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CNASL1225

FCC PART 15 SUBPART C TEST REPORT

FCC PART 15.247

Report Reference No......:	**TRE13040043 R/C:95789**
FCC ID.....**:**	**Z36-701**
Compiled by (position+printed name+signature)..:	File administrators Tim Zhang
Supervised by (position+printed name+signature)..:	Test Engineer Eric Zhang
Approved by (position+printed name+signature)..:	Manager Wenliang Li
Date of issue.....:	May 07, 2013
Testing Laboratory Name .....:	**Shenzhen Huatongwei International Inspection Co., Ltd**
Address .....:	Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Applicant's name.....:	**Raiing Medical Company**
Address .....:	21 Huoju St, Beijing, China
Test specification:	
Standard .....:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
TRF Originator.....:	Shenzhen Huatongwei International Inspection CO., Ltd
Master TRF.....:	Dated 2006-06

Test item description .....:	Wireless Thermometer
Trade Mark .....:	/
Model/Type reference.....:	WT701
Listed Models .....:	WT702
Modulation Type .....:	GFSK
Operation Frequency.....:	From 2400MHz to 2483.5MHz
Result.....:	**Positive**

T E S T R E P O R T

Test Report No. :	TRE13040043	May 07, 2013 Date of issue

Equipment under Test	:	Wireless Thermometer
Model /Type	:	WT701
Listed Models	:	WT702
Applicant	:	Raiing Medical Company
Address	:	21 Huoju St, Beijing, China
Manufacturer	:	Raiing Medical Company
Address	:	21 Huoju St, Beijing, China

Test Result according to the standards on page 4:	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10: American National Standard for Testing Unlicensed Wireless Devices

KDB558074: DTS Meas Guidance v02 of Measurement Procedure

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Apr 25, 2013
Testing commenced on	:	Apr 25, 2013
Testing concluded on	:	May 07, 2013

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	○	120V / 60 Hz	○	115V / 60Hz
		●	3.0V DC	○	24 V DC
		○	Other (specified in blank below)		

2.3. Description of the test mode

Bluetooth: fourty channels are provided to the EUT.

Channel	Frequency	Channel	Frequency
00	**2402**	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	**2440**	**39**	**2480**

2.4. Short description of the Equipment under Test (EUT)

2.4GHz (Bluetooth Wireless Thermometer(WT701))

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.5. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides command to control the EUT for staying in continous transmitting and receiving mode for testing.

2.6. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer
○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: Z36-701** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

2.9. NOTE

1. The EUT is a Bluetooth Wireless Thermometer(WT701),The functions of the EUT listed as below:

	Test Standards	Reference Report
Bluetooth	FCC Part 15 Subpart C (Section15.247)	TRE13040043

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
Bluetooth	√	—	—	—

3. The EUT provides one completed transmitter and receiver.

Modulation Mode	TX Function
Bluetooth	1TX

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Huatongwei International Inspection Co., Ltd
Keji Nan No.12 Road, Hi-tech Park, Shenzhen, China
Phone: 86-755-26715686 Fax: 86-755-26748089

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2009) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar.01. 2012. Valid time is until Feb. 28, 2015.

A2LA-Lab Cert. No. 2243.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is until Sept. 30, 2013.

FCC-Registration No.: 662850

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 662850, Renewal date Jun. 01, 2012, valid time is until Jun. 01, 2015.

IC-Registration No.: 5377A

The 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 5377A on Jan. 25, 2011, valid time is until Jan. 24, 2014.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

NEMKO-Aut. No.: ELA125

Shenzhen Huatongwei International Inspection Co., Ltd has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10, the authorization is valid through July 07, 2013

VCCI

The 3m Semi-anechoic chamber (12.2m×7.95m×6.7m) and Shielded Room (8m×4m×3m) of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-292. Date of Registration: Dec. 24, 2010. Valid time is until Dec. 23, 2013.

Main Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-2726. Date of Registration: Dec. 20, 2012. Valid time is until Dec. 19, 2015.

Telecommunication Ports Conducted Interference Measurement of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-1837. Date of Registration: May 07, 2010. Valid time is until May 06, 2013.

DNV

Shenzhen Huatongwei International Inspection Co., Ltd. has been found to comply with the requirements of DNV towards subcontractor of EMC and safety testing services in conjunction with the EMC and Low voltage Directives and in the voluntary field. The acceptance is based on a formal quality Audit and follow-ups according to relevant parts of ISO/IEC Guide 17025 (2005), in accordance with the requirements of the DNV Laboratory Quality Manual towards subcontractors. Valid time is until Aug. 24, 2013.

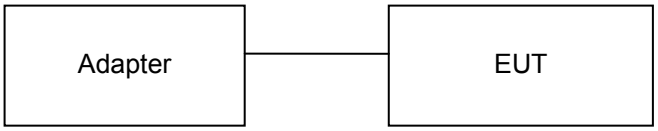
3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
HuPlugLink 500 Wireless “N” Adapterity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



3.5. Test Description

FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	N/A
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

Remark: The measurement uncertainty is not included in the test result.

3.6. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Huatongwei laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Frequency stability	25 Hz	(1)
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-12.75 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-12.75 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emissio 1~18GHz	5.16 dB	(1)

Test Items	Measurement Uncertainty	Notes
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)
Emission Mask	---------	(1)
Modulation Characteristic	---------	(1)
Transmitter Frequency Behavior	---------	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

3.7. Equipments Used during the Test

AC Power Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	2012/10/27
2	EMI Test Receiver	Rohde&Schwarz	ESCS 30	100038	2012/10/27
3	Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	2012/10/27
4	EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	2012/10/27

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	Rohde&Schwarz	HL562	100015	2012/10/27
2	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	2012/10/27
3	RF TEST PANEL	Rohde&Schwarz	TS / RSP	335015/ 0017	2012/10/27
4	TURNTABLE	ETS	2088	2149	2012/10/27
5	ANTENNA MAST	ETS	2075	2346	2012/10/27
6	EMI TEST OFTWARE	Rohde&Schwarz	ESK1	N/A	2012/10/27
7	HORN ANTENNA	Rohde&Schwarz	HF906	100039	2012/10/27
8	Amplifer	Sonoma	310N	E009-13	2012/10/27
9	JS amplifer	Rohde&Schwarz	JS4-00101800-28-5A	F201504	2012/10/27
10	High pass filter	Compliance Direction systems	BSU-6	34202	2012/10/27
11	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2012/10/27
12	Amplifer	Compliance Direction systems	PAP1-4060	120	2012/10/27
13	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	2012/10/27
14	Amplifer	Compliance Direction systems	PAP1-4060	120	2012/10/27
15	HORN ANTENNA	ShwarzBeck	9120D	1012	2012/10/27
16	TURNTABLE	MATURO	TT2.0	----	2012/10/27
17	ANTENNA MAST	MATURO	TAM-4.0-P	----	2012/10/27

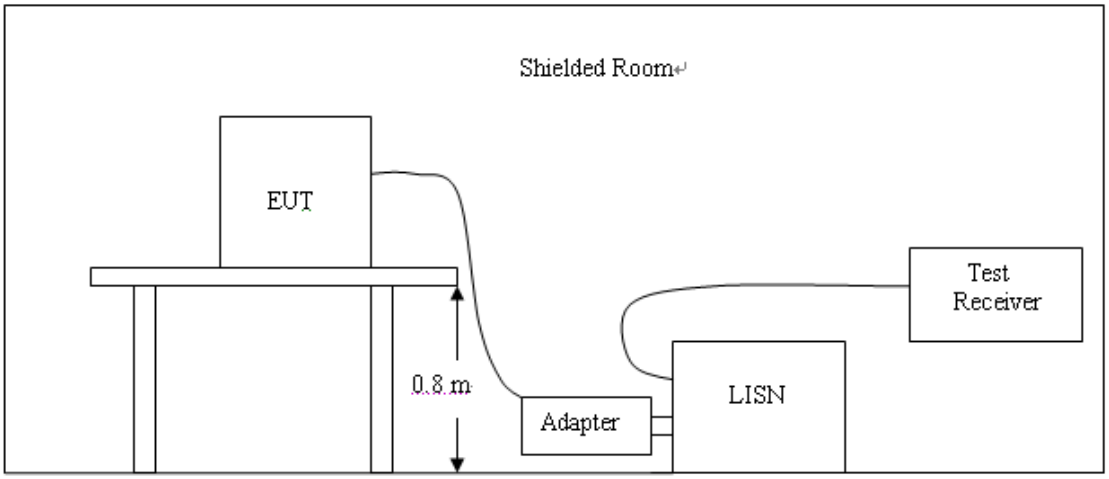
Maximum Peak Output Power / Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI TEST RECEIVER	Rohde&Schwarz	ESI 26	100009	2012/10/27
2	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	2012/10/27

The Cal.Interval was one year

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission（Not applicable）

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
2 Support equipment, if needed, was placed as per ANSI C63.4-2009
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009
4 The EUT received DC12V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

