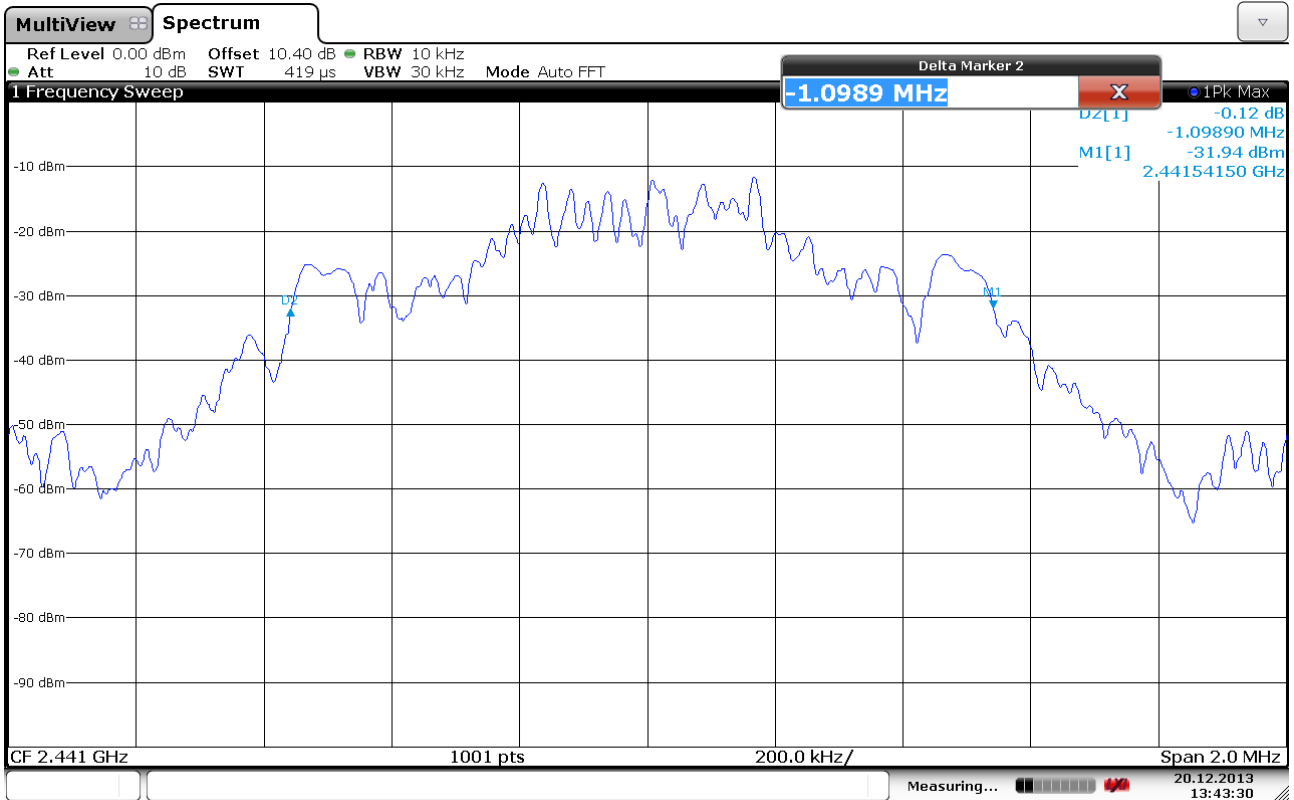
20 dB Bandwidth, 2441 MHz, DH5



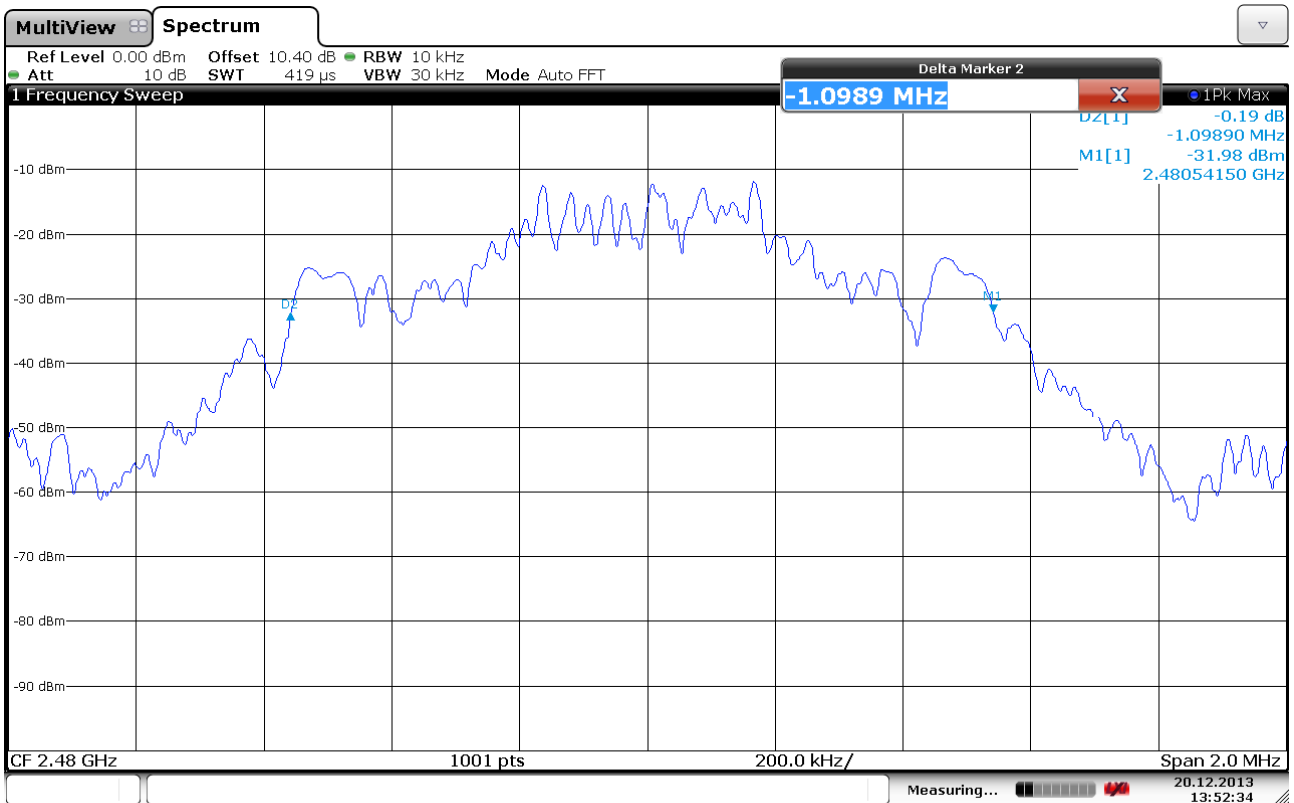
20 dB Bandwidth, 2480 MHz, DH5



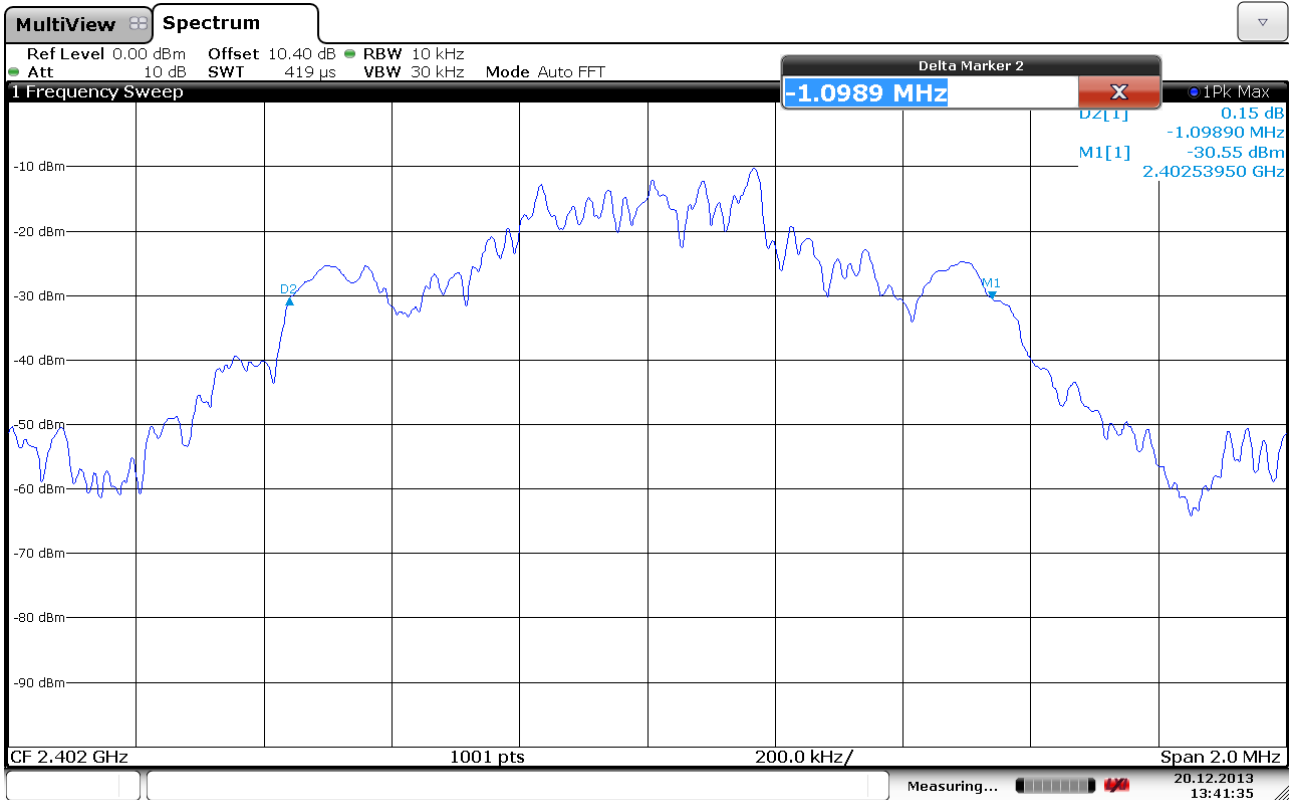
20 dB Bandwidth, 2402 MHz, 2-DH5



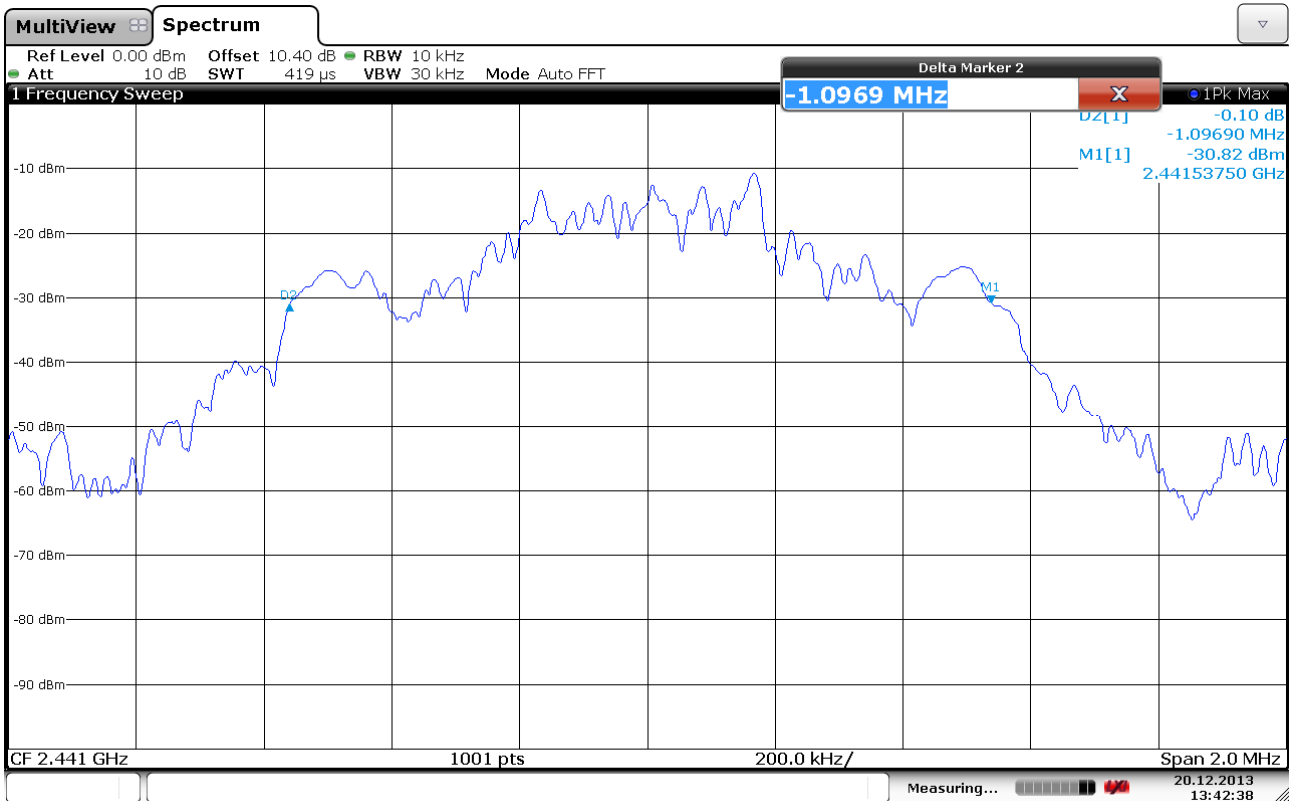
20 dB Bandwidth, 2441 MHz, 2-DH5



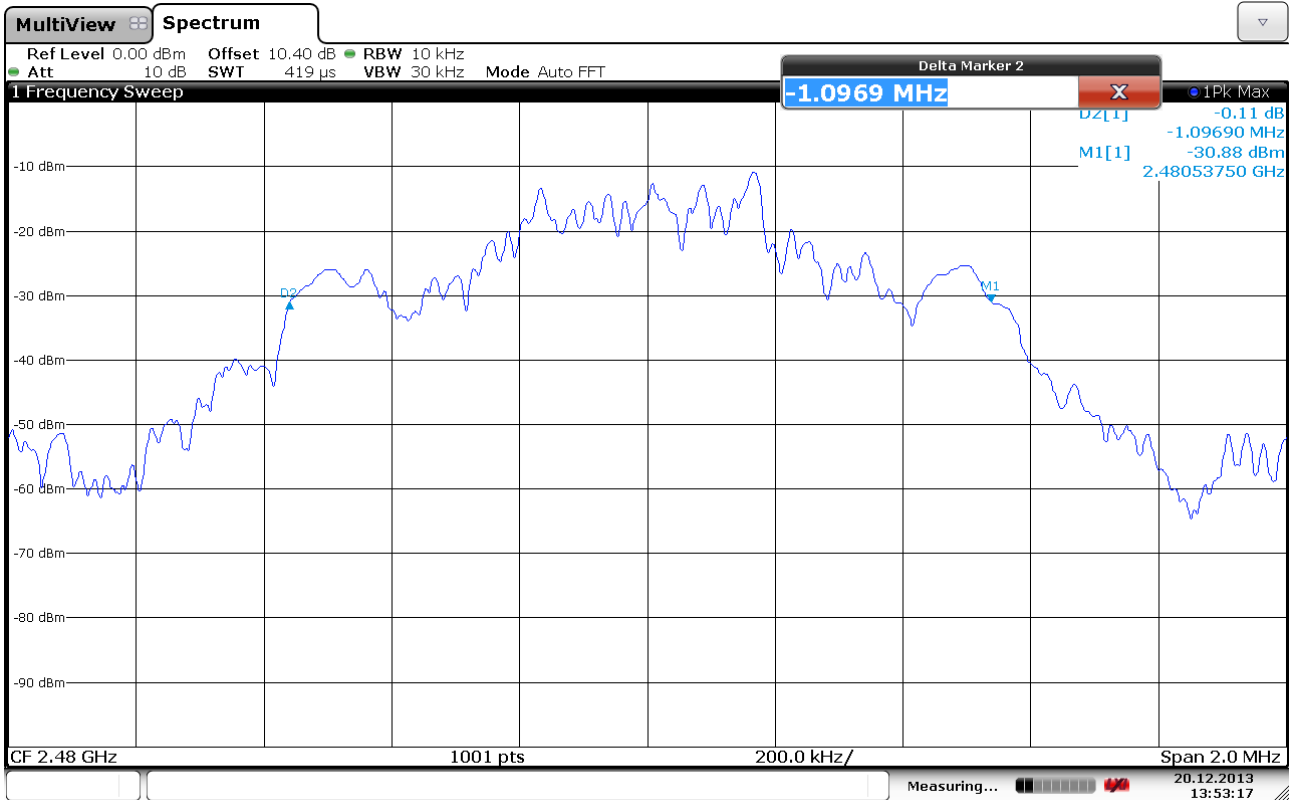
20 dB Bandwidth, 2480 MHz, 2-DH5



20 dB Bandwidth, 2402 MHz, 3-DH5



20 dB Bandwidth, 2441 MHz, 3-DH5



20 dB Bandwidth, 2480 MHz, 3-DH5

3.3 Pseudorandom Hopping Algorithm

Para. No.: 15.247 (a)(1)

Test Performed By: G.Suhanthakumar	Date of Test: 13 Nov 2013
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Test Results: Complies

Measurement Data: /

Requirements:

The channel frequencies shall be selected from a pseudorandom ordered list of hopping frequencies. Each frequency must be used equally by the transmitter.

Base Table Hopping Sequence

To be described in manufacturer documentation.

