FCC ID TEST REPORT

for

PMR 446 with Bluetooth

Model: X2 Slim

FCC ID: 2ACTIX2SLIM

Prepared for: Vigor Sports, Inc.
16310 Arthur Street Cerritos, CA 90703, USA

Prepared by: Shenzhen TCT Testing Technology Co.,Ltd
1F, Building 1, Yibaolai Industrial Park, Qiaotou Village, Fuyong Town, Baoan District, Shenzhen, Guangdong, China

TEL: +86-0755-27673339
FAX: +86-0755-27673332

Report Number: TCT140430015F2-1
Date of Test: July 04-July 17, 2014
Date of Report: July 17, 2014

The results detailed in this test report relate only to the specific sample(s) tested. It is the Application's responsibility to ensure that all production units are manufactured with equivalent EMC characteristics. This report is not to be reproduced except in full, without written approval from TCT Testing Technology

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1.0 General Details

1.1 Test Lab Details

Name :	Shenzhen Tongce Testing Lab
Address:	1F, Leinuo Watch Building, Fuyong Town, Baoan Dist, Shenzhen, China
Telephone:	13410377511
Fax:	--

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

FCC Registration Number: 572331

Shenzhen TCT Testing Technology Co., Ltd., Shenzhen EMC Laboratory: Shenzhen Tongce Testing Lab

The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

Registration Number: 572331

Industry Canada (IC)

The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

Registration Number IC: 10668A-1

1.2 Applicant Details

Applicant:	Vigor Sports, Inc.
Address:	16310 Arthur Street Cerritos, CA 90703, USA
Telephone:	562 407 2184
Fax:	562 802 3151

Manufacturer:	AIRTECH I & C., Ltd.
Address:	21, Namdong-daero 370beon-gil, Namdong-gu, Incheon 405-846, Korea
Telephone:	--
Fax:	--

1.3 Description of EUT	
Product:	PMR 446 with Bluetooth
Model No.:	X2 Slim
Additional Model No.:	N.A.
Brand Name	N.A.
Power supply:	DC 3.7V via Battery or DC 5V via Adapter Adapter Information: Model: FY0500500 Input: AC 100-240V, 50-60Hz Output: DC 5V, 0.5A
Modulation Type:	FM for GMRS and FRS, GFSK for Bluetooth
Max Tx deviation	2.5KHz for GMRS and FRS, 2MHz for Bluetooth
Emission type:	F3E
Operation Frequency:	Bluetooth : 2 402 MHz ~ 2 480 MHz GMRS : 462.55 MHz ~ 462.725 MHz FRS : 462.5625 MHz ~ 462.7125 MHz ; 467.5625MHz ~ 467.7125MHz
Number of Channel:	Bluetooth : 40 GMRS : 8 FRS : 14
Antenna Designation:	Bluetooth: An internal antenna and the maximum antenna gain is -1.95dBi. GMRS(FRS): An helical antenna and the maximum antenna gain is -3.22dBi.

1.4 Statement

Bluetooth :Operate frequency on each channel							
01	2402 MHz	11	2422 MHz	21	2442 MHz	31	2462 MHz
02	2404 MHz	12	2424 MHz	22	2444 MHz	32	2464 MHz
03	2406 MHz	13	2426 MHz	23	2446 MHz	33	2466 MHz
04	2408 MHz	14	2428 MHz	24	2448 MHz	34	2468 MHz
05	2410 MHz	15	2430 MHz	25	2450 MHz	35	2470 MHz
06	2412 MHz	16	2432 MHz	26	2452 MHz	36	2472 MHz
07	2414 MHz	17	2434 MHz	27	2454 MHz	37	2474 MHz
08	2416 MHz	18	2436 MHz	28	2456 MHz	38	2476 MHz
09	2418 MHz	19	2438 MHz	29	2458 MHz	39	2478 MHz
10	2420 MHz	20	2440 MHz	30	2460 MHz	40	2480 MHz

Note: All tests were conducted in three channels: Low channel: 2402MHz, Middle channel: 2440MHz, High channel: 2480MHz

1.4 Statement

N.A.

1.5 Test Engineer

The sample tested by

Printed name: Jack Kang

2.0 Test equipments and Associated Equipment used during the test.

2.1 Test Equipments

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	July 2, 2014	July 1, 2015
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	July 3, 2014	July 2, 2015
Power Meter	Agilent	E4416A	MY45101555	July 3, 2014	July 2, 2015
Power Sensor	Agilent	E9327A	MY44421198	July 3, 2014	July 2, 2015
System Controller	CT	SC100	-	July 3, 2014	July 2, 2015
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	July 3, 2014	July 2, 2015
Pre-amplifier	Teseq	LAN6900	--	July 3, 2014	July 2, 2015
Pre-amplifier	Agilent	8447D	83153007374	July 3, 2014	July 2, 2015
Pre-amplifier	Agilent	8449B	3008A01738	July 3, 2014	July 2, 2015
Loop antenna	A.R.A.	PLA-1030/ B	1029	July 3, 2014	July 2, 2015
Horn Antenna	ETS LINDGREN	3117	--	July 3, 2014	July 2, 2015
Horn Antenna	ETS LINDGREN	3160	--	July 3, 2014	July 2, 2015
EMI Test Receiver	R&S	ESCS30	100139	July 2, 2014	July 1, 2015
LISN	AFJ	LS16C	16010222119	July 2, 2014	July 1, 2015
Coaxial Cable	TCT	N/A	N/A	July 2, 2014	July 1, 2015
Coaxial Cable	TCT	N/A	N/A	July 2, 2014	July 1, 2015
Coaxial cable	TCT	N/A	N/A	July 2, 2014	July 1, 2015
Coaxial Cable	TCT	N/A	N/A	July 2, 2014	July 1, 2015

2.2 AE used during the test

Equipment type	Manufacturer	Model

3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following specifications:		
Test Item	CFR 47 Section	Result
AC Power Line Conducted Emission	15.207(a)	Complies
Maximum Peak Output Power	15.247(b)(3)	Complies
6 dB bandwidth	15.247 (a)(2)	Complies
Maximum Power Density	15.247(e)	Complies
Band age Measurement	15.247 (d), 15.205 (a), 15.209 (a)	Complies
Radiated Emission	15.209	Complies
Antenna Requirement	15.203,15.247(c)	Complies
RF Exposure	15.247(b), 1.1307(b)	Complies

Note: N/A=Not Applicable

3.2 Test Standards

FCC Part 15:2012 Subpart C, Paragraph 15.247

KDB 558074 D01 DTS Meas Guidance v03r02

4.0 EUT Modification

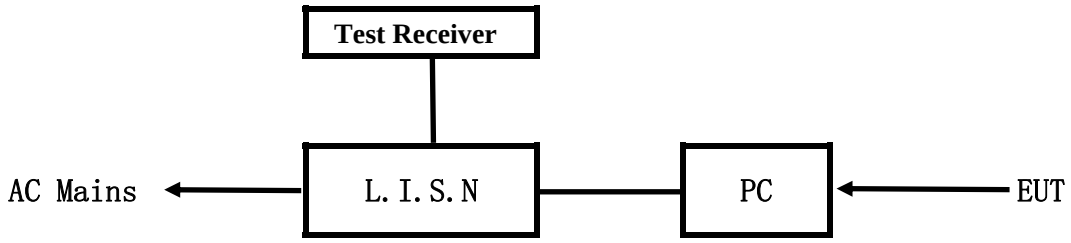
No modification by Shenzhen TCT Testing Technology Co., Ltd.

5.0 Measurement Uncertainty（95% confidence levels, k=2)

No.	Item	MU
1.	Radio Frequency	±1×10^{-9}
2.	Temperature	±0.1℃
3.	Humidity	±1.0%
4.	RF power, conducted	±0.34dB
5.	RF power density, conducted	±1.45dB
6.	Spurious emissions, conducted	±3.70dB
7.	All emissions, radiated	±4.50dB

6.0 Power Line Conducted Emission Test

6.1 Schematics of the test



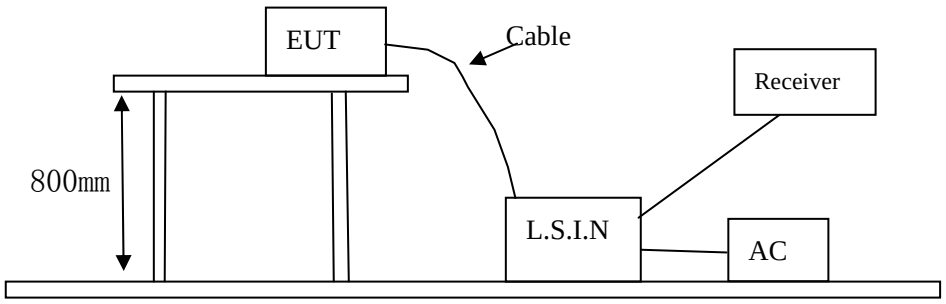
EUT: Equipment Under Test

6.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2009.The Frequency spectrum From 0.15MHz to 30MHz was investigated.

