FCC Test Report

for

Game-Bike

Model No. : 39800
FCC ID : YY8GAMEBIKE39800
Report Number : RF- A340-1010-040
Date of Receipt : October 15, 2010
Date of Report : December 3, 2010

Prepared for

Chen-Chang Health Technology Marketing Co., Ltd.
No.32, Ln. 197, Shenlin S. Rd., Daya Township, Taichung County 428, Taiwan (R.O.C.)

Prepared by

Central Research Technology Co.
EMC Test Laboratory
No.11, Lane41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

NVLAP LAB CODE 200575-0

This report shall not be reproduced, except in full, without the written approval of Central Research Technology Co.. It may be duplicated completely in its entirely for legal use with the permission of the applicant. It should not be used to claim product endorsement by NVLAP, NIST or any U.S. government agency. The test result in the report applies only to the sample tested.

Verification of Compliance

Equipment under Test	**: Game-Bike**
Model No.	**: 39800**
FCC ID	**: YY8GAMEBIKE39800**
Applicant	**: Chen-Chang Health Technology Marketing Co., Ltd**
Address	**: No.32, Ln. 197, Shenlin S. Rd., Daya Township, Taichung County 428, Taiwan (R.O.C.)**
Applicable Standards	**: 47 CFR part 15, Subpart C**
Date of Testing	**: October 23 ~ October 25, 2010**
Deviation	**: N/A**
Condition of Test Sample	**: Engineering Sample**

We, **Central Research Technology Co**., hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen , **DATE :** Dec. 3, 2010
(Cathy Chen/ Technical Manager)

APPROVED BY : J. Y. Shih , **DATE :** Dec. 3, 2010
(Tsun-Yu Shih/General Manager)

Contents

1 General Description

1.1 General Description of EUT

Equipment under Test	:	Game-Bike
Model No.	:	39800
Power in	:	6Vdc
Test Voltage	:	120Vac/ 60Hz to the adaptor
Adapter Specification	:	Model No. : TAD48-0601000DU
		Input : 120Vac/60Hz
		Output : 6Vdc 1000mA
Channel Numbers	:	77
Frequency Range	:	2404~2480MHz
Channel space	:	1MHz
Modulation	:	GFSK
Antenna Spec	:	Print Antenna 0 dBi
Function Description	:	

The EUT is used to transmit command only. Please refer to the user's manual for the details.

Perform the function of EUT continuously by executing the test program supplied by manufacturer.

1.2 Test Methodology

For this EUT, both conducted and radiated emissions were performed according to the procrdures illustrated in ANSI C63.4:2003 and other required measurements were illustrated in separate sections of this test report for detail.

1.3 Applied standards

(1) Conduction Emission Requirement

For intentional device, according to §15.207(a) line conduction emission limit is as below table.

Frequency of Emission (MHz)	Conducted 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.

(2) Radiated Emission Requirement

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

Frequency (MHz)	Measurement Distance (m)	Field Strength (uV/m)	Field Strength (dBuV/m)
30 – 88	3	100	40.0
88 – 216	3	150	43.5
216 – 960	3	200	46.0
960 – 1610	3	500	54.0
above 1610	3	500	54.0

Note 1- The lower limit shall apply at the transition frequency.

(3) 100kHz Bandedge

According to 15.247(c), 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).

(4) 6dB Bandwidth

According to 15.247(a)(2), the minimum 6 dB bandwidth shall be at least 500 kHz.

(5) Maximun Peak Output Power

According to 15.247(b)(3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

(6) Antenna Required

According to 15.247(b)(4) and (c)(1), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi 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 6 dBi.

(7) Power Spectrum Density

According to 15.247(e), 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.

(8) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (MHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
[2]1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(2)
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

1.4 The Support Units

No.	Equipment	Model No./ Serial No.	Brand	Power Line	Supported by lab.
1.	Notebook	LATITUDE D400/ 5FL891S	DELL	1.8m	V

1.5 Layout of the Setup

EUT
(Transmitter)

Connecting Cables

No.	Cable	Length	Shielded	Core	Supported by lab.	Note
a.	USB cable	0.6m	V		V	

Justification :

For both conducted and radiated emission below 1GHz, the system was configured for typical fashion as a customer could normal use it. The peripherals other than EUT was connected in normally standing by situation.

For line conducted emission, only measurement of TX/RX operated, for the digital circuits portion also function normally whenever TX or RX is operated. For radiated emission, measurement of radiated emission from digital circuit is performed with lowest channel, middle channel, and highest channel by transmitting mode.

1.6 Test Capability

Test Facility

The test facility used for evaluating the conformance of the EUT with each standard in the present report meets what required in CISPR16-1-4, CISPR16-2-3 and ANSI C63.4:2003.

Test Room	Type of Test Room	Descriptions
TR1	10m semi-anechoic chamber (23m×14m×9m)	Complying with the NSA requirements in documents CISPR 22 and ANSI C63.4:2003. For the radiated emission measurement.
TR11	3m semi-anechoic chamber (9m × 6m × 6m)	
TR13	Test Site	For the RF conducted emission measurement.
TR5	Shielding Room (8m×5m×4m)	For the conducted emission measurement.

Test Laboratory Competence Information

Central Research Technology Co. has been accredited / filed / authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	R.O.C. (Taiwan)	TAF	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033, SL2-IS-E-0033, SL2-R1/R2-E-0033, SL2-A1-E-0033 SL2-L1-E-0033	ISO/IEC 17025
Site Filing Document	USA	FCC	474046, TW1053	Test facility list & NSA Data
	Canada	IC	4699A-1,-3	Test facility list & NSA Data
	Japan	VCCI	R-1527,C-1609,T-131,T-1441 ,G-10	Test facility list & NSA Data
Authorization Certificate	Germany	TUV	10021687-2010	ISO/IEC 17025
	Norway	Nemko	ELA212	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.7 Measurement Uncertainty

The assessed measurement uncertainty with a suitable coverage factor K to ensure 95% confidence level for the normal distribution are shown as below, the values are less than U_{cispr} in table 1 of CISPR 16-4-2.

Test Item	Measurement Uncertainty	
Peak Output Power	1.1dB	
Radiated Emission: (30MHz~200MHz)	Horizontal 2.8dB；Vertical 3.5 dB	
Radiated Emission: (200MHz~1GHz)	Horizontal 3.4dB；Vertical 2.8dB	
Radiated Emission: (1GHz~18GHz)	Horizontal 2.5dB；Vertical 2.4dB	
Radiated Emission: (18GHz~26.5GHz)	Horizontal 4.0dB；Vertical 3.9dB	
Line Conducted Emission	ESH2-Z5	3.1dB
	ENV 4200	2.8dB

2 Maximum Peak Output Power

Result: Pass

2.1 Applied standard

According to 15.247(b)(3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt

Filed strength tranfers to peak output power is as below：

$$P = \frac{(ExD)^2}{30 \times G}$$

Note:
P : output power (W)
E : Field strength (V/m)
D : measurement distance = 3m
G : EUT antenna gain = 0dBi

Transfer:
P(dBm) = E(dBuV/m) – 90 + 20log3 – 10log30 – 0
= E(dBuV/m) – 90 + 9.54 – 14.77 – 0
= E(dBuV/m) – 95.23

2.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4407B/ MY45106795	2010/5/3	2011/5/3
Antenna	EMCO	3117/57416	2010/3/4	2011/3/4
RF Cable	N/A	N/A/C0081	2010/10/21	2011/4/21
Semi - anechoic Chamber	ETS.LINDGREN	TR11/ 906-A	2010/4/19	2011/4/19

Note:
1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
1MHz	3MHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：24℃ Relative Humidity : 54%

2.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

c. If the EUT is tabletop equipment, it was placed on a non-conducted table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT was set 3m away from the receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine higher emission level and record it.

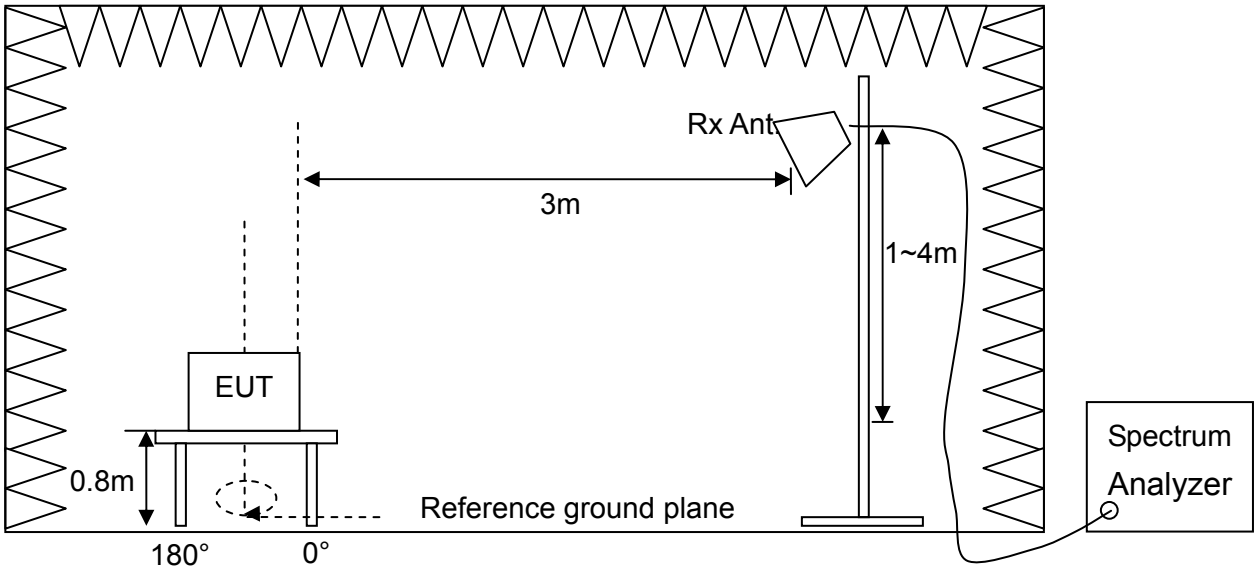
g. Then measure peak output power found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. Set the spectrum detector to be Peak or Average to find out the maximum level occurred.

i. Record test result and compare the maximum level with the required limit.

j. Change the receiving antenna to another polarization to measure radiated emission by following step e. to i. again.

2.4 Test configuration



2.5 Test Data

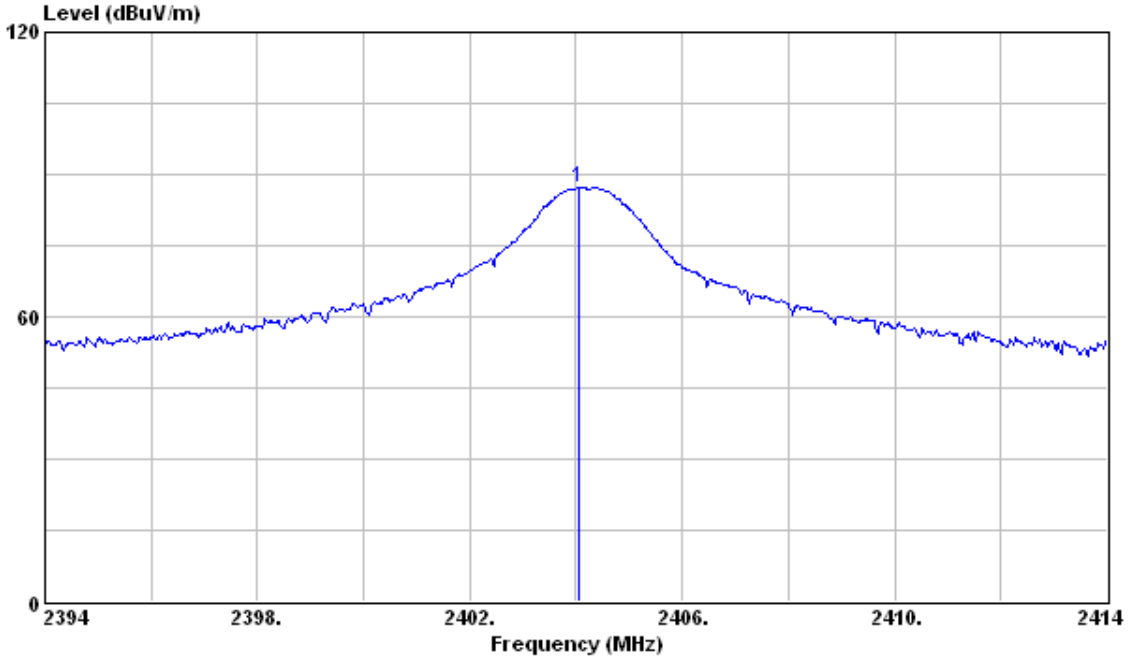
Test Mode : Continuous Transmitting **Tester : Jacky**

Operating Frequency (MHz)	Polarization	Reading Data (dBuV)	Correction Factor (dB/m)	Emission (dBuV/m)	Peak output power (dBm)	Limit (dBm)	Margin (dB)
2404	Vertical	89.51	-2.33	87.18	-8.05	30	38.05
2404	Horizontal	89.03	-2.33	86.7	-8.53	30	38.53
2442	Vertical	88.01	-2.34	85.67	-9.56	30	39.56
2442	Horizontal	90.21	-2.34	87.87	-7.36	30	37.36
2480	Vertical	84.29	-2.34	81.95	-13.28	30	43.28
2480	Horizontal	85.42	-2.34	83.08	-12.15	30	42.15

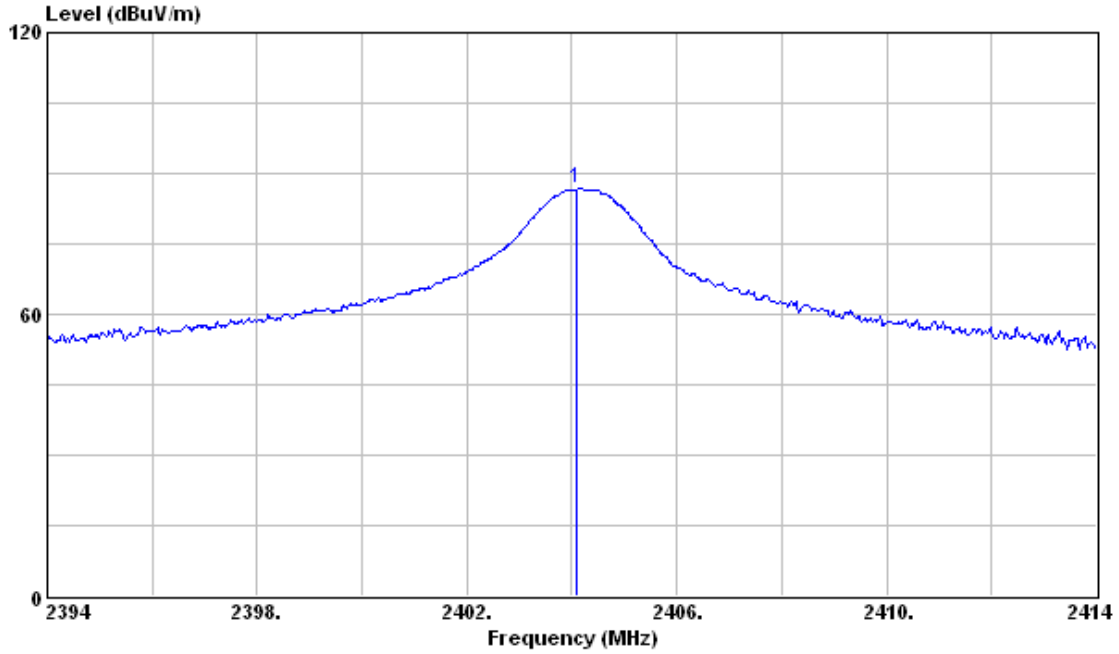
Note:

1. Correction Factor (dB) = Antenna factor + Cable Loss
2. Emission (dBuV/m) = Reading Data + Correction Factor
3. Peak output power (dBm) = Emission – 95.23(see section 2.1)
4. Margin (dB) = Limit – Peak output power

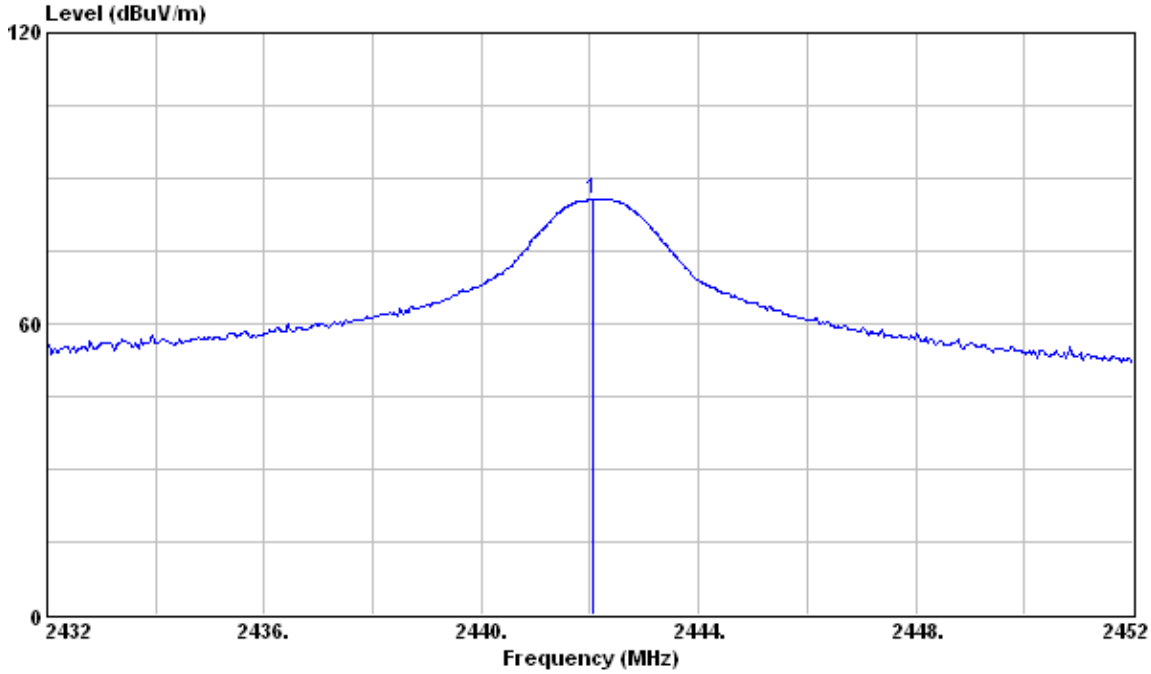
2404MHz- Vertical



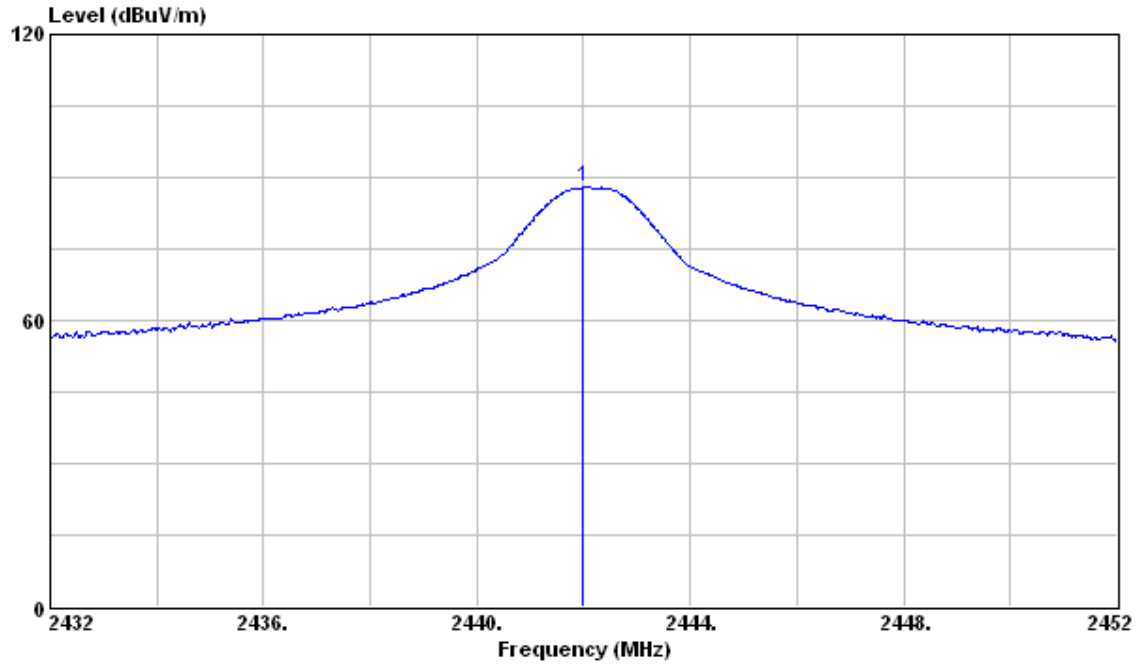
2404MHz- Horizontal



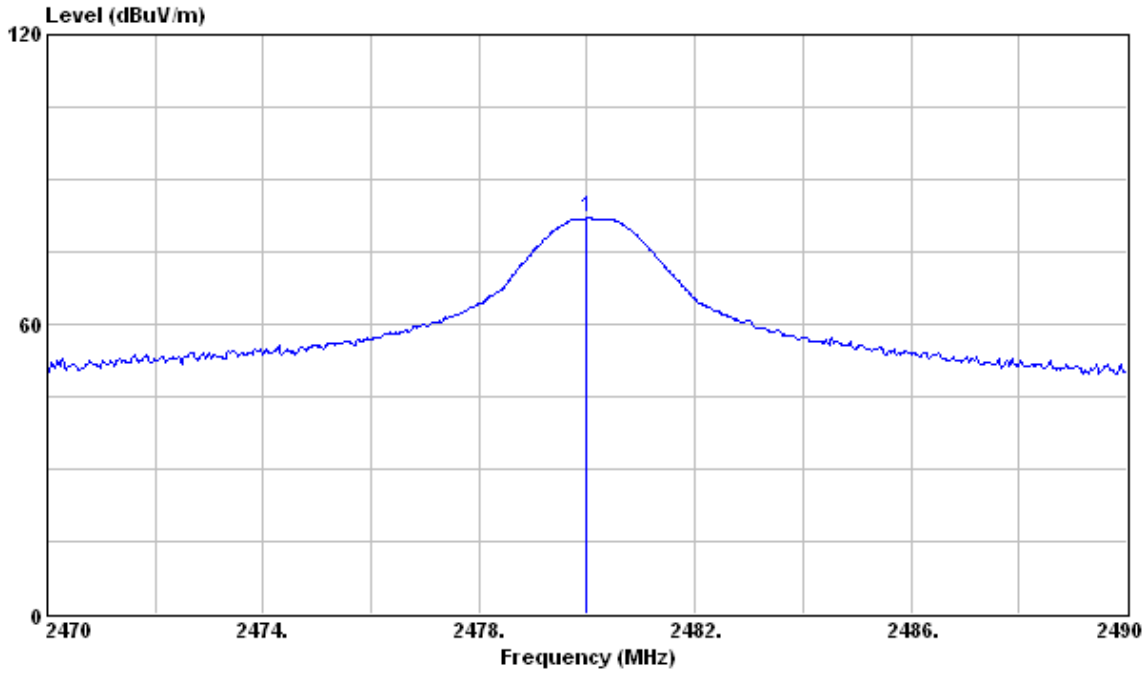
2442MHz- Vertical



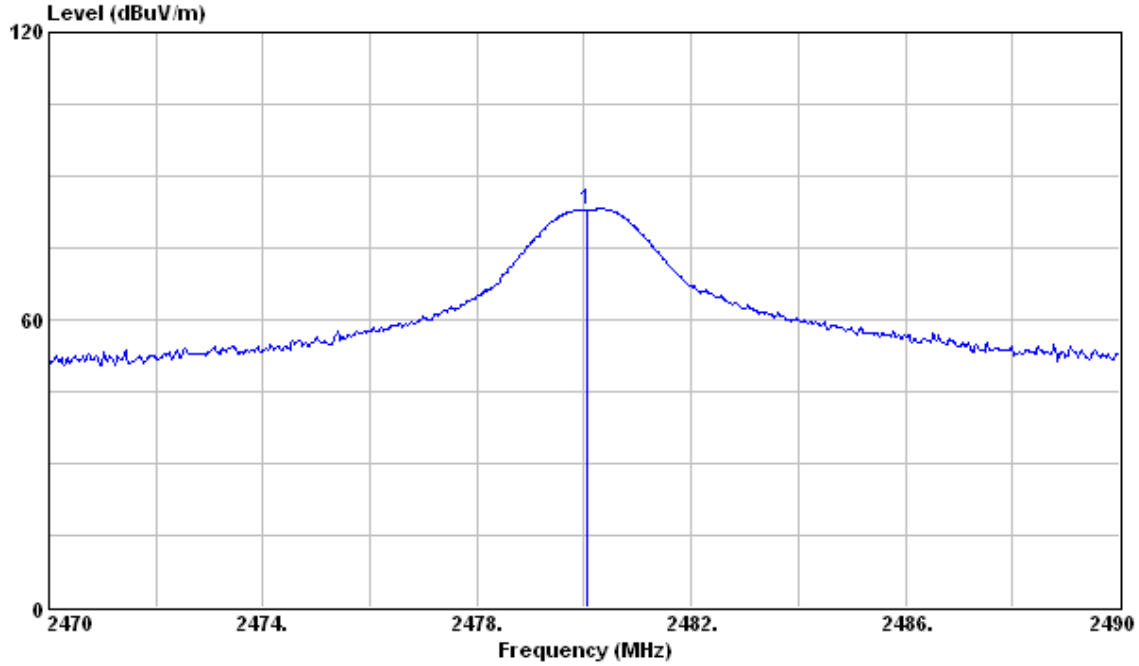
2442MHz- Horizontal



2480MHz- Vertical



2480MHz- Horizontal



3 6dB Bandwidth Measurement

Test Result: PASS

3.1 Applied standard

According to 15.247(a)(2),the minimum 6 dB bandwidth shall be at least 500 kHz.

