

Test report no. : 215166- 3

Item tested : CC2541KEYFOB

Type of equipment : 2.4 GHz Transceiver

FCC ID : ZAT2541KEYFOB

Client : Texas Instruments Norway AS

FCC Part 15.247

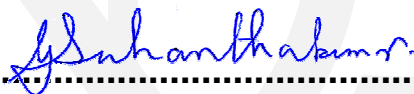
Digital Transmission System

RSS-210, Issue 8

Low Power Licence-Exempt
Radiocommunication Devices

4 December 2012

Authorized by :



G.Suhanthakumar
Technical Verificator

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1 GENERAL INFORMATION

1.1 Testhouse Info

Name : Nemko AS
Address : Nemko Kjeller
Instituttveien 6, Box 96
NO-2027 Kjeller, NORWAY
Telephone : +47 64 84 57 00
Fax : +47 64 84 57 05
E-mail: comlab@nemko.com
FCC test firm : 994405
IC OATS : 2040D-1
Total Number of Pages: 55

1.2 Client Information

Name : Texas Instruments Norway AS
Address : Gaustadalléen 21,
NO-0349 Oslo, Norway
Telephone : +47 22 95 85 44
Fax : +47 22 95 85 46

Contact:

Name : Dag Grini
Telephone : +47 22 95 83 01
E-mail : d.grini@ti.com

1.3 Responsible Manufacturer (If other than client)

Same as the client

2 Test Information

2.1 Test Item

Name :	Texas Instruments
FCC ID :	ZAT2541KEYFOB
IC :	451H-2541KEYFOB
Model/version :	CC2541KEYFOB
Serial number :	-
Hardware identity and/or version:	1.3.0
Software identity and/or version :	-
Frequency Range :	2402 – 2480 MHz
Number of Channels :	40
Type of Modulation :	GFSK, 250kHz deviation
Conducted Output power:	1.2 mW (Peak)
Data rate:	1000kbps
User Frequency Adjustment :	None
Type of Power Supply :	3.0 V DC (one CR2032 cell battery)
Antenna Connector :	PCB antenna
Antenna Diversity Supported :	No
Desktop Charger :	None

Description of Test Item

The CC2541KEYFOB supports the Bluetooth Low Energy (BLE) standard, which is considered Digital Modulation per FCC part 15.247a.

Exposure Evaluation

The EUT is exempted from RF Exposure Evaluation.

2.2 Test Environment

2.2.1 Normal test condition

Temperature:	21.0 – 21.2 °C
Relative humidity:	45.3 – 51.5 %
Normal test voltage:	Nominal 3 VDC (2 x AAA battery type/ LR03)

New batteries were used for all tests.

The values are the limit registered during the test period.

2.3 Test Period

Item received date:	2012-09-05
Test period :	from 2012-09-10 to 2012-09-11

3 TEST REPORT SUMMARY

3.1 General

Manufacturer: Texas Instruments

Model No.: CC2541KEYFOB

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.

Radiated tests were conducted in accordance with ANSI C63.4-2003. The radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

New Submission

Production Unit

Class II Permissive Change

Pre-production Unit

DTS 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".**



TEST REPORT #: 215166-3

TESTED BY: Thomas Dangle
Thomas Dangle, Test engineer

DATE: 2012-09-21

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3.2 Test Summary

Name of test	FCC Part 15 reference	RSS-210 Issue 8 reference	Result
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	Pass
Power Line Conducted Emission	15.107(a) 15.207(a)	7.2.2 (RSS-GEN)	N/A*
Minimum 6 dB Bandwidth	15.247(a)(2)	A8.2	Pass
Peak Power Output	15.247(b)	A8.4	Pass
Power Spectral Density	15.247(d)	A8.2	Pass
Spurious Emissions (Antenna Conducted)	15.247(c)	A8.5	Pass
Spurious Emissions (Radiated)	15.247(c) 15.109(a) 15.209(a)	A8.5	Pass
Receiver Emissions (Radiated)	N/A	2.3	N/A

*EUT is battery operated only.

3.3 Description of modification for Modification Filing

Not applicable.

3.4 Comments

All ports were populated during spurious emission measurements.

3.5 Family List Rational

Not Applicable.

4 TEST RESULTS

4.1 Power Line Conducted Emissions

Para. No.: 15.207 (a)

The test is not applicable since the device is powered by a cell coin battery.

Test Performed By: -	Date of Test: -
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Measurement procedure: ANSI C63.4-2003 using 50 μ H/50 ohms LISN.

Test Results: -

Measurement Data: -

4.2 Minimum 6 dB Bandwidth

Para. No.: 15.247 (a)(2)

Test Performed By: Thomas Dangle	Date of Test: 10 Sept. 2012
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Test Results: Complies

Measurement Data:

Measured 6 dB Bandwidth (kHz)		
2402MHz	2440 MHz	2480MHz
720	760	760

Requirements:

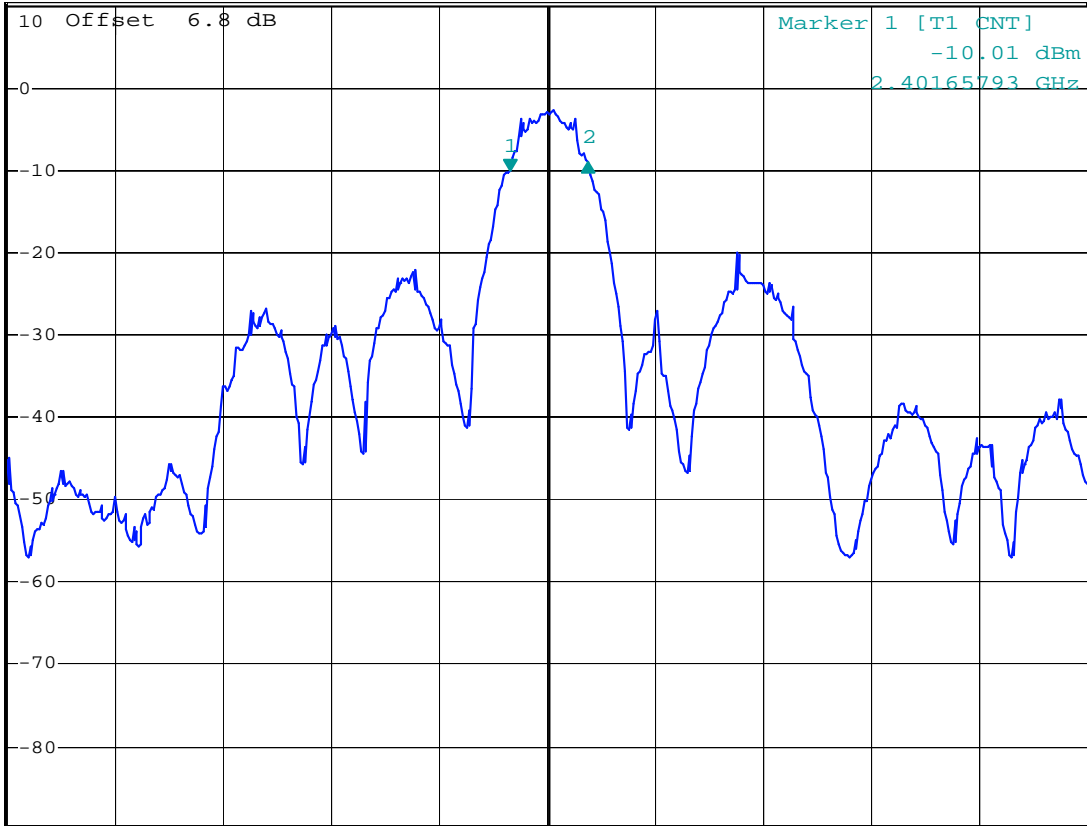
For Digital Transmission Systems in the 2400-2483.5 MHz band the minimum 6 dB bandwidth shall be at least 500 KHz.



DELTA MARKER 2
 720 kHz
 Ref 10.3 dBm * Att 20 dB

*RBW 30 kHz Delta 2 [T1]
 VBW 100 kHz 1.02 dB
 SWT 15 ms 720.000000000 kHz

1 PK
 MAXH



Center 2.402 GHz 1 MHz/ Span 10 MHz

Date: 10.SEP.2012 13:37:05

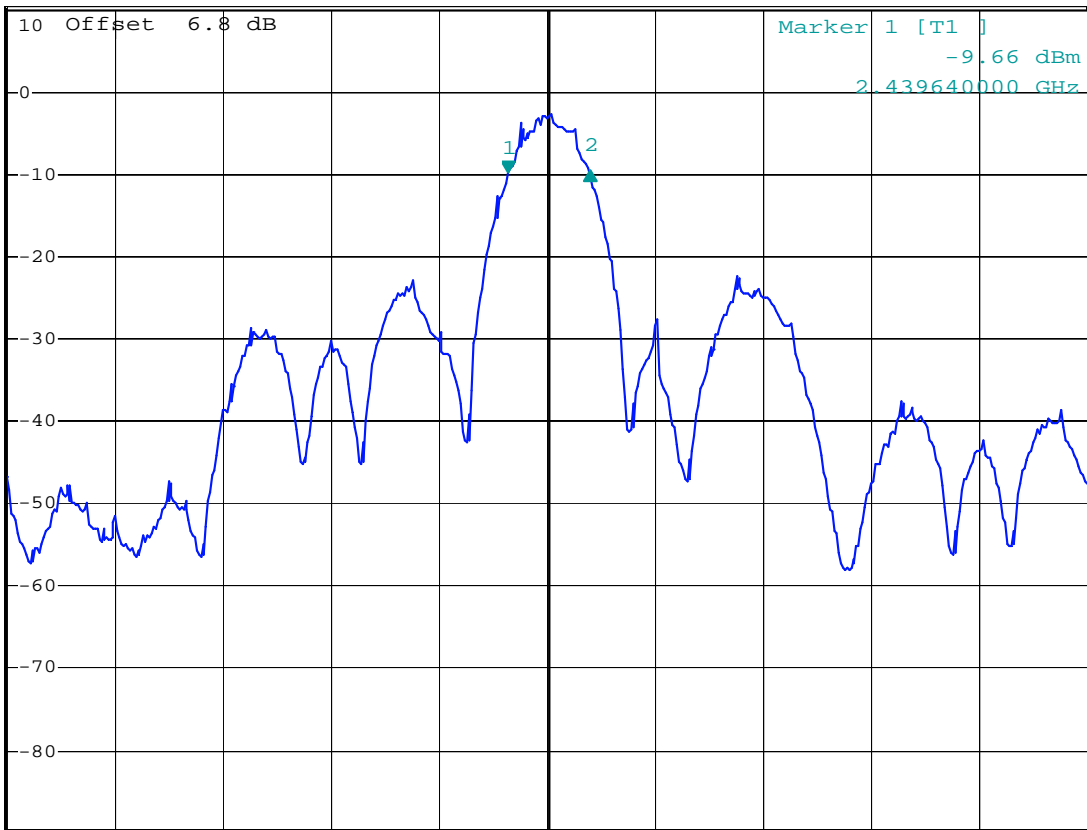
6 dB Bandwidth at 2402 MHz



DELTA MARKER 2
 760 kHz
 Ref 10.3 dBm * Att 20 dB

*RBW 30 kHz Delta 2 [T1]
 VBW 100 kHz 0.06 dB
 SWT 15 ms 760.000000000 kHz

1 PK
 MAXH



Center 2.44 GHz 1 MHz/ Span 10 MHz

Date: 10.SEP.2012 13:40:19

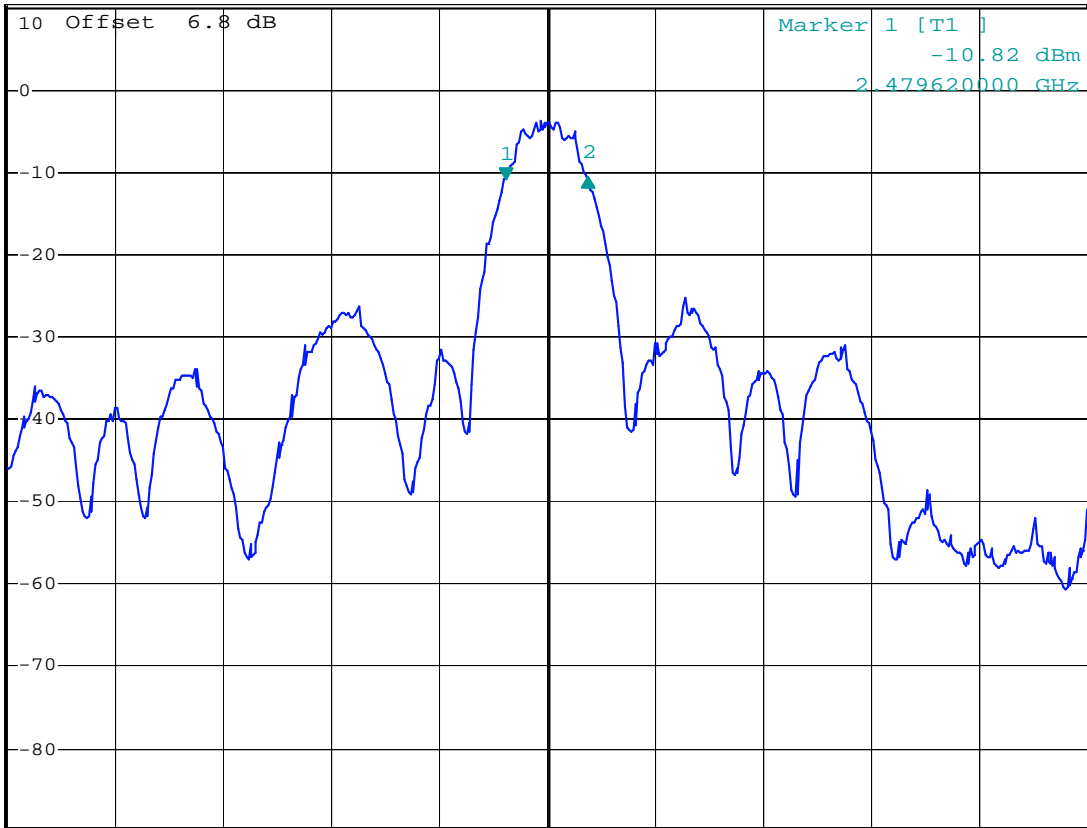
6 dB Bandwidth at 2440 MHz



DELTA MARKER 2
 760 kHz
 Ref 10.3 dBm * Att 20 dB

*RBW 30 kHz Delta 2 [T1]
 VBW 100 kHz 0.38 dB
 SWT 15 ms 760.00000000 kHz

1 PK
 MAXH



Center 2.48 GHz 1 MHz/ Span 10 MHz

Date: 10.SEP.2012 13:43:20

6 dB Bandwidth at 2480 MHz

4.3 20 dB Bandwidth

Test Performed By: Thomas Dangle	Date of Test: 10 Sept. 2012
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Measurement Data:

Measured 20 dB Bandwidth (MHz)
2440 MHz
1.24

Requirements:

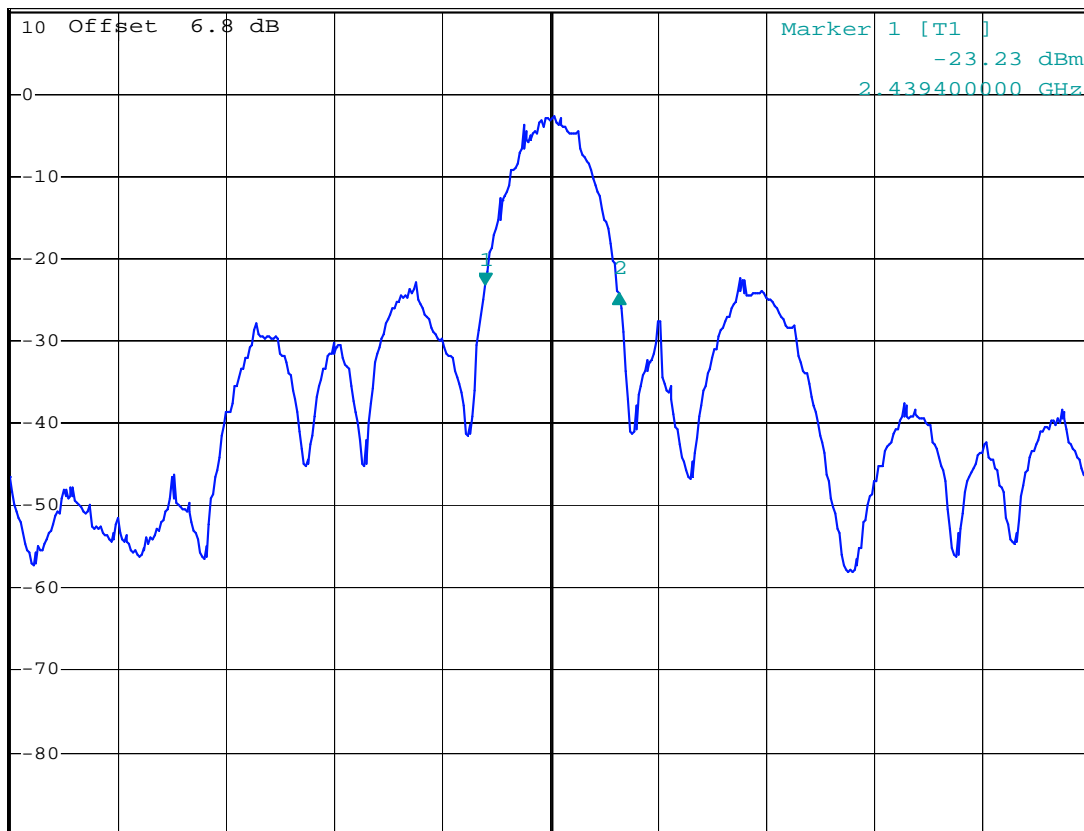
No requirements. Reported for information only.