Test Voltage: 120V~, 60Hz

Block diagram of Test setup



6.3 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009

A Setup the EUT and simulators as shown on the following

B Enable AF signal and confirm EUT active to normal condition

6.4 Test Equipment

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
EMI Test Receiver	R&S	ESCS30	100139	July 2, 2014	July 1, 2015
LISN	AFJ	LS16C	16010222119	July 2, 2014	July 1, 2015

6.5 Conducted Emission Limit

Frequency(MHz)	Class A Limits (dBμV)		Class B Limits (dBμV)	
	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level
0.15 ～ 0.50	79.0	66.0	66.0～56.0*	56.0～46.0*
0.50 ～ 5.00	73.0	60.0	56.0	46.0
5.00 ～ 30.00	73.0	60.0	60.0	50.0

Notes: 1. *Decreasing linearly with logarithm of frequency.

2. The tighter limit shall apply at the transition frequencies

6.6 Test specification:

Environmental conditions: Temperature: 23° C Humidity: 51% Atmospheric pressure: 103kPa

Frequency range: 0.15 MHz – 30 MHz

The test was carried out in the following operation mode(s):

- Tx mode

6.7 Test result

Min. limit margin 7.60 dB at 0.6070MHz

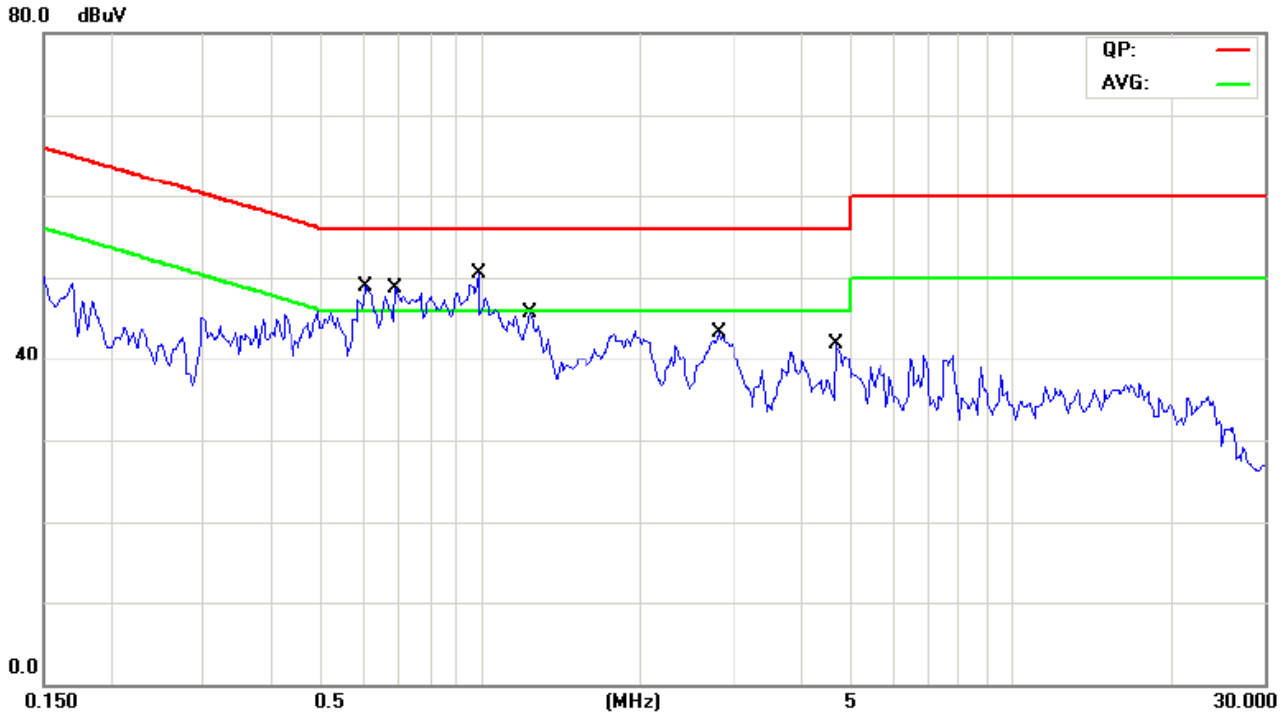
The requirements are FULFILLED

Remarks: According to FCC part 15.207.

A Conducted Emission on Line Terminal of the power line (150kHz to 30MHz)

EUT Description:	PMR 446 with Bluetooth
Operation Mode:	Tx mode + Charging mode
Tested By:	Beryl Zhao
Test date:	Jun. 25, 2014

Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s

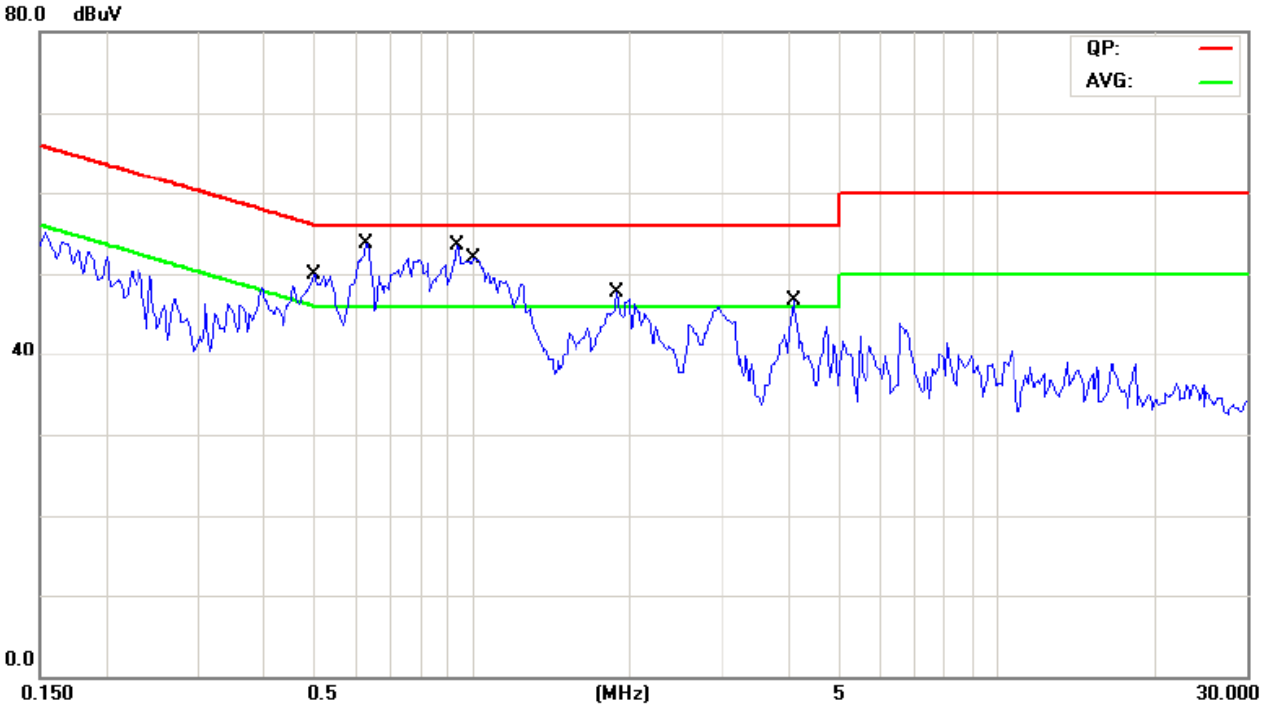


Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.6070	43.97	38.40	--	--	56.00	46.00
0.6891	41.00	31.46	--	--	56.00	46.00
0.9898	42.46	34.46	--	--	56.00	46.00
1.2359	38.91	28.02	--	--	56.00	46.00
2.7984	37.23	29.15	--	--	56.00	46.00
4.6483	33.41	22.90	--	--	56.00	46.00

