



FCC Part 15C Test Report

FCC ID: 2AKQERZS846

Product Name:	CLIPTEC 2.4GHZ 1200DPI WIRELESS OPTICAL MOUSE-TRAX
Trademark:	CLIPTEC
Model Name :	RZS846
Prepared For :	Cliptec International Sdn Bhd
Address :	NO.3, 5 & 7, Lorong Perda Timur 2, Bandar Perda, 14000 Bukit Mertajam, Penang, Malaysia.
Prepared By :	Shenzhen BCTC Technology Co., Ltd.
Address :	No.101, Yousong Road, Longhua New District, Shenzhen, China
Test Date:	Dec. 15 - Dec. 22, 2016
Date of Report :	Dec. 22, 2016
Report No.:	BCTC-FY161206179E



TEST RESULT CERTIFICATION

Applicant's name : Cliptec International Sdn Bhd
Address : NO.3, 5 & 7, Lorong Perda Timur 2, Bandar Perda, 14000 Bukit Mertajam, Penang, Malaysia.
Manufacture's Name : Cliptec International Sdn Bhd
Address : NO.3, 5 & 7, Lorong Perda Timur 2, Bandar Perda, 14000 Bukit Mertajam, Penang, Malaysia.

Product description

Product name : CLIPTEC 2.4GHZ 1200DPI WIRELESS OPTICAL MOUSE-TRAX

Trademark : CLIPTEC

Model and/or type reference : RZS846

Standards : FCC Part15.249
ANSI C63.10-2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Testing Engineer : 

Eric Yang

Reviewer (Supervisor) : 

Jade Yang

Approved & Authorized Signer(Manager) : 

**Table of Contents**

	Page
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	5
1.2 MEASUREMENT UNCERTAINTY	5
2 . GENERAL INFORMATION	6
2.1 GENERAL DESCRIPTION OF EUT	6
2.2 DESCRIPTION OF TEST MODES	7
2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	8
2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	8
2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS	9
3 . EMC EMISSION TEST	10
3.1 CONDUCTED EMISSION MEASUREMENT	10
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	10
3.1.2 TEST PROCEDURE	10
3.1.3 DEVIATION FROM TEST STANDARD	10
3.1.4 TEST SETUP	11
3.1.5 EUT OPERATING CONDITIONS	11
3.1.6 TEST RESULTS	11
3.2 RADIATED EMISSION MEASUREMENT	12
3.2.1 RADIATED EMISSION LIMITS	12
3.2.2 TEST PROCEDURE	13
3.2.3 DEVIATION FROM TEST STANDARD	13
3.2.4 TEST SETUP	13
3.2.5 EUT OPERATING CONDITIONS	14
3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)	15
3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)	16
3.2.8 TEST RESULTS (1GHZ~25GHZ)	18
3.3 RADIATED BAND EMISSION MEASUREMENT	20
3.3.1 TEST REQUIREMENT:	20
3.3.2 TEST PROCEDURE	20
3.3.3 DEVIATION FROM TEST STANDARD	21
3.3.4 TEST SETUP	21
3.3.5 EUT OPERATING CONDITIONS	21
4 . BANDWIDTH TEST	24
4.1 APPLIED PROCEDURES / LIMIT	24
4.1.1 TEST PROCEDURE	24

**Table of Contents**

	Page
4.1.2 DEVIATION FROM STANDARD	24
4.1.3 TEST SETUP	24
4.1.4 EUT OPERATION CONDITIONS	24
4.1.5 TEST RESULTS	25
5 . ANTENNA REQUIREMENT	27
5.1 STANDARD REQUIREMENT	27
5.2 EUT ANTENNA	27
6 . TEST SEUUP PHOTO	28
7 . EUT PHOTO	29



1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.249) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	N/A	
15.249	Radiated Spurious Emission	PASS	
15.249	Bandwidth	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.

Add. : No.101, Yousong Road, Longhua New District, Shenzhen, China

FCC Registered No.: 187086

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power, conducted	$\pm 0.16\text{dB}$
3	Spurious emissions, conducted	$\pm 0.21\text{dB}$
4	All emissions, radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	CLIPTEC 2.4GHZ 1200DPI WIRELESS OPTICAL MOUSE-TRAX													
Trademark	CLIPTEC													
Model Name	RZS846													
Model Difference	N/A													
Product Description	<p>The EUT is a CLIPTEC 2.4GHZ 1200DPI WIRELESS OPTICAL MOUSE-TRAX</p> <table border="1"><tr><td>Operation Frequency:</td><td>2405~2479MHz</td></tr><tr><td>Modulation Type:</td><td>GFSK</td></tr><tr><td>Bit Rate of Transmitter</td><td>2Mbps</td></tr><tr><td>Number Of Channel</td><td>38 CH</td></tr><tr><td>Antenna type:</td><td>PCB antenna</td></tr><tr><td>Antenna Gain (dBi)</td><td>0dBi</td></tr></table>		Operation Frequency:	2405~2479MHz	Modulation Type:	GFSK	Bit Rate of Transmitter	2Mbps	Number Of Channel	38 CH	Antenna type:	PCB antenna	Antenna Gain (dBi)	0dBi
Operation Frequency:	2405~2479MHz													
Modulation Type:	GFSK													
Bit Rate of Transmitter	2Mbps													
Number Of Channel	38 CH													
Antenna type:	PCB antenna													
Antenna Gain (dBi)	0dBi													
Channel List	Please refer to the Note 2.													
Power	DC 3.0V													
hardware version	--													
Software version	--													
Serial number	--													
Connecting I/O Port(s)	Please refer to the User's Manual													

Note:

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



2.