DELTA MARKER 2
 1.24 MHz
 Ref 10.3 dBm *Att 20 dB

*RBW 30 kHz Delta 2 [T1]
 VBW 100 kHz -1.08 dB
 SWT 15 ms 1.24000000 MHz

1 PK
 MAXH



Center 2.44 GHz 1 MHz/ Span 10 MHz

Date: 10.SEP.2012 13:41:28

20 dB Bandwidth at 2440 MHz

4.4 Peak Power Output

Para. No.: 15.247 (b)

Test Performed By: Thomas Dangle	Date of Test: 10 & 11 June 2012
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Test Results: Complies

Measurement Data:

RF channel	2402 MHz	2440 MHz	2480 MHz
Measured Conducted Power (dBm)	0.7	0.3	-0.2
Measured Maxium Field strength (dB μ V/m) –VP	97.5	97.3	96.5
Calc. Radiated Power (dBm)	0.1	-0.1	-0.9
Calc. Antenna Gain (dB)	-0.6	-0.4	-0.7

The maximum field strength is obtained in YZ plane and vertical polarization.

Radiated Power is calculated from measured field strength using the methods in “KDB 412172 D01 Determining ERP and EIRP v01”.

See attached graph.

Detachable antenna?

Yes No

If detachable, is the antenna connector non-standard?

Yes No

Requirements:

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

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

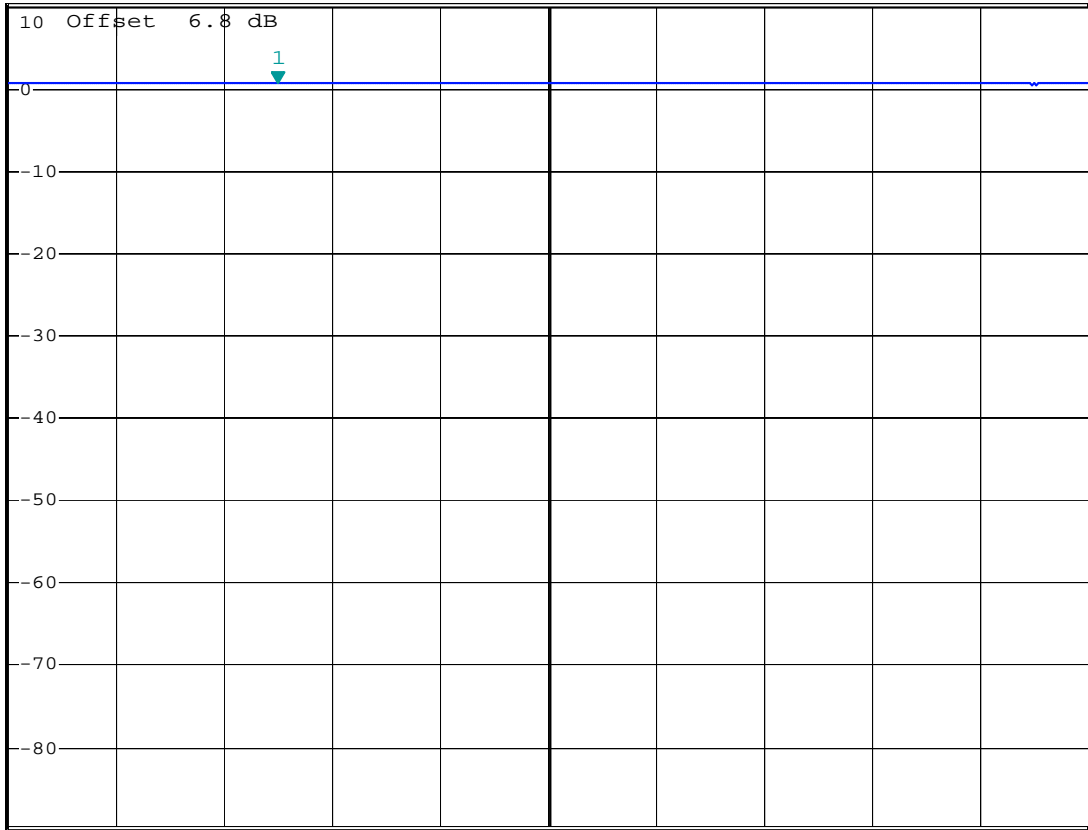
If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced below the stated value above by the amount in dB that the directional gain of the antenna exceeds 6 dBi.



MARKER 1
 625 μ s
 Ref 10.3 dBm *Att 20 dB

RBW 3 MHz Marker 1 [T1]
 VBW 10 MHz 0.66 dBm
 SWT 2.5 ms 625.000000 μ s

1 PK
 MAXH



Center 2.40236 GHz 250 μ s/

Date: 10.SEP.2012 13:51:06

Conducted Power, 2402 MHz

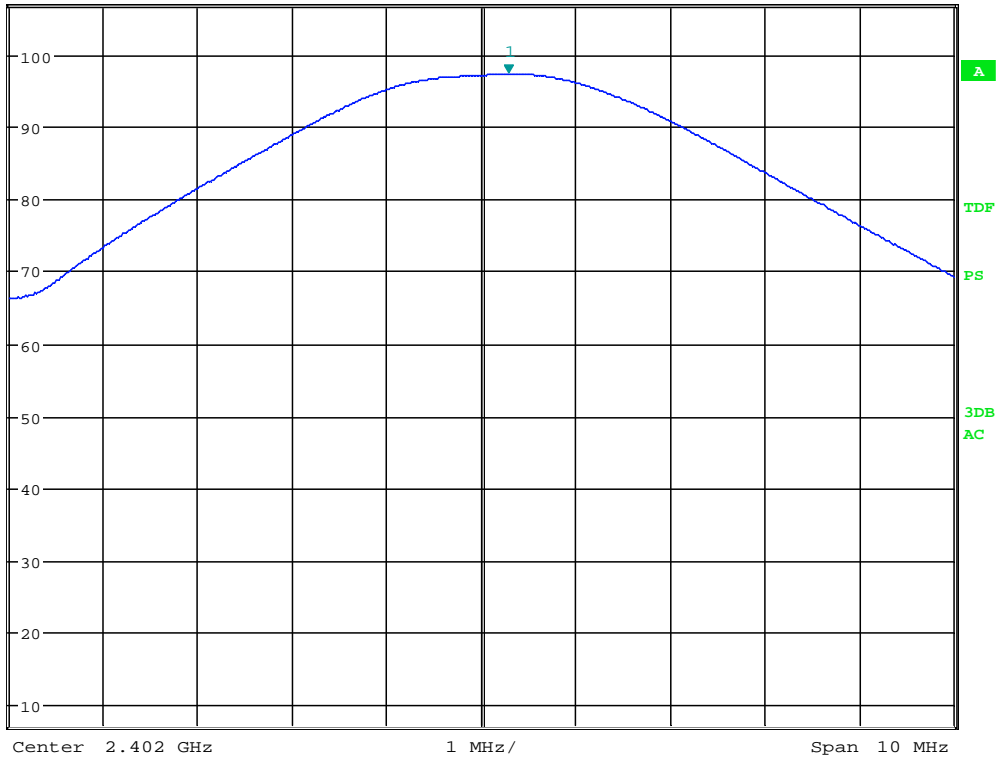


* RBW 2 MHz Marker 1 [T1]
 VBW 5 MHz 97.49 dBµV/m
 SWT 2.5 ms 2.402288462 GHz

Ref 107 dBµV/m

* Att 10 dB

1 PK
 MAXH



Date: 10.SEP.2012 09:48:47

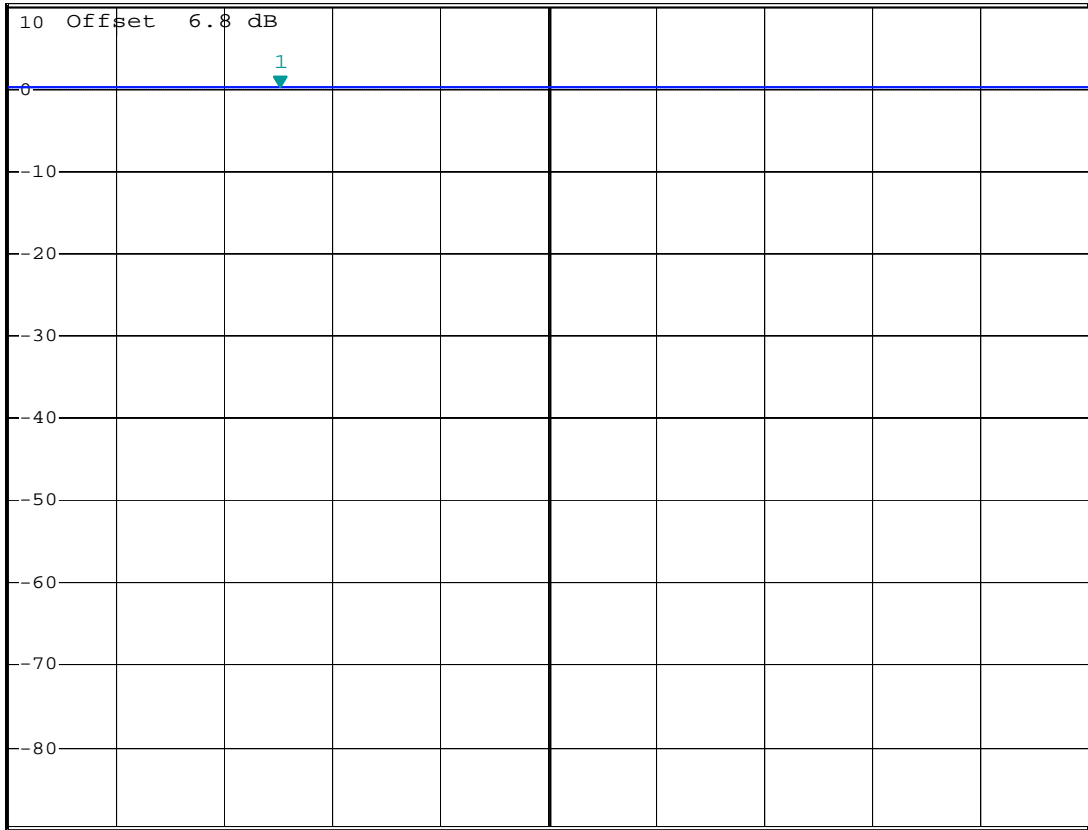
Radiated Field strength, HP , 2402 MHz



MARKER 1
 630 μ s
 Ref 10.3 dBm *Att 20 dB

RBW 3 MHz Marker 1 [T1]
 VBW 10 MHz 0.26 dBm
 SWT 2.5 ms 630.000000 μ s

1 PK
 MAXH



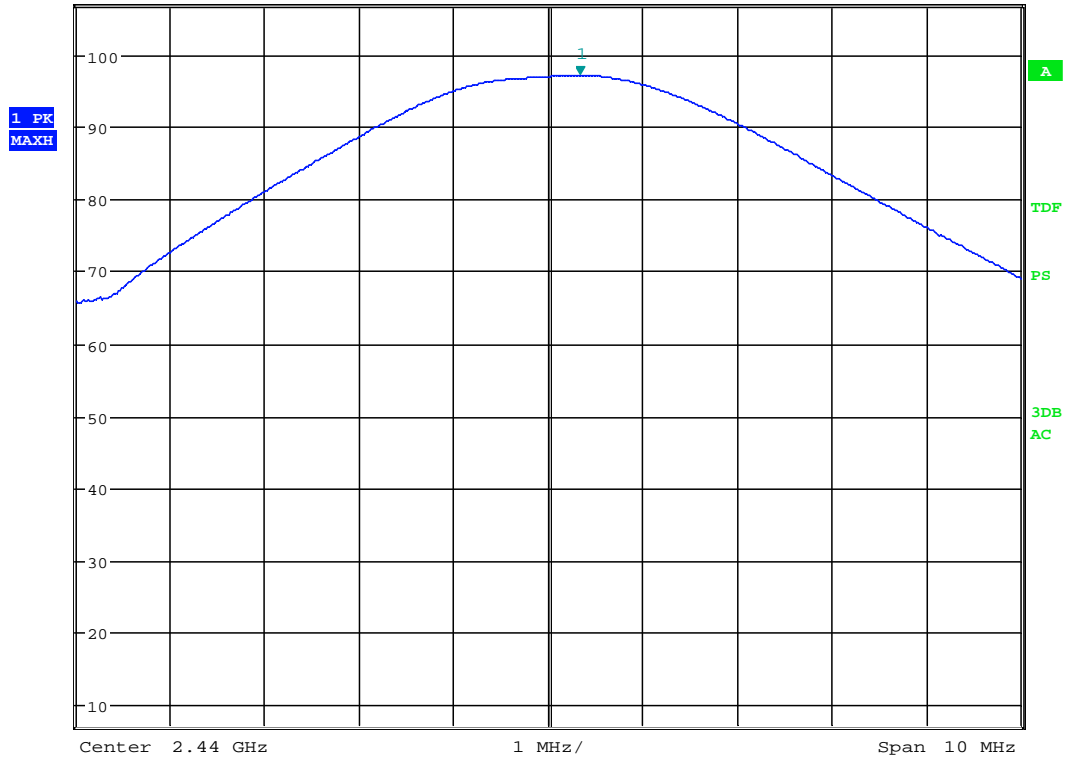
Center 2.44036 GHz 250 μ s/

Date: 10.SEP.2012 13:53:04

Conducted Power, 2440 MHz



Ref 107 dB μ V/m *Att 10 dB *RBW 2 MHz Marker 1 [T1]
 VBW 5 MHz 97.29 dB μ V/m
 SWT 2.5 ms 2.440336538 GHz