3.4 Occupancy Time

Para. No.: 15.247 (a)(1)(iii)

Test Performed By: G.Suwanthakumar	Date of Test: 05 Nov 2013
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Test Results: Complies

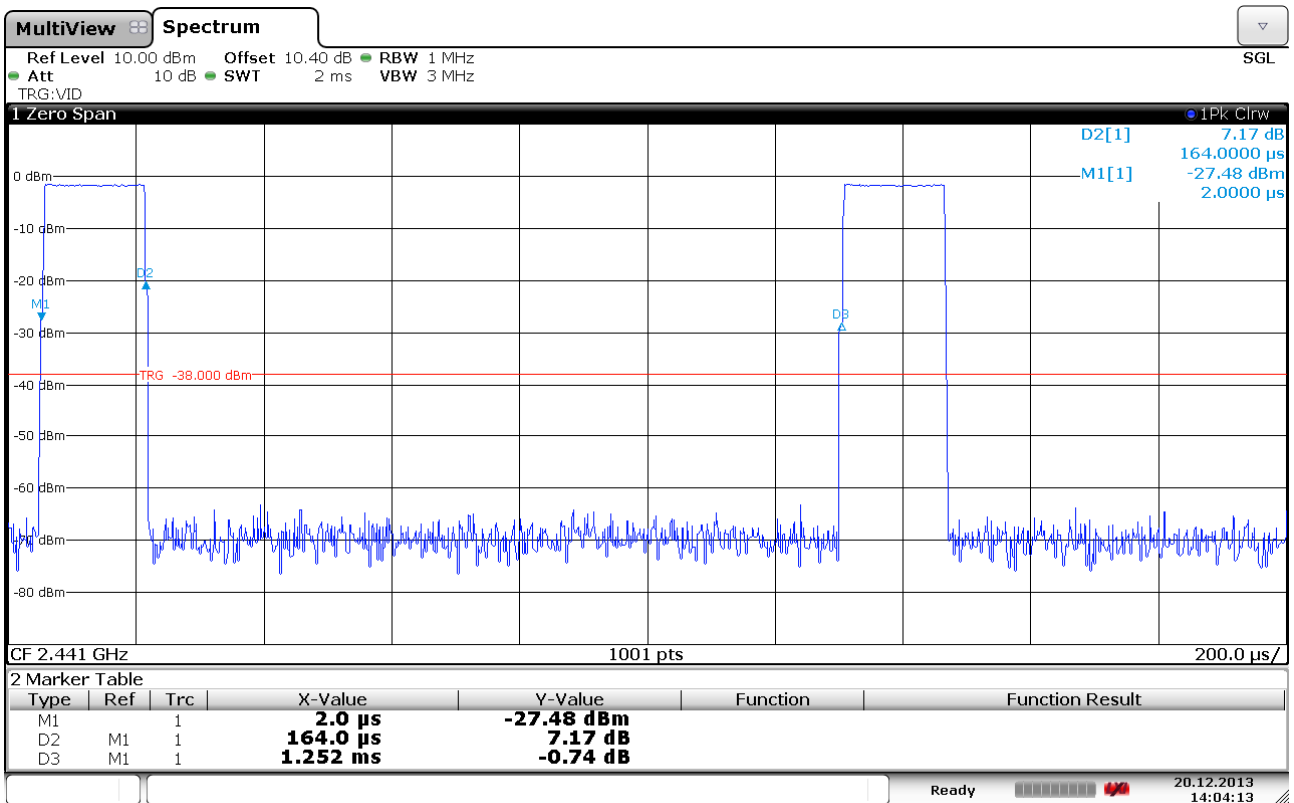
Measurement Data:

Number of RF channel:	79
RF burst pr channel :	0.164 ms
Time between each RF burst on same RF channel:	$1.252 \times 79 = 98.908$ ms
Time of occupancy:	$(0.164 \times 400 \times 79) / 98.908 = 52.4$ ms (Max Occupancy: DH1)

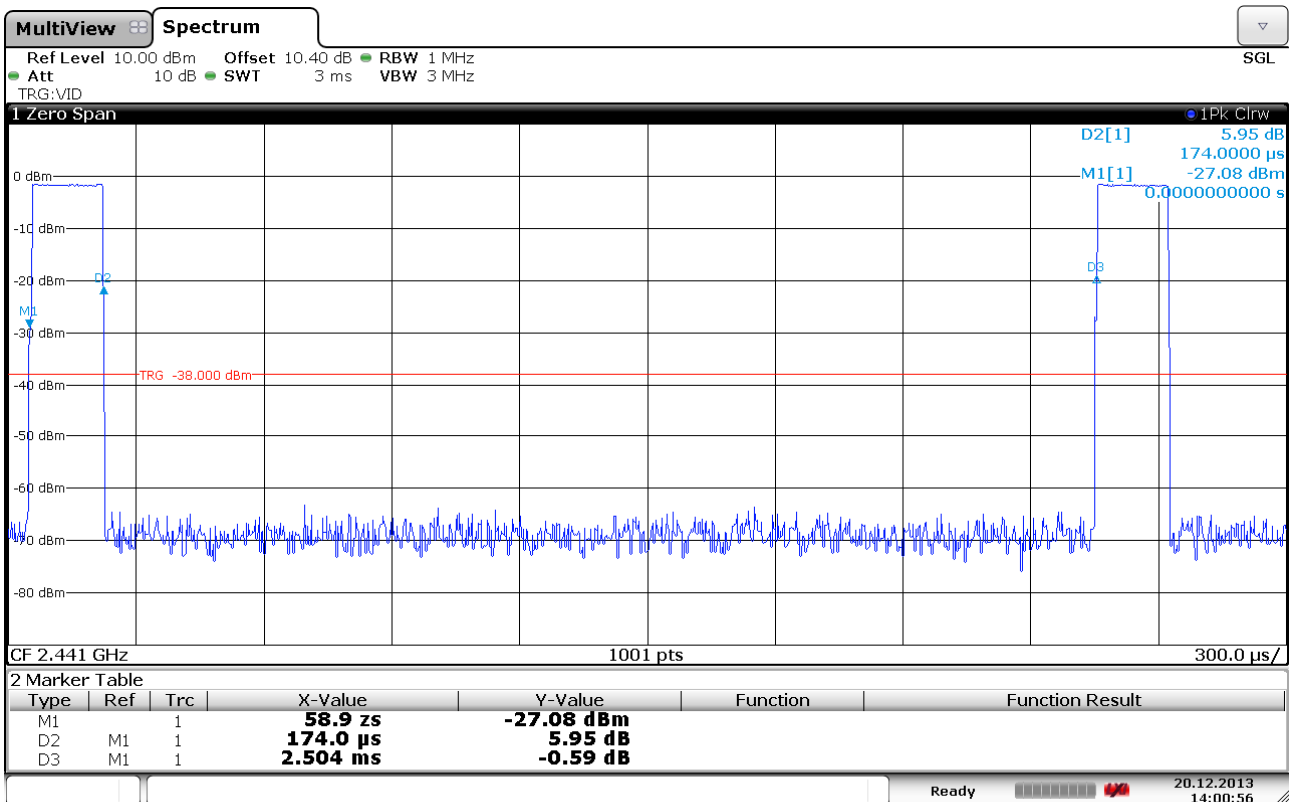
See plots.

Requirements:

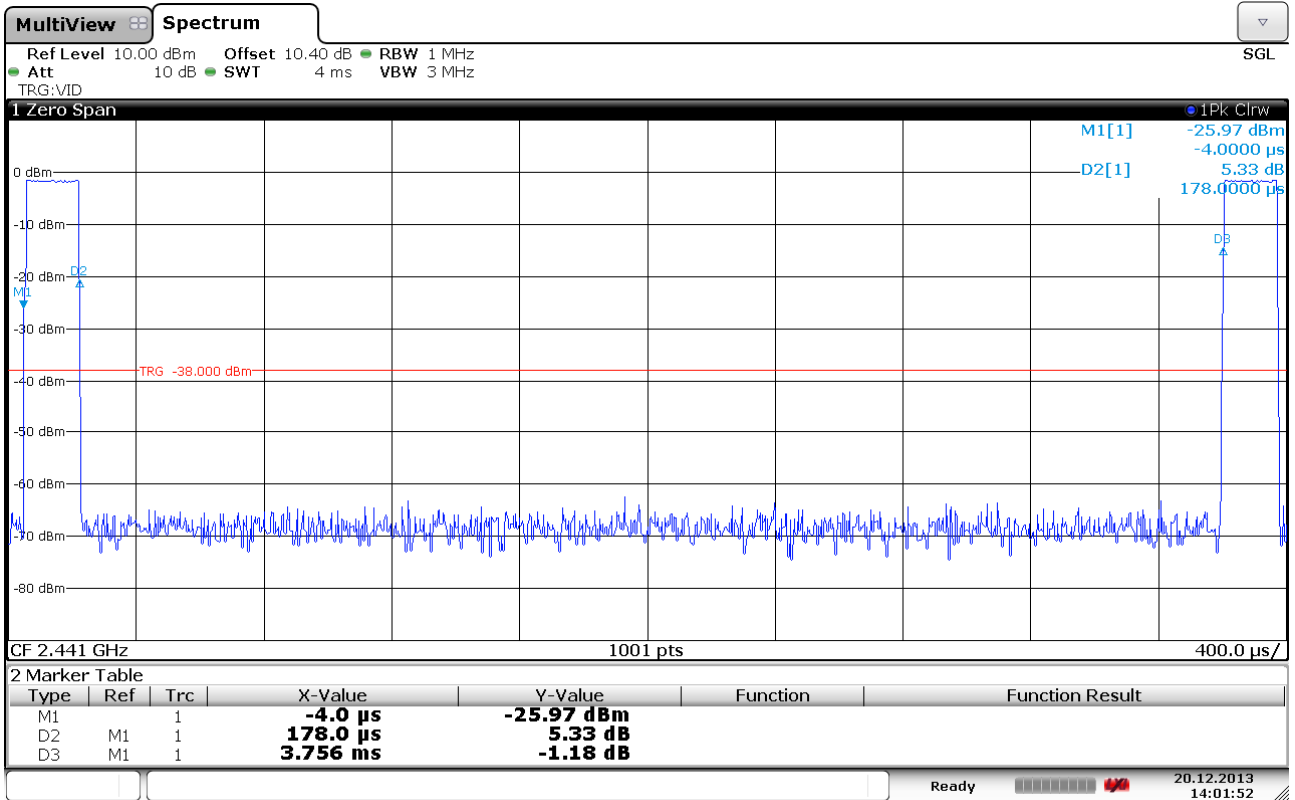
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.



Occupancy Time, DH1



Occupancy Time, DH3



Occupancy Time, DH5

3.5 Occupied Bandwidth

Para. No.: 15.247 (a)(1)(iii)

Test Performed By: G.Suwanthakumar

Date of Test: 05 Nov 2013

Test Results: Complies

Measurement Data: 79 RF channels in use

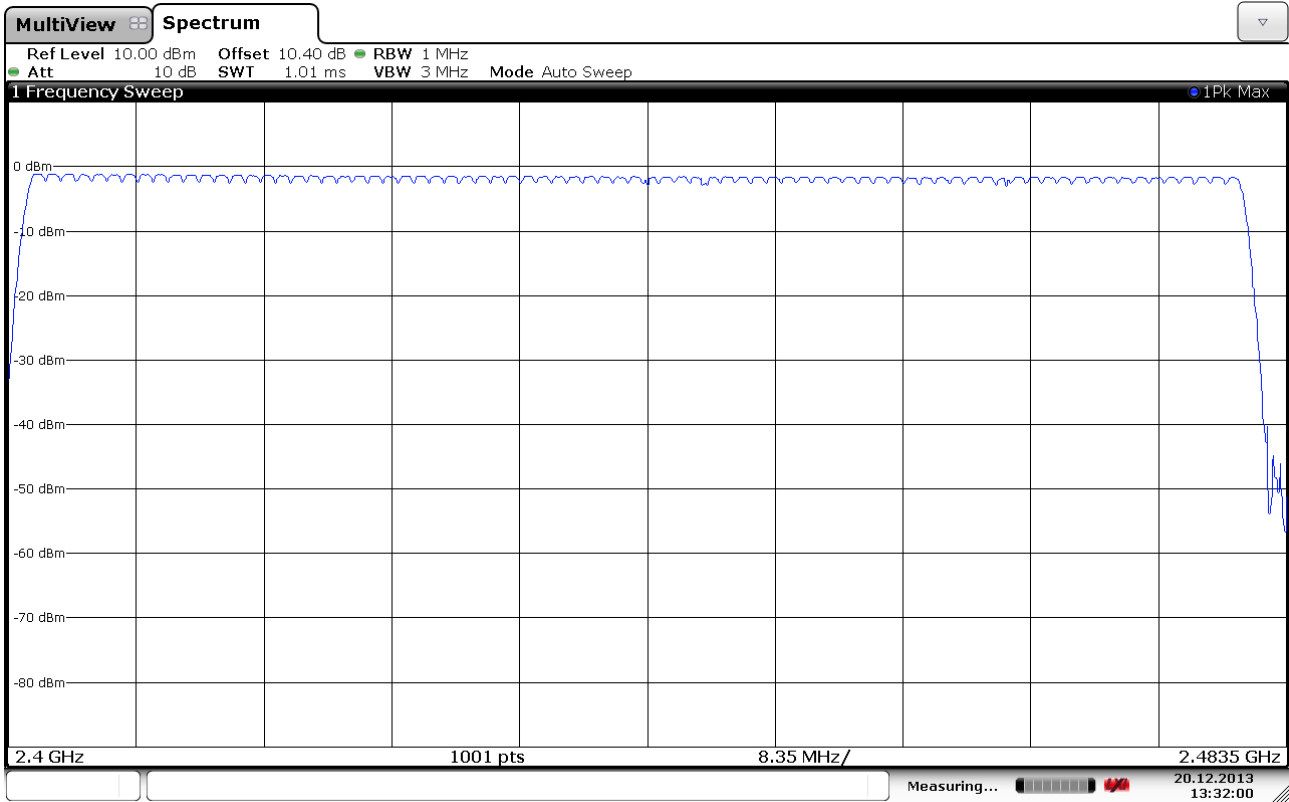
Channel Centre Frequencies:

The 79 channels are centered at each full MHz from 2402 to 2480 MHz.

See plot.

Requirements:

Frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 15 non-overlapping channels. No requirements for bandwidth for this frequency band.



RF Channels in use, Full Band

3.6 Peak Power Output

Para. No.: 15.247 (b)

Test Performed By: G.Suwanthakumar	Date of Test: 05 & 28 Nov 2013
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Test Results: Complies

Measurement Data:

	2402 MHz	2441/2442 MHz	2480 MHz
Peak Power (dBm)	-0.87	-1.32	-1.42
Peak Power (Watts)	0.00082	0.00074	0.00072
Field Strength (dBµV/m)	97.47	97.25	93.34
EIRP, Calculated (dBm)	2.24	2.02	-0.89
EIRP, Calculated (Watts)	0.0016	0.0015	0.0008
Antenna gain (dBi)	3.1	3.3	0.5

Highest power level obtained in DH5

Antenna gain = $10 \cdot \log(\text{EIRP}/\text{Conducted power})$ dBi

EIRP is calculated from measured field strength by the Free-Field Formula (See 558074 D01 Meas Guidance).

See attached graph.

Detachable antenna?

Yes No

If detachable, is the antenna connector non-standard?

Yes No

Type of antenna connector: N/A

Requirements:

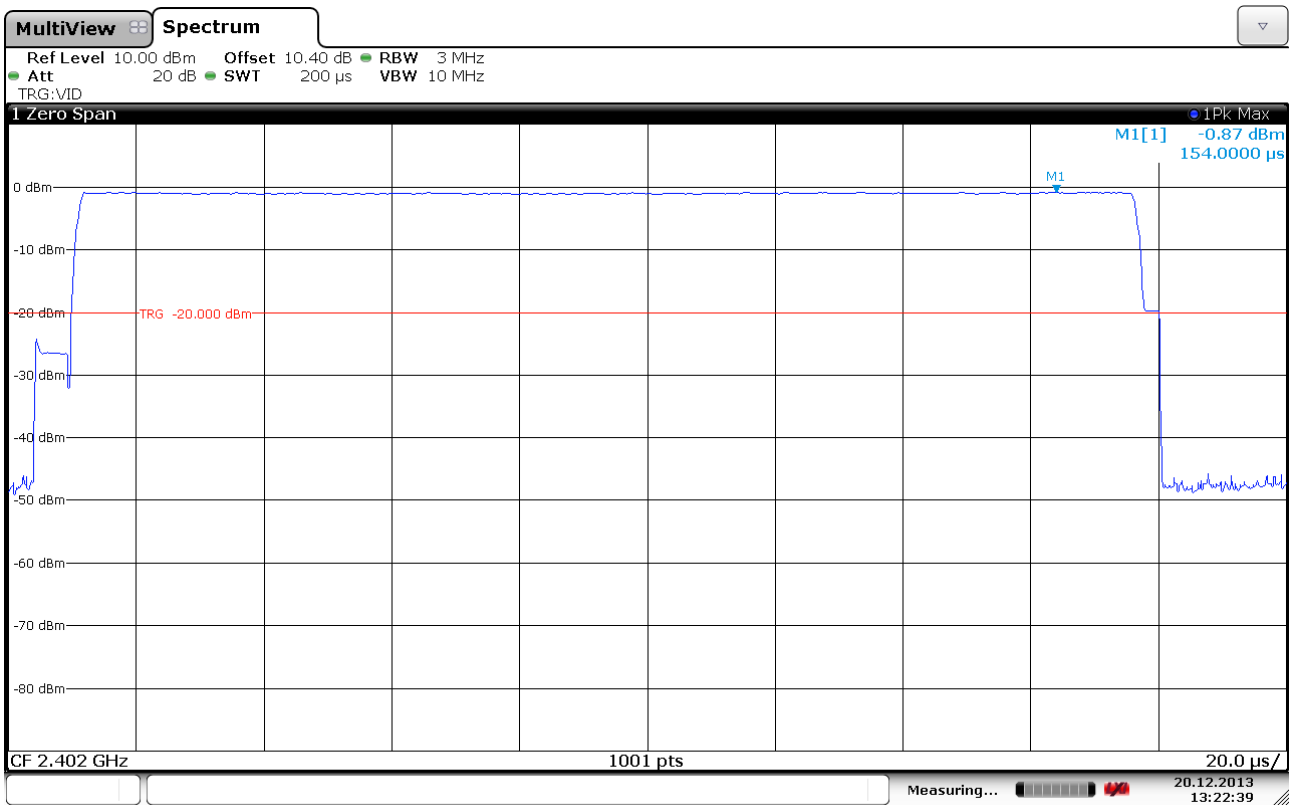
The maximum peak output power shall not exceed the following limits:

For frequency hopping systems employing at least 75 hopping channels: 1 Watt

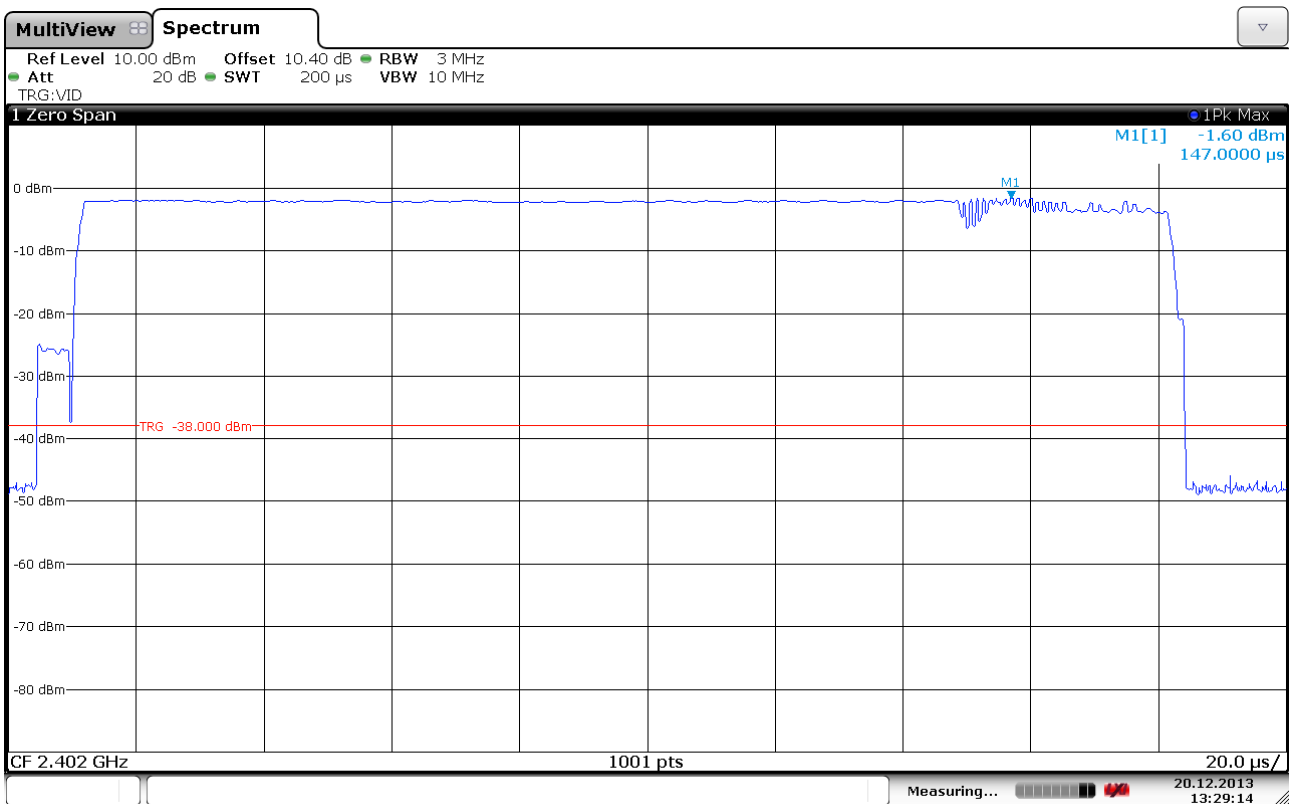
For all other frequency hopping systems in the 2400 - 2483.5 MHz band: 0.125 Watts