B Conducted Emission on Neutral Terminal of the power line (150kHz to 30MHz)

EUT Description:	PMR 446 with Bluetooth
Operation Mode:	Tx mode + Charging mode
Tested By:	Beryl Zhao
Test Date:	Jun. 25, 2014

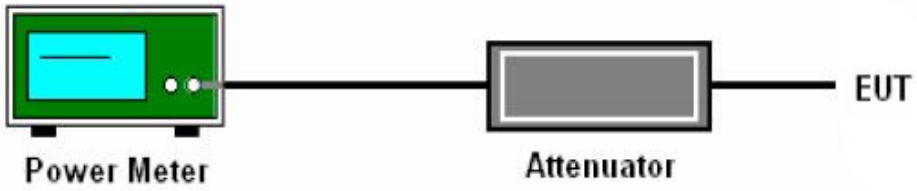
Start Frequency	Stop Frequency	Step	IF BW	Detector	Final M-Time
0.15MHz	30MHz	4.5KHz	10KHz	QP+AV	1s



Frequency (MHz)	Reading(dB μ V)				Limit (dB μ V)	
	Live		Neutral			
	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.5016	--	--	44.07	34.31	56.00	46.00
0.6305	--	--	46.67	36.79	56.00	46.00
0.9430	--	--	45.20	32.86	56.00	46.00
1.0094	--	--	45.46	33.60	56.00	46.00
1.8883	--	--	40.99	30.09	56.00	46.00
4.0977	--	--	39.06	29.17	56.00	46.00

7.0 Maximum Peak Output Power

7.1 Test Setup



7.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

7.3 Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r02

1. The RF output of EUT was connected to the power meter by a low loss cable
2. Measure the power by power meter

7.4 Test Equipment:

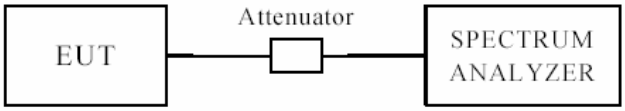
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Power Meter	Agilent	E4416A	MY45101555	July 3, 2014	July 2, 2015
Power Sensor	Agilent	E9327A	MY44421198	July 3, 2014	July 2, 2015

7.5 Test Result

Test channel	Peak output power (dBm)	Limit (dBm)	Result
Lowest	-1.46	30	Pass
Middle	-0.78	30	Pass
Highest	-0.16	30	Pass

8.0 6dB Bandwidth Measurement

8.1 Test Setup



8.2 Limits of 6dB Bandwidth Measurement

The minimum of 6 dB Bandwidth is >500 kHz

8.3 Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r02，the transmitter output was connected to the spectrum analyzer through an attenuator. The spectrum analyzer is setting as follows: RBW=100 kHz, VBW=300 kHz, Detector=Peak, Trace mode=max hold, Sweep=auto couple. The 6dB bandwidth is defined as the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

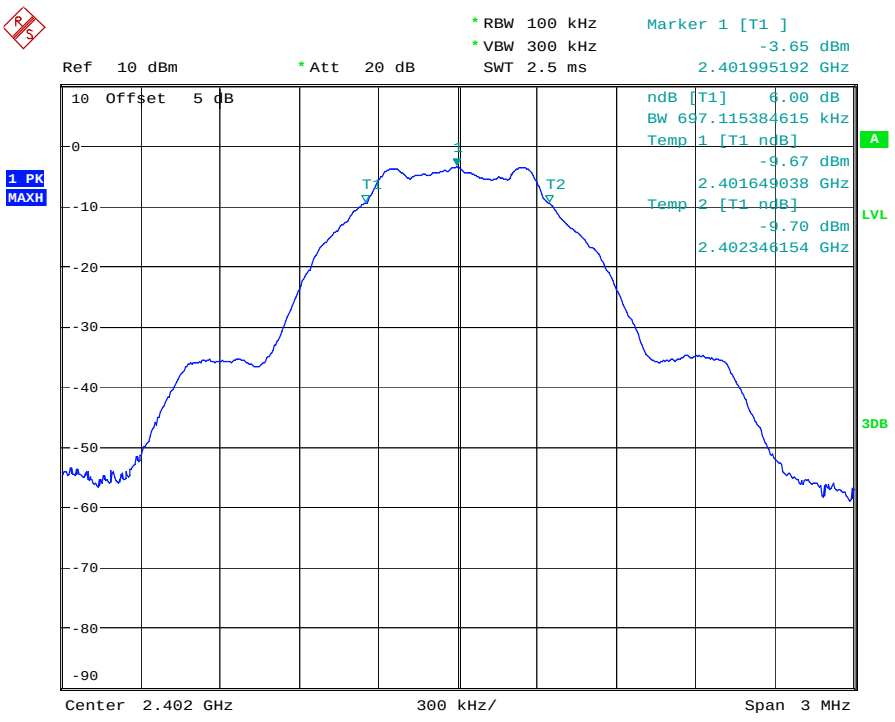
8.4 Test Equipment:

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSU	1166.1660.03	July 3, 2014	July 2, 2015

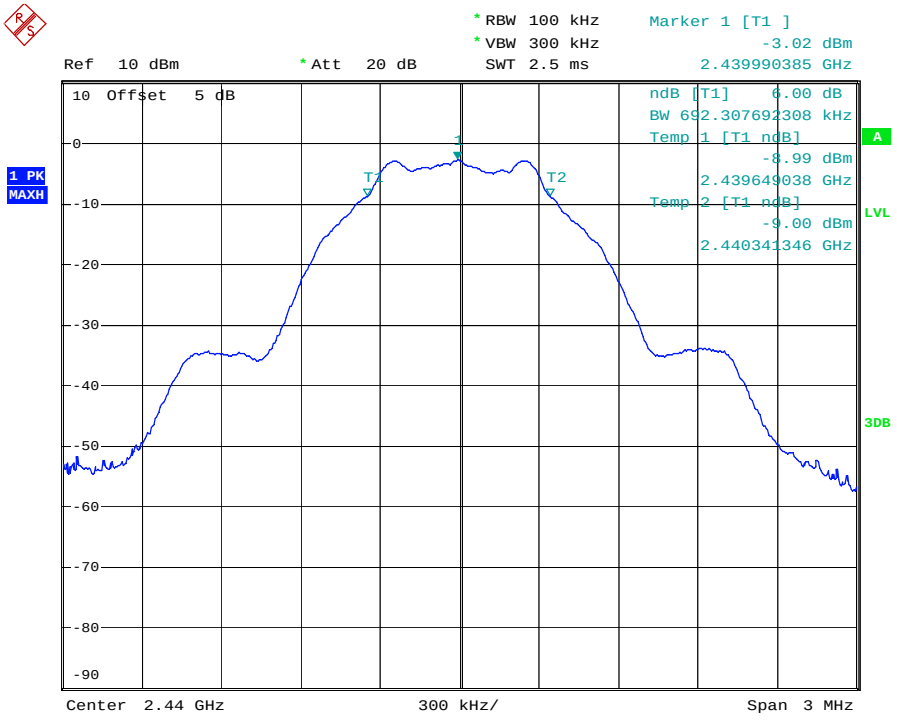
8.5 Test Result

Test channel	6 dB occupied bandwidth (kHz)	Limit (kHz)	Result
Lowest	697.1	500	Pass
Middle	692.3	500	Pass
Highest	706.7	500	Pass