Date: 10.SEP.2012 09:56:10

Radiated field strength, HP, 2440 MHz

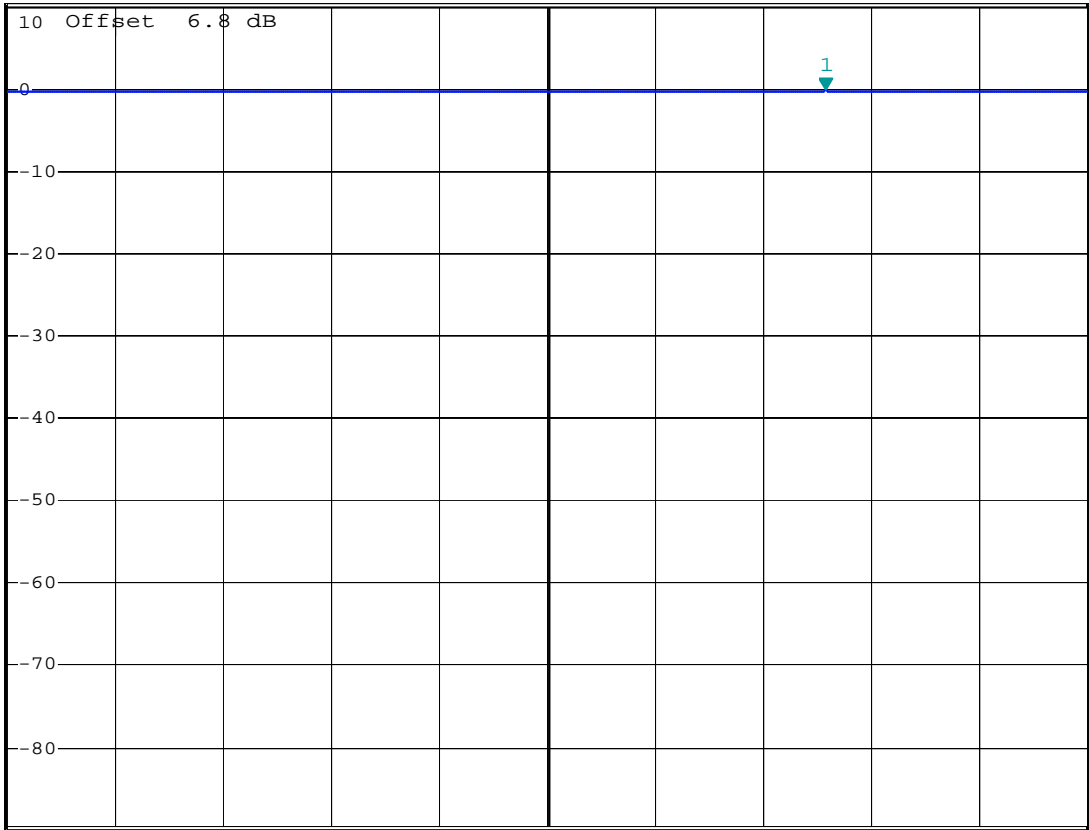


MARKER 1
 1.895 ms

RBW 3 MHz Marker 1 [T1]
 VBW 10 MHz -0.17 dBm
 SWT 2.5 ms 1.895000 ms

Ref 10.3 dBm *Att 20 dB

1 PK
 MAXH



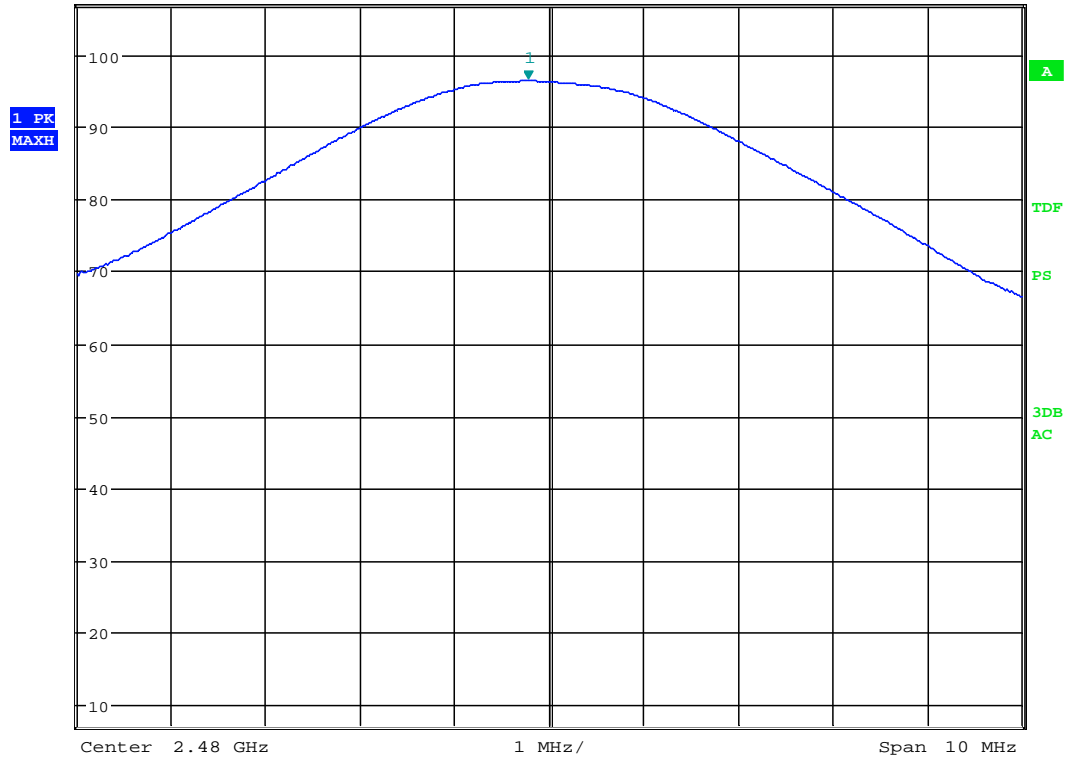
Center 2.479806 GHz 250 μs/

Date: 10.SEP.2012 13:48:44

Conducted Power, 2480 MHz



Ref 107 dB μ V/m *Att 10 dB *RBW 2 MHz Marker 1 [T1]
 VBW 5 MHz 96.53 dB μ V/m
 SWT 2.5 ms 2.479775641 GHz



Date: 10.SEP.2012 09:16:33

Radiated field strength, HP, 2480 MHz

4.5 Spurious Emissions (Radiated)

Para. No.: 15.247 (c)

Test Performed By: Thomas Dangle	Date of Test: 14 & 27 June 2012
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Test Results: Complies

Measurement Data:

Band-edge, @3m

Frequency	Measured Field Strength @3m, dBµV/m	Detector	Limit dBµV/m	Margin dB
2.39 GHz	46.5 ¹	AV	54	7.5
	54.9	PK	74	19.1
2.4835 GHz	54.0 ¹	AV	54	0.0
	57.8	PK	74	16.2

¹ Includes 3.8 dB Duty Cycle Correction Factor

See attached plots.

Duty cycle correction for the upper band-edge is

$$-20 \log (dc) = (97.21 - 39.39) - 54 = 3.8 \text{ dB}$$

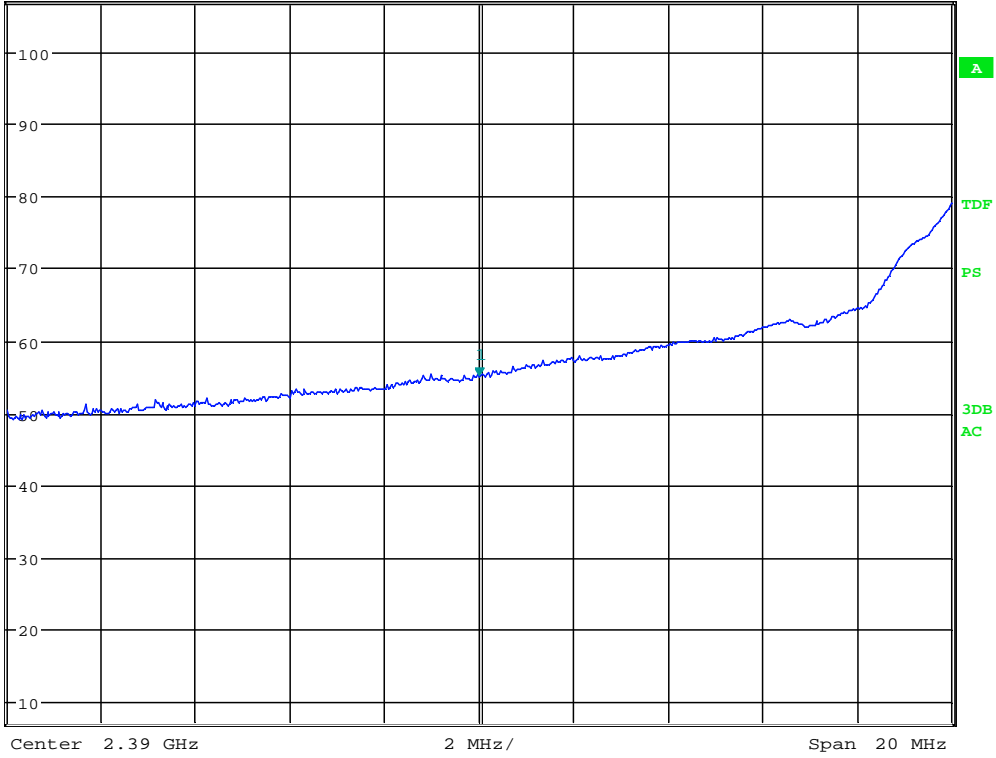
The worst case duty cycle is 64.4 %



* RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 54.91 dBμV/m
 SWT 2.5 ms 2.390000000 GHz

Ref 107 dBμV/m * Att 10 dB

1 PK
 MAXH

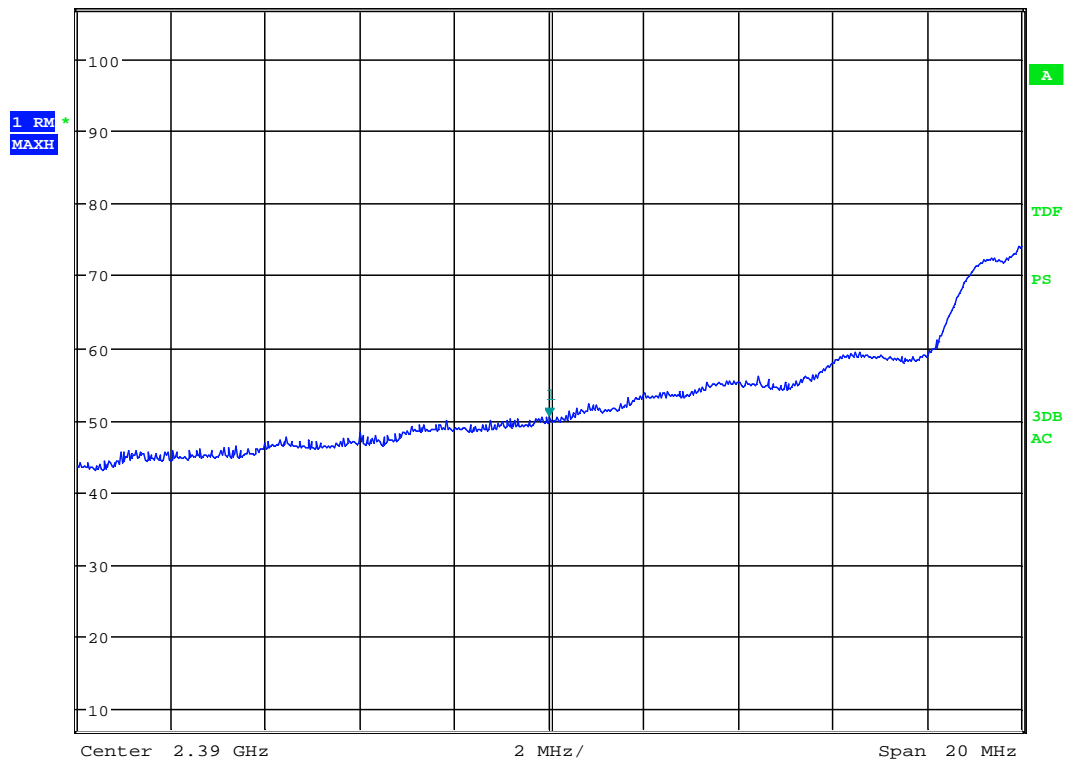


Date: 11.SEP.2012 10:04:36

Band Edge, 2390 MHz, Peak Detector



Ref 107 dB μ V/m * Att 10 dB * RBW 1 MHz Marker 1 [T1]
 VBW 10 MHz 50.34 dB μ V/m
 SWT 2.5 ms 2.390000000 GHz



Date: 11.SEP.2012 10:03:03

Band Edge, 2390 MHz, RMS Detector

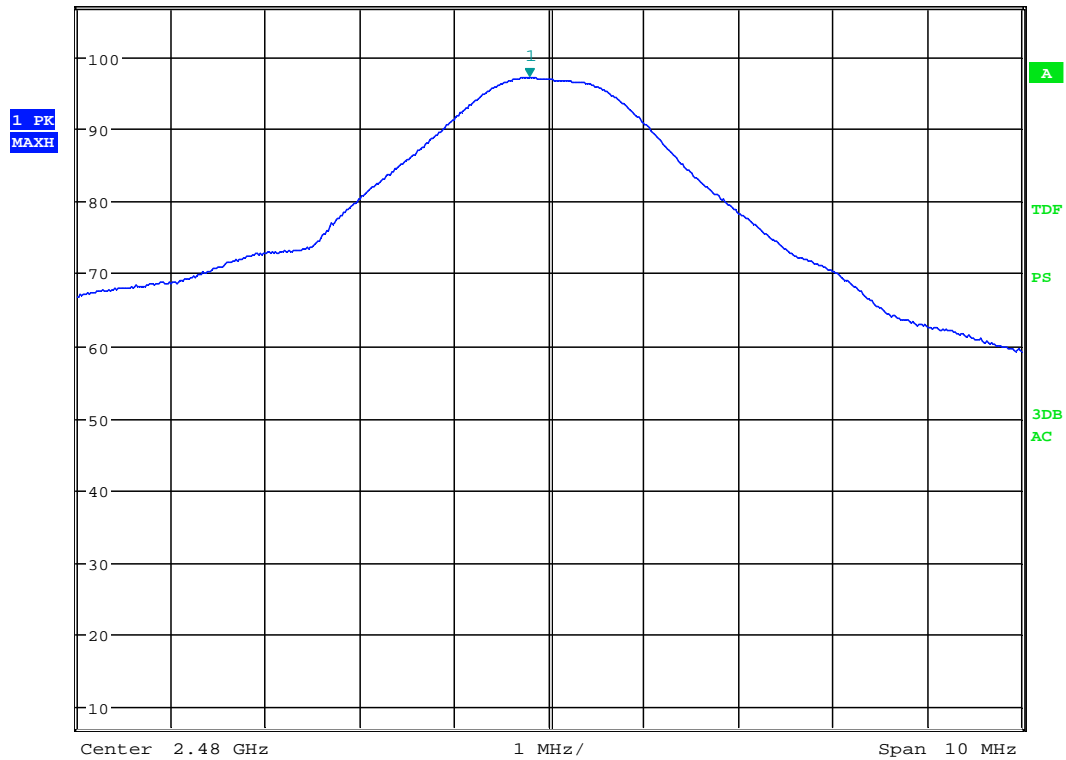


Date: 11.SEP.2012 10:12:14

Band Edge, 2483.5 MHz, Peak detector – Delta Marker



Ref 107 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 97.21 dB μ V/m
 SWT 2.5 ms 2.479791667 GHz