Channel List							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2405	/	/	/	/	31	2467
01	2407	/	/	/	/	32	2469
02	2409	/	/	/	/	33	2471
03	2411	/	/	/	/	34	2473
04	2413	/	/	/	/	35	2475
05	2415	/	/	/	/	36	2477
06	2417	15	2435	28	2461	37	2479
07	2419	16	2437	29	2463		
08	2421	17	2439	30	2465		

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH16
Mode 3	CH37
Mode 4	Link Mode

For Conducted & Radiated Emission	
Final Test Mode	Description
Mode 1	CH00
Mode 2	CH16
Mode 3	CH37
Mode 4	Link Mode

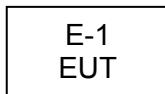
Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Emission Test



Conducted Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	CLIPTEC 2.4GHZ 1200DPI WIRELESS OPTICAL MOUSE-TRAX	CLIPTEC	RZS846	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in «Length» column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	1166.5950K 03-101165-ha	2016.06.06	2017.06.05	1 year
2	LISN	R&S	NSLK81 26	812646 6	2016.08.24	2017.08.23	1 year
3	LISN	R&S	NSLK81 26	812648 7	2016.08.24	2017.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 7	2016.06.07	2017.06.06	1 year
5	RF cables	R&S	R204	R20X	2016.07.06	2017.07.05	1 year

Radiation test, Band-edge test and 20db bandwidth test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY4510804 0	2016.07.06	2017.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2016.06.07	2017.06.06	1 year
3	Bilog Antenna	R&S	VULB 9168	VULB91 68-438	2016.07.06	2017.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 6	2016.06.07	2017.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2016.06.07	2017.06.06	1 year
6	Horn Antenna	R&S	HF906	10027	2016.07.06	2017.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2016.07.06	2017.07.05	1 year
8	Amplifier	R&S	BBV9743	9743-01 9	2016.08.25	2017.08.24	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2016.06.08	2017.06.07	1 year
10	RF cables	R&S	R203	R20X	2016.07.06	2017.07.05	1 year
11	Antenna connector	Florida RFLabs	Lab-Fle	RF 01#	2016.07.06	2017.07.05	1 year



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

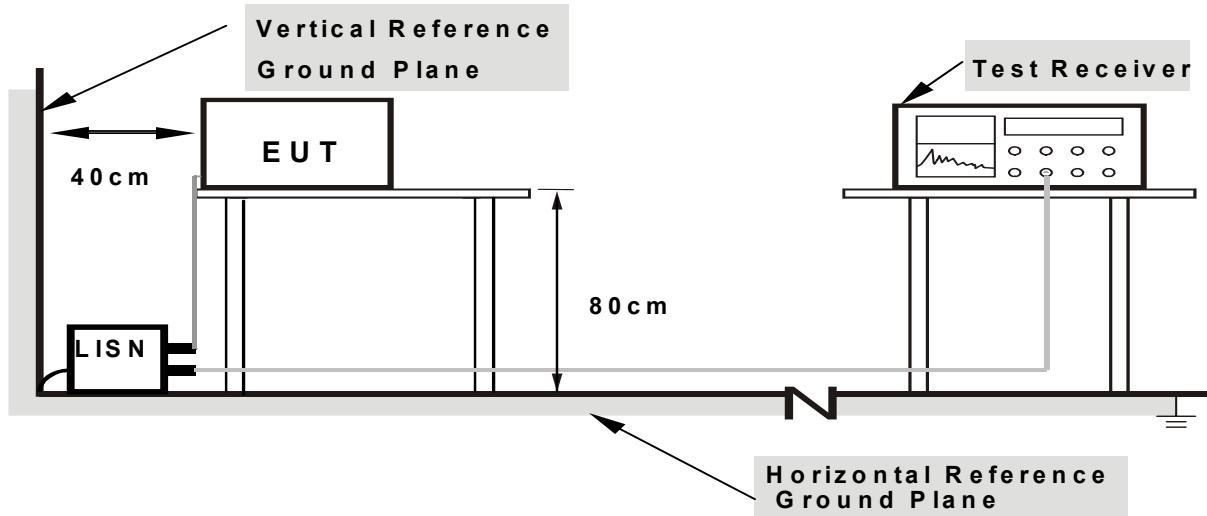
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

NOTE: This EUT is powered by the Battery only, this test item is not applicable.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

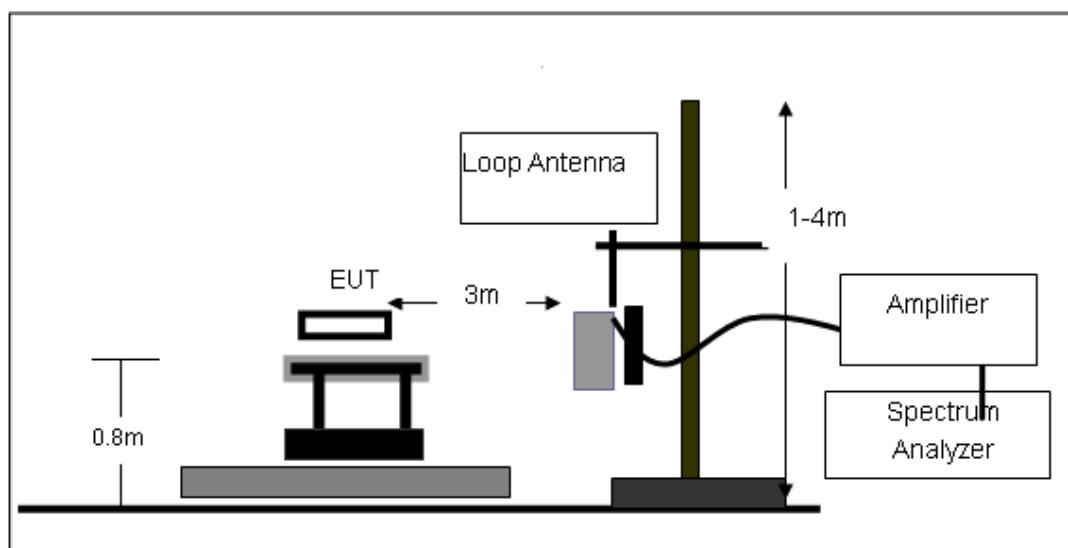
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