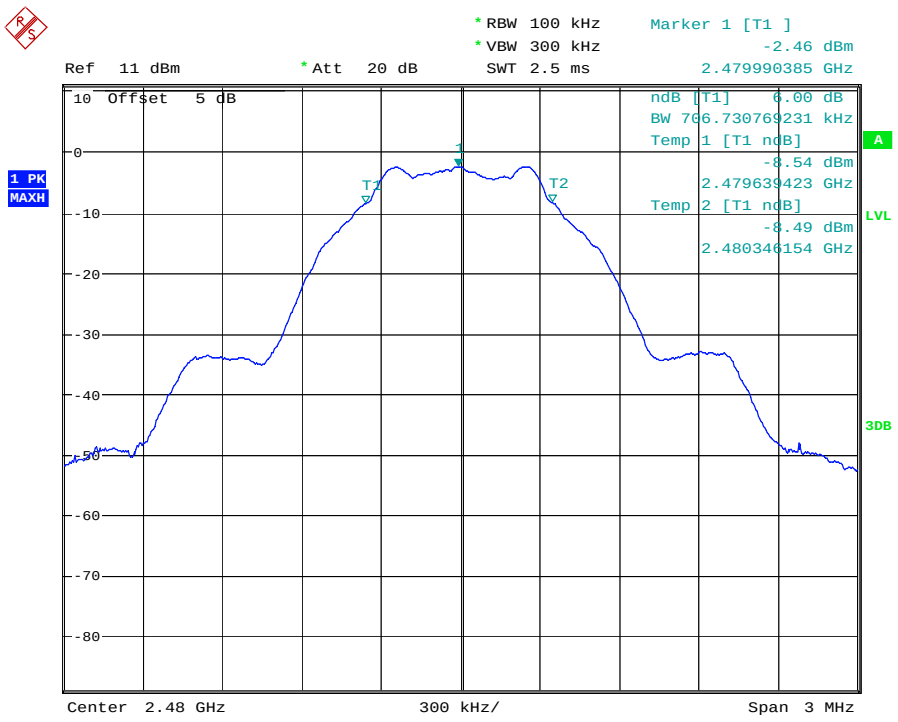
Low channel



Middle channel

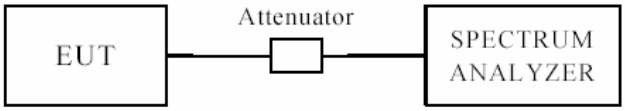


High channel



9.0 Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density is 8 dBm in any 3 kHz.

9.3 Test Procedure

According to KDB 558074 D01 DTS Meas Guidance v03r02，the transmitter output was connected to the spectrum analyzer through an attenuator.

The spectrum analyzer is setting as follows:

1) Set analyzer centre frequency to DTS channel centre frequency.
2) Set the span to 1.5 times the DTS channel bandwidth.
3) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz
4) Set the VBW>=3*RBW.
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 amplitude level.
10) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

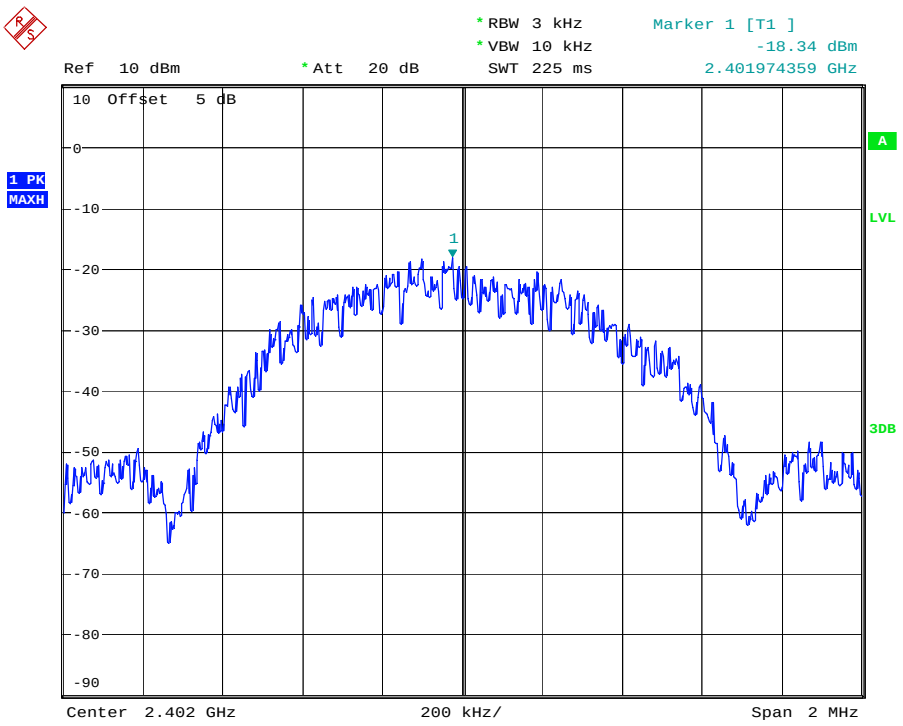
9.4 Test Equipment:

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSU	1166.1660.03	July 3, 2014	July 2, 2015

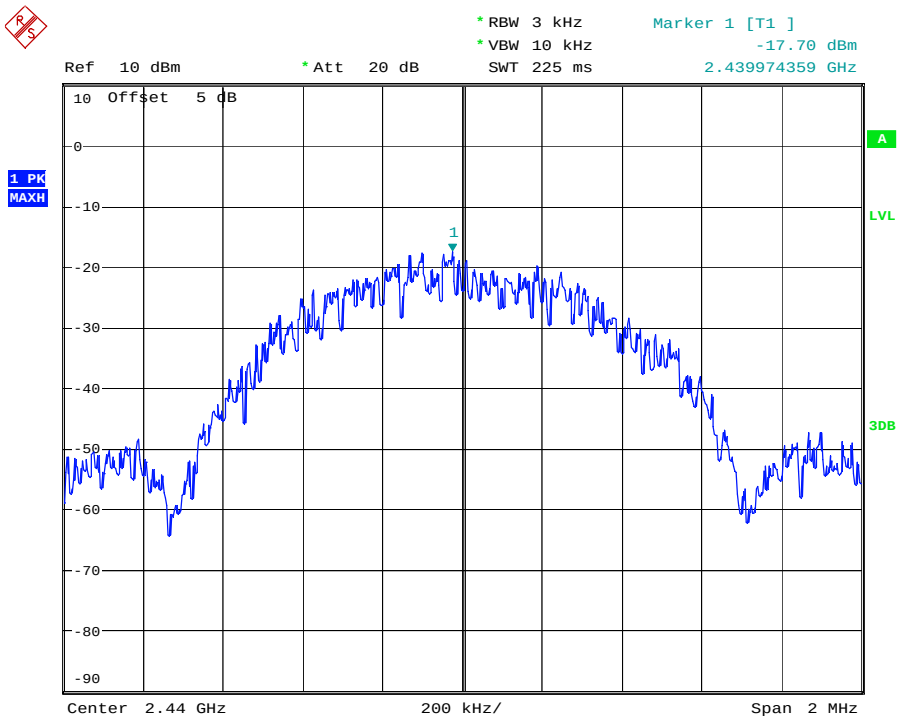
9.5 Test Result

Test channel	Peak Power Spectral Density (dBm)	Limit (dBm)	Result
Lowest	-18.34	8	Pass
Middle	-17.70	8	Pass
Highest	-17.15	8	Pass

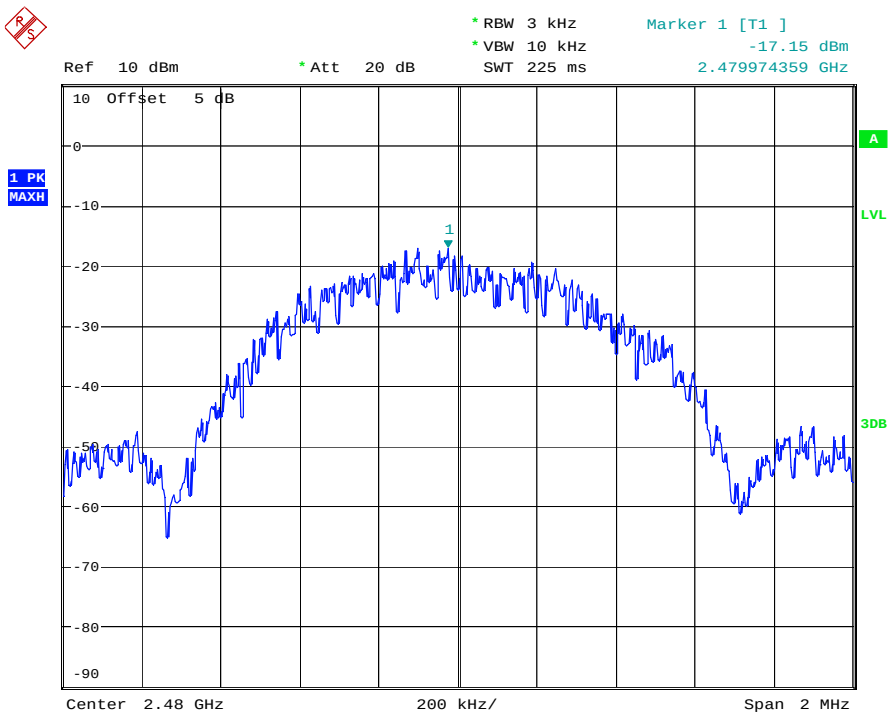
Low channel



Middle channel



High channel



10.0 Band age Measurement

10.1 Test Equipment

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSU	1166.1660.03	July 3, 2014	July 2, 2015
Pre-amplifier	Agilent	8449B	3008A01738	July 3, 2014	July 2, 2015
Horn Antenna	ETS LINDGREN	3117	--	July 3, 2014	July 2, 2015
Horn Antenna	ETS LINDGREN	3160	--	July 3, 2014	July 2, 2015