3.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4405B/ MY45106706	2010/3/25	2011/3/24
Test Site	N.A.	TR13	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100KHz	300KHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：24℃ Relative Humidity : 54%

3.3 Test Procedures

1. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
2. A software provided by client enabled the EUT to transmit data at low, middle and high channel frequencies individually.
3. Measure the 6 dB bandwidth and compare with the required limit.

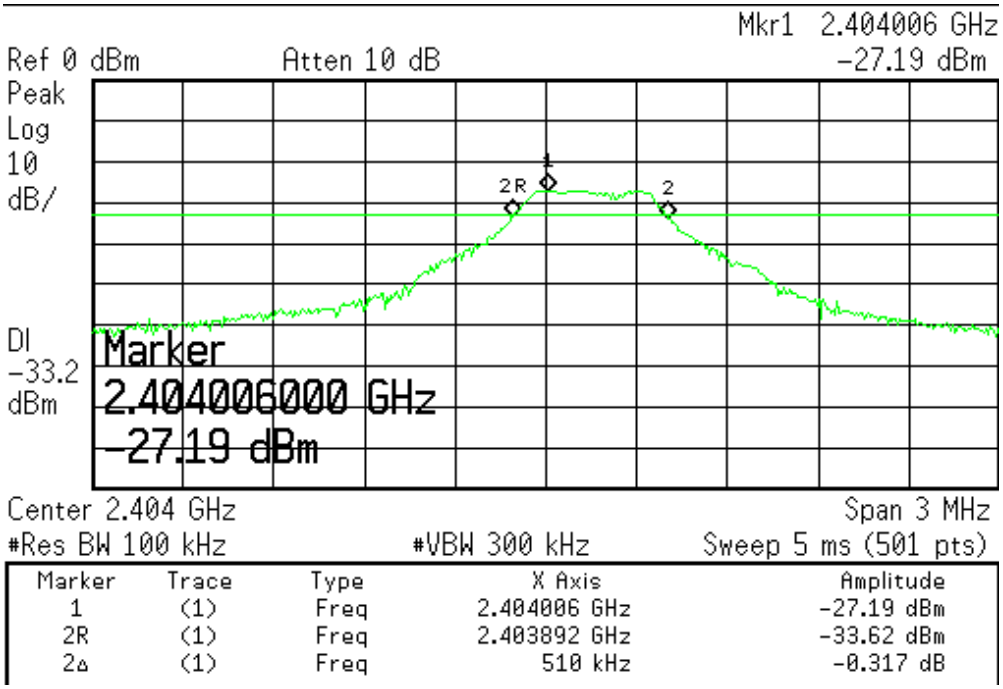
3.4 Test Configurations

3.5 Test Results

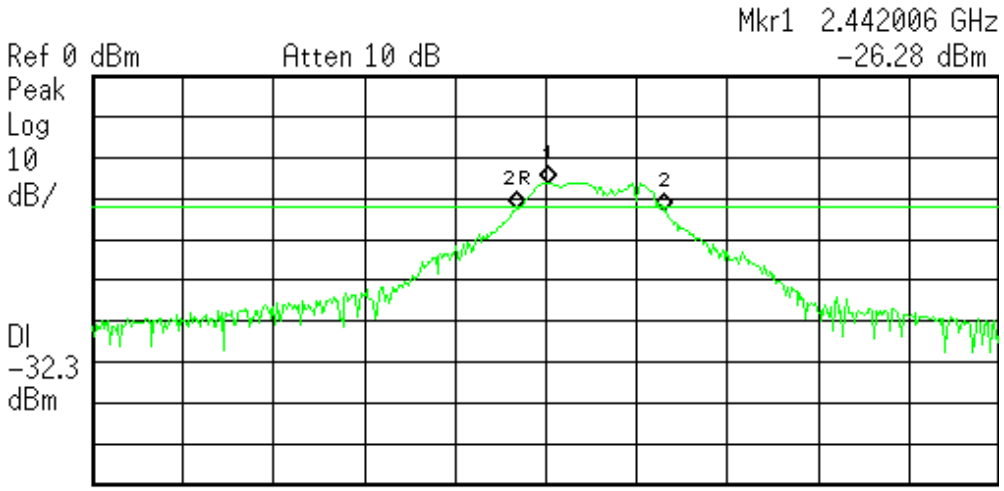
Test Mode : Transmitter Tester :

Operating Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
2404	0.510	0.5
2442	0.506	0.5
2480	0.508	0.5

2404MHz

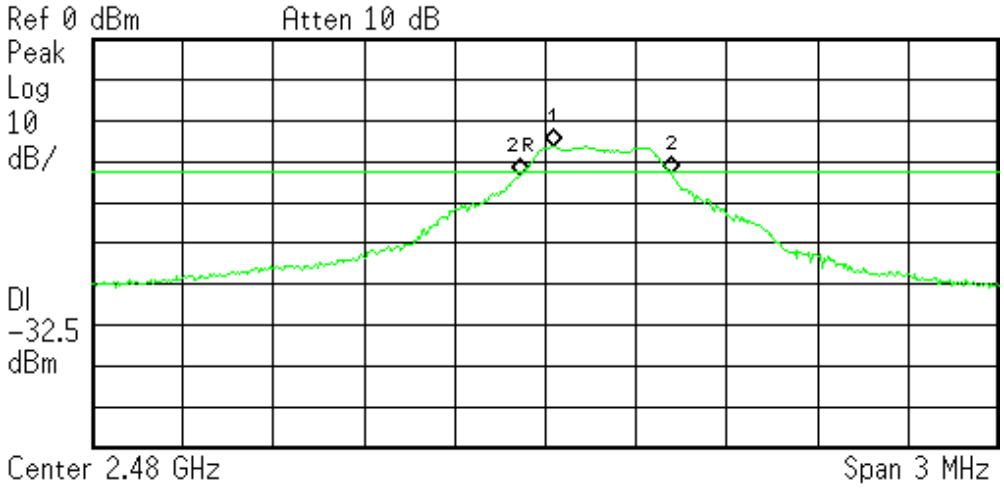


2442MHz



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.442006 GHz	-26.28 dBm
2R	(1)	Freq	2.441904 GHz	-32.39 dBm
2Δ	(1)	Freq	506 kHz	-0.506 dB

2480MHz



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.480009 GHz	-26.51 dBm
2R	(1)	Freq	2.479901 GHz	-33.29 dBm
2Δ	(1)	Freq	508 kHz	0.179 dB

4 Bandedge Measurement

Result: Pass

4.1 Applied standard

According to 15.247(c),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).

4.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Analyzer	Agilent	E4407B/ MY45106795	2010/5/3	2011/5/3
Antenna	EMCO	3117/57408	2010/3/4	2011/3/4
Pre-amplifier	MITEQ	JS4-00101800-28-5 A/742309	2009/12/21	2010/12/21
RF Cable	N/A	N/A/C0081	2010/10/21	2011/4/21
Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	2010/4/19	2011/4/19

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the semi-anechoic chamber listed above is the date of NSA measurement.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100kHz	100kHz	Peak	Maxhold	100kHz Bandedge
1MHz	3MHz	Peak	Maxhold	Radiated Measurement, Peak
1MHz	10Hz	Peak	Maxhold	Radiated Measurement, Average

Climatic Condition

Ambient Temperature：24℃ Relative Humidity : 54%

4.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at lowest and highest channel frequencies individually.

c. If the EUT is tabletop equipment, it was placed on a non-conducted table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT was set 3m away from the receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

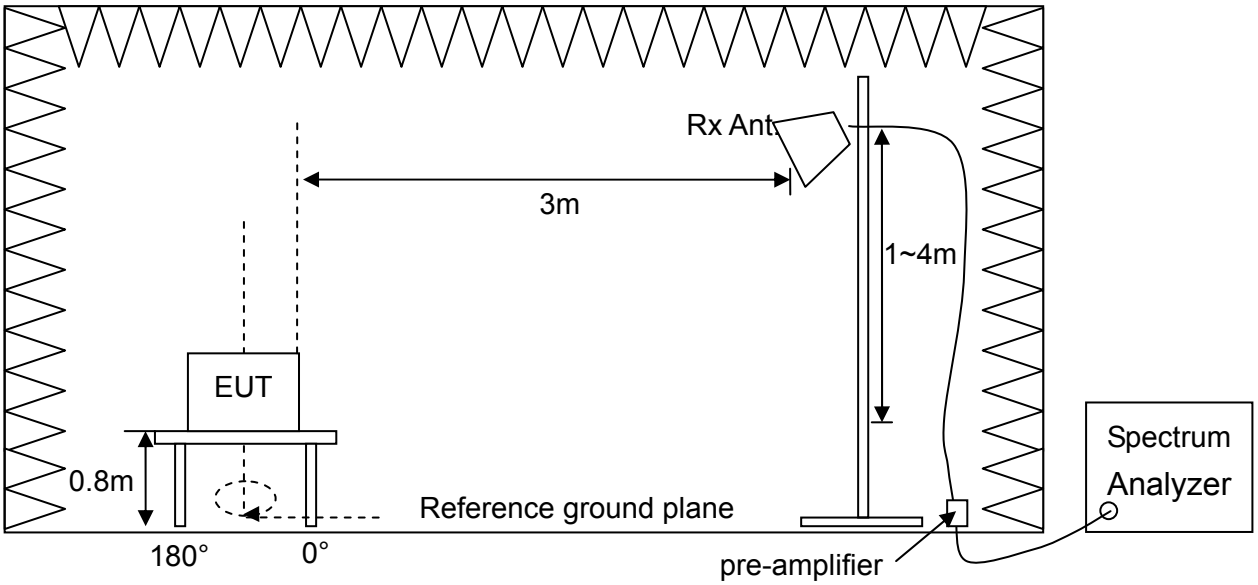
f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.

g. Then measure bandedge found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. Record test result and compare the maximum level with the required limit.

i. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.

4.4 Test configuration



4.5 Test Data

100kHz Bandedge Measurement

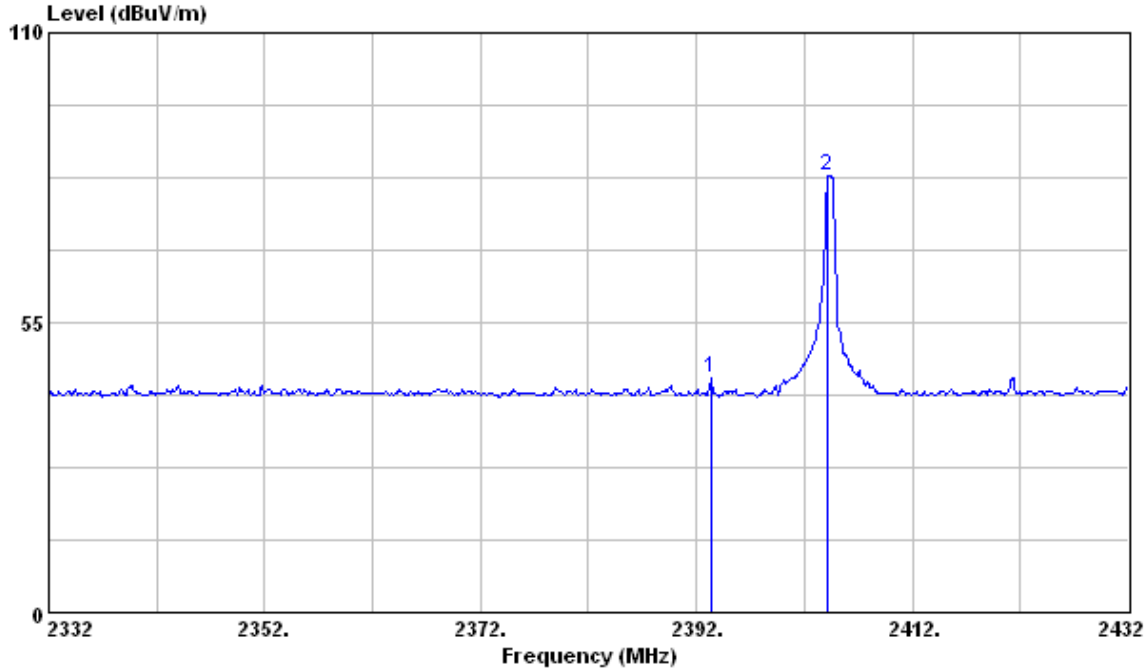
Test Mode : Continuous Transmitting **Tester :** Jacky

Operating Frequency (MHz)	Antenna Polarization	Frequency (MHz)	Main Frequency Emission Data (dBuV/m)	Bandedge Emission Data (dBuV/m)	Attenuation (dB)	Limit (dB)	Margin (dB)
2404	V	2393.3	82.76	44.35	38.41	20	18.41
2404	H	2393.3	85.14	45.75	39.39	20	19.39
2480	V	2483.5	86.30	45.58	40.72	20	20.72
2480	H	2507.3	85.20	45.60	39.60	20	19.60

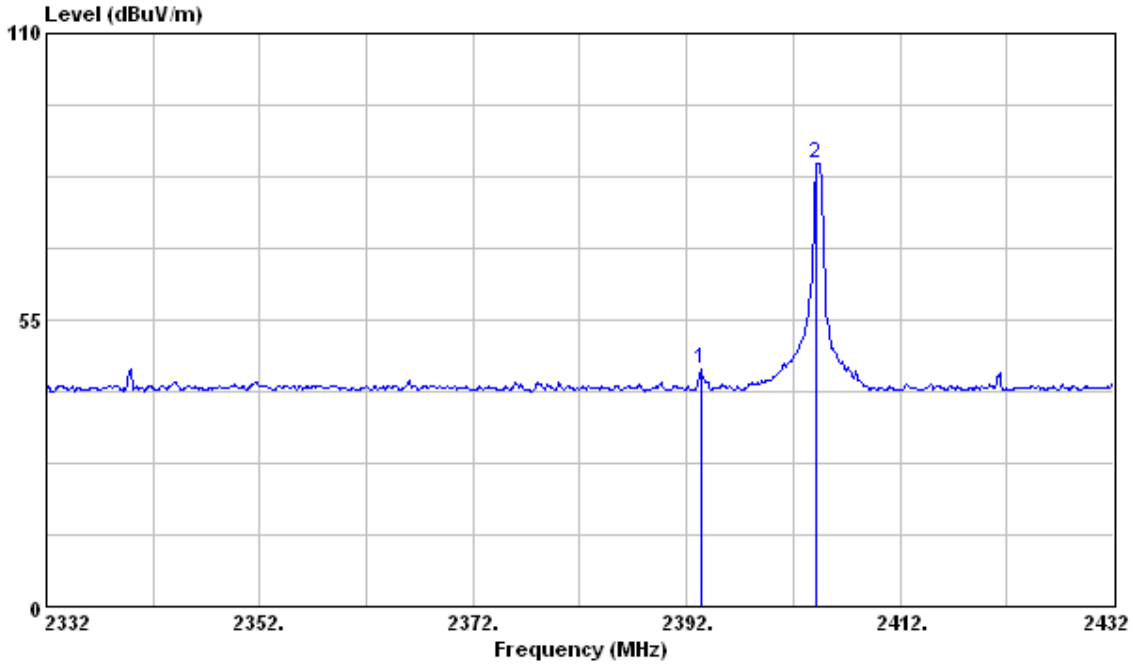
Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Attenuation (dB) = Main Frequency Emission Data - Bandedge Emission Data
3. Margin(dB) = Attenuation – Limit

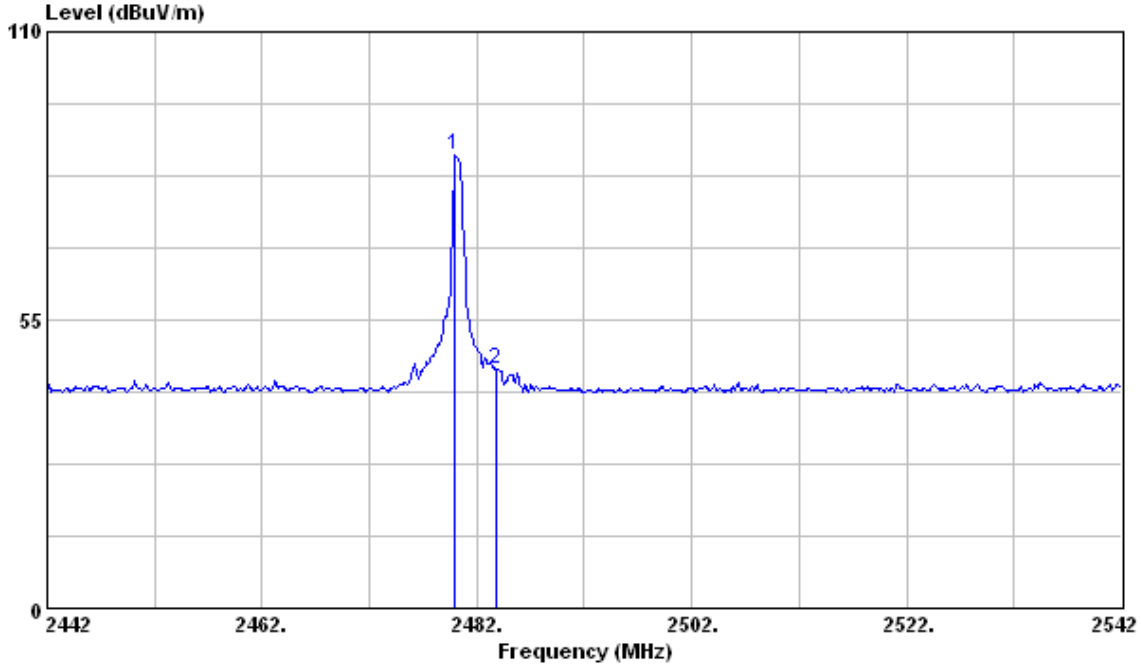
2404MHz – Vertical



2404MHz –Horizontal

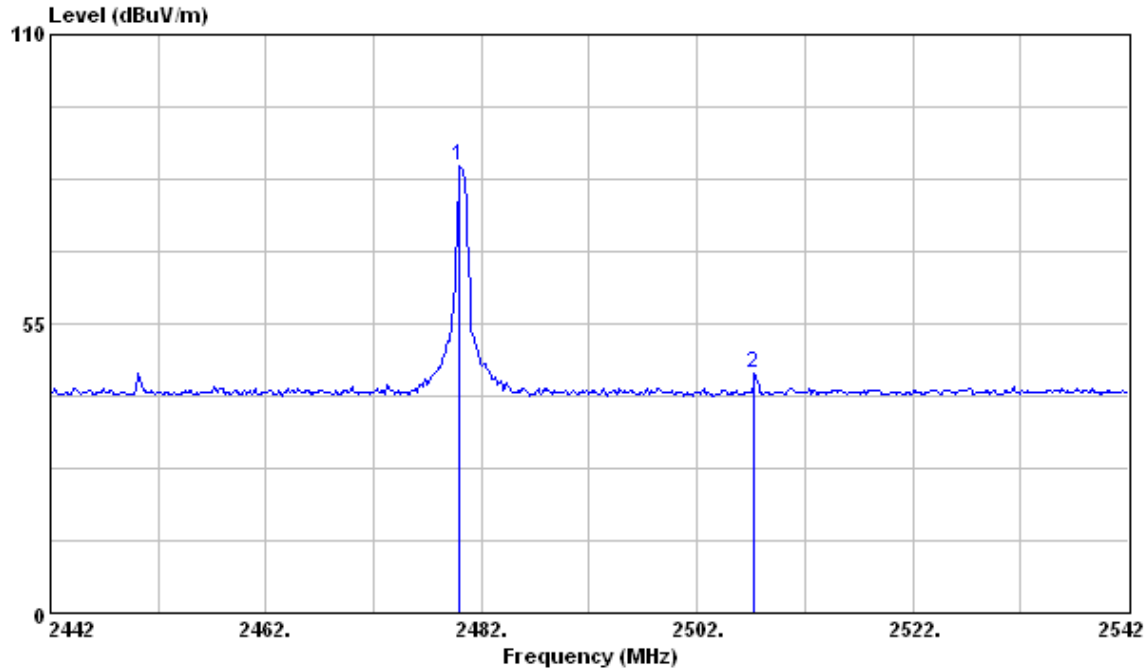


2480MHz – Vertical



b

2480MHz – Horizontal



Radiated Measurement

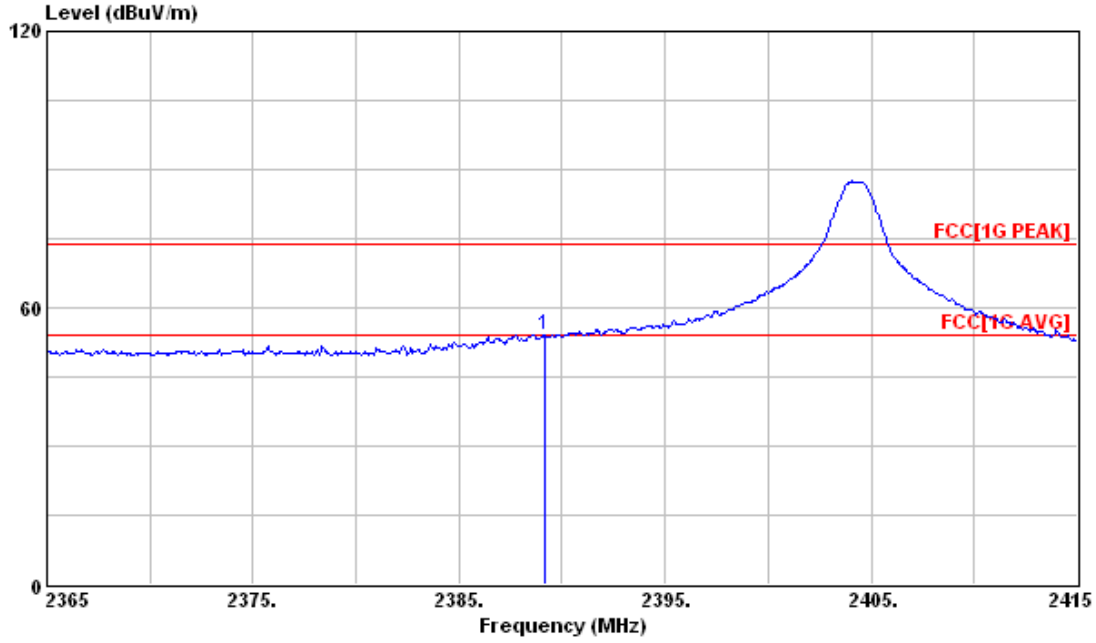
Test Mode : Continuous Transmitting **Tester : Jacky**

