Shenzhen GTI Technology Co., Ltd

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EMC TEST REPORT

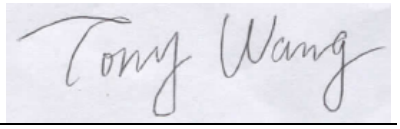
Product name	:	Intelligent Bluetooth Electronic Cigarette
Trademark	:	N/A
Model no.	:	IEGO,IVOD,IECIG 4G,IECIG 5G,IECIG PAX,IVAP,ISPIER
FCC ID	:	**2ACPWIEGO**
Test Standards	:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
Applicant	:	**Shenzhen Iecig Technology Co., Ltd.**
Address of applicant	:	Second Floor, Silicon Valley Power Qinghu Park, A2 Building, Longhua New District, Shenzhen, Guangdong, China.
Date of Receipt	:	June 21, 2014
Date of Test	:	June 21, 2014 to July 08, 2014
Data of issue.	:	July 09, 2014

Test result :	**Pass**

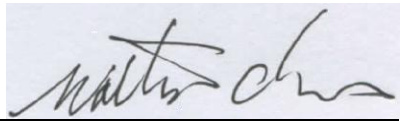
GENERAL DESCRIPTION OF EUT	
Equipment	Intelligent Bluetooth Electronic Cigarette
Model Name	IEGO,IVOD,IECIG 4G,IECIG 5G,IECIG PAX,IVAP,ISPIER
Manufacturer	Shenzhen Iecig Technology Co., Ltd.
Manufacturer Address	Second Floor, Silicon Valley Power Qinghu Park, A2 Building, Longhua New District, Shenzhen, Guangdong, China.
Power Source	Battery
Power Rating	3.7VDC

Testing Engineer 

(Allen Wang)

Reviewed By: 

(Tony Wang)

Approved Signatory 

(Walter Chen)

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1 TEST SUMMARY

1.1 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 D01 V03: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

1.2 Test Description

FCC PART 15 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
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

1.3 TEST FACILITY

1.3.1 Address of the test laboratory

Shenzhen GTI Technology Co., Ltd

1F, 2 Block, Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong, China

1.3.2 Laboratory accreditation

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

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

Shenzhen GTI Technology 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 214666, Sep 19, 2011

1.4 MEASUREMENT UNCERTAINTY

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 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)
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

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

2 GENERAL INFORMATION

2.2 Environmental conditions

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

Temperature:	15~35°C
lative Humidity:	30~60 %
Air Pressure:	950~1050mba

2.3 General Description Of EUT

Name of EUT:	Intelligent Bluetooth Electronic Cigarette
Trade Mark:	/
Model Number:	IEGO,IVOD,IECIG 4G,IECIG 5G,IECIG PAX,IVAP,ISPIER
Model Difference:	All models are same except for model number, model IEGO is selected for test.
Power supply:	DC 3.7V From internal battery
Adapter information:	eGo USB charger Input:DC 5V 500mA Output:DC 4.2V 420mA
Bluetooth	
Supported type:	Version 4.0 for low Energy
Modulation:	GFSK
Operation frequency:	2402MHz to 2480MHz
Channel number:	40
Channel separation:	2 MHz
Antenna type:	Internal Antenna
Antenna gain:	0dBi

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.4 Description of Test Modes

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. There are 40 channels of EUT, and the test carried out at the lowest channel, middle channel and highest channel.

Operation Frequency：

Channel	Frequency (MHz)
00	2402
01	2404
02	2406
⋮	⋮
19	2440
⋮	⋮
37	2476
38	2478
39	2480

2.5 Description Of Test Peripheral

No.	Equipment	Manufacturer	Model No.	Serial No.	Notes
1	PC	Lenovo	G480	WB07239716	DOC

2.6 Measurement Instruments List

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.	Calibrated until
1	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4391.40	Oct 25,2014
2	Climate Chamber	ESPEC	EL-10KA	05107008	Oct 25,2014

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100658	Dec 26,2014
2	High pass filter	Compliance Direction systems	BSU-6	34202	Oct 25,2014
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Dec 27,2014
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Dec 27,2014
5	Loop Antenna	LAPLAC INSTRUMENTS LTD	RF300	9138	Nov 15,2014
6	Spectrum Analyzer	HP	8563E	02052	Dec 27,2014
7	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Dec 27,2014
8	Pre-Amplifier	HP	8447D	1937A03050	Dec 26,2014
9	Pre-Amplifier	EMCI	EMC051835	980075	Dec 27,2014
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A

CONDUCTED EMISSION					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	101112	Dec. 26, 2014
3	EMI Test Receiver	R&S	ESCI	100920	Dec. 26, 2014

The Cal.Interval was one year.

3 TEST CONDITIONS AND RESULTS

3.1 Conducted Emission (AC Main)

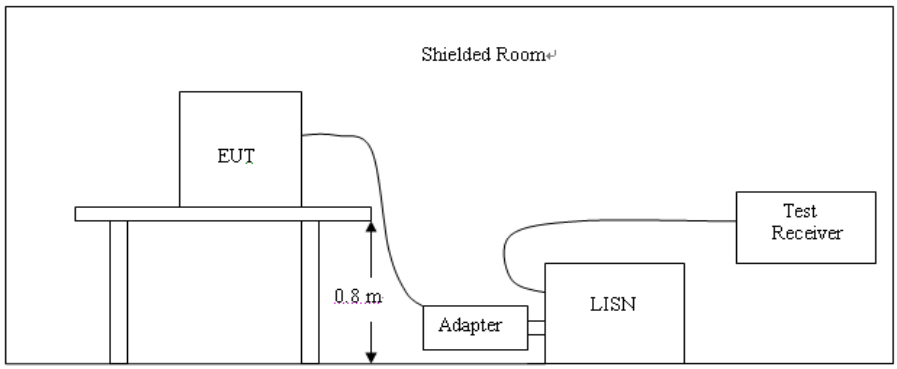
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



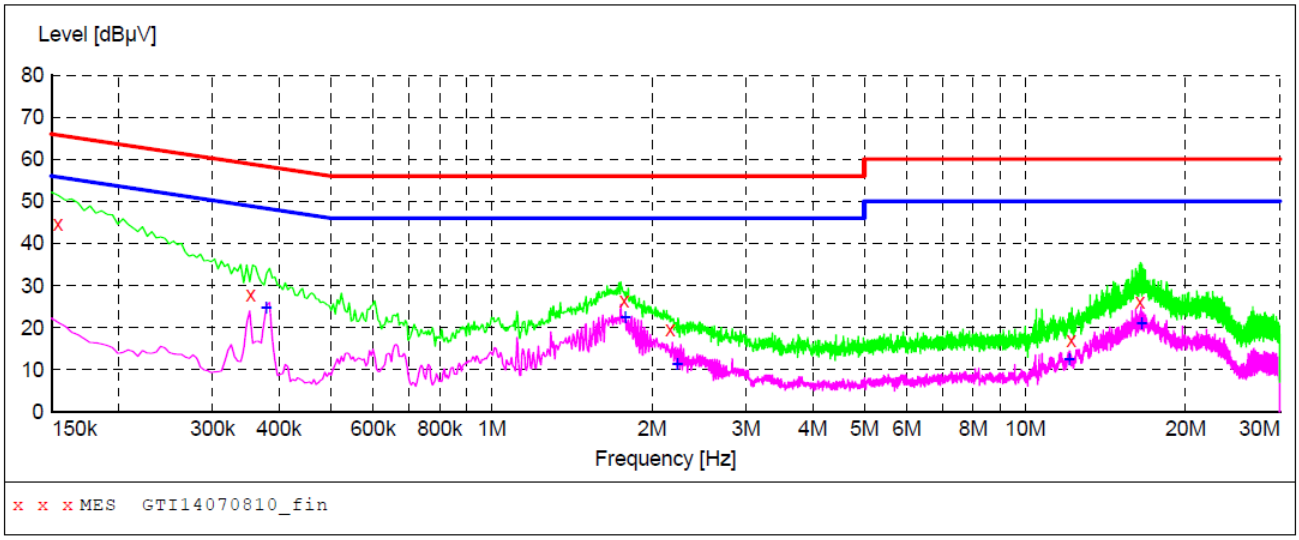
TEST PROCEDURE

1. The equipment was set up as the test configuration to simulate typical actual usage of 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 C63.10-2009.
2 Support equipment, if needed, was placed as per ANSI C63.10-2009
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2009
4 The EUT received DC5V power from PC, the adapter of PC 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.