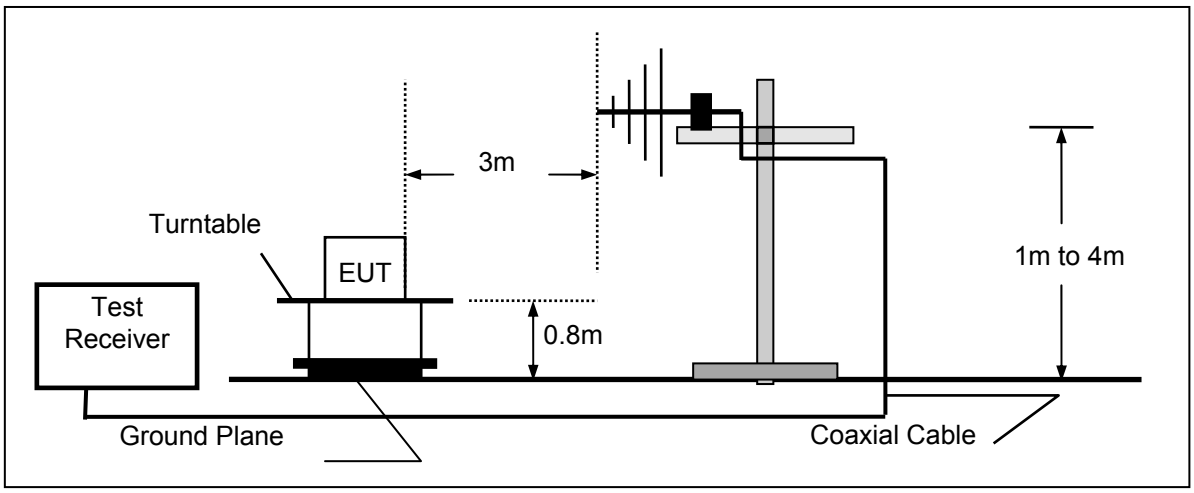
TEST RESULTS

Not applicable to this device (beacuse the equipment Power supply is battery)

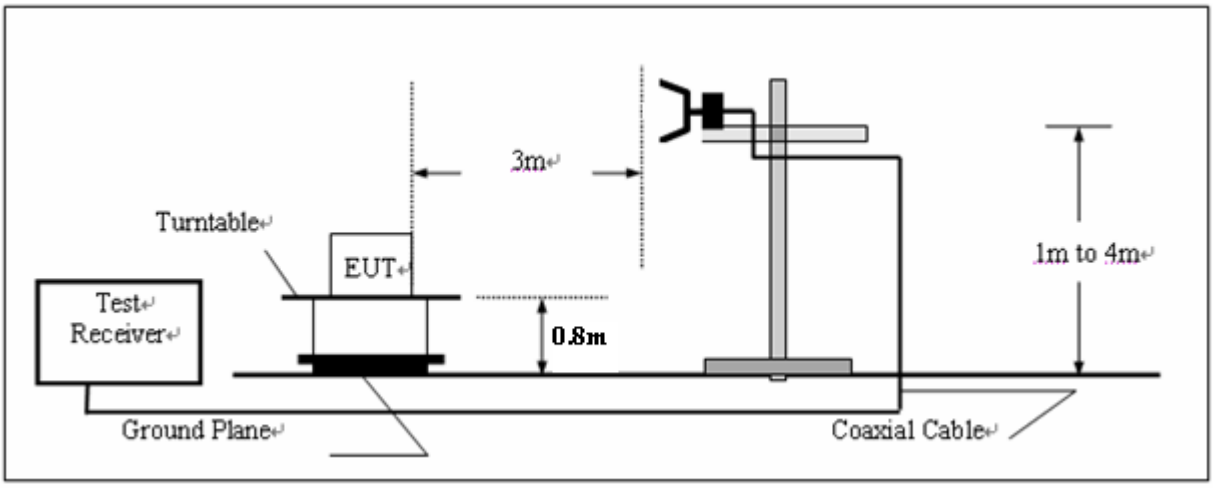
4.2. Radiated Emission

TEST CONFIGURATION

(a) Radiated Emission Test Set-Up, Frequency below 1000MHz



(b) Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

1 The EUT was placed on a turn table which is 0.8m above ground plane.
2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The minimum frequency was 32.768KHz and maximum operation frequency was 2480MHz,so radiated emission test frequency from 9KHz to 25GHz.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL + AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.
The frequency spectrum above 1 GHz for Transmitter was investigated. All emission not reported are much lower than the prescribed limits. Set the RBW=1MHz,VBW=3MHz for Peak Detector while the RBW=1MHz,VBW=10Hz for Average Detector,Readings are both peak and average values.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	300	20log(2400/F(KHz))	2400/F(KHz)
0.49-1.705	30	20log(24000/F(KHz))	24000/F(KHz)
1.705-30	30	20log(30)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following table.

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)
1.705-30	3	20log(30)+ 40log(30/3)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

TEST RESULTS

Note: 1.The radiated measurement are performed the each channel, the datum recorded below is the worst case.
2. ULTRA-BROADBAND ANTENNA for the radiation emission test below 1G.
3. HORN ANTENNA for the radiation emission test above 1G.

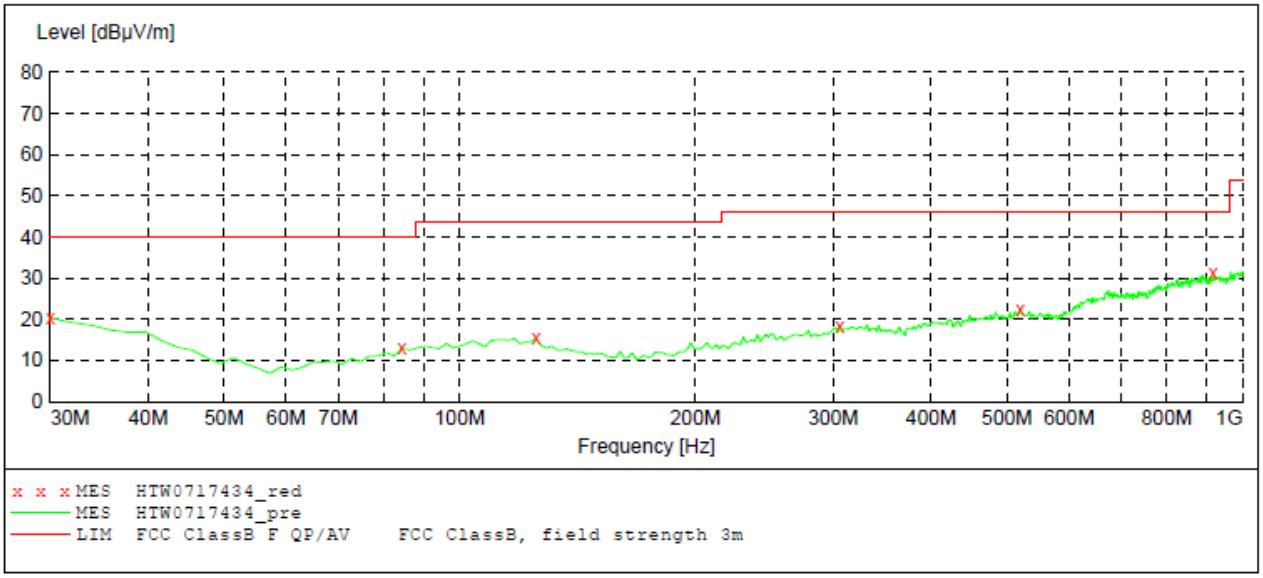
For 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dBμV/m)@3m	FCC Limit (dBμV/m) @3m	Margin (dB)	Detector	Result
0.96	49.12	67.96	18.84	QP	Pass
1.39	42.06	64.74	22.68	QP	Pass
10.20	46.25	69.54	23.29	QP	Pass
23.02	42.20	69.54	27.34	QP	Pass

For 30MHz to 1000MHz

SCAN TABLE: "test Field (30M-1G) QP"

```
  Short Description:              Field Strength (30M-1G)
  Start      Stop       Step      Detector  Meas.     IF       Transducer
  Frequency  Frequency  Width               Time      Bandw.
  30.0 MHz   1.0 GHz    60.0 kHz  QuasiPeak 1.0 s     120 kHz HL562
```



MEASUREMENT RESULT: "HTW0717434_red"

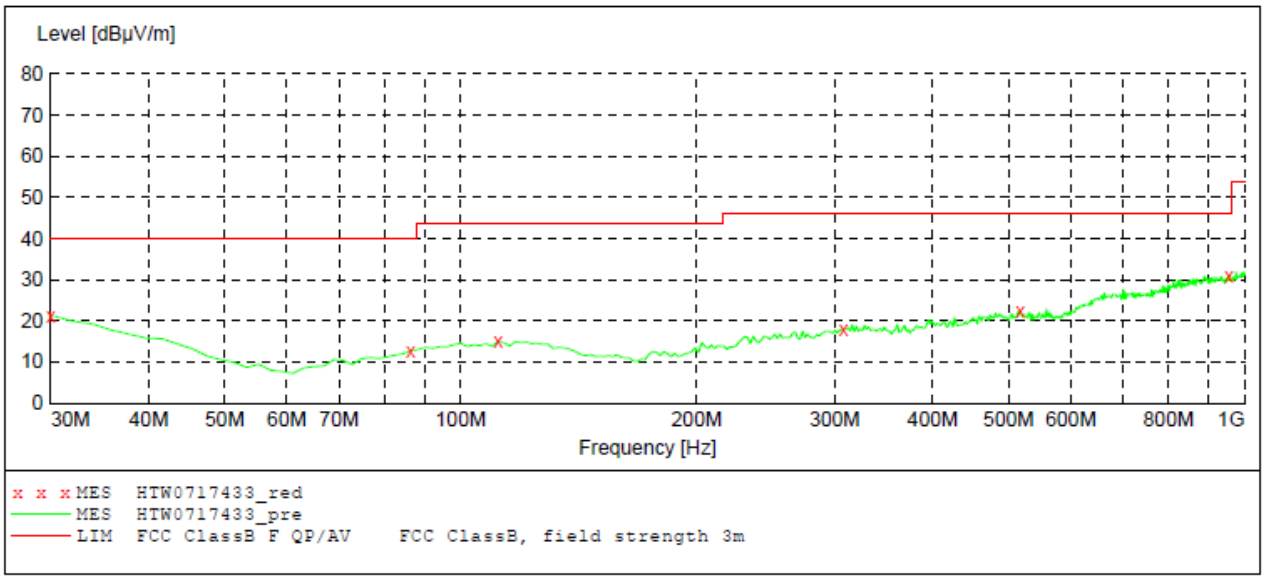
7/17/2012 7:53PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	20.30	-11.3	40.0	19.7	QP	100.0	3.00	VERTICAL
84.428858	12.90	-21.2	40.0	27.1	QP	100.0	24.00	VERTICAL
125.250501	15.30	-19.7	43.5	28.2	QP	100.0	0.00	VERTICAL
306.032064	18.20	-16.6	46.0	27.8	QP	100.0	162.00	VERTICAL
519.859719	22.30	-12.9	46.0	23.7	QP	100.0	103.00	VERTICAL
916.412826	31.30	-7.2	46.0	14.7	QP	100.0	295.00	VERTICAL