Date: 11.SEP.2012 10:49:48

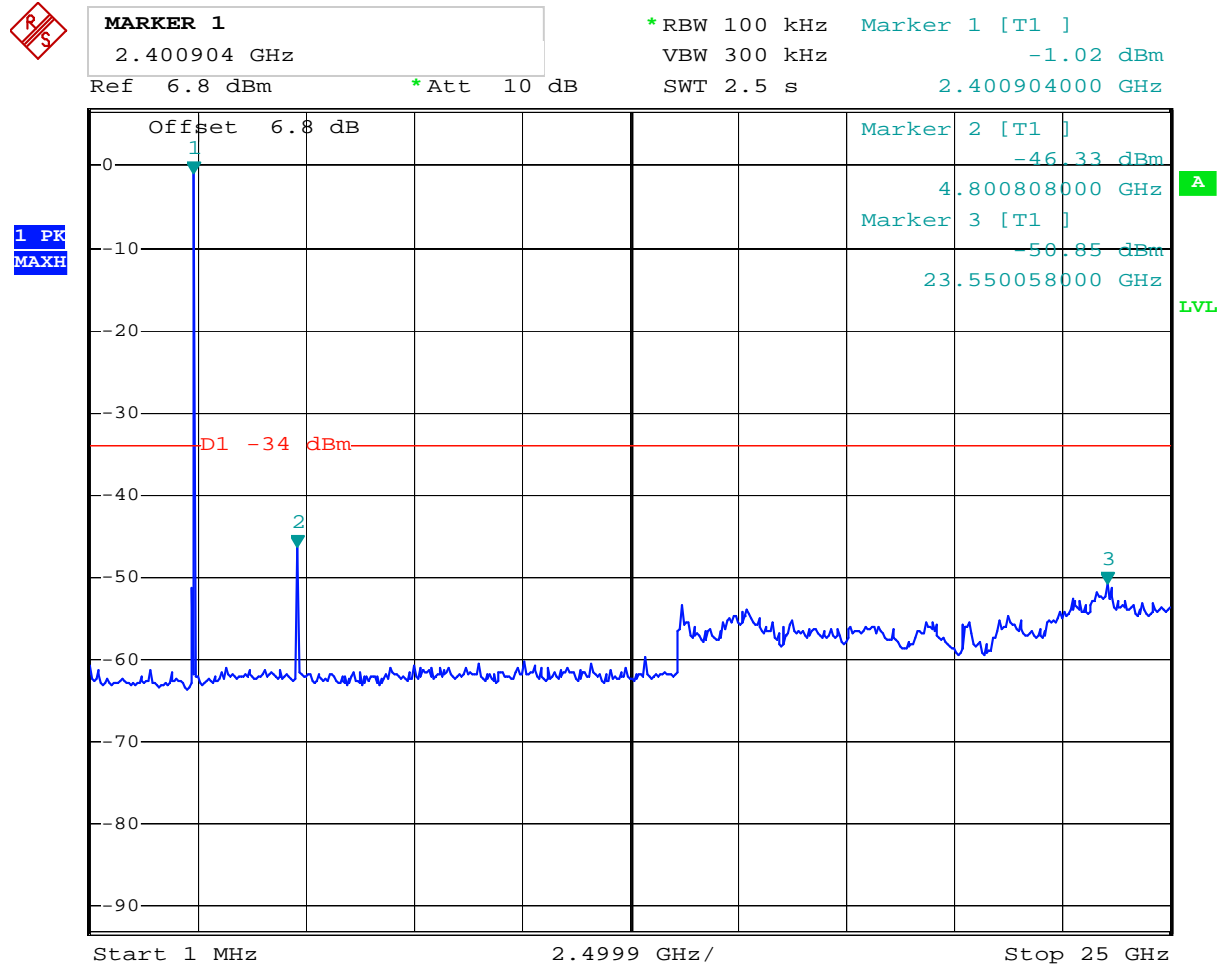
Band Edge, 2483.5 MHz, Max power with Peak detector

RF conducted power

Scan performed radiated with 100 kHz Bandwidth from 1 MHz to 25 GHz.

All emissions are more than 20dB below carrier.

See attached plots.



Date: 10.SEP.2012 13:57:48

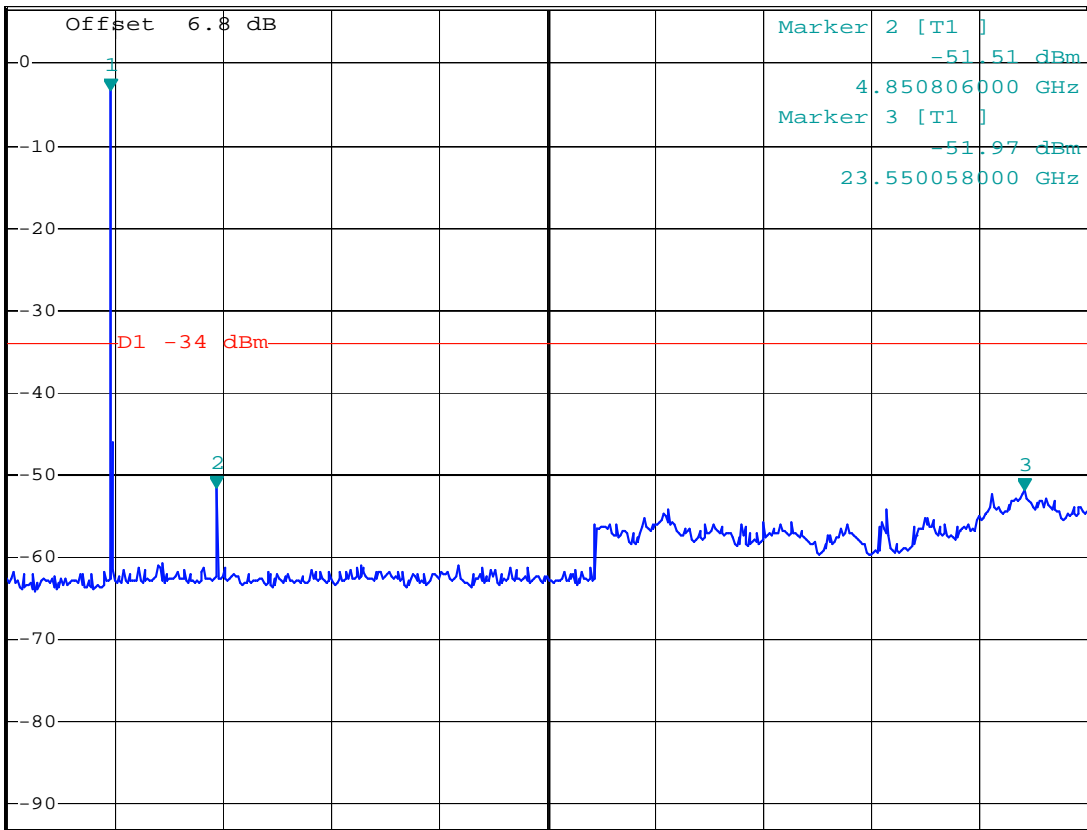
Ch 2402 MHz, Conducted Emissions, 1 MHz – 25 GHz



MARKER 1
 2.400904 GHz
 Ref 6.8 dBm * Att 10 dB

*RBW 100 kHz Marker 1 [T1]
 VBW 300 kHz -3.39 dBm
 SWT 2.5 s 2.400904000 GHz

1 PK
 MAXH



Offset 6.8 dB
 Start 1 MHz 2.4999 GHz/ Stop 25 GHz

Date: 10.SEP.2012 14:02:44

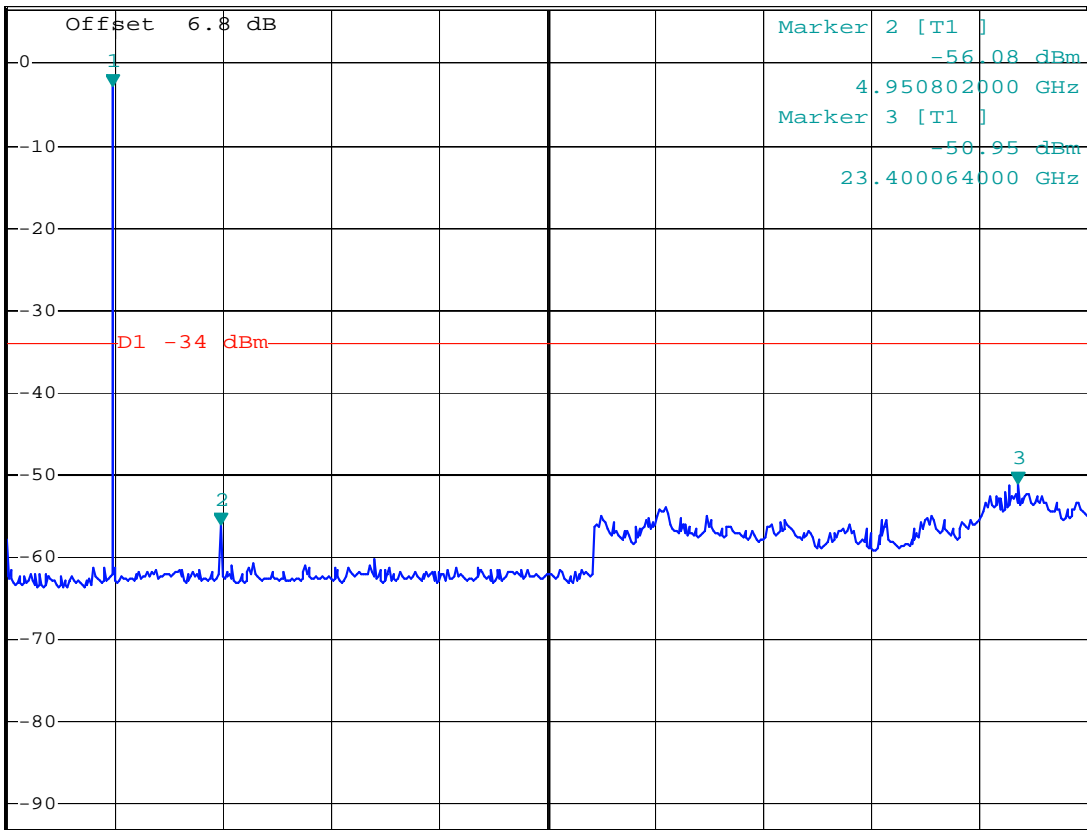
Ch 2440 MHz, Conducted Emissions, 1 MHz – 25 GHz



MARKER 1
 2.450902 GHz
 Ref 6.8 dBm * Att 10 dB

*RBW 100 kHz Marker 1 [T1]
 VBW 300 kHz -2.91 dBm
 SWT 2.5 s 2.450902000 GHz

1 PK
 MAXH



Start 1 MHz 2.4999 GHz/ Stop 25 GHz

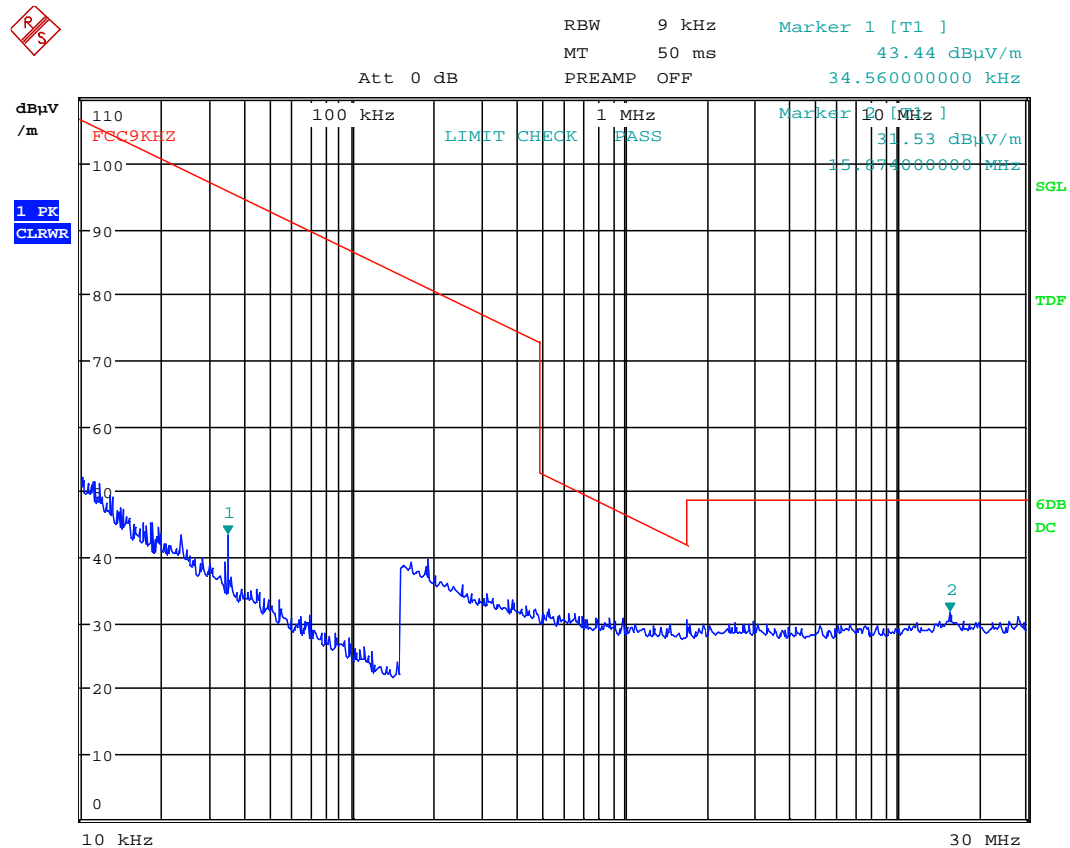
Date: 10.SEP.2012 14:04:04

Ch 2480 MHz, Conducted Emissions, 1 MHz – 25 GHz

Radiated emissions 9kHz - 30 MHz.

Detector: Quasi-Peak

Measuring distance 10 m.



Date: 11.SEP.2012 15:11:12

Radiated Emissions, 9 kHz – 30 MHz @10m – TX on at ch. 2440 MHz

Radiated emission 30 – 1000 MHz.

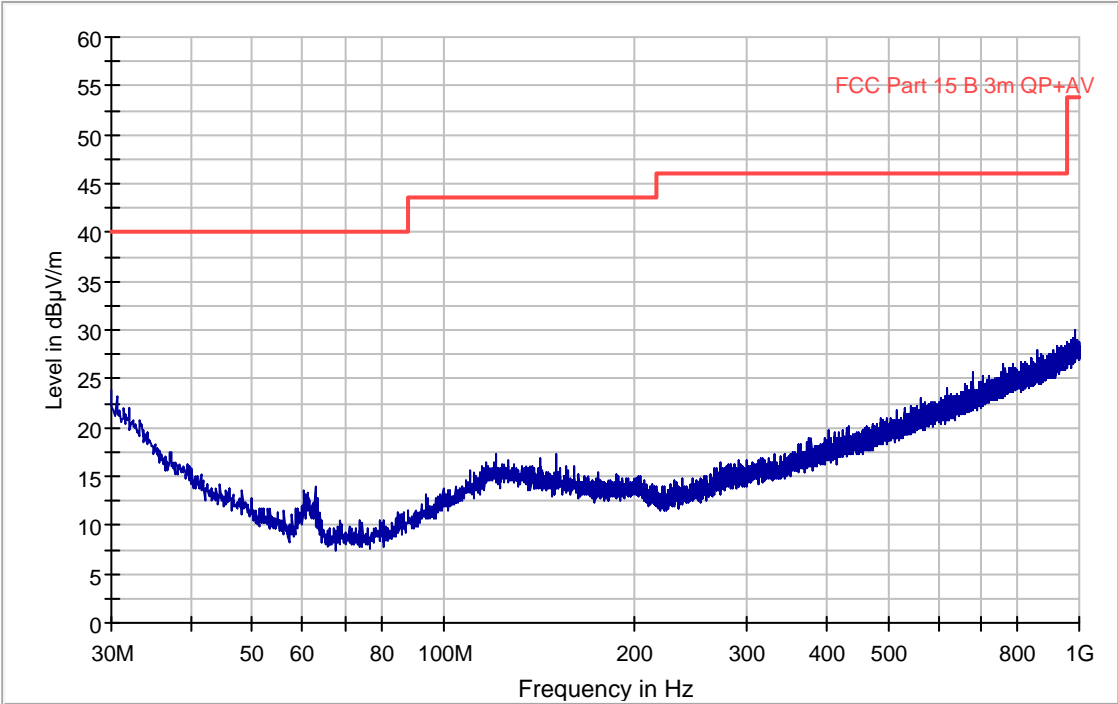
Detector: Peak

Measuring distance at 3m.