For Digital Transmission Systems in the 2400 - 2483.5 MHz band: 1 Watt

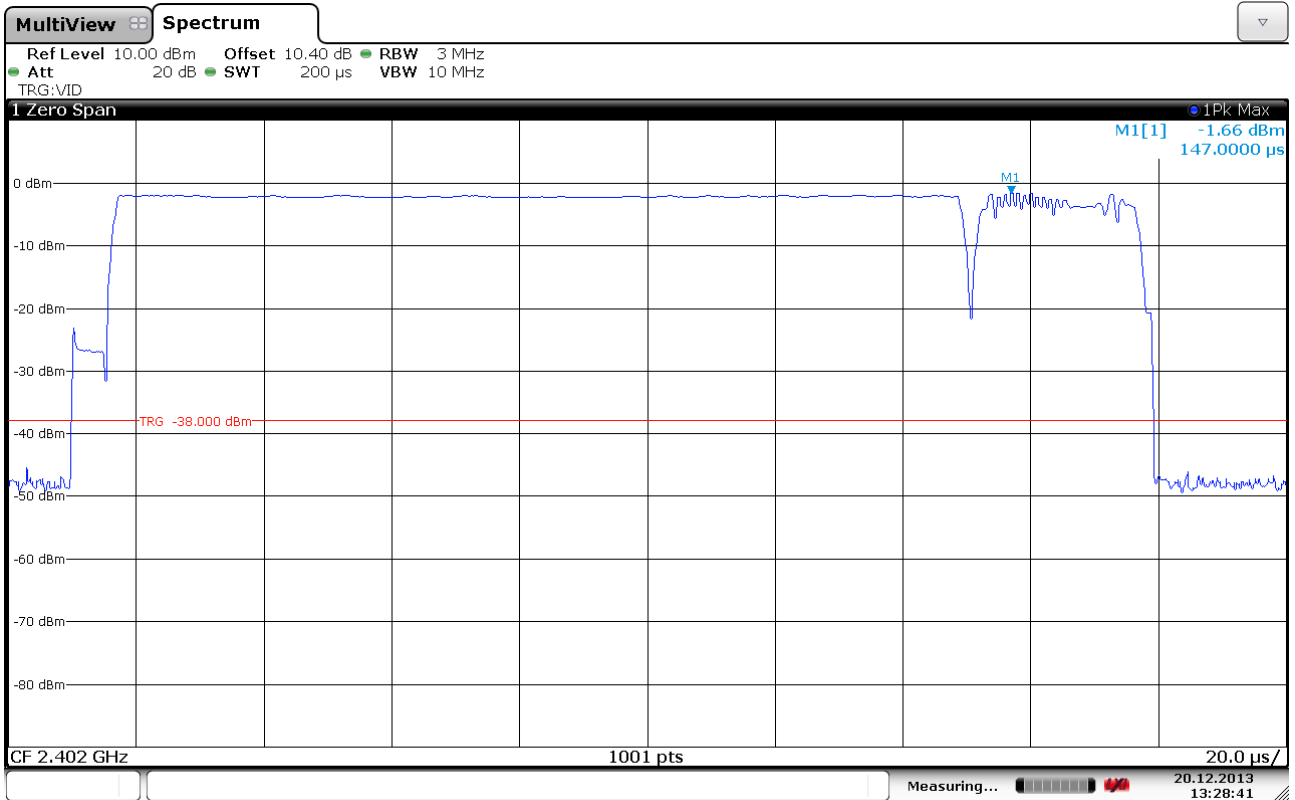
If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated value above by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



Conducted Output Power, 2402MHz, DH5



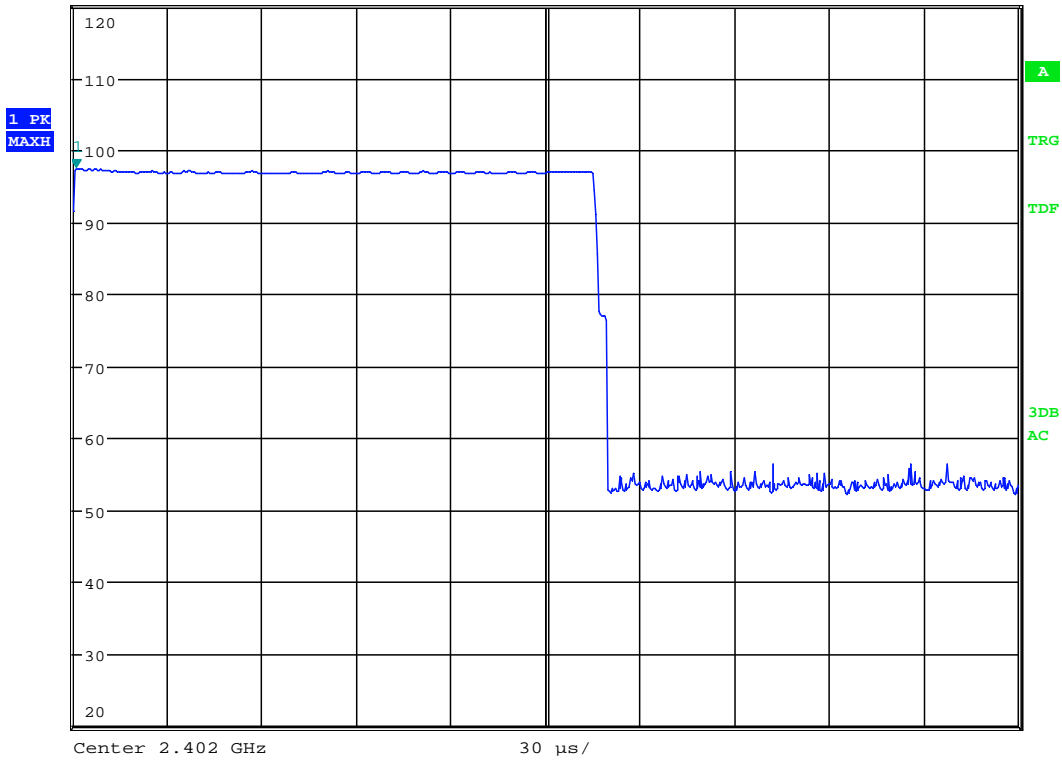
Conducted Output Power, 2402MHz, 2-DH5



Conducted Output Power, 2402MHz, 3-DH5

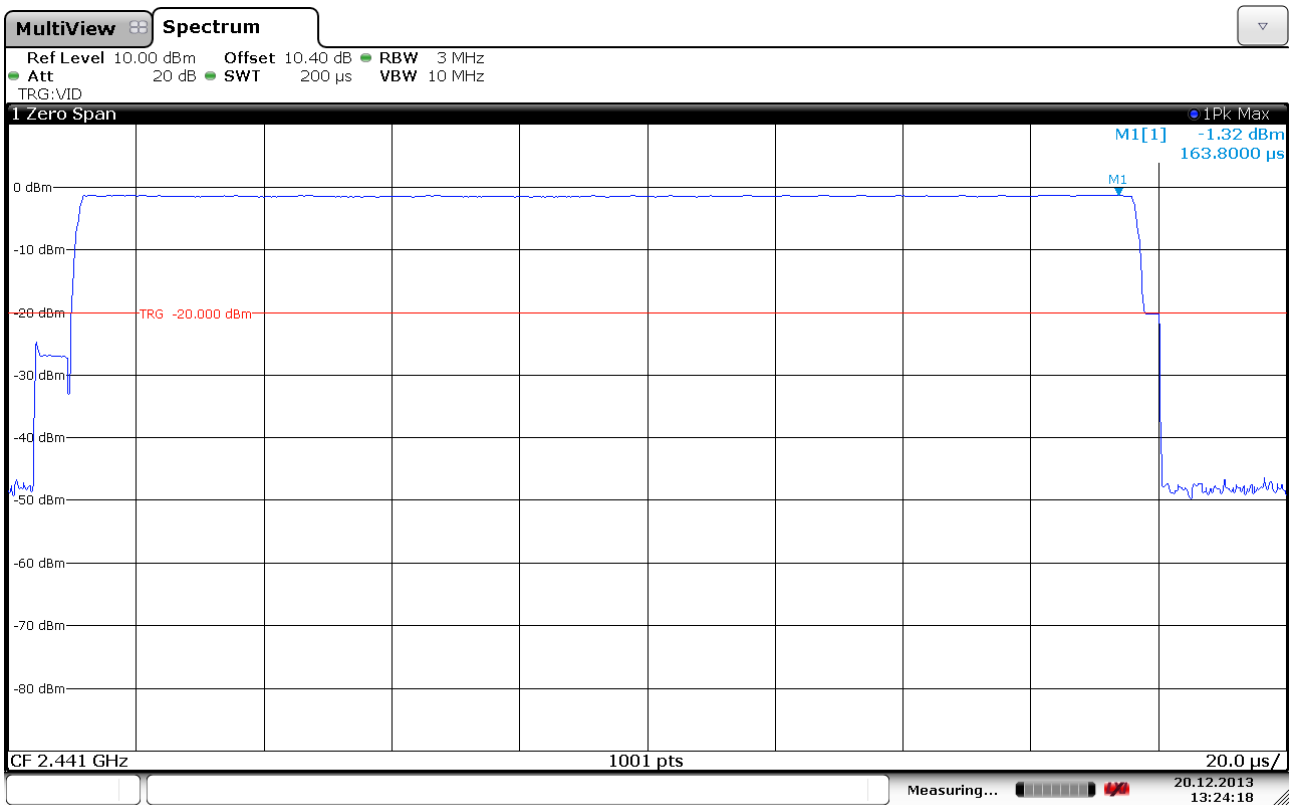


RBW 3 MHz Marker 1 [T1]
 VBW 10 MHz 97.47 dBµV/m
 Ref 120 dBµV/m *Att 20 dB SWT 300 µs 961.538462 ns

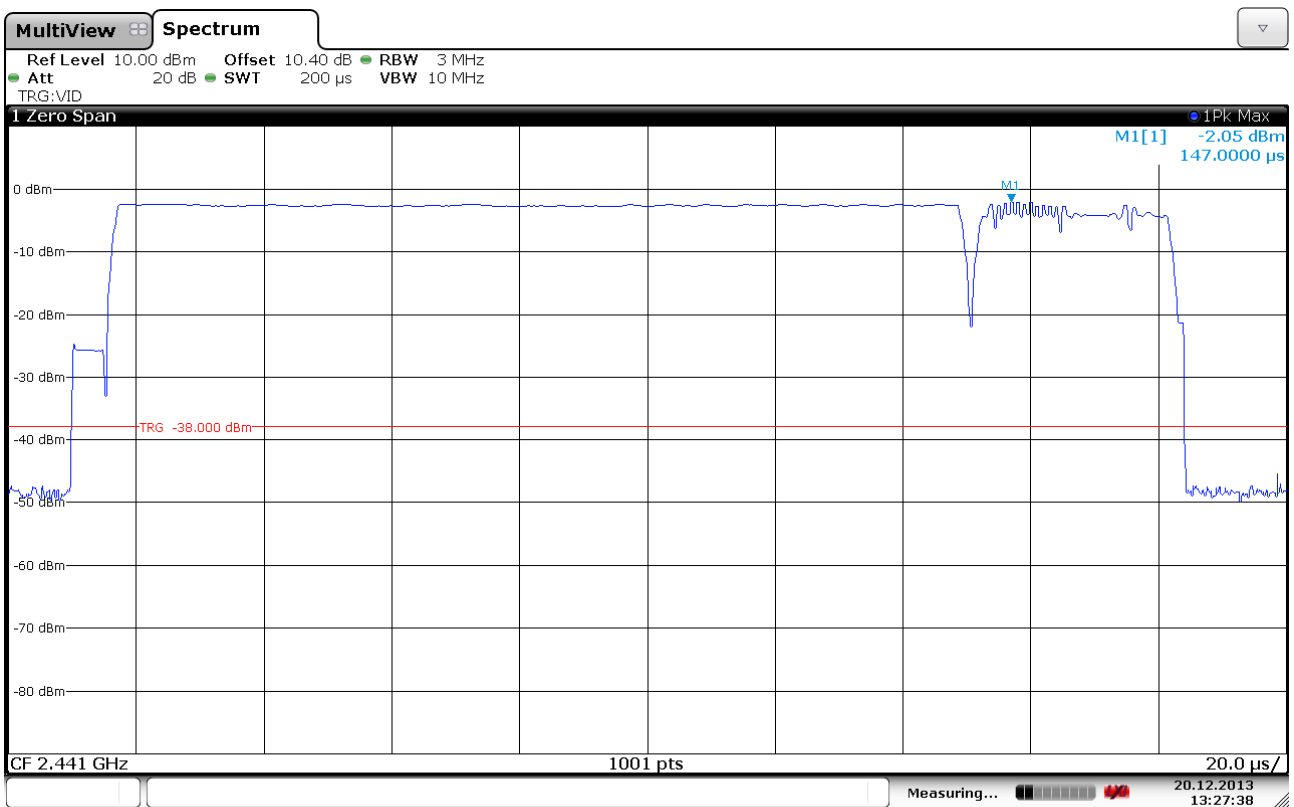


Date: 5.NOV.2013 14:20:39

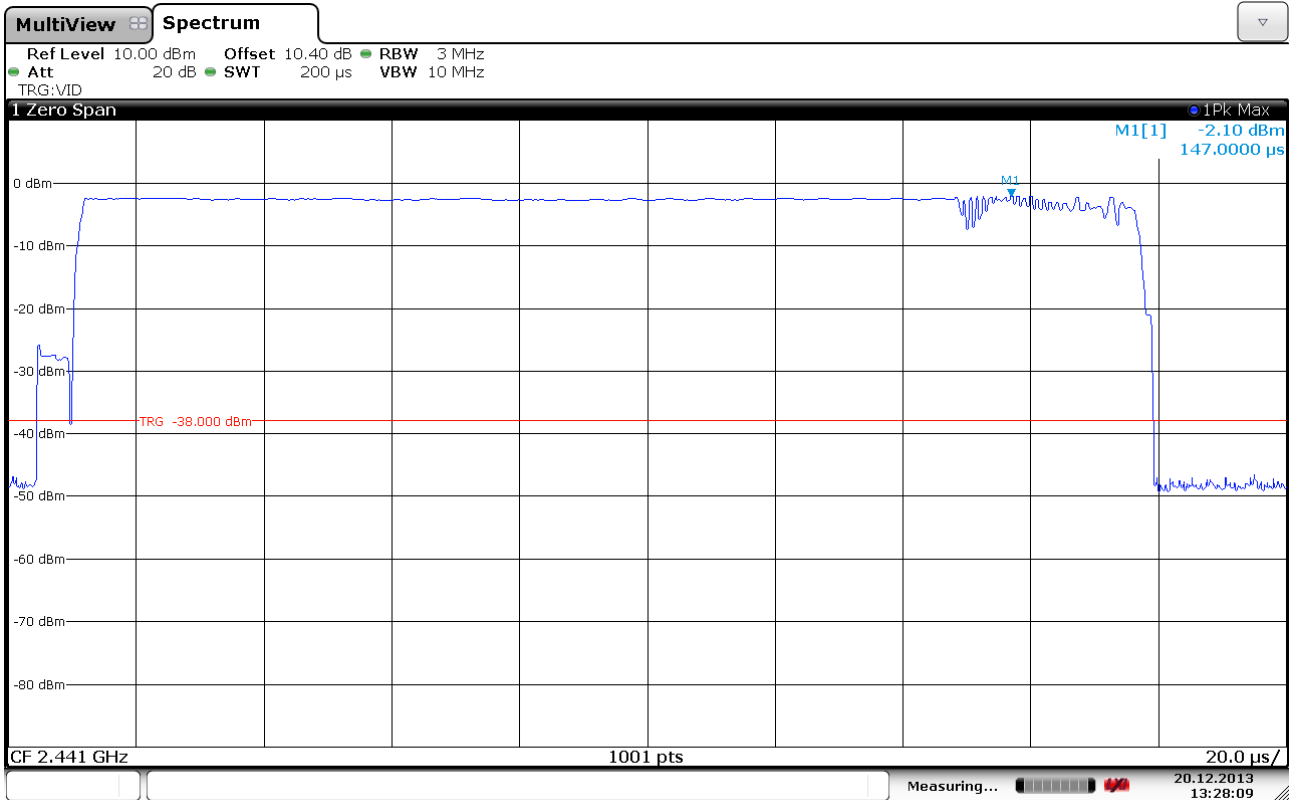
Maximum Field Strength, 2402MHz (Max: EUT XY plane, VP)-DH5