TEST RESULTS

Test Mode :	USB Charge	Line:	L

SCAN TABLE: "Voltage (9K-30M) FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI14070810_fin"

7/8/2014 9:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.154000	44.60	9.9	66	21.2	QP	L1	GND
0.354000	28.00	9.9	59	30.9	QP	L1	GND
1.772000	26.50	10.3	56	29.5	QP	L1	GND
2.162000	19.60	10.4	56	36.4	QP	L1	GND
12.212000	17.00	10.7	60	43.0	QP	L1	GND
16.418000	26.20	10.7	60	33.8	QP	L1	GND

MEASUREMENT RESULT: "GTI14070810_fin2"

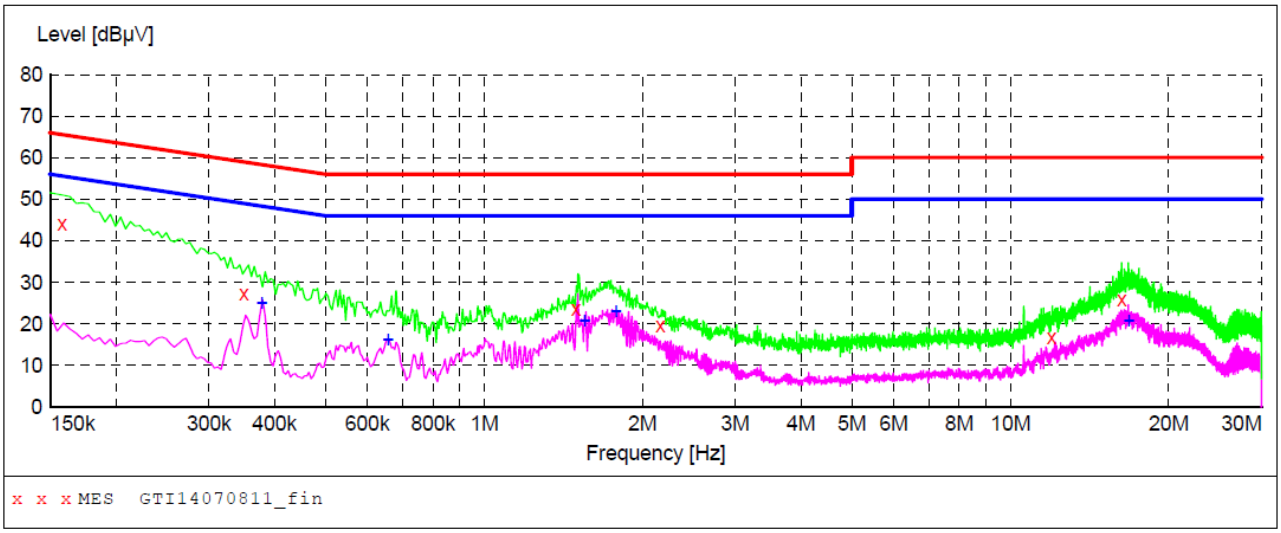
7/8/2014 9:52AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.378000	24.80	9.9	48	23.5	AV	L1	GND
1.778000	22.50	10.3	46	23.5	AV	L1	GND
2.228000	11.30	10.4	46	34.7	AV	L1	GND
12.086000	12.50	10.7	50	37.5	AV	L1	GND
16.496000	20.90	10.7	50	29.1	AV	L1	GND

Test Mode :	USB Charge	Line:	N

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI14070811_fin"

7/8/2014 9:55AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.158000	44.00	9.9	66	21.6	QP	N	GND
0.350000	27.40	9.9	59	31.6	QP	N	GND
1.496000	23.60	10.3	56	32.4	QP	N	GND
2.162000	19.50	10.4	56	36.5	QP	N	GND
11.984000	16.80	10.7	60	43.2	QP	N	GND
16.298000	26.00	10.7	60	34.0	QP	N	GND

MEASUREMENT RESULT: "GTI14070811_fin2"

7/8/2014 9:55AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.378000	25.10	9.9	48	23.2	AV	N	GND
0.656000	16.30	10.0	46	29.7	AV	N	GND
1.550000	20.60	10.3	46	25.4	AV	N	GND
1.778000	22.90	10.3	46	23.1	AV	N	GND
16.784000	20.70	10.7	50	29.3	AV	N	GND

3.2 Radiated Emission

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. The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBuV/m)	Radiated (uV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	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

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 EUT minimum operation frequency was 32.768KHz and maximum operation frequency was 2480MHz.so radiated emission test frequency band 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	

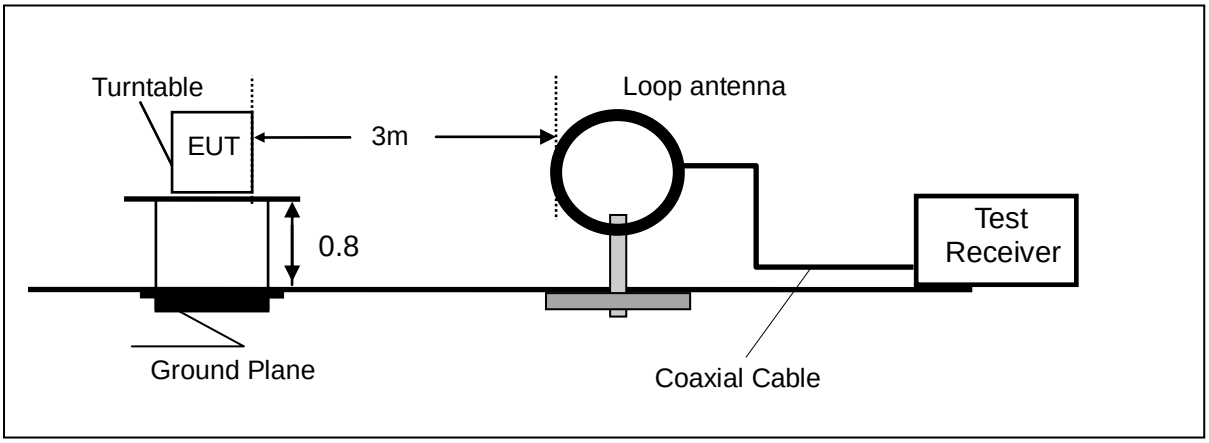
For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

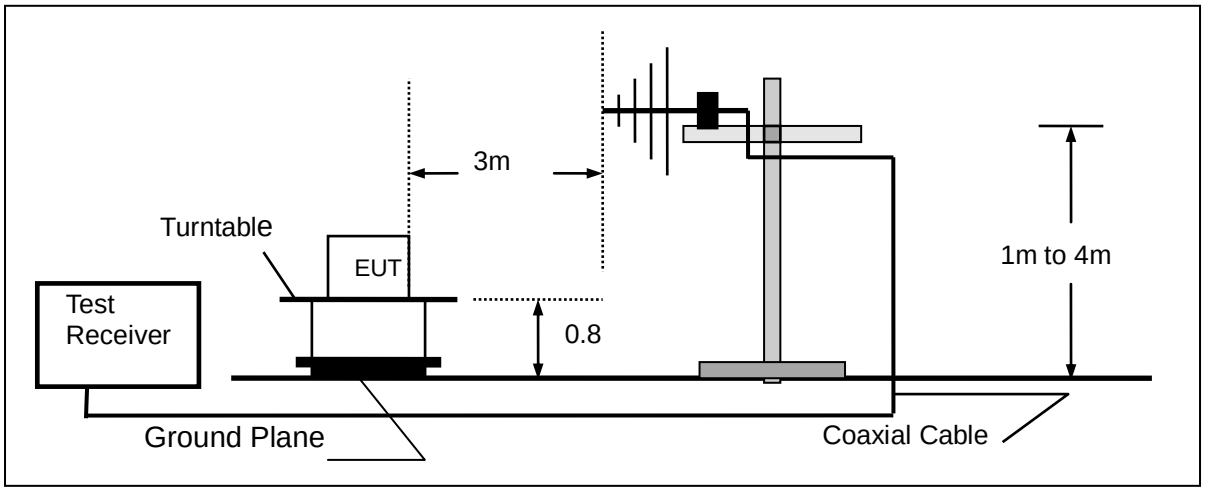
Transd=AF +CL-AG

Test Configuration

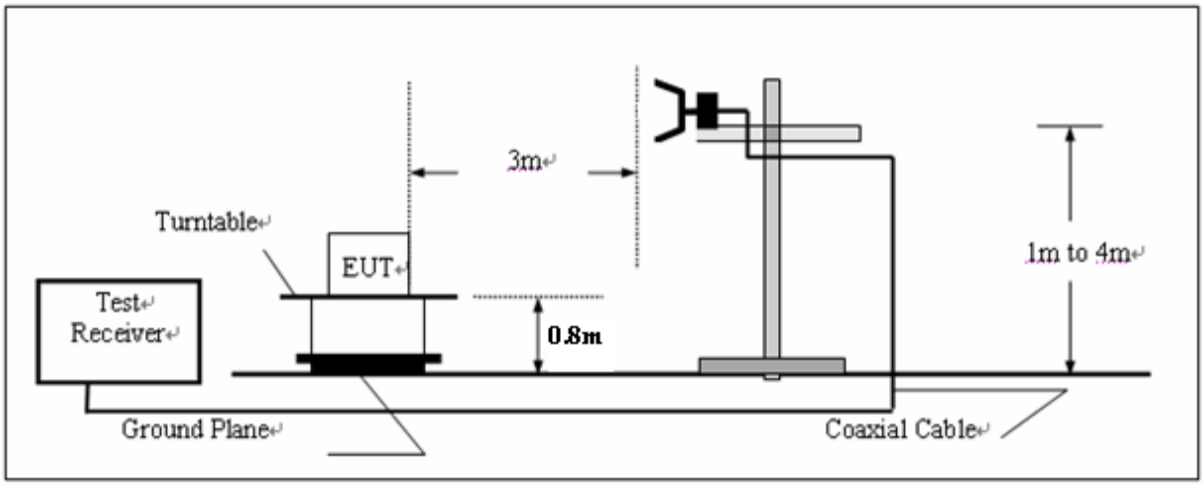
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