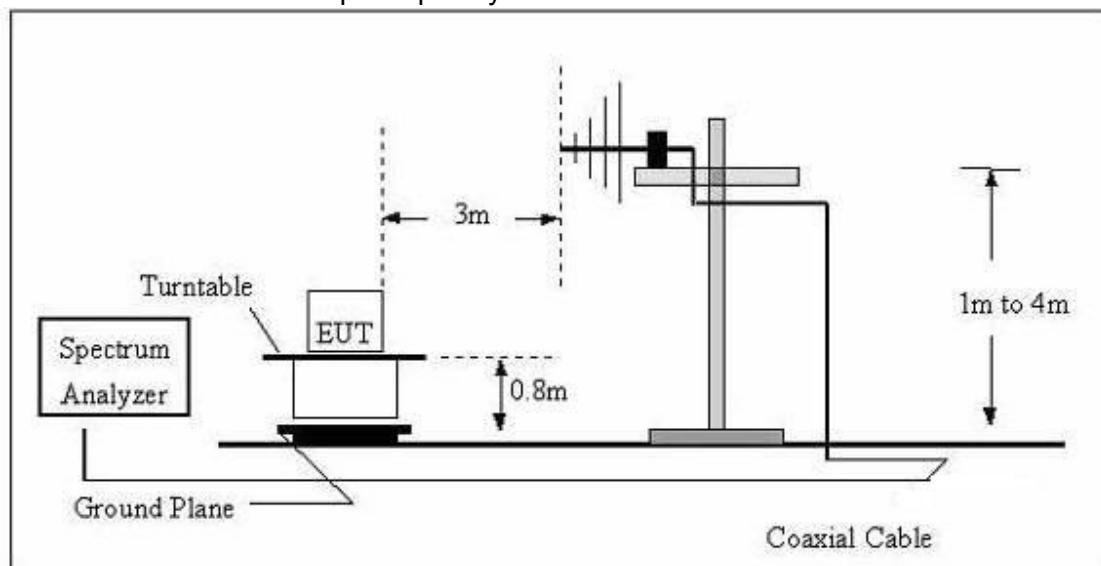
No deviation

3.2.4 TEST SETUP

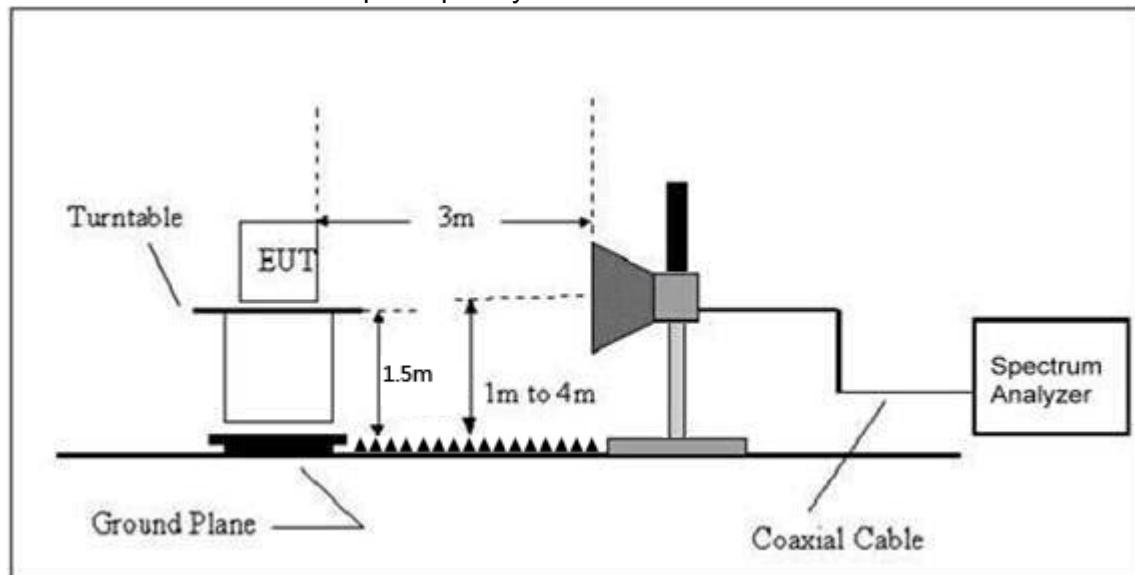
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)

Temperature:	20°C	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 3.0V
Test Mode :	Mode 4	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

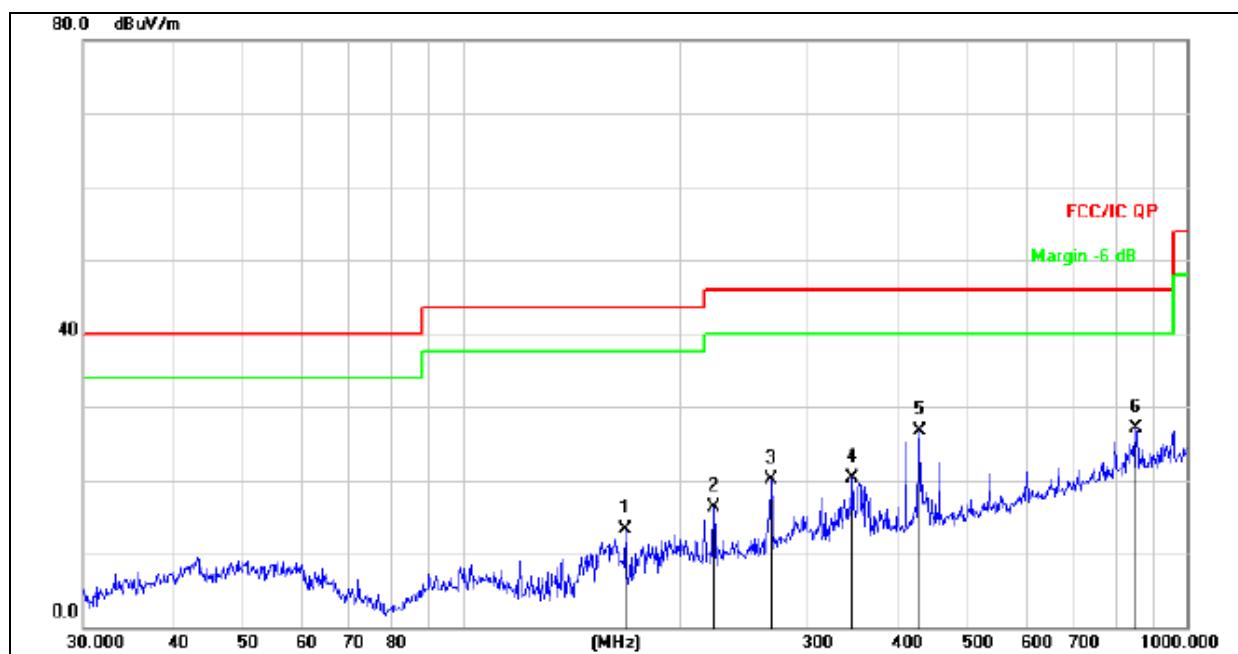
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log(\text{specific distance}/\text{test distance})$ (dB);
Limit line = specific limits(dBuV) + distance extrapolation factor.