Conducted Output Power, 2441MHz –DH5



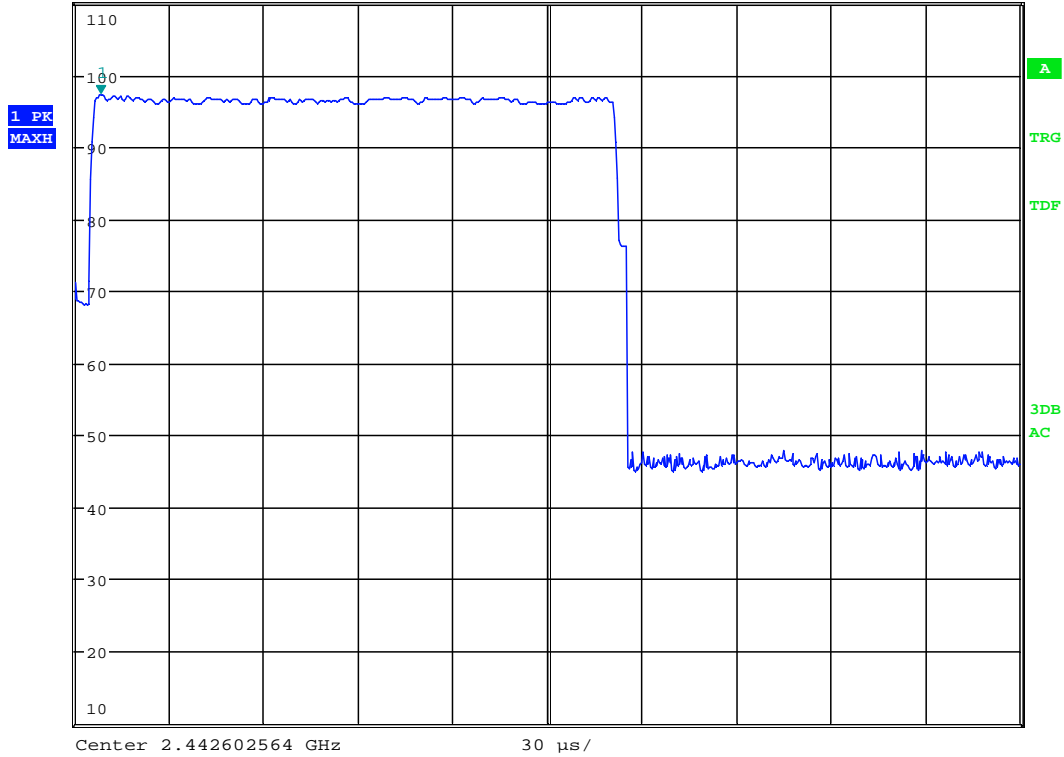
Conducted Output Power, 2441MHz, 2-DH5



Conducted Output Power, 2441MHz, 3-DH5

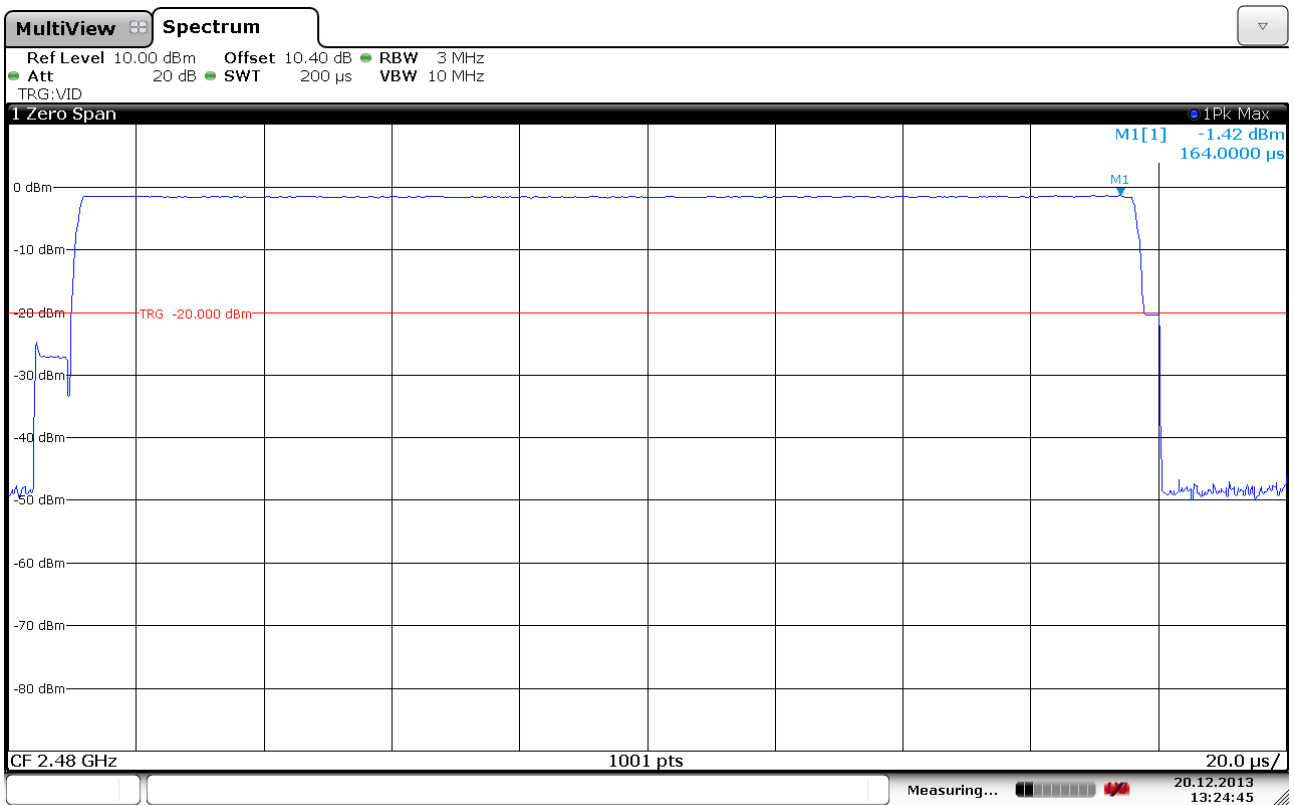


MARKER 1	RBW 3 MHz	Marker 1 [T1]
8.173076923 μ s	VBW 10 MHz	97.25 dB μ V/m
Ref 110 dB μ V/m * Att 10 dB	SWT 300 μ s	8.173077 μ s



Date: 5.NOV.2013 15:02:00

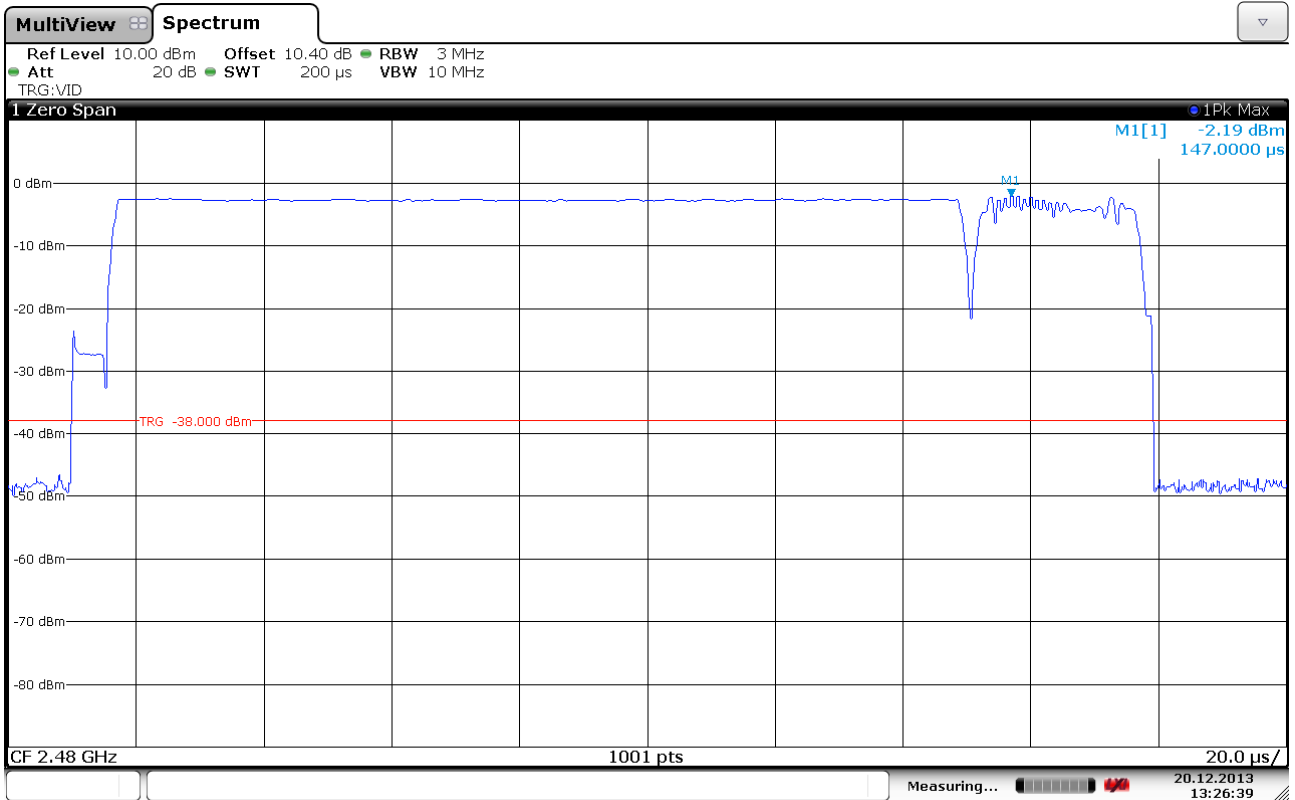
Maximum Field Strength, 2442MHz (Max: EUT XY plane, VP)-DH5



Conducted Output Power, 2480MHz, DH5



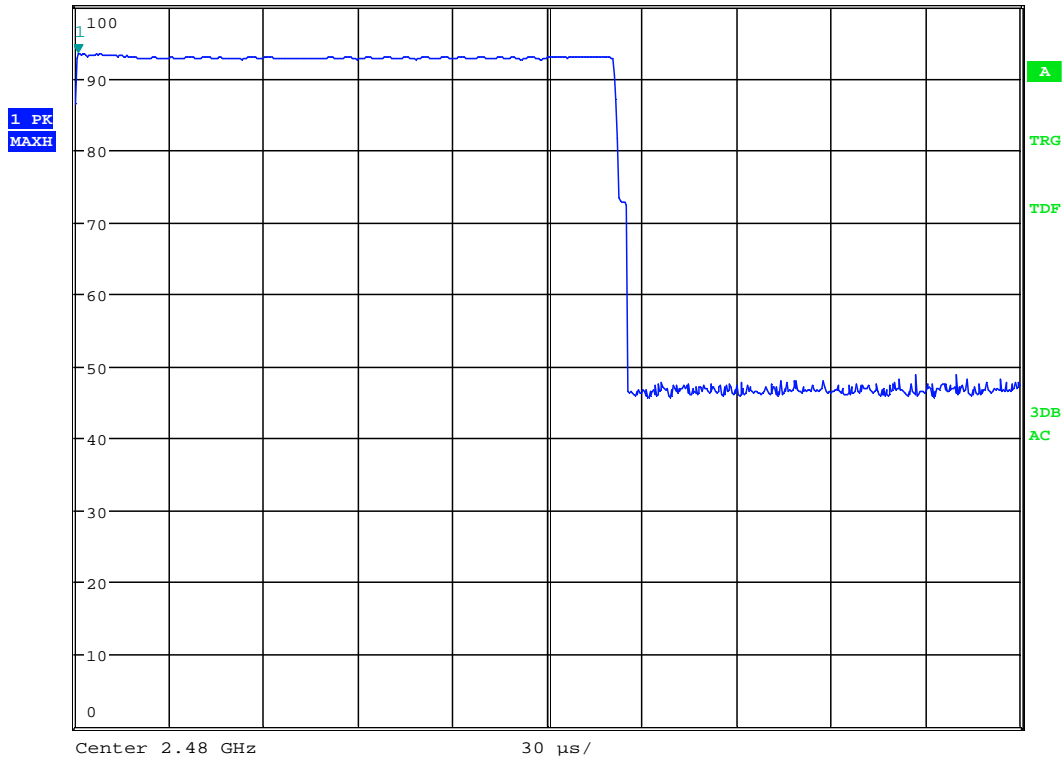
Conducted Output Power, 2480MHz, 2-DH5



Conducted Output Power, 2480MHz, 3-DH5



MARKER 1	RBW 3 MHz	Marker 1 [T1]
961.5384615 ns	VBW 10 MHz	93.34 dBμV/m
Ref 100 dBμV/m	* Att 10 dB	SWT 300 μs
		961.538462 ns



Date: 5.NOV.2013 15:25:40

Maximum Field Strength, 2480MHz (Max: EUT XYplane, VP),DH5

3.7 Spurious Emissions (Radiated)

Para. No.: 15.247 (c)

Test Results: Complies

Measurement Data:

Band-edge, Peak Detector

Frequency GHz	Field Strength, dB μ V/m		Limit dB	Margin dB
	Hopping Off	Hopping On		
2.39	46.5	42.4	74	27.5
2.4835	51.4	47.2	74	22.6

Band-edge, Average Detector

Frequency GHz	Field Strength, dB μ V/m		Limit dB	Margin dB
	Hopping Off	Hopping On		
2.39	26.5	22.4	54	27.5
2.4835	31.4	27.2	54	22.6

Peak values are lower than average limit.

See plots.

Measurements with Hopping On were only performed Conducted, values above are calculated using the method from KDB 558074 D01 v03r01, clause 12.2.2. Reported value for Hopping On is the highest of the measurements.

Maximum Duty Cycle Correction Factor according to Para 15.35 (b): 20 dB

RF conducted power to 25 GHz see plots.

Maximum RF level outside operating band:

2402MHz: >40 dB/C, margin >20 dB

2441MHz: >40 dB/C, margin >20 dB

2480MHz: >40 dB/C, margin >20 dB

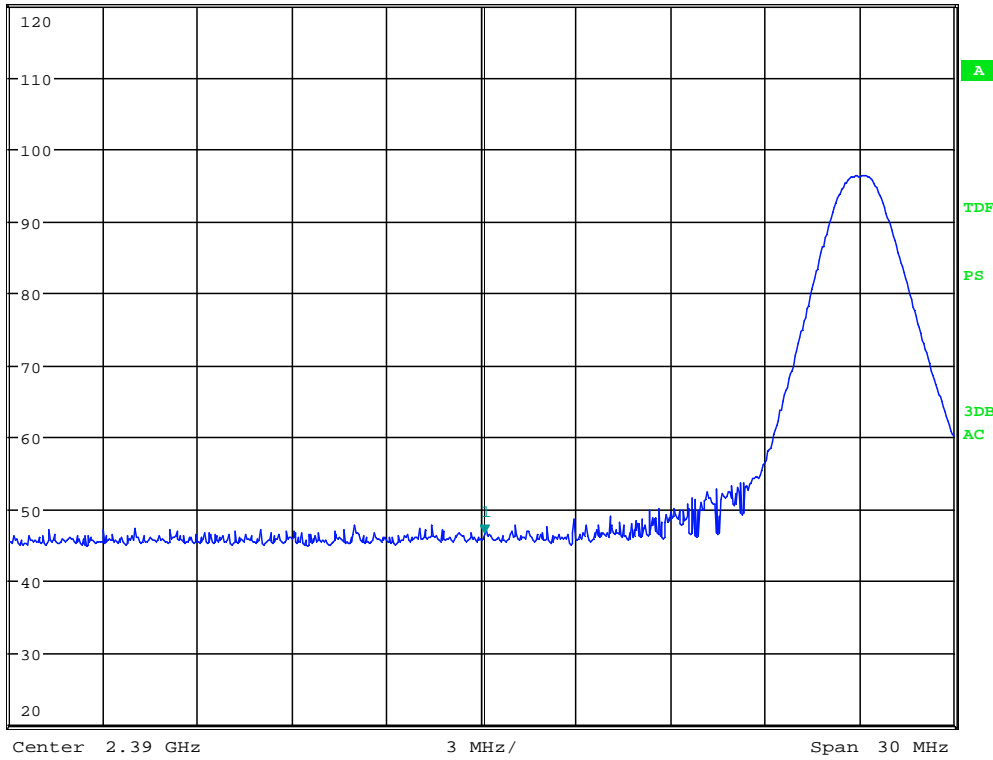


MARKER 1
 2.390096154 GHz
 Ref 120 dBµV/m *Att 20 dB

*RBW 1 MHz
 VBW 3 MHz
 SWT 2.5 ms

Marker 1 [T1]
 46.48 dBµV/m
 2.390096154 GHz

1 PK
 MAXH

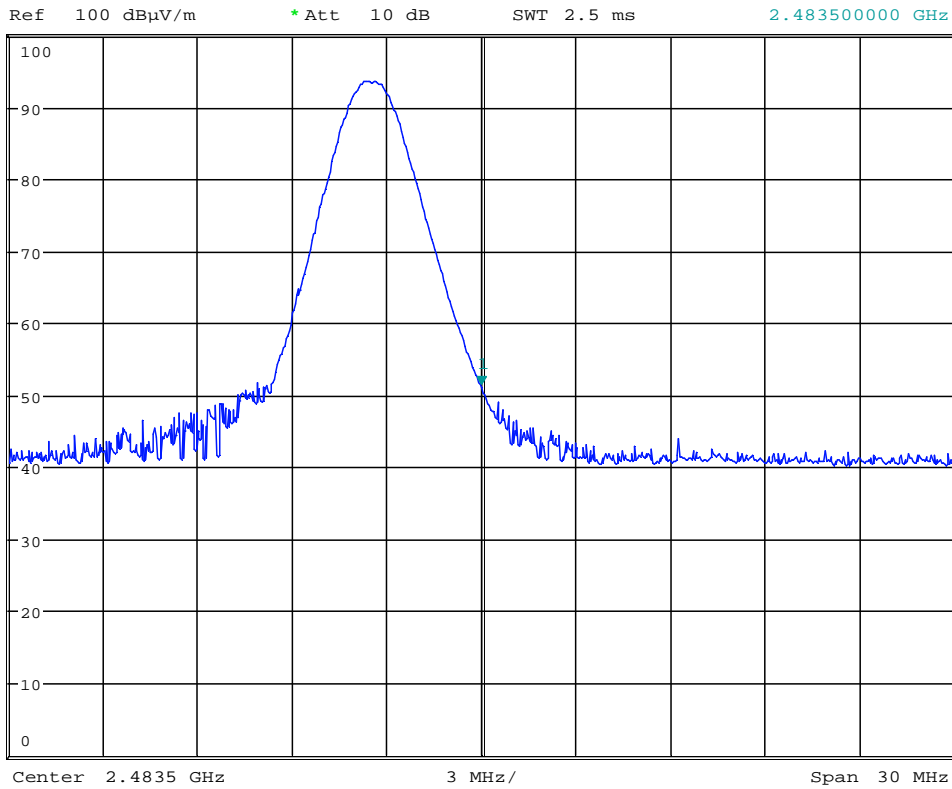


Date: 5.NOV.2013 14:41:51

Radiated Band Edge, Lower Channel

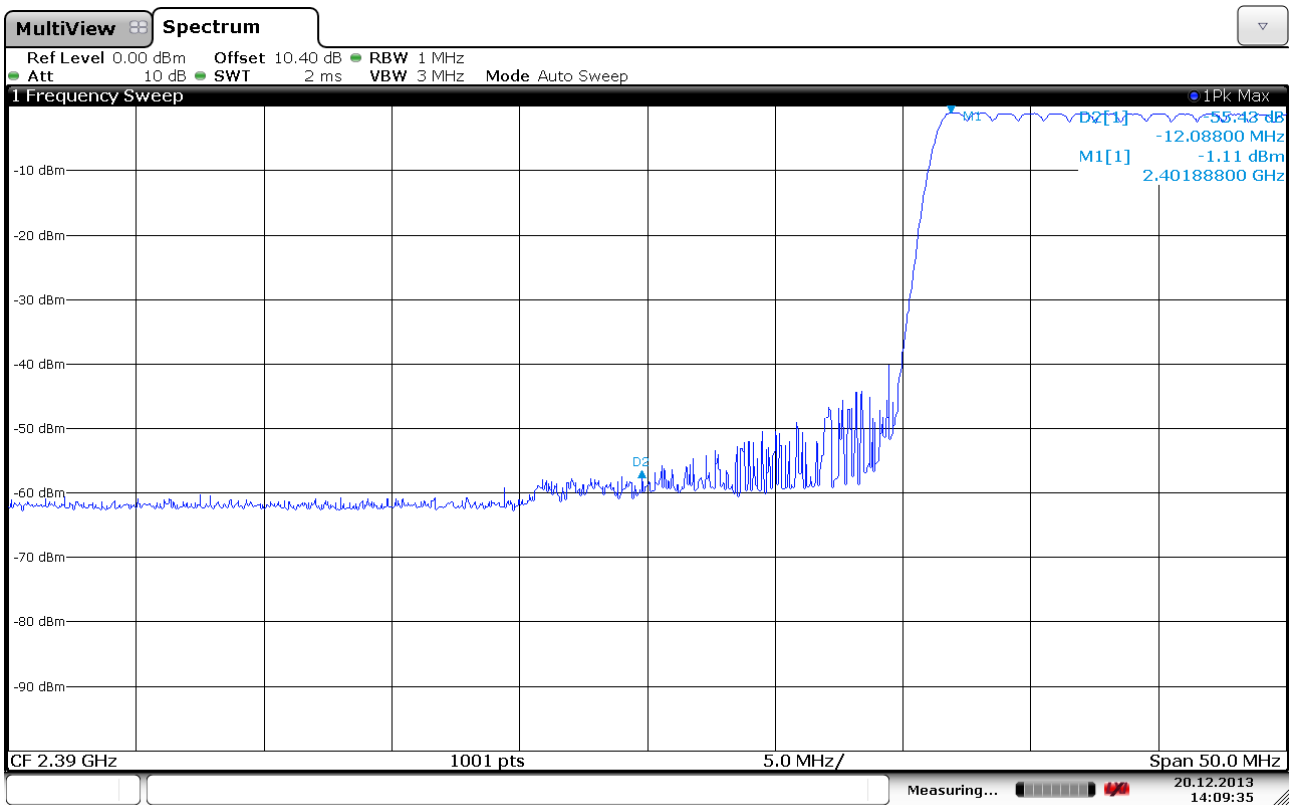


*RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 51.39 dBµV/m
 SWT 2.5 ms 2.483500000 GHz