10.2 Test specification:

Environmental conditions: Temperature 22° C Humidity: 50% Atmospheric pressure: 103kPa

10.3 Limit:

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

10.4 Test Procedure

The EUT was setup according to ANSI C63.10:2009 and tested according to ANSI 63.10:2009 for compliance to FCC 47 CFR 15.247 requirements. The EUT is placed on a turn table which is 0.8 m above ground. The turn table is rotated 360 degrees to determine to the position of the maximum emission level. The EUT was positioned such That the distance from antenna to the EUT was 3 metres. The antenna is scanned from 1 metre to 4 metres to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2009 on radiated measurement.

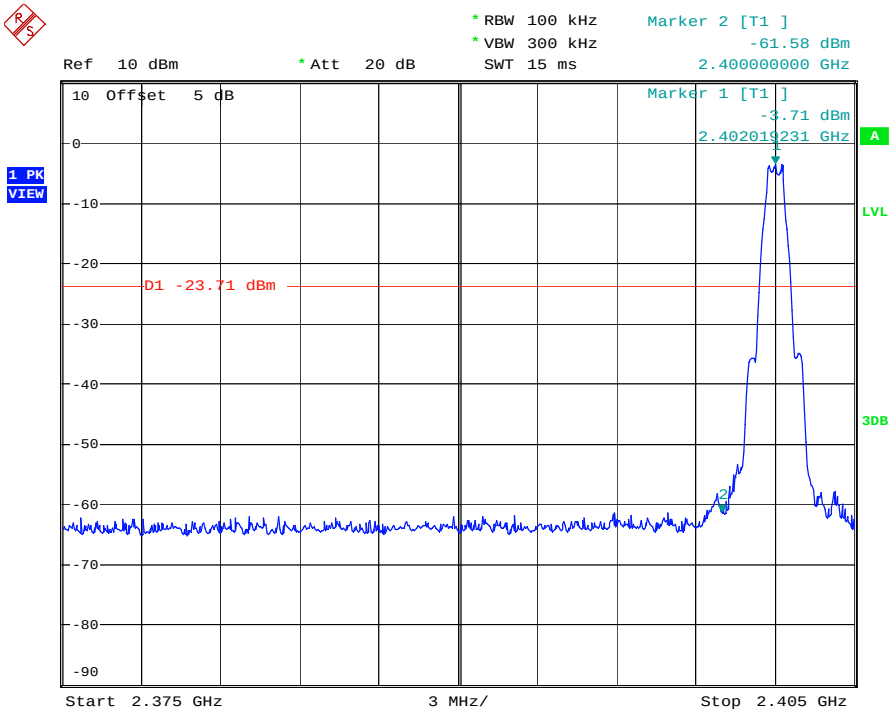
Spectrum analyzer parameters setting as shown below:

1): Peak: RBW=1MHz, VBW=1MHz, Sweep=Auto

2): Average: RBW=1MHz, VBW=10Hz, Sweep=Auto

10.5 Test Result:

Low channel

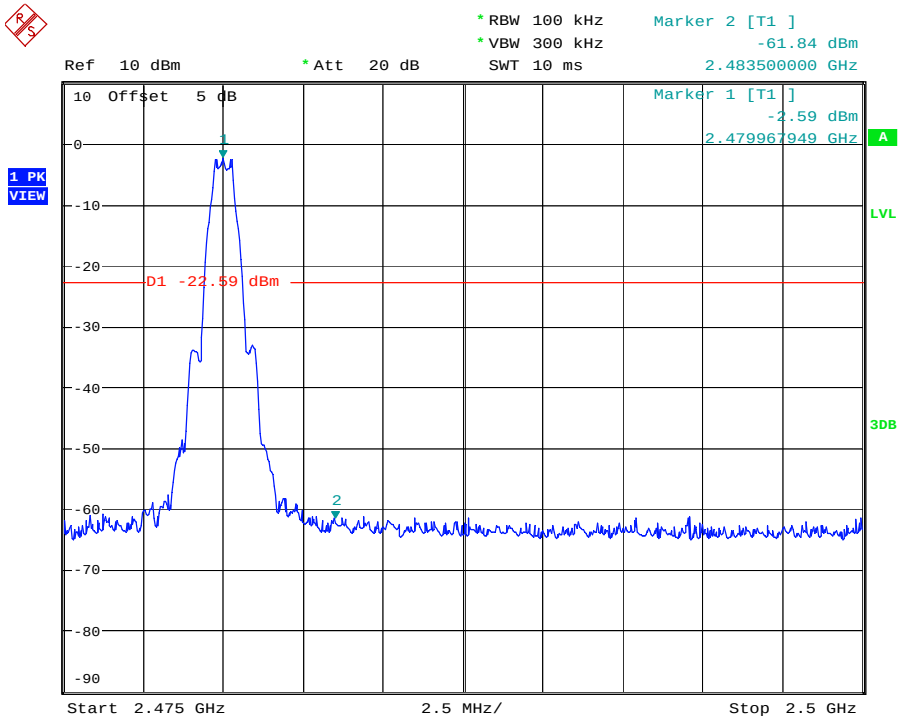


Remark: 1) The radiated measurement was made in horizontal and vertical polarity;

2) The maximum emission was 45.25dBuV/m@3m at 2383.1MHz, which is less than the Average limit.

3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

High channel



Remark: 1) The radiated measurement was made in horizontal and vertical polarity;

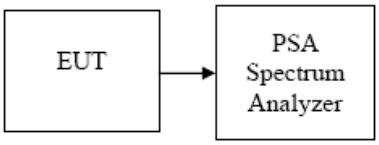
2) The maximum emission was 46.07dBuV/m@3m at 2494.5MHz, which is less than the Average limit.

3) Radiated emissions which fall in the restricted band, as defined in 15.205(a), comply with the radiated emission limits specified in 15.209(a).

11.0 Spurious Emission Test

11.1 Conducted emissions Measurement

11.1.1 Test configuration



11.1.2 Limit:

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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

11.1.3 Test procedure:

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site. The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 100 kHz. Measurements are made over the 30MHz to 25 GHz range with the transmitter set to the lowest, middle, and highest channels.