3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 3.0V		
Test Mode :	Mode 4		



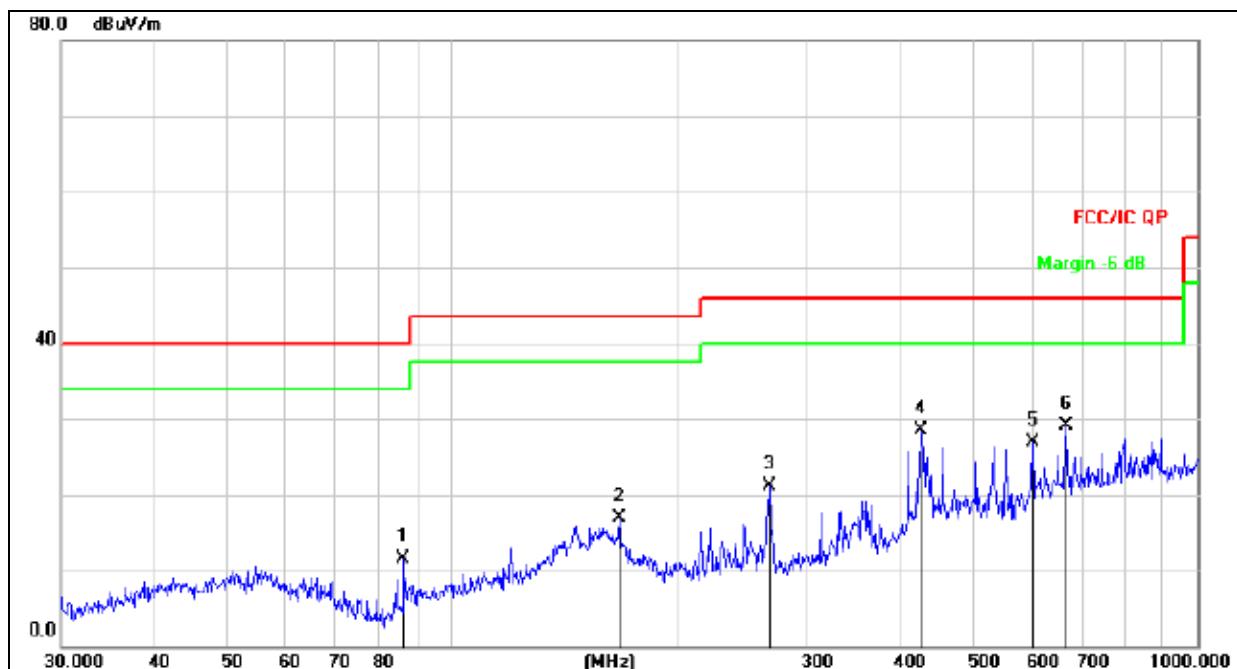
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
1		167.8243	31.81	-18.57	13.24	43.50	-30.26 QP
2		222.1698	31.46	-15.20	16.26	46.00	-29.74 QP
3		266.6089	33.29	-13.18	20.11	46.00	-25.89 QP
4		345.5952	30.83	-10.52	20.31	46.00	-25.69 QP
5		428.0193	35.39	-8.70	26.69	46.00	-19.31 QP
6	*	851.0353	27.44	-0.27	27.17	46.00	-18.83 QP



Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 3.0V		
Test Mode :	Mode 4		



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over
			Level	Factor	ment		
1		86.2001	30.83	-19.30	11.53	40.00	-28.47 QP
2		167.8243	35.47	-18.57	16.90	43.50	-26.60 QP
3		266.6089	34.20	-13.18	21.02	46.00	-24.98 QP
4		426.5210	37.22	-8.73	28.49	46.00	-17.51 QP
5		601.4265	31.35	-4.47	26.88	46.00	-19.12 QP
6	*	665.8035	32.58	-3.54	29.04	46.00	-16.96 QP