Operating Frequency (MHz)	Antenna Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
			PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
2404	V	2389.50	56.57	42.03	-2.37	54.20	39.66	74	54	19.8	14.34
2404	H	2389.80	57.60	42.03	-2.37	55.23	39.66	74	54	18.77	14.34
2480	V	2483.5	60.84	42.48	-2.34	58.50	40.14	74	54	15.50	13.86
2480	H	2483.5	63.35	43.01	-2.34	61.01	40.67	74	54	12.99	13.33

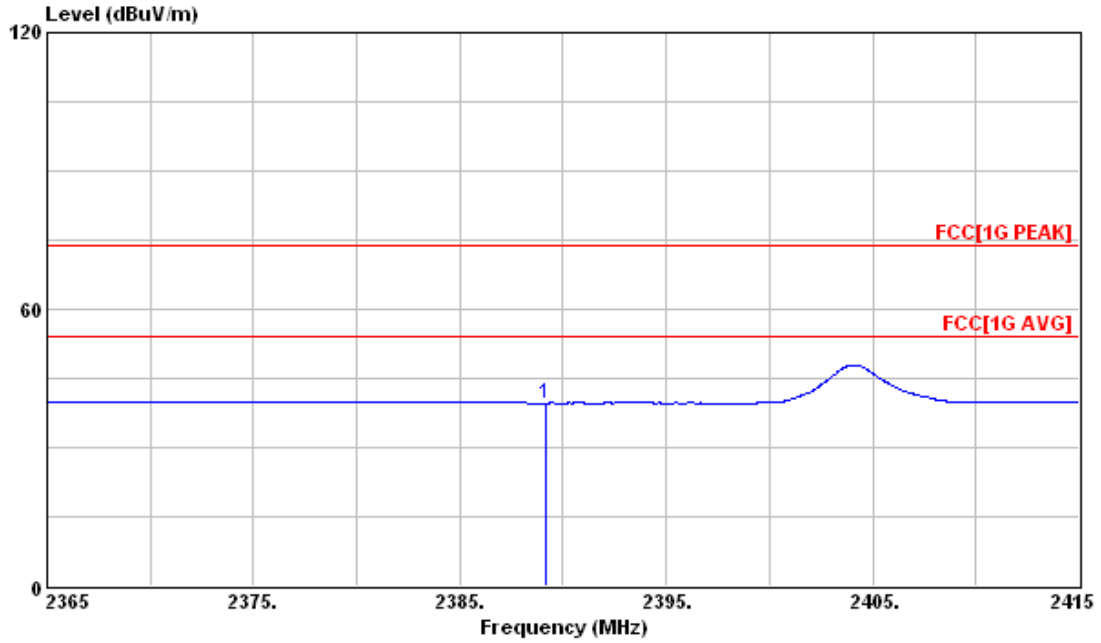
Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Pre-amplifier
2. Emission (dBuV/m) = Reading Data + Correction Factor
3. Margin(dB) = Limit – Emission

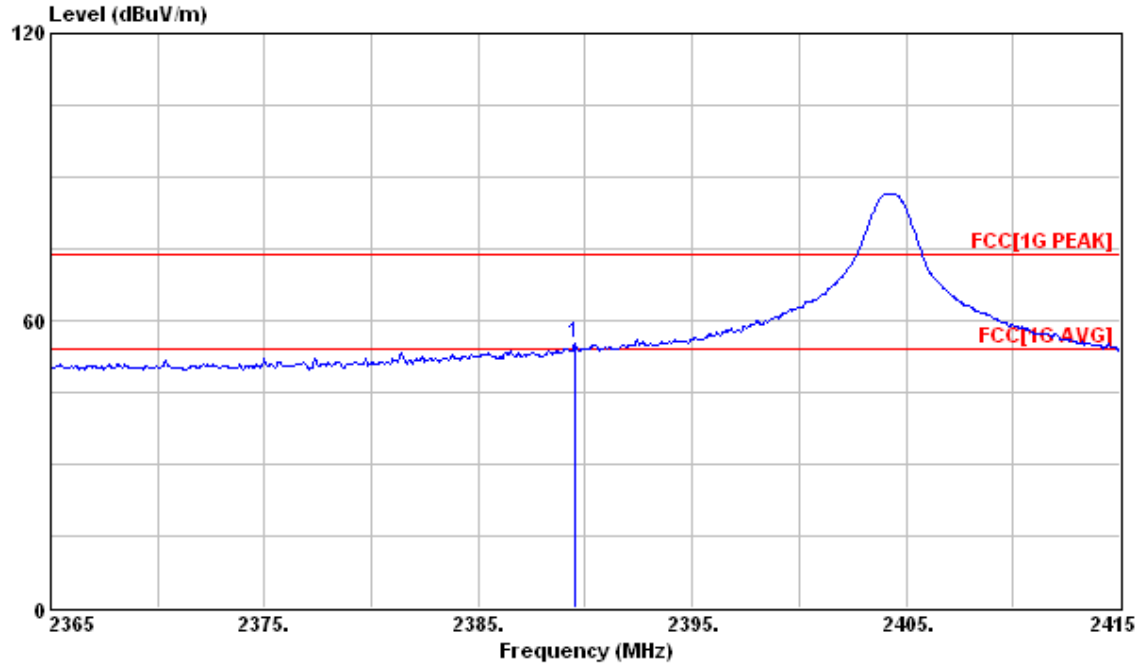
2404MHz, V Polarization – PK.



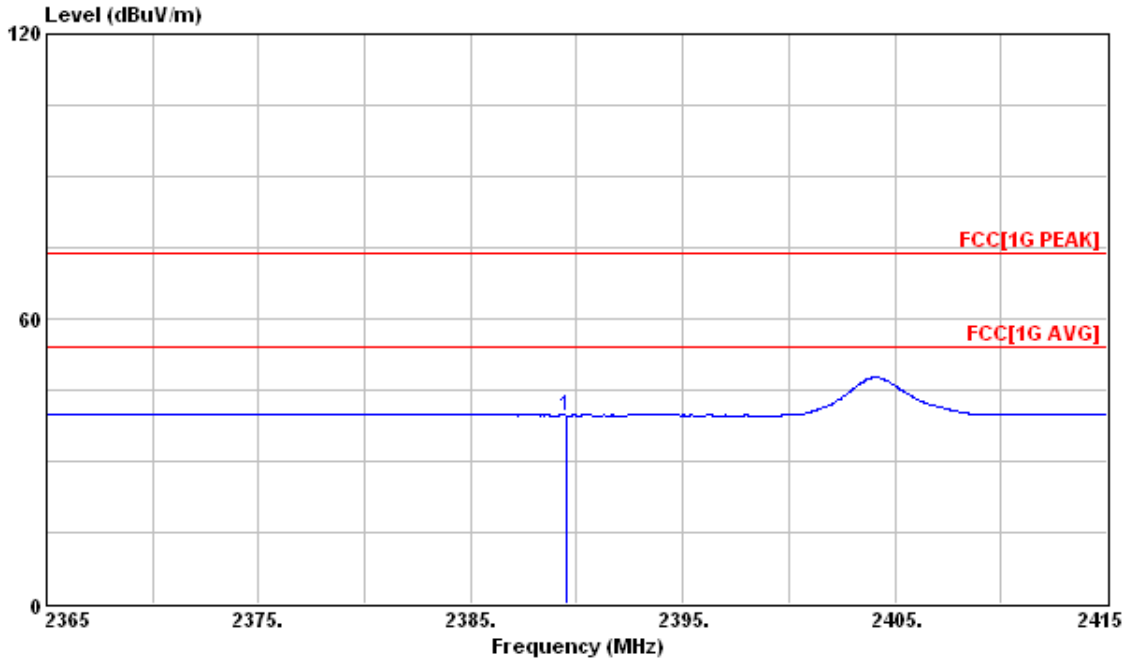
2404MHz, V Polarization – AV.



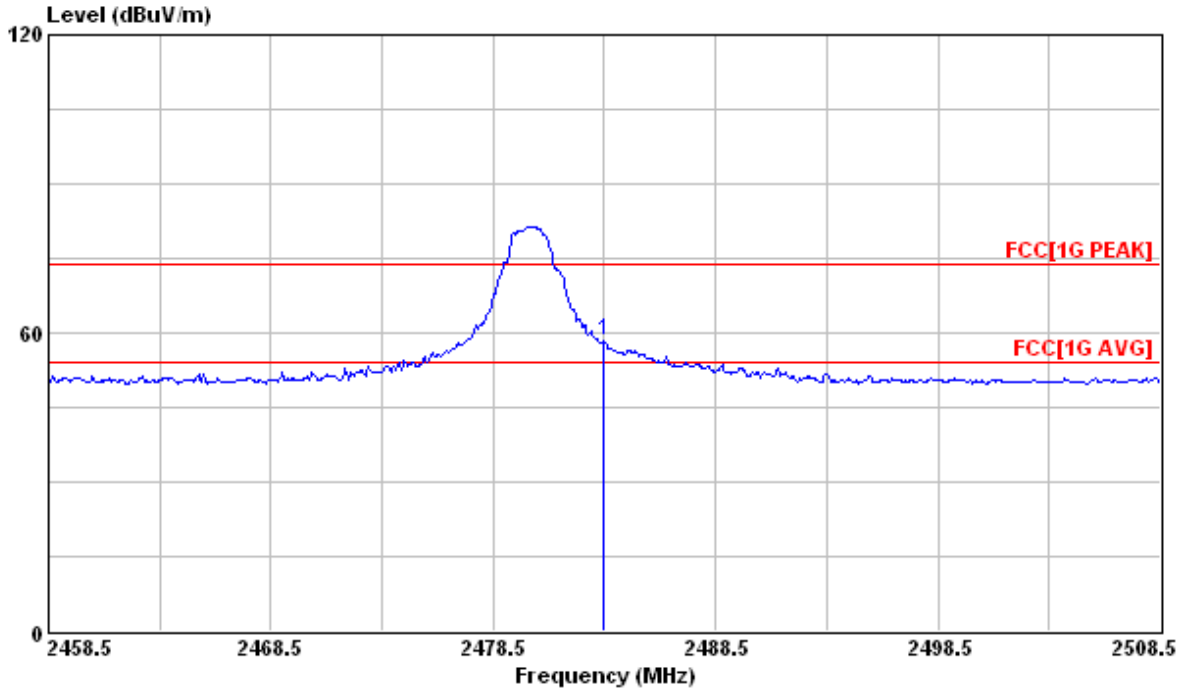
2404MHz, H Polarization – PK.



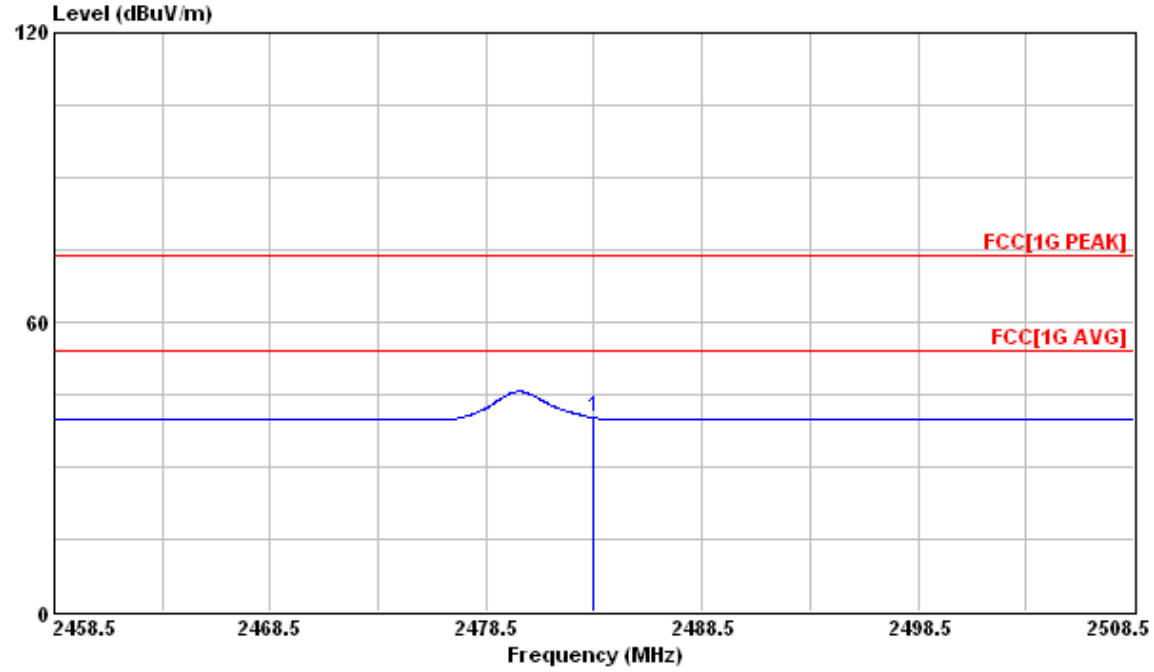
2404MHz, H Polarization – AV.



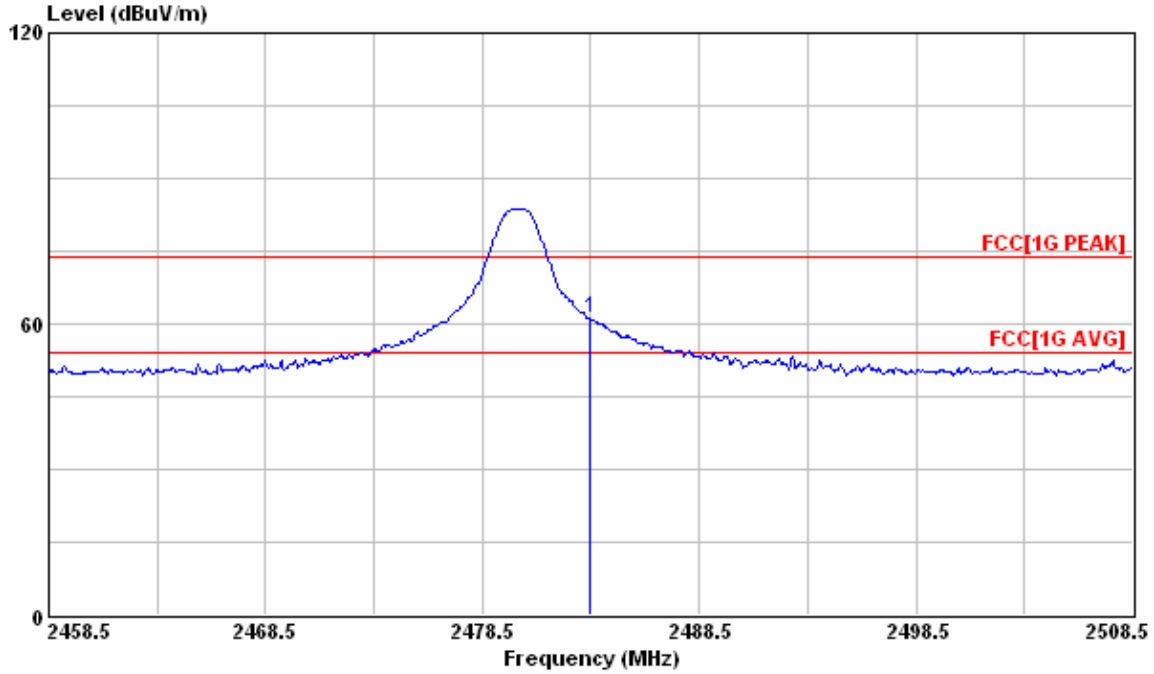
2480MHz, V Polarization – PK.



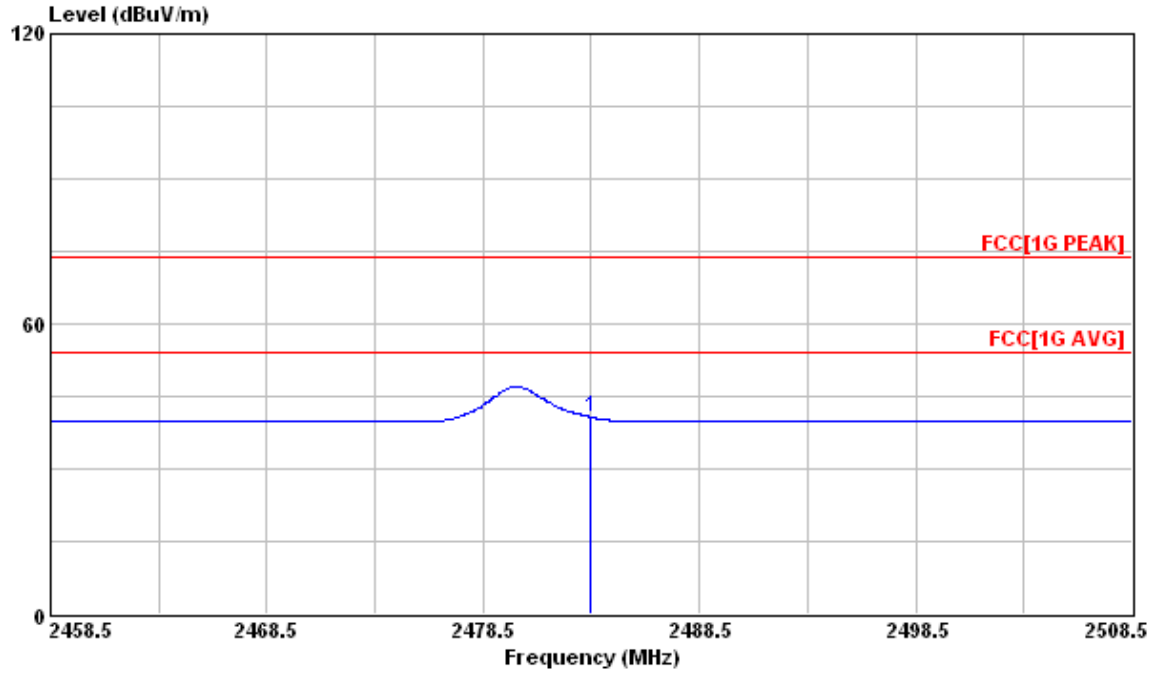
2480MHz, V Polarization – AV.



2480MHz, H Polarization – PK.



2480MHz, H Polarization – AV.



5 Radiated Emission Measurement

Result: Pass

5.1 Applied standard

According to 15.247(c),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).

5.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Test Receiver	R&S	ESCI/100019	2010/5/18	2011/5/18
Spectrum Analyzer	Agilent	E4407B/ MY45106795	2010/5/3	2011/5/3
Broadband Antenna	EMCO	3142C/52088	2010/5/17	2011/5/17
Antenna	EMCO	3117/57408	2010/3/4	2011/3/4
Antenna	EMCO	3116/58959	2010/1/31	2011/1/31
Pre-amplifier	MITEQ	JS4-00101800-28-5 A /742229	2009/12/14	2010/12/14
Pre-amplifier	MITEQ	AMF-4D-005180-24-10P/742309	2009/12/21	2010/12/21
Pre-amplifier	Mini Circuit	ZKL-2/004	2010/2/5	2011/2/5
RF Cable	N/A	N/A/C0080	2010/8/6	2011/2/6
RF Cable	N/A	N/A/C0081	2010/10/21	2011/4/21
Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	2010/4/19	2011/4/19

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the semi-anechoic chamber listed above is the date of NSA measurement.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
120kHz	N/A	Quasi-Peak	Maxhold	Below 1GHz
1MHz	3MHz	Peak	Maxhold	Above 1GHz, Peak
1MHz	10Hz	Peak	Maxhold	Above 1GHz, Average

Climatic Condition

Ambient Temperature：24℃ Relative Humidity : 54%

5.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

c. If the EUT is tabletop equipment, it was placed on a non-conducted table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT was set 3m away from the interference receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.

g. Then measure each frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred.

i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any.

j. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.