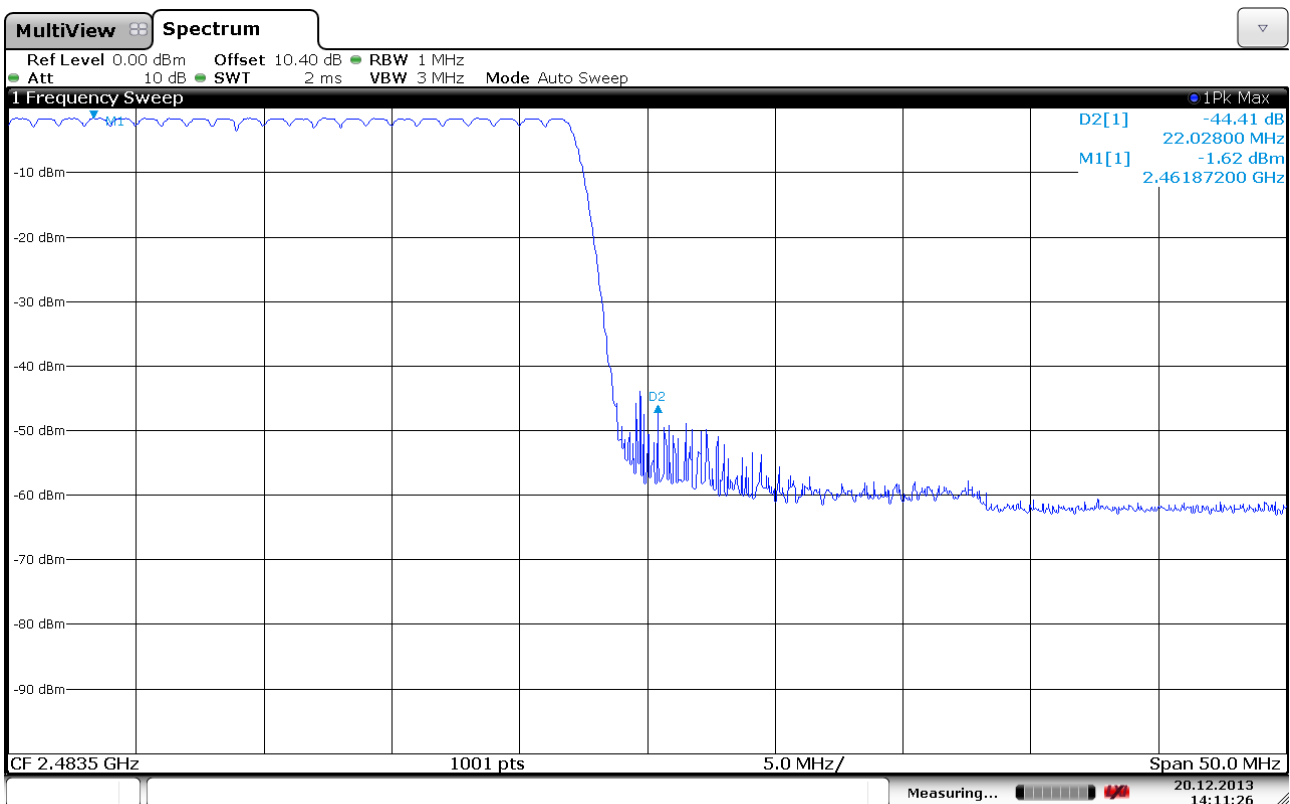


Date: 5.NOV.2013 15:28:55

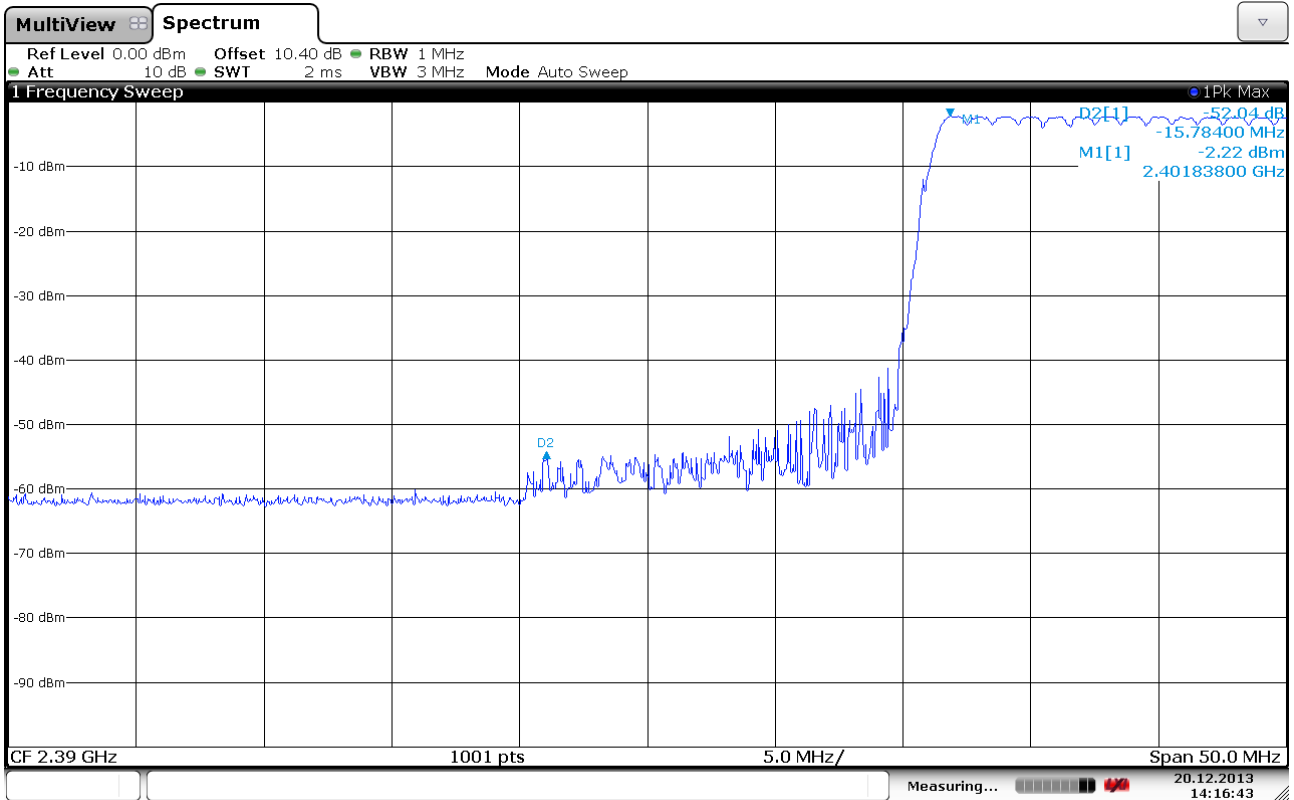
Radiated Band Edge, Upper Channel



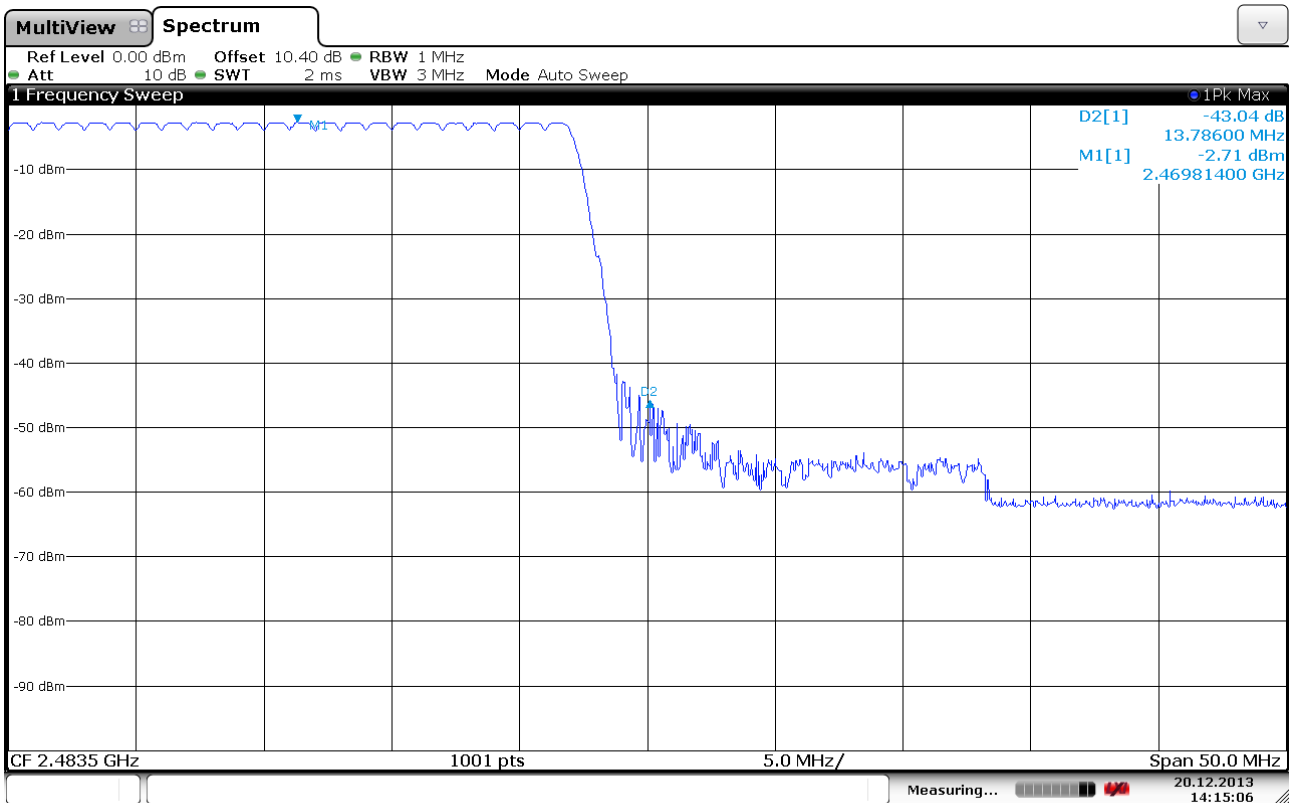
Conducted Band Edge, Lower Channel, Hopping ON, DH5



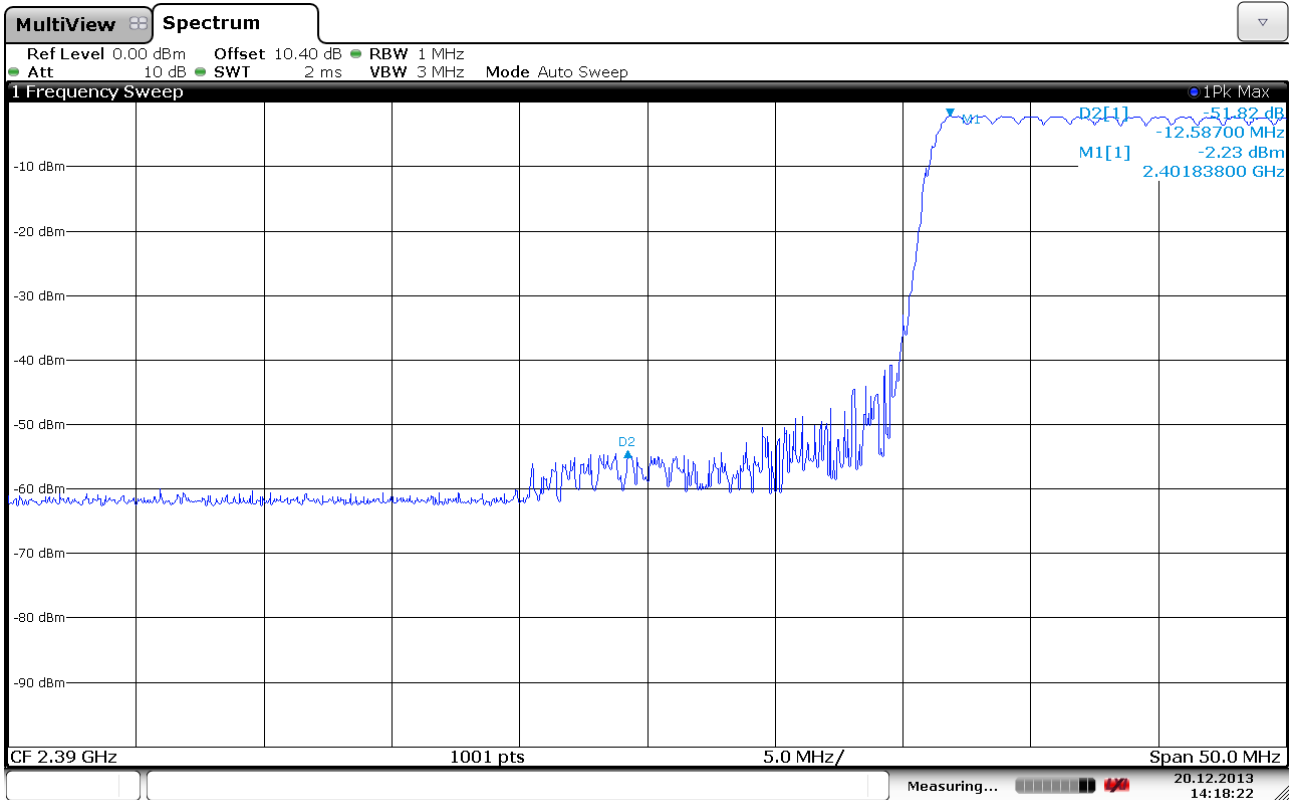
Conducted Band Edge, Upper Channel, Hopping ON, DH5



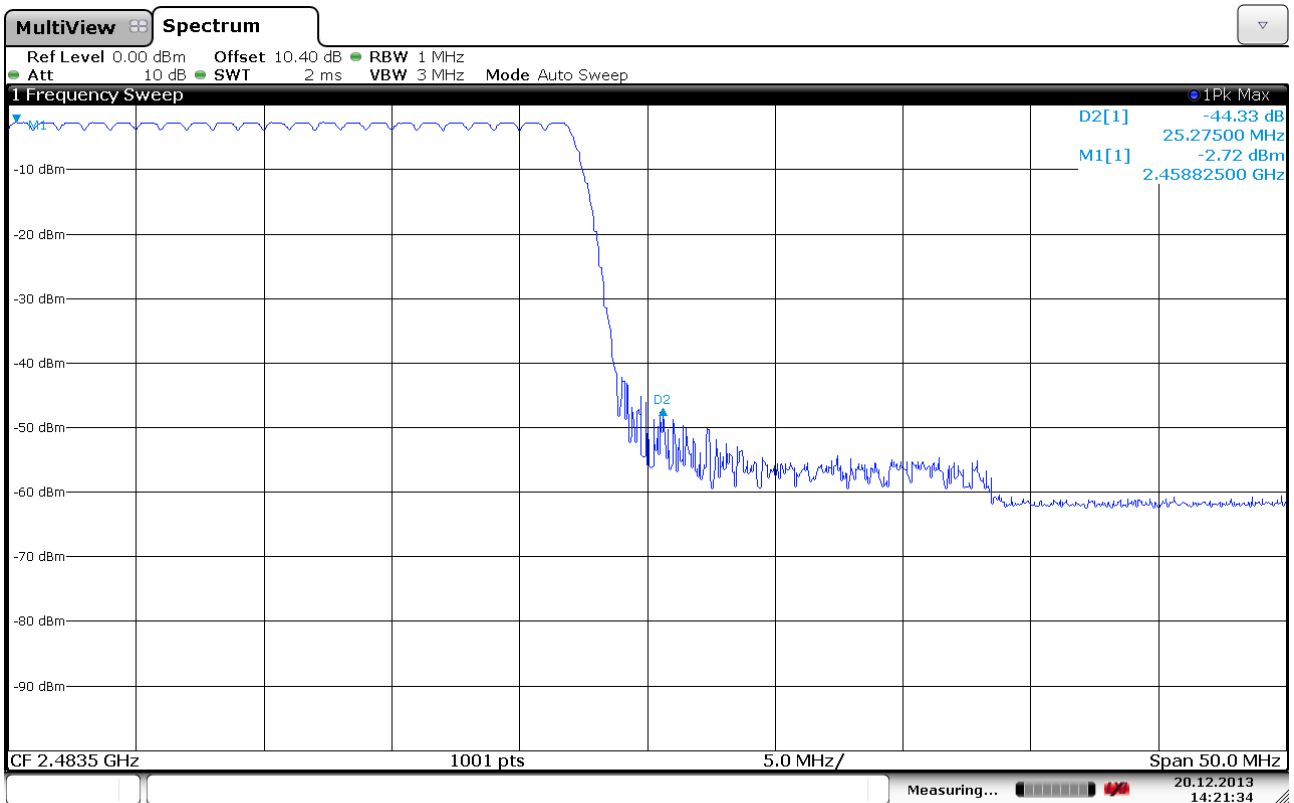
Conducted Band Edge, Lower Channel, Hopping ON, 2-DH5



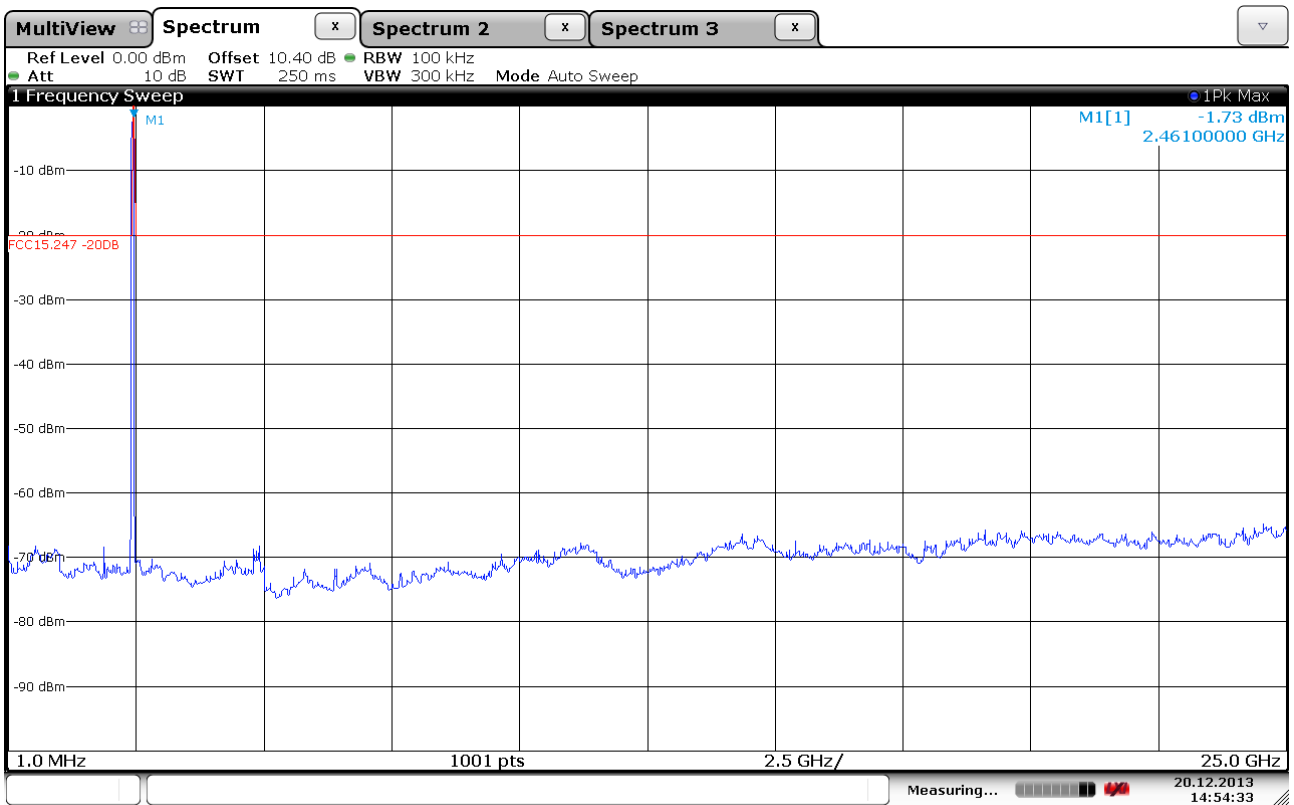
Conducted Band Edge, Upper Channel, Hopping ON, 2-DH5