3.2.8 TEST RESULTS (1GHZ~25GHZ)

	Freq.	Receiver Reading	Detector	Polar	Corrected Factor	Emission Level	Limit	Result
	(MHz)	(dB μ V)	(PK/QP/Ave)	(H/V)	(dB)	(dB μ V/m)	(dB μ V/m)	
Lower Channel 2405MHz	2405.00	90.87	PK	H	13.85	104.72	114.00	Pass
	2405.00	72.63	Ave	H	13.85	86.48	94.00	Pass
	4810.00	50.62	PK	H	19.33	69.95	74.00	Pass
	4810.00	29.73	Ave	H	19.33	49.06	54.00	Pass
	12355.00	27.53	PK	H	17.81	45.34	74.00	Pass
	17850.00	20.41	PK	H	25.39	45.80	74.00	Pass
	2405.00	89.75	PK	V	13.85	103.60	114.00	Pass
	2405.00	72.35	Ave	V	13.85	86.20	94.00	Pass
	4810.00	47.63	PK	V	19.33	66.96	74.00	Pass
	4811.00	27.39	Ave	V	19.33	46.72	54.00	Pass
	12355.00	26.68	PK	V	17.81	44.49	74.00	Pass
	17850.00	20.59	PK	V	25.39	45.98	74.00	Pass
Middle Channel 2437MHz	2437.00	90.58	PK	H	13.94	104.52	114.00	Pass
	2437.00	71.65	Ave	H	13.94	85.59	94.00	Pass
	4874.00	47.94	PK	H	19.43	67.37	74.00	Pass
	4874.00	29.79	Ave	H	19.43	49.22	54.00	Pass
	12355.00	26.96	PK	H	17.81	44.77	74.00	Pass
	17850.00	19.84	PK	H	25.39	45.23	74.00	Pass
	2437.00	91.29	PK	V	13.94	105.23	114.00	Pass
	2437.00	72.86	Ave	V	13.94	86.80	94.00	Pass
	4874.00	48.34	PK	V	19.43	67.77	74.00	Pass
	4874.00	28.55	Ave	V	19.43	47.98	54.00	Pass
	12355.00	25.54	PK	V	17.81	43.35	74.00	Pass
	17850.00	19.43	PK	V	25.39	44.82	74.00	Pass
Upper Channel 2479MHz	2479.00	89.64	PK	H	14.02	103.66	114.00	Pass
	2479.00	70.26	Ave	H	14.02	84.28	94.00	Pass
	4958.00	45.78	PK	H	19.51	65.29	74.00	Pass
	4958.00	27.82	Ave	H	19.51	47.33	54.00	Pass



	12355.00	24.88	PK	H	17.81	42.69	74.00	Pass
	17850.00	19.26	PK	H	25.39	44.65	74.00	Pass
	2479.00	90.98	PK	V	14.02	105.00	114.00	Pass
	2479.00	71.56	Ave	V	14.02	85.58	94.00	Pass
	4958.00	45.28	PK	V	19.51	64.79	74.00	Pass
	4958.00	27.37	Ave	V	19.51	46.88	54.00	Pass
	12355.00	26.43	PK	V	17.81	44.24	74.00	Pass
	17850.00	19.25	PK	V	25.39	44.64	74.00	Pass

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Meter Reading + Factor

Margin = Emission Level - Limit

Other harmonics emissions are lower than 20dB below the allowable limit.



3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the Highest channel

Note:

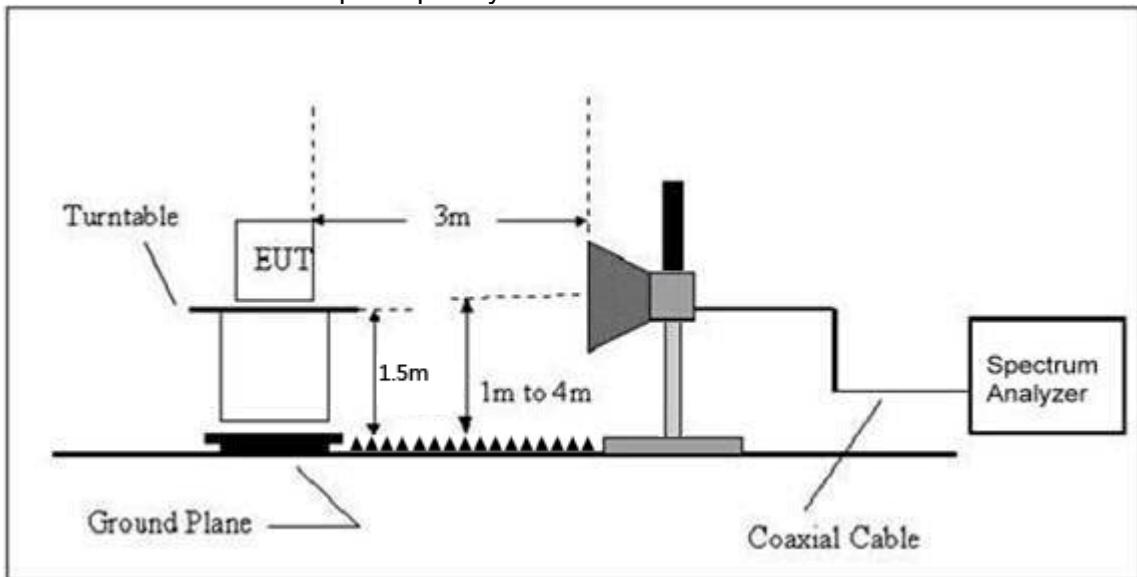
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



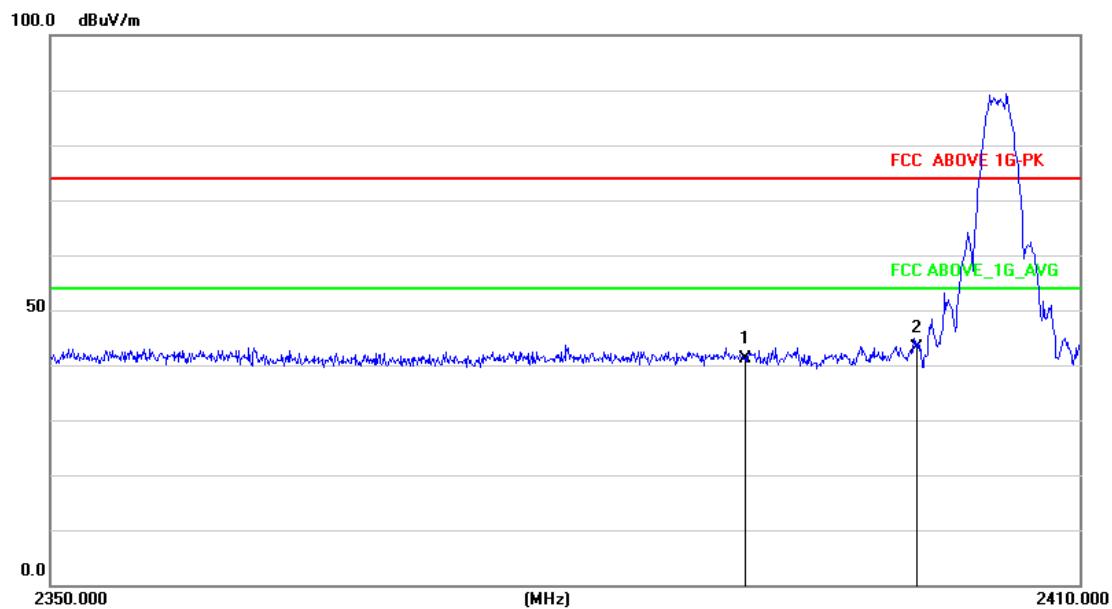
3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