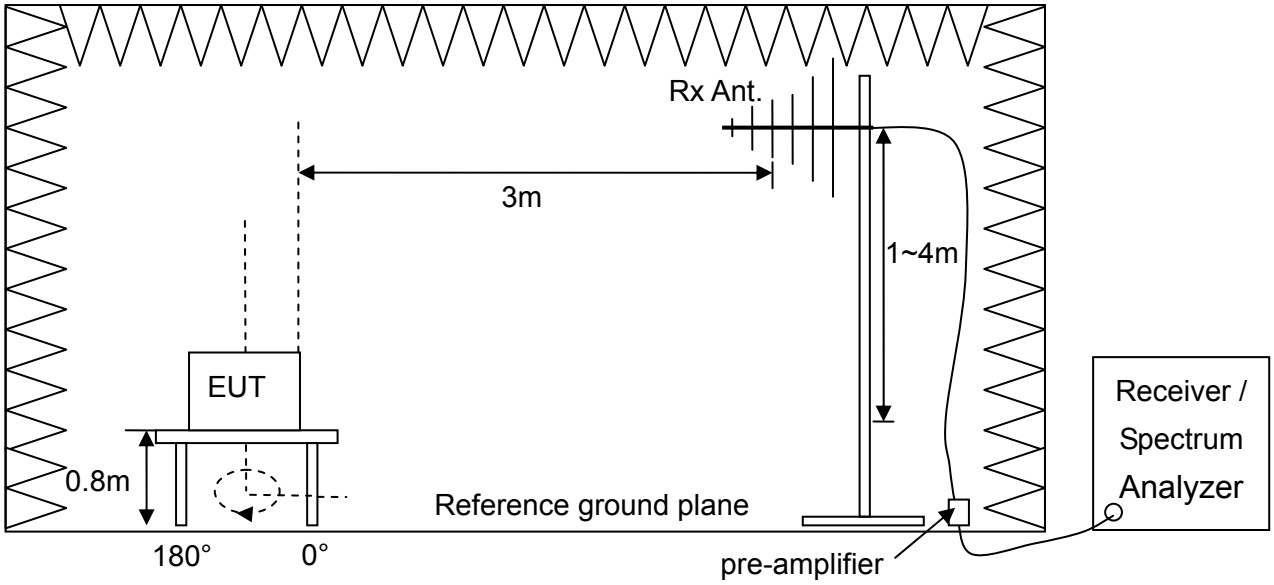
k. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.

l. If the peak emission level below 1000MHz measured from step f. is 4dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.

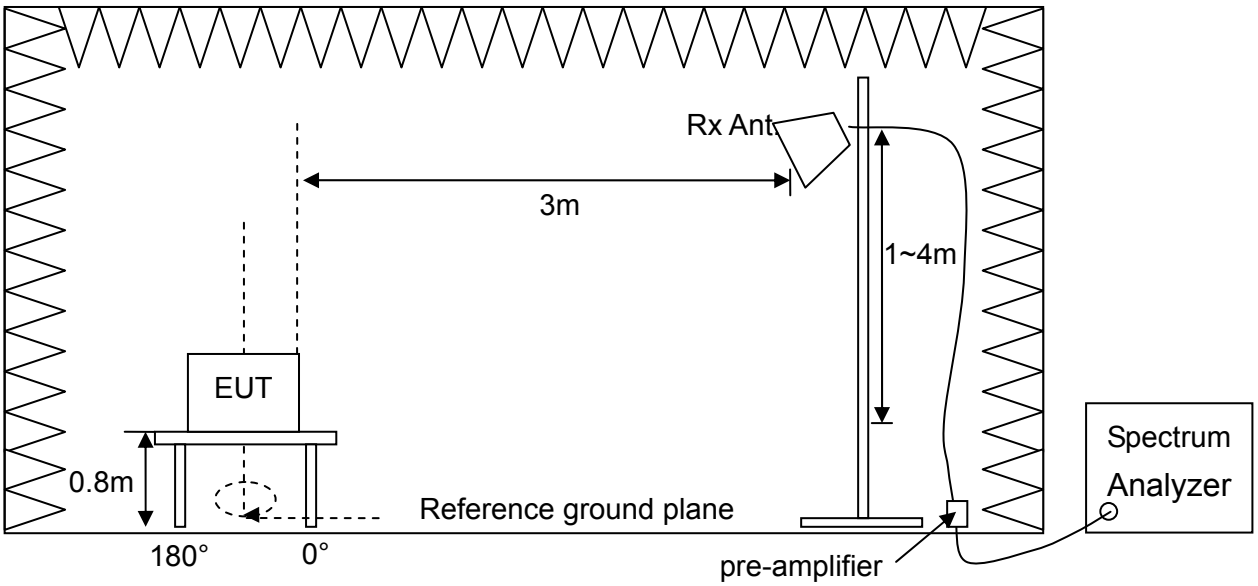
m. If the peak emission level above 1000MHz measured from step f. is 20dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate A.V. value will be measured and presented.

5.4 Test configuration

Radiated Emission Measurement below 1000MHz



Radiated Emission Measurement above 1000MHz



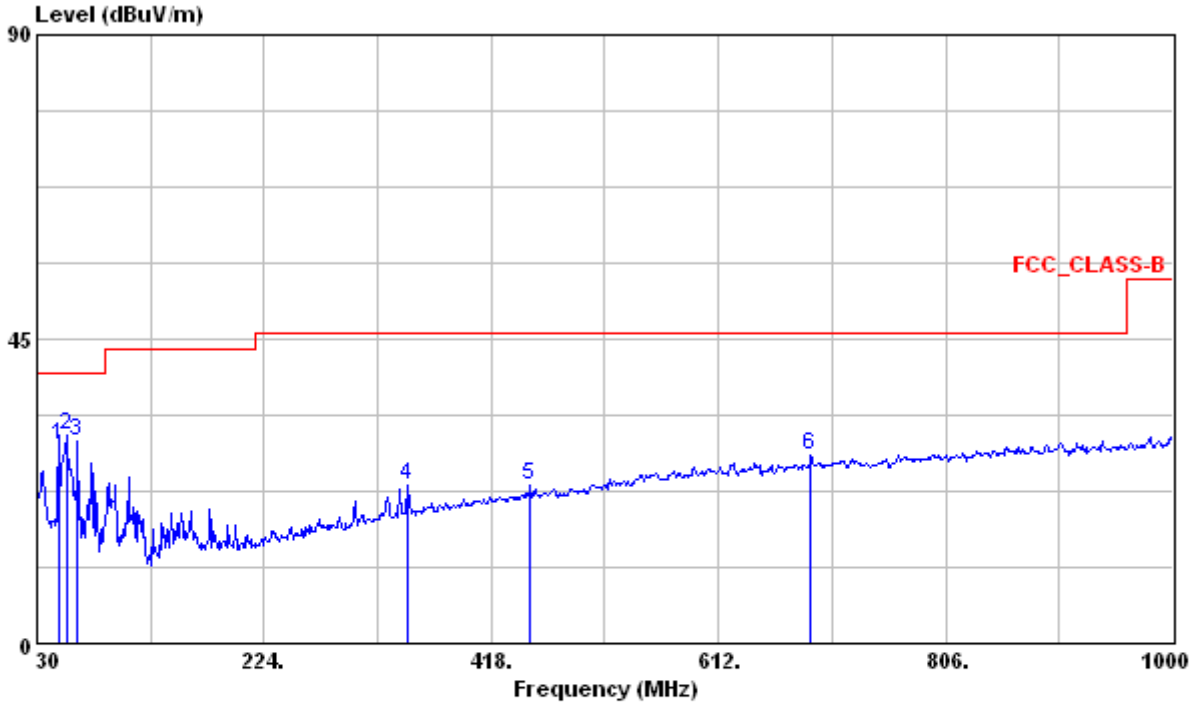
5.5 Test Data

Radiated Emission Measurement below 1000MHz

Test Mode : **2404MHz, Continuous Transmitting**

Test Distance : 3m **Tester** : Jacky

Polarization : Vertical **Frequency Range** : 30MHz~1000MHz

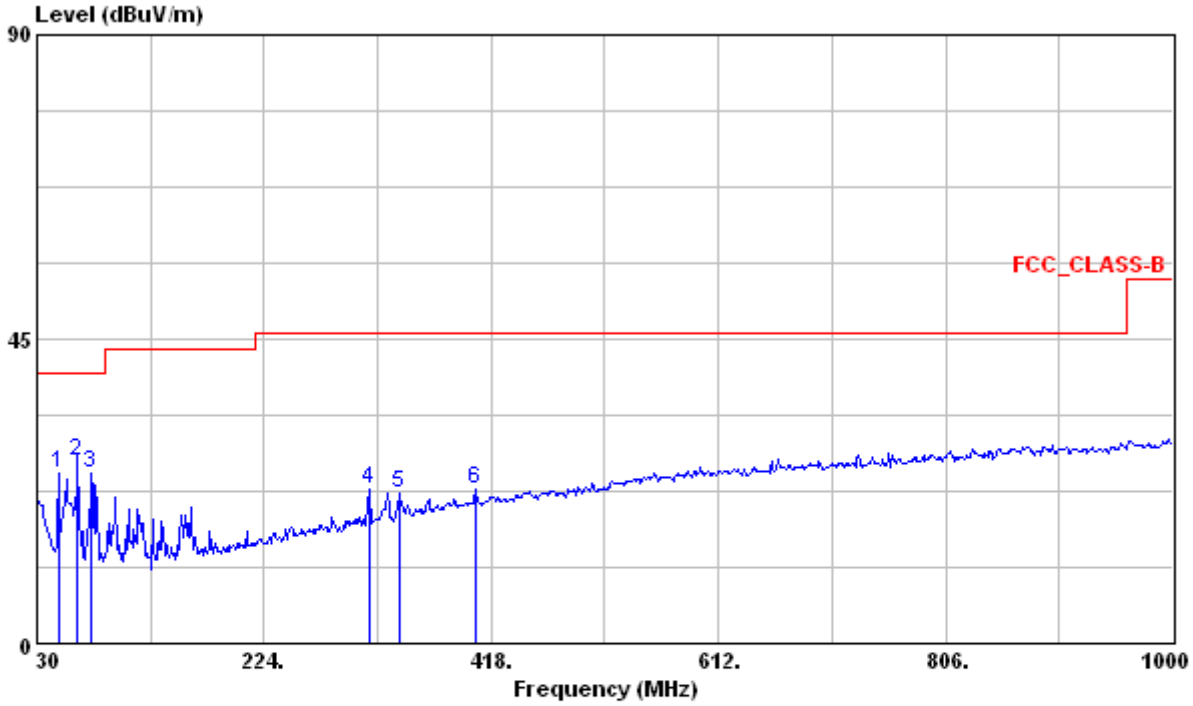


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	48.090	29.35	-17.18	46.53	40.00	-10.65	100	262	VERTICAL	QP
2 @	54.840	30.68	-18.51	49.19	40.00	-9.32	---	---	VERTICAL	Peak
3	64.290	29.87	-19.49	49.36	40.00	-10.13	---	---	VERTICAL	Peak
4	346.900	23.35	-10.60	33.95	46.00	-22.65	---	---	VERTICAL	Peak
5	450.500	23.25	-7.94	31.19	46.00	-22.75	---	---	VERTICAL	Peak
6	690.600	27.85	-3.21	31.06	46.00	-18.15	---	---	VERTICAL	Peak

Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: 2404MHz, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Jacky
Polarization	**:** Horizontal	**Frequency Range**	**:** 30MHz~1000MHz

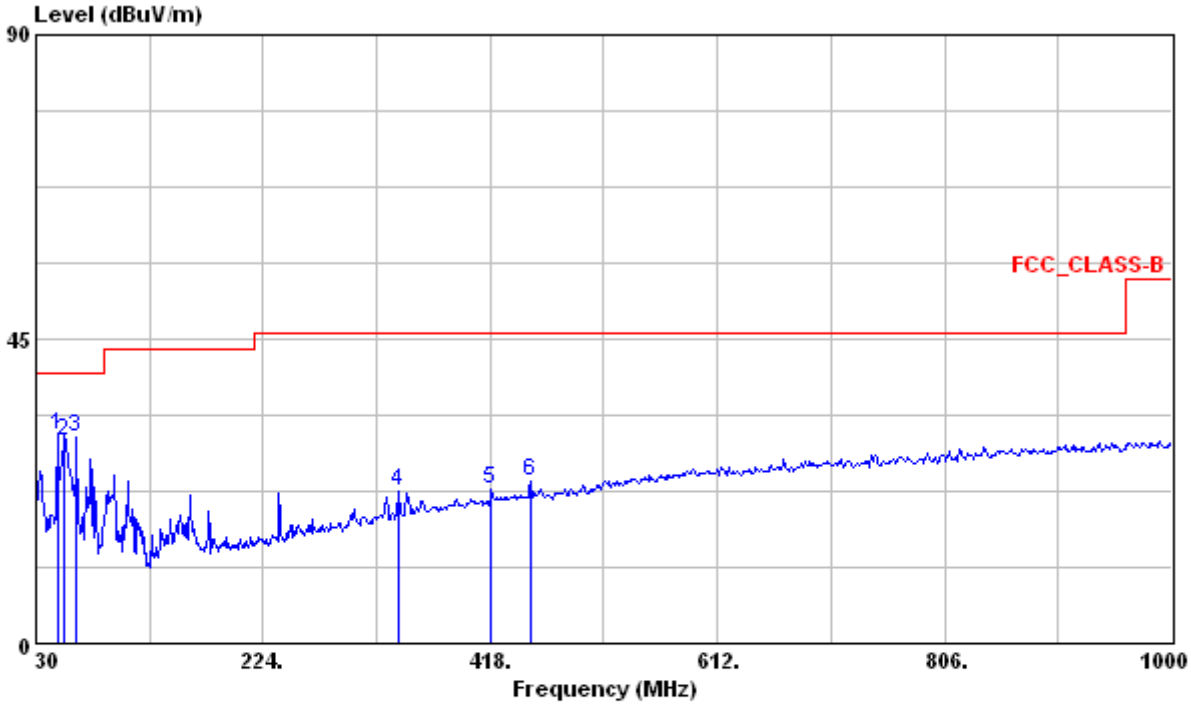


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	48.090	25.08	-17.18	42.26	40.00	-14.92	---	---	HORIZONTAL	Peak
2	64.290	27.07	-19.49	46.56	40.00	-12.93	150	165	HORIZONTAL	QP
3	76.440	25.17	-19.82	44.99	40.00	-14.83	---	---	HORIZONTAL	Peak
4	313.300	22.73	-11.82	34.55	46.00	-23.27	---	---	HORIZONTAL	Peak
5	339.900	22.18	-10.85	33.03	46.00	-23.82	---	---	HORIZONTAL	Peak
6	405.000	22.93	-8.98	31.91	46.00	-23.07	---	---	HORIZONTAL	Peak

Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: 2442MHz, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Jacky
Polarization	**:** Vertical	**Frequency Range**	**:** 30MHz~1000MHz

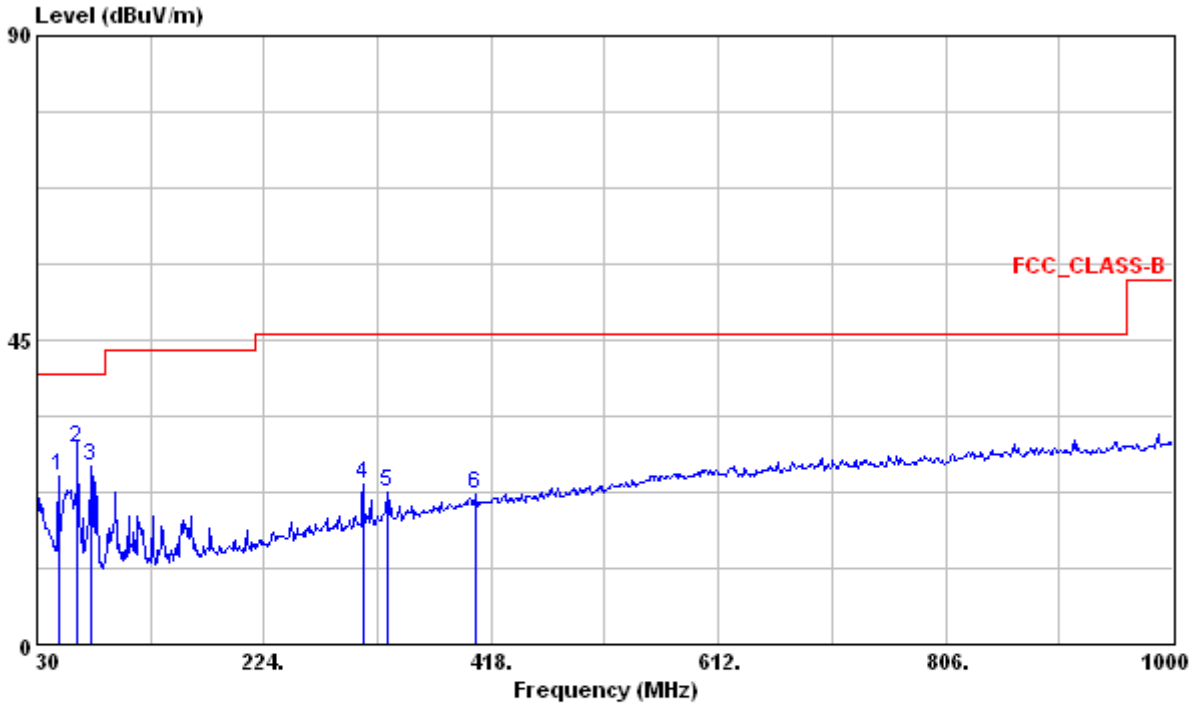


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 @	48.090	30.76	-17.18	47.94	40.00	-9.24	---	---	VERTICAL	Peak
2	53.490	29.95	-18.31	48.26	40.00	-10.05	110	130	VERTICAL	QP
3	64.290	30.50	-19.49	49.99	40.00	-9.50	---	---	VERTICAL	Peak
4	339.900	22.39	-10.85	33.24	46.00	-23.61	---	---	VERTICAL	Peak
5	419.000	22.70	-8.66	31.36	46.00	-23.30	---	---	VERTICAL	Peak
6	451.900	23.88	-7.92	31.80	46.00	-22.12	---	---	VERTICAL	Peak

Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Mode	**: 2442MHz, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Jacky
Polarization	**:** Horizontal	**Frequency Range**	**:** 30MHz~1000MHz

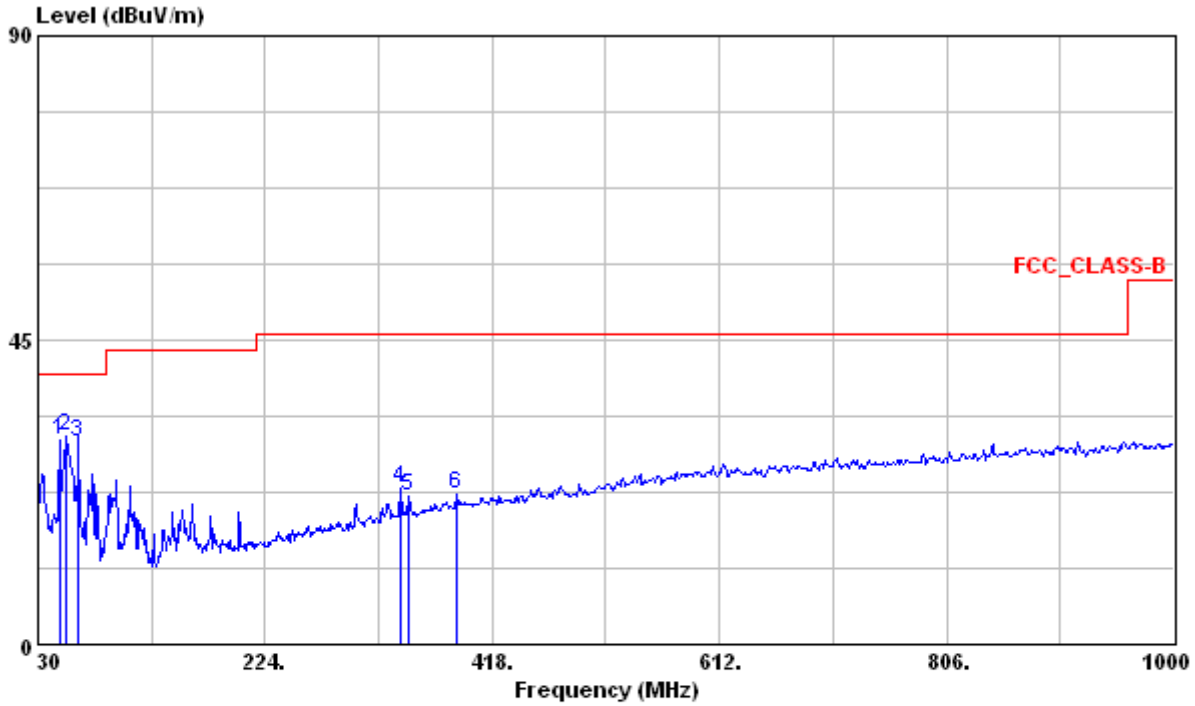


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	48.090	24.94	-17.18	42.12	40.00	-15.06	---	---	HORIZONTAL	Peak
2	64.290	29.04	-19.49	48.53	40.00	-10.96	132	55	HORIZONTAL	QP
3	76.440	26.28	-19.82	46.10	40.00	-13.72	---	---	HORIZONTAL	Peak
4	308.400	23.64	-12.01	35.65	46.00	-22.36	---	---	HORIZONTAL	Peak
5	329.400	22.36	-11.24	33.60	46.00	-23.64	---	---	HORIZONTAL	Peak
6	405.000	22.08	-8.98	31.06	46.00	-23.92	---	---	HORIZONTAL	Peak

Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Model	**: 2480MHz, Continuous Transmitting**		
Test Distance	**:** 3m	**Tester**	**:** Jacky
Polarization	**:** Vertical	**Frequency Range**	**:** 30MHz~1000MHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	48.090	30.27	-17.18	47.45	40.00	-9.73	---	---	VERTICAL	Peak
2 @	53.490	30.89	-18.31	49.20	40.00	-9.11	---	---	VERTICAL	Peak
3	64.290	29.87	-19.49	49.36	40.00	-10.13	110	135	VERTICAL	QP
4	339.900	23.22	-10.85	34.07	46.00	-22.78	---	---	VERTICAL	Peak
5	346.900	21.89	-10.60	32.49	46.00	-24.11	---	---	VERTICAL	Peak
6	387.500	22.19	-9.45	31.64	46.00	-23.81	---	---	VERTICAL	Peak

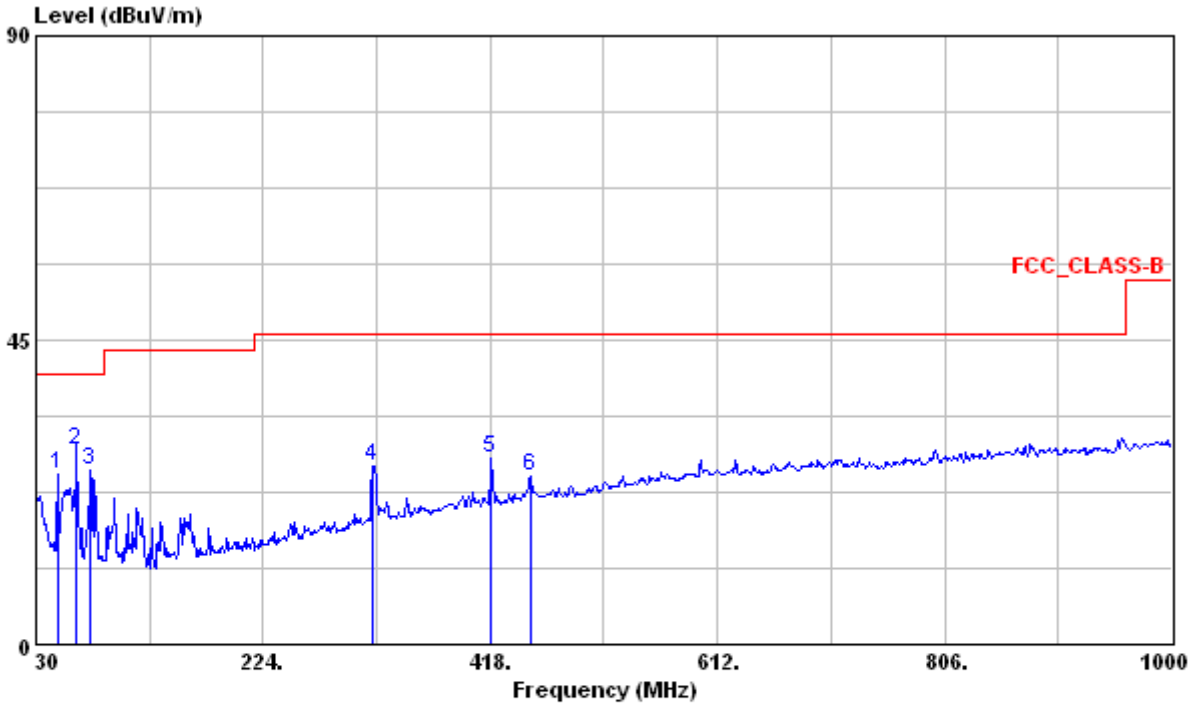
Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Test Model **: 2480MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Jacky