All values are below the limit even when measured with Peak Detector.

See attached plot.

FCC Pt15 Class B 30-1000M 3m



Radiated Emissions, 30 – 1000 MHz, VP and HP, @3m – TX on at ch. 2440 MHz

Radiated Emissions, 1-25 GHz

1-3 GHz measured at a distance of 3 m

3 - 18 GHz measured at 1m

Prescan performed from 18 to 25 GHz.

Pk Det:

Frequency MHz	Field strength @1 & 3m dB μ V/m	Detector	Limit dB μ V/m	Margin dB
4804	41.8	Pk	74	32.22
4882	46.5	Pk	74	27.53
4958	49.8	Pk	74	24.21

Av Det (calculated):

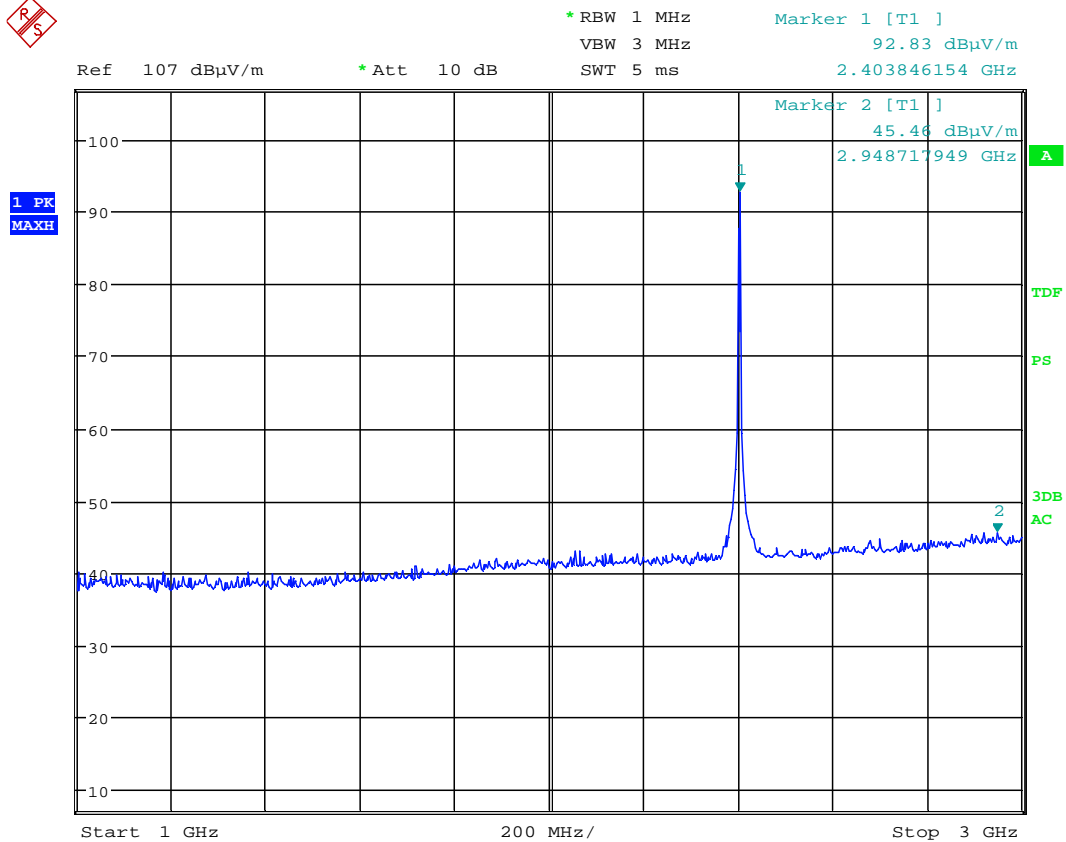
Frequency MHz	Field strength @1 & 3m dB μ V/m	Detector	Limit dB μ V/m	Margin dB
4804	38.0	AV	54	16.02
4882	42.7	AV	54	11.33
4958	46.0	AV	54	8.01

Average Detector values above includes 3.8 dB Duty Cycle Correction.

All emissions are below the Average Limit, even when measured with Peak Detector.

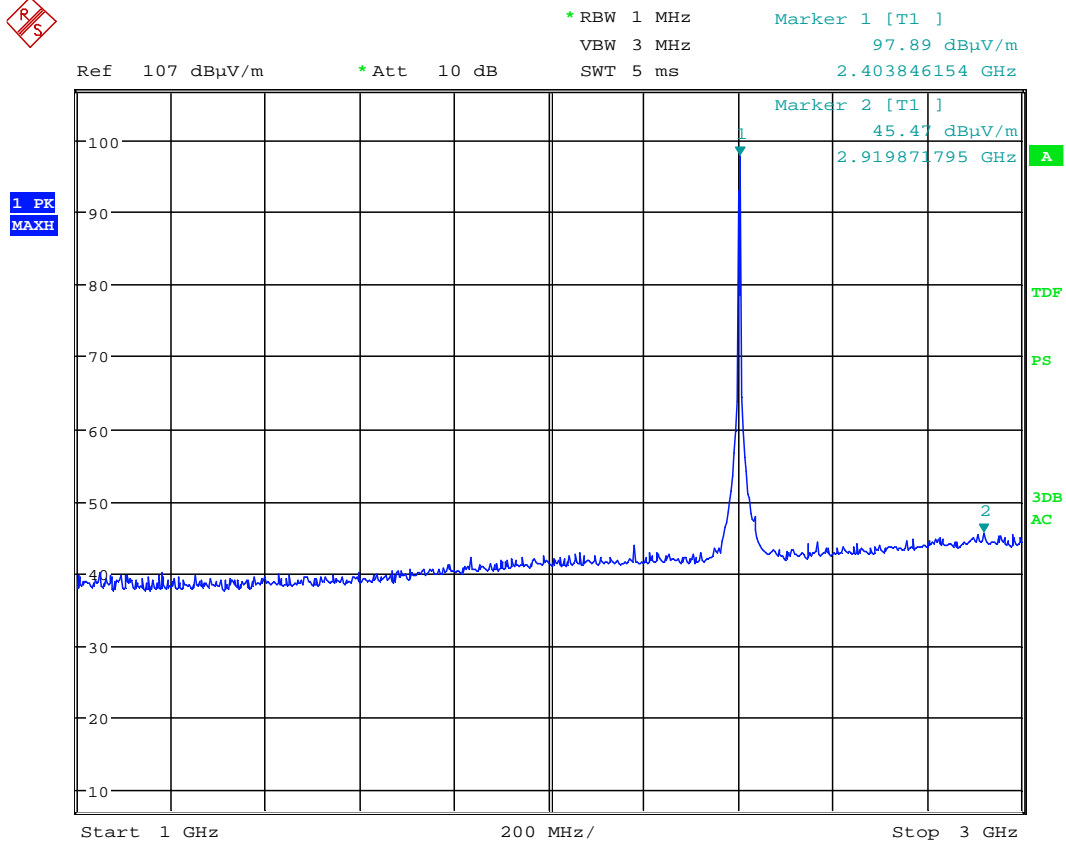
Antenna factor, amplifier gain and cable loss are included in Spectrum Analyzer "Transducer factor".

See attached graphs.



Date: 11.SEP.2012 09:27:51

Radiated Emissions ch. 2402 MHz, 1 – 3 GHz, VP, @3m – Pre-scan with Peak detector

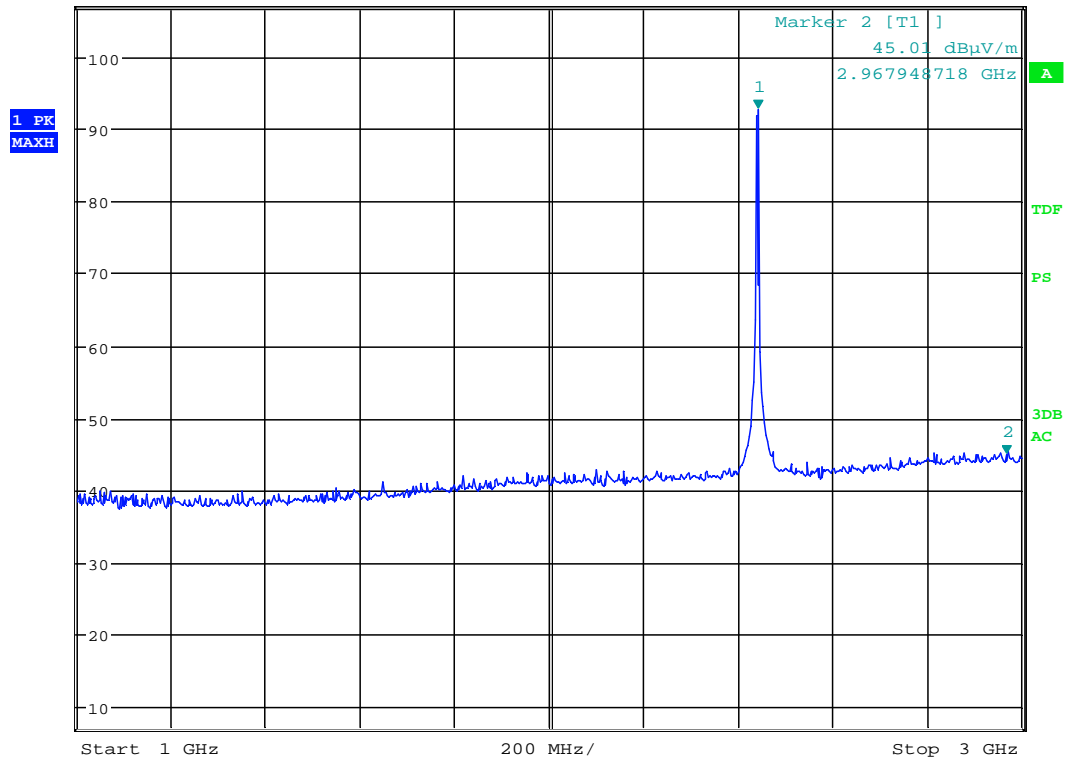


Date: 11.SEP.2012 09:25:02

Radiated Emissions ch. 2402 MHz, 1 – 3 GHz, HP, @3m – Pre-scan with Peak detector



Ref 107 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 92.75 dB μ V/m
 SWT 5 ms 2.442307692 GHz

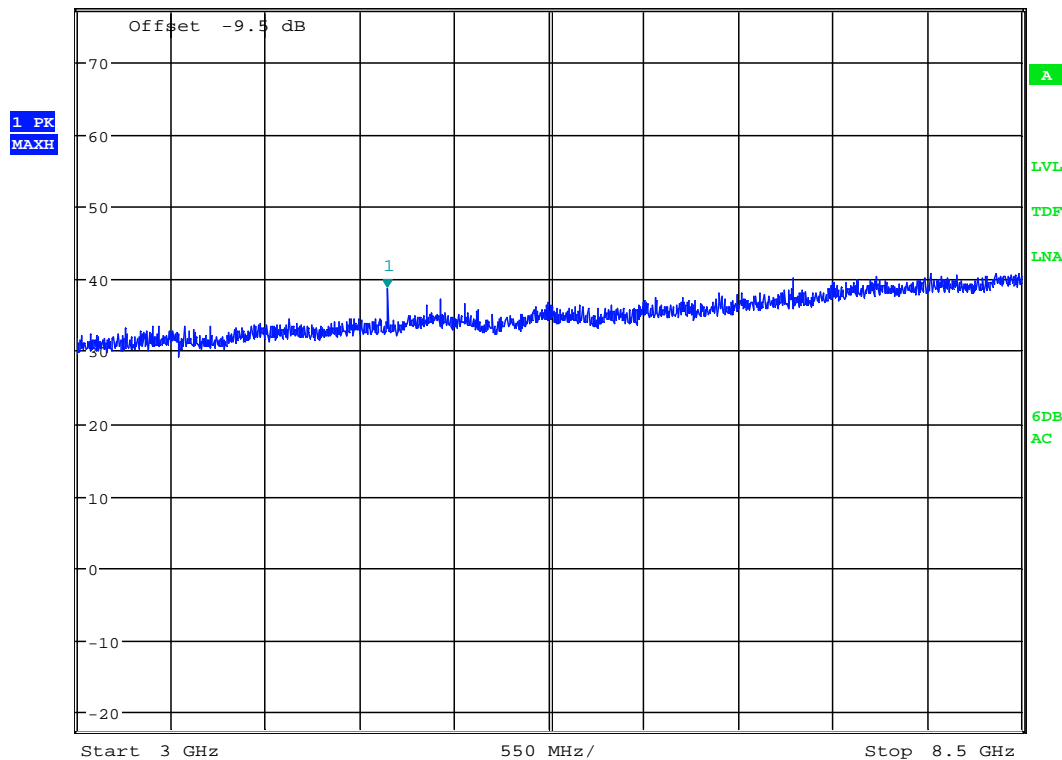


Date: 11.SEP.2012 09:30:53

Radiated Emissions ch. 2440 MHz, 1 – 3 GHz, VP, @3m – Pre-scan with Peak detector



Ref 77.5 dBµV/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 38.77 dBµV/m
 SWT 35 ms 4.806200000 GHz

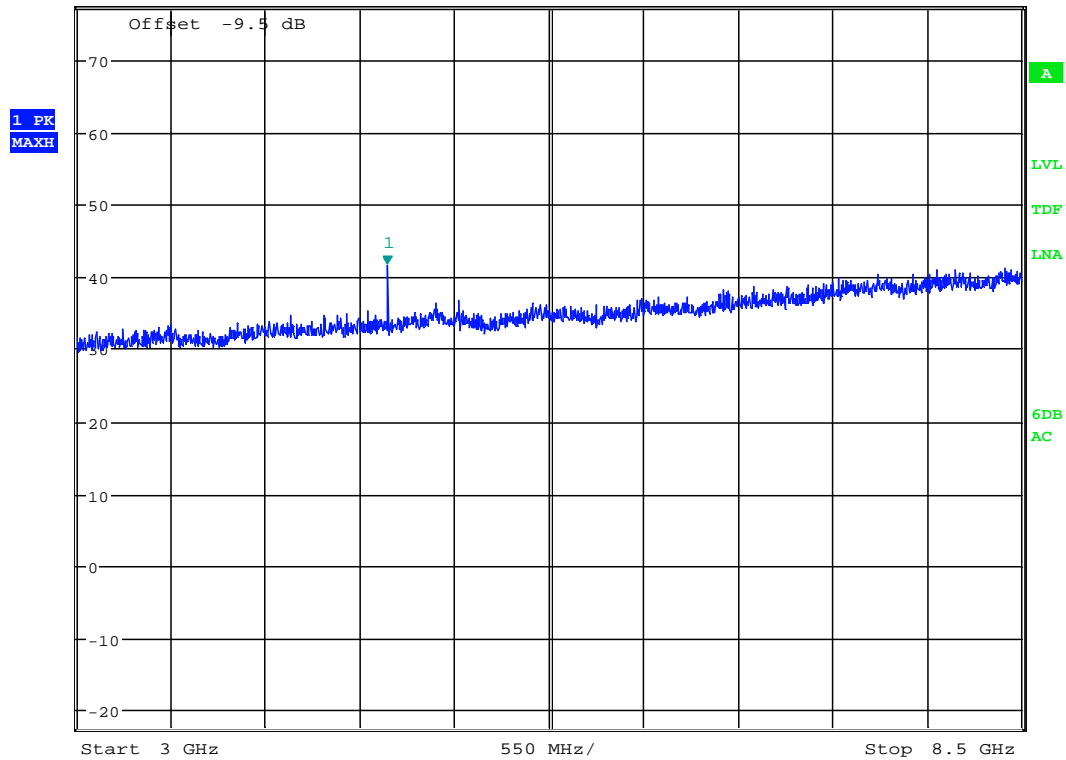


Date: 11.SEP.2012 13:29:05

Radiated Emissions ch. 2402 MHz, 3 – 8.5 GHz, HP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 77.5 dBµV/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 41.78 dBµV/m
 SWT 35 ms 4.806200000 GHz