SCAN TABLE: "test Field (30M-1G) QP"

Short Description: Field Strength (30M-1G)

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	QuasiPeak	1.0 s	120 kHz	HL562



MEASUREMENT RESULT: "HTW0717433_red"

7/17/2012 7:51PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	21.30	-11.3	40.0	18.7	QP	100.0	254.00	HORIZONTAL
86.372745	12.70	-20.8	40.0	27.3	QP	300.0	358.00	HORIZONTAL
111.643287	15.00	-19.5	43.5	28.5	QP	100.0	337.00	HORIZONTAL
307.975952	18.00	-16.4	46.0	28.0	QP	100.0	204.00	HORIZONTAL
517.915832	22.30	-13.0	46.0	23.7	QP	100.0	231.00	HORIZONTAL
955.290581	30.90	-7.1	46.0	15.1	QP	300.0	257.00	HORIZONTAL

Channel 00

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	*2402.00	85.38	PK			1.00 H	360	88.78	28.3	4.90	-36.6	-3.40
1	*2402.00	84.45	AV			1.00 H	360	87.85	28.3	4.90	-36.6	-3.40
2	4804.00	42.24	PK	74.00	31.76	1.00 H	359	39.04	32.7	7.00	-36.5	3.20
2	4804.00	38.15	AV	54.00	15.85	1.00 H	359	34.95	32.7	7.00	-36.5	3.20
3	7206.00	51.35	PK	74.00	22.65	1.00 H	152	41.95	35.8	8.90	-35.3	9.40
3	7206.00	48.78	AV	54.00	5.22	1.00 H	152	39.38	35.8	8.90	-35.3	9.40
4	9608.00	55.35	PK	74.00	18.65	1.00 H	140	42.75	37.2	10.20	-34.8	12.60
4	9608.00	49.48	AV	54.00	4.52	1.00 H	140	36.88	37.2	10.20	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（2402MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	*2402.00	85.78	PK			1.00 V	124	89.18	28.3	4.90	-36.6	-3.40
1	*2402.00	84.12	AV			1.00 V	124	87.52	28.3	4.90	-36.6	-3.40
2	4804.00	42.15	PK	74.00	31.85	1.00 V	339	38.95	32.7	7.00	-36.5	3.20
2	4804.00	38.75	AV	54.00	15.25	1.00 V	339	35.55	32.7	7.00	-36.5	3.20
3	7206.00	51.35	PK	74.00	22.65	1.00 V	340	41.95	35.8	8.90	-35.3	9.40
3	7206.00	48.79	AV	54.00	5.21	1.00 V	340	39.39	35.8	8.90	-35.3	9.40
4	9608.00	55.34	PK	74.00	18.66	1.00 V	20	42.74	37.2	10.20	-34.8	12.60
4	9608.00	49.18	AV	54.00	4.82	1.00 V	20	36.58	37.2	10.20	-34.8	12.60

Channel 19

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（2440MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	*2440.00	85.78	PK			1.00 H	153	88.98	28.3	5.10	-36.6	-3.20
1	*2440.00	84.57	AV			1.00 H	153	87.77	28.3	5.10	-36.6	-3.20
2	4880.00	42.28	PK	74.00	31.72	1.00 H	202	38.88	32.3	7.60	-36.5	3.40
2	4880.00	38.67	AV	54.00	15.33	1.00 H	202	35.27	32.3	7.60	-36.5	3.40
3	7320.00	51.47	PK	74.00	22.53	1.00 H	355	42.07	36.1	8.60	-35.3	9.40
3	7320.00	48.39	AV	54.00	5.61	1.00 H	355	38.99	36.1	8.60	-35.3	9.40
4	9760.00	55.48	PK	74.00	18.52	1.00 H	28	42.88	37.2	10.20	-34.8	12.60
4	9760.00	49.28	AV	54.00	4.72	1.00 H	28	36.68	37.2	10.20	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（2440MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	*2440.00	85.78	PK			1.00 V	121	88.98	28.3	5.10	-36.6	-3.20
1	*2440.00	84.52	AV			1.00 V	121	87.72	28.3	5.10	-36.6	-3.20
2	4880.00	42.35	PK	74.00	31.65	1.00 V	97	38.95	32.3	7.60	-36.5	3.40
2	4880.00	38.15	AV	54.00	15.85	1.00 V	97	34.75	32.3	7.60	-36.5	3.40
3	7320.00	51.20	PK	74.00	22.8	1.00 V	288	41.8	36.1	8.60	-35.3	9.40
3	7320.00	48.26	AV	54.00	5.74	1.00 V	288	38.86	36.1	8.60	-35.3	9.40
4	9760.00	55.12	PK	74.00	18.88	1.00 V	89	42.52	37.2	10.20	-34.8	12.60
4	9760.00	49.45	AV	54.00	4.55	1.00 V	89	36.85	37.2	10.20	-34.8	12.60

Channel 39

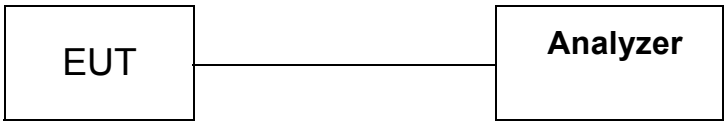
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	*2480.00	85.85	PK			1.00 H	154	89.15	28.6	4.70	-36.6	-3.30
1	*2480.00	84.74	AV			1.00 H	154	88.04	28.6	4.70	-36.6	-3.30
2	4960.00	42.02	PK	74.00	31.98	1.00 H	100	38.22	33.0	7.00	-36.2	3.80
2	4960.00	38.25	AV	54.00	15.75	1.00 H	100	34.45	33.0	7.00	-36.2	3.80
3	7540.00	51.25	PK	74.00	22.75	1.00 H	190	41.85	36.2	8.50	-35.3	9.40
3	7540.00	48.42	AV	54.00	5.58	1.00 H	190	39.02	36.2	8.50	-35.3	9.40
4	10020.00	55.55	PK	74.00	18.45	1.00 H	113.	42.95	37.2	10.20	-34.8	12.60
4	10020.00	49.25	AV	54.00	4.75	1.00 H	113	36.65	37.2	10.20	-34.8	12.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（2480MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier	Correction Factor (dB/m)
1	*2480.00	86.98	PK			1.00 V	247	90.28	28.6	4.70	-36.6	-3.30
1	*2480.00	85.02	AV			1.00 V	247	88.32	28.6	4.70	-36.6	-3.30
2	4960.00	42.48	PK	74.00	31.52	1.00 V	90	38.68	33.0	7.00	-36.2	3.80
2	4960.00	38.68	AV	54.00	15.32	1.00 V	90	34.88	33.0	7.00	-36.2	3.80
3	7540.00	51.58	PK	74.00	22.42	1.00 V	29	42.18	36.2	8.50	-35.3	9.40
3	7540.00	47.24	AV	54.00	6.76	1.00 V	29	37.84	36.2	8.50	-35.3	9.40
4	10020.00	55.58	PK	74.00	18.42	1.00 V	222	42.98	37.2	10.20	-34.8	12.60
4	10020.00	48.45	AV	54.00	5.55	1.00 V	222	35.85	37.2	10.20	-34.8	12.60

REMARKS: 1. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)+Pre-amplifier Factor
3. The other emission levels were very low against the limit.
4. Margin value = Limit value- Emission level.
5. " * " : Fundamental frequency