11.1.4 Test Equipment

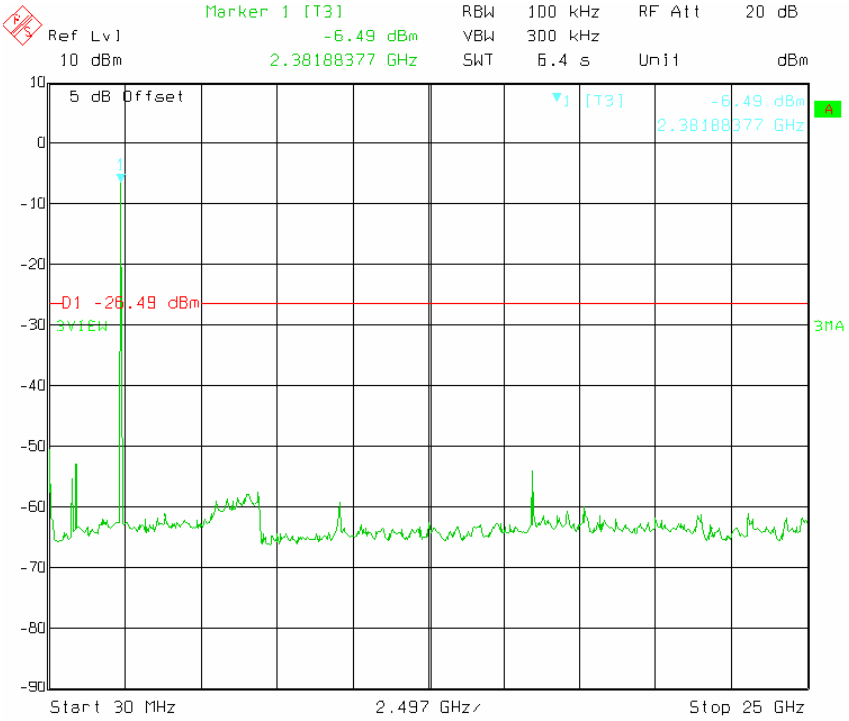
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	July 2, 2014	July 1, 2015

11.1.5 Test Result:

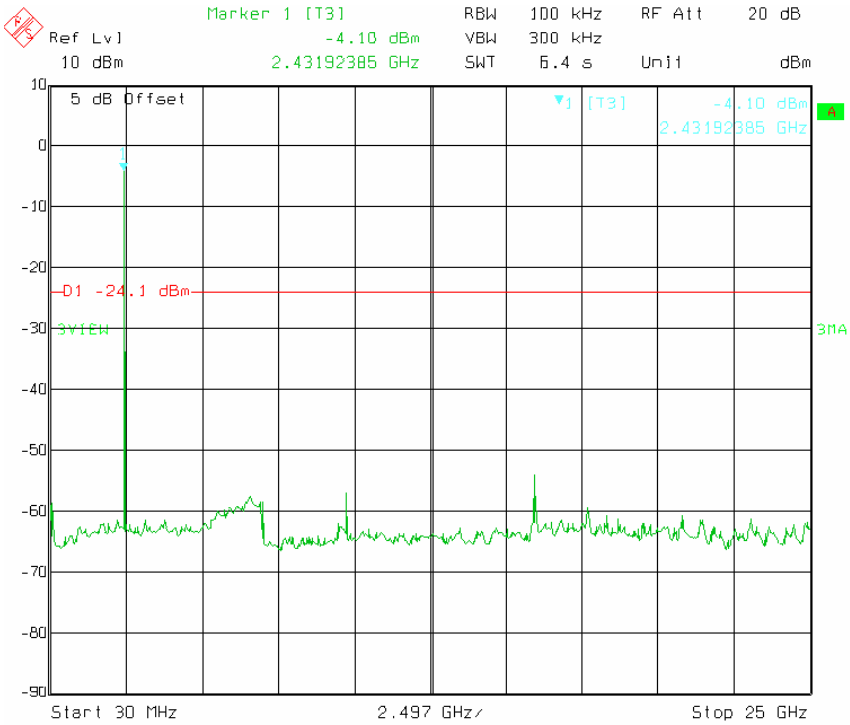
Test plots please refer to next pages.

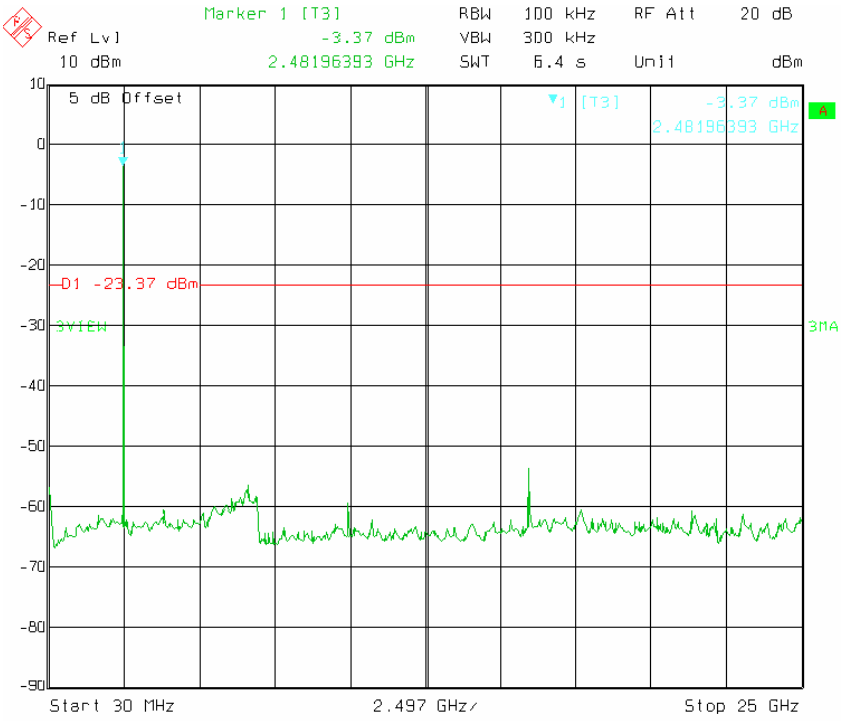
Note: Conducted emissions measurements below 30 MHz were made, and the maximum peak was detected, which is much less the limit. So it is not submitted in the report.

Low channel



Middle channel



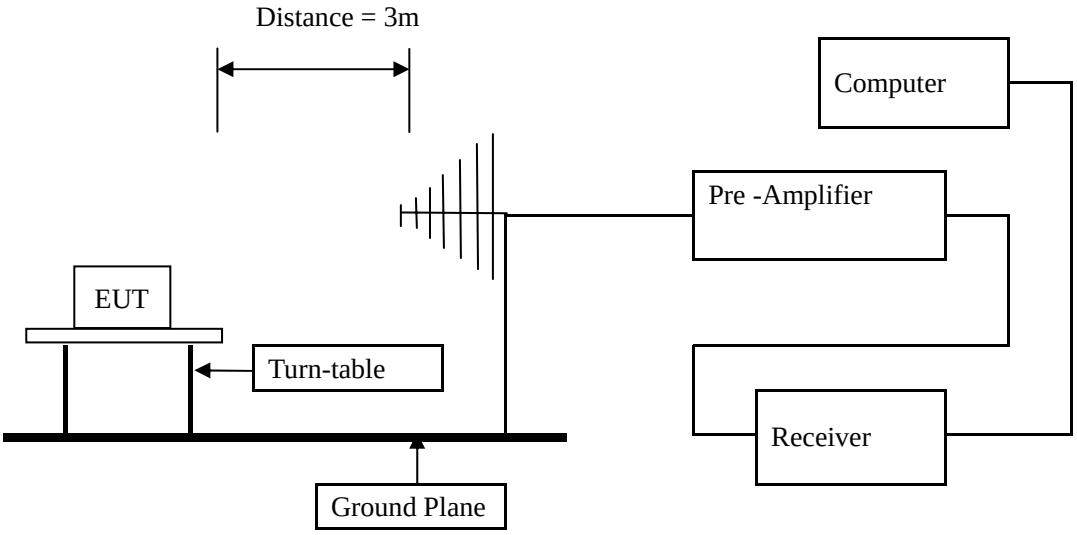
High channel


11.2 Radiated emissions Measurement

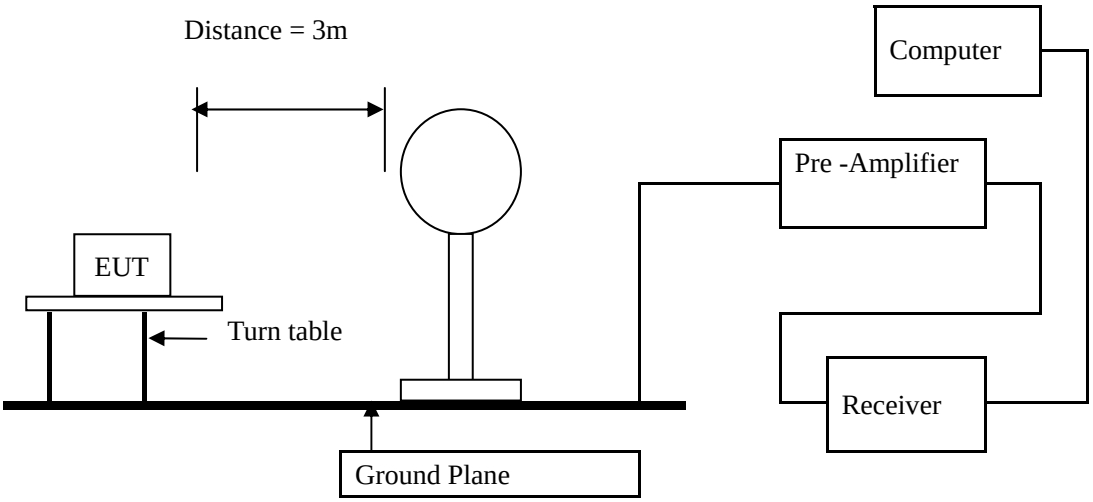
11.2.1 Test Method and test Procedure:

1) The EUT was tested according to ANSI C63.10 –2009.
2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2009.
3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz . Measurements were made at 3 meters.
4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
5) The antenna polarization: Vertical polarization and Horizontal polarization.