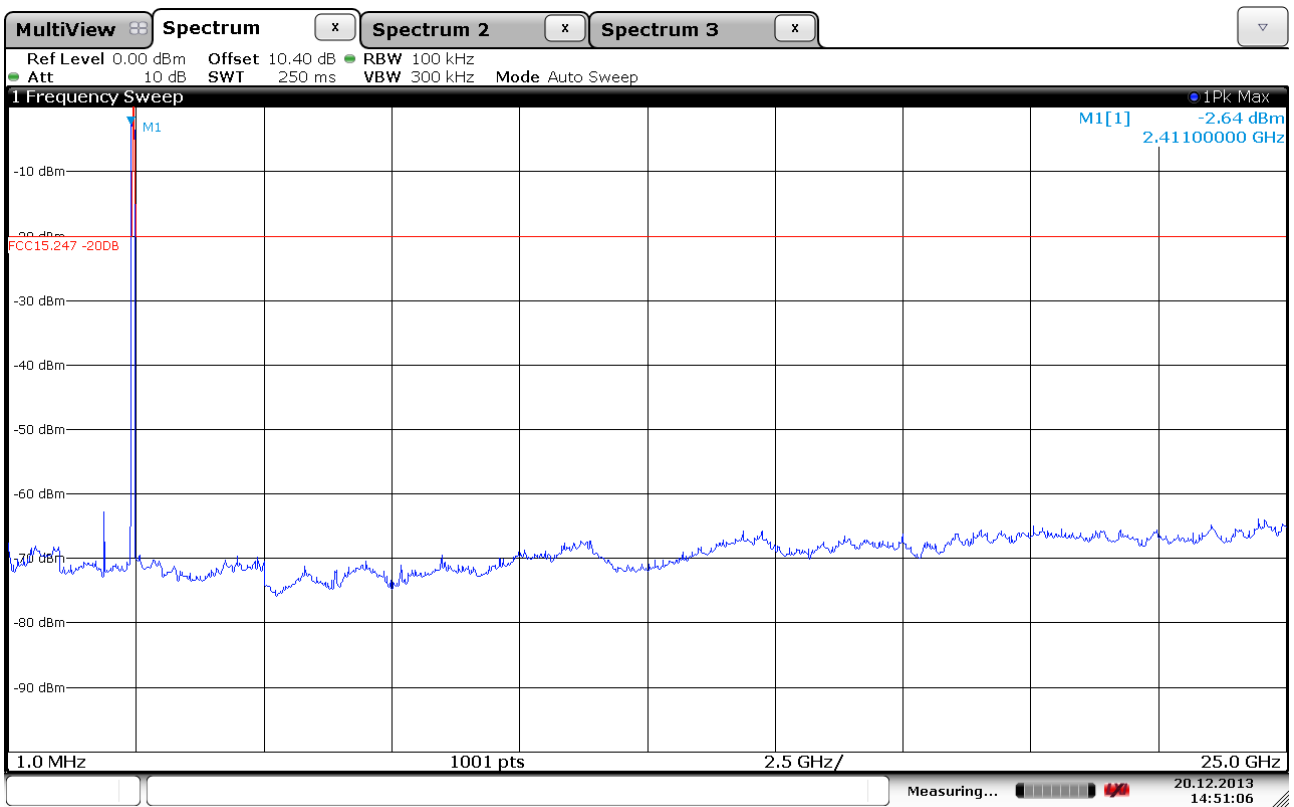
Conducted Band Edge, Lower Channel, Hopping ON, 3-DH5



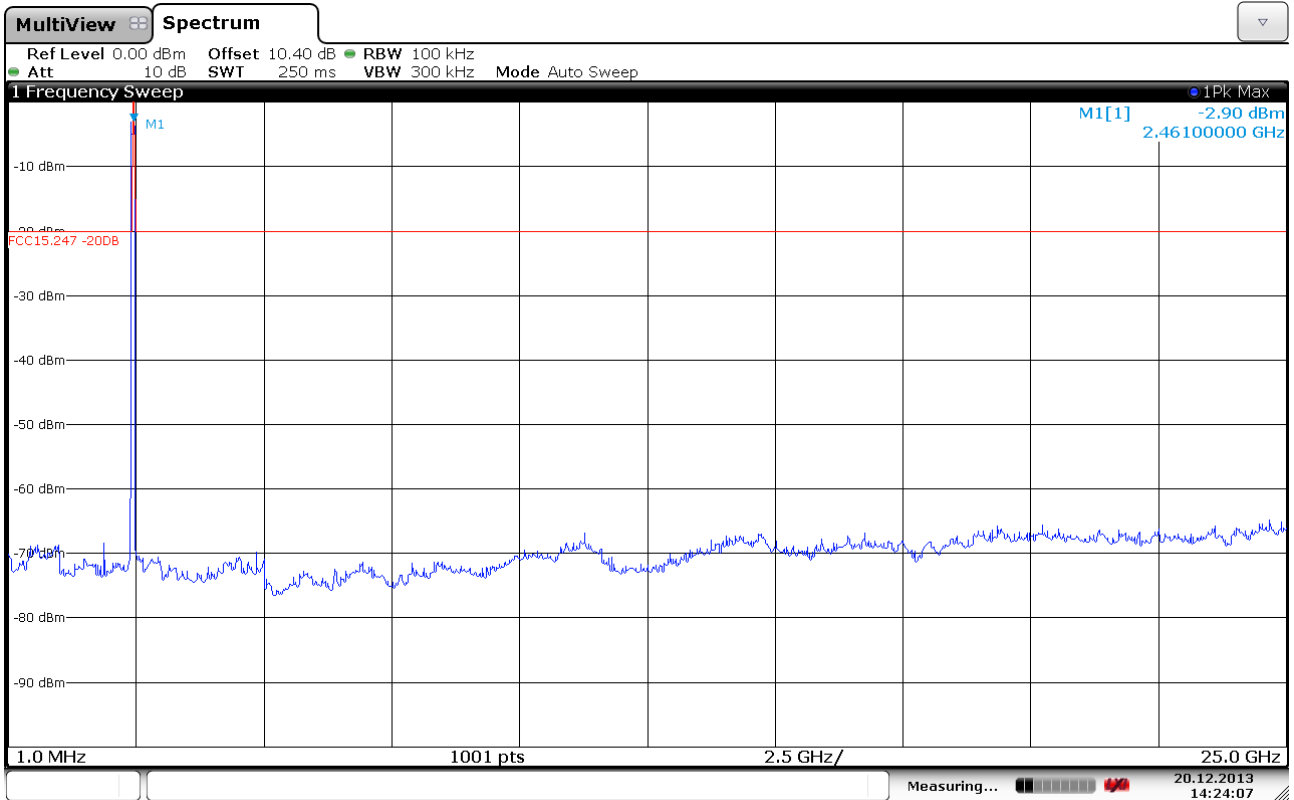
Conducted Band Edge, Upper Channel, Hopping ON, 3-DH5



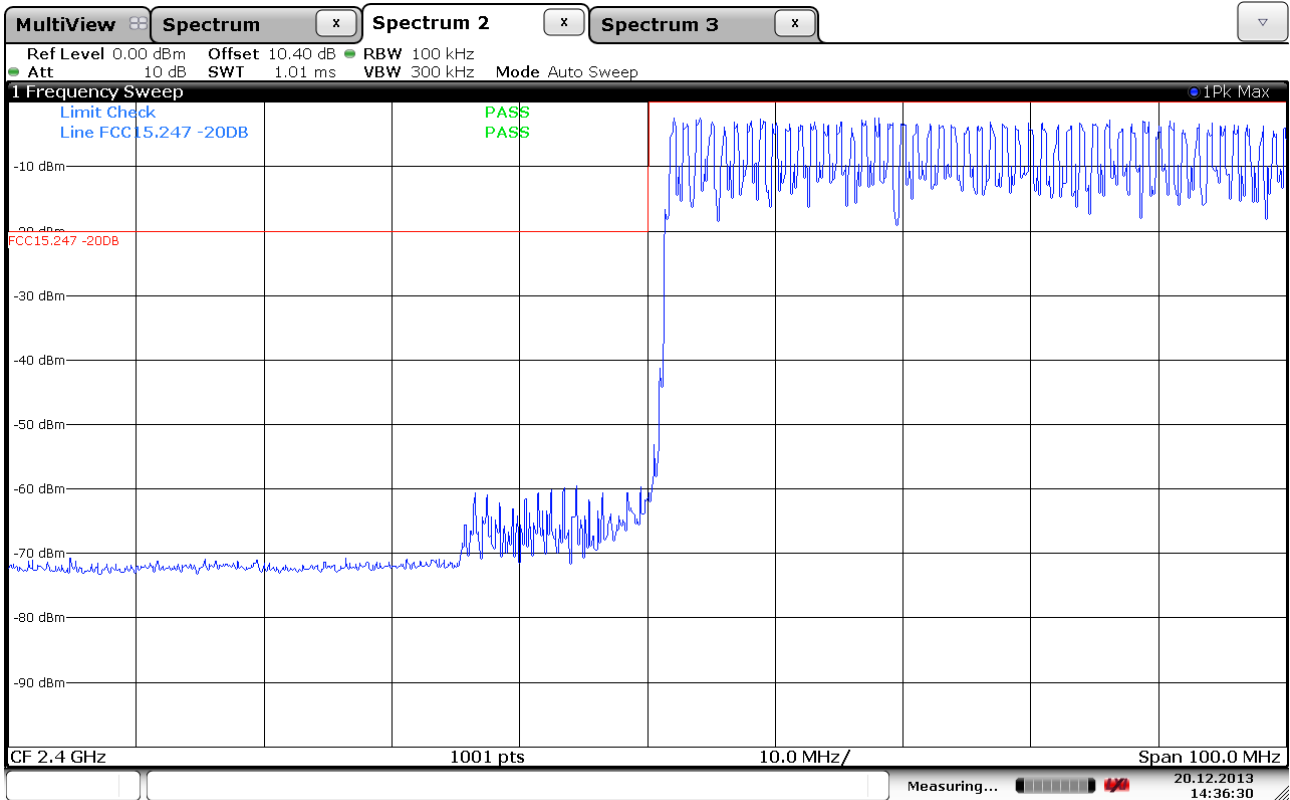
Conducted Emissions, Hopping On, 1 - 25000 MHz, DH5



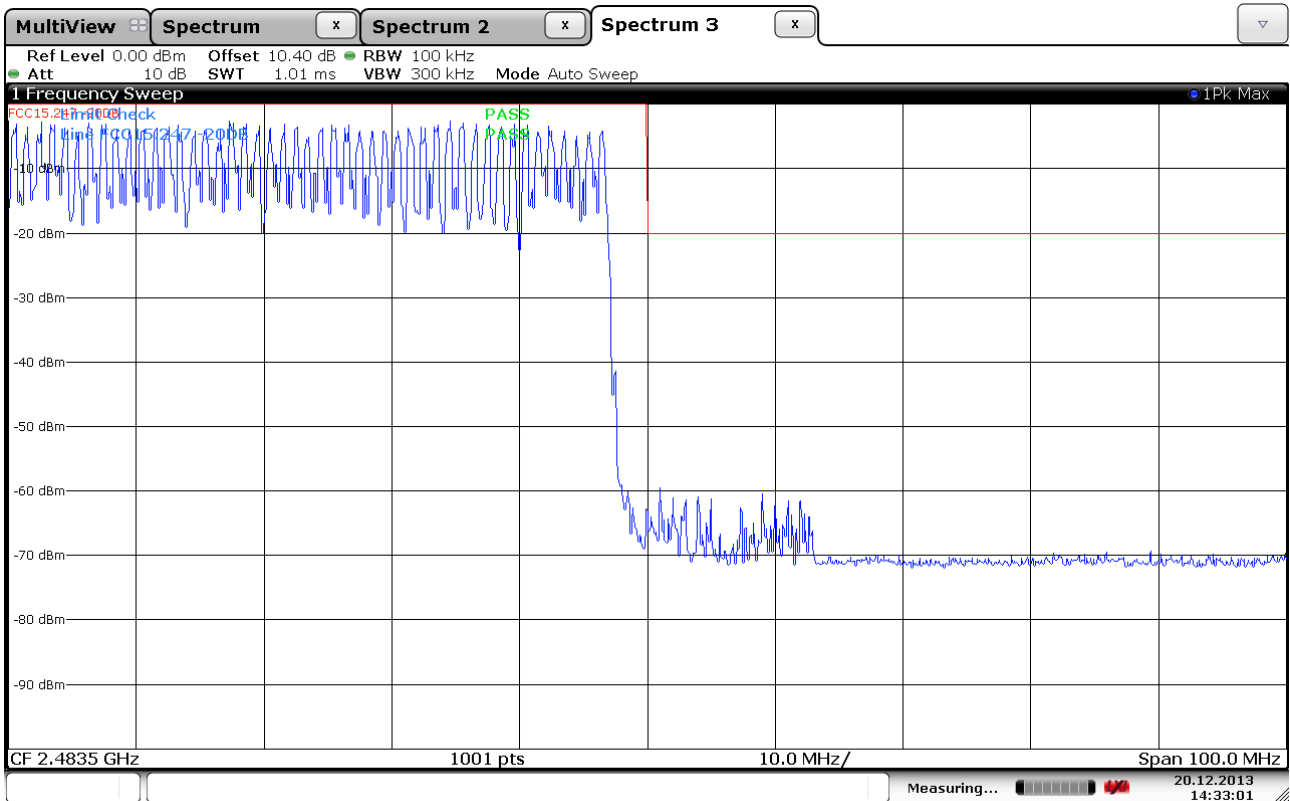
Conducted Emissions, Hopping On, 1 - 25000 MHz, 2-DH5



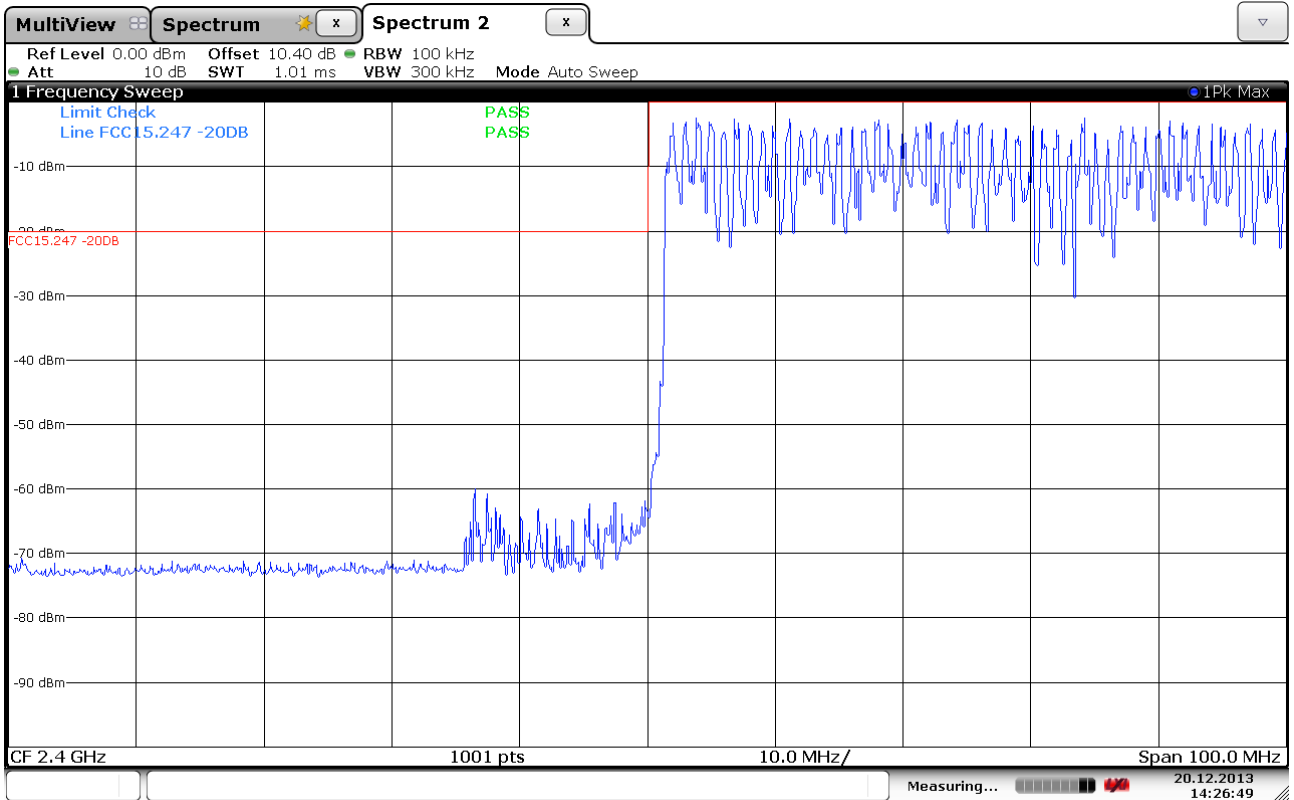
Conducted Emissions, Hopping On, 1 - 25000 MHz, 3-DH5



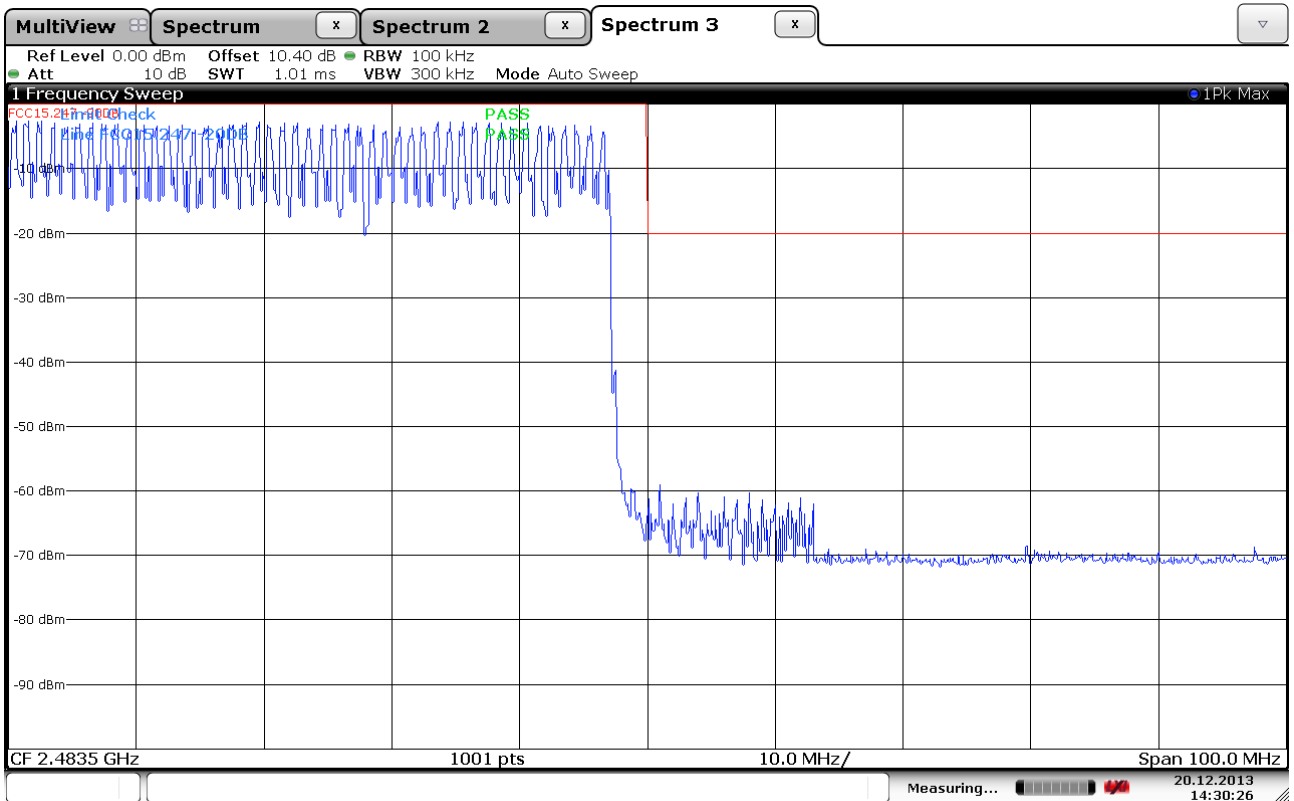
Conducted Emissions, Lower Band Edge, Hopping On, 2-DH5