4.3. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

Follow KDB 558074 D01 V02 DTS Meas Guidance v02 of measurement procedure 8.1.2

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

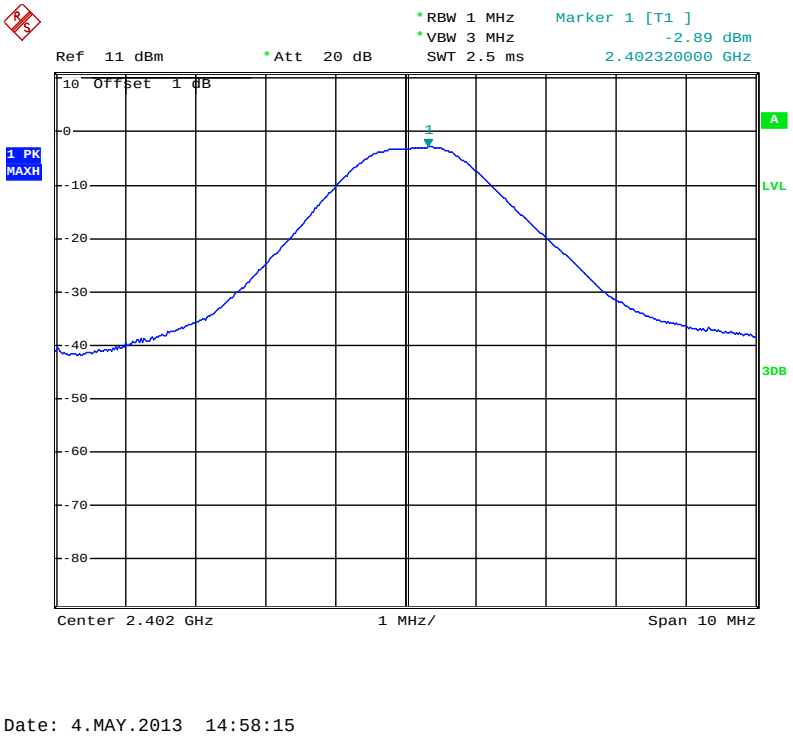
TEST RESULTS

Channel Number	Frequency (MHz)	Reading Power Output(dBm)	Limit (dBm)	Verdict
00	2402	-2.89	30	PASS
19	2440	-4.24	30	PASS
39	2480	-5.71	30	PASS

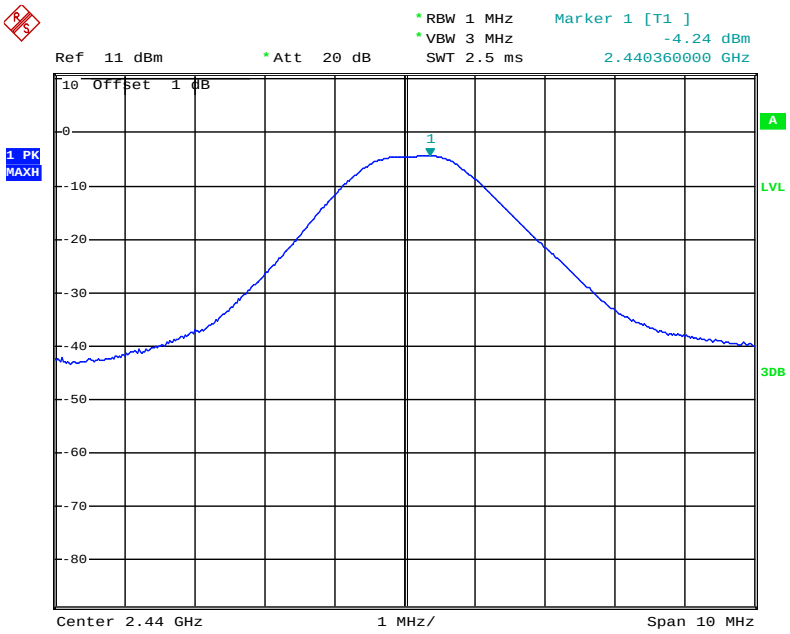
Note: The test results including the cable lose.

Photos of Maximum Peak Output Power

Channel 00

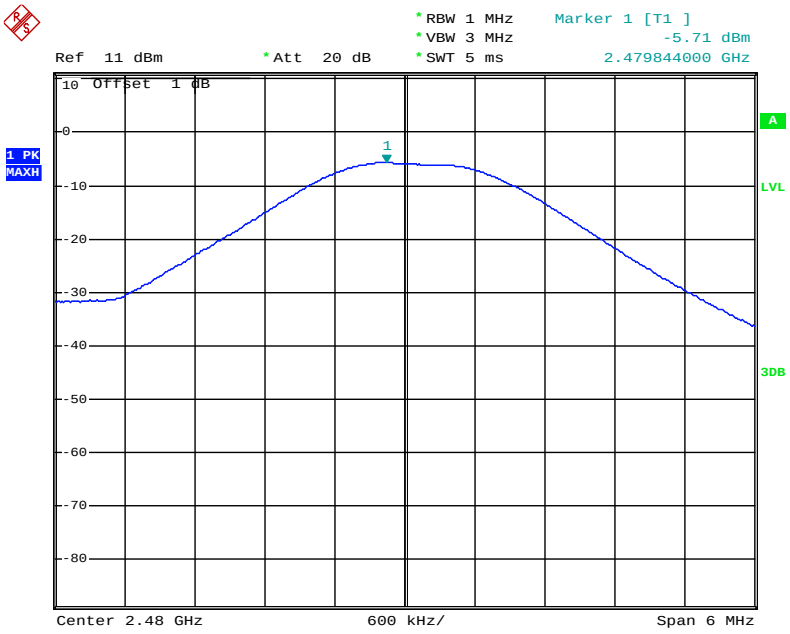


Channel 19



Date: 4.MAY.2013 14:58:58

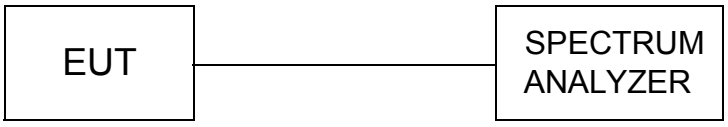
Channel 39



Date: 4.MAY.2013 14:45:53

4.4. Power Spectral Density

TEST CONFIGURATION



TEST PROCEDURE

1.Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.

2.Set the RBW ⩾ 3 kHz.

3.Set the VBW ⩾ 3× RBW.

4.Set the span to 1.5 times the DTS channel bandwidth.

5.Detector = peak.

6.Sweep time = auto couple.

7.Trace mode = max hold.

8.Allow trace to fully stabilize.

9.Use the peak marker function to determine the maximum power level.

10.If measured value exceeds limit,reduce RBW(no less than 3 kHz)and repeat.

11.The resulting peak PSD level must be 8 dBm.

Follow KDB 558074 D01 DTS Meas Guidance v02 of measurement procedure 9.1

LIMIT

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

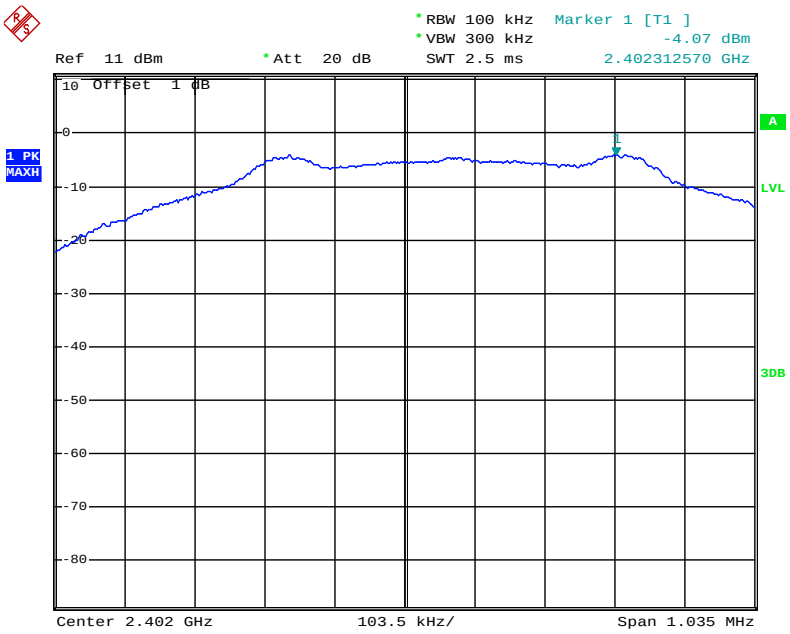
TEST RESULTS

Channel	Frequency (MHz)	Measured PSD (dBm/100kHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
00	2402	-4.07	-19.30	8	PASS
19	2440	-4.60	-19.80	8	PASS
39	2480	-6.15	-21.38	8	PASS

Note: The test results including the cable lose.

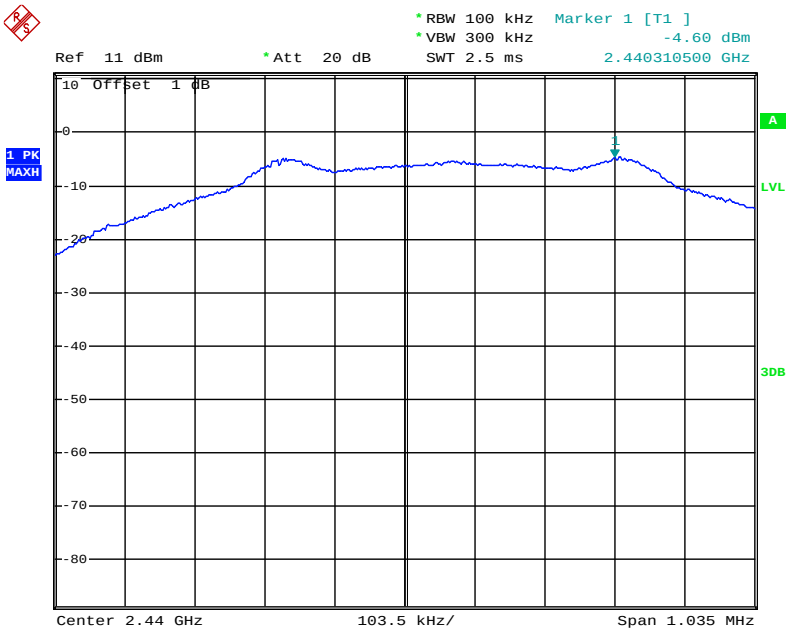
Photos of Power Spectral Density Measurement