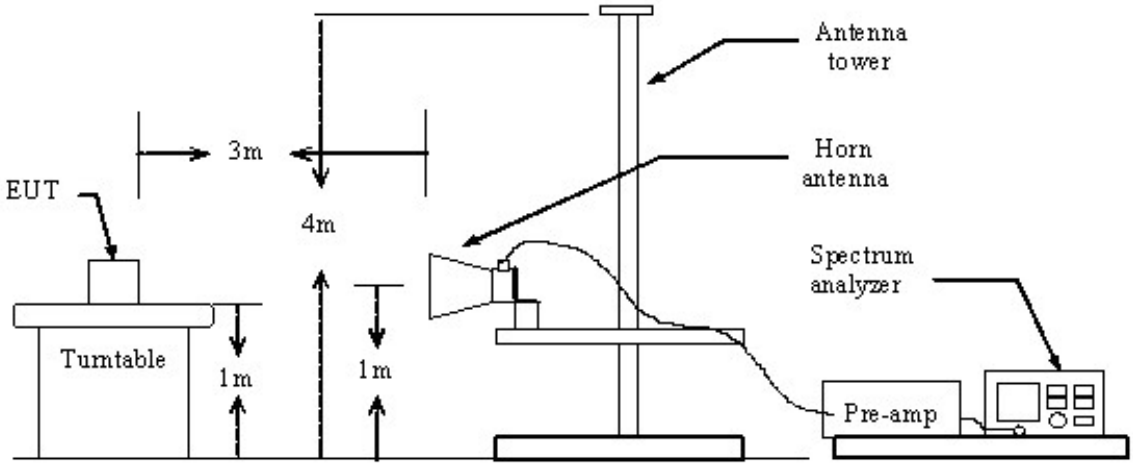
Block diagram of Test setup



Block diagram of Test setup for frequency below 30MHz



Block diagram of Test setup for frequency above 1GHz



11.2.2 EUT Operating Condition

Operating condition is according to ANSI C63.10 -2009

11.2.3 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB μ V/m)
0.009-0.490	3	20log 2400/F (kHz) + 80
0.490-1.705	3	20log 24000/F (kHz) + 40
1.705-30	3	20log 30 + 40
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note: 1) RF Voltage (dBuV) = 20 log RF Voltage (uV)

2) In the Above Table, the tighter limit applies at the band edges.

3) Distance refers to the distance in meters between the measuring instrument antenna and the EUT

4) This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

5) All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK and AV detector.

6) If measurement is made at 3m distance, then F.S Limitation at 3m distance is adjusted by using the formula Ld1 = Ld2 * (d2/d1)

11.2.4 Test Equipment:

Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	July 2, 2014	July 1, 2015
Spectrum Analyzer	ROHDE&SCHWARZ	FSEM	848597/001	July 2, 2014	July 1, 2015
Pre-amplifier	Teseq	LNA6900	--	July 3, 2014	July 2, 2015
Pre-amplifier	Agilent	8447D	83153007374	July 3, 2014	July 2, 2015
Pre-amplifier	Agilent	8449B	3008A01738	July 3, 2014	July 2, 2015
Loop antenna	A.R.A.	PLA-1030/B	1029	July 3, 2014	July 2, 2015
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	July 3, 2014	July 2, 2015
Horn Antenna	ETS LINDGREN	3117	--	July 3, 2014	July 2, 2015
Horn Antenna	ETS LINDGREN	3160	--	July 3, 2014	July 2, 2015

11.2.5 Test specification:

Environmental conditions: Temperature 22° C Humidity: 51% Atmospheric pressure: 103kPa

11.2.6 Test result

A Radiated Emission (9 kHz----30 MHz)

Note: 1) Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor
2) The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement

Result: Pass

Frequency (MHz)	Level@3m (dBμV/m)	Limit@3m (dBμV/m)
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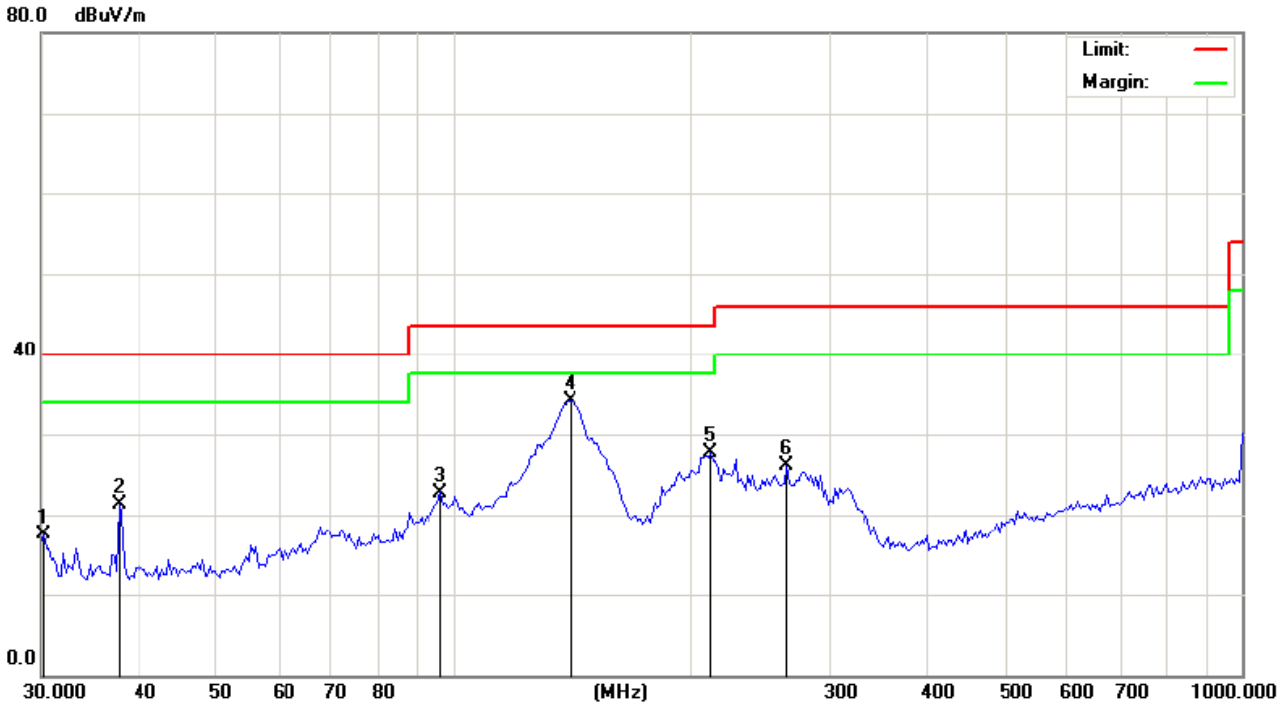
B General Radiated Emissions Data