Conducted Emissions, Upper Band Edge, Hopping On, 2-DH5



Conducted Emissions, Lower Band Edge, Hopping On, 3-DH5



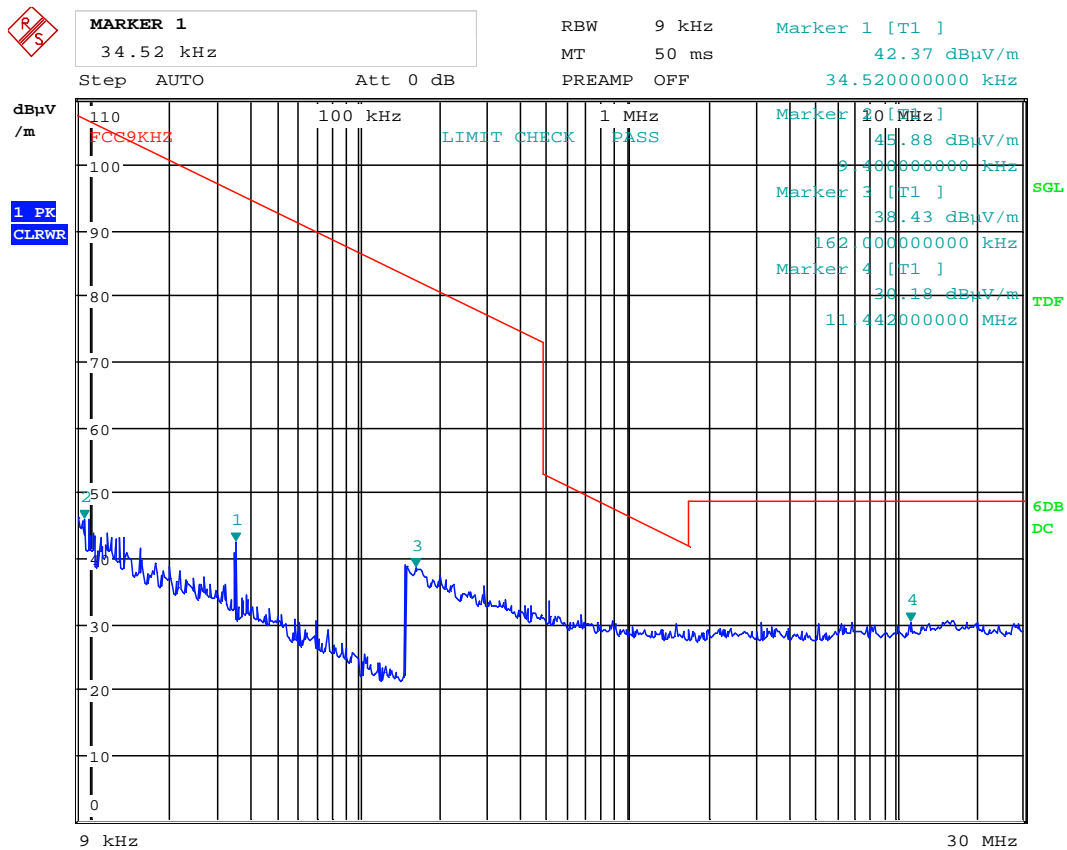
Conducted Emissions, Upper Band Edge, Hopping On, 3-DH5

Radiated emissions 10 kHz-30 MHz.

Measuring distance 10 m, measured with Peak detector.

No component detected, see plot.

Limit is converted to 10 m using 40 dB/decade according to 15.31 (f) (2).



Date: 5.NOV.2013 13:28:04

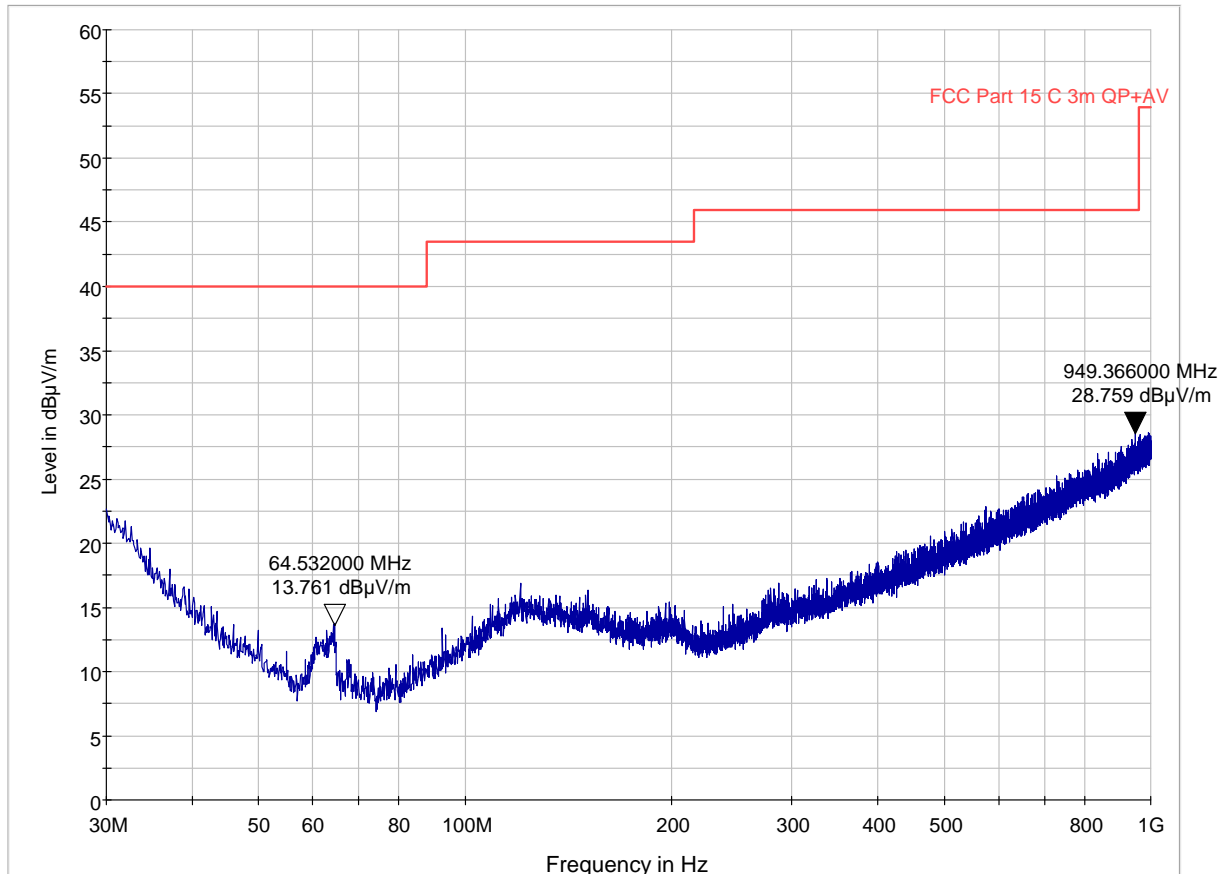
Radiated Emissions, 0.010 -30MHz

Radiated emission 30 – 1000 MHz.

Detector: Peak

Measuring distance: 3m

All values are below the limit even when measured with Peak Detector, RBW=100kHz, VBW=300kHz.



Radiated Emissions, 30 -1000MHz, VP and HP @3m

Radiated Emissions, 1-25 GHz

Measuring distance: 3m (1 – 8.5 GHz)
 1m (8.5 – 18 GHz)

A pre-scan was performed above 18 GHz and no spurious emissions were detected.

Peak Detector:

Frequency	RF channel	Field strength, Peak Detector, 3m	Limit	Margin
GHz	L,M,H	dB μ V/m	dB μ V/m	dB
All freqs	L	None detected	74	>20
All freqs	M	None detected	74	>20
All freqs	H	None detected	74	>20
Other freqs	L,M,H	None detected	74	>20

Average Detector:

Frequency	RF channel	Field strength, Average Detector, 3m	Limit	Margin
GHz	L,M,H	dB μ V/m	dB μ V/m	dB
All freqs	L	None detected	54	>20
All freqs	M	None detected	54	>20
All freqs	H	None detected	54	>20
Other freqs	L,M,H	None detected	54	>20

Average Detector values are calculated from Peak values by Duty Cycle Correction Factor (20 dB).

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor".

Distance correction factor is included in the plots at 1m.

See plots.

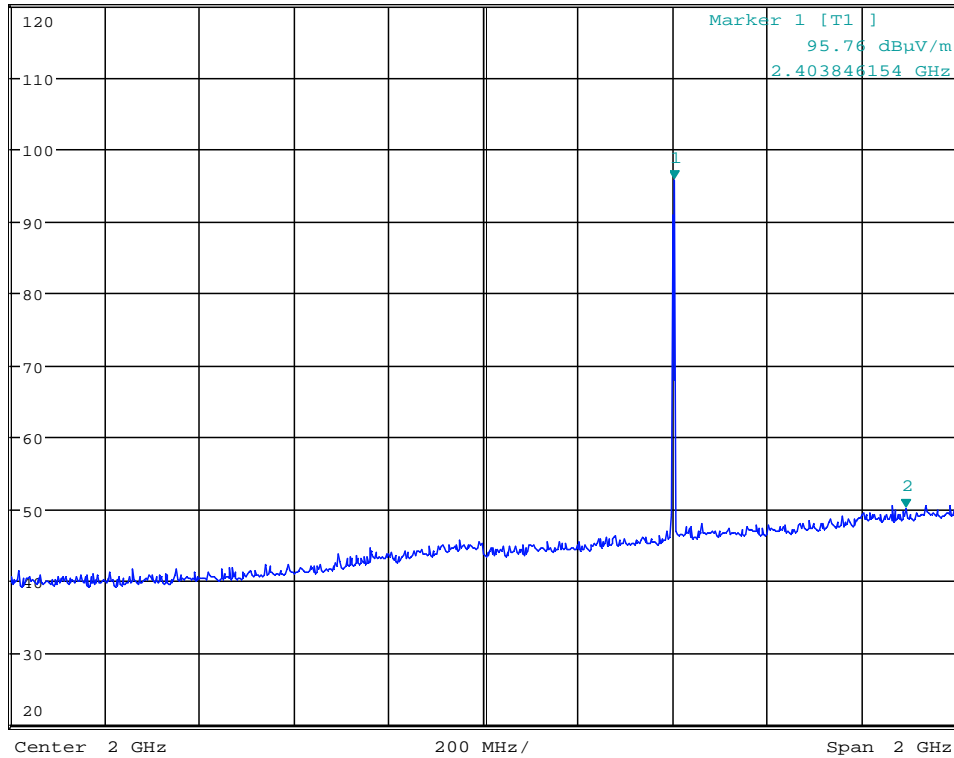


MARKER 2
 2.894230769 GHz
 Ref 120 dBµV/m *Att 20 dB

*RBW 1 MHz
 VBW 3 MHz
 SWT 5 ms

Marker 2 [T1]
 50.20 dBµV/m
 2.894230769 GHz

1 PK
 MAXH

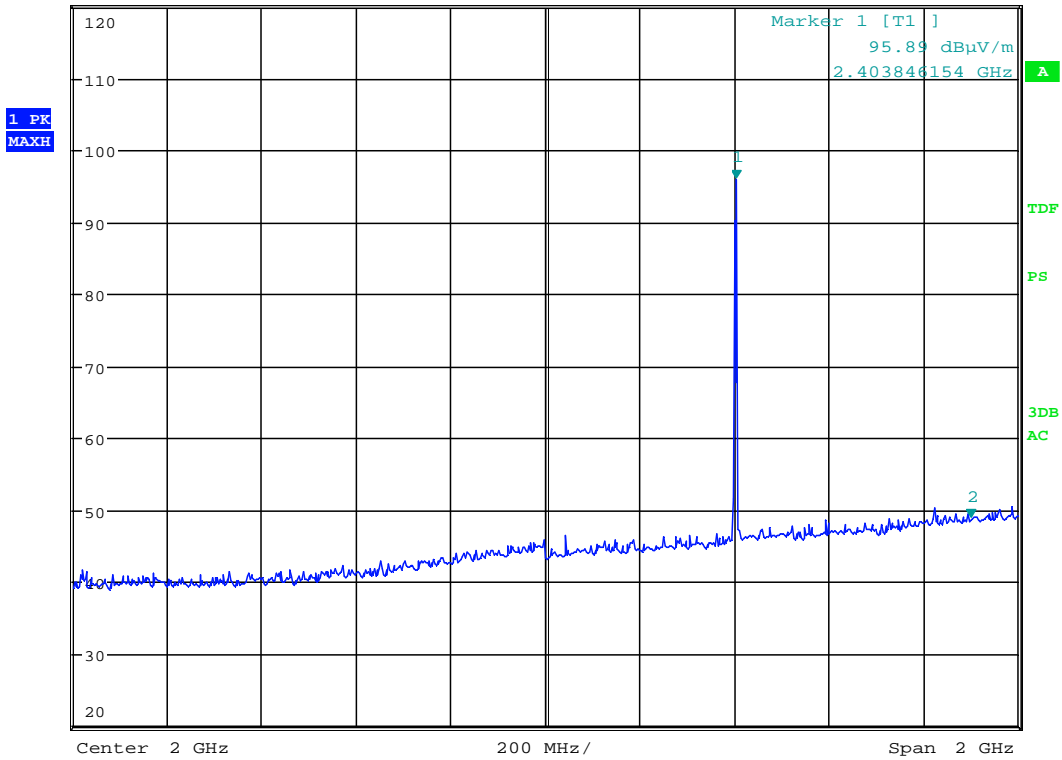


Date: 5.NOV.2013 14:39:31

Radiated Emissions, 1000 -3000MHz, VP – Lower channel



*RBW 1 MHz Marker 2 [T1]
 VBW 3 MHz 48.81 dBuV/m
 Ref 120 dBuV/m *Att 20 dB SWT 5 ms 2.900641026 GHz

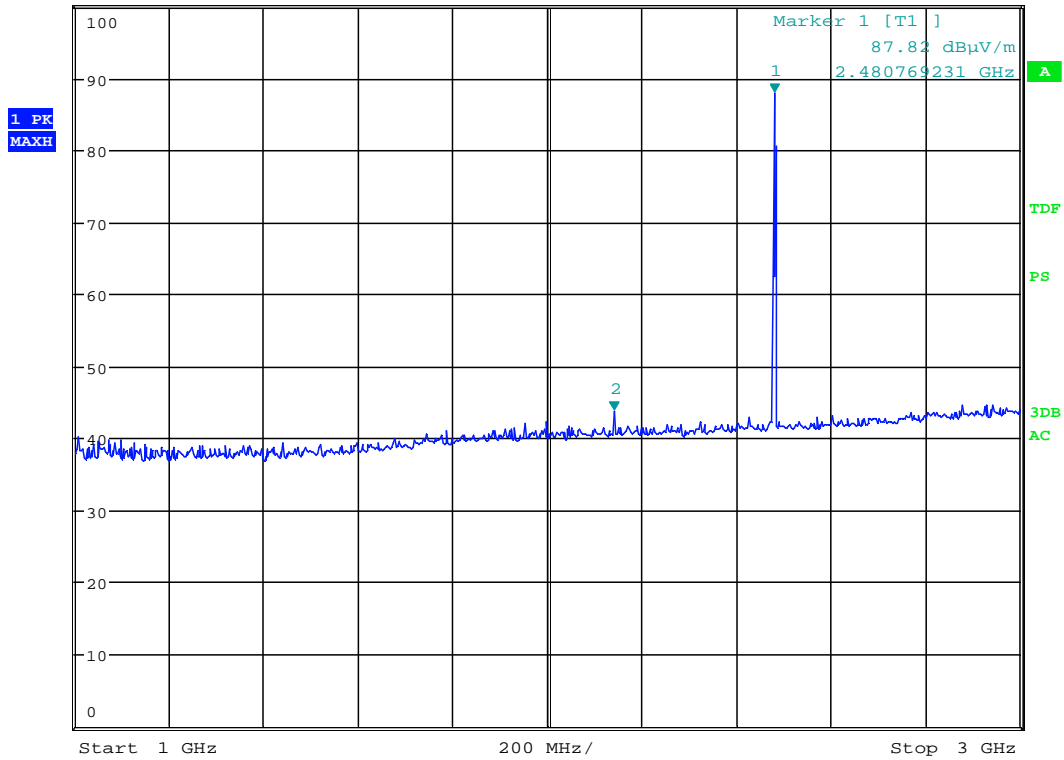


Date: 5.NOV.2013 14:37:45

Radiated Emissions, 1000 -3000MHz, HP- Lower channel



MARKER 2
 2.141025641 GHz
 Ref 100 dBuV/m *Att 10 dB
 *RBW 1 MHz Marker 2 [T1]
 VBW 3 MHz 43.80 dBuV/m
 SWT 5 ms 2.141025641 GHz

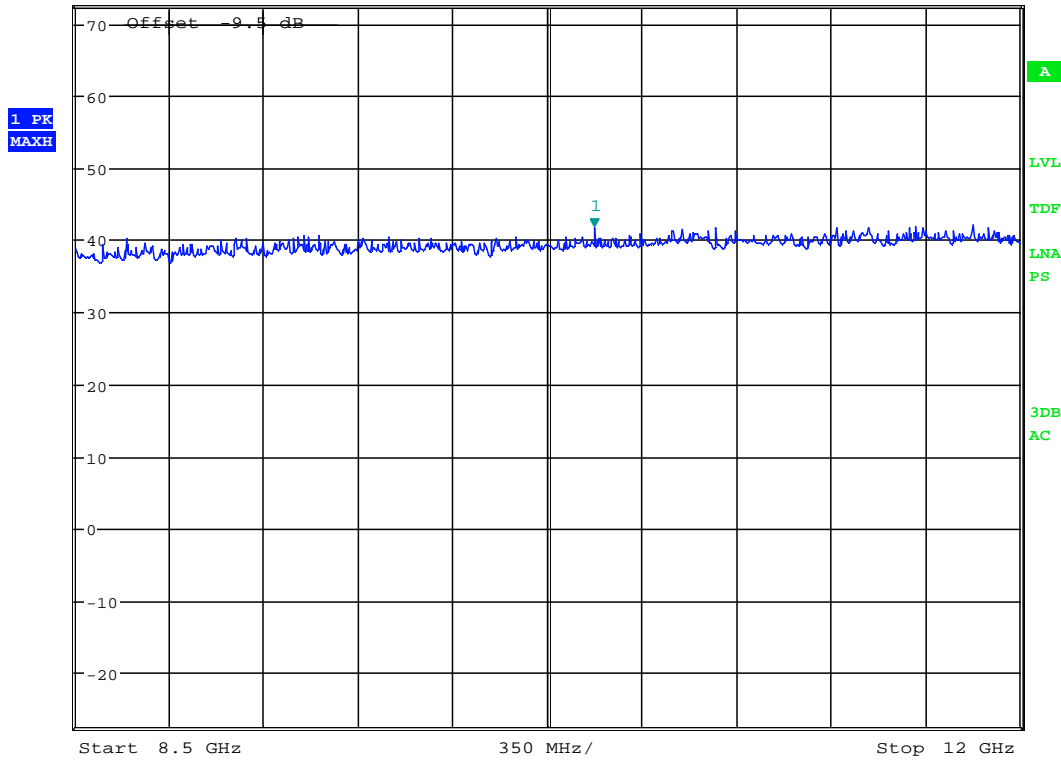


Date: 5.NOV.2013 15:22:31

Radiated Emissions, 1000 -3000MHz, HP- Upper channel



MARKER 1
 10.42387821 GHz
 Ref 72.5 dBµV/m *Att 10 dB
 *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 41.75 dBµV/m
 SWT 25 ms 10.423878205 GHz