Channel 00



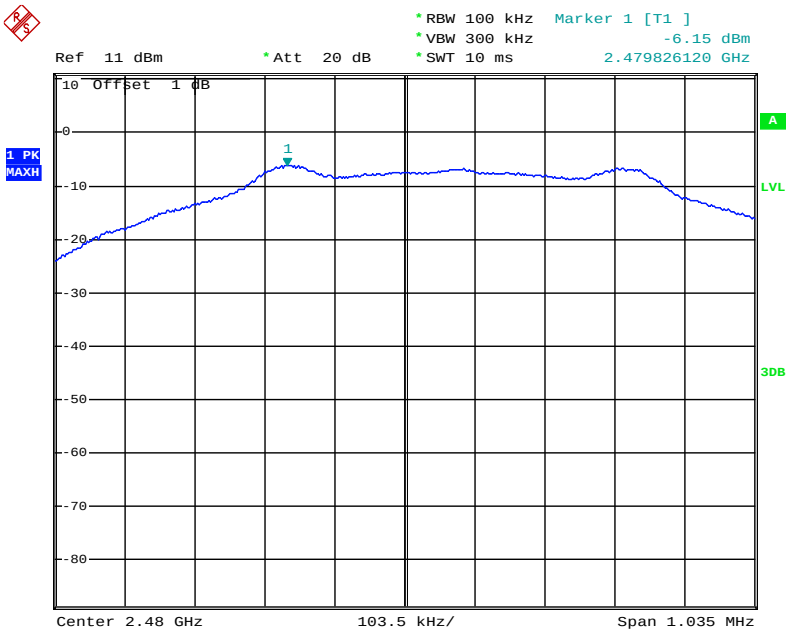
Date: 4.MAY.2013 14:57:49

Channel 19



Date: 4.MAY.2013 15:00:17

Channel 39



Date: 4.MAY.2013 14:48:13

4.5. Band Edge Compliance of RF Emission

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. For Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=10Hz for average detector.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. § 15.209(a) specifies radiated emissions limits for unwanted emissions in the restricted bands in terms of the maximum permissible electric field strength at a specified measurement distance. A correspondent EIRP level can be determined from the following relationship:
   E = EIRP -20log(d) + 104.8
   where:
   EIRP = the equivalent isotropic radiated power in dBm,
   E = electric field strength in dBμV/m,
   d = measurement distance in meters.
7. For emissions at frequencies less than or equal to 30 MHz , a maximum ground reflection factor of 6 dB shall be used and for emissions at frequencies greater than 30 MHz but less than or equal to 1000 MHz, a maximum ground reflection factor of 4.7 dB shall be used. For emissions on frequencies greater than 1000 MHz, no ground reflection factor is applied.

LIMIT

Below -20dB of the highest emission level in operating band.

Radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)

TEST RESULTS

For Radiated Band Edge

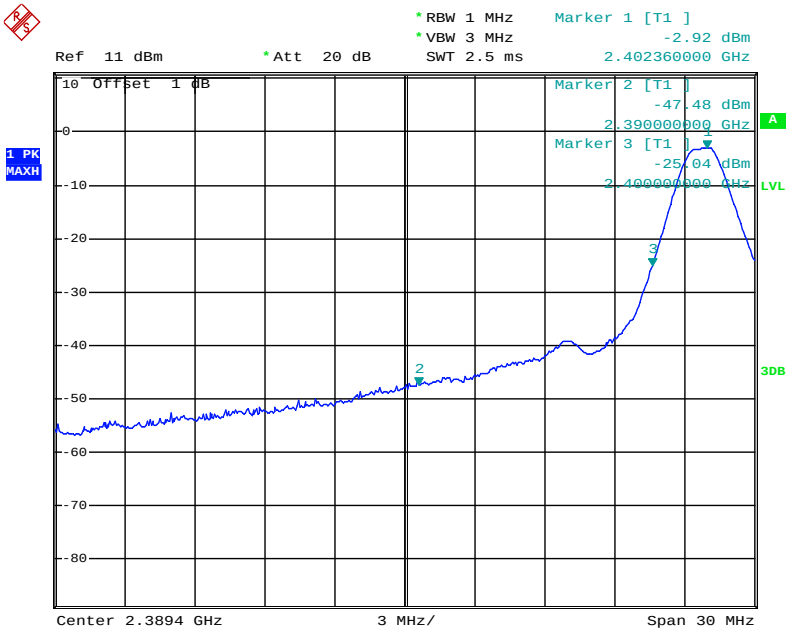
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground reflection factor(dBi)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)
2390.00	-47.48	0.8	0	48.57	PK	74.00
2390.00	-59.63	0.8	0	36.43	AV	54.00
2483.50	-40.37	0.8	0	55.69	PK	74.00
2483.50	-45.43	0.8	0	50.63	AV	54.00

For Conducted Band Edge

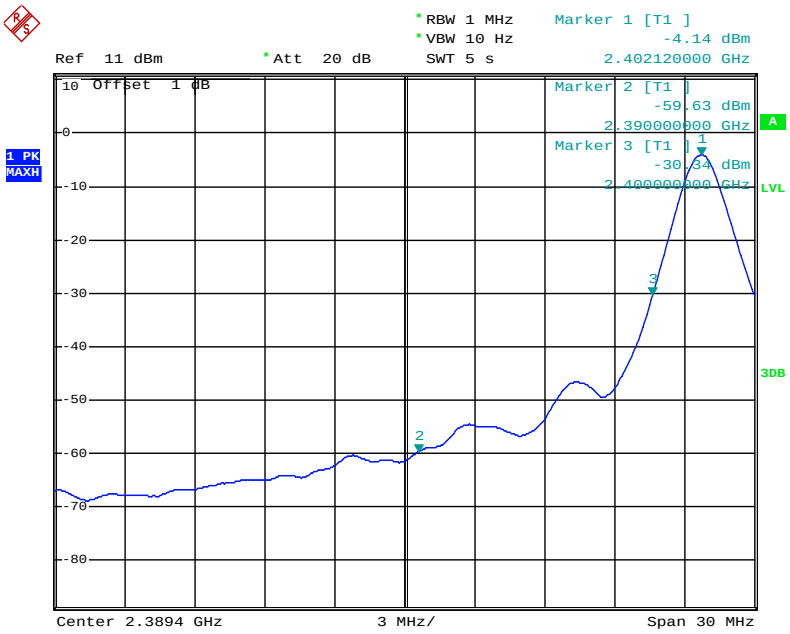
Channel Number	Channel Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
00	2390.00	51.45	20	PASS
39	2483.50	46.34	20	PASS

