


## Test Report

<b>Product</b>	Evaluation Board for CC2260 BLE System-on-Chip	
<b>Name and address of the applicant</b>	Texas Instruments Norway AS Gaustadalléen 21, NO-0349 Oslo, Norway	
<b>Name and address of the manufacturer</b>	Texas Instruments Norway AS Gaustadalléen 21, NO-0349 Oslo, Norway	
<b>Model</b>	7IDEM	
<b>Rating</b>	3.0Vdc	
<b>Trademark</b>	Texas Instruments	
<b>Serial number</b>	/	
<b>Additional information</b>	BLE, System-on-Chip	
<b>Tested according to</b>	<b>FCC Part 15.247</b> Digital Transmission Systems <b>Industry Canada RSS-210, Issue 8</b> Low Power Licence-Exempt Radiocommunications Devices	
<b>Order number</b>	250971	
<b>Tested in period</b>	2014.01.03 to 2014.01.10	
<b>Issue date</b>	2014.01.24	
<b>Name and address of the testing laboratory</b>	  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 :	Texas Instruments
FCC ID :	ZAT7IDEM
IC :	451H-7IDEM
Model/version :	7IDEM
Serial number :	/
Hardware identity and/or version:	1.2.1
Software identity and/or version :	/
Frequency Range :	2402 – 2480 MHz
Number of Channels :	40
Type of Modulation :	250 kHz, GFSK (Digital)
Conducted Output Power:	3.64 mW (Peak)
User Frequency Adjustment :	None
Type of Power Supply :	3.0V <sub>DC</sub> (2xAAA Battery)
Antenna Connector :	None
Antenna type:	PCB antenna
Number of Antennas :	1
Desktop Charger :	None

### Description of Test Item

The 71DEM RF-transceiver module is an evaluation board for the CC2650 System-on-Chip designed to operate in the 2.4 GHz ISM band. The CC2650 radio complies with the BLE PHY requirements.

### Exposure Evaluation

The EUT is exempted from RF Exposure Evaluation.

## 1.2 Test Environment

### 1.2.1 Normal test condition

Temperature:	21 - 22 °C
Relative humidity:	42 - 48 %
Normal test voltage:	3.0 V DC

The values are the limit registered during the test period.

## 1.3 Test Engineer(s)

G.Suhandhakumar

## 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.

Radiated tests were conducted in accordance with ANSI C63.4-2003 and KDB 558074 D01 DTS Measurement Guidance v03r01. The 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.

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> New Submission  | <input type="checkbox"/> Production Unit                |
| <input type="checkbox"/> Class II Permissive Change | <input checked="" type="checkbox"/> Pre-production Unit |
| <b>DTS</b> Equipment Code                           | <input type="checkbox"/> 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 & RSS-GEN Issue 3	Result
Supply Voltage Variations	15.31(e)	N/A	Complies <sup>1</sup>
Antenna Requirement	15.203	7.1.4 (RSS-GEN)	N/A <sup>2</sup>
Power Line Conducted Emission	15.107(a) 15.207(a)	7.2.2 (RSS-GEN)	N/A <sup>1</sup>
Minimum 6 dB Bandwidth	15.247(a)(2)	A8.2	Complies
Peak Power Output	15.247(b)	A8.4	Complies
Power Spectral Density	15.247(d)	A8.2	Complies
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
Receiver Emissions (Radiated)	N/A	2.3	N/A

<sup>1</sup> EUT is battery operated only.

<sup>2</sup> PCB antenna(integral)

RSS Gen issue 3 covers section 7 & 6

RSS 210 issue 8 covers section A2.9

## 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)

The test is not applicable since the device is battery powered.

Test Performed By: -	Date of Test: -
----------------------	-----------------

Measurement procedure: ANSI C63.4-2003 using 50  $\mu$ H/50 ohms LISN.

Test Results: -

Measurement Data: -

### 3.2 Minimum 6 dB Bandwidth

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

Test Performed By: G.Suhanthakumar	Date of Test: 06 Jan 2014
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Test Results: **Complies**

Measurement Data:

Measured 6 dB Bandwidth (kHz)		
2402MHz	2440 MHz	2480MHz
673.08	777.24	777.24

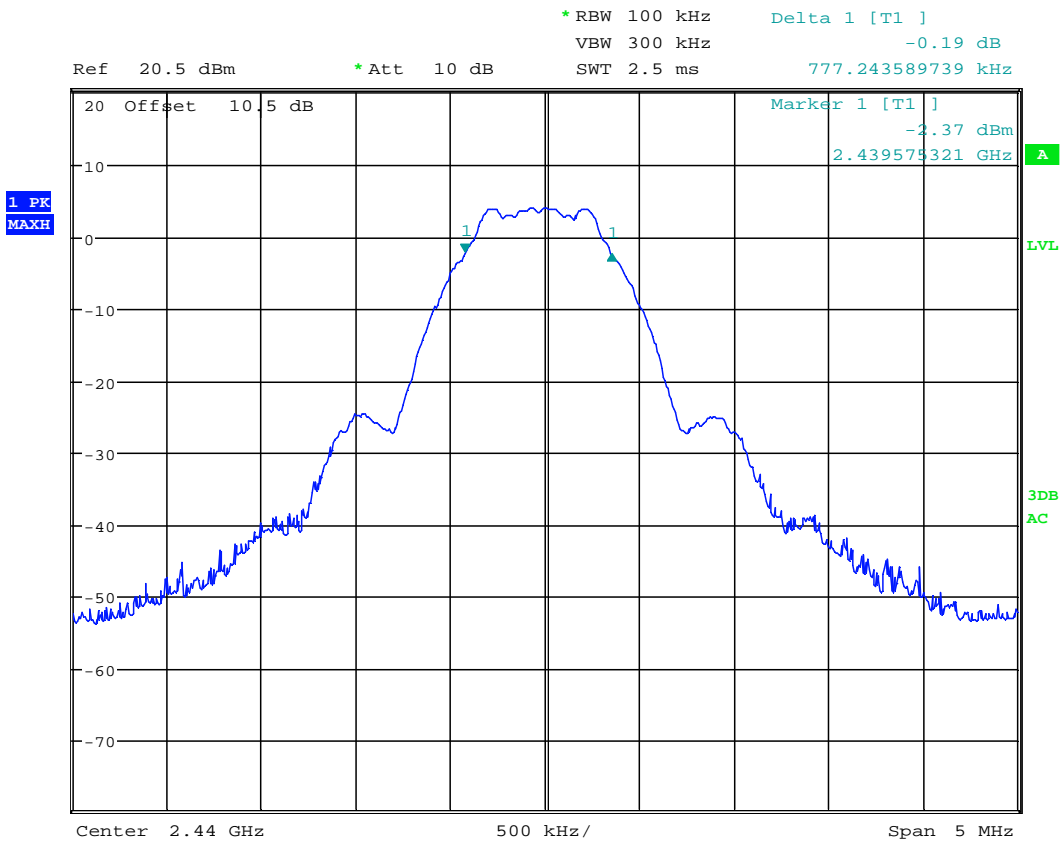
Tested according to KDB 558074 D01 DTS Meas Guidance v03r01, Section 8.1.

**Requirements:**

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

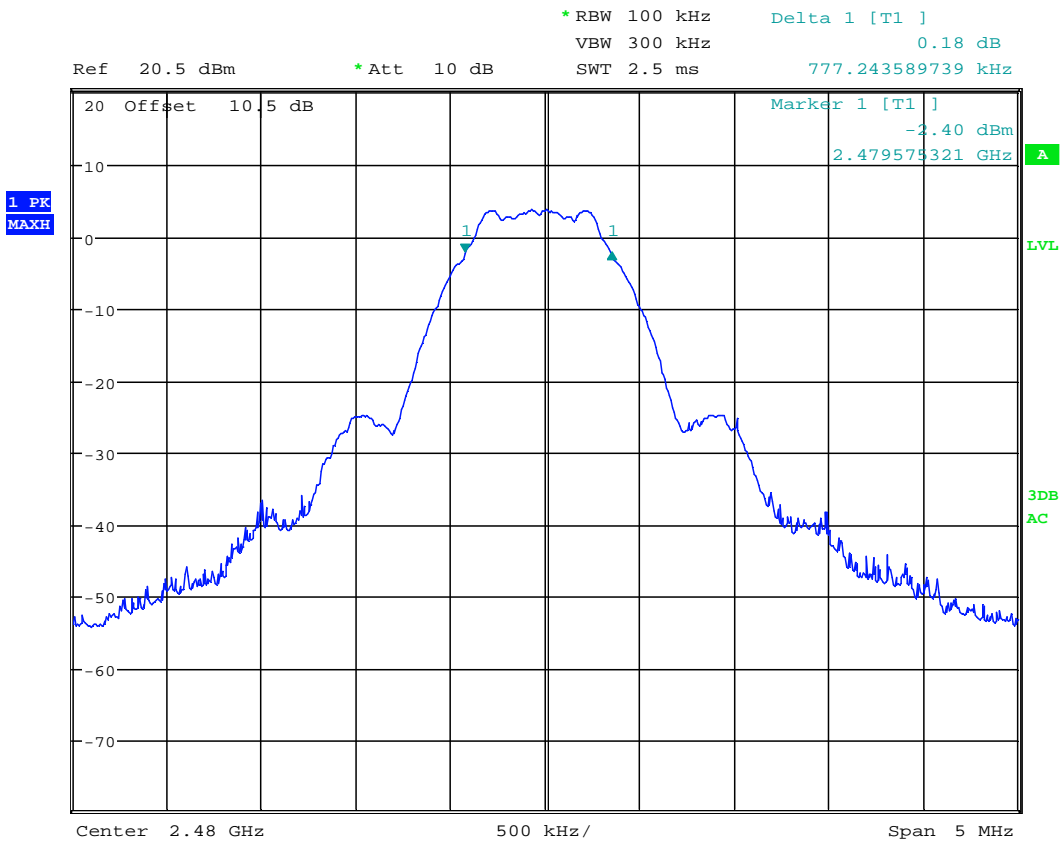






Date: 6.JAN.2014 16:27:47

**6 dB Bandwidth at 2440 MHz**



Date: 6.JAN.2014 16:26:26

**6 dB Bandwidth at 2480 MHz**

### 3.3 20 dB Bandwidth

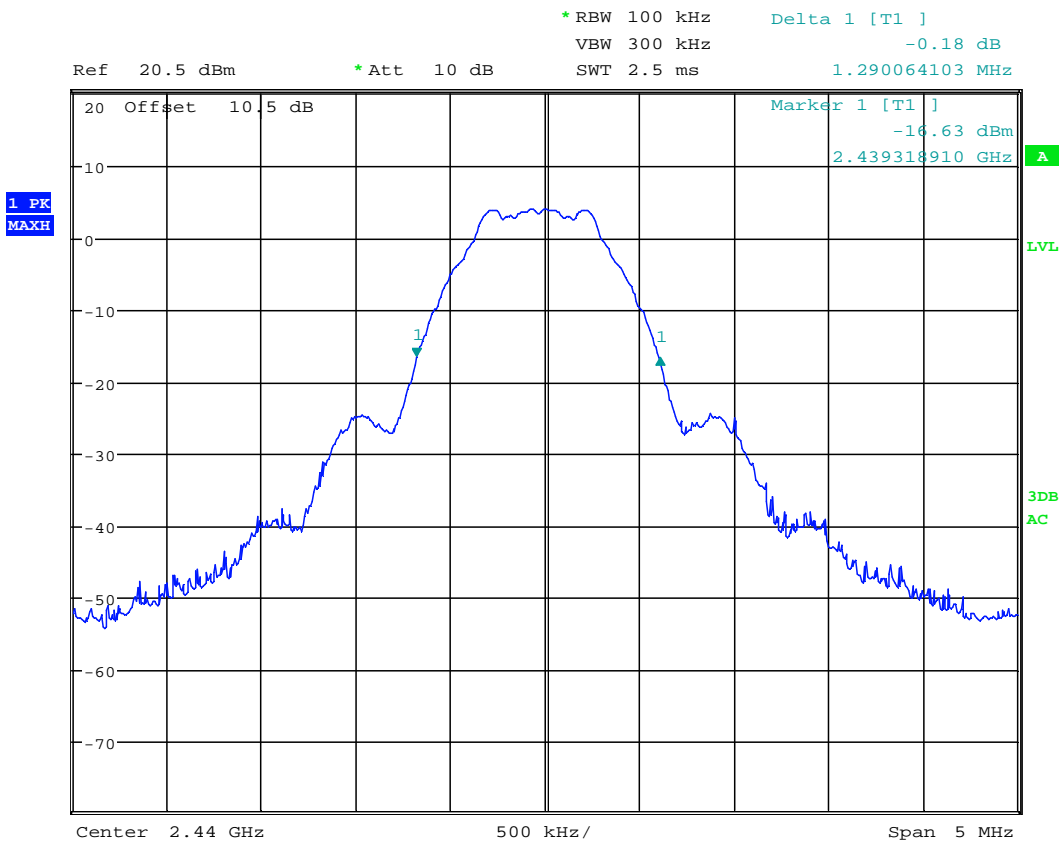
Test Performed By: G.Suhanthakumar	Date of Test: 06 Jan 2014
------------------------------------	---------------------------

**Measurement Data:**

<b>Measured 20 dB Bandwidth (MHz)</b>
<b>2440 MHz</b>
1.29

**Requirements:**

No requirements. Reported for information only.



Date: 6.JAN.2014 16:29:58

**20 dB Bandwidth at 2440 MHz**

### 3.4 Peak Power Output

Para. No.: 15.247 (b)

Test Performed By: G.Suhanthakumar	Date of Test: 03 Jan 2014
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Test Results: Complies

**Measurement Data:**

RF channel	2402 MHz	2440 MHz	2480 MHz
Measured Maxium Field strength (dB $\mu$ V/m) –VP	103.28	103.54	103.88
Calc. Radiated Power (dBm)	8.02	8.28	8.62
Calc. Radiated Power (mW)	6.34	6.73	7.28
Measured Conducted Power (dBm)	5.61	5.42	5.22
Measured Conducted Power (mW)	3.64	3.48	3.32
Calculated Antenna Gain (dBi)	2.41	2.86	3.40

Tested according to KDB 558074 D01 DTS Meas Guidance v03r01, Section 9.1.1.

EIRP is calculated according to KDB 558074 D01 DTS Meas Guidance v03r01, Section 12.2.2. (e)

The maximum field strength is obtained in XZ plane and Vertical polarization.

**See attached graph.**

Detachable antenna?

Yes  No

If detachable, is the antenna connector non-standard?

Yes  No

**Requirements:**

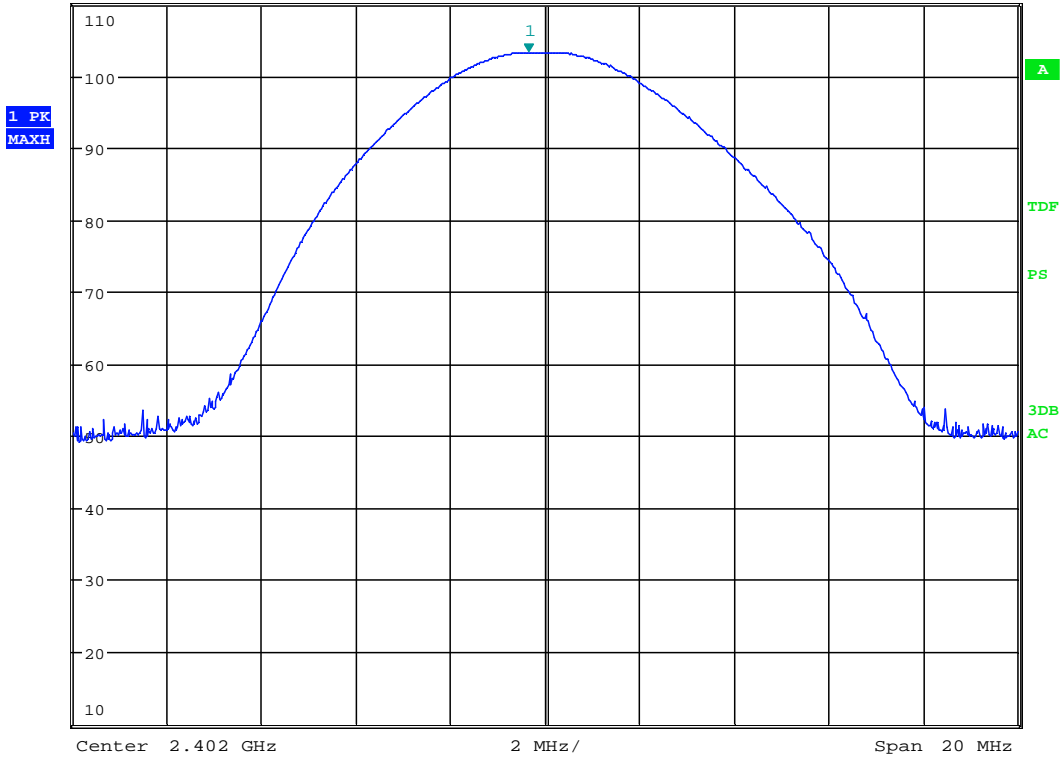
The maximum peak output power shall not exceed the following limits:

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.