Polarization **:** Horizontal **Frequency Range :** 30MHz~1000MHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	48.090	25.12	-17.18	42.30	40.00	-14.88	---	---	HORIZONTAL	Peak
2	64.290	28.76	-19.49	48.25	40.00	-11.24	111	65	HORIZONTAL	QP
3	76.440	25.88	-19.82	45.70	40.00	-14.12	---	---	HORIZONTAL	Peak
4	316.800	26.33	-11.69	38.02	46.00	-19.67	---	---	HORIZONTAL	Peak
5	419.000	27.44	-8.66	36.10	46.00	-18.56	---	---	HORIZONTAL	Peak
6	451.900	24.95	-7.92	32.87	46.00	-21.05	---	---	HORIZONTAL	Peak

Note：

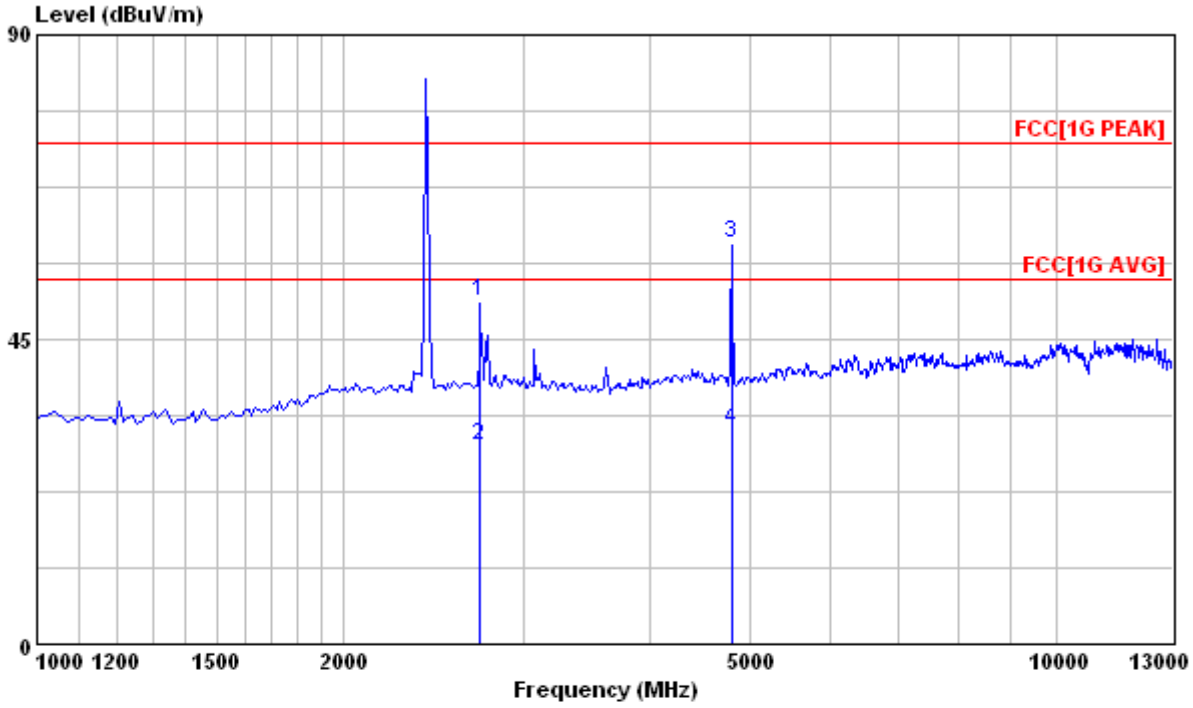
1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor

Radiated Emission Measurement above 1000MHz

Test Model : **2404MHz, Continuous Transmitting**

Test Distance : 3m **Tester** : Jacky

Antenna Polarization : Vertical **Frequency Range** :1GHz~25GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	2713.875	50.70	-35.81	86.51	74.00	-23.30	122	104	VERTICAL	Peak
2	2713.875	29.40	-35.81	65.21	54.00	-24.60	122	104	VERTICAL	Average
3	4808.175	59.08	-33.15	92.23	74.00	-14.92	115	158	VERTICAL	Peak
4	4808.175	31.78	-33.15	64.93	54.00	-22.22	115	158	VERTICAL	Average

Note:

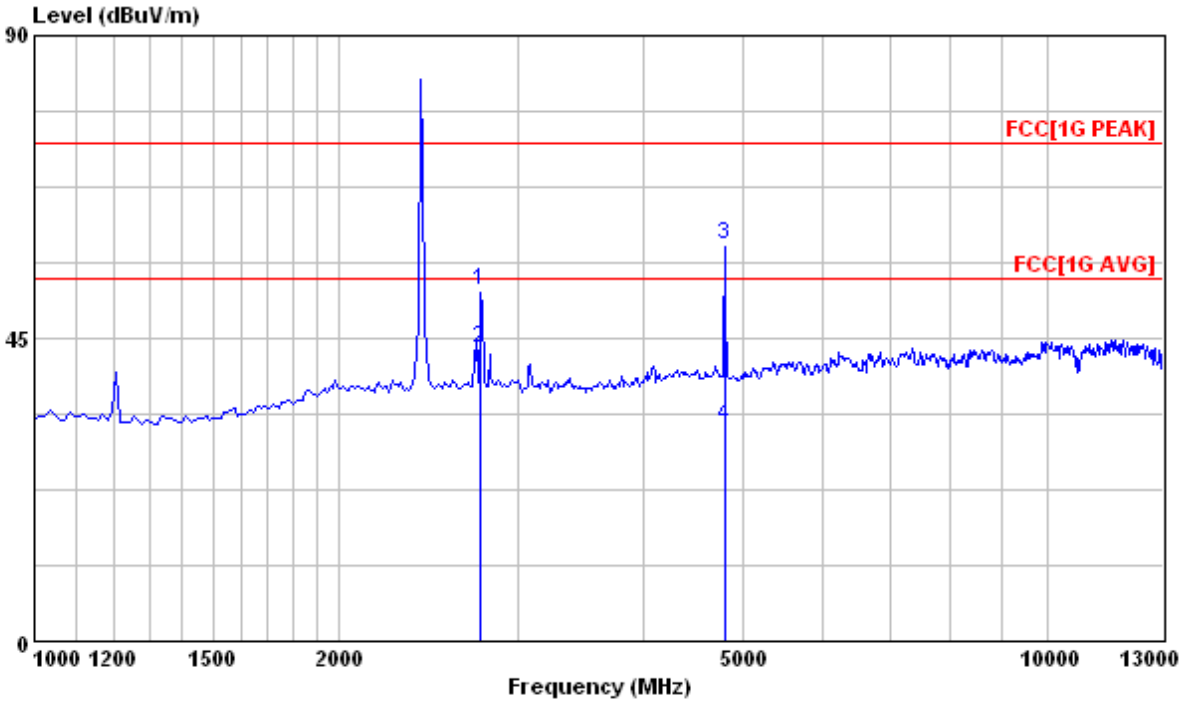
1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 13GHz to 25GHz, so the graphs are omitted above 13GHz.

Test Model **: 2404MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Jacky

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~25GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	2751.050	52.00	-35.84	87.84	74.00	-22.00	130	118	HORIZONTAL	Peak
2 @	2751.050	43.59	-35.84	79.43	54.00	-10.41	130	118	HORIZONTAL	Average
3	4808.150	58.83	-33.15	91.98	74.00	-15.17	166	160	HORIZONTAL	Peak
4	4808.150	32.06	-33.15	65.21	54.00	-21.94	166	160	HORIZONTAL	Average

Note:

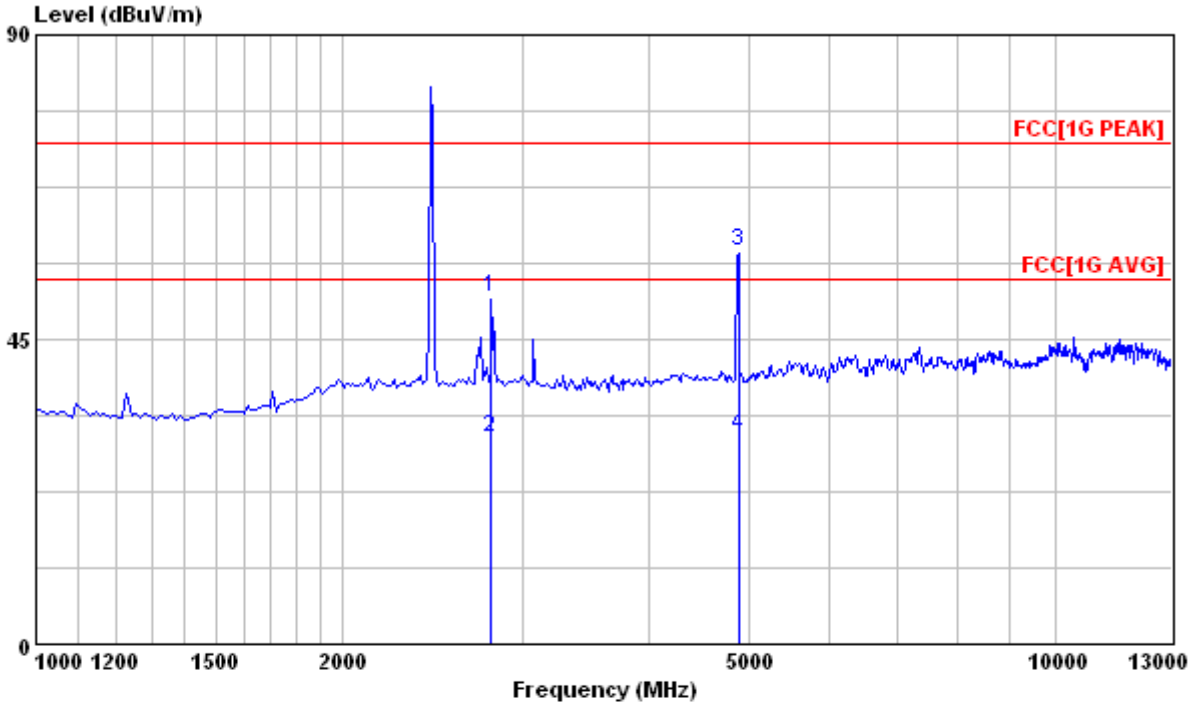
1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 13GHz to 25GHz, so the graphs are omitted above 13GHz.

Test Model **: 2442MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Jacky

Antenna Polarization **:** Vertical **Frequency Range :**1GHz~25GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	2793.780	51.33	-35.89	87.22	74.00	-22.67	102	25	VERTICAL	Peak
2	2793.780	30.42	-35.89	66.31	54.00	-23.58	102	25	VERTICAL	Average
3	4884.138	57.98	-33.08	91.06	74.00	-16.02	105	147	VERTICAL	Peak
4	4884.138	30.75	-33.08	63.83	54.00	-23.25	105	147	VERTICAL	Average

Note:

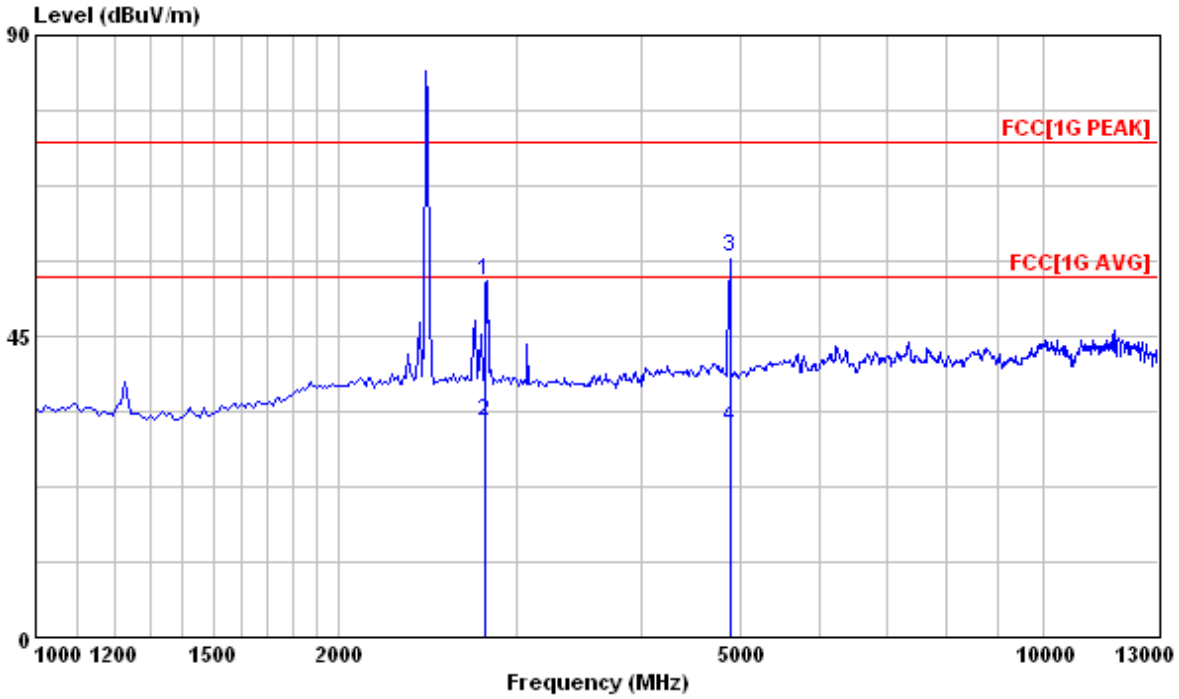
1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 13GHz to 25GHz, so the graphs are omitted above 13GHz.

Test Model **: 2442MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Jacky

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~25GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	2793.800	53.40	-35.89	89.29	74.00	-20.60	100	262	HORIZONTAL	Peak
2	2793.800	32.37	-35.89	68.26	54.00	-21.63	100	262	HORIZONTAL	Average
3	4884.025	56.92	-33.08	90.00	74.00	-17.08	134	165	HORIZONTAL	Peak
4	4884.025	31.42	-33.08	64.50	54.00	-22.58	134	165	HORIZONTAL	Average

Note:

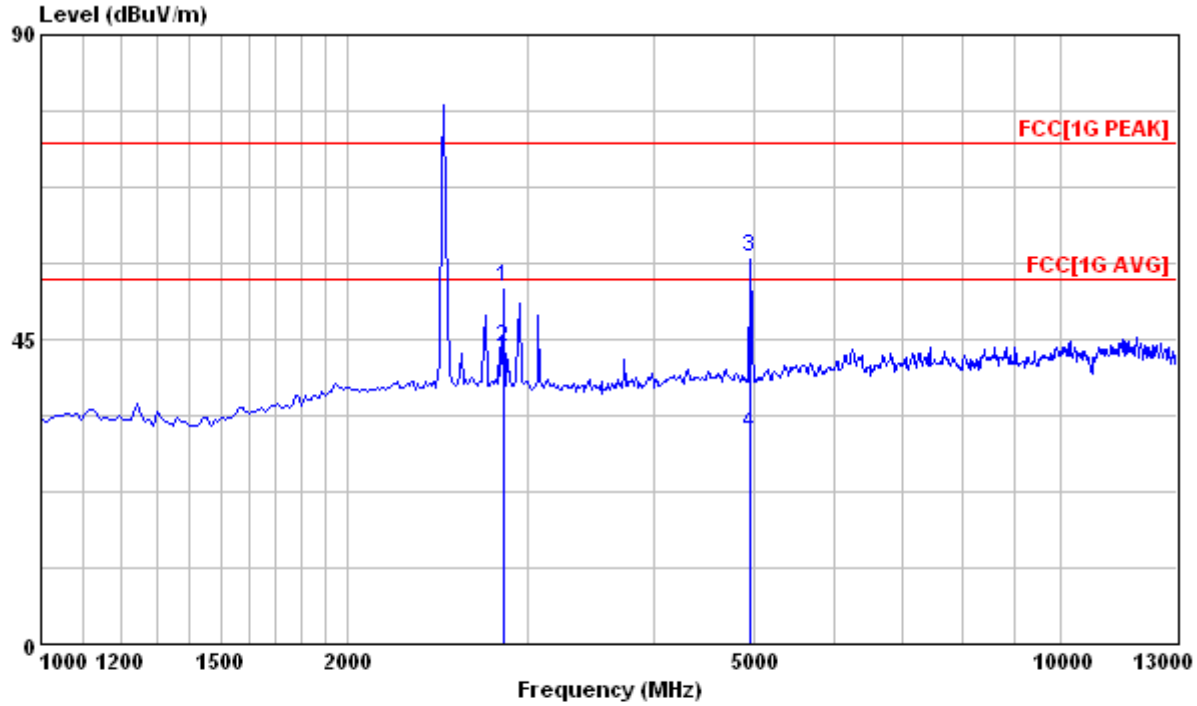
1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 13GHz to 25GHz, so the graphs are omitted above 13GHz.

Test Model **: 2480MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Jacky

Antenna Polarization **:** Vertical **Frequency Range :**1GHz~25GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	2838.125	52.83	-35.84	88.67	74.00	-21.17	137	34	VERTICAL	Peak
2	2838.125	43.79	-35.84	79.63	54.00	-10.21	137	34	VERTICAL	Average
3	4960.275	57.05	-32.98	90.03	74.00	-16.95	115	82	VERTICAL	Peak
4	4960.275	31.23	-32.98	64.21	54.00	-22.77	115	82	VERTICAL	Average

Note:

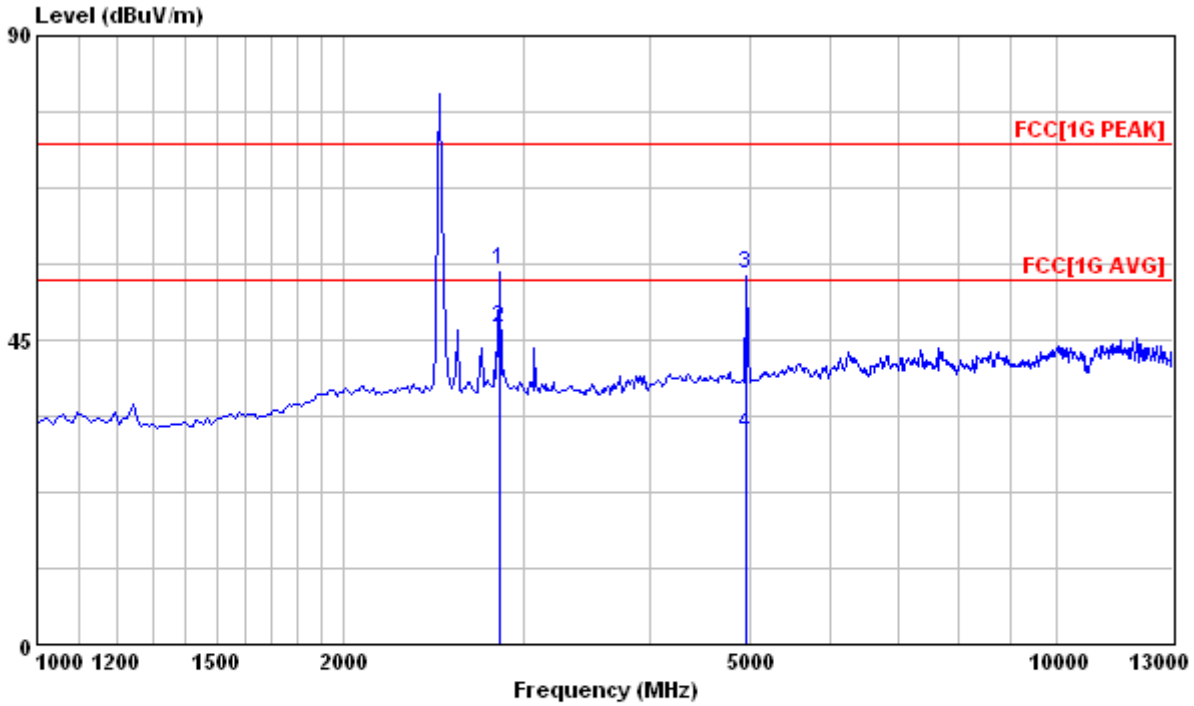
1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 13GHz to 25GHz, so the graphs are omitted above 13GHz.

Test Model **: 2480MHz, Continuous Transmitting**

Test Distance **:** 3m **Tester** **:** Jacky

Antenna Polarization **:** Horizontal **Frequency Range :**1GHz~25GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	2837.900	55.31	-35.84	91.15	74.00	-18.69	156	116	HORIZONTAL	Peak
2 @	2837.900	46.82	-35.84	82.66	54.00	-7.18	156	116	HORIZONTAL	Average
3	4959.900	54.82	-32.98	87.80	74.00	-19.18	160	134	HORIZONTAL	Peak
4	4959.900	31.18	-32.98	64.16	54.00	-22.82	160	134	HORIZONTAL	Average

Note:

1. Emission Level (dBuV/m) = Reading Value + Correction Factor.
2. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. PK. and AV. are abbreviation of peak and average respectively.

No signal can be detected from 13GHz to 25GHz, so the graphs are omitted above 13GHz.

6 Peak Power Spectral Density Measurement

Test Result: PASS

6.1 Applied Standard

According to 15.247(e), 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.