Photos of Radiated Band Edge Measurement

Channel 00

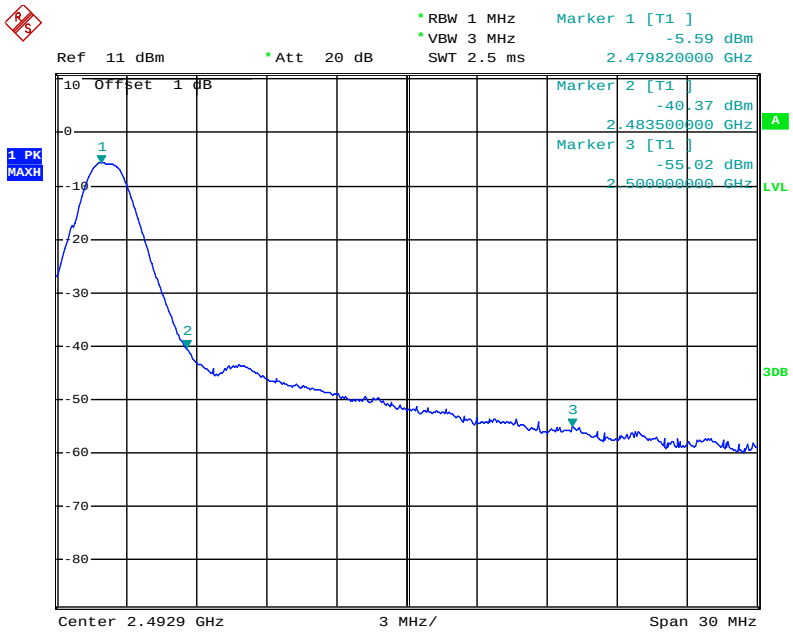


Date: 4.MAY.2013 14:54:31

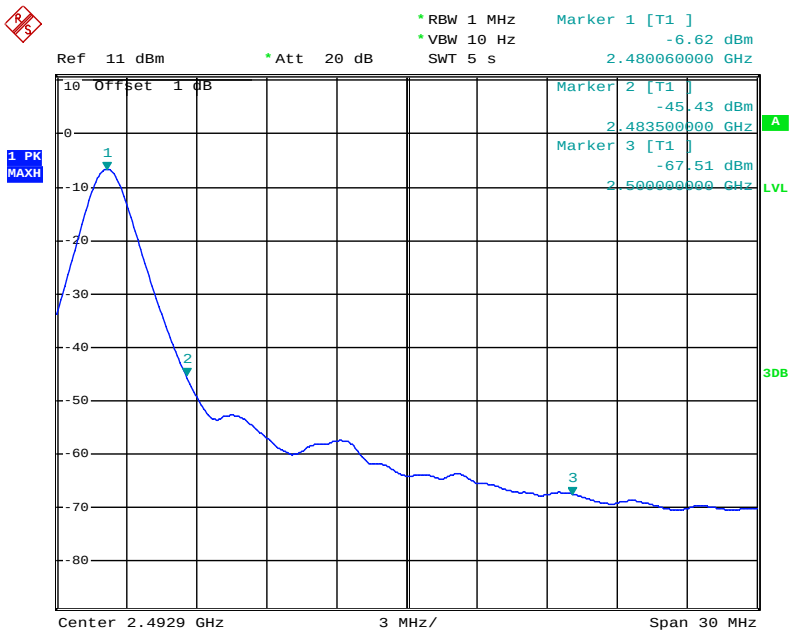


Date: 4.MAY.2013 14:54:57

Channel 39



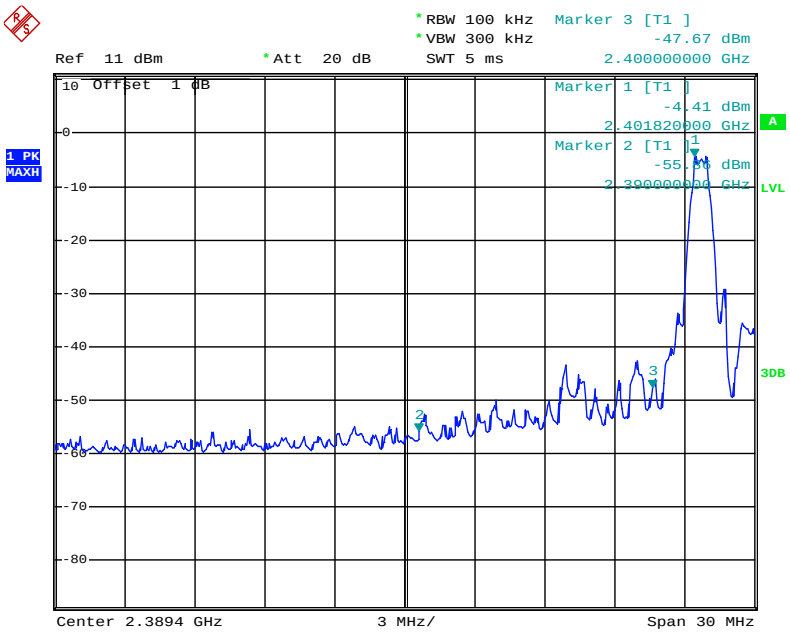
Date: 4.MAY.2013 14:52:20



Date: 4.MAY.2013 14:52:41

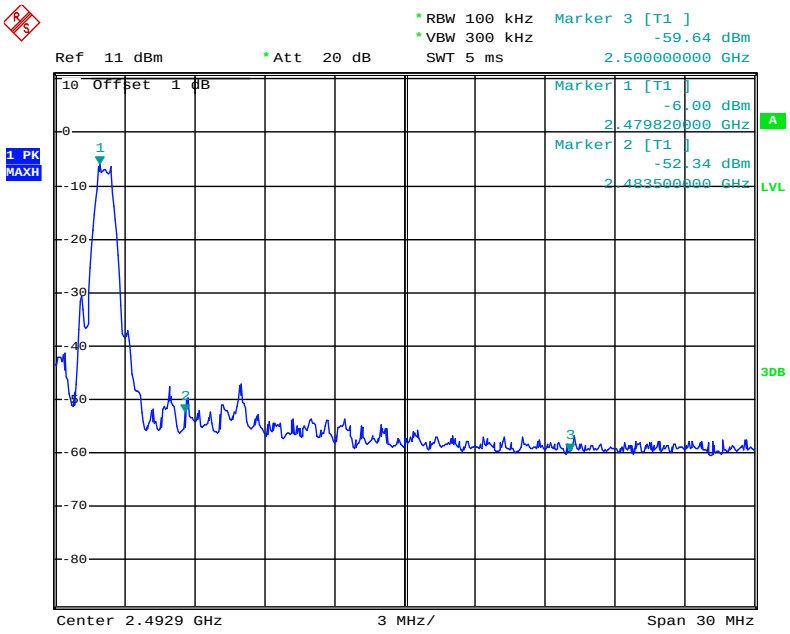
Photos of Conducted Band Edge Measurement

Channel 00



Date: 4.MAY.2013 14:54:03

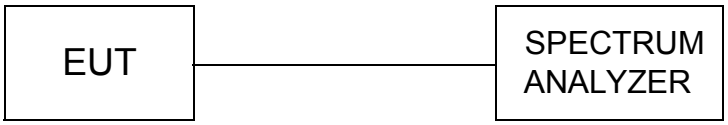
Channel 39



Date: 4.MAY.2013 14:52:03

4.6. Spurious RF Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

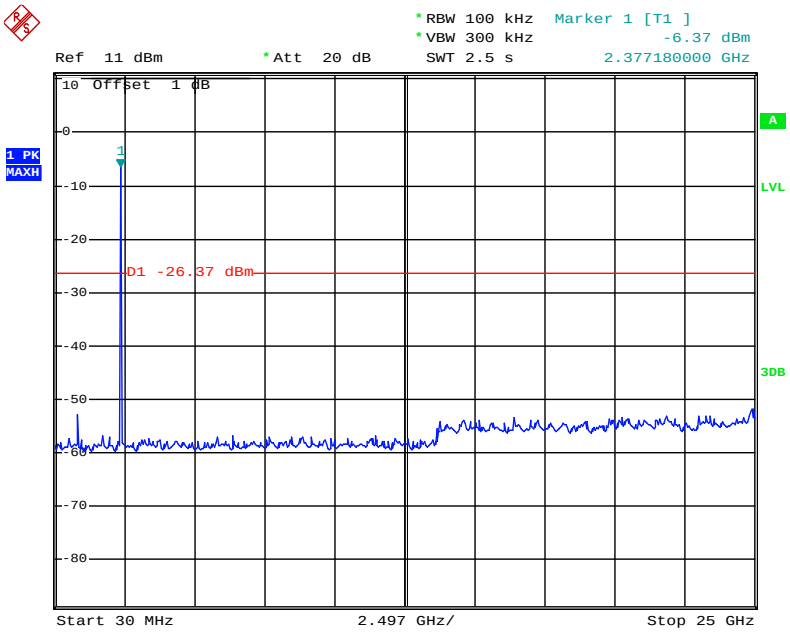
The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2009 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300KHz to measure the peak field strength , and mwasure frequeny range from 30MHz to 26.5GHz.

LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

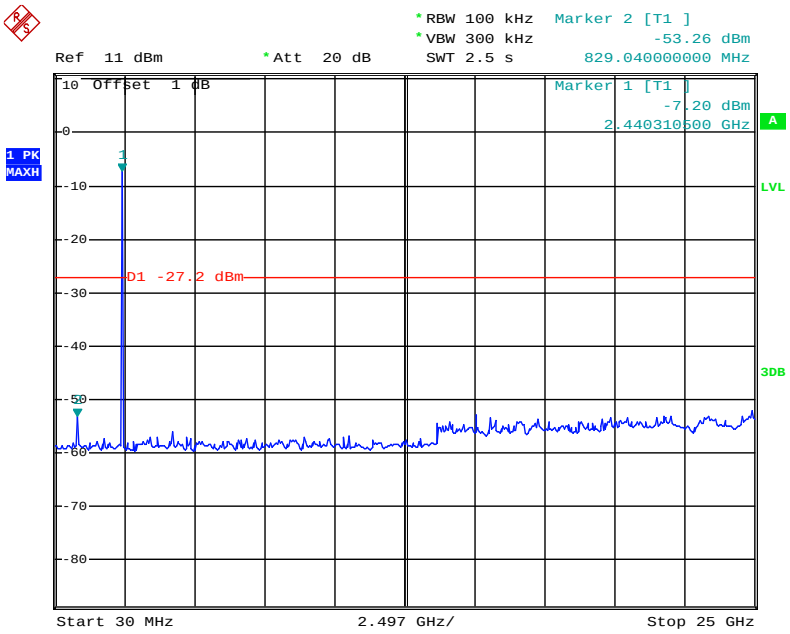
TEST RESULTS

Channel 00



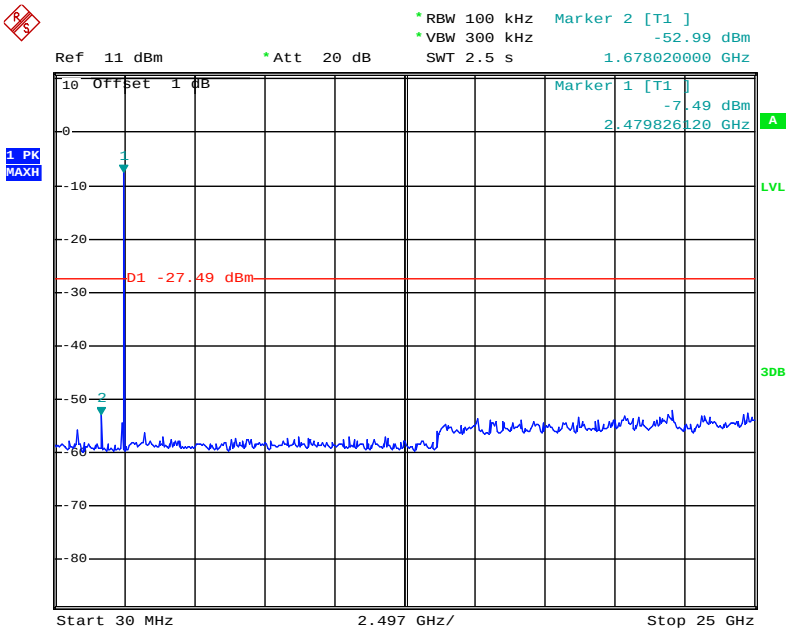
Date: 4.MAY.2013 15:02:40

Channel 19



Date: 4.MAY.2013 15:01:27

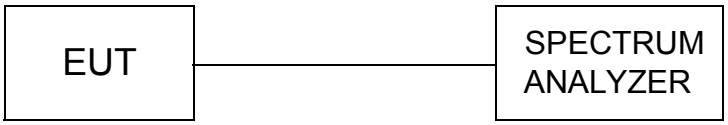
Channel 39



Date: 4.MAY.2013 14:50:20

4.7. 6dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with100 KHz RBW and 300KHz VBW.