Test Results

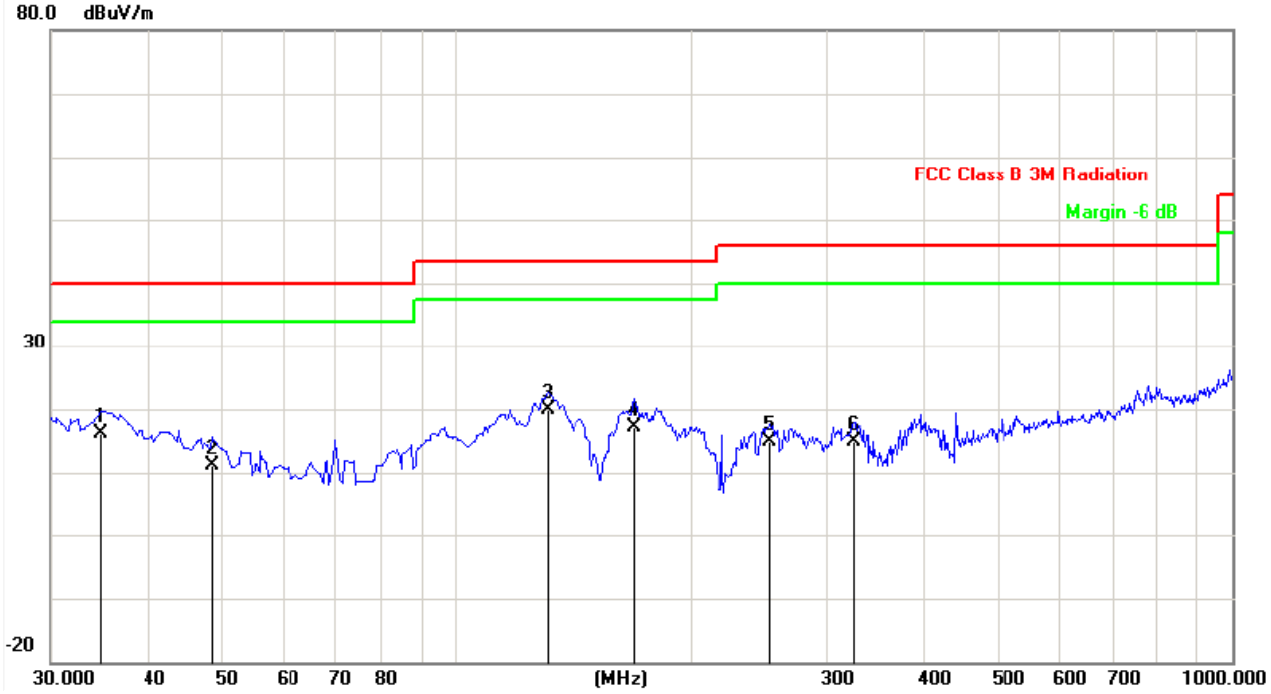
Remark: 1.We tested three channels for each mode and recorded worst case at low channel below 1GHz.
2.we test with EUT on X,Y,Z three polarities and recorded worst case on Y polarity.

For 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dBμV/m)@3m	FCC Limit (dBμV/m) @3m	Margin (dB)	Detector	Result
0.68	52.45	71.21	18.76	QP	PASS
1.42	46.38	63.05	16.67	QP	PASS
15.35	45.47	69.54	24.07	QP	PASS
23.57	48.68	69.54	20.86	QP	PASS

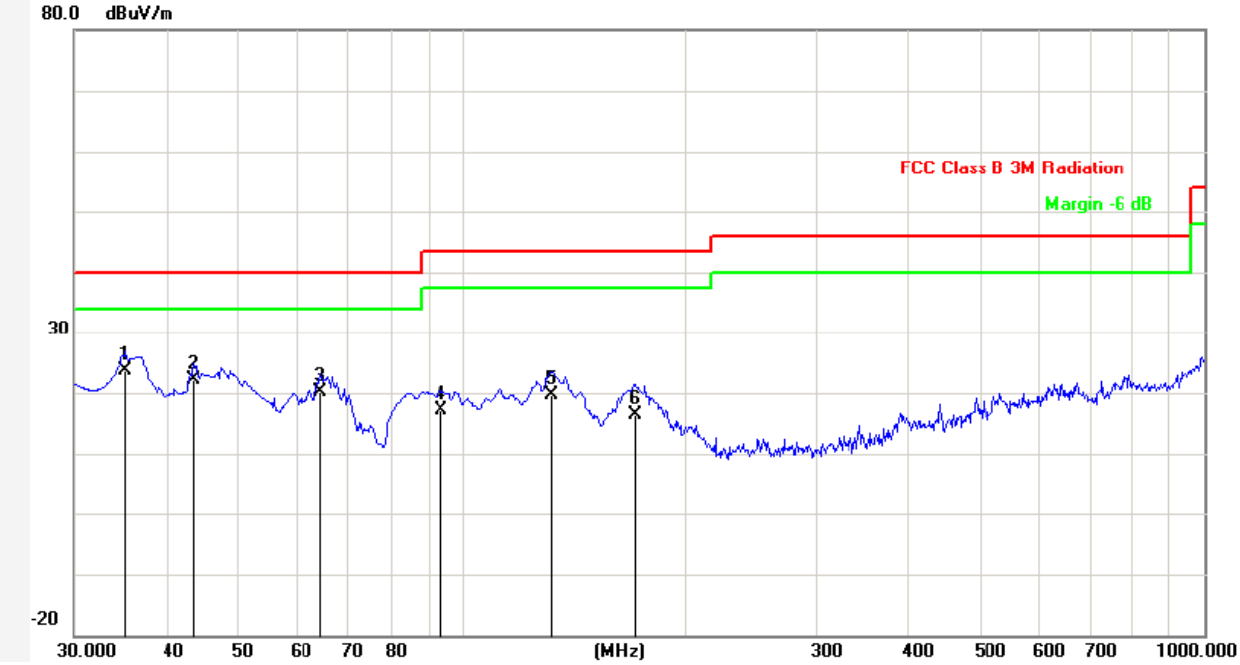
For 30MHz to 1GHz

Horizontal



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ( )	P/F	Remark
1	34.8500	-10.38	26.50	16.12	40.00	-23.88	QP			P	
2	48.4299	-14.89	25.90	11.01	40.00	-28.99	QP			P	
3	130.8797	-18.84	38.60	19.76	43.50	-23.74	QP			P	
4	169.6799	-20.33	37.50	17.17	43.50	-26.33	QP			P	
5	254.0697	-17.55	32.50	14.95	46.00	-31.05	QP			P	
6	324.8798	-16.22	31.10	14.88	46.00	-31.12	QP			P	

Vertical



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth ( )	P/F	Remark
1	35.1276	-10.49	34.20	23.71	40.00	-16.29	QP			P	
2	43.5799	-13.47	35.50	22.03	40.00	-17.97	QP			P	
3	64.4330	-21.05	41.20	20.15	40.00	-19.85	QP			P	
4	93.4402	-19.86	36.90	17.04	43.50	-26.46	QP			P	
5	131.8497	-18.85	38.50	19.65	43.50	-23.85	QP			P	
6	171.6200	-20.24	36.70	16.46	43.50	-27.04	QP			P	

For 1GHz to 25GHz

Low Channel @ Channel 00 @ 2402 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M												
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 (dB)	Correction Factor (dB/m)
1	*2402.00	96.24	PK	114.00	17.76	1.00	224	93.88	31.58	6.98	36.2	2.36
2	*2402.00	73.56	AV	94.00	20.44	1.00	124	71.20	31.58	6.98	36.2	2.36
3	4804.00	52.09	PK	74.00	21.91	1.00	216	42.53	37.06	8.80	36.3	9.56
4	4804.00	40.25	AV	54.00	13.75	1.00	216	30.69	37.06	8.80	36.3	9.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M												
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 (dB)	Correction Factor (dB/m)
1	*2402.00	94.65	PK	114.00	19.35	1.00	224	92.29	31.58	6.98	36.2	2.36
2	*2402.00	69.58	AV	94.00	24.42	1.00	124	67.22	31.58	6.98	36.2	2.36
3	4804.00	54.09	PK	74.00	19.91	1.00	216	44.53	37.06	8.80	36.3	9.56
4	4804.00	42.20	AV	54.00	11.80	1.00	216	32.64	37.06	8.80	36.3	9.56

Middle Channel @ Channel 19 @ 2440 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M												
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 (dB)	Correction Factor (dB/m)
1	*2440.00	98.25	PK	114.00	15.75	1.00	224	96.59	31.14	7.02	36.5	1.66
2	*2440.00	72.15	AV	94.00	21.85	1.00	124	70.50	31.14	7.02	36.5	1.66
3	4880.00	55.29	PK	74.00	18.71	1.00	216	45.39	37.35	8.85	36.3	9.90
4	4880.00	40.64	AV	54.00	13.36	1.00	216	30.74	37.35	8.85	36.3	9.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M												
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 (dB)	Correction Factor (dB/m)
1	*2440.00	89.15	PK	114.00	24.85	1.00	224	87.49	31.14	7.02	36.5	1.66
2	*2440.00	65.12	AV	94.00	28.88	1.00	124	63.46	31.14	7.02	36.5	1.66
3	4882.00	54.09	PK	74.00	19.91	1.00	216	44.19	37.35	8.85	36.3	9.90
4	4882.00	41.25	AV	54.00	12.75	1.00	216	31.35	37.35	8.85	36.3	9.90

High Channel @ Channel 39 @ 2480 MHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M												
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 (dB)	Correction Factor (dB/m)
1	*2480.00	93.64	PK	114.00	20.36	1.00	224	91.27	31.44	7.23	36.3	2.37
2	*2480.00	63.47	AV	94.00	30.53	1.00	124	61.10	31.44	7.23	36.3	2.37
3	4960.00	57.22	PK	74.00	16.78	1.00	216	46.39	38.32	8.91	36.4	10.83
4	4960.00	42.09	AV	54.00	11.91	1.00	216	31.26	38.32	8.91	36.4	10.83

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M												
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 (dB)	Correction Factor (dB/m)
1	*2480.00	93.64	PK	114.00	20.36	1.00	224	91.27	31.44	7.23	36.3	2.37
2	*2480.00	64.26	AV	94.00	29.74	1.00	124	61.89	31.44	7.23	36.3	2.37
3	4960.00	55.20	PK	74.00	18.80	1.00	216	44.37	38.32	8.91	36.4	10.83
4	4960.00	43.19	AV	54.00	10.81	1.00	216	32.36	38.32	8.91	36.4	10.83

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
3. The other emission levels were very low against the limit.
4. Margin value = Limit value- Emission level.
5. The average measurement was not performed when the peak measured data under the limit of average detection.