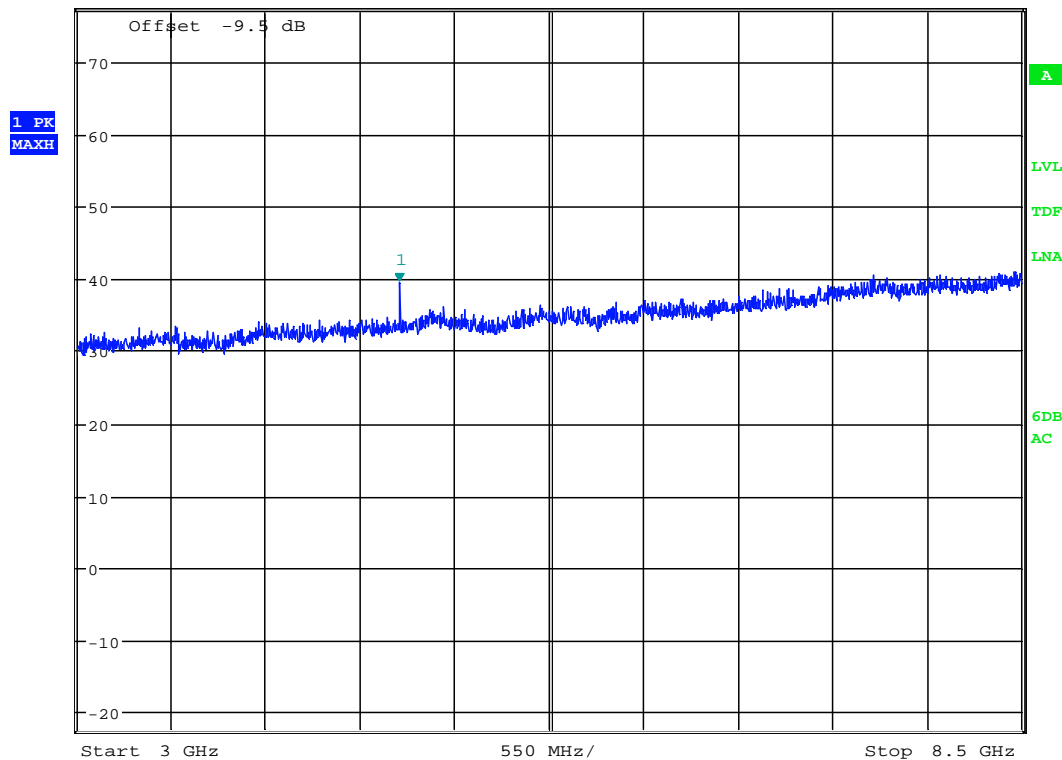


Date: 11.SEP.2012 13:26:10

Radiated Emissions ch. 2402 MHz, 3 – 8.5 GHz, VP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 77.5 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 39.65 dB μ V/m
 SWT 35 ms 4.881000000 GHz

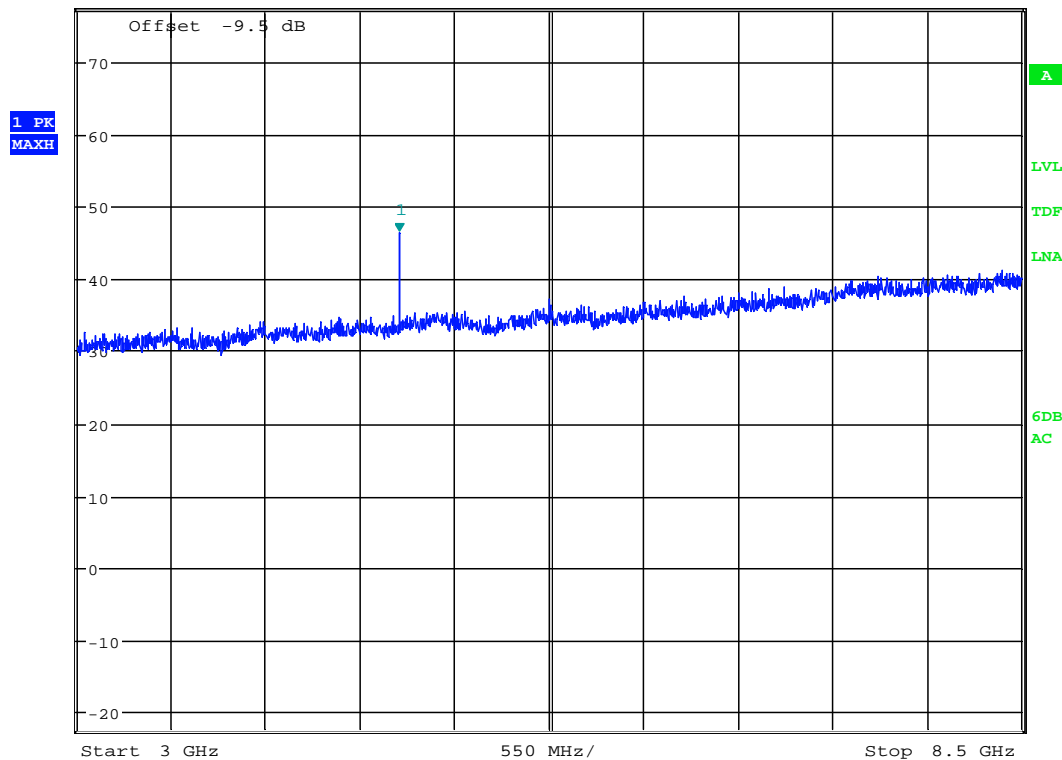


Date: 11.SEP.2012 13:31:29

Radiated Emissions ch. 2440 MHz, 3 – 8.5 GHz, HP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 77.5 dBµV/m * Att 10 dB * RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 46.47 dBµV/m
 SWT 35 ms 4.881000000 GHz

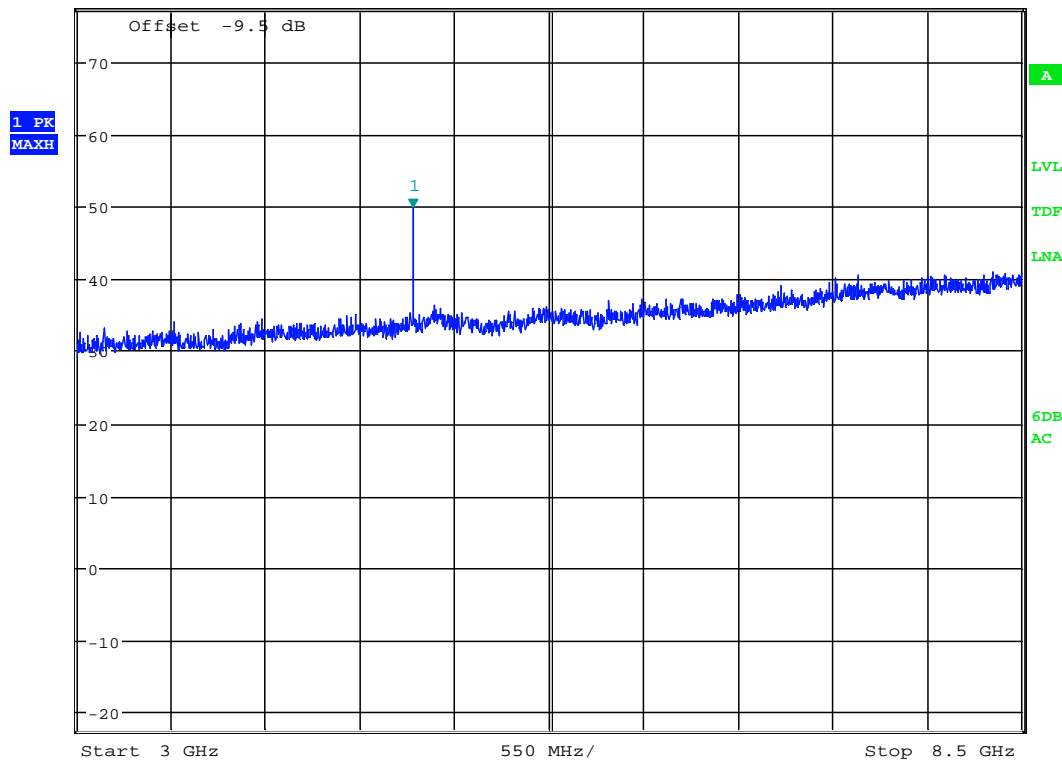


Date: 11.SEP.2012 13:33:32

Radiated Emissions ch. 2440 MHz, 3 – 8.5 GHz, VP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 77.5 dBµV/m * Att 10 dB * RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 49.79 dBµV/m
 SWT 35 ms 4.958000000 GHz

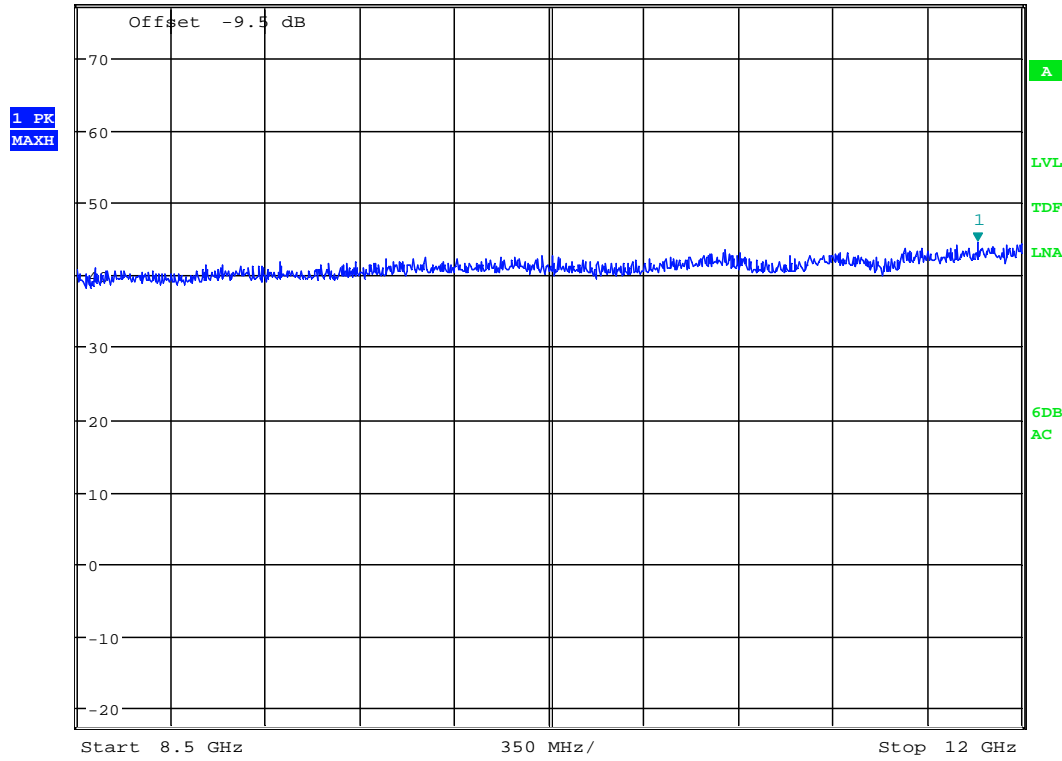


Date: 11.SEP.2012 13:40:17

Radiated Emissions ch. 2480 MHz, 3 – 8.5 GHz, VP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 87 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 44.52 dB μ V/m
 SWT 25 ms 11.834800000 GHz

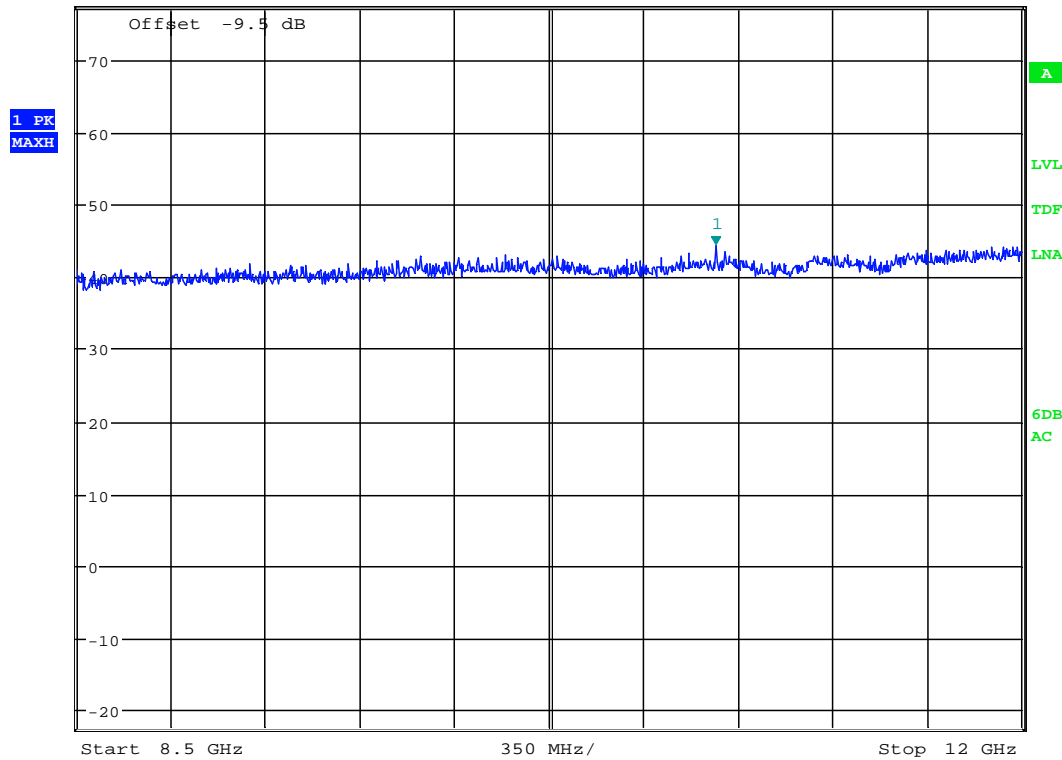


Date: 11.SEP.2012 14:14:44

Radiated Emissions ch. 2440 MHz, 8.5 – 12 GHz, HP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 87 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 44.32 dB μ V/m
 SWT 25 ms 10.868800000 GHz