The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

LIMIT

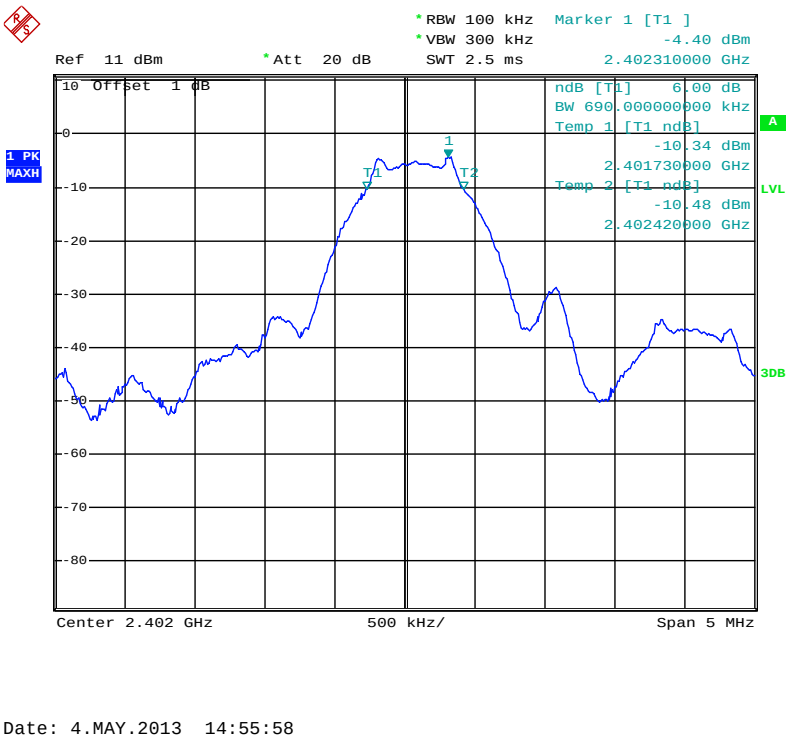
For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (MHz)	Result
00	2402	0.690	0.500	PASS
19	2419	0.690	0.500	PASS
39	2439	0.690	0.500	PASS

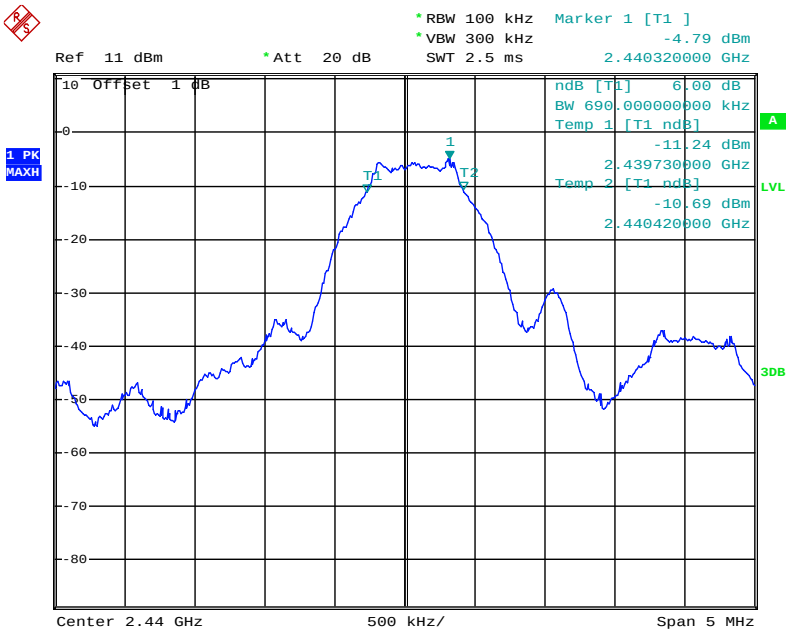
Photos of 6dB Bandwidth Measurement

Channel 00



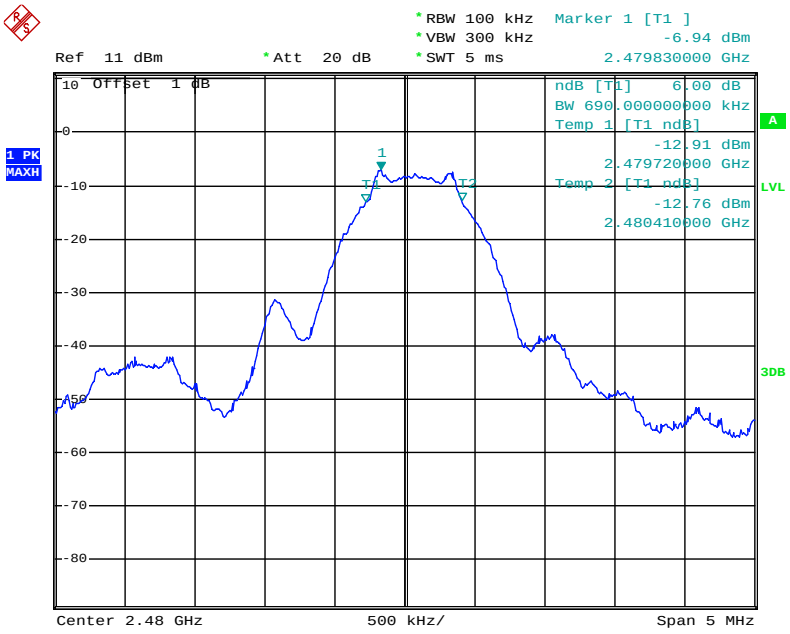
Date: 4.MAY.2013 14:55:58

Channel 19



Date: 4.MAY.2013 14:59:38

Channel 39



Date: 4.MAY.2013 14:46:43

4.8. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

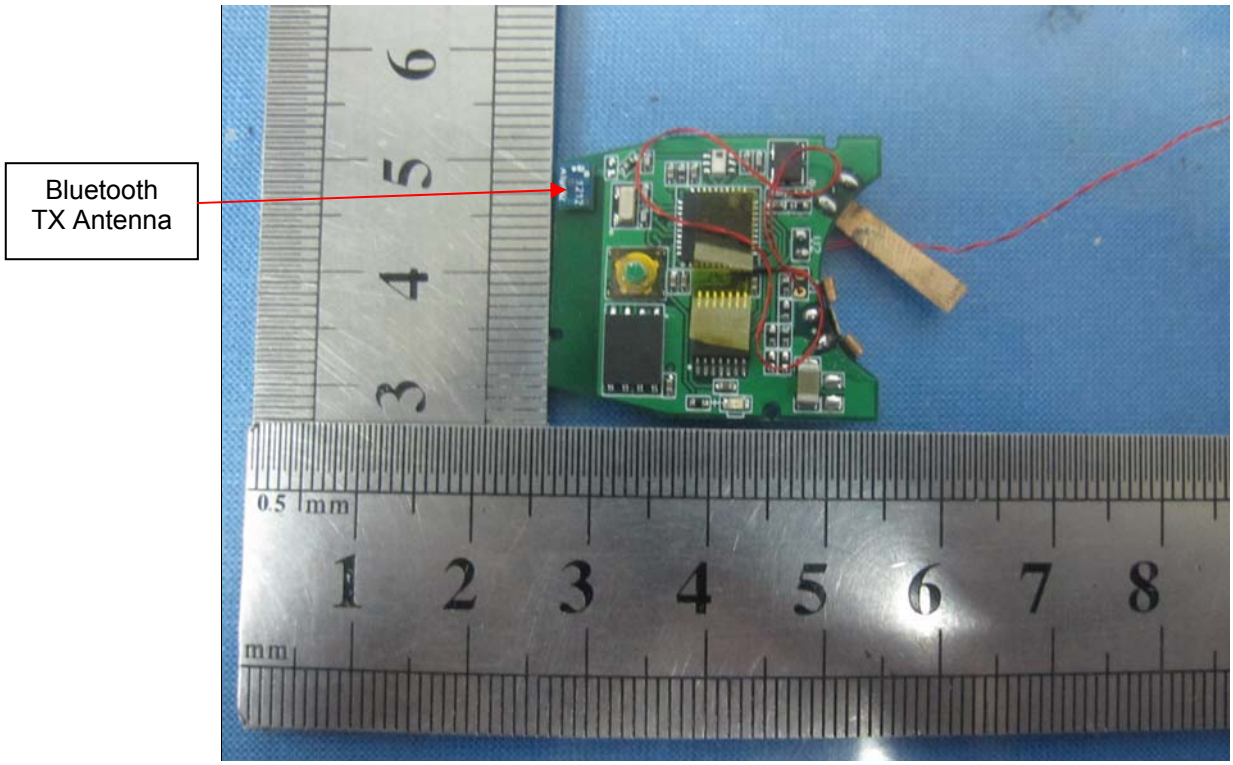
And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The Gain of the antenna is 0.8dBi.