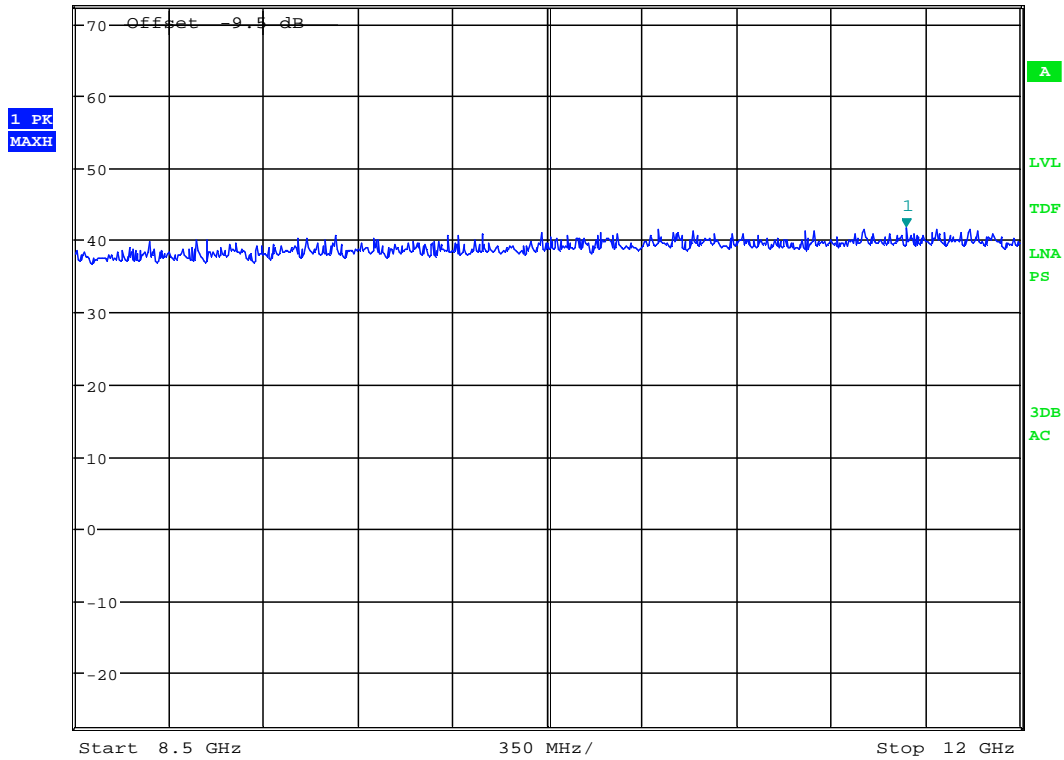


Date: 5.NOV.2013 15:40:31

Radiated Emissions, 8500 -12000MHz, VP, @1m



MARKER 1
 11.57932692 GHz
 Ref 72.5 dBµV/m *Att 10 dB
 *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 41.63 dBµV/m
 SWT 25 ms 11.579326923 GHz

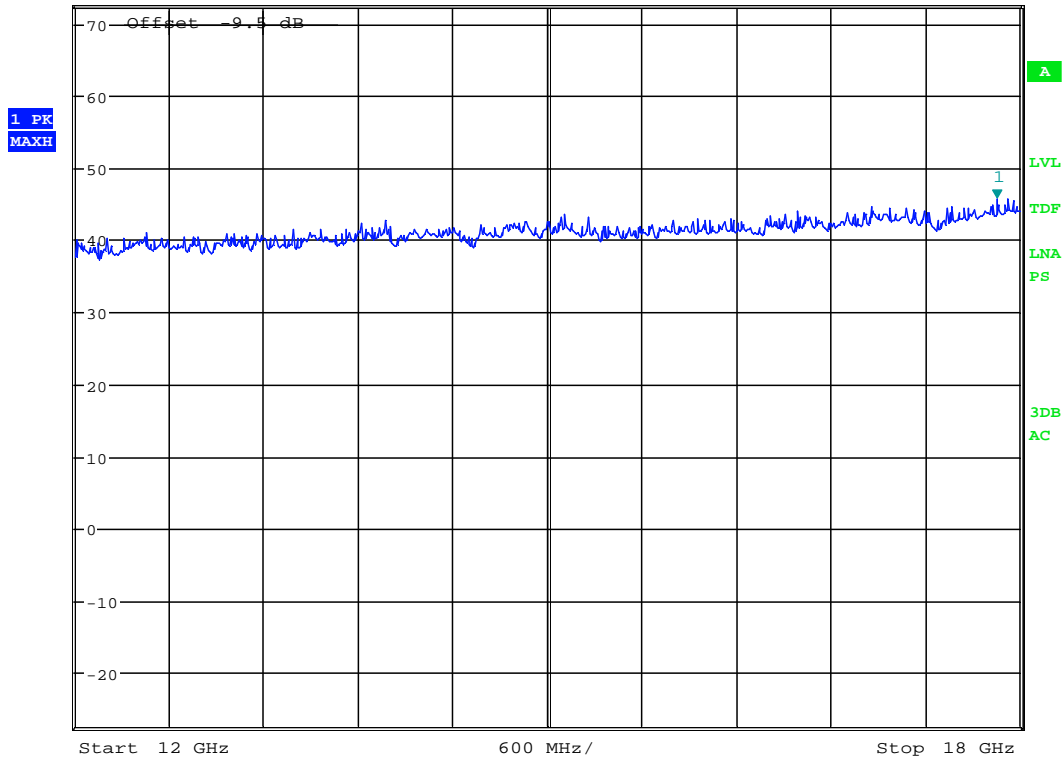


Date: 5.NOV.2013 15:41:13

Radiated Emissions, 8500 -12000MHz, HP, @1m



MARKER 1	*RBW 1 MHz	Marker 1 [T1]
17.85576923 GHz	VBW 3 MHz	45.61 dBµV/m
Ref 72.5 dBµV/m	*Att 10 dB	SWT 35 ms
		17.855769231 GHz

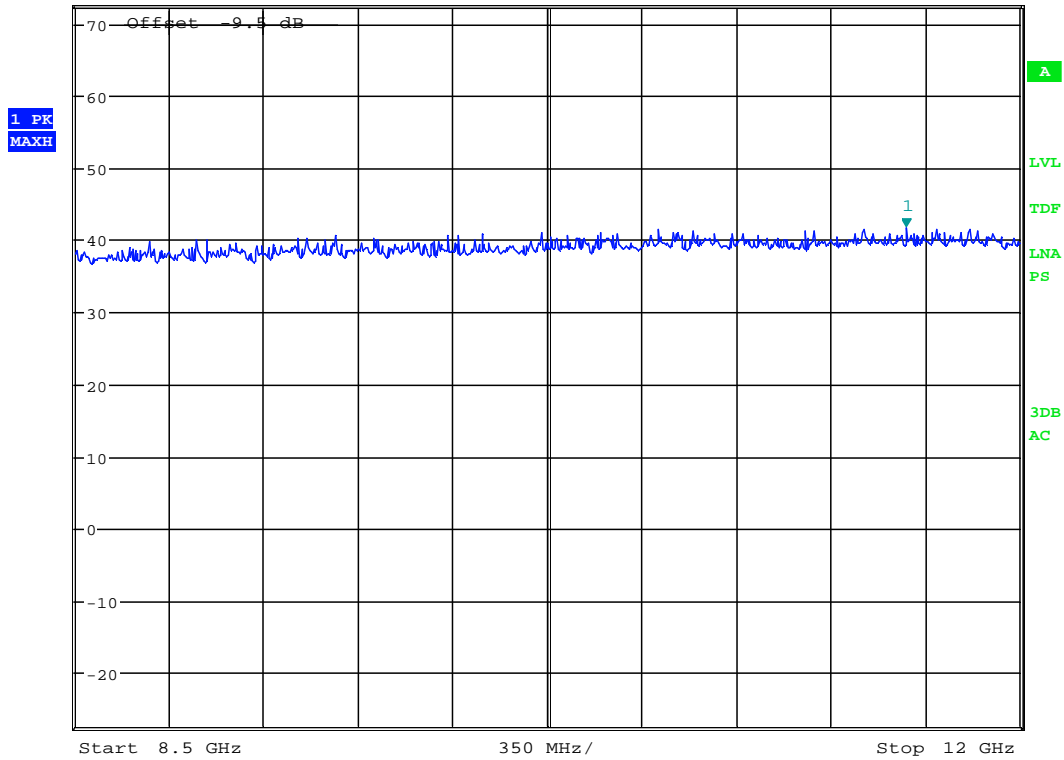


Date: 5.NOV.2013 15:43:23

Radiated Emissions, 12000 -18000MHz, VP, @1m



MARKER 1
 11.57932692 GHz
 Ref 72.5 dBµV/m *Att 10 dB
 *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 41.63 dBµV/m
 SWT 25 ms 11.579326923 GHz

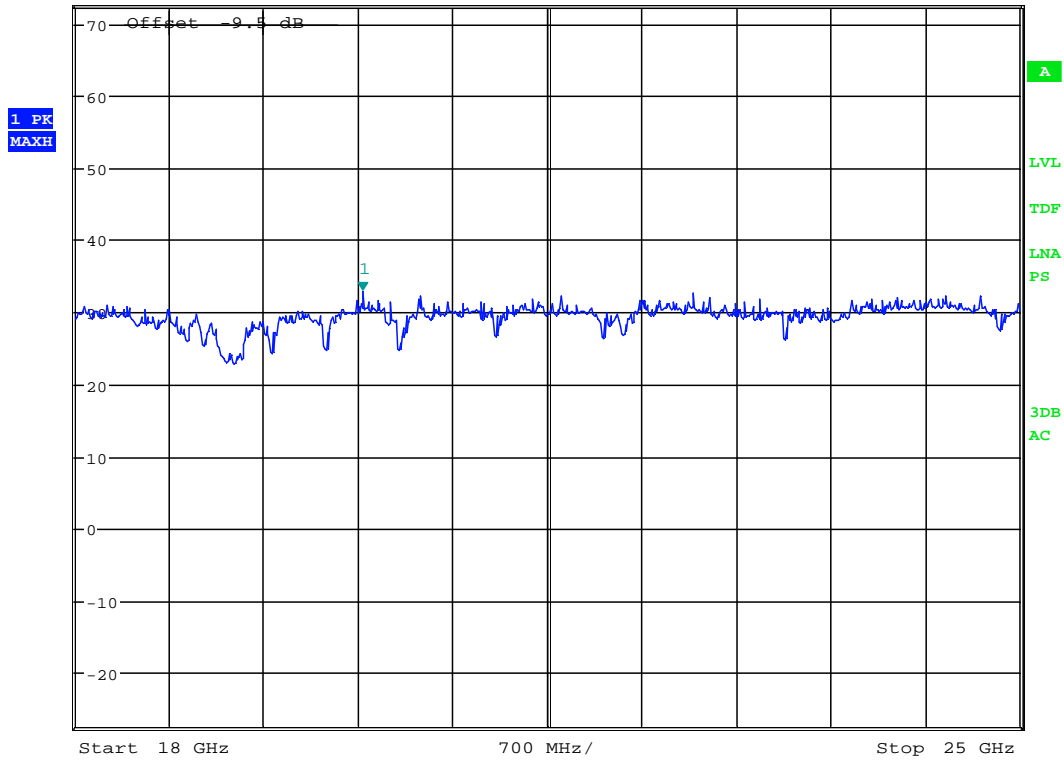


Date: 5.NOV.2013 15:41:13

Radiated Emissions, 12000 -18000MHz, HP, @1m



MARKER 1
 20.13141026 GHz
 Ref 72.5 dBµV/m *Att 10 dB
 *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 32.90 dBµV/m
 SWT 45 ms 20.131410256 GHz



Date: 5.NOV.2013 15:44:59

Pre-scan, 18000 -25000MHz

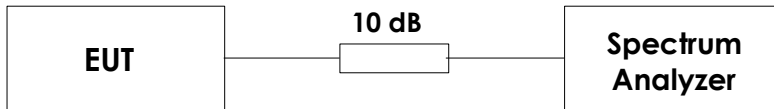
4 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	ESU40	Spectrum Analyzer	Rohde & Schwarz	LR 1639	2013.09.24	2014.09.24
3	4768-10	Attenuator	Narda	LR1647	2013.06	2014.06
4	ESHS10	EMI receiver	Rohde & Schwarz	N3528	2013.09.09	2014.09.09
5	ESH3-Z5	Two Line V-Network	Rohde & Schwarz	LR 1076	Cal b4 use	
6	80S	Signal Generator	Powertron	LT 502	Cal b4 use	
7	6812B	AC Power Source	Agilent	LR 1515	2013.10.28	2014.10.28
8	ESH3-Z2	Pulse Limiter	Rohde & Schwarz	LR 1074	2012.04.24	2014.04.24
9	ESCI	Measuring Receiver	Rohde & Schwarz	N-4259	2013.03.21	2015.03.21
10	JB3	BiLog Antenna	Sunol Sciences	N-4525	2011.09.07	2014.09.07
11	LNA6900	Preamplifier	Teseq	LR 1593	Cal b4 use	
12	3115	Horn Antenna	EMCO	LR 1330	2010.08.05	2015.08.05
14	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2013.09	2014.09
15	HFH2-Z2	Loop Antenna	Rohde & Schwarz	LR 285	2010.11	2015.11
16	PM7320X	Antenna horn	Siverts lab	LR 103	2009.01.26	2014.01.26
17	DBF-520-20	Antenna horn	Systron Donner	LR 101	2009.01.26	2014.01.26
18	638	Antenna horn	Narda	LR 1480	2010.06.17	2015.06.17
19	FSW26	Spectrum Analyzer	Rohde & Schwarz	LR 1640	2013.08.30	2014.08.30
20	Model 87 V	Multimeter	Fluke	LR 1599	2012.10.29	2014.10.29

5 BLOCK DIAGRAM

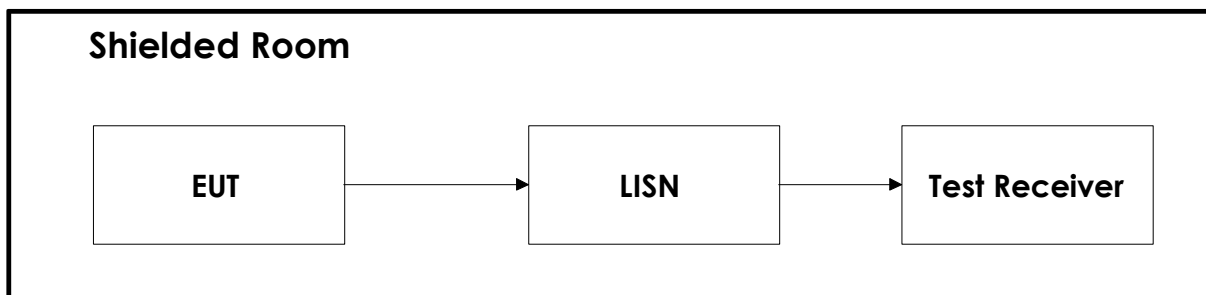
5.1 Conducted Tests



Test equipment included: 1, 2, 19

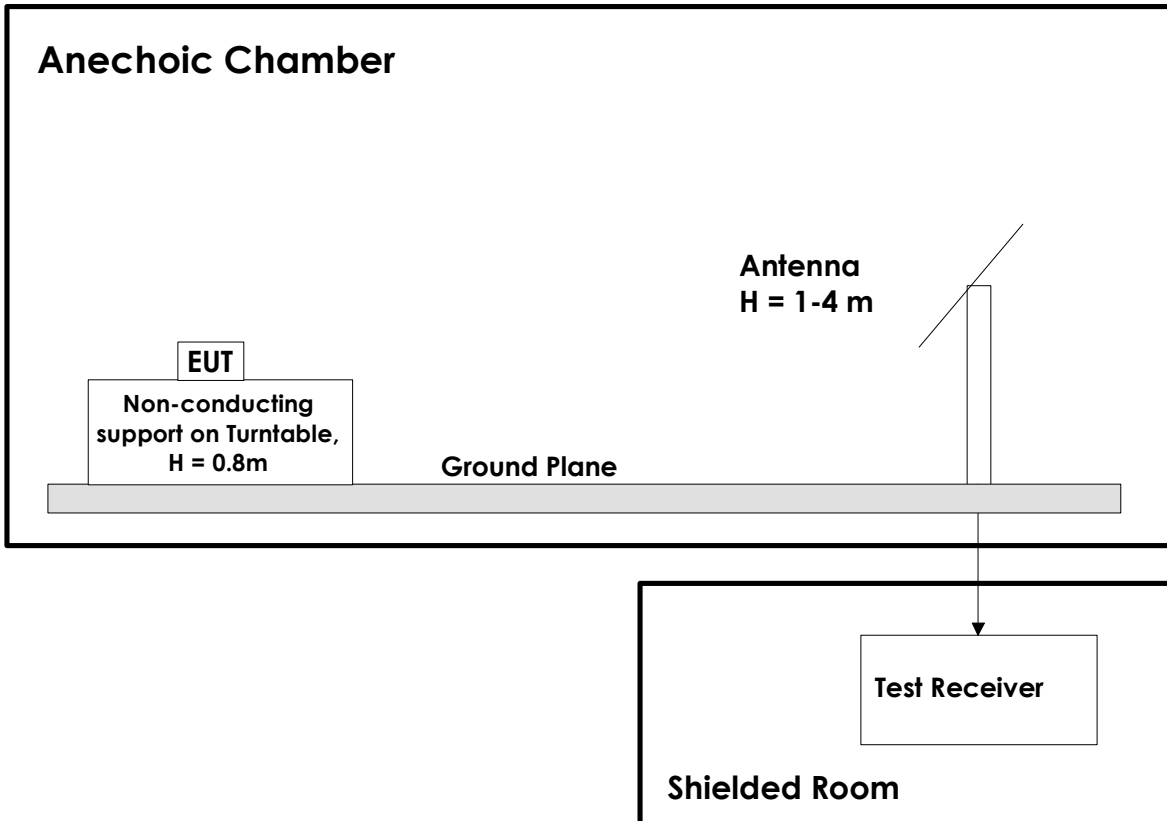
This setup is used for all measurements on 50 ohm antenna connector.

5.2 Power Line Conducted Emission



Test equipment: 3, 4, 6, 7, 18

5.3 Test Site Radiated Emission



Test equipment: 1, 9, 10, 11, 12, 13, 14, 15, 16, 18,20

This test setup is used for all radiated emissions tests. For frequencies below 30 MHz the measuring distance is 10 m, for all other frequencies it is 3m or 1m. Emissions above 1 GHz were measured with a Spectrum Analyzer and Horn Antenna and with the preamplifier after the antenna. For measurements above 18 GHz the test receiver is moved inside the anechoic chamber and located next to the antenna to minimize the cable loss.