3.3 Maximum Peak Output Power

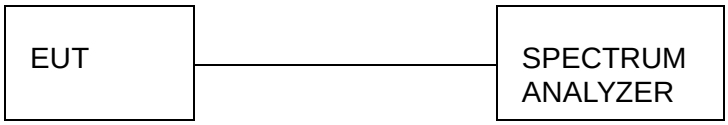
Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.

Test Configuration



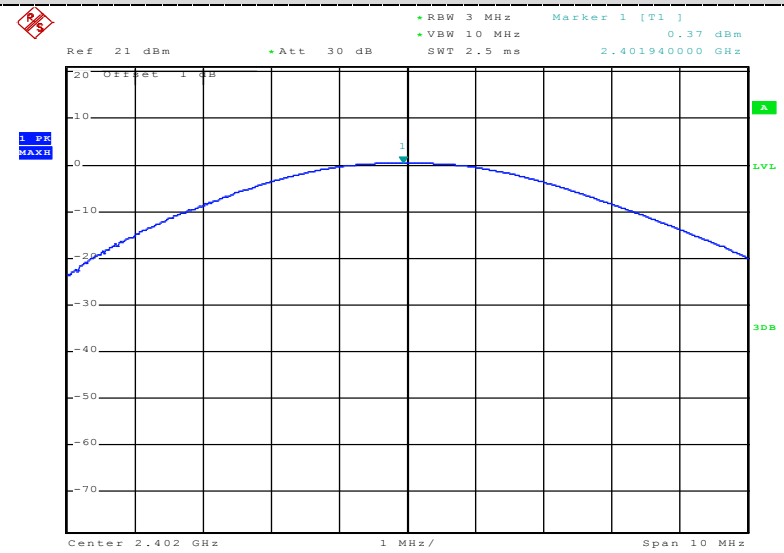
Test Results

Channel	Frequency	Output power (dBm)	Limit (dBm)	Result
00	2402	0.37	30.00	Pass
19	2440	0.70		
39	2480	0.95		

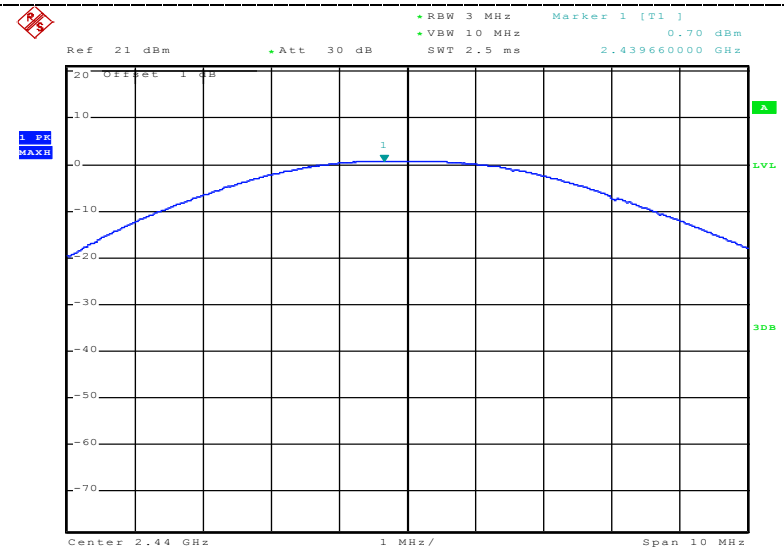
Note: 1.The test results including the cable lose.

Test plot as follows:

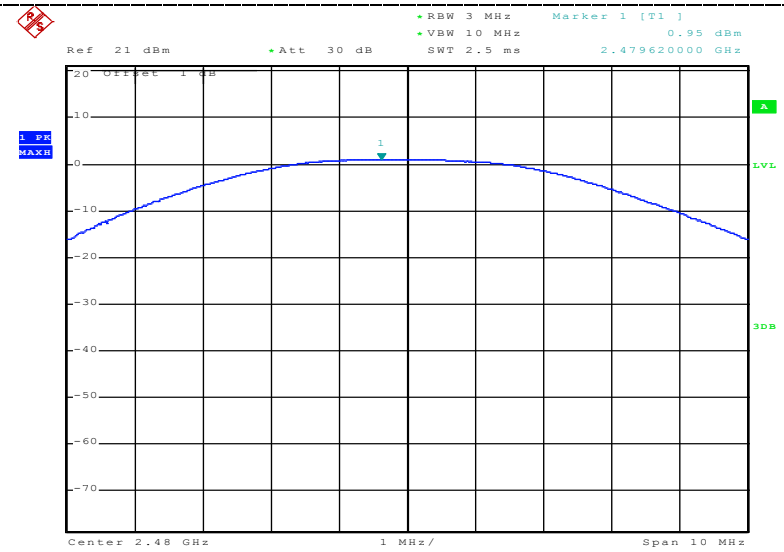
BT4.0



CH00



CH19



CH39

3.4 Power Spectral Density

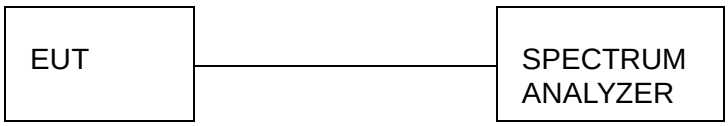
Limit

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 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.

Test Configuration

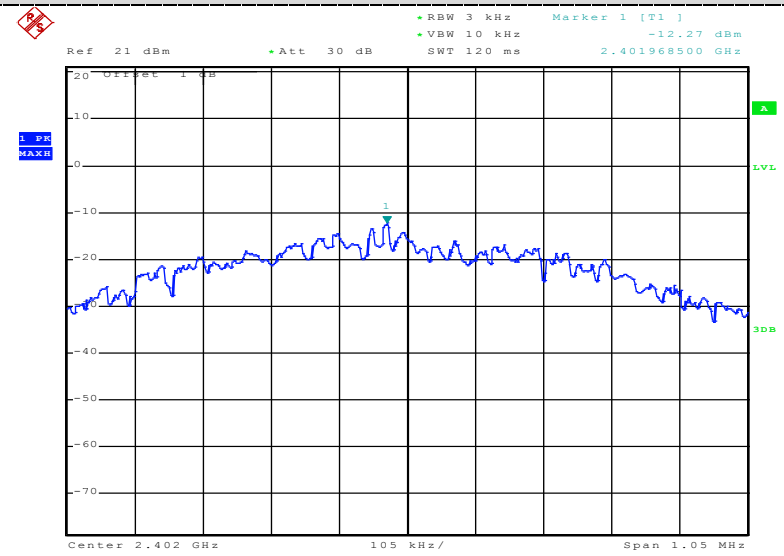


Test Results

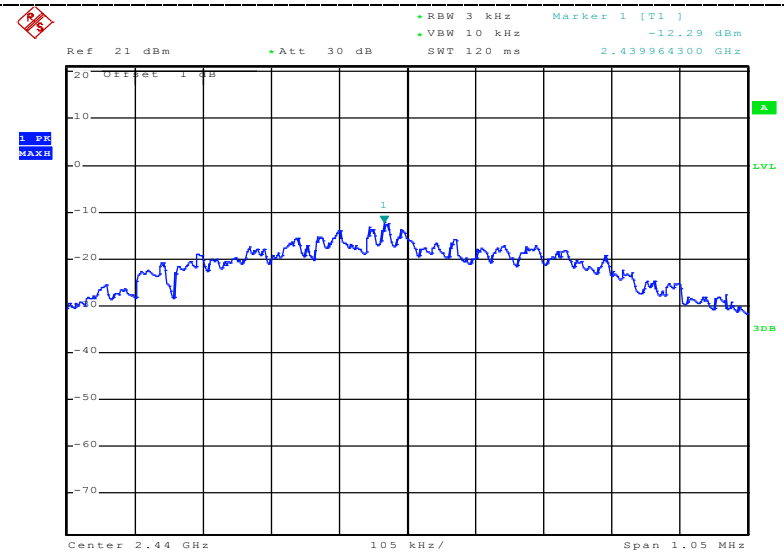
Channel	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS/FAIL
00	2402	-12.27	8	PASS
19	2440	-12.29	8	PASS
39	2480	-12.87	8	PASS

Test plot as follows:

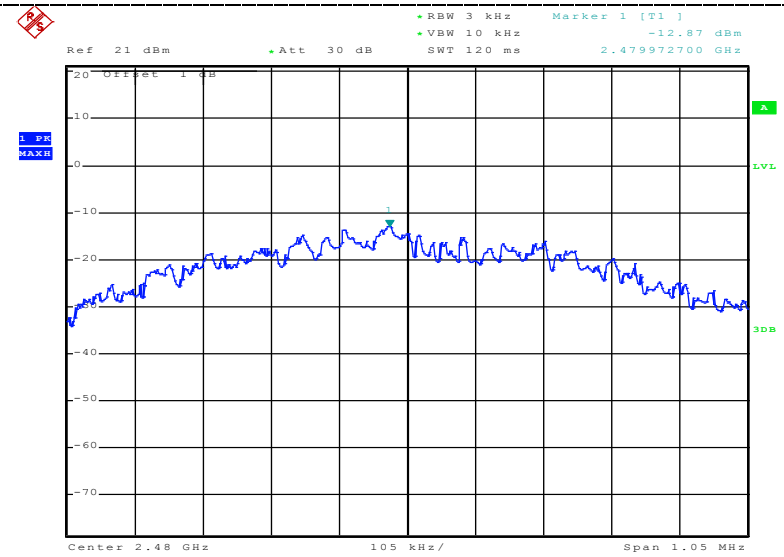
BT4.0



CH00



CH19



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3.5 6dB Bandwidth

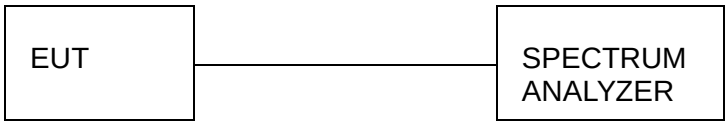
Limit

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

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 with 100KHz RBW and 300KHz VBW.The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration

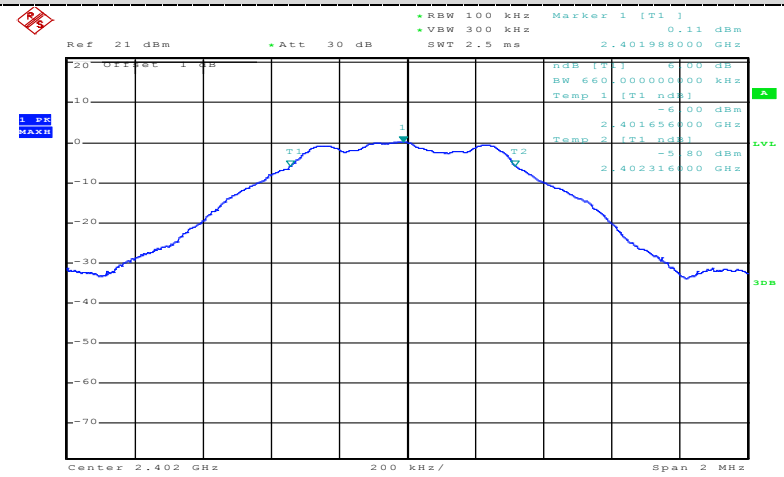


Test Results

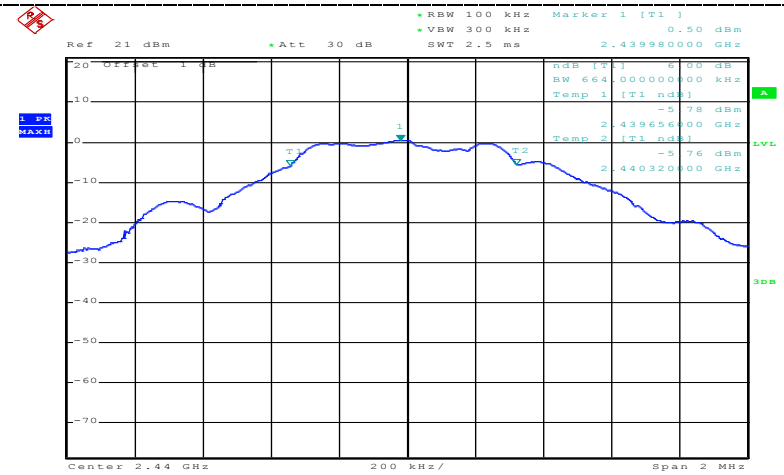
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	MINIMUM LIMIT(MHz)	Verdict
00	2402	0.6600	0.5	PASS
19	2440	0.6640	0.5	PASS
39	2480	0.7000	0.5	PASS

Test plot as follows:

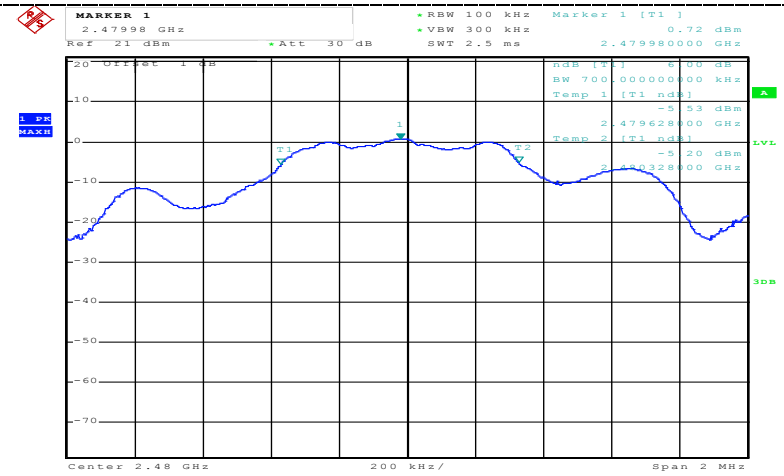
BT4.0



CH00



CH19



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3.6 Band Edge Compliance of RF Emission

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, 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)).

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 Procedure

According to KDB 558074 D01 V03 for Antenna-port conducted measurement. Antenna-port conducted measurements may also be used as an alternative to radiated measurements for demonstrating compliance in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test for cabinet/case spurious emissions is required.

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. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, 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. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 12.2.2, 12.2.3, and 12.2.4 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
7. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
8. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies $\leqslant$ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
9. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).

10. Convert the resultant EIRP level to an equivalent electric field strength using the following relationship:

E = EIRP – 20log D + 104.8

where:

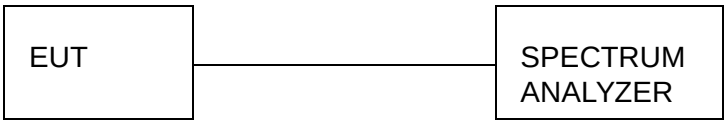
E = electric field strength in dBμV/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

Compare the resultant electric field strength level to the applicable regulatory limit. Perform radiated spurious emission test

Test Configuration

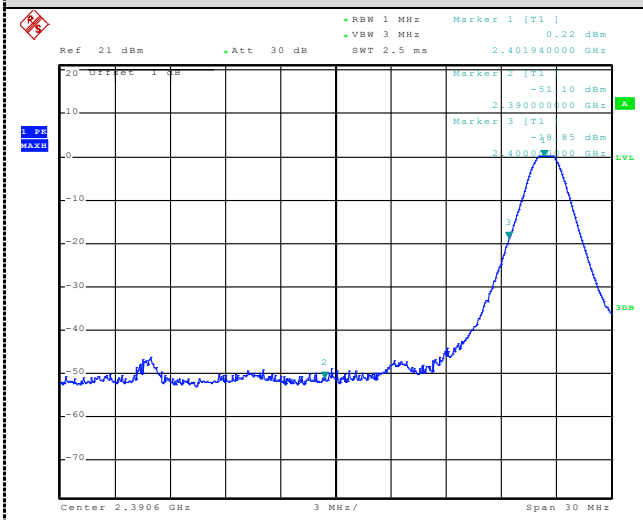
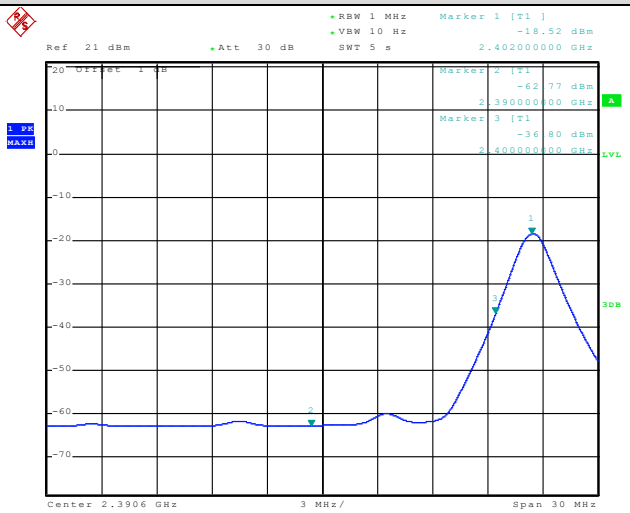
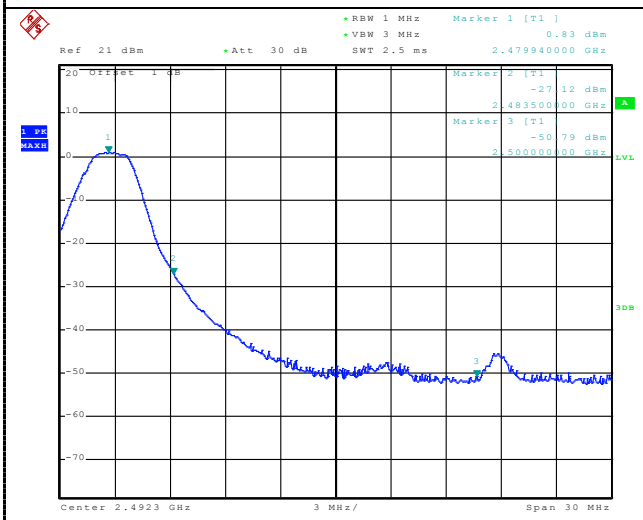
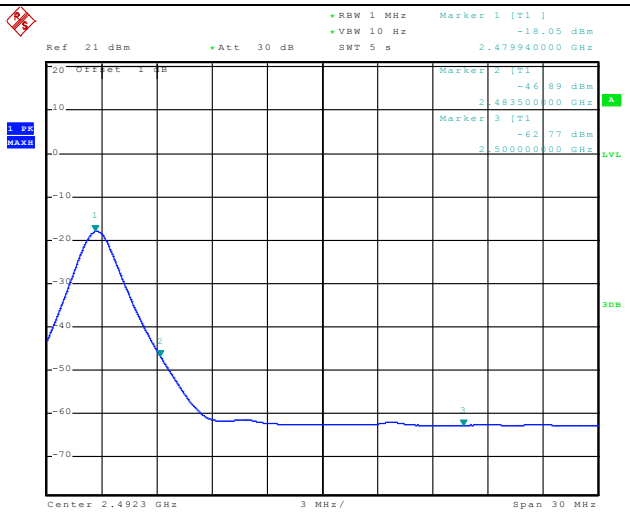