\*RBW 3 MHz      Marker 1 [T1 ]  
 VBW 10 MHz      103.28 dBμV/m  
 Ref 110 dBμV/m    \*Att 10 dB      SWT 2.5 ms      2.401647436 GHz



Date: 3.JAN.2014 08:29:20

**Radiated Field strength, VP , 2402 MHz,PK**

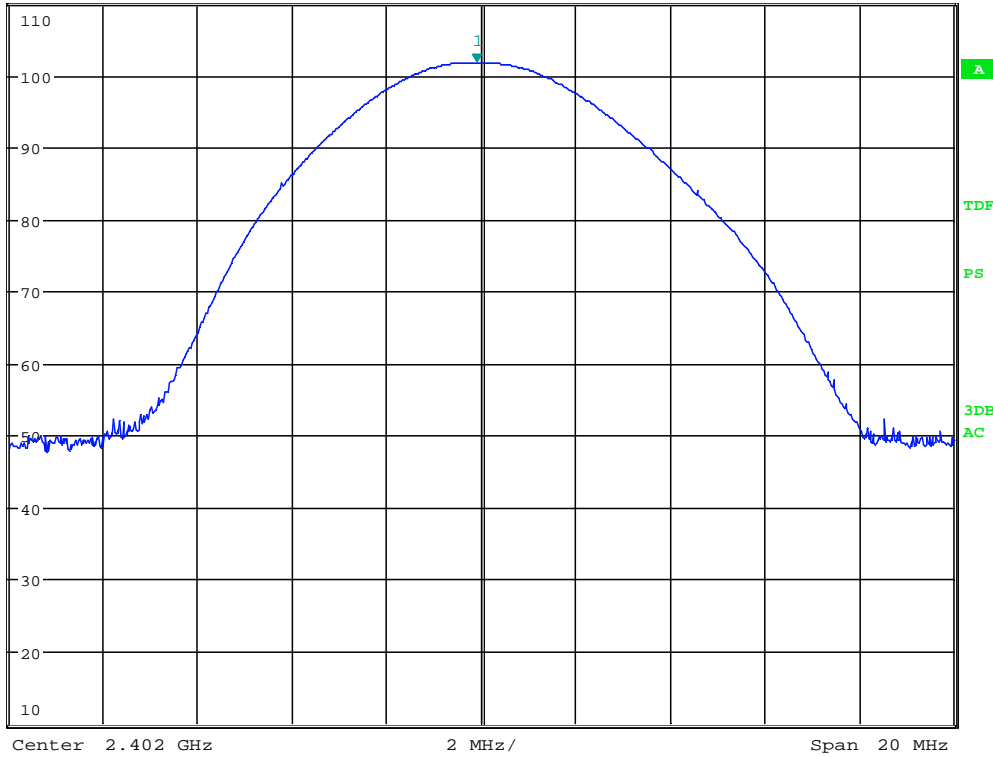


\*RBW 3 MHz      Marker 1 [T1 ]  
 VBW 10 MHz      101.72 dBµV/m  
 SWT 2.5 ms      2.401903846 GHz

Ref 110 dBµV/m

\*Att 10 dB

1 PK  
 MAXH



Date: 3.JAN.2014 08:28:32

**Radiated field strength, HP, 2402 MHz,PK**

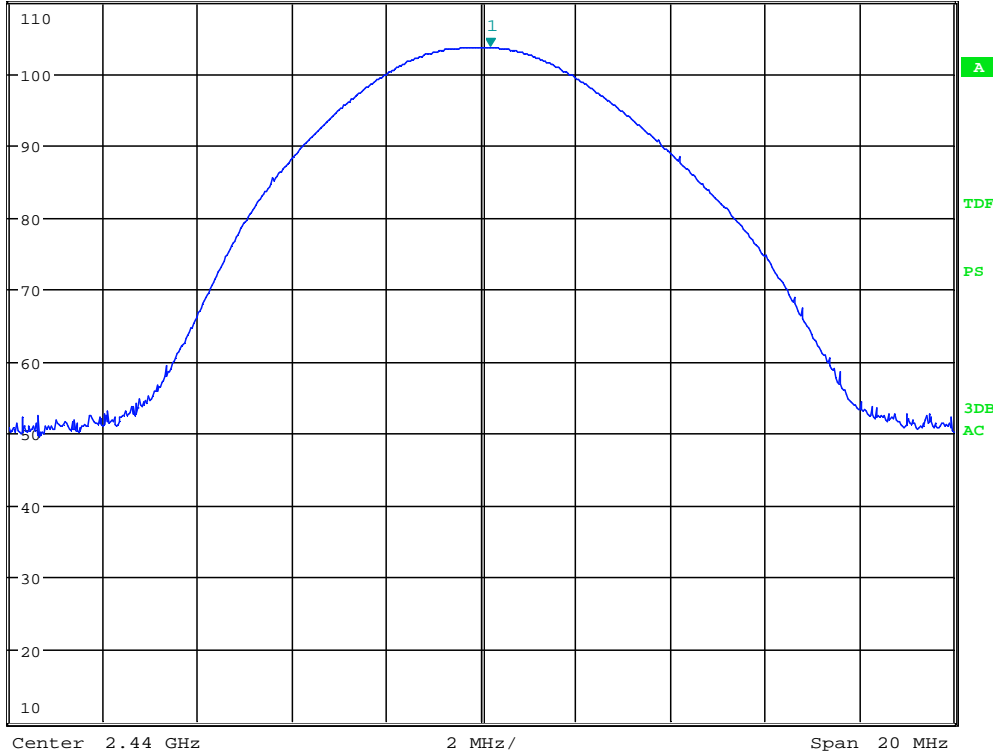


\* RBW 3 MHz      Marker 1 [T1 ]  
 VBW 10 MHz      103.54 dBμV/m  
 SWT 2.5 ms      2.440192308 GHz

Ref 110 dBμV/m

\* Att 10 dB

1 PK  
 MAXH



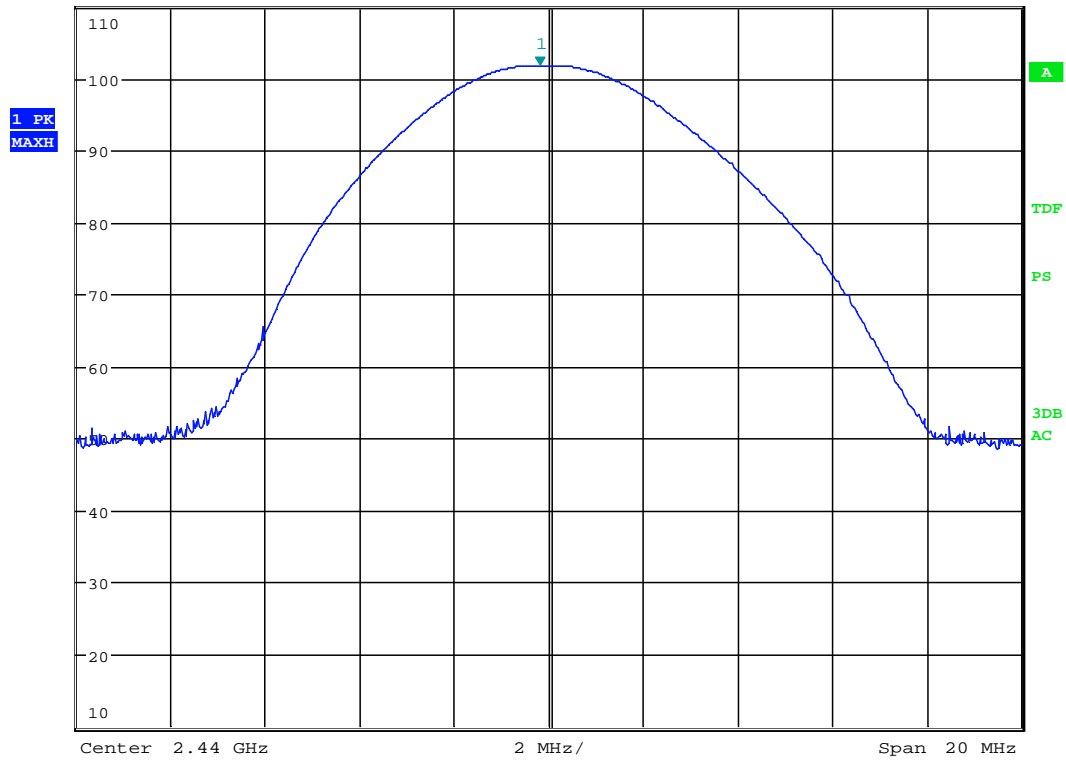
Date: 3.JAN.2014 08:44:29

**Radiated field strength, VP, 2440 MHz,PK**





\*RBW 3 MHz      Marker 1 [T1 ]  
 VBW 10 MHz      101.79 dBμV/m  
 SWT 2.5 ms      2.439807692 GHz  
 Ref 110 dBμV/m      \*Att 10 dB