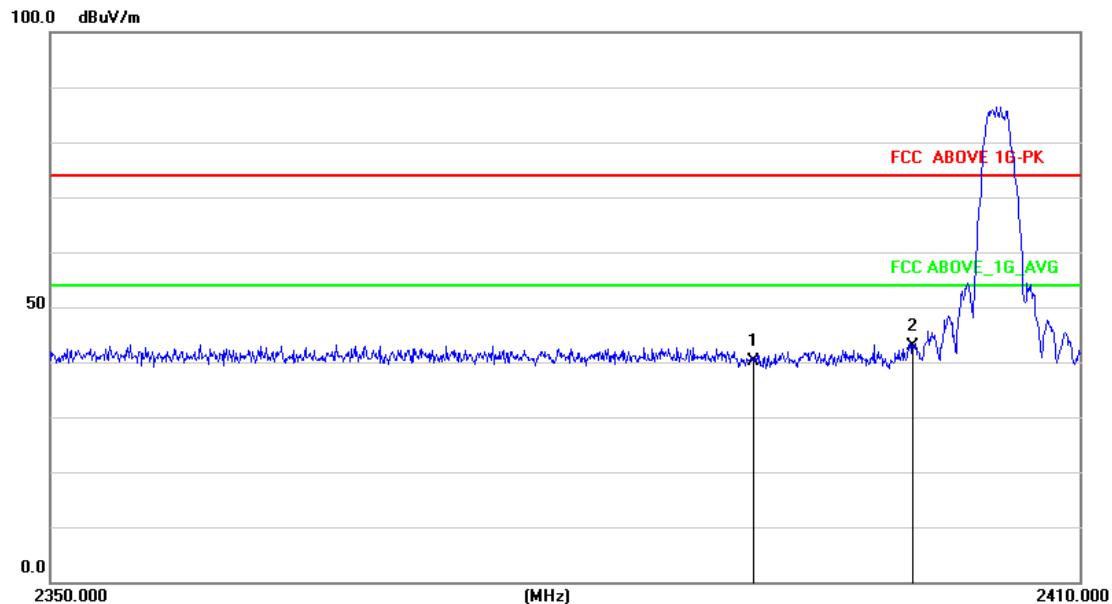
3.3.6 TEST RESULT

2405MHz Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.380	45.89	-4.72	41.17	74.00	-32.83	peak
2	2400.460	47.88	-4.77	43.11	74.00	-30.89	peak

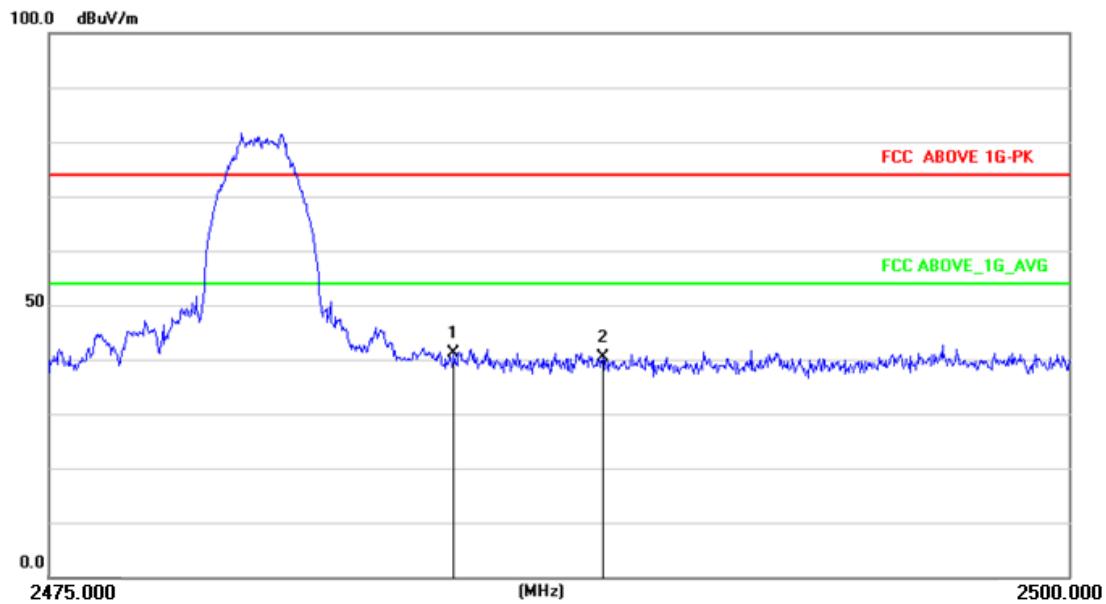
2405MHz Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.860	44.80	-4.73	40.07	74.00	-33.93	peak
2	2400.220	47.65	-4.77	42.88	74.00	-31.12	peak