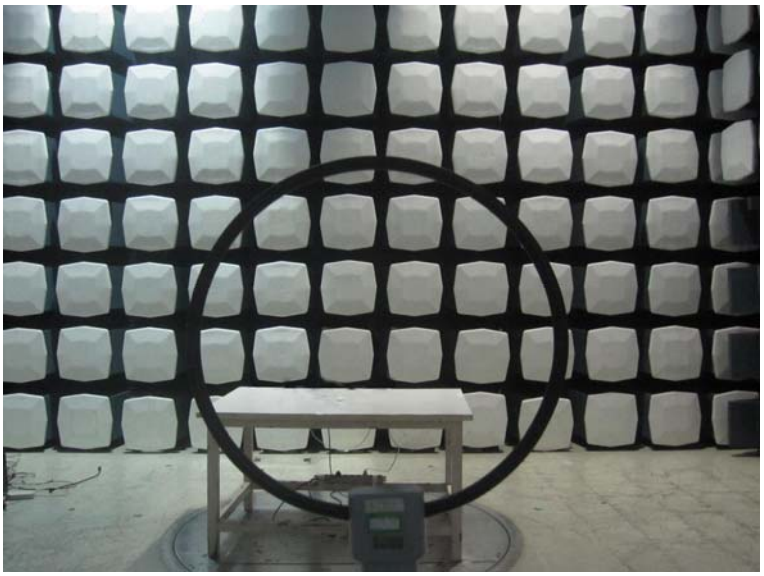


5. Test Setup Photos of the EUT

Radiated Emission (30MHz-1GHz)

Radiated Emission (above 1GHz)

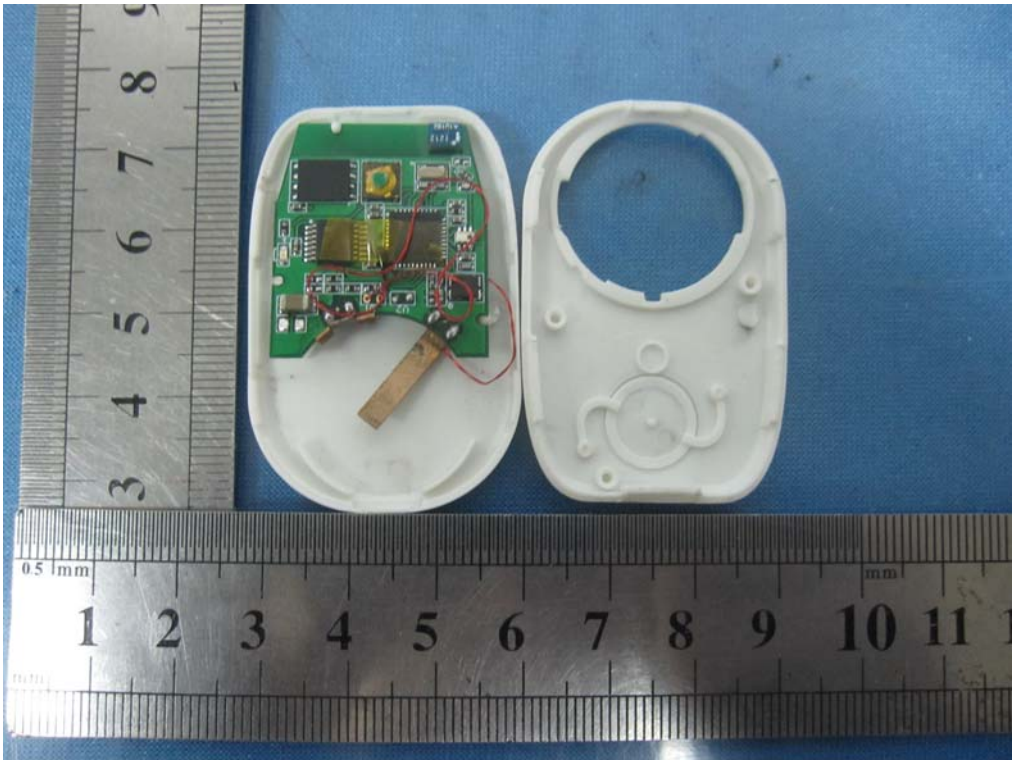
Radiated Emission (Below 30MHz)

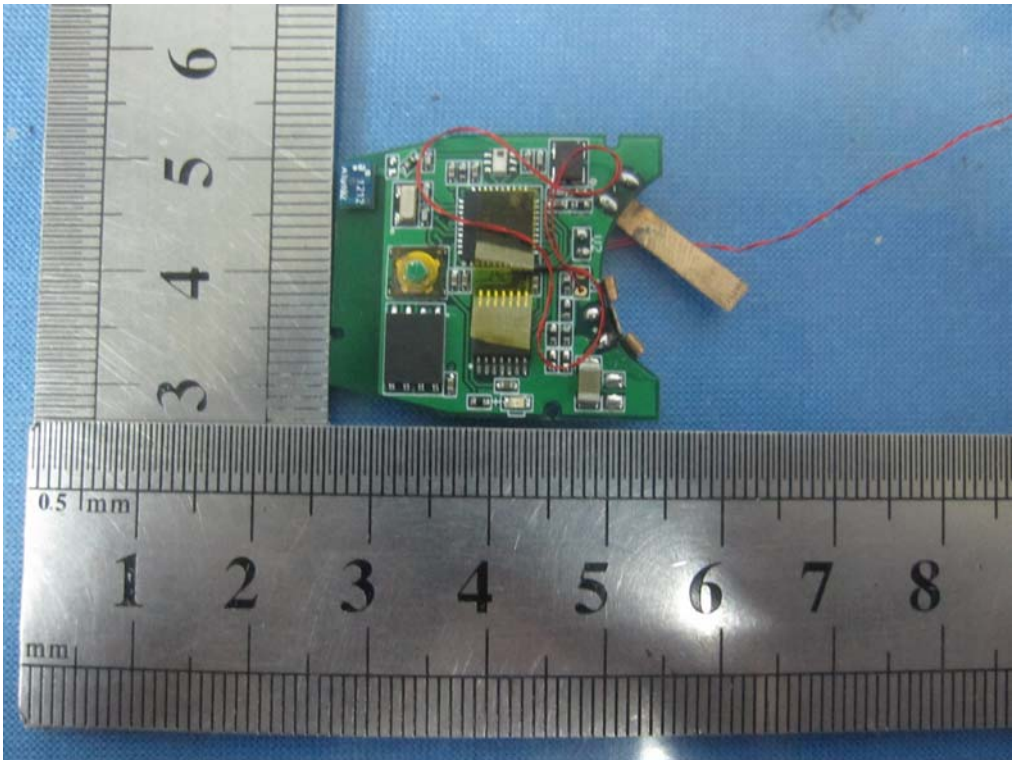


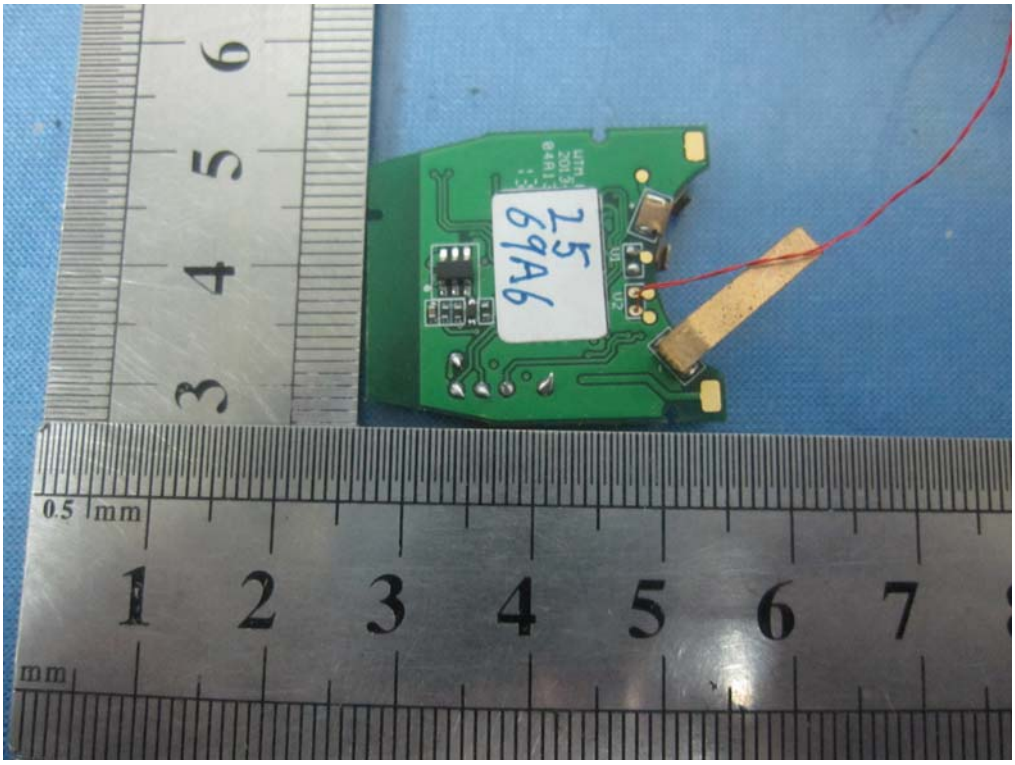
6. External and Internal Photos of the EUT

External Photos

Internal Photos







.....End of Report.....