Please refer to following diagram for individual

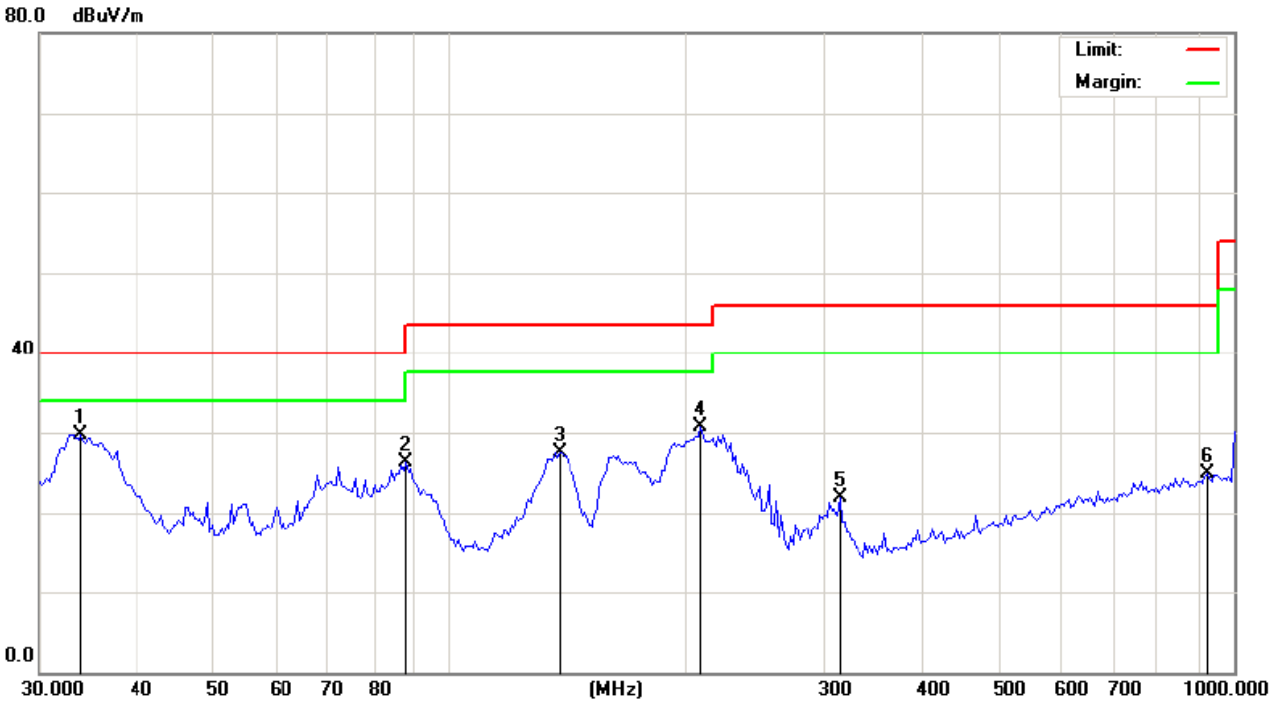
Radiated Emission In Horizontal (30MHz----1000MHz)

Test mode: Tx mode + Charging mode



Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
30.2116	17.59	H	40.00
37.5648	21.26	H	40.00
96.3230	22.80	H	43.50
140.7767	34.14	H	43.50
211.6112	27.66	H	43.50
264.9710	26.17	H	46.00

Radiated Emission In Vertical (30MHz----1000MHz)



Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m)
33.8067	29.72	V	40.00
87.9136	26.30	V	40.00
137.8400	27.54	V	43.50
208.6580	30.65	V	43.50
313.6482	21.84	V	46.00
925.6132	24.87	V	46.00

Note: Measurements were conducted in all three channels (high, middle, low), and the worst case (high channel) was submitted only.

C Fundamental & Harmonics Radiated Emission Data (1000MHz-25000MHz)

Test mode: Tx mode + Charging mode

Low channel: 2402 MHz									
Freq. (MHz)	Ant. Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor (dB)	Emission Level		Peak limit (dBuV/m)	AV limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
1303.12	H	51.48	---	-4.20	47.28	---	74	54	-6.72
4804.00	H	50.14	---	-3.94	46.20	---	74	54	-7.80
5600.11	H	48.84	---	-2.83	46.01	---	74	54	-7.99
7206.00	H	45.65	---	0.52	46.17	---	74	54	-7.83
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1304.09	V	51.06	---	-4.25	46.81	---	74	54	-7.19
4804.00	V	49.95	---	-3.94	46.01	---	74	54	-7.99
5604.23	V	49.73	---	-2.87	46.86	---	74	54	-7.14
7206.00	V	44.88	---	0.59	45.47	---	74	54	-8.53
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Notes: 1) Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

2) Radiated emissions measured in frequencies above 1GHz were made with peak detector and Average (AV) detector.

3) Average test would be performed if the peak readings were greater than the average limit.

4) Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

5) Emission Level=Peak (AV) Reading + Correction Factor;

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

6) Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

Middle channel: 2440 MHz									
Freq. (MHz)	Ant. Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor (dB)	Emission Level		Peak limit (dBuV/m)	AV limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
1301.67	H	50.29	---	-4.20	46.09	---	74	54	-7.91
4880.00	H	50.05	---	-3.98	46.07	---	74	54	-7.93
5601.07	H	49.56	---	-2.83	46.73	---	74	54	-7.27
7320.00	H	44.92	---	0.56	45.48	---	74	54	-8.52
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1301.28	V	51.06	---	-4.25	46.81	---	74	54	-7.19
4880.00	V	50.87	---	-3.98	46.89	---	74	54	-7.11
5601.84	V	48.72	---	-2.87	45.85	---	74	54	-8.15
7320.00	V	45.47	---	0.57	46.04	---	74	54	-7.96
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Notes: 1) Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

2) Radiated emissions measured in frequencies above 1GHz were made with peak detector and Average (AV) detector.

3) Average test would be performed if the peak readings were greater than the average limit.

4) Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

5) Emission Level=Peak (AV) Reading + Correction Factor;

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

6) Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

High channel: 2480 MHz									
Freq. (MHz)	Ant. Pol. H/V	Peak reading (dBuV)	AV reading (dBuV)	Correction Factor (dB)	Emission Level		Peak limit (dBuV/m)	AV limit (dBuV/m)	Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
1303.34	H	50.61	---	-4.20	46.41	---	74	54	-7.59
4960.00	H	49.44	---	-3.98	45.46	---	74	54	-8.54
5602.67	H	49.86	---	-2.83	47.03	---	74	54	-6.97
7440.00	H	45.67	---	0.52	46.19	---	74	54	-7.81
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1309.82	V	51.14	---	-4.25	46.89	---	74	54	-7.11
4960.00	V	50.47	---	-3.98	46.49	---	74	54	-7.51
5610.45	V	48.72	---	-2.87	45.85	---	74	54	-8.15
7440.00	V	47.65	---	0.57	48.22	---	74	54	-5.78
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Notes: 1) Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency.

2) Radiated emissions measured in frequencies above 1GHz were made with peak detector and Average (AV) detector.

3) Average test would be performed if the peak readings were greater than the average limit.

4) Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

5) Emission Level=Peak (AV) Reading + Correction Factor;

Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

6) Margin (dB) = Emission Level (Peak) (dBuV/m)-Average limit (dBuV/m)

12.0 Antenna Requirement

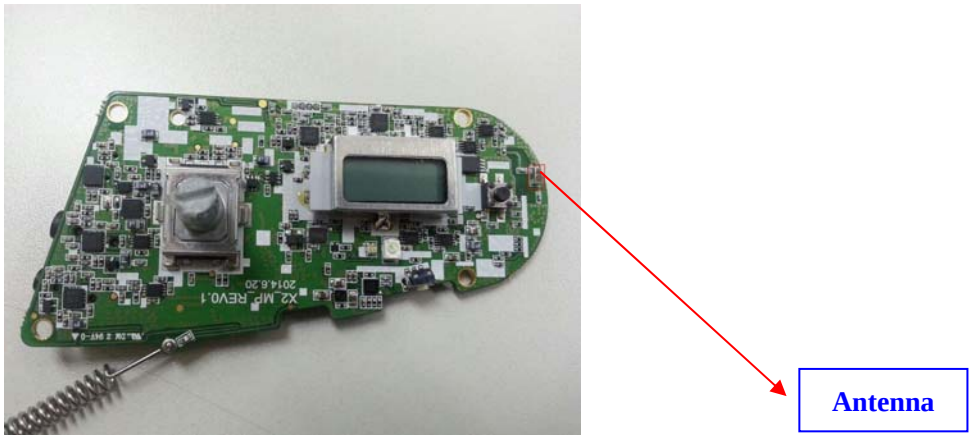
12.1 Standard Applicable

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 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

12.2 Antenna Specification

According to the manufacturer declared, the EUT has an internal antenna; the directional gain of antenna is -1.95 dBi, and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.



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