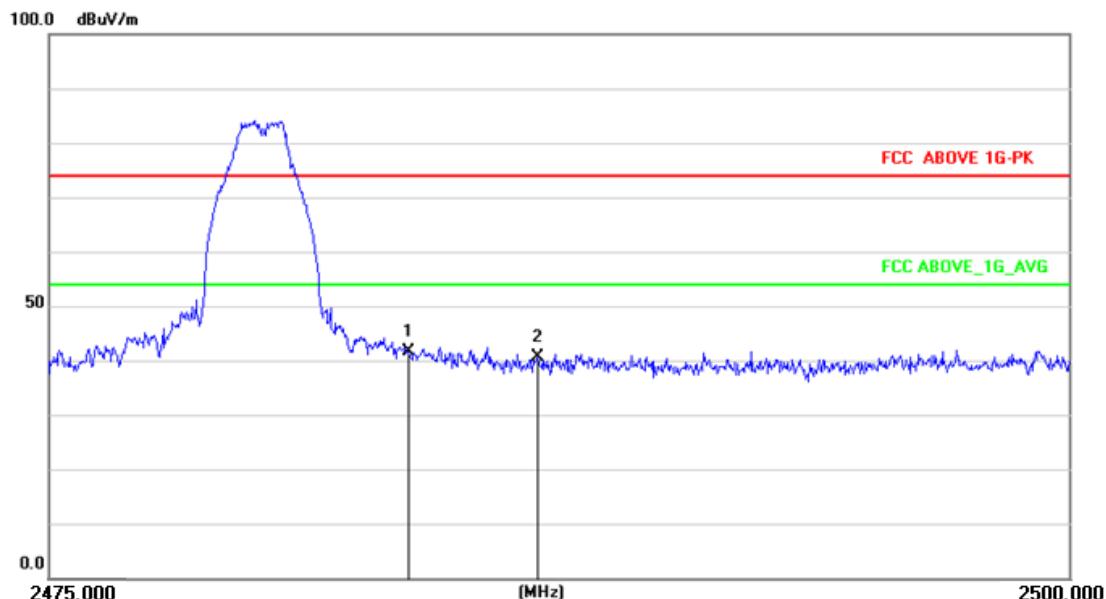


2479MHz Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2484.900	46.32	-5.08	41.24	74.00	-32.76	peak
2	2488.550	45.35	-5.08	40.27	74.00	-33.73	peak

2479MHz Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.800	46.79	-5.08	41.71	74.00	-32.29	peak
2	2486.950	45.71	-5.08	40.63	74.00	-33.37	peak



4. BANDWIDTH TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.249) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.249	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