Date: 3.JAN.2014 08:43:38

**Radiated field strength, HP, 2440 MHz,PK**



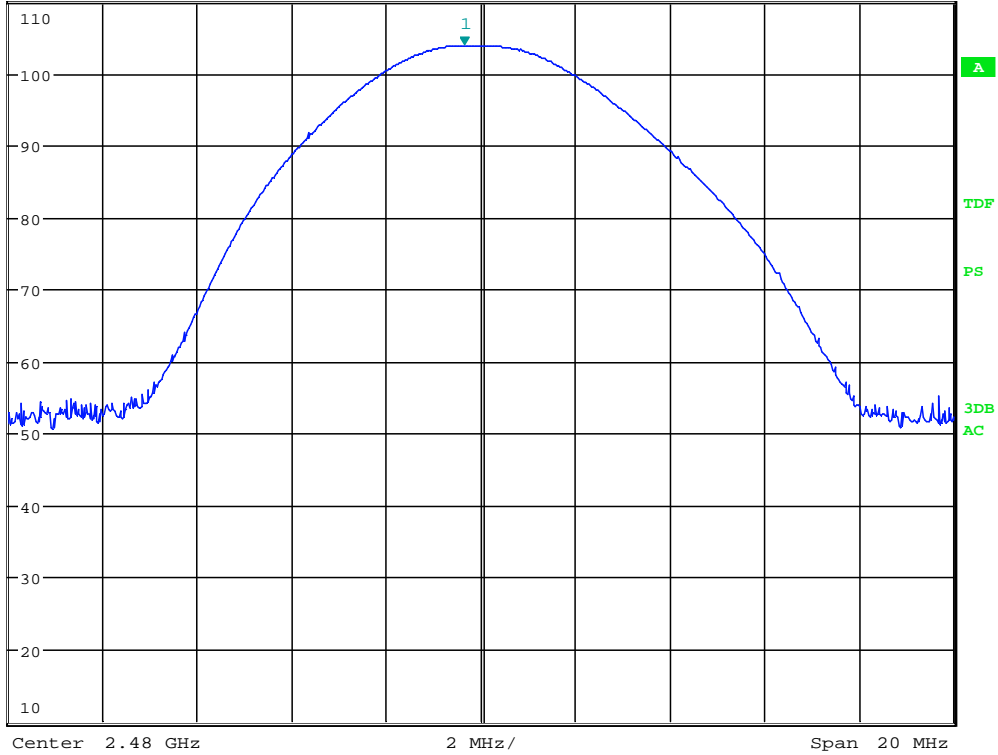
**MARKER 1**  
 2.479807692 GHz

\*RBW 3 MHz  
 VBW 10 MHz  
 SWT 2.5 ms

Marker 1 [T1 ]  
 103.88 dBμV/m  
 2.479647436 GHz

Ref 110 dBμV/m \*Att 10 dB

1 PK  
 MAXH



Date: 3.JAN.2014 08:57:49

**Radiated field strength, VP, 2480 MHz,PK**



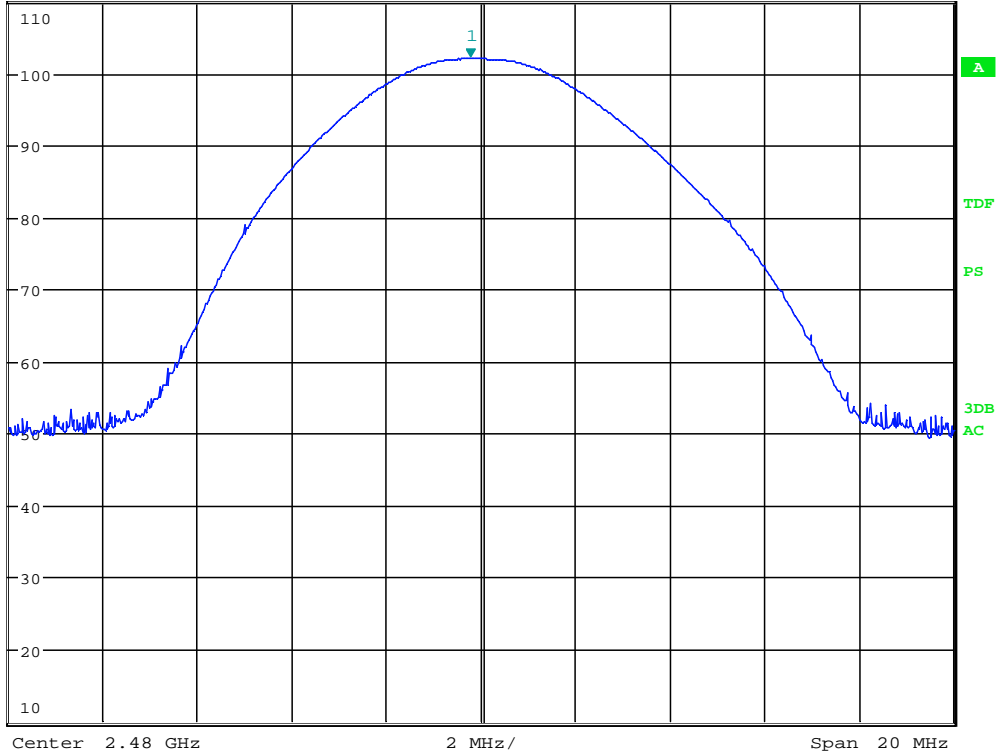
**MARKER 1**  
 2.479807692 GHz

\*RBW 3 MHz  
 VBW 10 MHz  
 SWT 2.5 ms

Marker 1 [T1 ]  
 102.05 dBμV/m  
 2.479775641 GHz

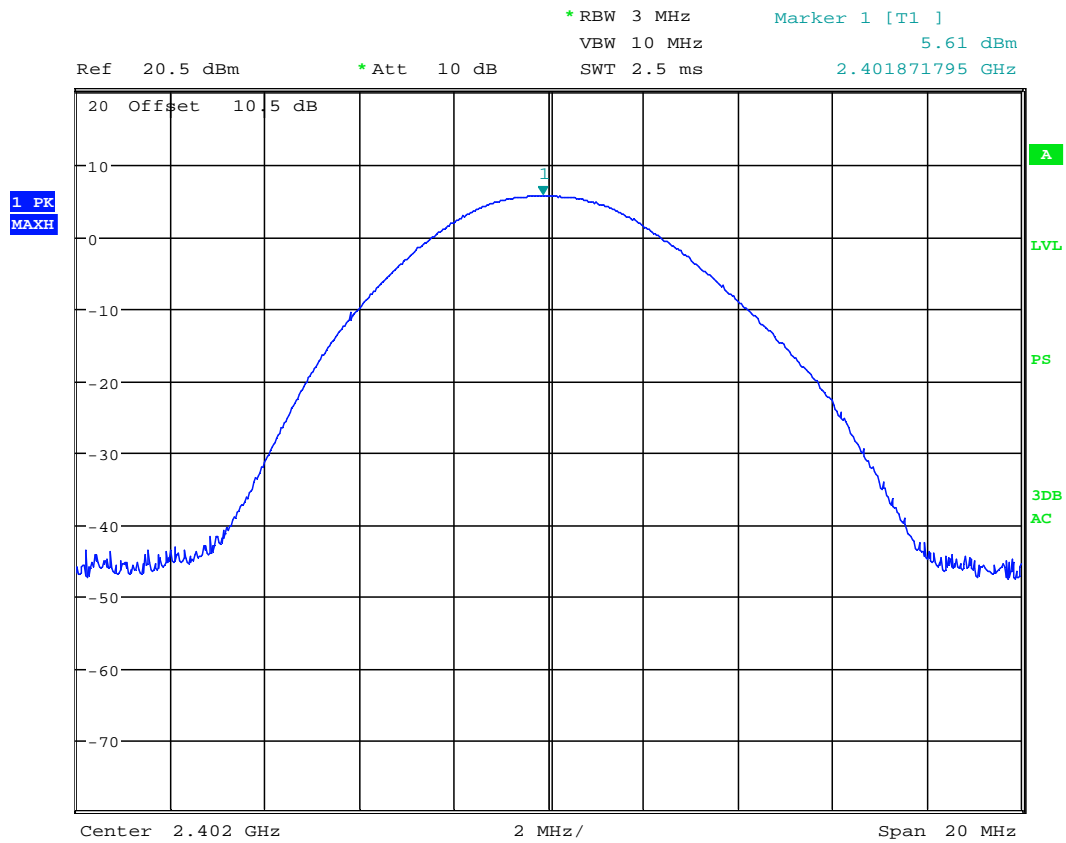
Ref 110 dBμV/m \*Att 10 dB

1 PK  
 MAXH



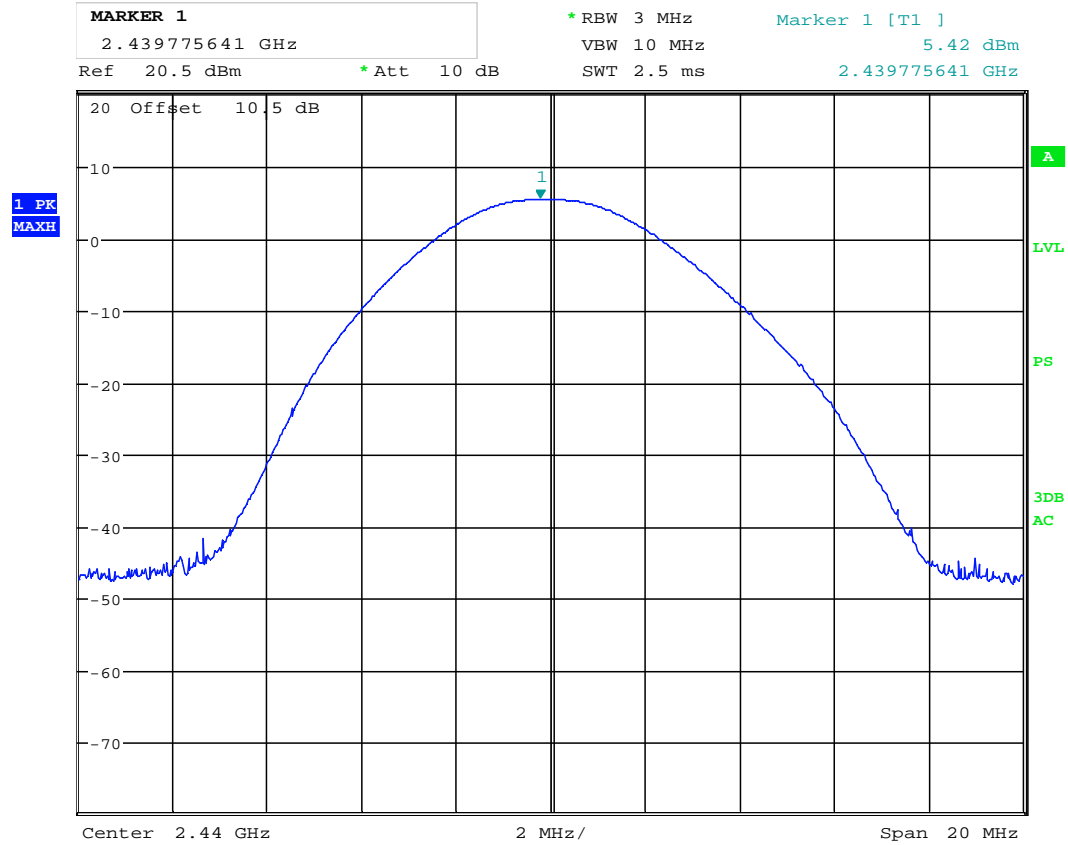
Date: 3.JAN.2014 08:56:45

**Radiated field strength, HP, 2480 MHz,PK**



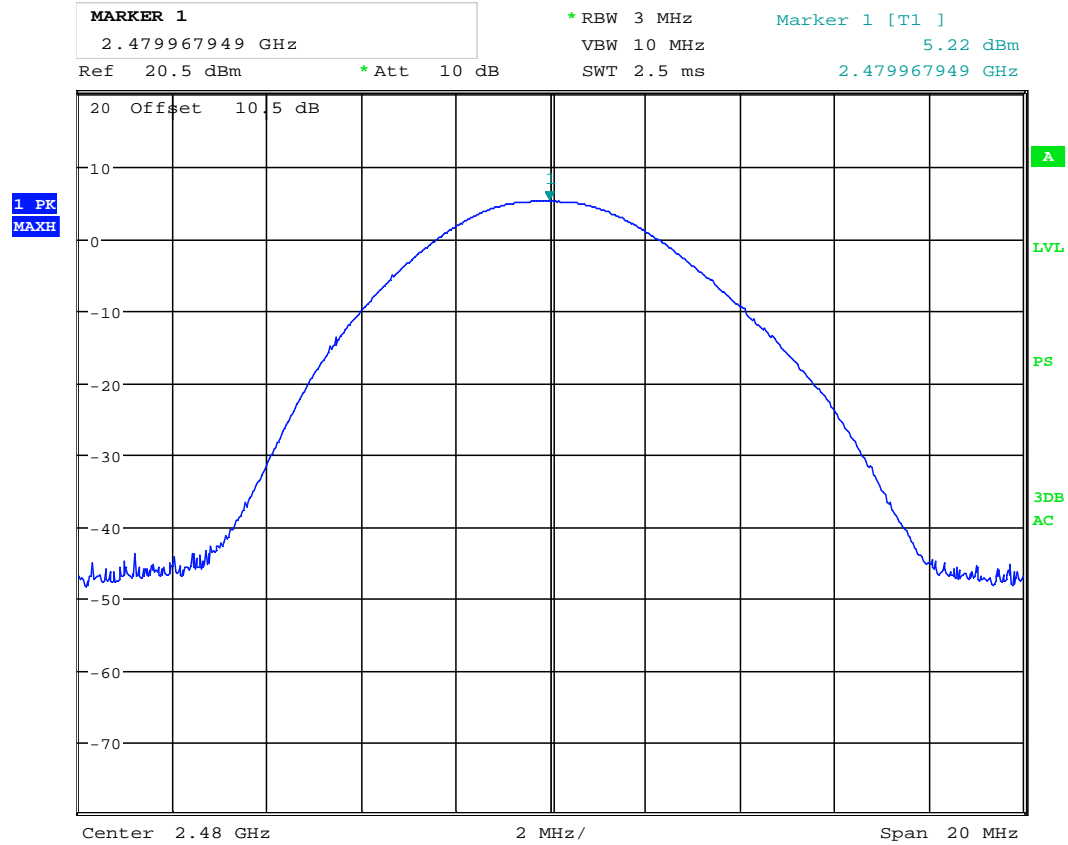
Date: 6.JAN.2014 16:17:27

**Conducted power – 2402MHz,PK**



Date: 6.JAN.2014 16:18:48

**Conducted power – 2440MHz,PK**



Date: 6.JAN.2014 16:19:18

**Conducted power – 2480MHz, PK**

### 3.5 Spurious Emissions (Radiated)

Para. No.: 15.247 (c)

Test Performed By: G.Suhanthakumar	Date of Test: 03 Jan 2014
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Test Results: Complies

**Measurement Data:**

**Band-edge, @3m**

Frequency	Measured Field Strength @3m, dB $\mu$ V/m	Detector	Limit dB $\mu$ V/m	Margin dB
2.39 GHz	47.68	PK	74	26.32
	43.62	AV	54	10.38
2.4835 GHz	63.17	PK	74	10.83
	39.14	AV	54	14.86

Tested according to KDB 558074 D01 DTS Measurement Guidance v03r01, Section 13.1 & 13.3.2.

**100% duty cycle**

See attached plots.

**RF conducted spurious emission**

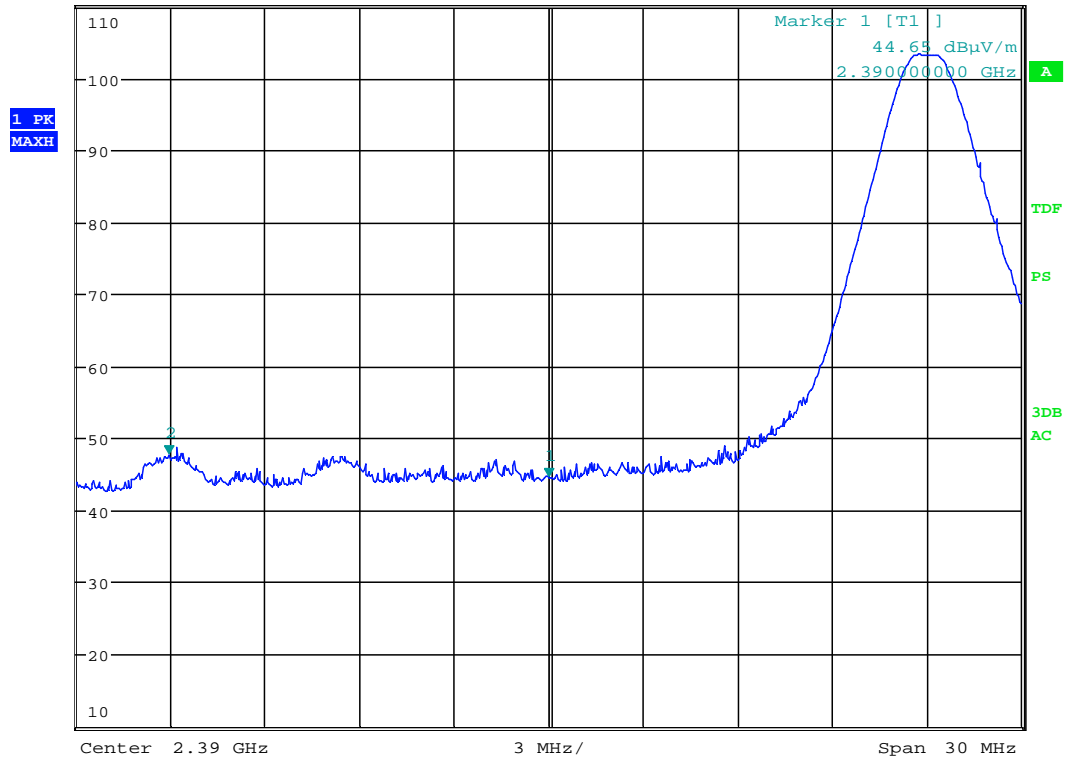
Scan performed with 100 kHz Bandwidth from 0.01 to 25 GHz.

All emissions are more than 20dB below carrier.

See plots.



Ref 110 dB $\mu$ V/m      \* Att 10 dB      \* RBW 1 MHz      Marker 2 [T1 ]  
 VBW 3 MHz      47.68 dB $\mu$ V/m  
 SWT 2.5 ms      2.377932692 GHz



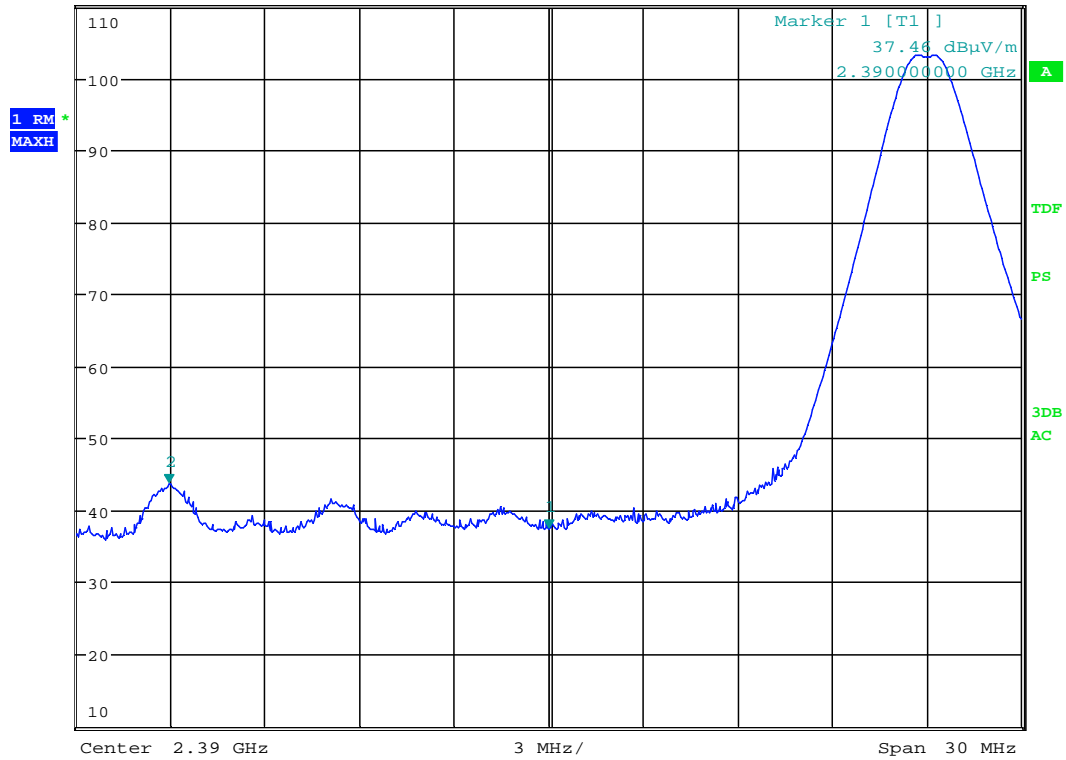
Date: 3.JAN.2014 08:32:18

**Lower Band Edge, Peak Detector**





Ref 110 dB $\mu$ V/m      \* Att 10 dB      \* RBW 1 MHz      Marker 2 [T1 ]  
 VBW 10 MHz      43.62 dB $\mu$ V/m  
 SWT 2.5 ms      2.377932692 GHz

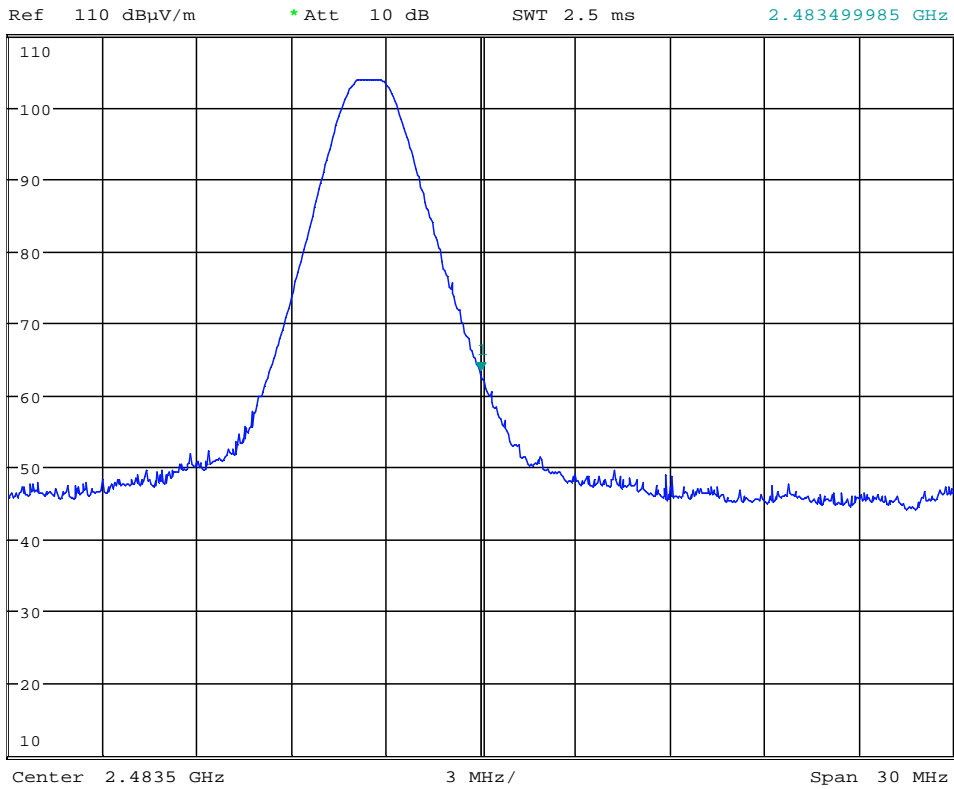


Date: 3.JAN.2014 08:32:52

**Lower Band Edge, Average Detector**



\*RBW 1 MHz      Marker 1 [T1 ]  
 VBW 3 MHz      63.17 dBμV/m  
 SWT 2.5 ms      2.483499985 GHz



Date: 3.JAN.2014 09:10:16

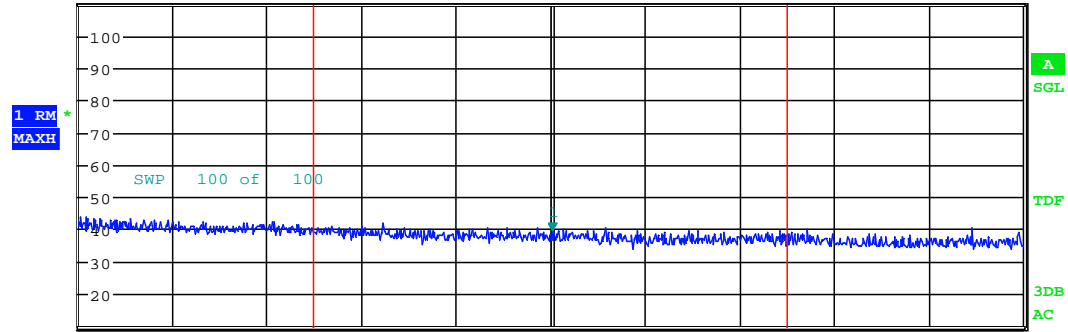
**Band Edge, 2483.5 MHz, Peak Detector**