Filed strength tranfers to peak output power is as below：

$$P = \frac{(ExD)^2}{30 \times G}$$

Note:
P : output power (W)
E : Field strength (V/m)
D : measurement distance = 3m
G : EUT antenna gain = 0dBi

Transfer:
P(dBm) = E(dBuV/m) – 90 + 20log3 – 10log30 – 0
= E(dBuV/m) – 90 + 9.54 – 14.77 – 0
= E(dBuV/m) – 95.23

6.2 Test Instruments

As section 2.2

Instrument Setting

RBW	VBW	Detector	Trace	Comment
3kHz	10kHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：24℃ Relative Humidity : 54%

6.3 Test Procedures

As section 2.3

6.4 Test Configurations

As section 2.4

6.5 Test Results

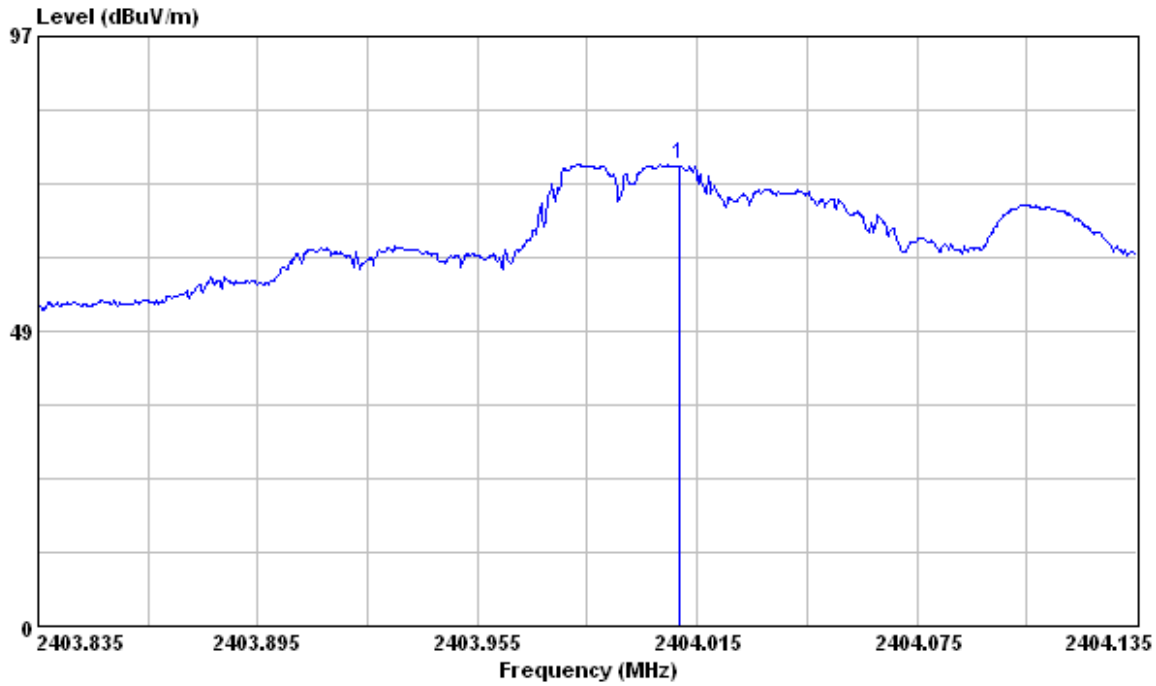
Test Mode : Continuous Transmitting **Tester :** Jacky

Operating Frequency (MHz)	Reading Data (dBuV/m)	Correction Factor (dB)	Emission (dBuV/m)	Peak Power Spectral Density (dBm)	Limit (dBm)	Margin (dBm)
2404	78.17	-2.33	75.84	-19.39	8	27.39
2442	77.49	-2.34	75.15	-20.08	8	28.08
2480	78.79	-2.34	76.45	-18.78	8	26.78

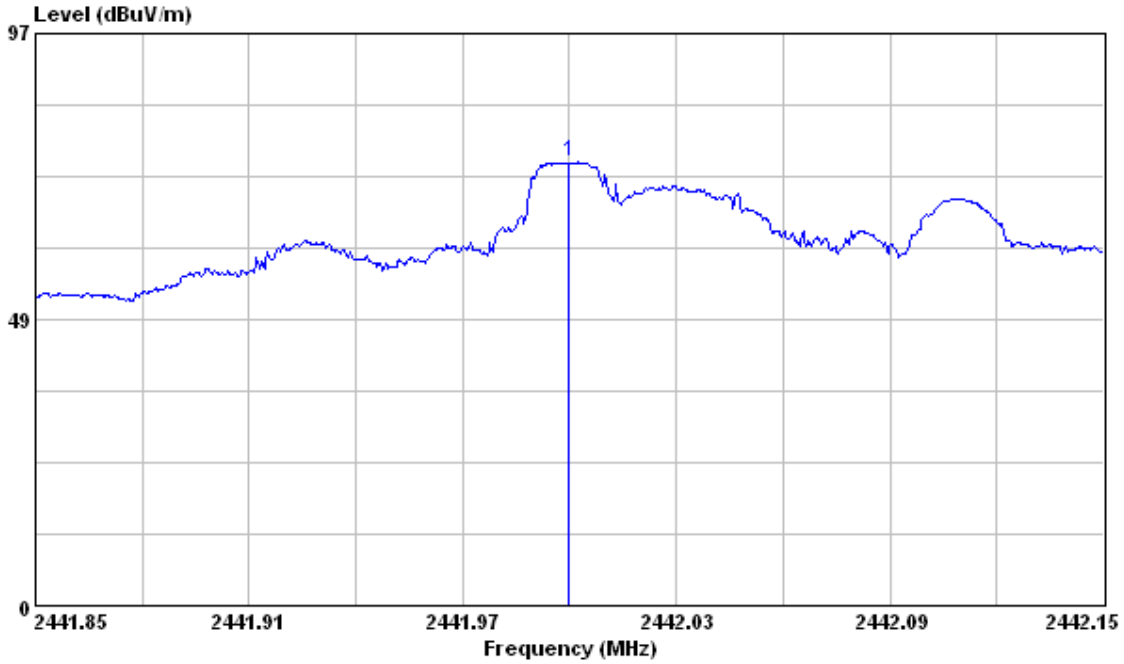
Note:

1. Correction Factor (dB) = Antenna factor + Cable Loss r
2. Emission (dBuV/m) = Reading Data + Correction Factor
3. Peak Power Spectral Density (dBm) = Emission – 95.23(see section 6.1)
4. Margin (dB) = Limit –Peak Power Spectral Density

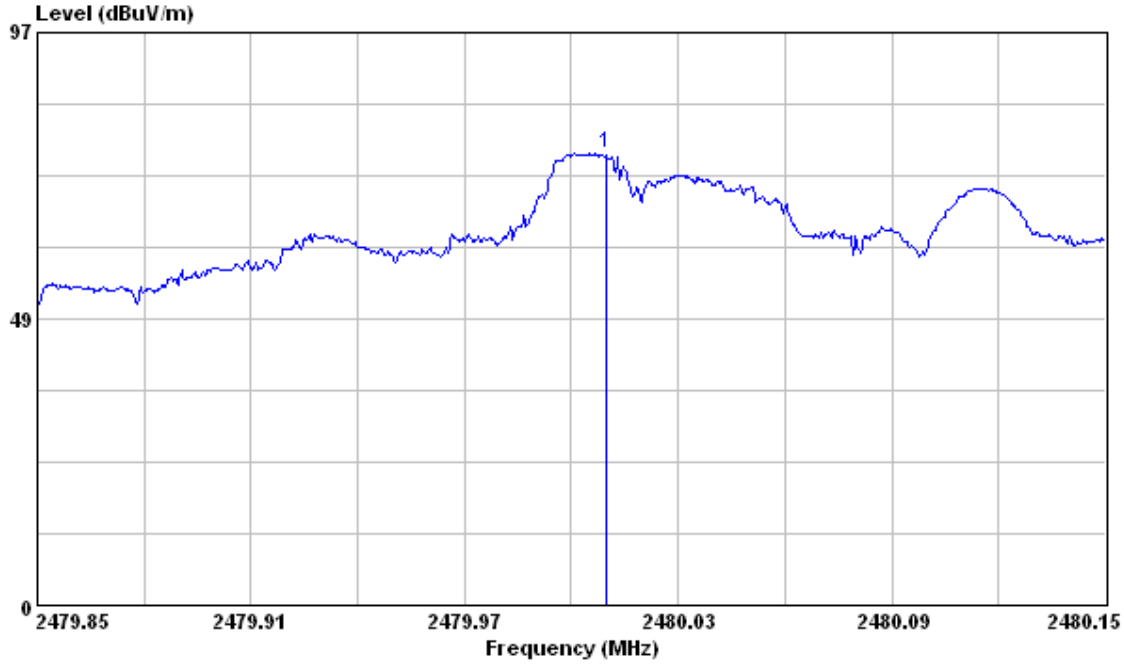
2404MHz



2442MHz



2480MHz



7 Conducted Emission Measurement

Result: Pass

7.1 Applied standard

For intentional device, according to §15.207(a) line conduction emission limit is as below table.

Frequency of Emission (MHz)	Conducted 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.

7.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Test Receiver	R&S	ESCS 30/836858/021	2010/1/12	2011/1/12
LISN	R&S	ESH2-Z5/836613/001	2010/5/26	2011/5/26
2nd LISN	R&S	ENV4200/833209/010	2010/1/12	2011/1/12
50Ω terminator	N/A	N/A/001	2010/8/26	2011/8/26
RF Switch	N/A	RSU28/338965/002	2010/8/23	2011/8/23
RF Cable	N/A	N/A/C0052 ~ 56	2010/8/23	2011/8/23
Test Software	Audix	e3/ Ver. 5.2004-2-19k	NCR	NCR
shielded room	ETS LINDGREN	TR5/15353-F	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.

Instrument Setting

IF BW	Measurement Time	Detector	Trace	Comment
9kHz	1 second	Quasi-Peak / Average	Maxhold	

Climatic Condition

Ambient Temperature：24℃; Relative Humidity : 53%

7.3 Measurement Procedure

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. If the EUT is tabletop equipment, it was placed on a non-conducted table with a height of 0.8 meters above the reference ground plane and 0.4 meters from the conducting wall of the shielded room. Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane.

c. Connect the EUT's power source to the appropriate power mains through the LISN.

d. All the other peripherals are connected to the 2nd LISN, if any.

e. The LISN was placed 0.8 meters from the EUT and at least 0.8 meters from other units and other metal planes.

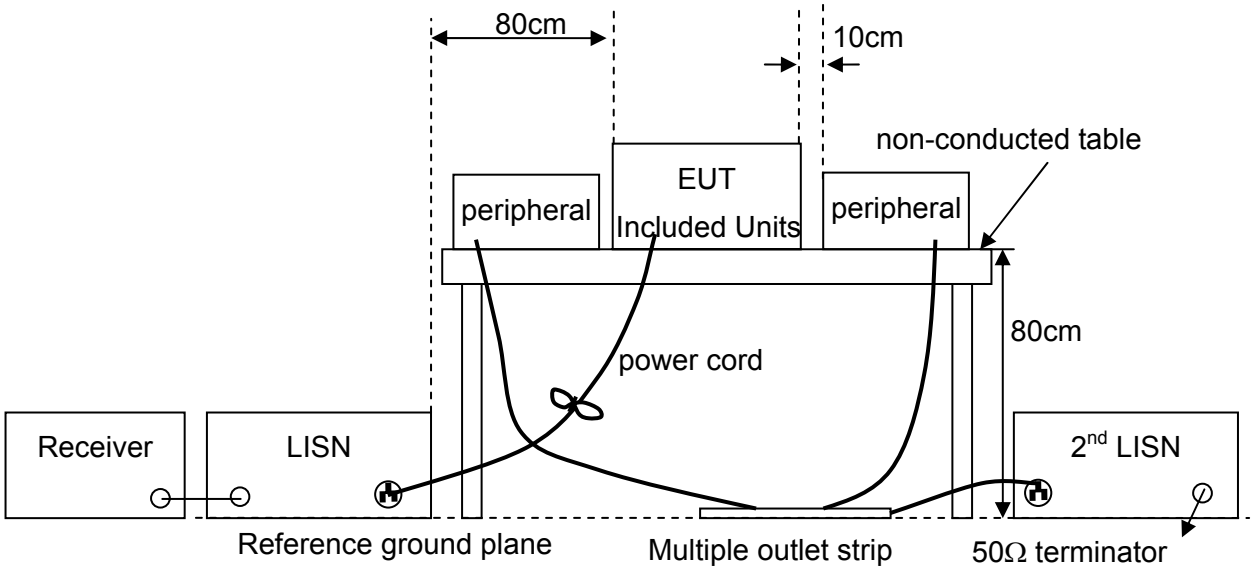
f. Measure the conducted emissions on each power line (Neutral Line and Line 1 – Hot side) of the EUT's power source by using the test receiver connected to the coupling RF output port of LISN.

g. Rapidly scan the signal from 150kHz to 30MHz by using the receiver through the Maximum-Peak detector to determine those frequencies associated with higher emission levels for each measured line.

h. Then measure the maximum level of conducted disturbance for each frequency found from step g. by using the receiver through the Quasi-Peak and Average detectors per CISPR 16-1.

i. Record the level for each frequency and compare with the required limit.

7.4 Test configuration

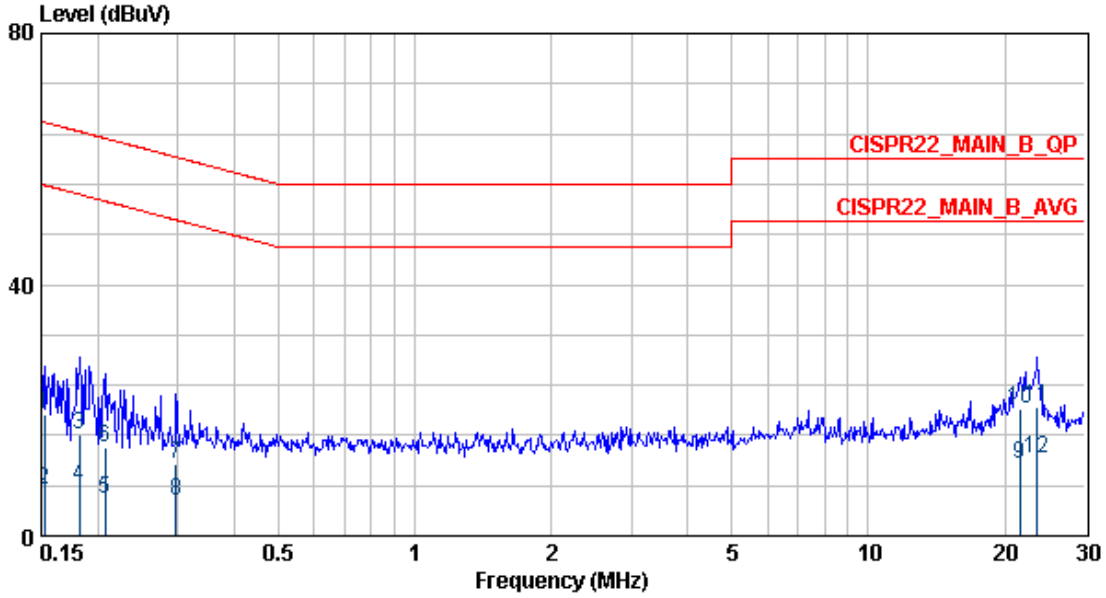


7.5 Test Data

Test Mode : **Continuous Transmitting, 2404MHz**

Frequency Range : 150kHz~30MHz **Phase** : Line

Tester : CDC



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	cm		
1	0.152	19.25	0.23	19.02	65.87	-46.62	---	LINE	QP
2	0.152	7.26	0.23	7.03	55.87	-48.61	---	LINE	AVERAGE
3	0.182	16.06	0.24	15.82	64.37	-48.31	---	LINE	QP
4	0.182	7.81	0.24	7.57	54.37	-46.56	---	LINE	AVERAGE
5	0.207	5.98	0.25	5.73	53.32	-47.34	---	LINE	AVERAGE
6	0.207	13.93	0.25	13.68	63.32	-49.39	---	LINE	QP
7	0.297	11.29	0.26	11.03	60.32	-49.04	---	LINE	QP
8	0.297	5.57	0.26	5.31	50.32	-44.76	---	LINE	AVERAGE
9	21.600	11.47	1.32	10.15	50.00	-38.53	---	LINE	AVERAGE
10	21.600	20.21	1.32	18.89	60.00	-39.79	---	LINE	QP
11	23.636	20.53	1.35	19.18	60.00	-39.47	---	LINE	QP
12	23.636	12.34	1.35	10.99	50.00	-37.66	---	LINE	AVERAGE

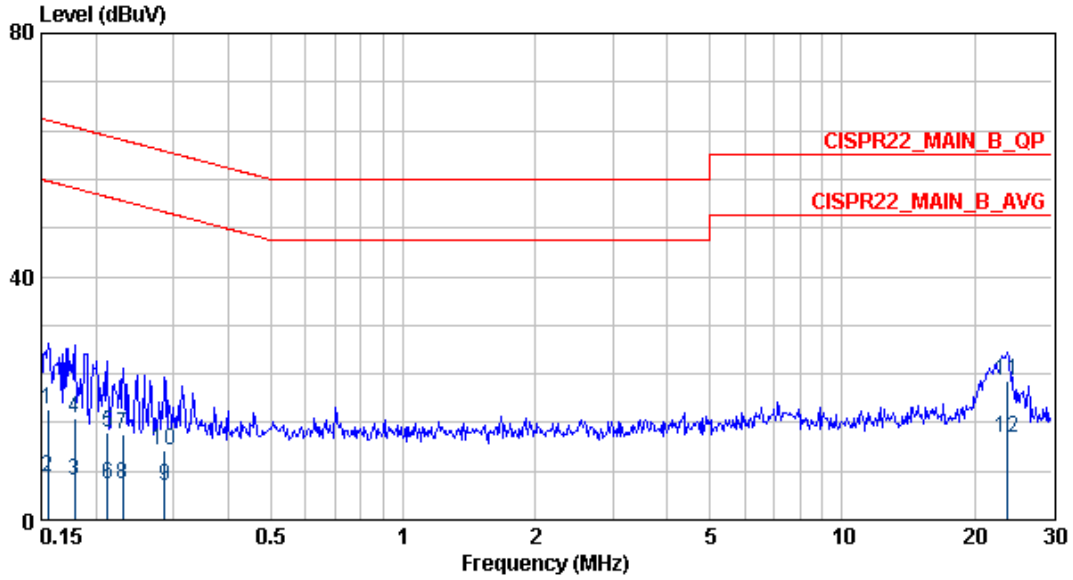
Note:

1. Emission Level = Reading Data + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. P.K., Q.P. and AV. are abbreviation of peak, quasi-peak and average respectively.

Test Mode : **Continuous Transmitting, 2404MHz**

Frequency Range : 150kHz~30MHz **Phase** : Neutral

Tester : CDC



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	cm		
1	0.156	18.07	0.29	17.78	65.69	-47.62	---	NEUTRAL	QP
2	0.156	6.91	0.29	6.62	55.69	-48.78	---	NEUTRAL	AVERAGE
3	0.179	6.50	0.30	6.20	54.55	-48.05	---	NEUTRAL	AVERAGE
4	0.179	16.81	0.30	16.51	64.55	-47.74	---	NEUTRAL	QP
5	0.213	14.49	0.30	14.19	63.10	-48.60	---	NEUTRAL	QP
6	0.213	5.75	0.30	5.45	53.10	-47.34	---	NEUTRAL	AVERAGE
7	0.230	14.01	0.30	13.71	62.44	-48.42	---	NEUTRAL	QP
8	0.230	5.86	0.30	5.56	52.44	-46.57	---	NEUTRAL	AVERAGE
9	0.286	5.70	0.31	5.39	50.63	-44.93	---	NEUTRAL	AVERAGE
10	0.286	11.30	0.31	10.99	60.63	-49.33	---	NEUTRAL	QP
11	23.762	22.97	0.56	22.41	60.00	-37.03	---	NEUTRAL	QP
12	23.762	13.39	0.56	12.83	50.00	-36.61	---	NEUTRAL	AVERAGE

Note:

1. Emission Level = Reading Data + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. P.K., Q.P. and AV. are abbreviation of peak, quasi-peak and average respectively.

8 Antenna Requirement

8.1 Applied standard

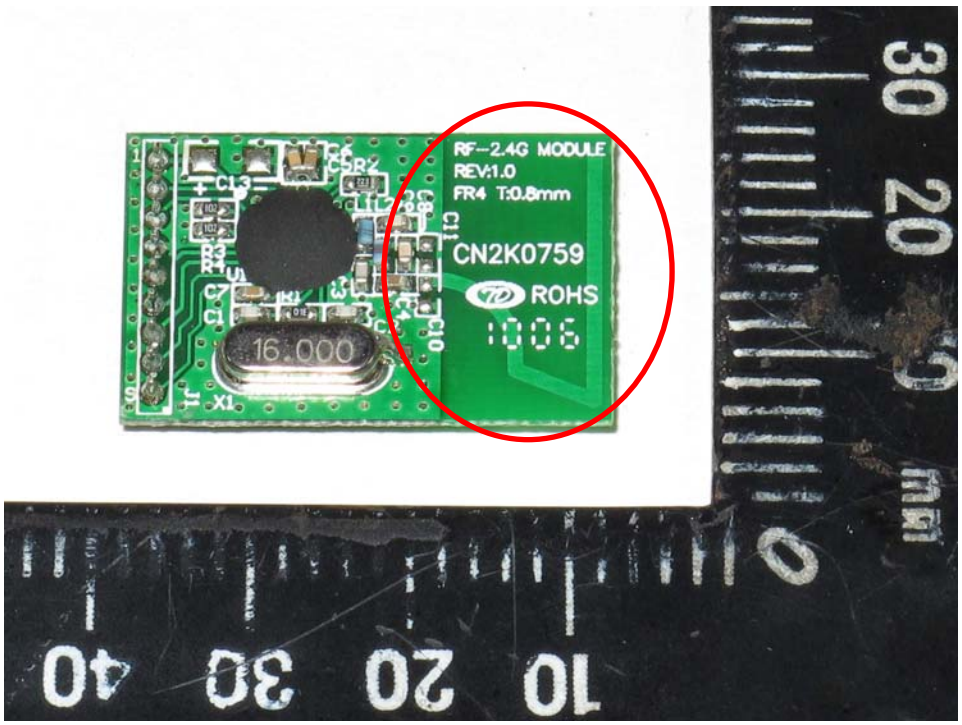
According to 15.247(4) and (c)(1), The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi 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 6 dBi.