4.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

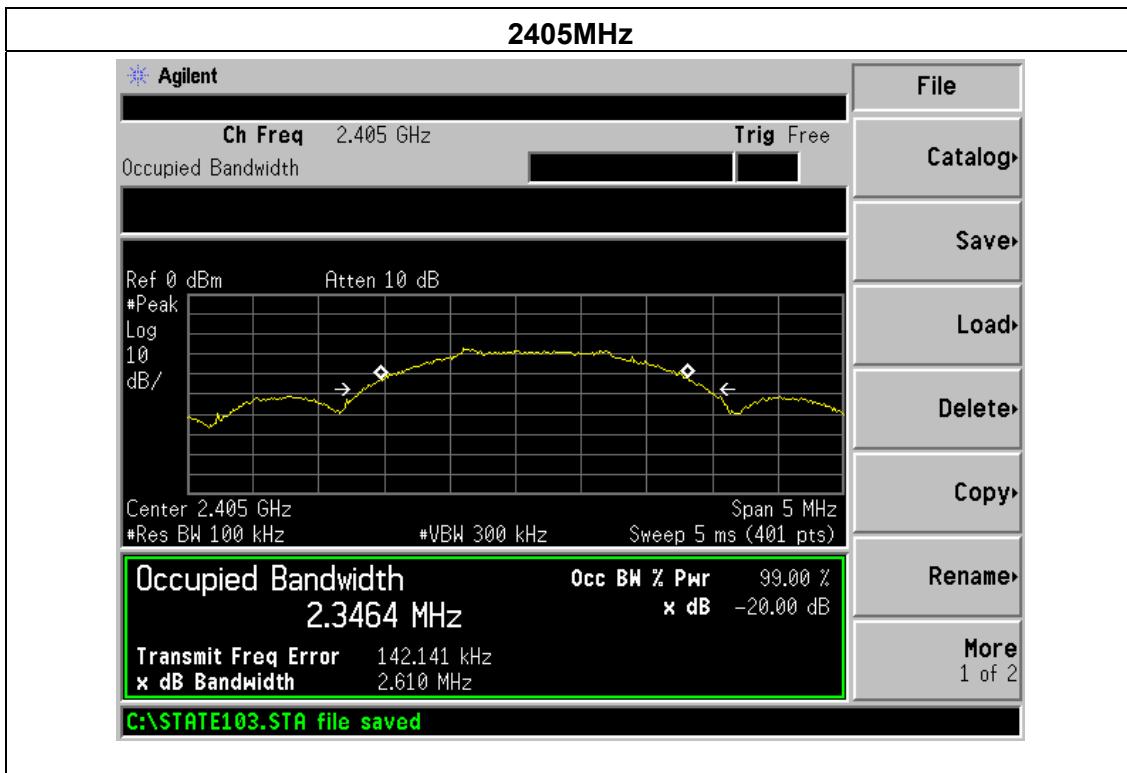


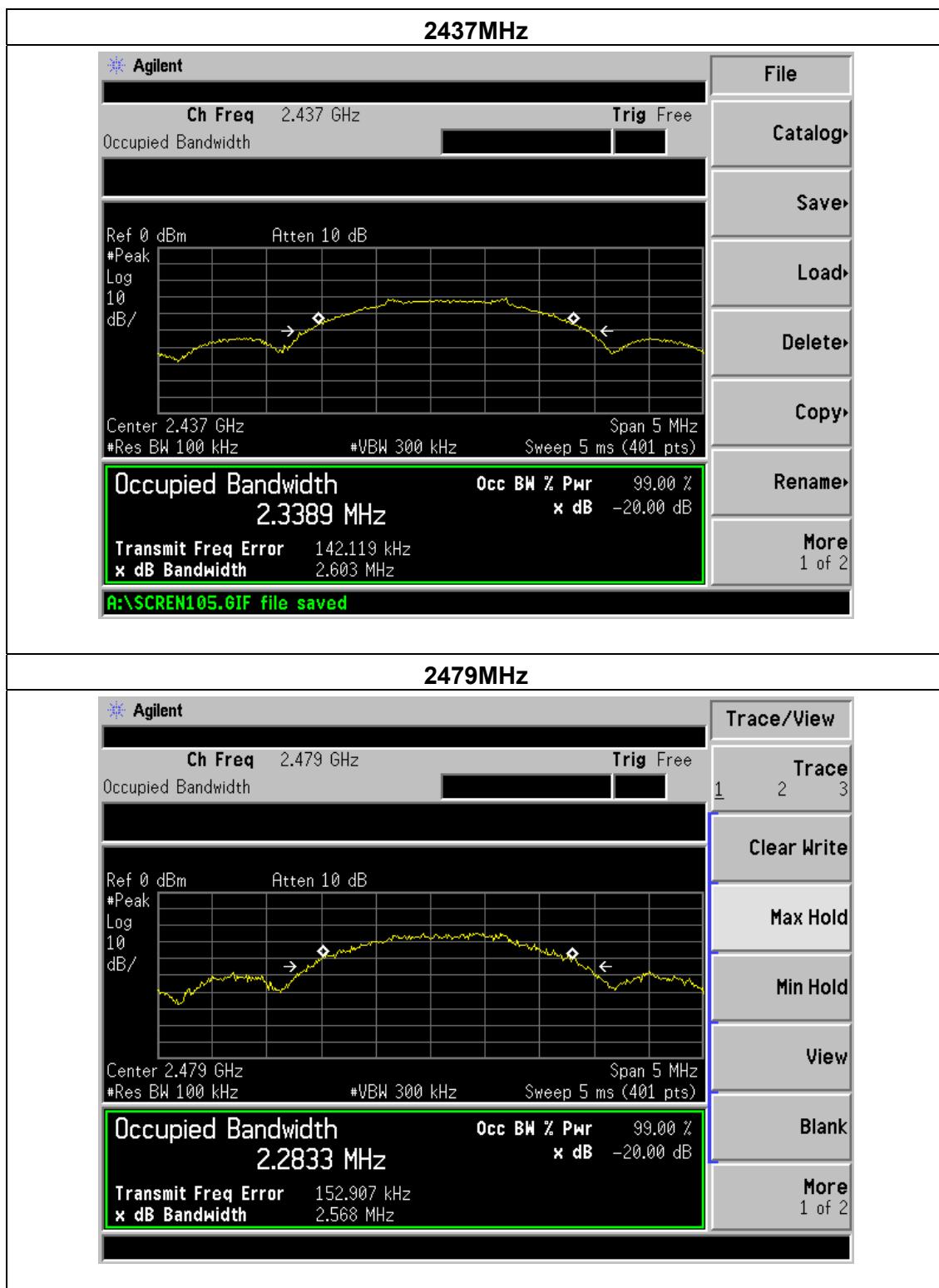
4.1.5 TEST RESULTS

Temperature :	25°C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.0V
Test Mode :	TX Mode		

	Frequency (MHz)	20dB bandwidth (kHz)	Result
GFSK	2405	2610	Pass
	2437	2603	Pass
	2479	2568	Pass

GFSK







5. ANTENNA REQUIREMENT

5.1 STANDARD REQUIREMENT

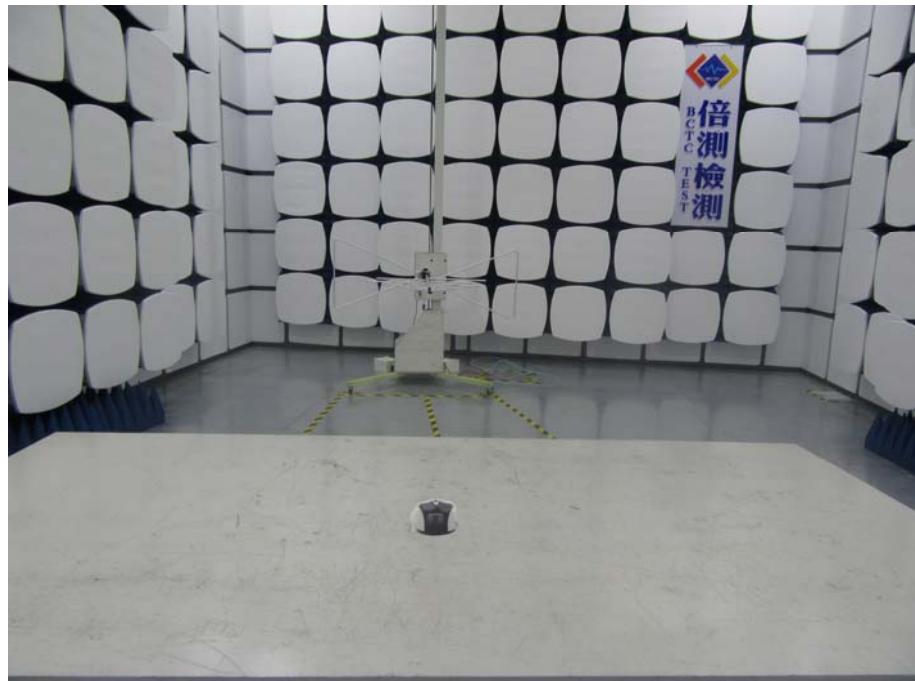
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

5.2 EUT ANTENNA

The EUT antenna is PCB antenna,. It comply with the standard requirement.

6. TEST SEUUP PHOTO

Radiated Measurement Photos



7. EUT PHOTO



***** END OF REPORT *****