MARKER 1  
 2.483503174 GHz

\* RBW 100 kHz  
 VBW 1 MHz  
 SWT 10 ms

Marker 1 [T1]  
 39.14 dBµV/m  
 2.483503174 GHz

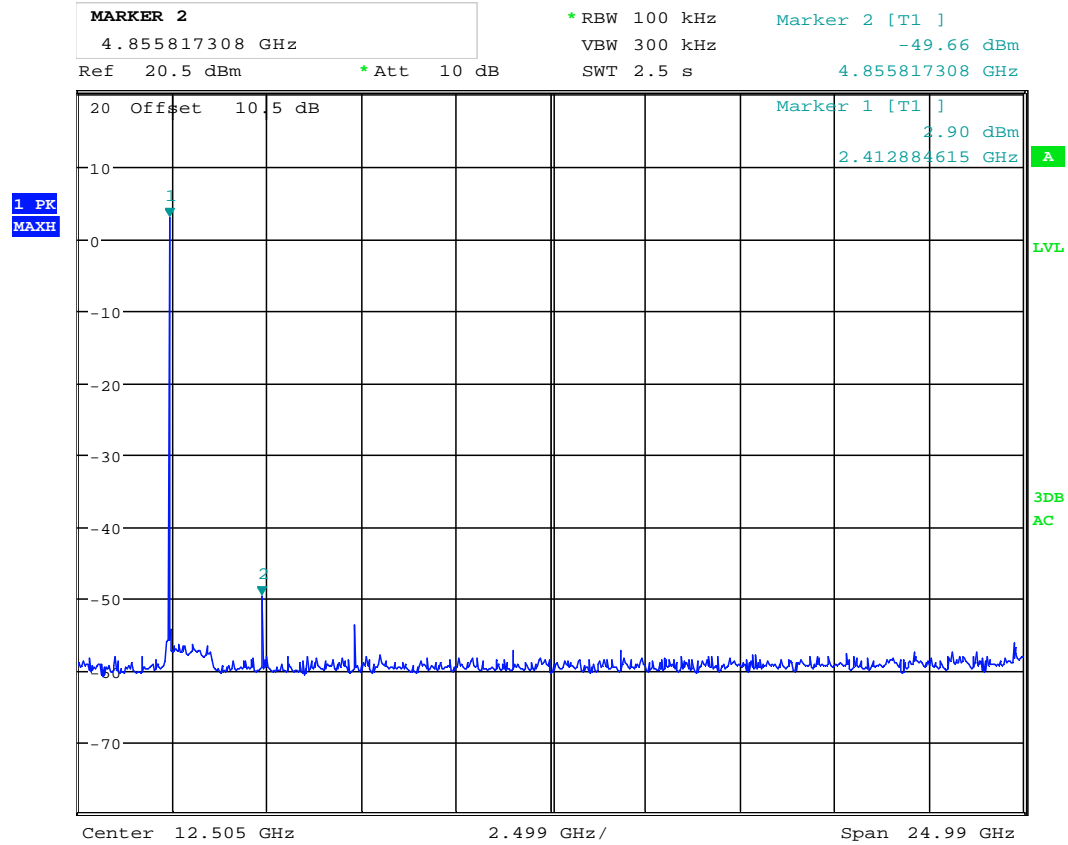


Tx Channel  
 Bandwidth 1 MHz      Power 47.51 dBµV/m

Date: 3.JAN.2014 09:11:30

**Band edge power, 2483.5MHz, AV detector**





Date: 6.JAN.2014 16:23:55

**Conducted spurious emission 10MHz – 25GHz - ch2440MHz**



**Radiated emissions 9kHz - 30 MHz.**

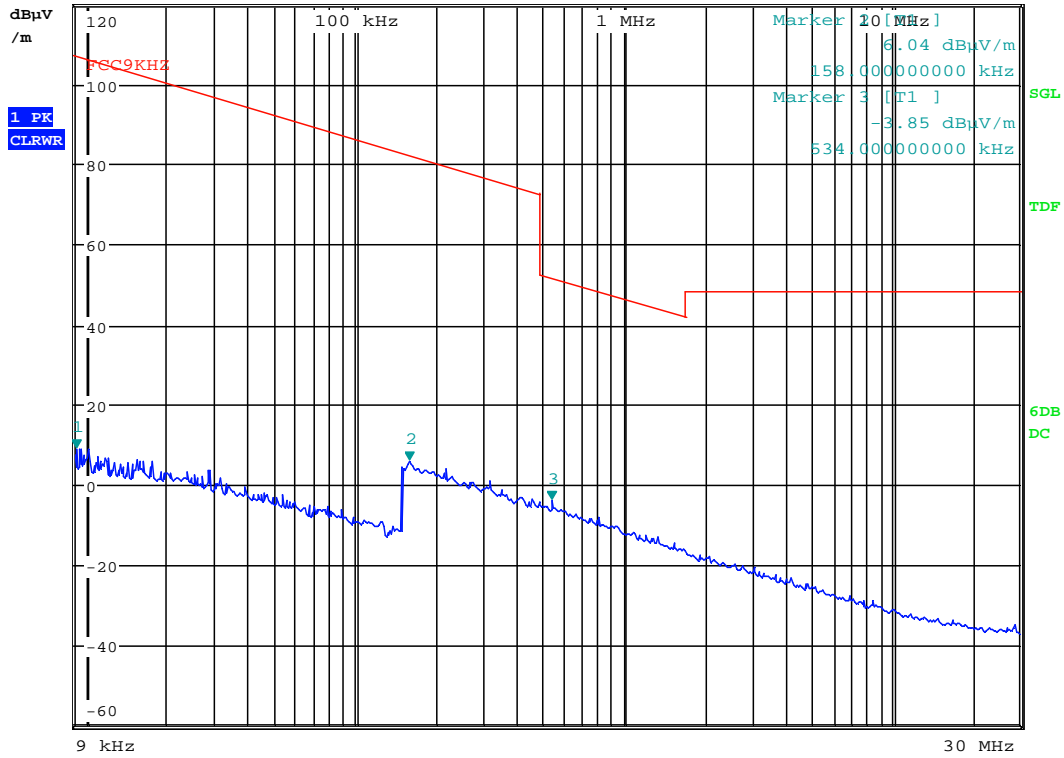
Detector: Quasi-Peak

Measuring distance 10 m.



<b>MARKER 1</b>
9.08 kHz
Step AUTO
Att 0 dB

RBW 9 kHz      Marker 1 [T1 ]  
 MT 50 ms      9.16 dBµV/m  
 PREAMP OFF      9.080000000 kHz



Date: 3.JAN.2014 11:16:49

**Radiated Emissions, 9 kHz – 30 MHz @10m**

**Radiated emission 30 – 1000 MHz.**

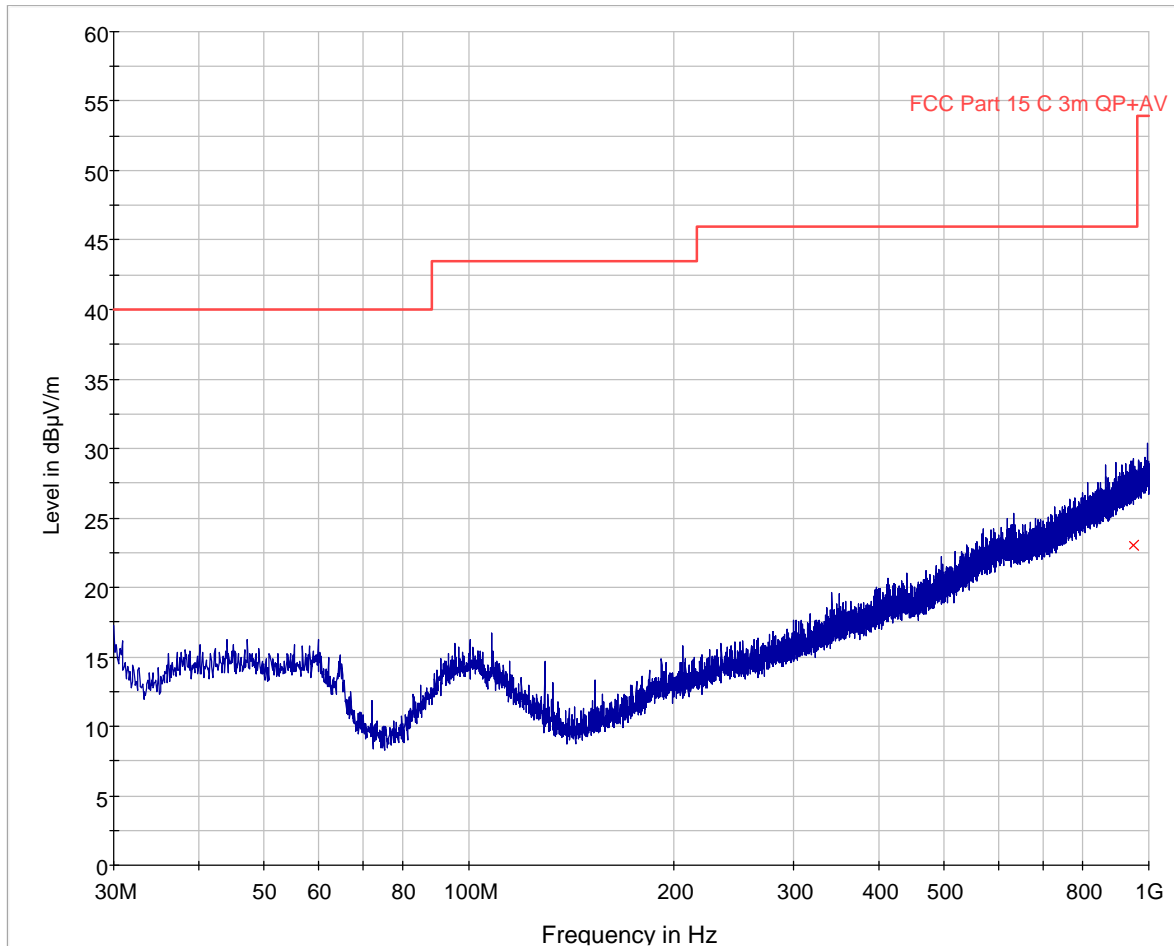
Detector: Peak

Measuring distance at 3m.

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

See attached plot.

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Polarization	Margin (dB)	Limit (dBµV/m)	Comment
948.559085	23.1	120.000	H	22.9	46.0	



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



### Radiated Emissions, 1-25 GHz

1-8 GHz measured at a distance of 3 m

8 - 25 GHz measured at 1m

#### Peak detector

Frequency MHz	Field Strength @3m dB $\mu$ V/m	Detector	Limit dB $\mu$ V/m	Margin dB
4804	59.97	Pk	74	14.03
4880	58.50	Pk	74	15.5
4960	56.52	Pk	74	17.48
7205	56.97	Pk	74	17.03
7320	58.01	Pk	74	15.99
7440	59.48	Pk	74	14.52

#### Average detector

Frequency MHz	Field Strength @3m dB $\mu$ V/m	Detector	Limit dB $\mu$ V/m	Margin dB
4804	53.94*	AV	54	0.06
4880	53.13	AV	54	0.87
4960	49.64	AV	54	4.36
7205	50.22	AV	54	3.78
7320	51.39	AV	54	2.61
7440	53.32	AV	54	0.68

\*On-time per 100 ms (worst case): 81% (the maximum duty cycle in actual use)

Duty cycle calculation:

$$(81 \text{ ms}) / (100 \text{ ms}) = 0.81\% \text{ on-time}$$

$$20 \log(0.81) = -1.83 \text{ dB}$$

i.e. at 4804MHz Average field strength is:  $55.77 - 1.83 = 53.94 \text{ dB}\mu\text{V/m}$

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

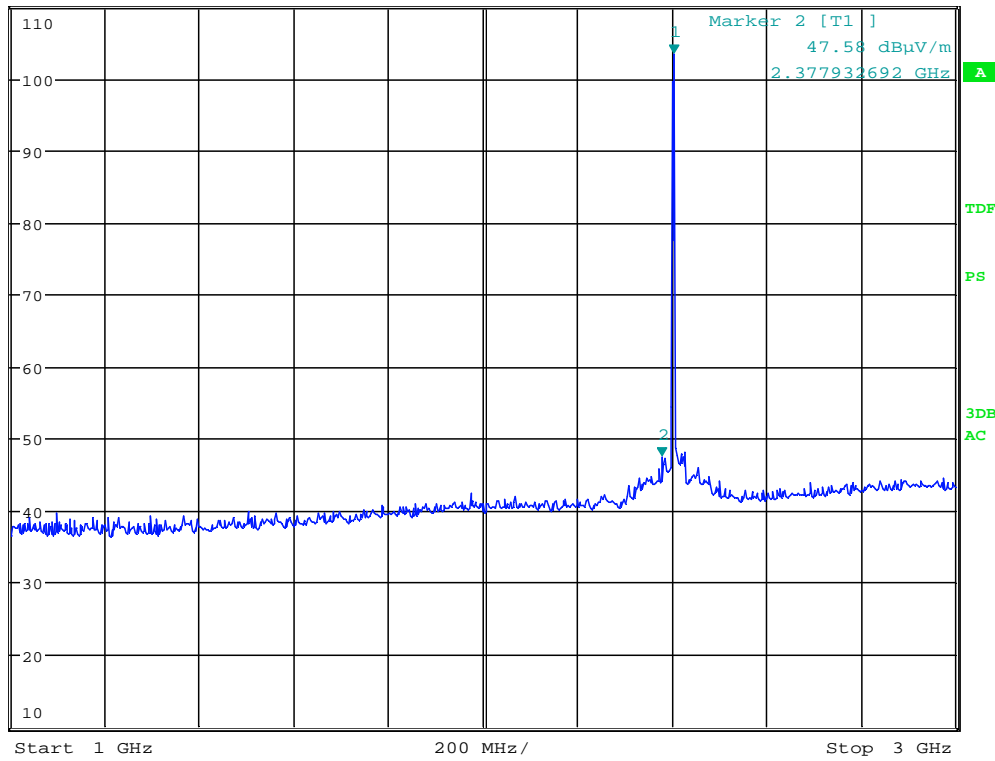
See attached graphs.



**MARKER 1**  
 2.403846154 GHz  
 Ref 110 dBuV/m \* Att 10 dB

\* RBW 1 MHz Marker 1 [T1 ]  
 VBW 3 MHz 103.38 dBuV/m  
 SWT 5 ms 2.403846154 GHz

1 PK  
 MAXH



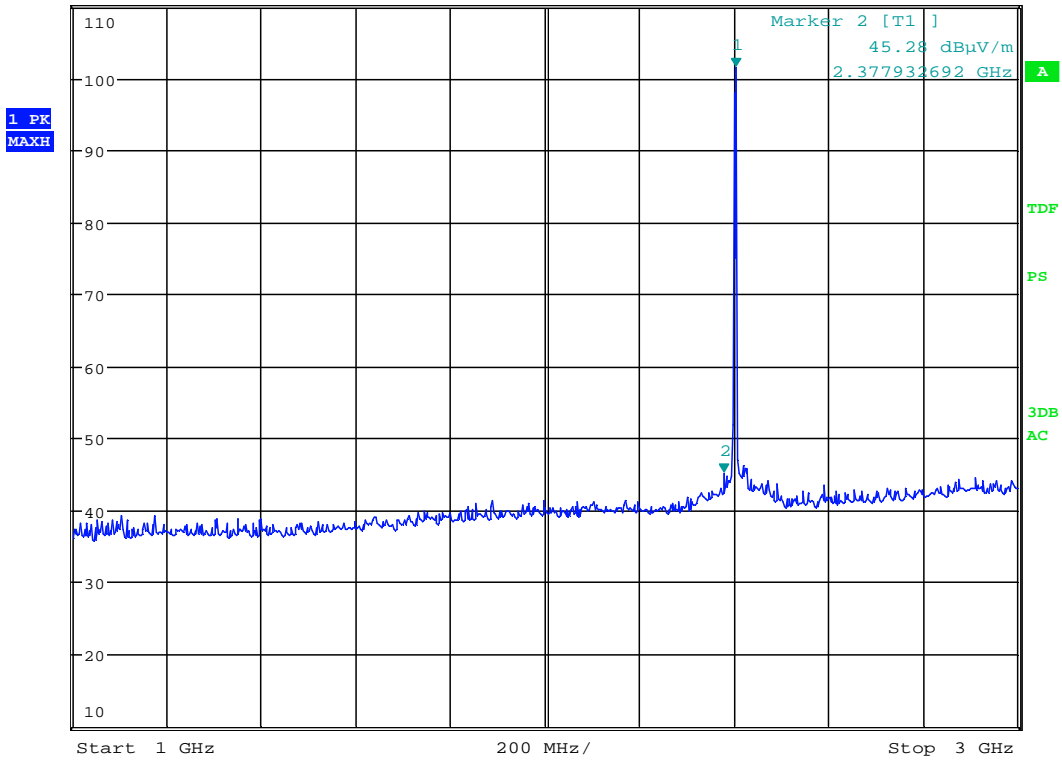
Date: 3.JAN.2014 08:33:39

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



\*RBW 1 MHz      Marker 1 [T1 ]  
 VBW 3 MHz      101.57 dBuV/m  
 SWT 5 ms      2.403846154 GHz

Ref 110 dBuV/m      \*Att 10 dB

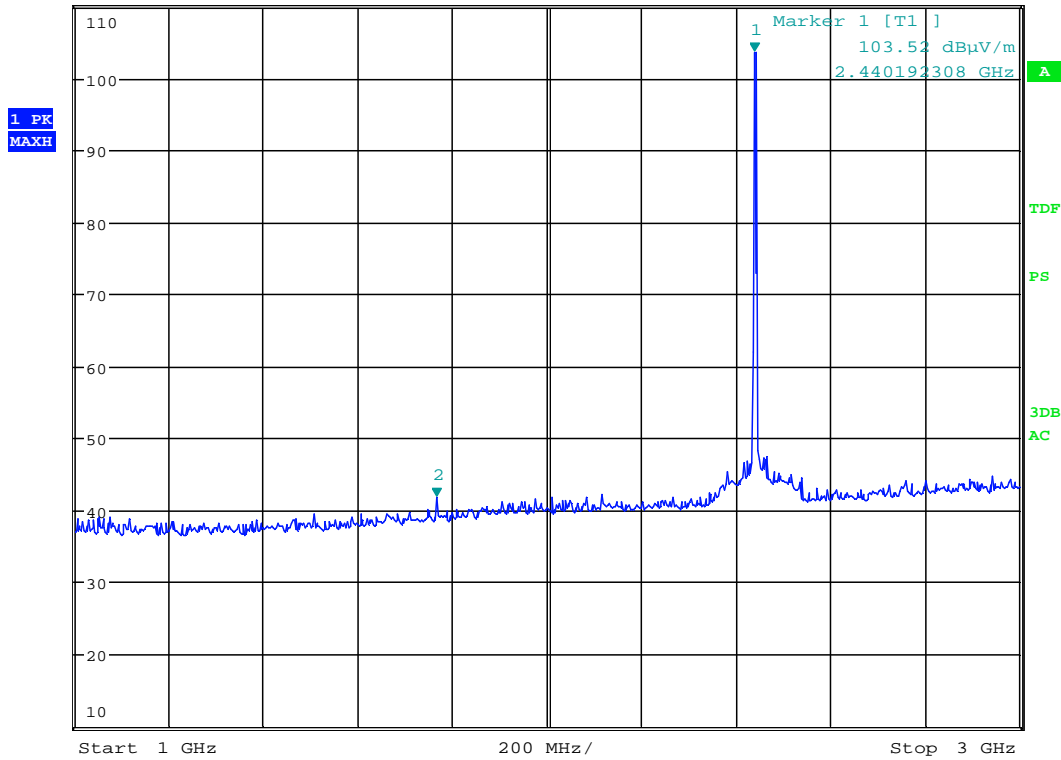


Date: 3.JAN.2014 08:34:32

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



**MARKER 2**  
 1.766025641 GHz  
 Ref 110 dBuV/m \* Att 10 dB  
 \* RBW 1 MHz Marker 2 [T1 ]  
 VBW 3 MHz 41.74 dBuV/m  
 SWT 5 ms 1.766025641 GHz