8.2 Antenna Information

This antenna's relative information as follow:

Brand	Model	Frequency Range (MHz)	Gain (dBi)	Comment
N/A	CN2K0759	2400 ~ 2500	0	

Antenna Position:



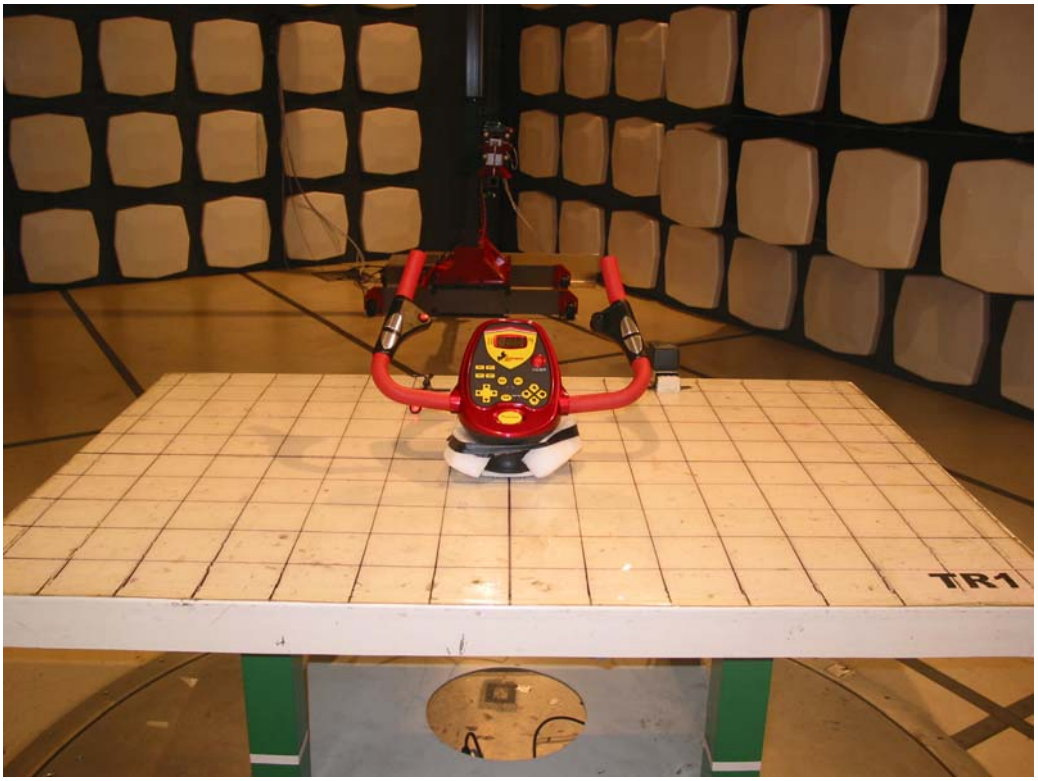
8.3 Result

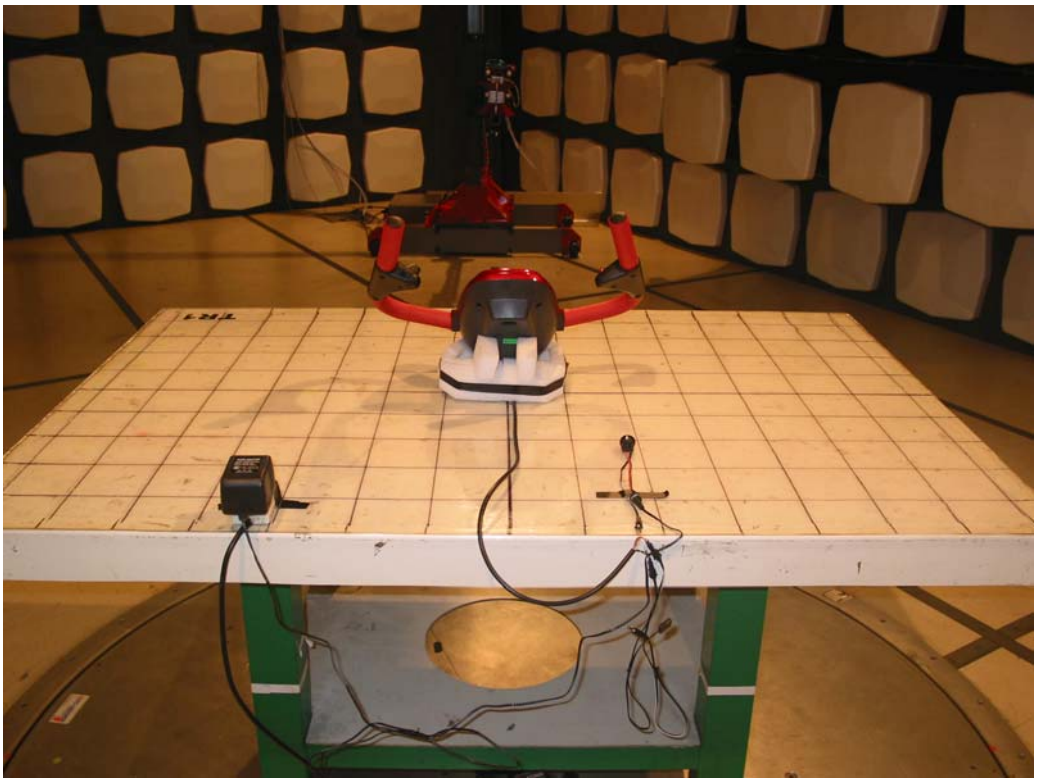
Gain of the antenn is less than 6dBi.

Attachment 1

Photographs of the Test Configurations

Radiated Emission Measurement





Conducted Emission Measurement

Attachment 2

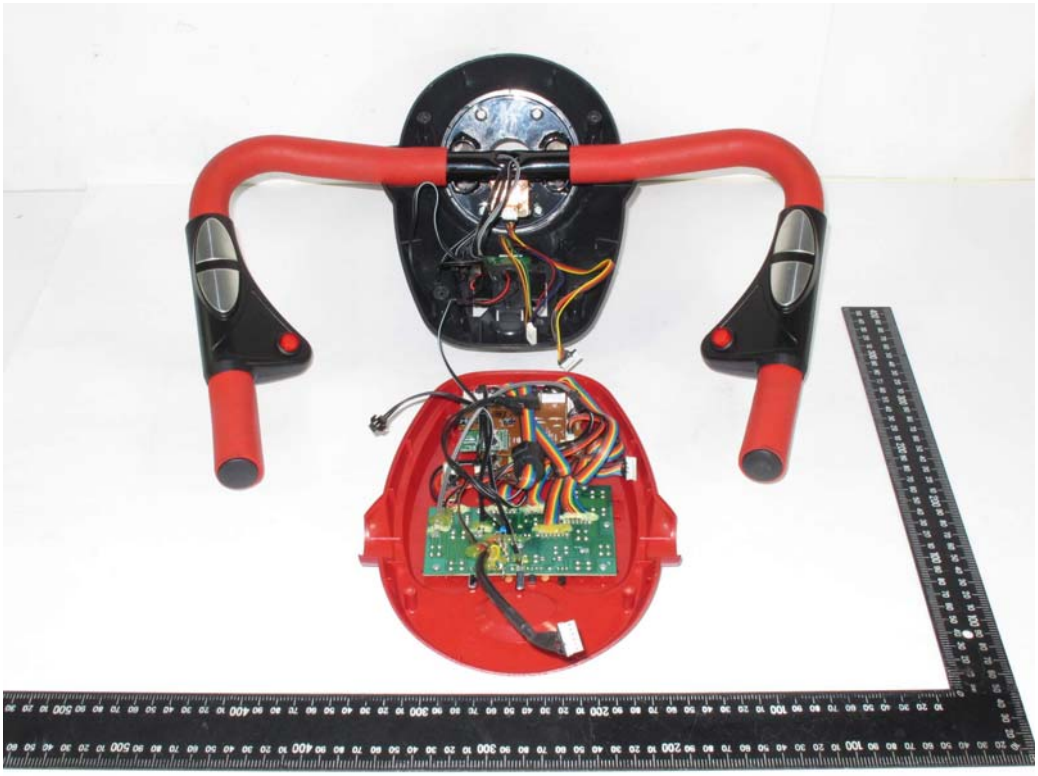
External Photographs of EUT

Adaptor

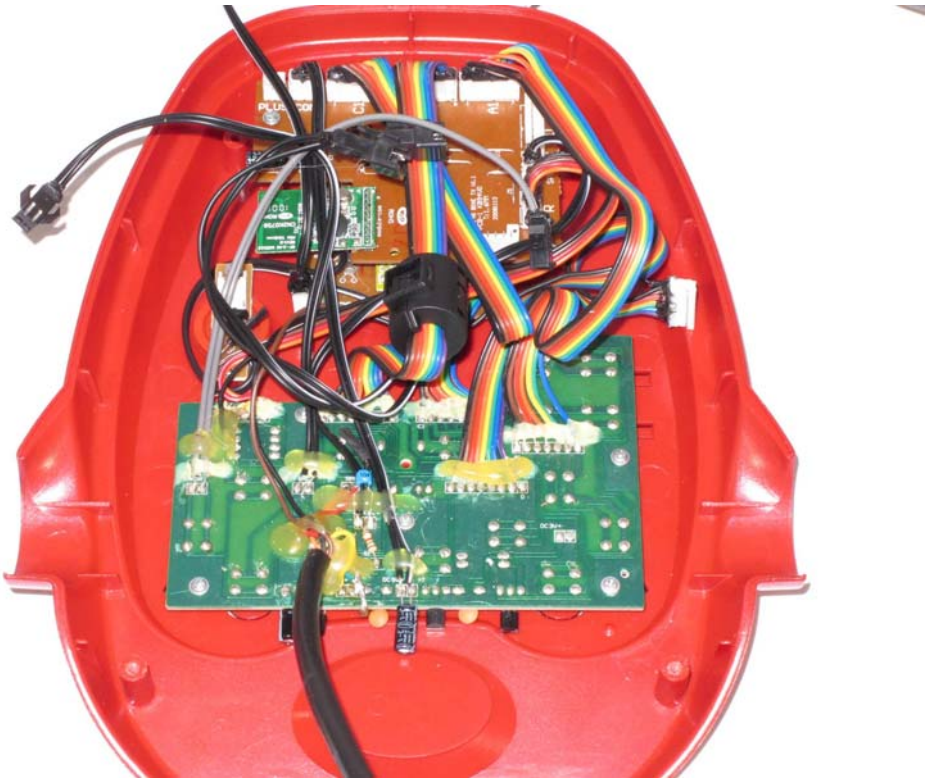

AC/DC ADAPTOR
CLASS 2 POWER SUPPLY
MODEL: TAD48-0601000DU
INPUT: 120V AC 60Hz
OUTPUT: 6V DC 1000mA
MADE IN TAIWAN

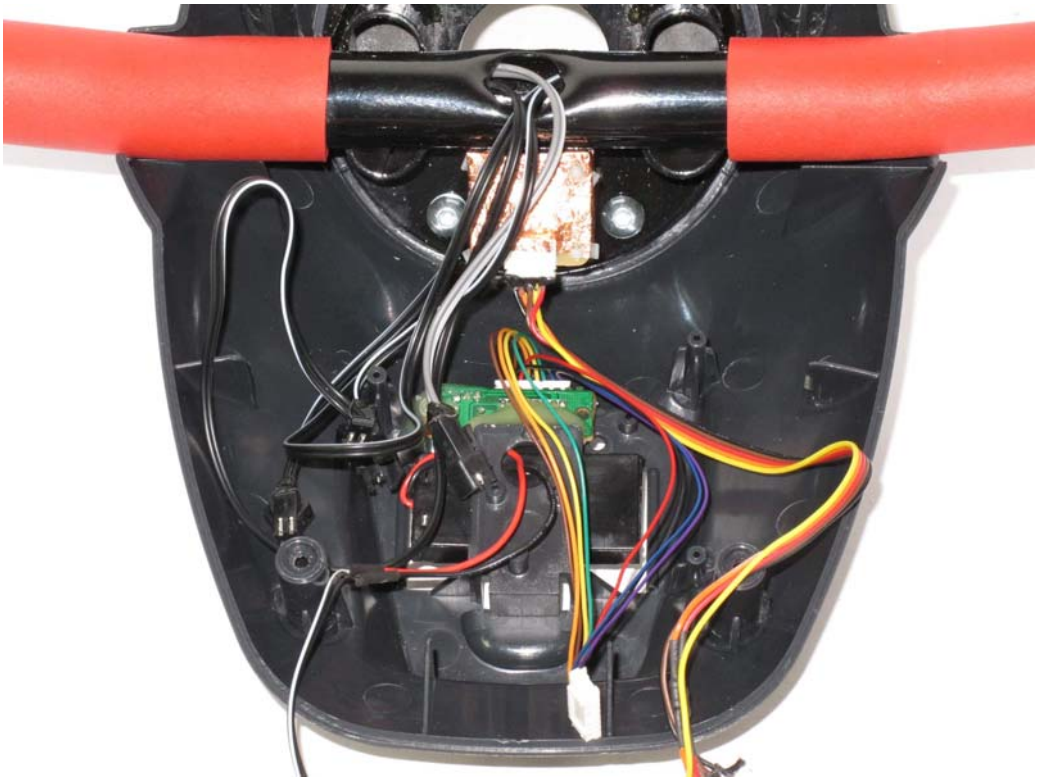
Attachment 3

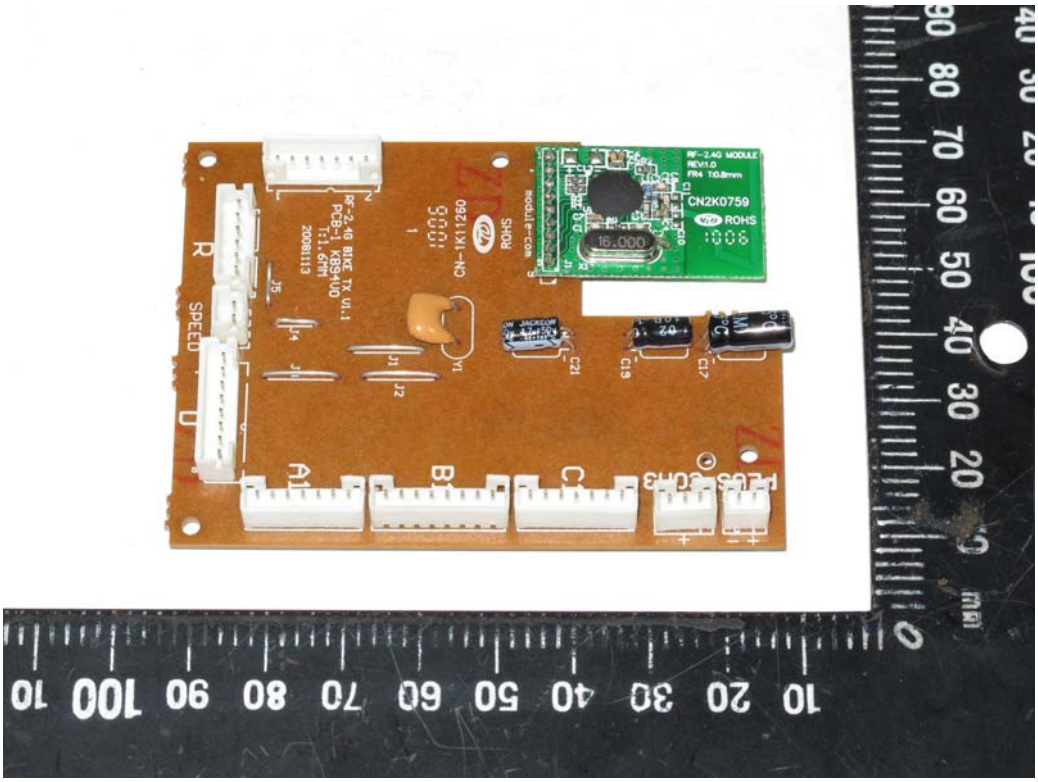
Internal Photographs of EUT

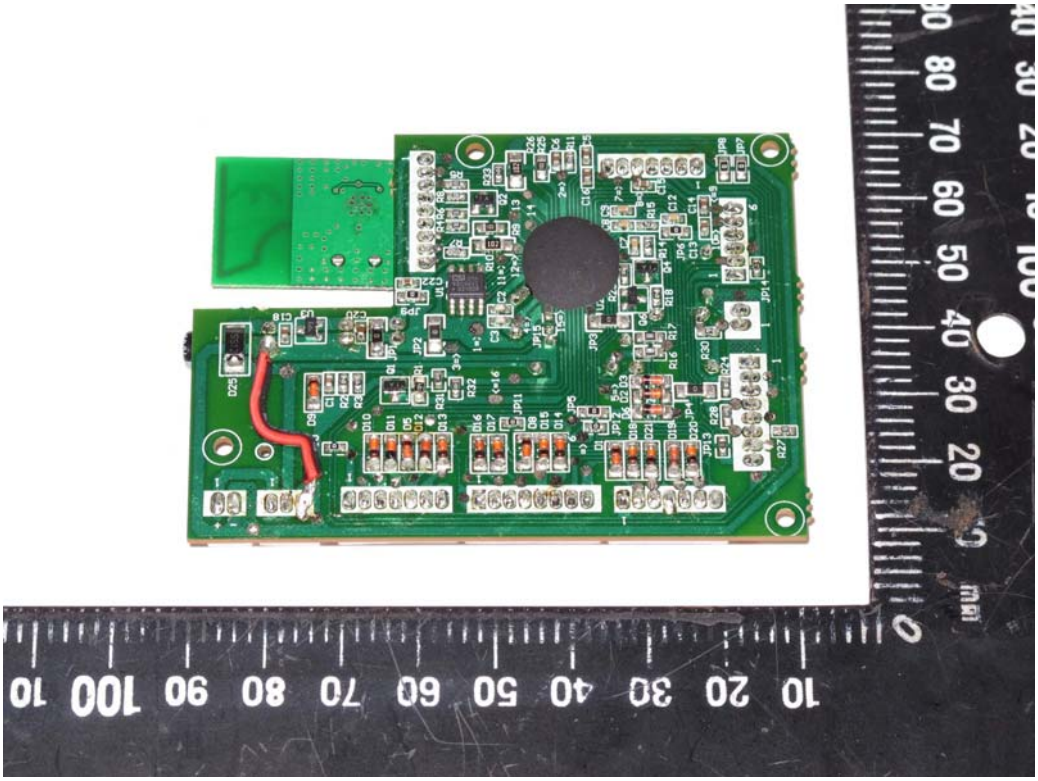


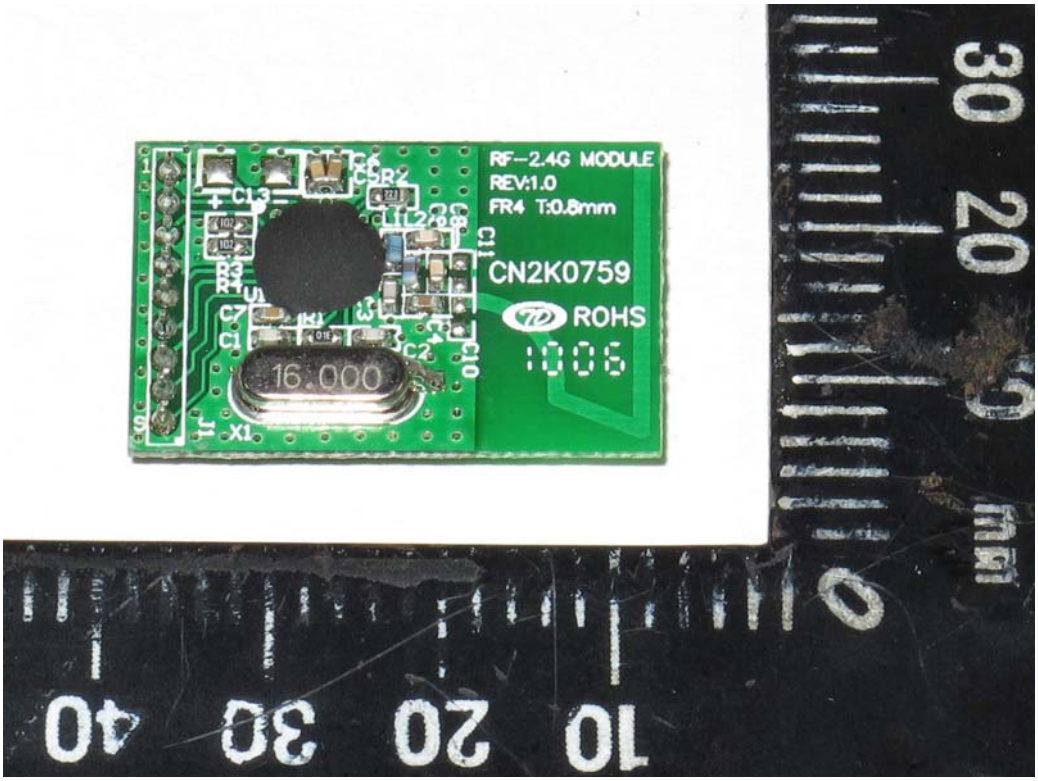
CENTRAL RESEARCH TECHNOLOGY CO.
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.
TEL. : 886-2-25984542
FAX. : 886-2-25984546