Test Results

Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Ground Reflection Factor (dB)	Covert Radiated E Level At 3m (dBuV/m)	Detector	Limit (dBuV/m)
2390.00	-51.10	2.00	0.00	46.16	Peak	74.00
2390.00	-62.77	2.00	0.00	34.49	AV	54.00
2401.94	0.22	2.00	0.00	97.48	Peak	---
2402.00	-18.52	2.00	0.00	78.74	AV	---
2479.94	0.83	2.00	0.00	98.09	Peak	---
2479.94	-18.05	2.00	0.00	79.21	AV	---
2483.50	-27.12	2.00	0.00	70.14	Peak	74.00
2483.50	-46.89	2.00	0.00	50.37	AV	54.00

Note: 1. The test results including the cable lose.
2. “---“means that the fundamental frequency not for 15.209 limits requirement.

Test plot as follows:

BT4.0	
	
CH 00	
	
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3.7 Spurious RF Conducted Emission

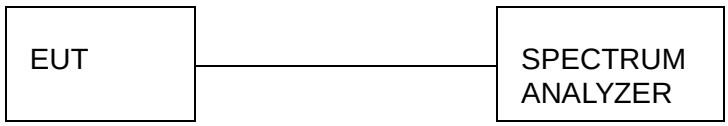
Limit

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 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 measured frequency range from 30MHz to 25GHz.

Test Configuration

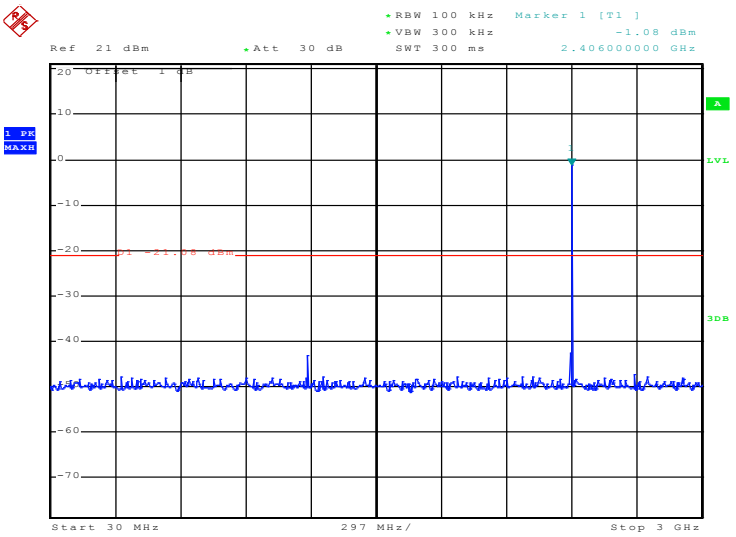


Test Results

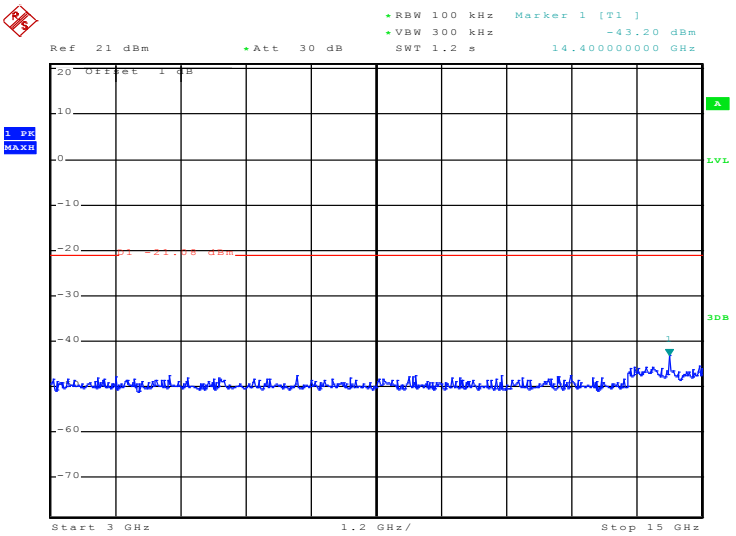
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.

Test plot as follows:

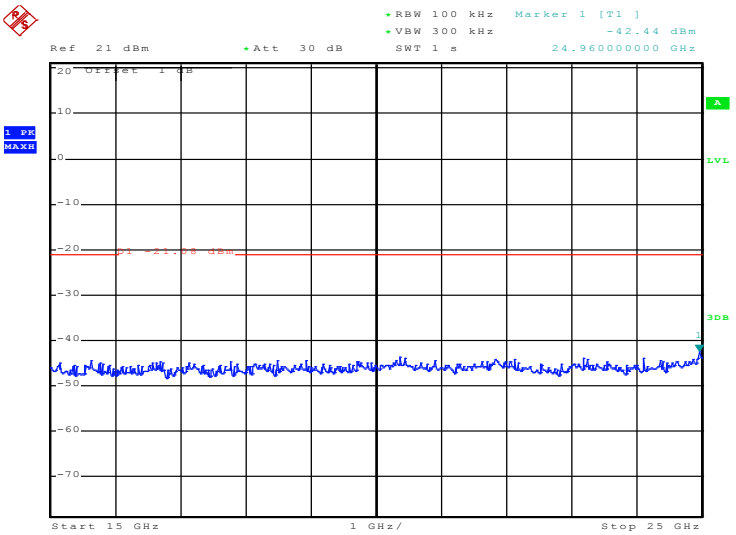
Test Mode:	BT4.0	Test channel :	00



30MHz~3GHz

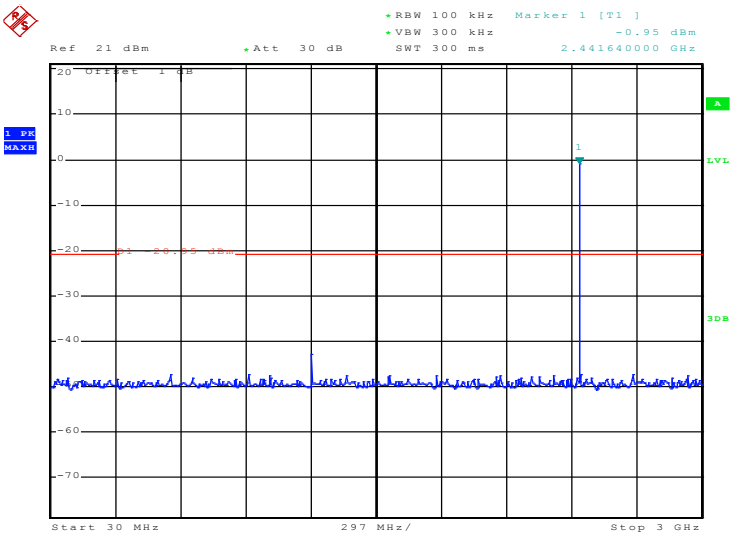


3GHz~15GHz

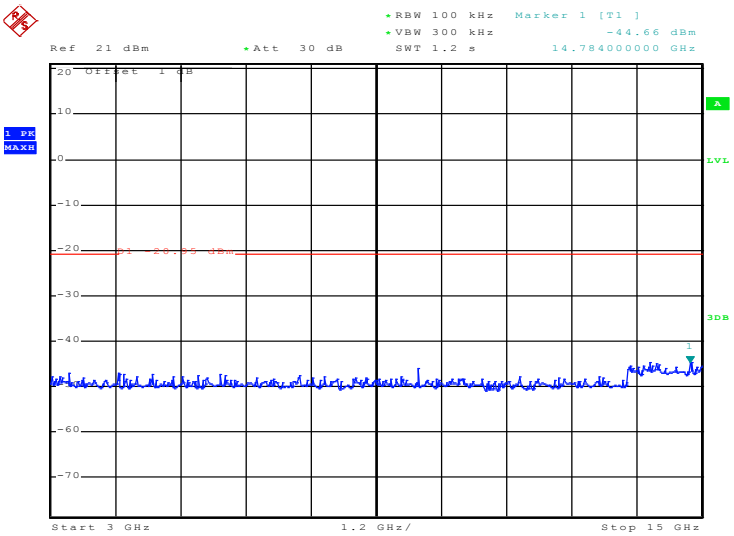


15GHz~25GHz

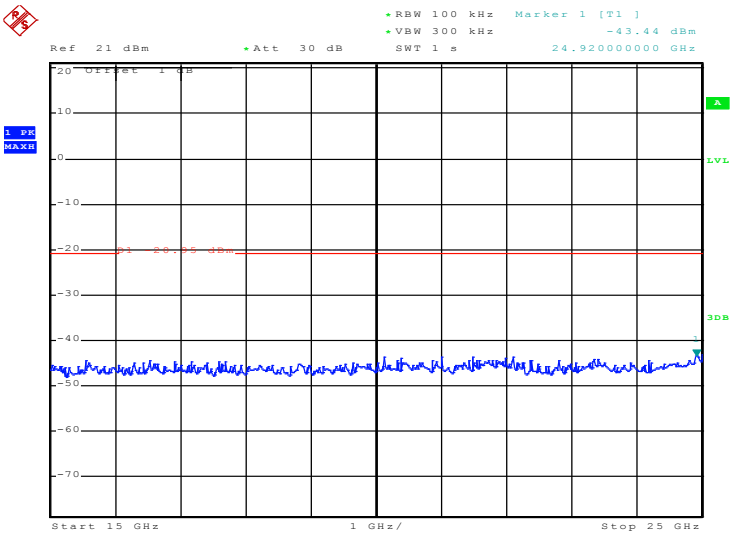
Test Mode:	BT4.0	Test channel :	19



30MHz~3GHz

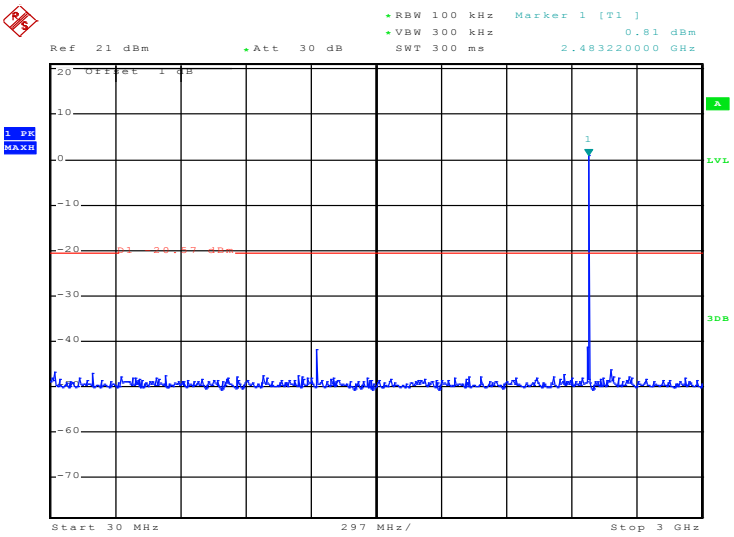


3GHz~15GHz

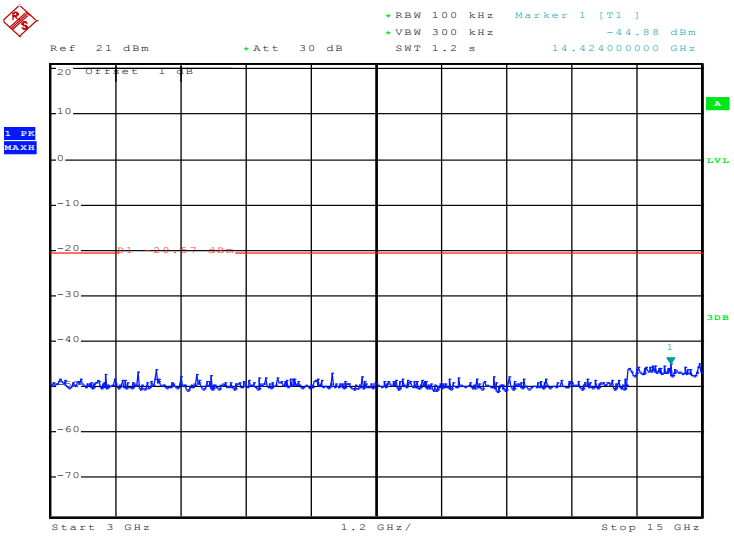


15GHz~25GHz

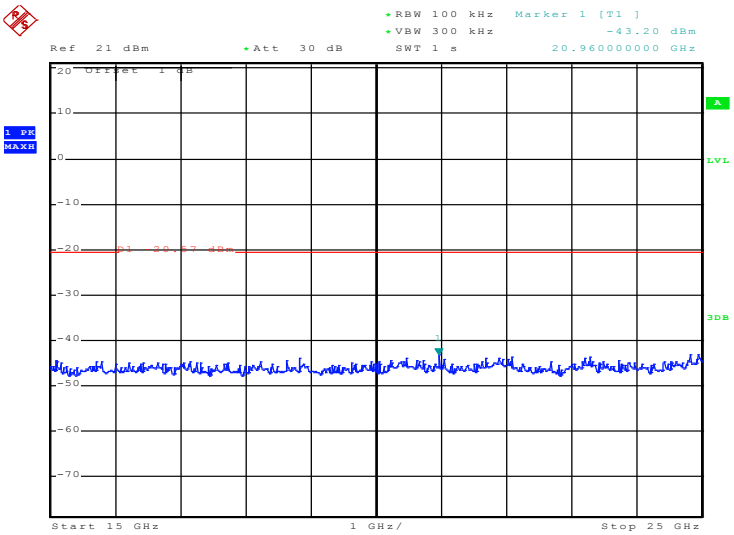
Test Mode:	BT4.0	Test channel :	39



30MHz~3GHz



3GHz~15GHz



15GHz~25GHz

3.8 Antenna Requirement

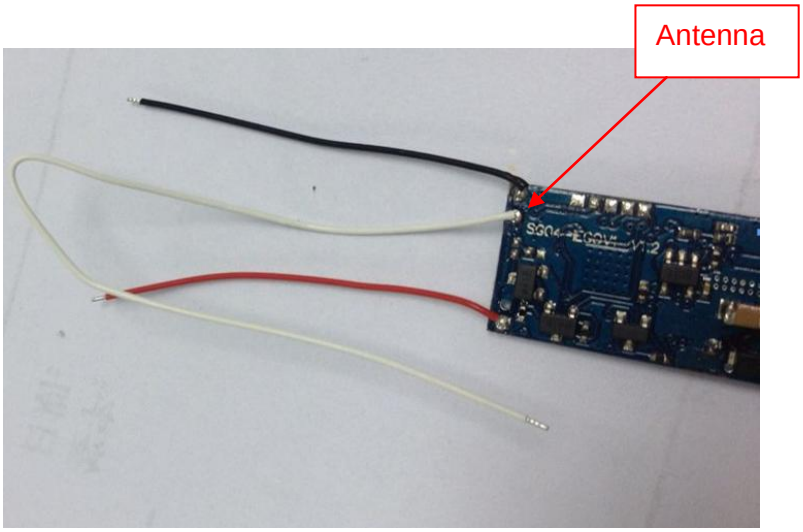
Standard Applicable

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

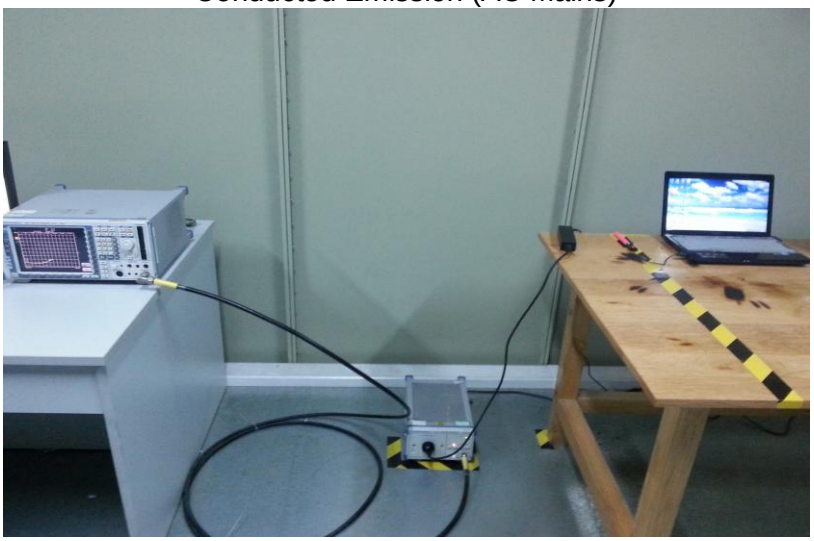
Test Result:

The antenna is integral antenna, the best case gain of the antenna is 0.00dBi

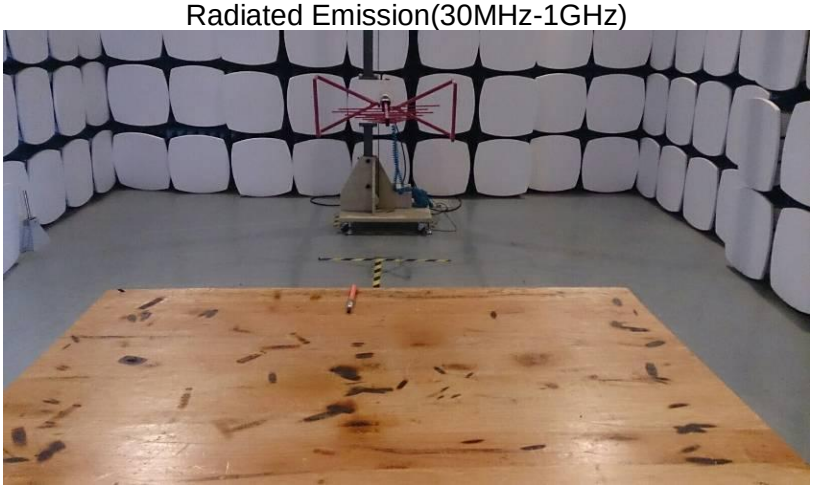


4 EUT TEST PHOTO

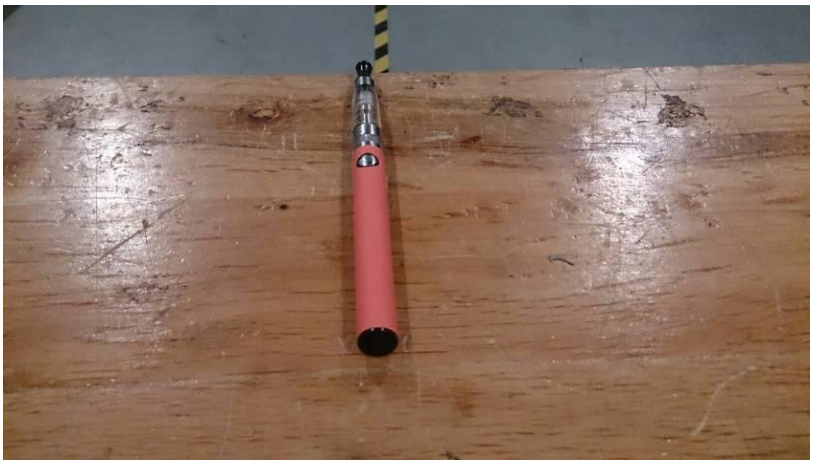
Conducted Emission (AC Mains)



Radiated Emission(30MHz-1GHz)

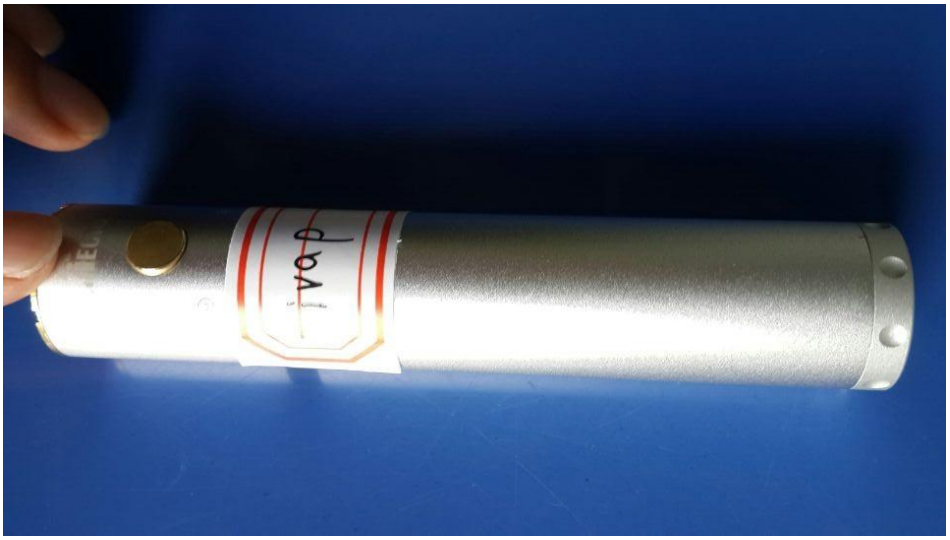


Radiated Emission(1GHz-25G)



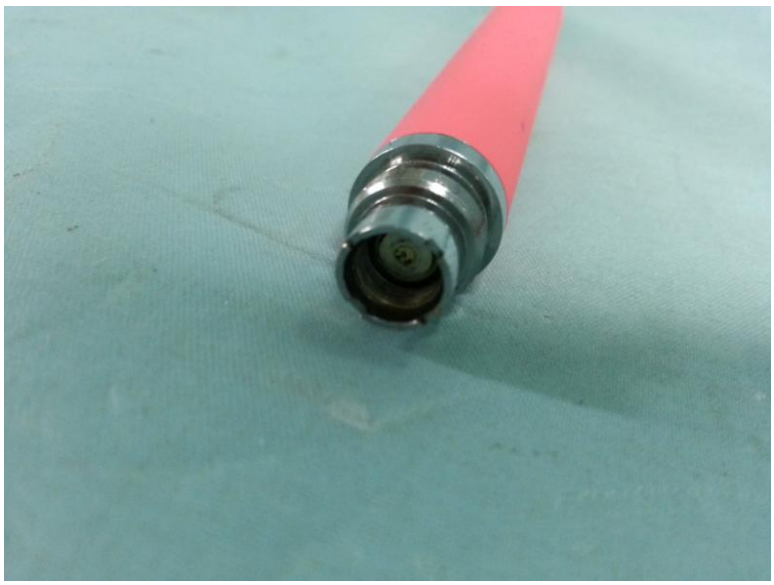
5 APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

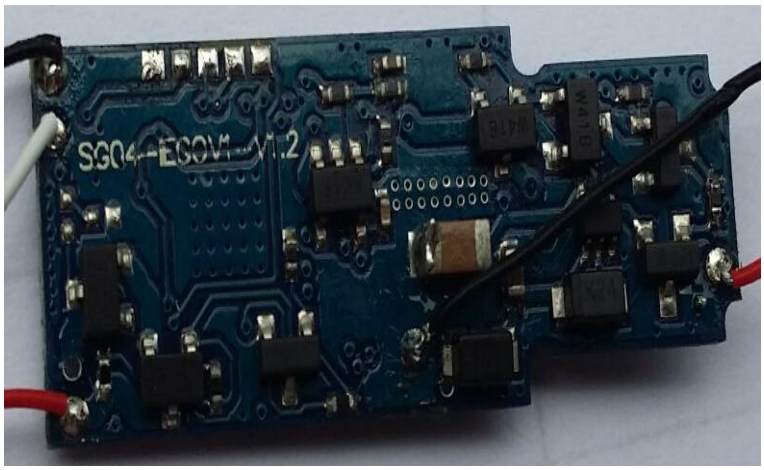
External photos of EUT

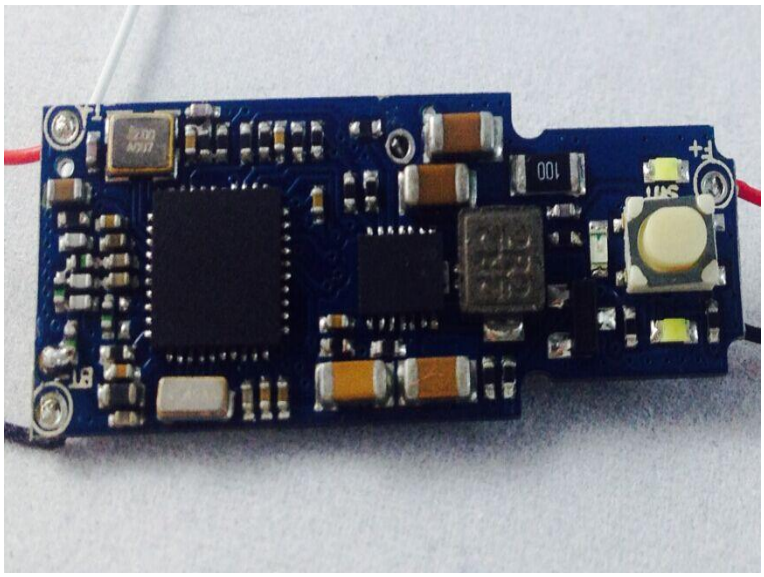


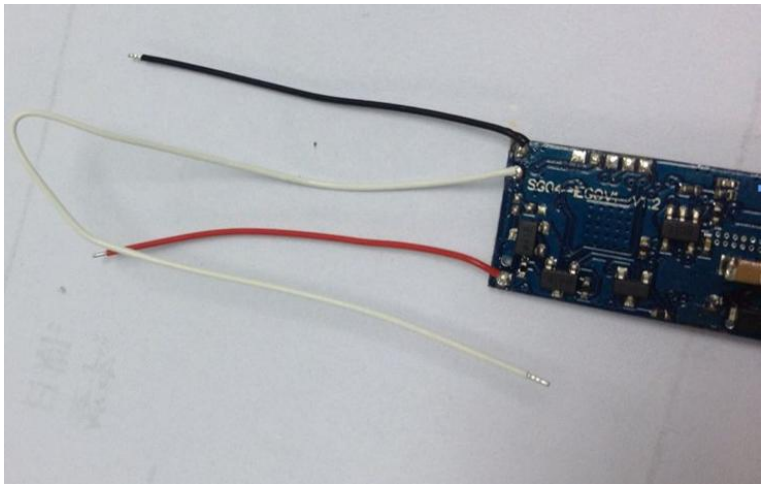

eGo USB charger:
Input: DC 5V 500mA
Output: DC 4.2V 420mA

Internal photos of EUT









**************************THE END**************************