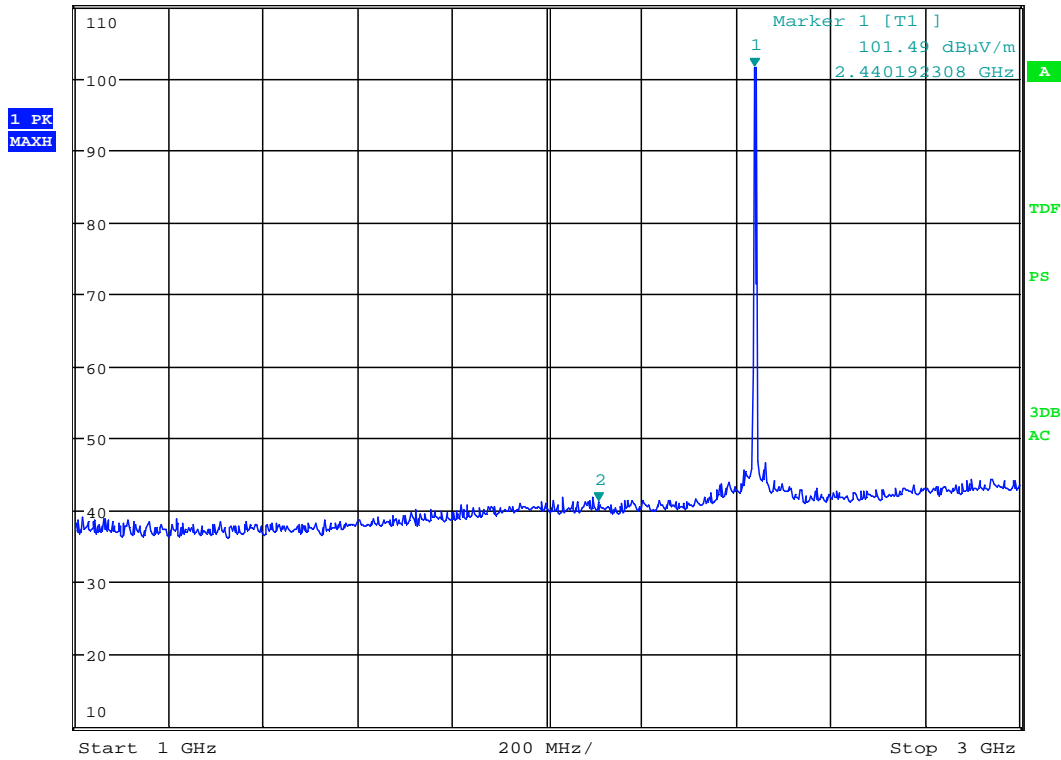


Date: 3.JAN.2014 08:49:38

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



Ref 110 dBuV/m      \* Att 10 dB      \* RBW 1 MHz      Marker 2 [T1 ]  
 VBW 3 MHz      41.15 dBuV/m  
 SWT 5 ms      2.108974359 GHz

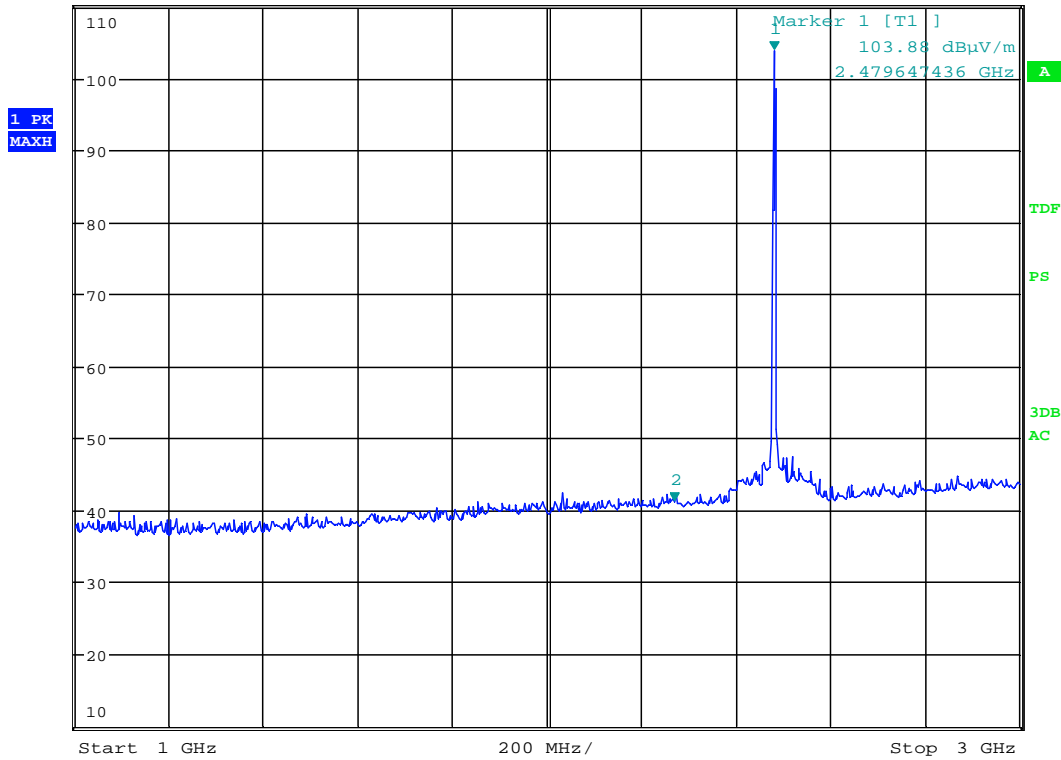


Date: 3.JAN.2014 08:48:43

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



**MARKER 2**  
 2.269230769 GHz  
 Ref 110 dBuV/m \* Att 10 dB  
 \* RBW 1 MHz Marker 2 [T1 ]  
 VBW 3 MHz 41.20 dBuV/m  
 SWT 5 ms 2.269230769 GHz



Date: 3.JAN.2014 08:59:41

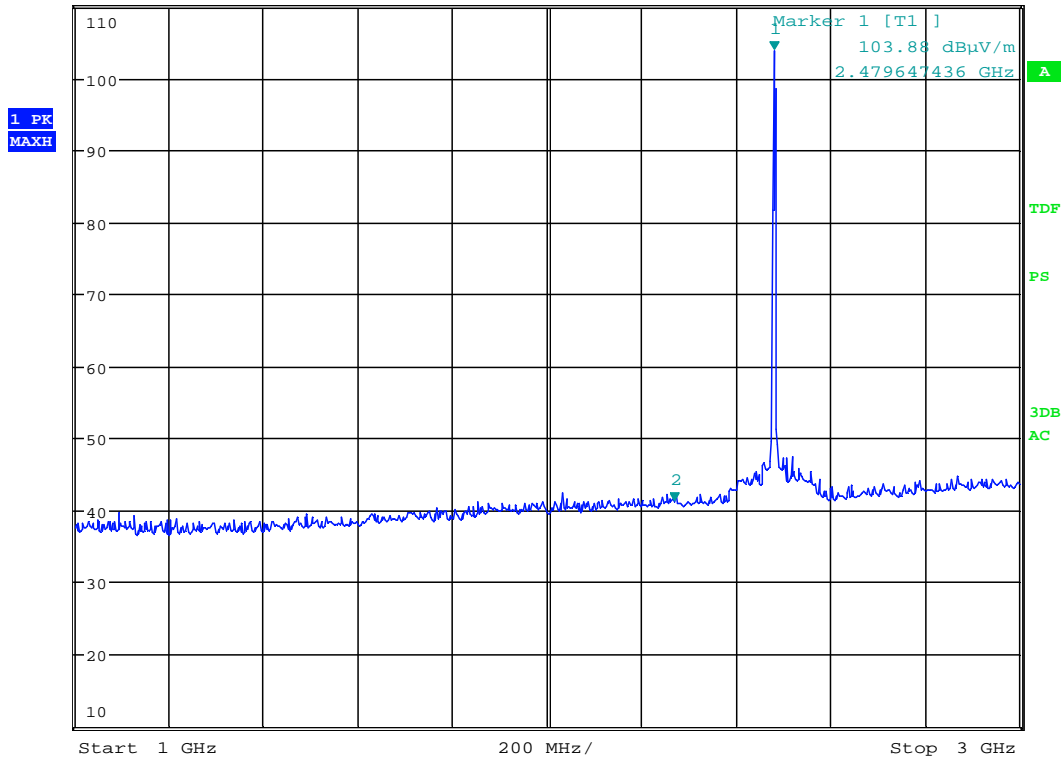
**Radiated Emissions ch. 2480 MHz, 1 – 3 GHz, VP, @3m – Pre-scan with Peak detector**



**MARKER 2**  
 2.269230769 GHz  
 Ref 110 dBuV/m \* Att 10 dB

\* RBW 1 MHz  
 VBW 3 MHz  
 SWT 5 ms

Marker 2 [T1 ]  
 41.20 dBuV/m  
 2.269230769 GHz

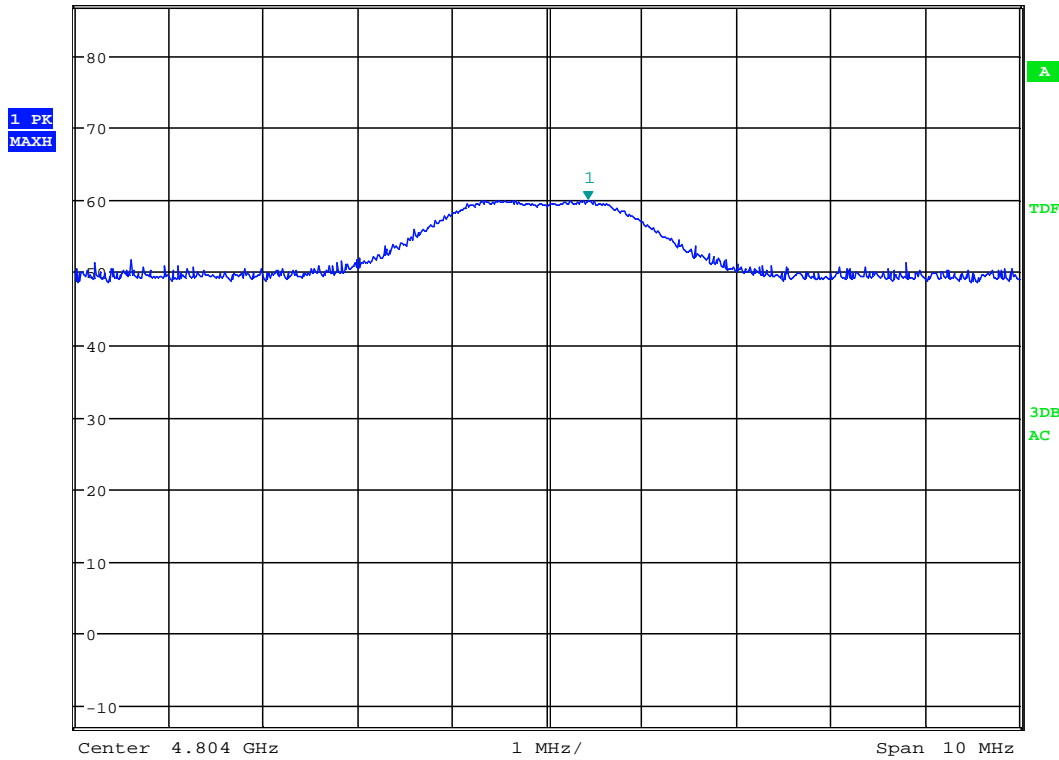


Date: 3.JAN.2014 08:59:41

**Radiated Emissions ch. 2480 MHz, 1 – 3 GHz, HP, @3m – Pre-scan with Peak detector**



<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1 ]
4.804432692 GHz	VBW 3 MHz	59.97 dBµV/m
Step 87 dBµV/m	Att 10 dB	SWT 20 ms
		4.804432692 GHz



Date: 8.JAN.2014 14:56:04

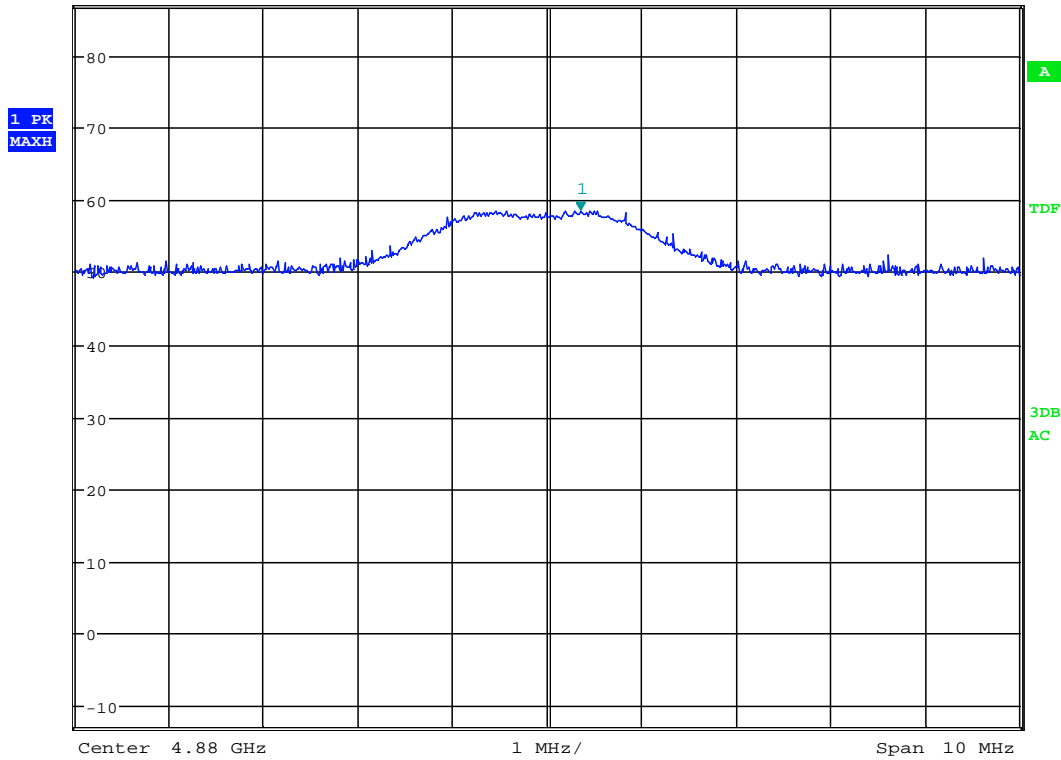
**2<sup>nd</sup> harmonic , ch2402MHz – HP, PK detector**







<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1 ]
4.88035 GHz	VBW 3 MHz	58.50 dBµV/m
Step 87 dBµV/m	Att 10 dB	SWT 20 ms
		4.880350000 GHz



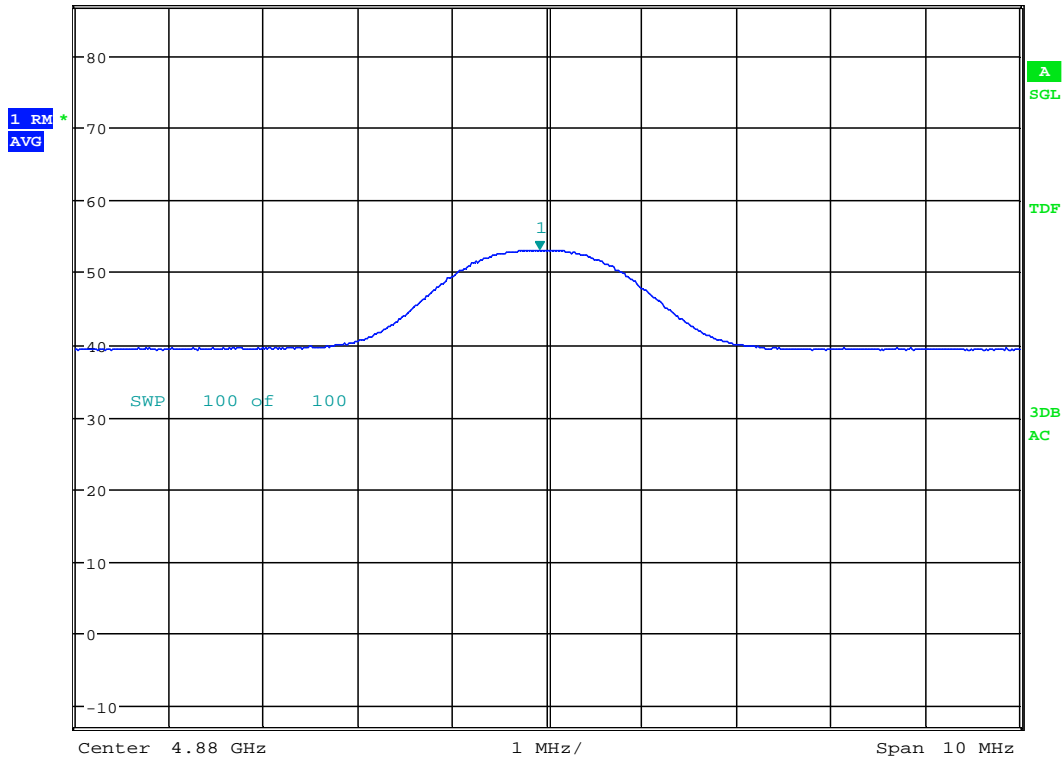
Date: 8.JAN.2014 15:01:42

**2<sup>nd</sup> harmonic , ch2440MHz – HP, PK detector**



**MARKER 1**  
 4.8799125 GHz  
 Step 87 dB $\mu$ V/m Att 10 dB

\*RBW 1 MHz Marker 1 [T1 ]  
 VBW 10 MHz 53.13 dB $\mu$ V/m  
 SWT 20 ms 4.879912500 GHz