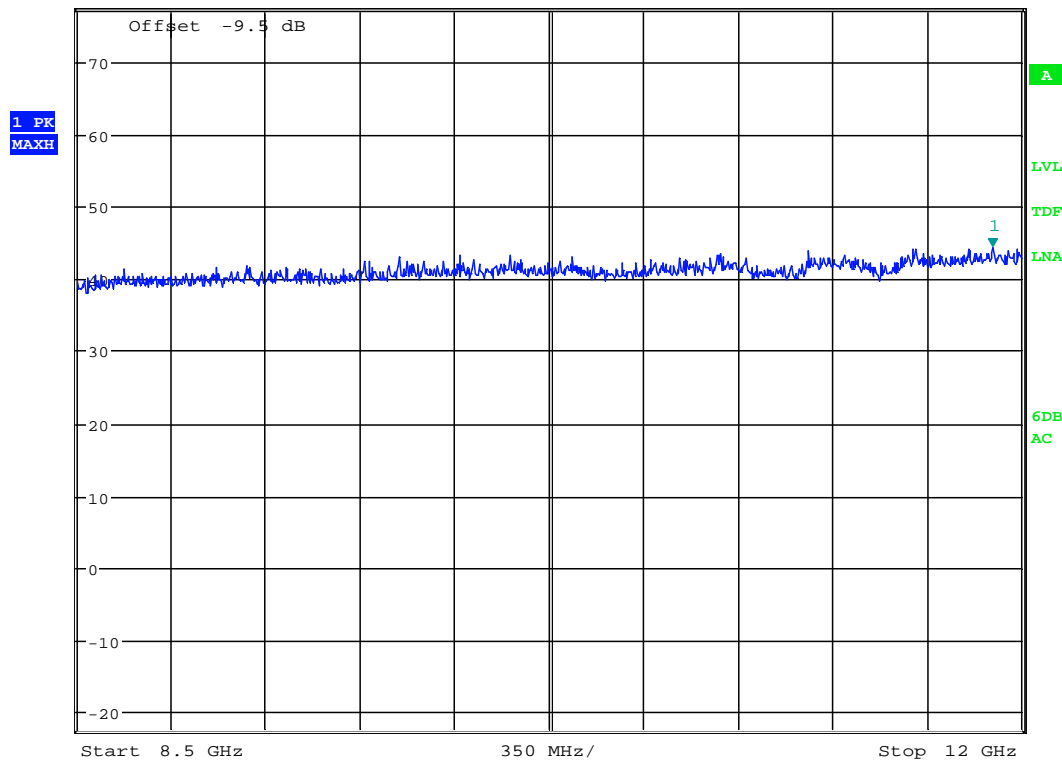


Date: 11.SEP.2012 14:17:09

Radiated Emissions ch. 2440 MHz, 8.5 – 12 GHz, VP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 87 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 44.43 dB μ V/m
 SWT 25 ms 11.893600000 GHz

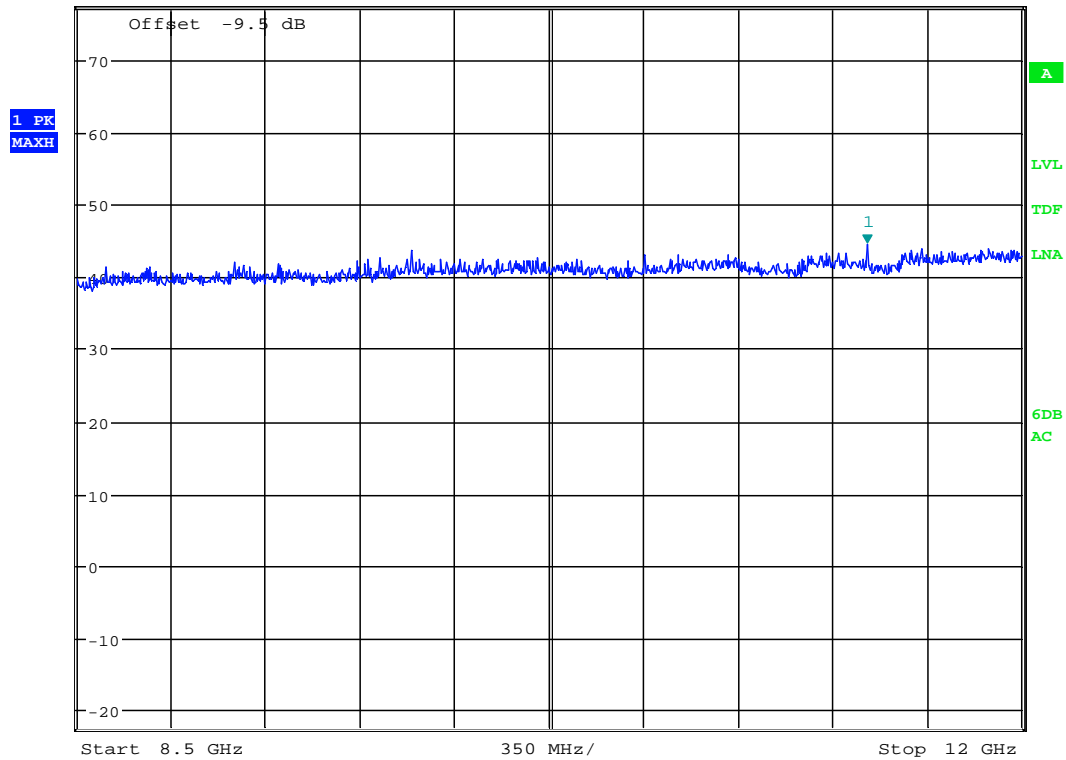


Date: 11.SEP.2012 14:21:35

Radiated Emissions ch. 2480 MHz, 8.5 – 12 GHz, HP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 87 dB μ V/m *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 44.52 dB μ V/m
 SWT 25 ms 11.426000000 GHz

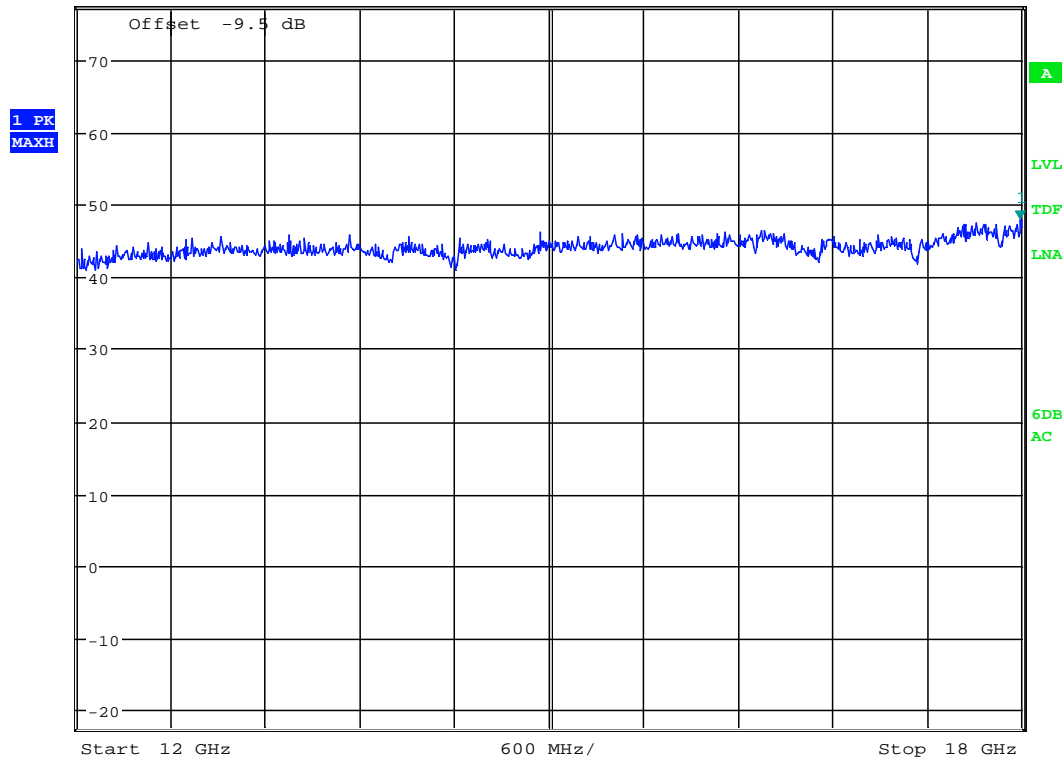


Date: 11.SEP.2012 14:19:28

Radiated Emissions ch. 2480 MHz, 8.5 – 12 GHz, VP, @1m – Pre-scan with Peak detector and High Pass filter



Ref 77.5 dBµV *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 48.04 dBµV
 SWT 35 ms 17.985600000 GHz

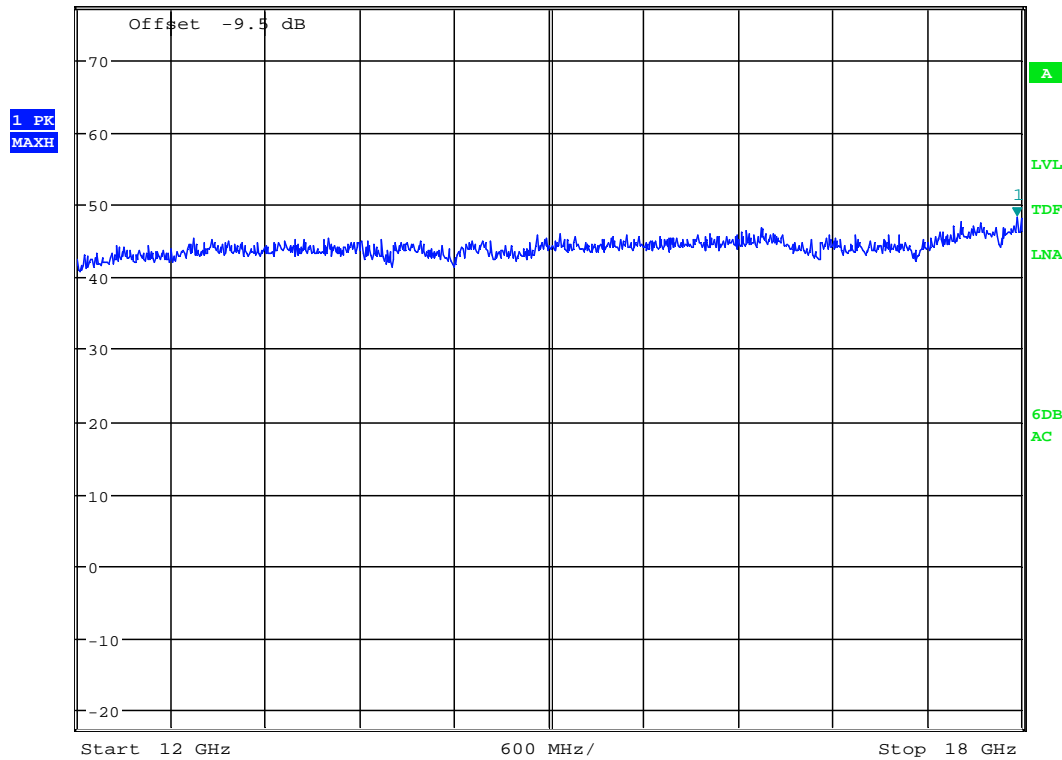


Date: 11.SEP.2012 14:36:53

Radiated Emissions ch. 2440 MHz, 12 – 18 GHz, VP, @1m – Pre-scan with Peak detector



Ref 77.5 dBµV *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 48.32 dBµV
 SWT 35 ms 17.971200000 GHz

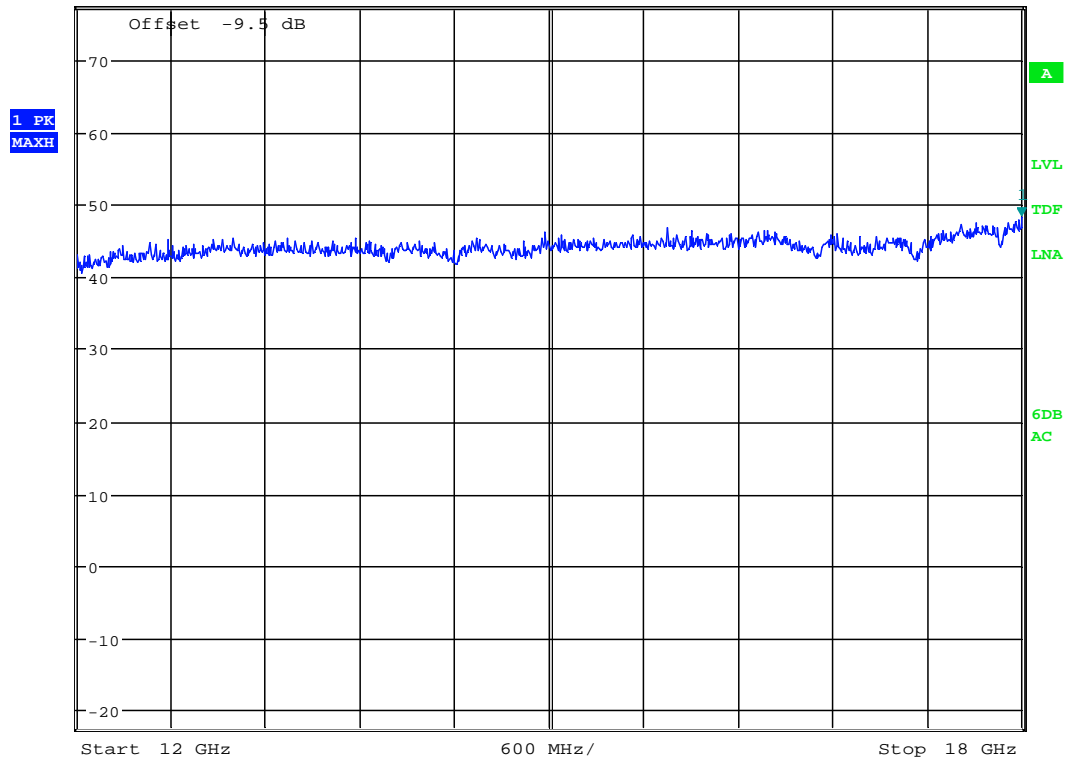


Date: 11.SEP.2012 14:35:09

Radiated Emissions ch. 2440 MHz, 12 – 18 GHz, HP, @1m – Pre-scan with Peak detector



Ref 77.5 dBµV *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 48.33 dBµV
 SWT 35 ms 18.000000000 GHz

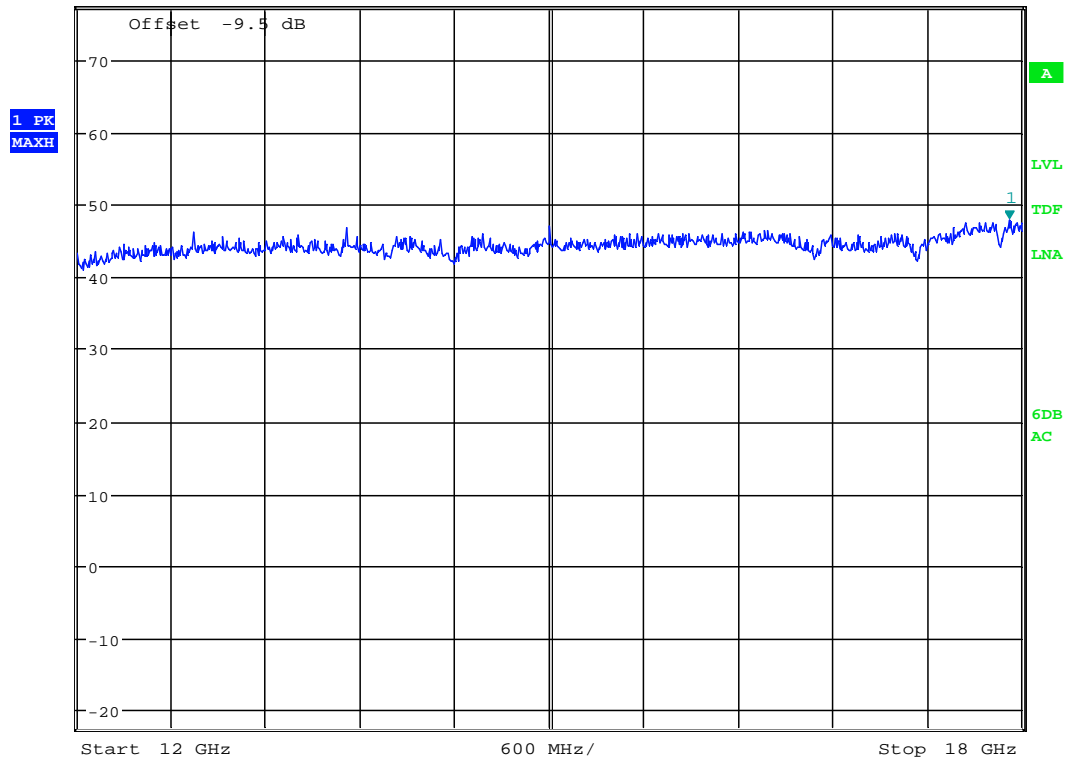


Date: 11.SEP.2012 14:29:32

Radiated Emissions ch. 2480 MHz, 12 – 18 GHz, VP, @1m – Pre-scan with Peak detector



Ref 77.5 dBµV *Att 10 dB *RBW 1 MHz Marker 1 [T1]
 VBW 3 MHz 48.07 dBµV
 SWT 35 ms 17.918400000 GHz



Date: 11.SEP.2012 14:32:46

Radiated Emissions ch. 2480 MHz, 12 – 18 GHz, HP, @1m – Pre-scan with Peak detector

4.6 Power Spectral Density (PSD)

Para. No.: 15.247 (e)

Test Performed By: Thomas Dangle	Date of Test: 10 Sept. 2012
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Test Results: Complies

Measured and Calculated Data:

The test procedure in chapter 5.3.1 and the bandwidth correction factor BWCF = -15.2 dB described in guidance on measurements for Digital Transmission Systems is used.