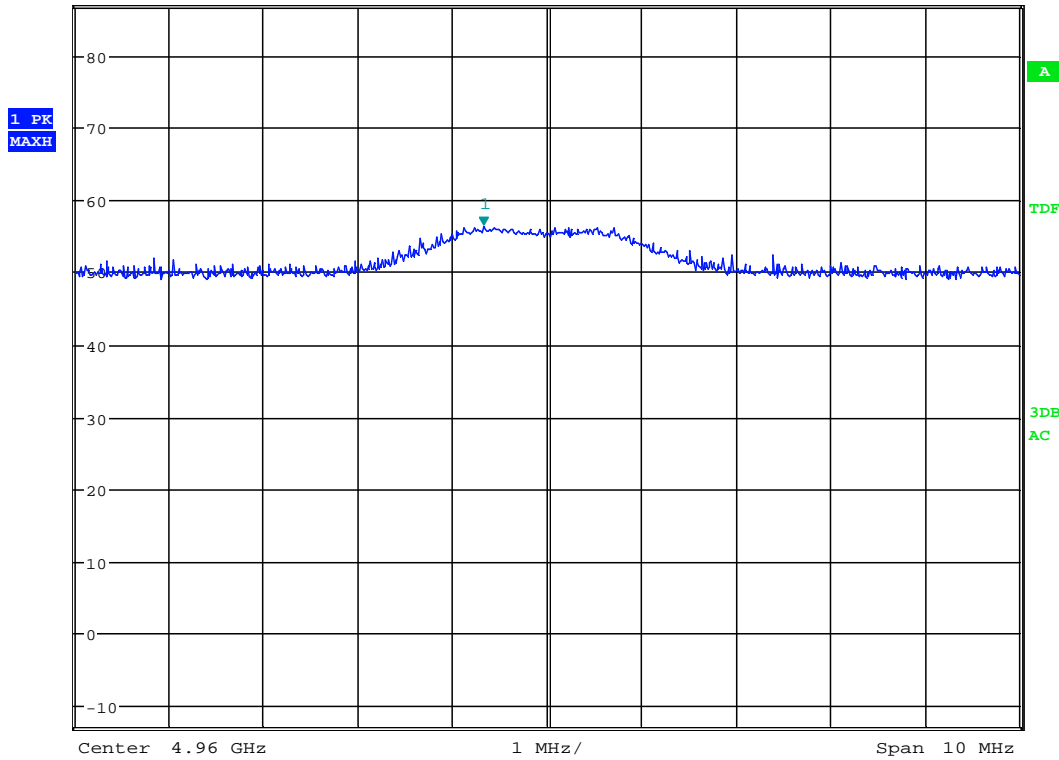


Date: 8.JAN.2014 15:02:37

**2<sup>nd</sup> harmonic , ch2440MHz – HP, AV detector**



<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1 ]
4.959325 GHz	VBW 3 MHz	56.52 dBµV/m
Step 87 dBµV/m	Att 10 dB	SWT 20 ms
		4.959325000 GHz

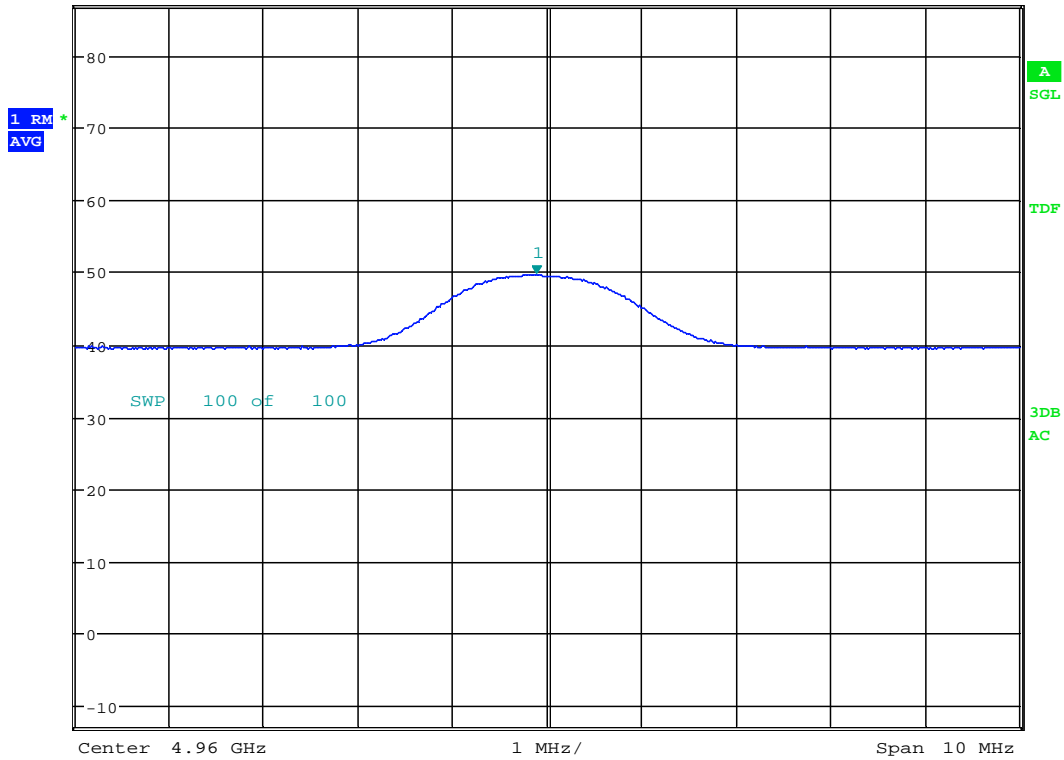


Date: 8.JAN.2014 15:05:23

**2<sup>nd</sup> harmonic , ch2480MHz – HP, PK detector**



<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1]
4.9598875 GHz	VBW 10 MHz	49.64 dBµV/m
Step 87 dBµV/m	Att 10 dB	SWT 20 ms
		4.959887500 GHz

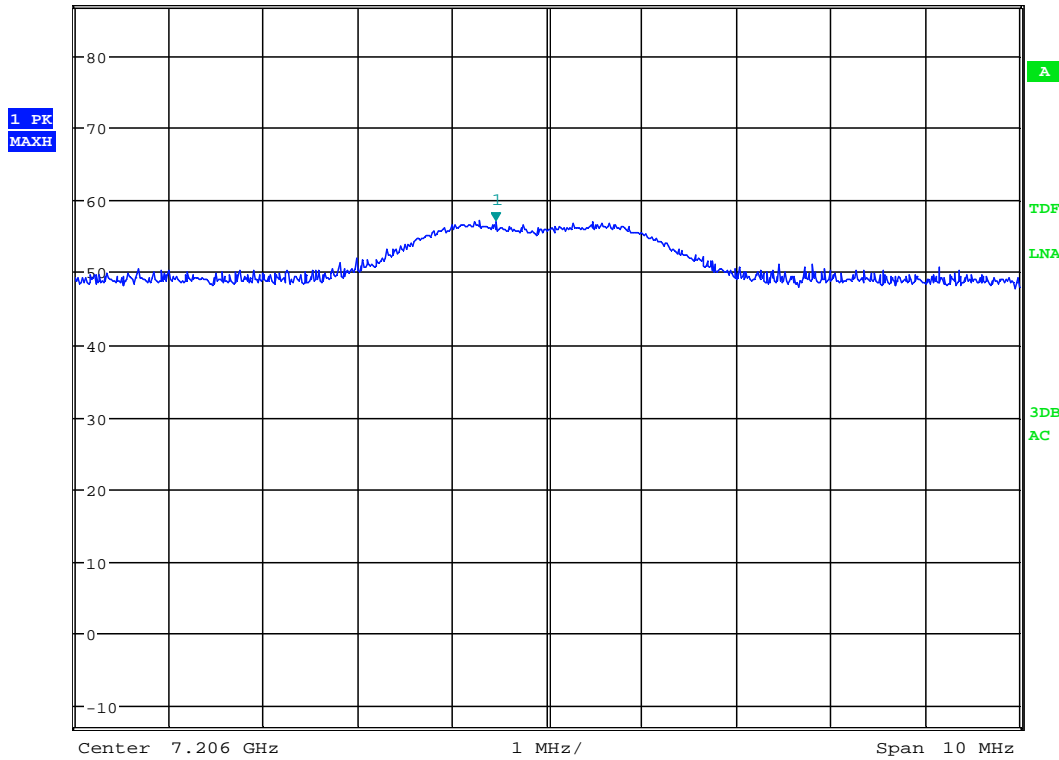


Date: 8.JAN.2014 15:05:58

**2<sup>nd</sup> harmonic , ch2480MHz – HP, AV detector**



<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1 ]
7.2054625 GHz	VBW 3 MHz	56.97 dBµV/m
Step 87 dBµV/m	* Att 15 dB	7.205462500 GHz
	SWT 20 ms	

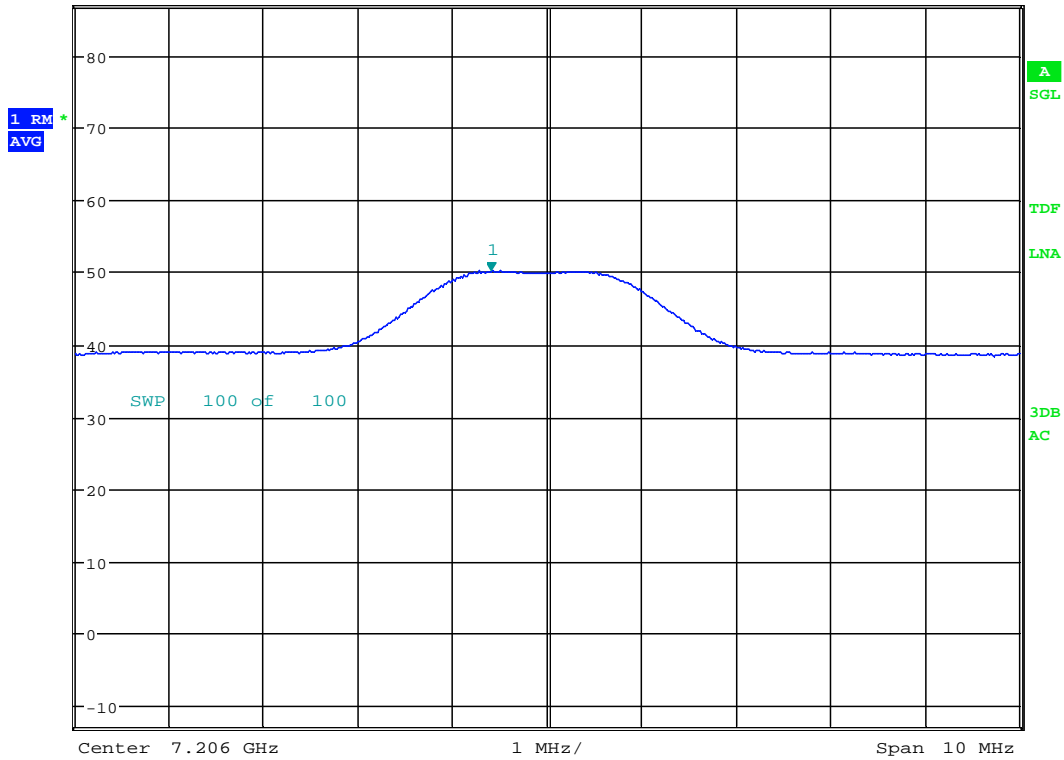


Date: 8.JAN.2014 15:15:59

**3<sup>rd</sup> harmonic, ch2402MHz – VP, PK detector**



**MARKER 1**  
 7.2054125 GHz  
 Step 87 dB $\mu$ V/m      \* Att 15 dB  
 \* RBW 1 MHz      Marker 1 [T1 ]  
 VBW 10 MHz      50.22 dB $\mu$ V/m  
 SWT 20 ms      7.205412500 GHz

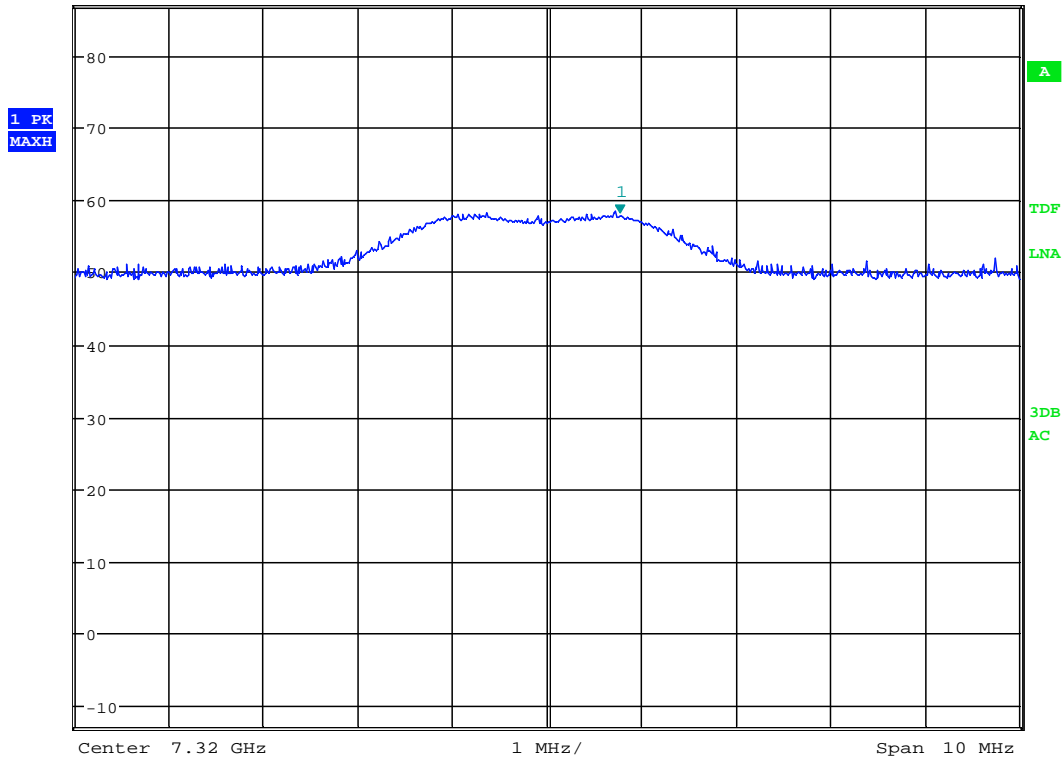


Date: 8.JAN.2014 15:16:30

**3<sup>rd</sup> harmonic, ch2402MHz – VP, AV detector**



<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1]
7.3207625 GHz	VBW 3 MHz	58.01 dBµV/m
Step 87 dBµV/m	* Att 15 dB	SWT 20 ms
		7.320762500 GHz



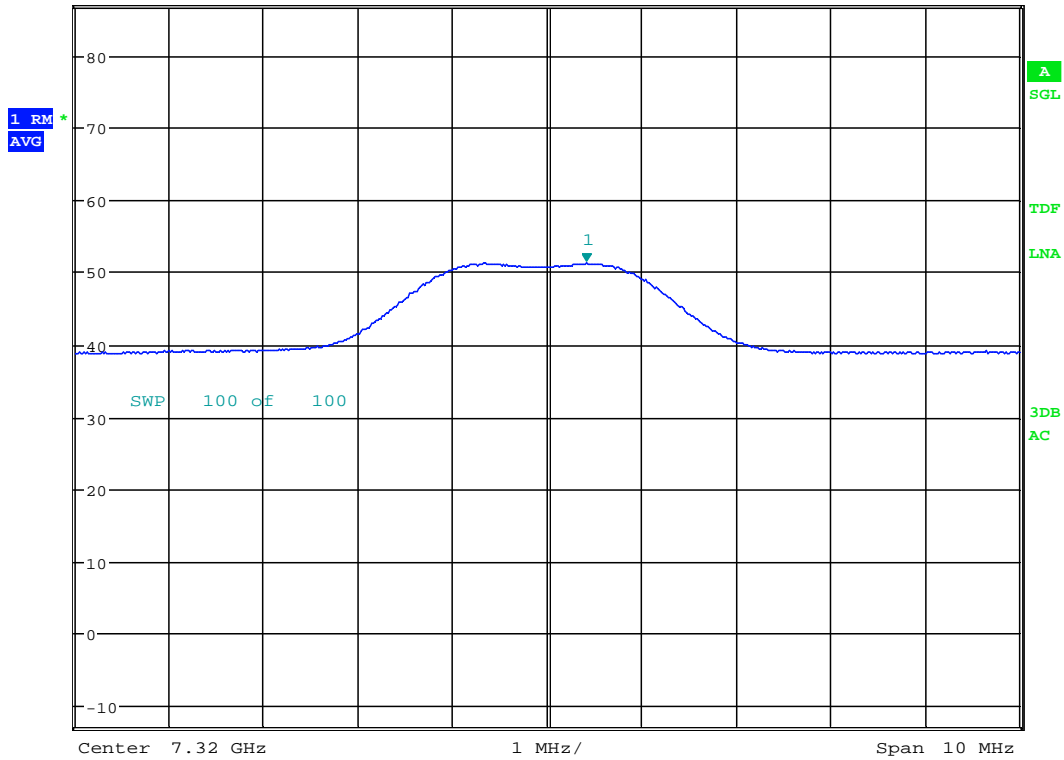
Date: 8.JAN.2014 15:12:48

**3<sup>rd</sup> harmonic, ch2440MHz – VP, PK detector**





<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1 ]
7.3204125 GHz	VBW 10 MHz	51.39 dBμV/m
Step 87 dBμV/m	* Att 15 dB	SWT 20 ms
		7.320412500 GHz

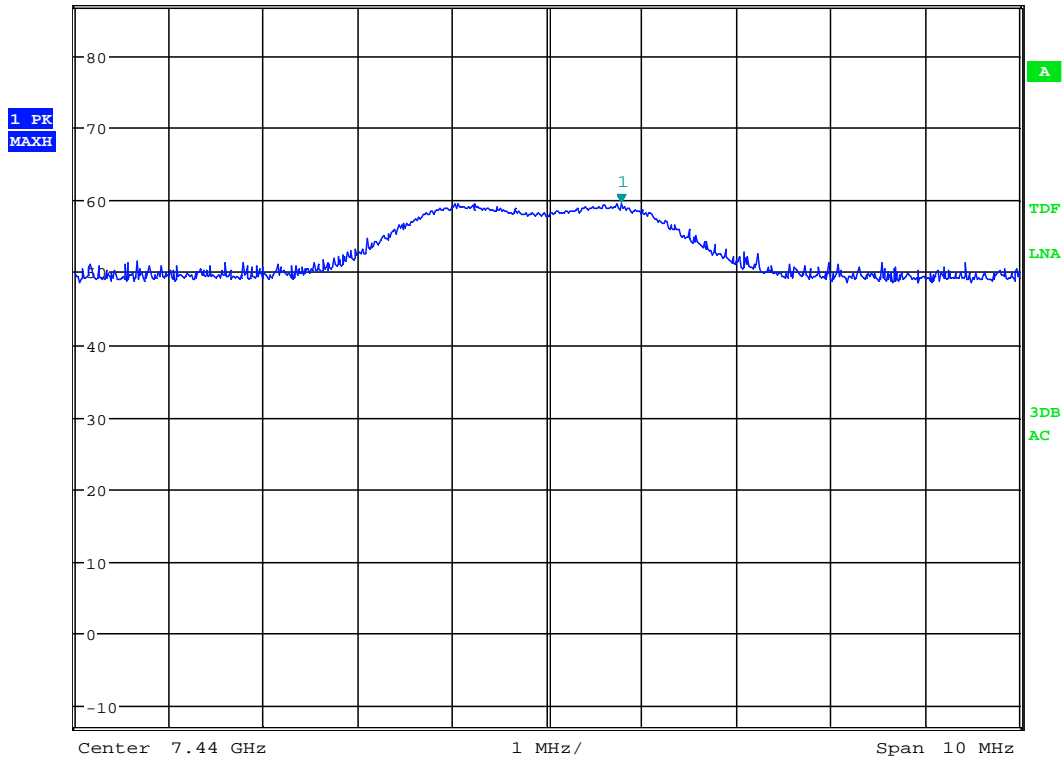


Date: 8.JAN.2014 15:13:37

**3<sup>rd</sup> harmonic, ch2440MHz – VP, AV detector**



<b>MARKER 1</b>	* RBW 1 MHz	Marker 1 [T1]
7.4407875 GHz	VBW 3 MHz	59.48 dB $\mu$ V/m
Step 87 dB $\mu$ V/m	* Att 15 dB	SWT 20 ms
		7.440787500 GHz

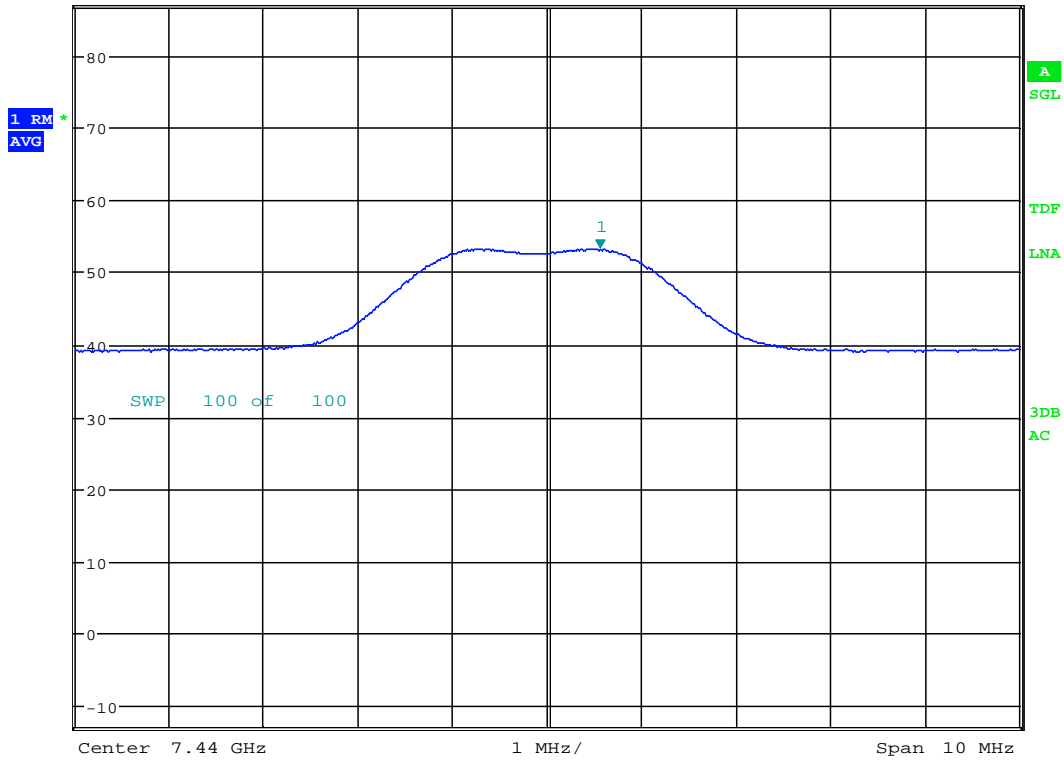


Date: 8.JAN.2014 15:09:01

**3<sup>rd</sup> harmonic, ch2480MHz – VP, PK detector**



**MARKER 1**  
 7.4405625 GHz  
 Step 87 dB $\mu$ V/m      \* Att 15 dB  
 \* RBW 1 MHz      Marker 1 [T1 ]  
 VBW 10 MHz      53.32 dB $\mu$ V/m  
 SWT 20 ms      7.440562500 GHz

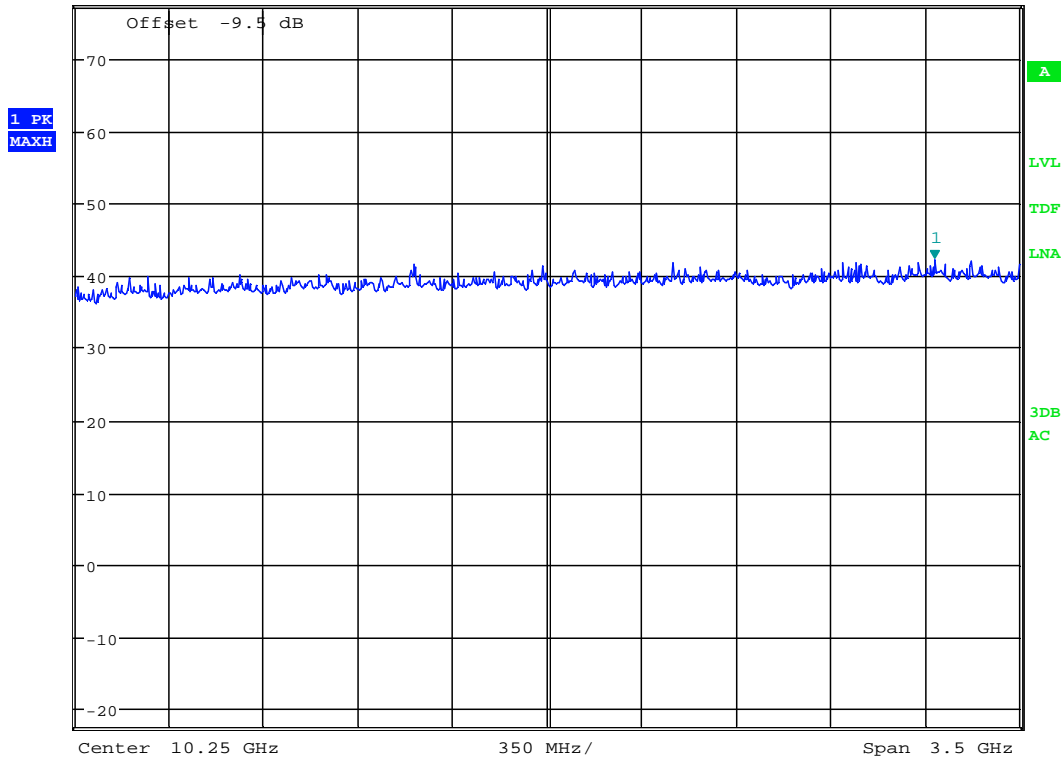


Date: 8.JAN.2014 15:09:31

**3<sup>rd</sup> harmonic, ch2480MHz – VP, AV detector**



**MARKER 1**  
 11.68589744 GHz  
 Ref 77.5 dBµV/m \*Att 10 dB  
 \*RBW 1 MHz Marker 1 [T1 ]  
 VBW 3 MHz 42.28 dBµV/m  
 SWT 25 ms 11.685897436 GHz

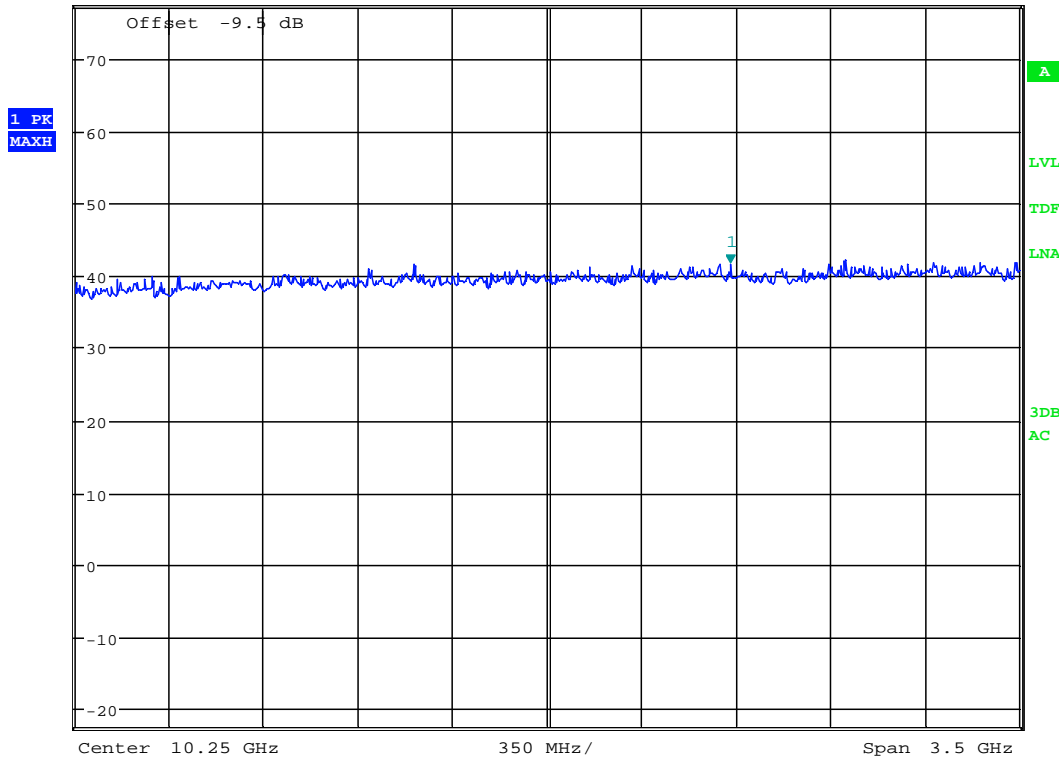


Date: 3.JAN.2014 10:43:01

**Radiated Emissions ch. 2402 MHz, 8.5 – 12 GHz, VP, @1m – Pre-scan with Peak detector , Distance Correction factor of -9.5 dB is included in the graph**



**MARKER 1**  
 10.9286859 GHz  
 Ref 77.5 dBµV/m \*Att 10 dB  
 \*RBW 1 MHz  
 VBW 3 MHz  
 SWT 25 ms  
 Marker 1 [T1 ]  
 41.78 dBµV/m  
 10.928685897 GHz

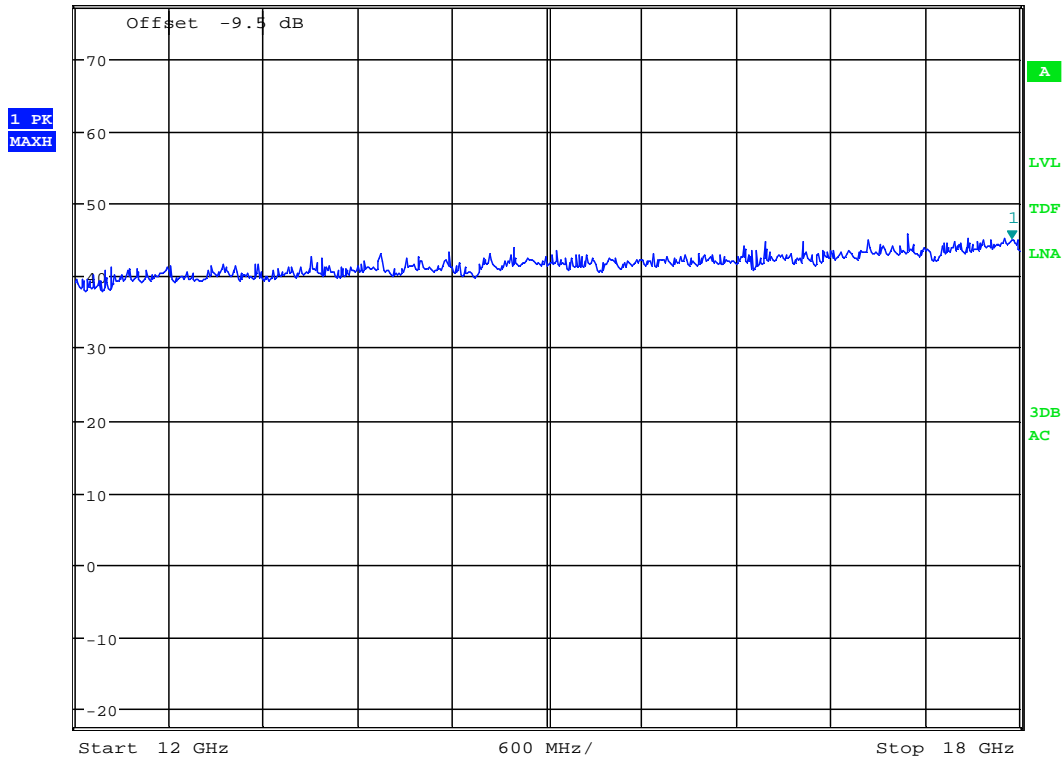


Date: 3.JAN.2014 10:42:11

**Radiated Emissions ch. 2402 MHz, 8.5 – 12 GHz, HP, @1m – Pre-scan with Peak detector , Distance Correction factor of -9.5 dB is included in the graph.**



**MARKER 1**  
 17.95192308 GHz  
 Ref 77.5 dBµV/m \*Att 10 dB  
 \*RBW 1 MHz Marker 1 [T1 ]  
 VBW 3 MHz 45.02 dBµV/m  
 SWT 35 ms 17.951923077 GHz