	Measured and calculated peak PSD dBm
Power Spectral Density @2402 MHz	-15.1
Power Spectral Density @2440 MHz	-15.5
Power Spectral Density @2480 MHz	-16.1

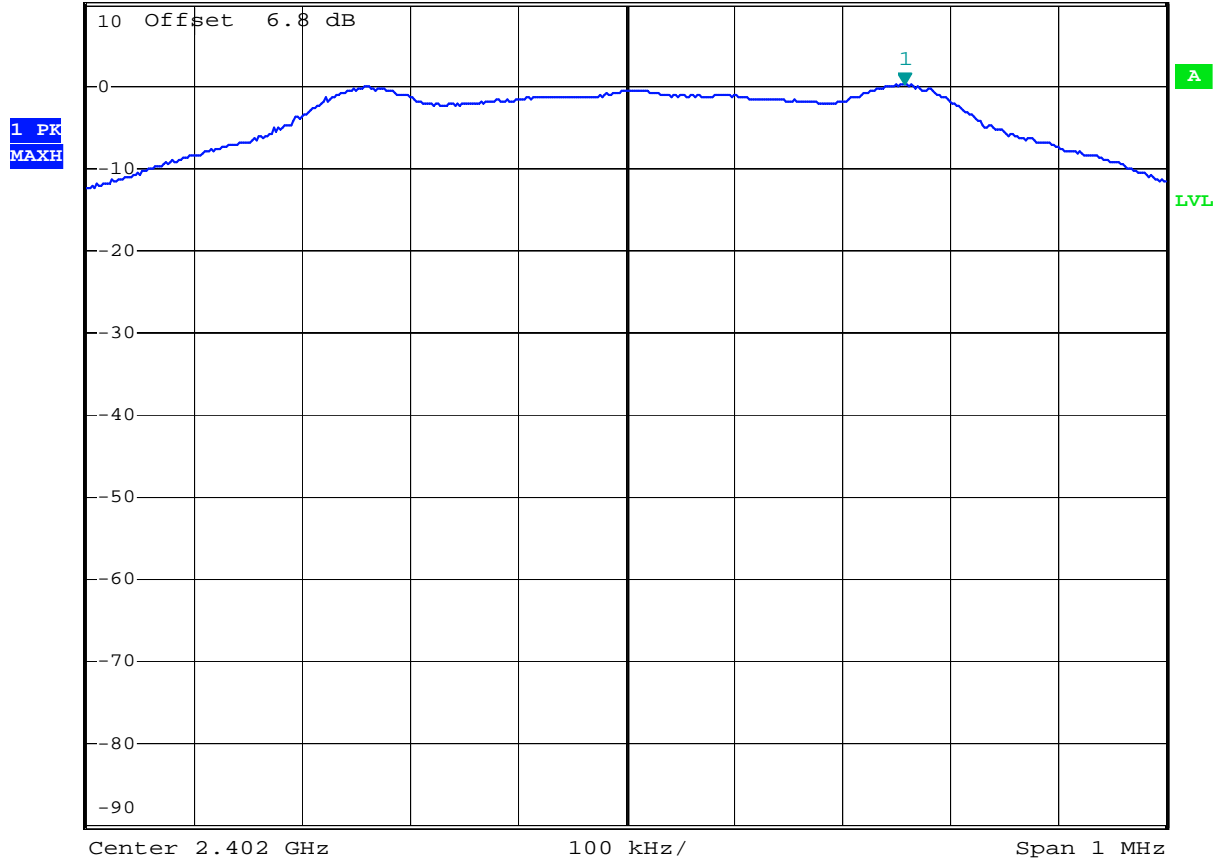
Requirements:

The Power Spectral Density of a Digital Transmission System shall be no greater than +8 dBm in any 3 kHz band.



MARKER 1
 2.402258 GHz
 Ref 10 dBm *Att 20 dB

*RBW 100 kHz Marker 1 [T1]
 VBW 300 kHz 0.11 dBm
 SWT 2.5 ms 2.402258000 GHz



Date: 10.SEP.2012 14:41:22

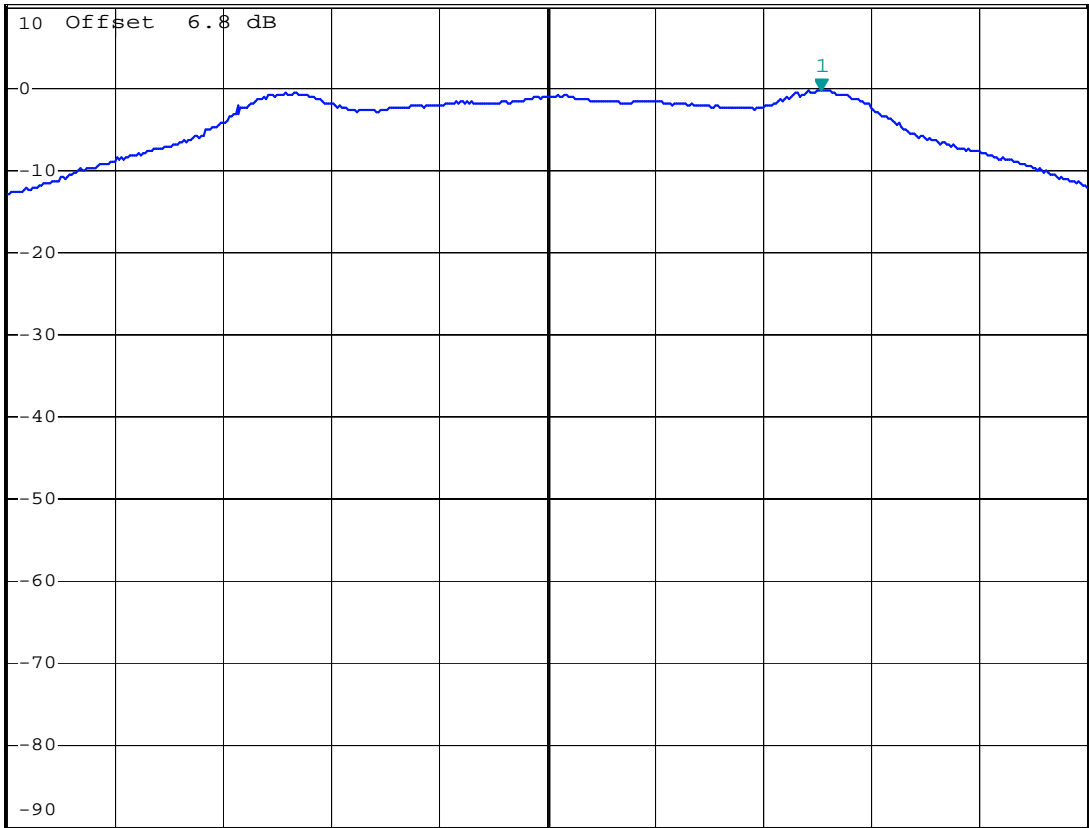
PSD Measurement - 2402MHz



MARKER 1
 2.440254 GHz
 Ref 10 dBm * Att 20 dB

*RBW 100 kHz Marker 1 [T1]
 VBW 300 kHz -0.31 dBm
 SWT 2.5 ms 2.440254000 GHz

1 PK
 MAXH



Center 2.44 GHz 100 kHz/ Span 1 MHz

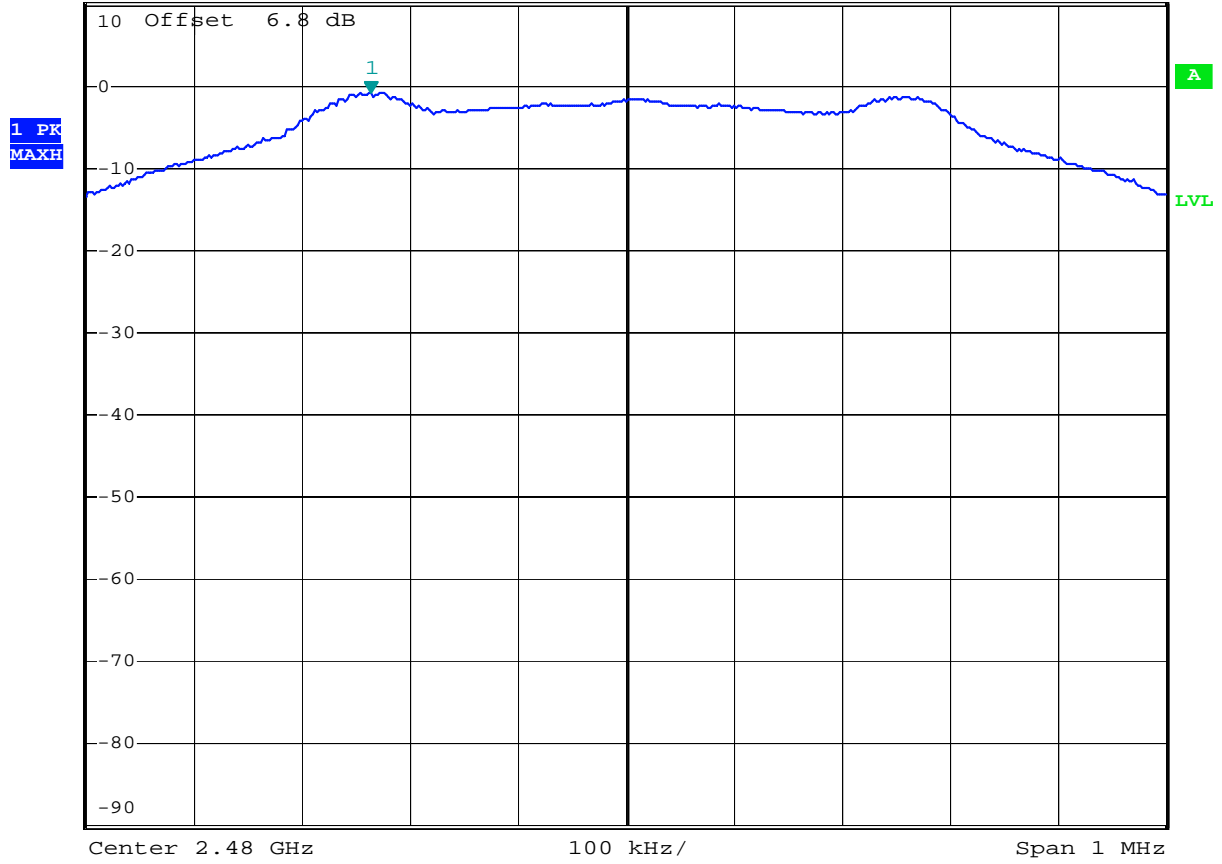
Date: 10.SEP.2012 14:43:39

PSD Measurement – 2440MHz



MARKER 1
 2.479764 GHz
 Ref 10 dBm * Att 20 dB

*RBW 100 kHz Marker 1 [T1]
 VBW 300 kHz -0.97 dBm
 SWT 2.5 ms 2.479764000 GHz



Date: 10.SEP.2012 14:44:35

PSD Measurement - 2480MHz

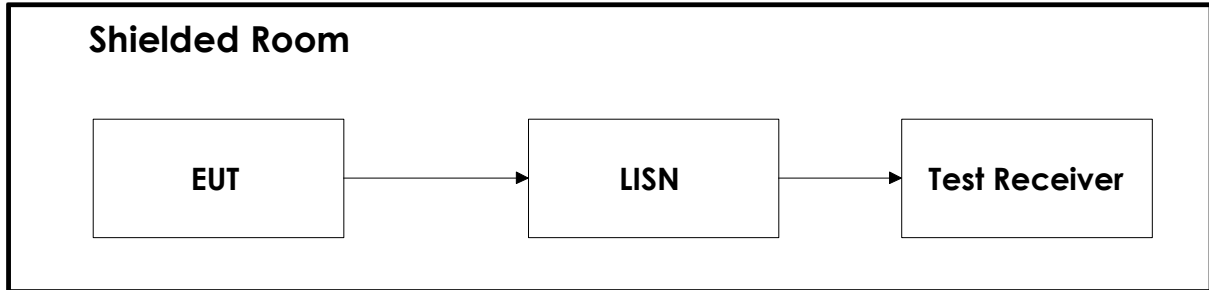
5 LIST OF TEST EQUIPMENT

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.	Instrument/ ancillary	Type of instrument/ ancillary	Manufacturer	Ref. no.	Cal. Date	Cal. Due
1	FSP30	Spectrum Analyzer	Rohde & Schwarz	LR 1551	2012.04.05	2013.04.05
2	ESU40	EMI Receiver	Rohde & Schwarz	LR1639	2010.06	2013.06
3	3115	Antenna horn	EMCO	LR 1330	2010.08.05	2013.08.05
4	643	Antenna horn	Narda	LR 093	2009.01.26	2014.01.26
5	642	Antenna horn	Narda	LR 220	2009.01.26	2014.01.26
6	PM7320X	Antenna horn	Siverts lab	LR 103	2009.01.26	2014.01.26
7	DBF-520-20	Antenna horn	Systron Donner	LR 101	2009.01.26	2014.01.26
8	638	Antenna horn	Narda	LR 098	2010.06.17	2015.06.17
9	VULB 9163	Antenna TriLog	Schwarzbeck	LR1616	2010-08	2012-08
10	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2011-09-27	2012-09-27
11	LNA6900	Pre-amplifier	Teseq	LR 1593	2011-11	2012-11
12	ESCI	Test Receiver	Rohde & Schwarz	N-4529	2010.11.08	2012.11.08
13	ESH3-Z3	LISN	Rohde & Schwarz	LR 1076	2011-11-03	2013-11-03
14	80S	Signal Generator	Powertron	LT 502	Cal b4 use	
15	Model 87 V	Multimeter	Fluke	LR 1598	2011-12-14	2012-12-14
17	FSU26	Spectrum Analyzer	Rohde & Schwarz	LR 1504	2010.09.28	2012.09.28
18	ESH3-Z2	Puls Limiter	Rohde & Schwarz	N-3932	2010.11.04	2012.11.04
19	6810.17A	10 attenuator	Suhner	LR 1143	2010.09.15	2012.09.15
20	FA210A1010003030	Microwave cable	Rosenberger	LR1566	Cal b4 use	
21	6HC 3000-18000	HP Filter	Trithlic	LR1614	Cal b4 use	

6 BLOCK DIAGRAM

6.1 Power Line Conducted Emission



6.2 Test Site Radiated Emission