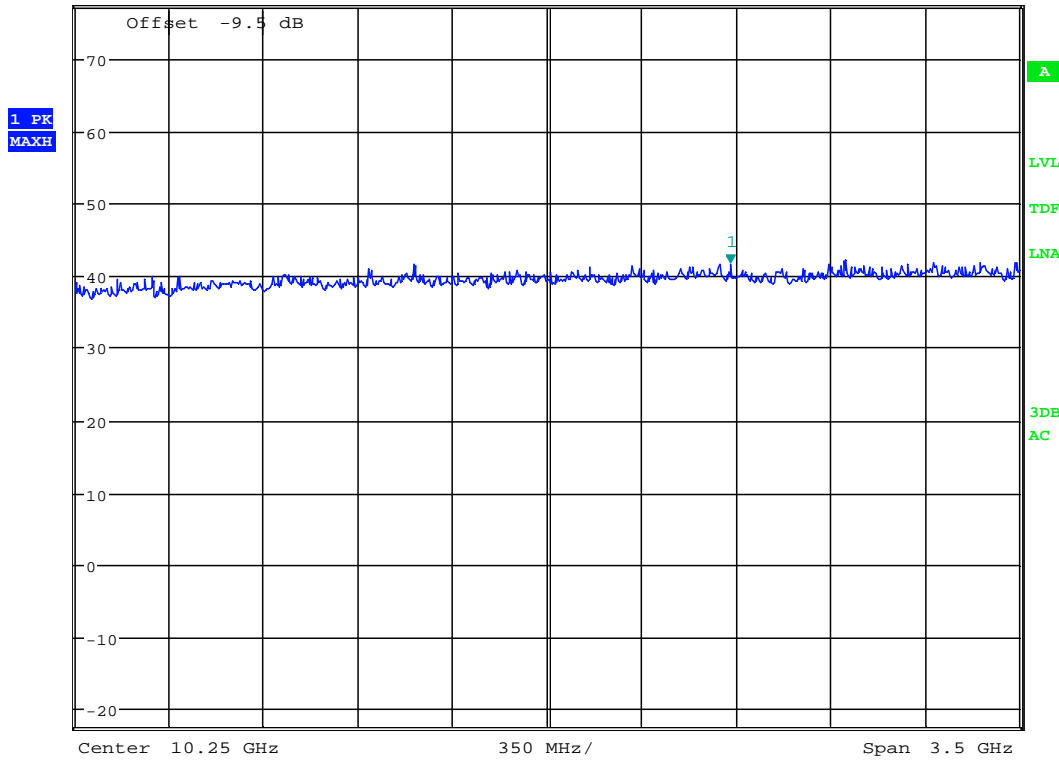


Date: 3.JAN.2014 10:44:45

**Radiated Emissions ch. 2402 MHz, 12 – 18 GHz, VP, @1m – Pre-scan with Peak detector, Distance Correction factor of -9.5 dB is included in the graph.**



**MARKER 1**  
 10.9286859 GHz  
 Ref 77.5 dB $\mu$ V/m \* Att 10 dB \* RBW 1 MHz  
 VBW 3 MHz Marker 1 [T1 ]  
 41.78 dB $\mu$ V/m  
 SWT 25 ms 10.928685897 GHz

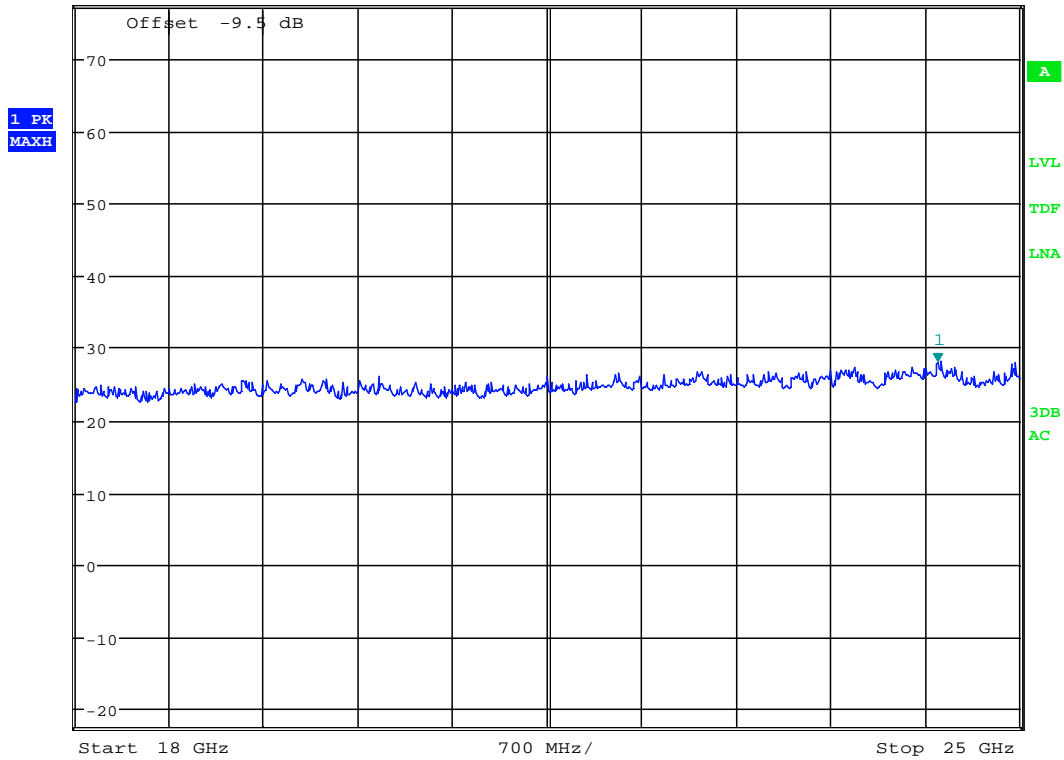


Date: 3.JAN.2014 10:42:11

**Radiated Emissions ch. 2402 MHz, 12 – 18 GHz, HP, @1m – Pre-scan with Peak detector, Distance Correction factor of -9.5dB is included in the graph.**



**MARKER 1**  
 24.39423077 GHz  
 Ref 77.5 dBµV/m \*Att 10 dB  
 \*RBW 1 MHz Marker 1 [T1 ]  
 VBW 3 MHz 28.12 dBµV/m  
 SWT 45 ms 24.394230769 GHz



Date: 3.JAN.2014 10:48:09

**Radiated Emissions ch. 2402 MHz, 18 – 25 GHz, VP/HP, Pre-scan with Peak detector, Distance Correction factor -9.5dB is included in the graph.**



### 3.6 Power Spectral Density (PSD)

Para. No.: 15.247 (e)

Test Performed By: G.Suhanthakumar	Date of Test: 06 Jan 2014
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Test Results: Complies

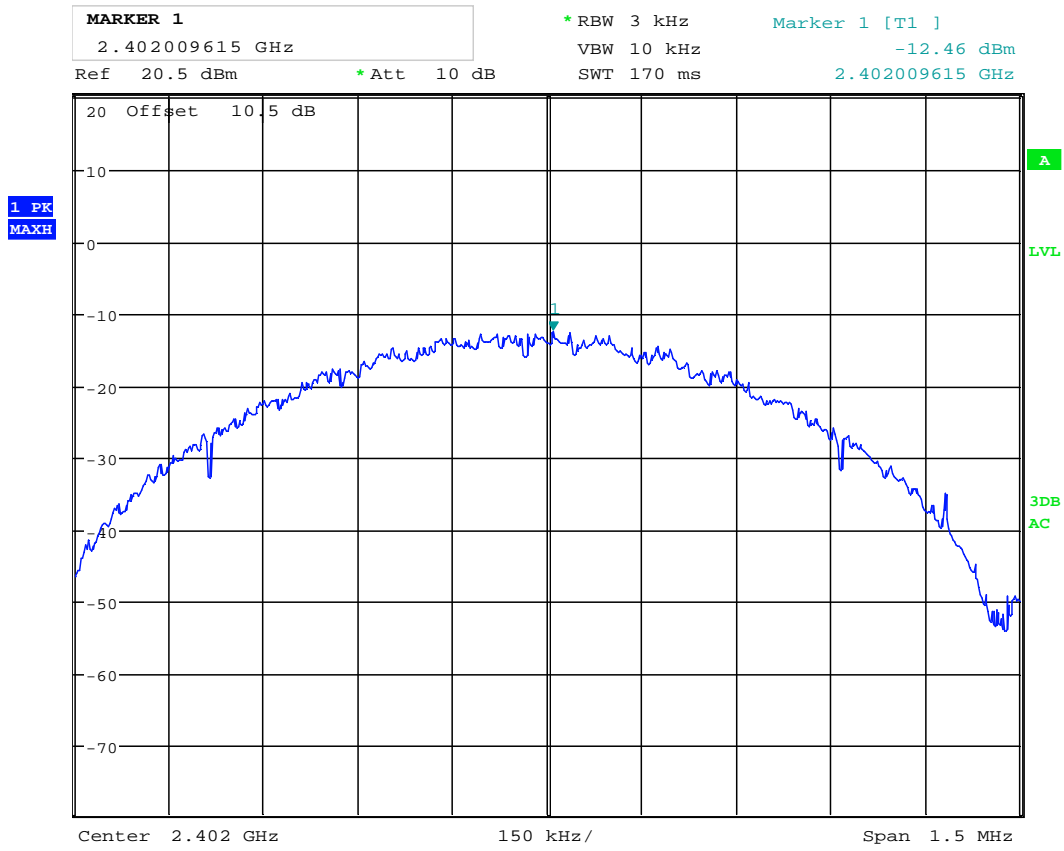
Measured and Calculated Data:

	calculated peak PSD dBm
Power Spectral Density @2402 MHz	-12.46
Power Spectral Density @2440 MHz	-13.54
Power Spectral Density @2480 MHz	-12.86

Tested according to KDB 558074 D01 DTS Meas Guidance v03r01, Section 10.2.

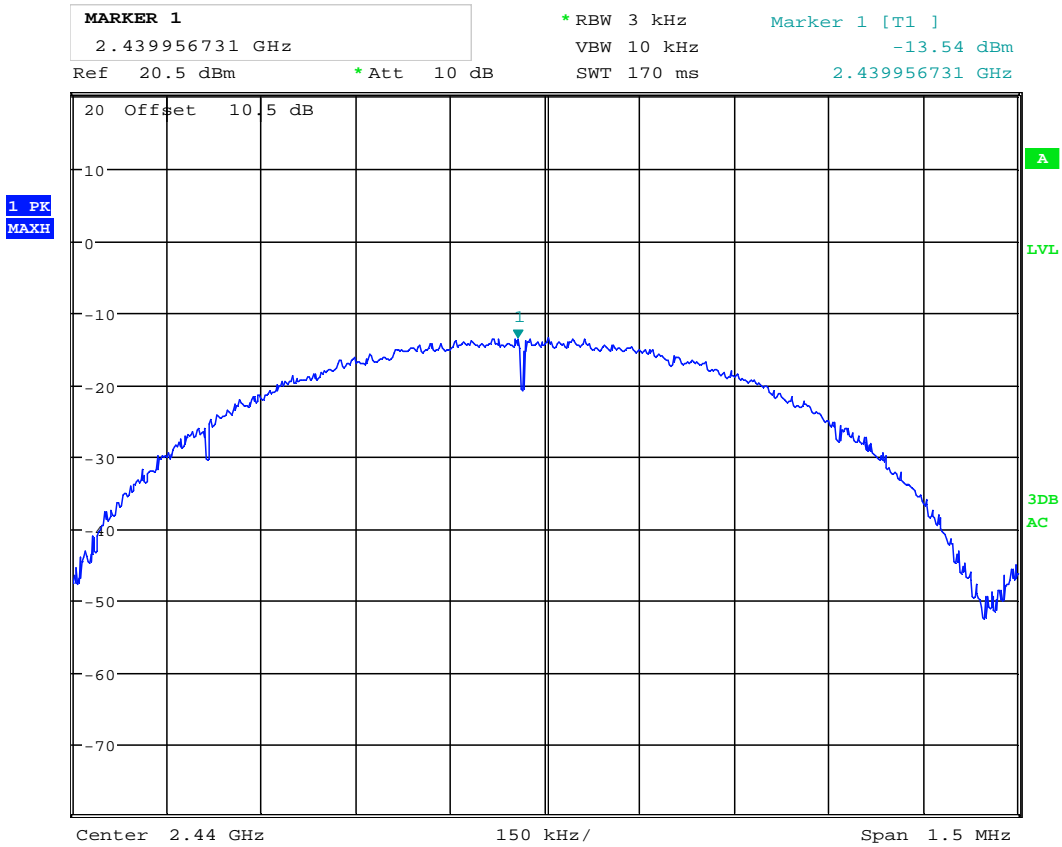
**Requirements:**

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



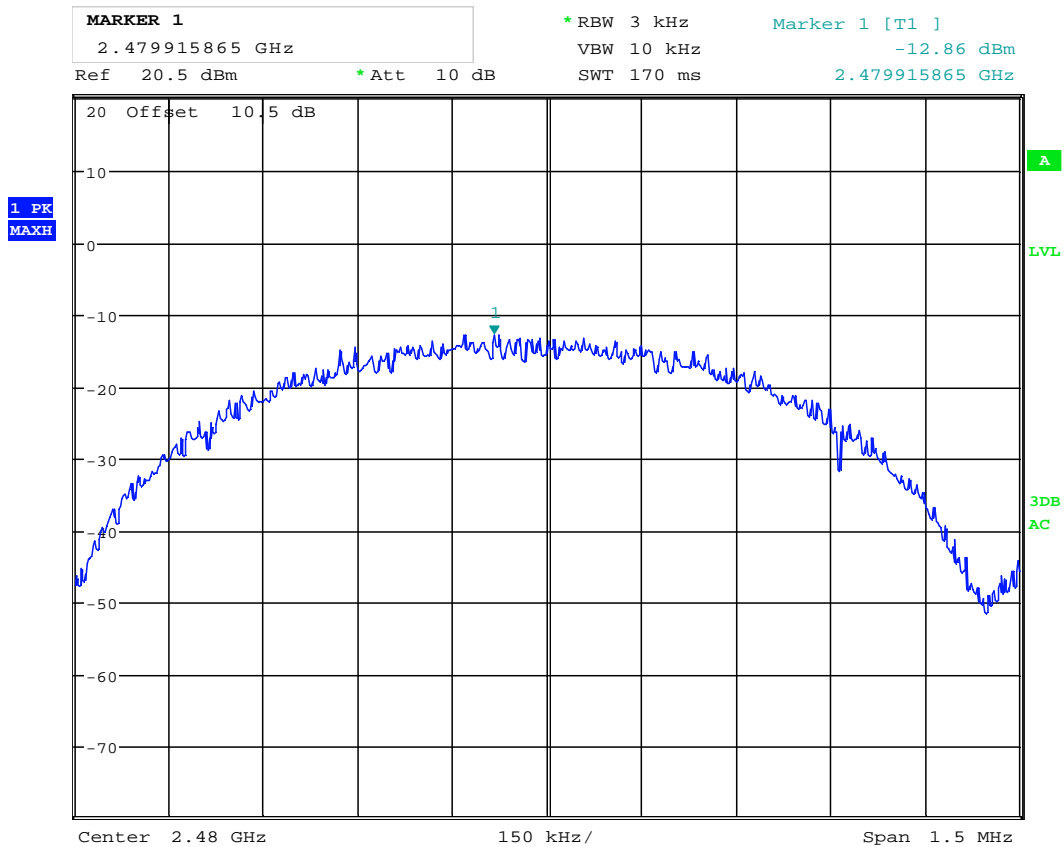
Date: 6.JAN.2014 16:21:37

### PSD Measurement - 2402MHz



Date: 6.JAN.2014 16:21:08

**PSD Measurement – 2440MHz**



Date: 6.JAN.2014 16:20:38

**PSD Measurement - 2480MHz**

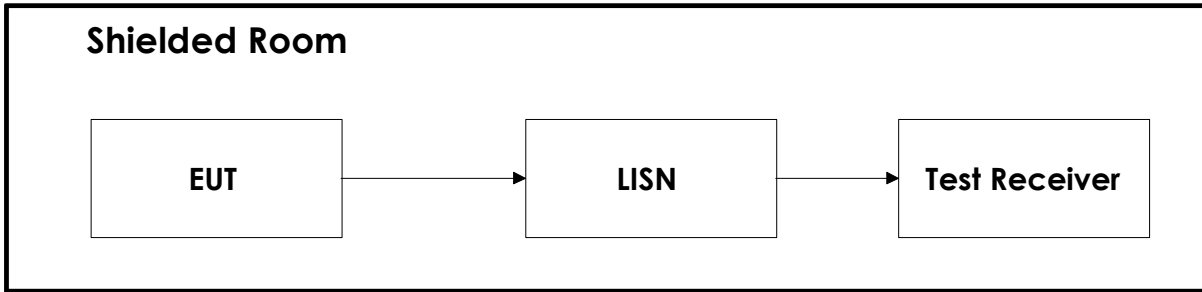
## 4 LIST OF TEST EQUIPMENT

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.	Instrument/ ancillary	Type of instrument/ ancillary	Manufacturer	Ref. no.	Cal. Date	Cal. Due
1	FSU26	Spectrum Analyzer	Rohde & Schwarz	LR 1504	2013.11	2015.11
2	ESU40	EMI Receiver	Rohde & Schwarz	LR1639	2013.09.24	2014.09.24
3	3115	Antenna horn	EMCO	LR 1330	2010.08.05	2015.08.05
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	JB3	BiLog Antenna	Sunol Sciences	N-4525	2011.09.07	2014.09.07
10	8449B	Pre-amplifier	Hewlett Packard	LR 1322	2013.09.27	2014.09.27
11	LNA6900	Pre-amplifier	Teseq	LR 1593	2013.11	2014.11
14	80S	Signal Generator	Powertron	LT 502	Cal b4 use	
15	Model 87 V	Multimeter	Fluke	LR 1598	2012-12-14	2014-12-14
17	6810.17A	10 attenuator	Suhner	LR 1143	2012.09.15	2014.09.15
18	FA210A1010003030	Microwave cable	Rosenberger	LR1566	Cal b4 use	
19	6HC 3000-18000	HP Filter	Trithlic	LR1614	Cal b4 use	
20	6HC 2500-18000	HP Filter	Trithlic	LR1615	Cal b4 use	
21	FSW	Spectrum Analyzer	Rohde & Schwarz	LR1640	2012.06	2014.06
22	6502	Antenna, Loop	EMCO	N3488	2010.10.08	2014.10.08

## 5 BLOCK DIAGRAM

### 5.1 Power Line Conducted Emission



### 5.2 Test Site Radiated Emission