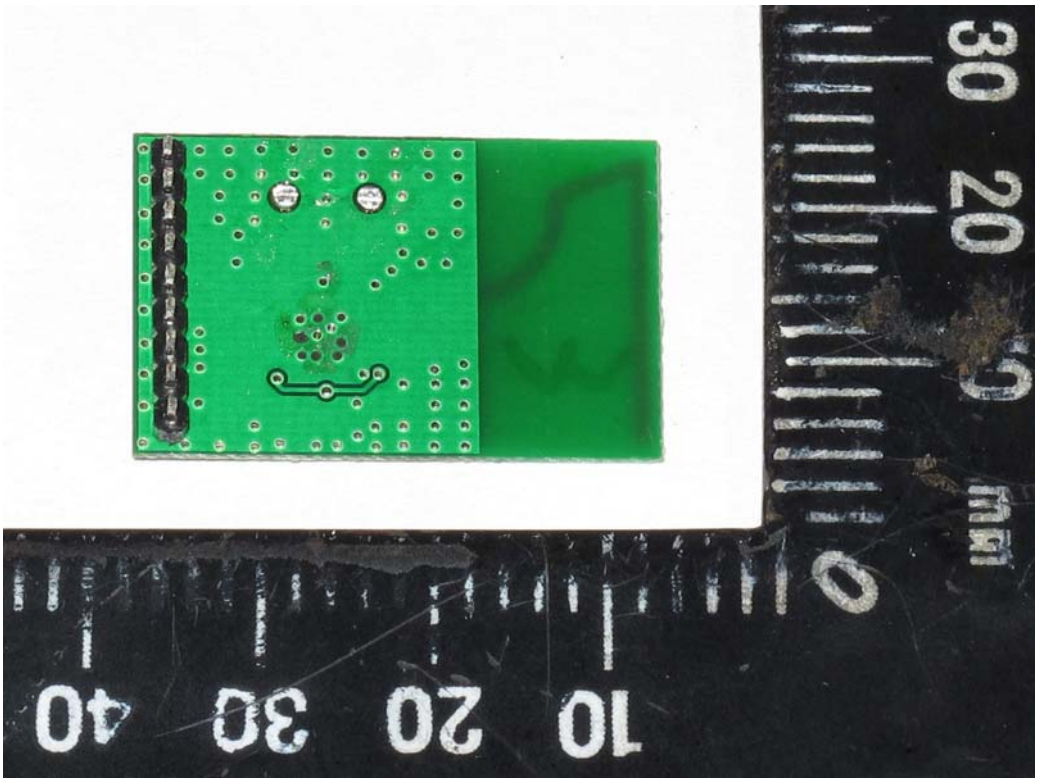


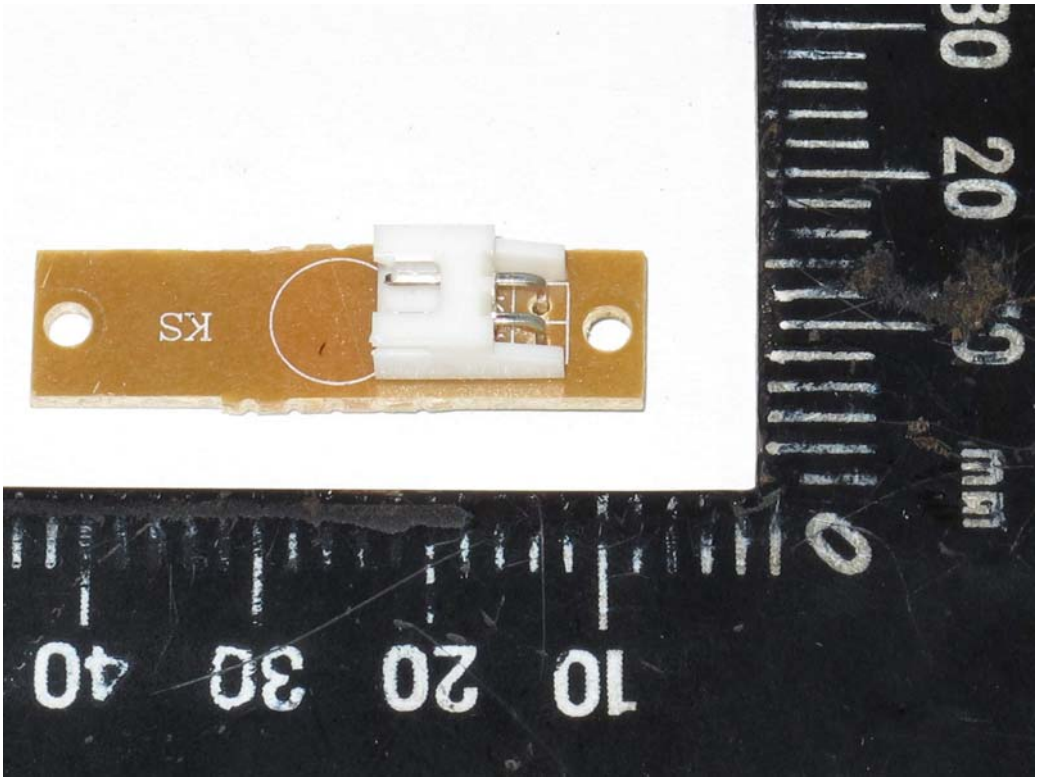


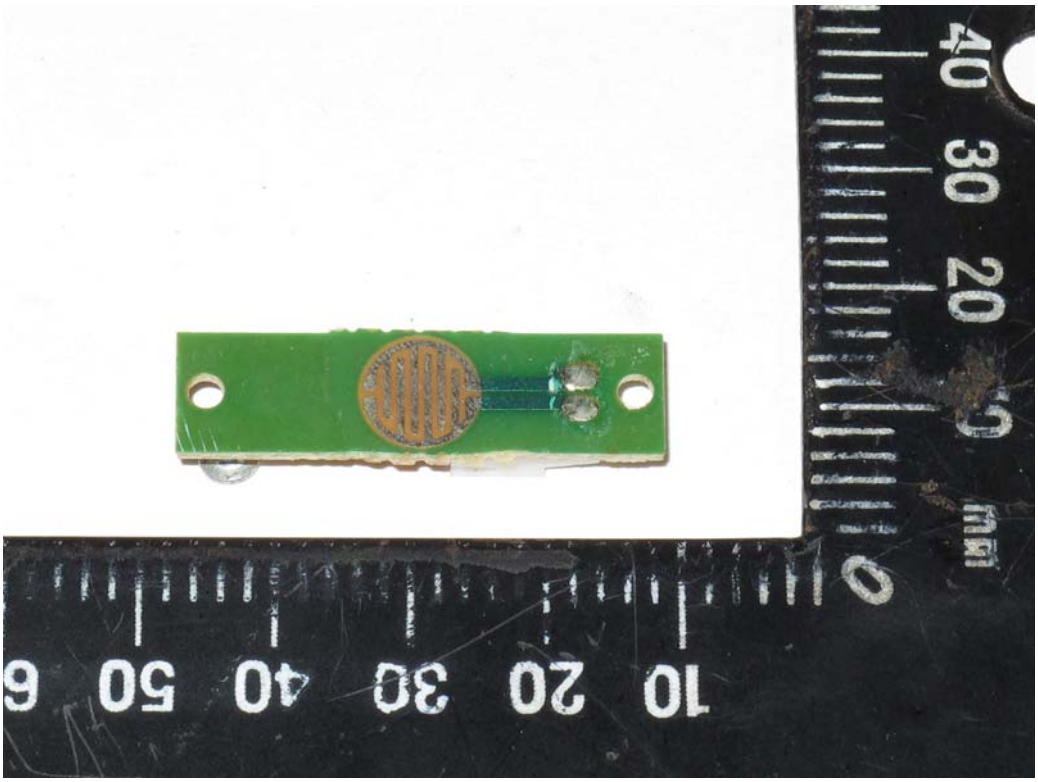

RF-2.4G MODULE
REV1.0
CN2K0759
ROHS
16.000
RF-2.4G BIKE TX V1.1
PCB-1 KB94U0
20081113
SPEED
A1
B1
C
SW3

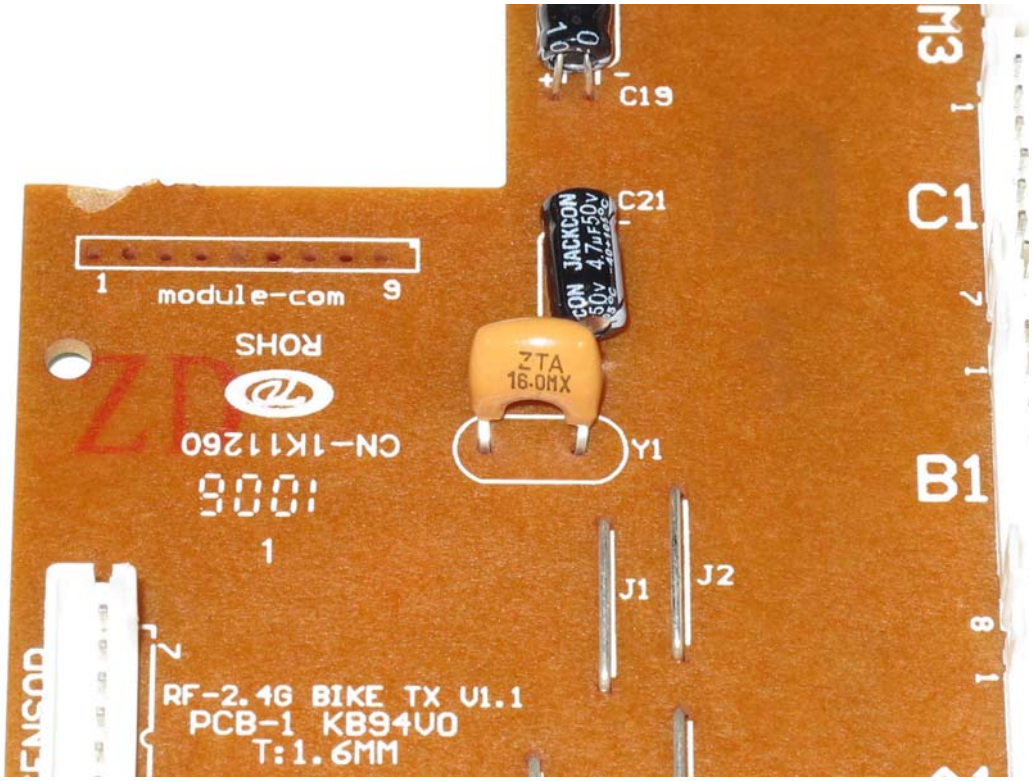


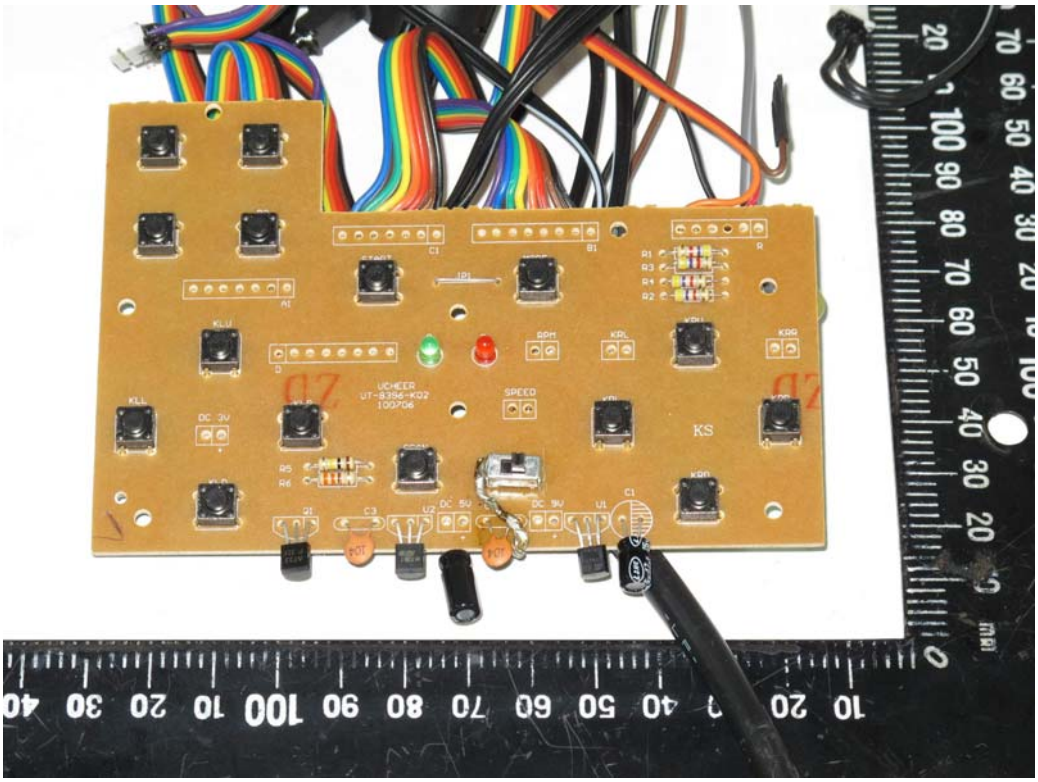

RF-2.4G MODULE
REV:1.0
FR4 T:0.8mm
CN2K0759
ROHS
1006
16.000

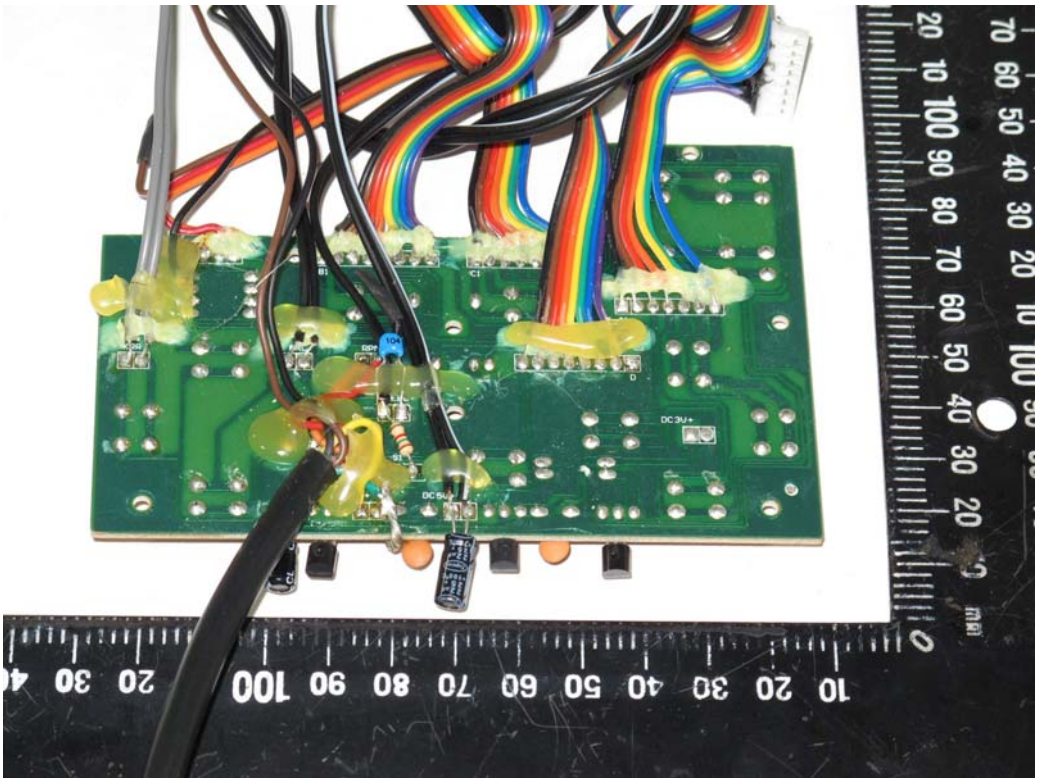


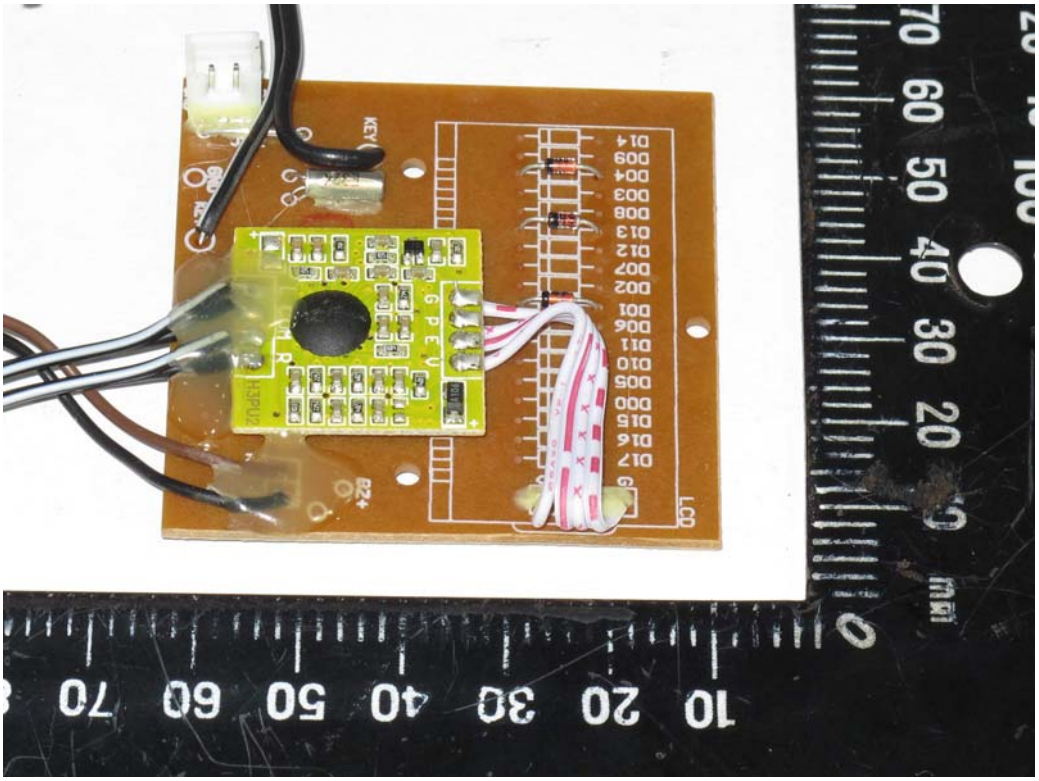

KS
10 20 30 40
0 10 20 30
mm


10 20 30 40 50 6
0 10 20 30 40
mm

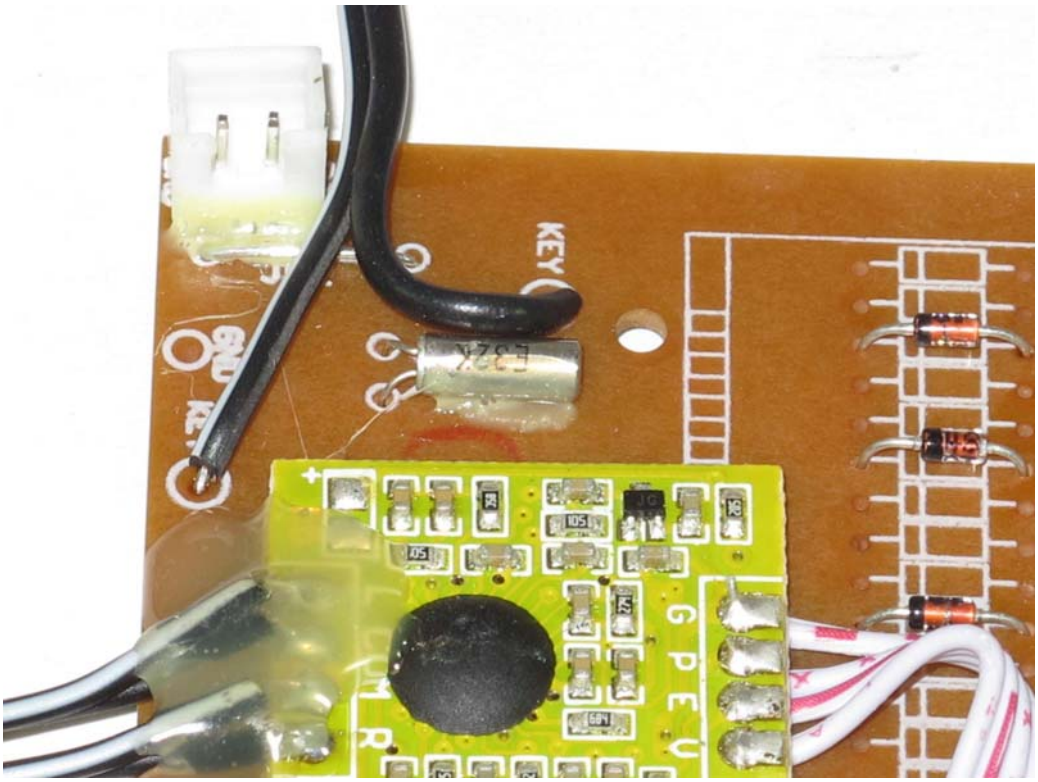

C19
C21
module-com
ZTA
16.0MX
Y1
J1
J2
RF-2.4G BIKE TX V1.1
PCB-1 KB94V0
T:1.6MM

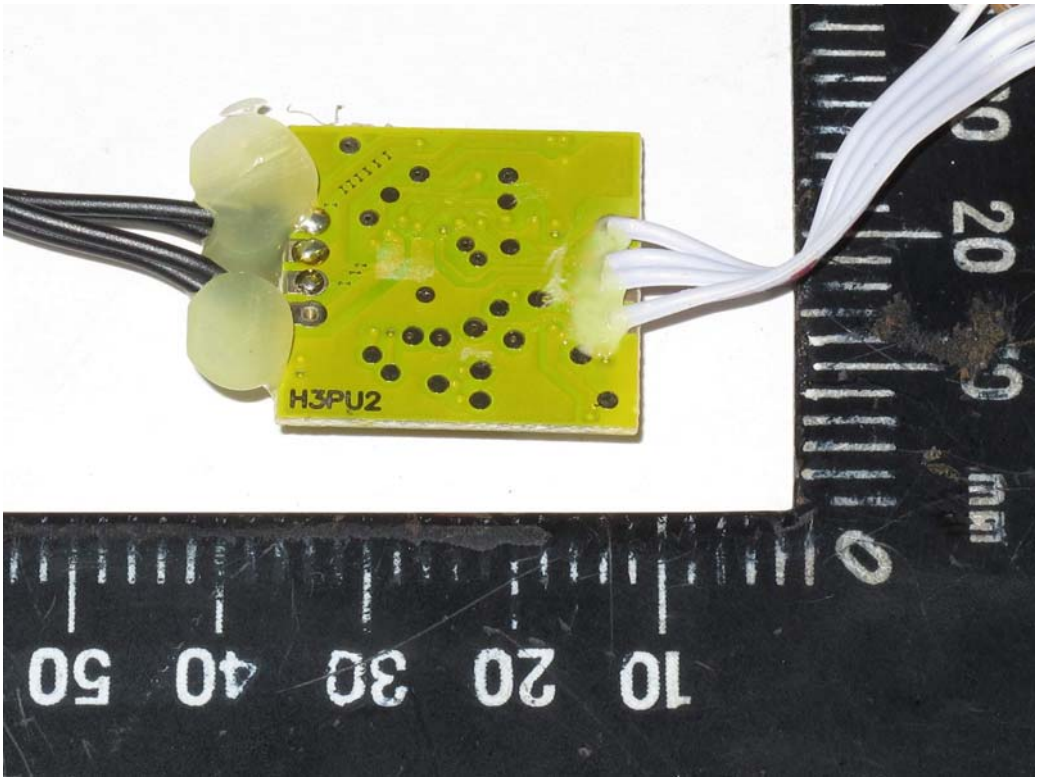


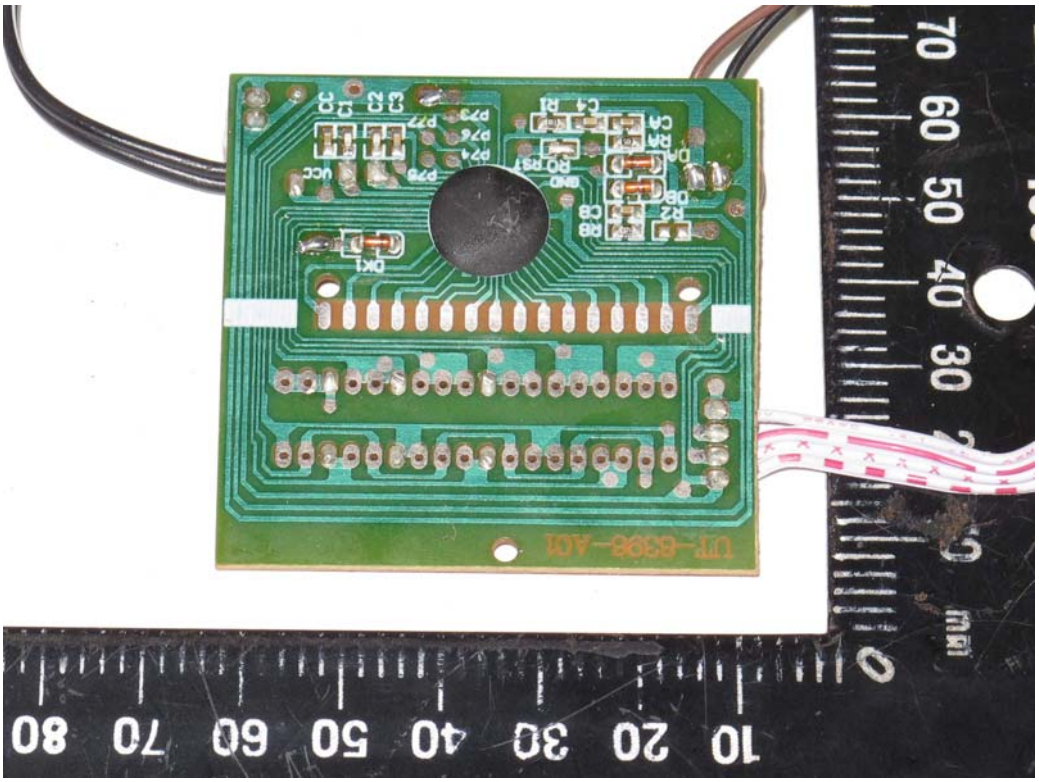


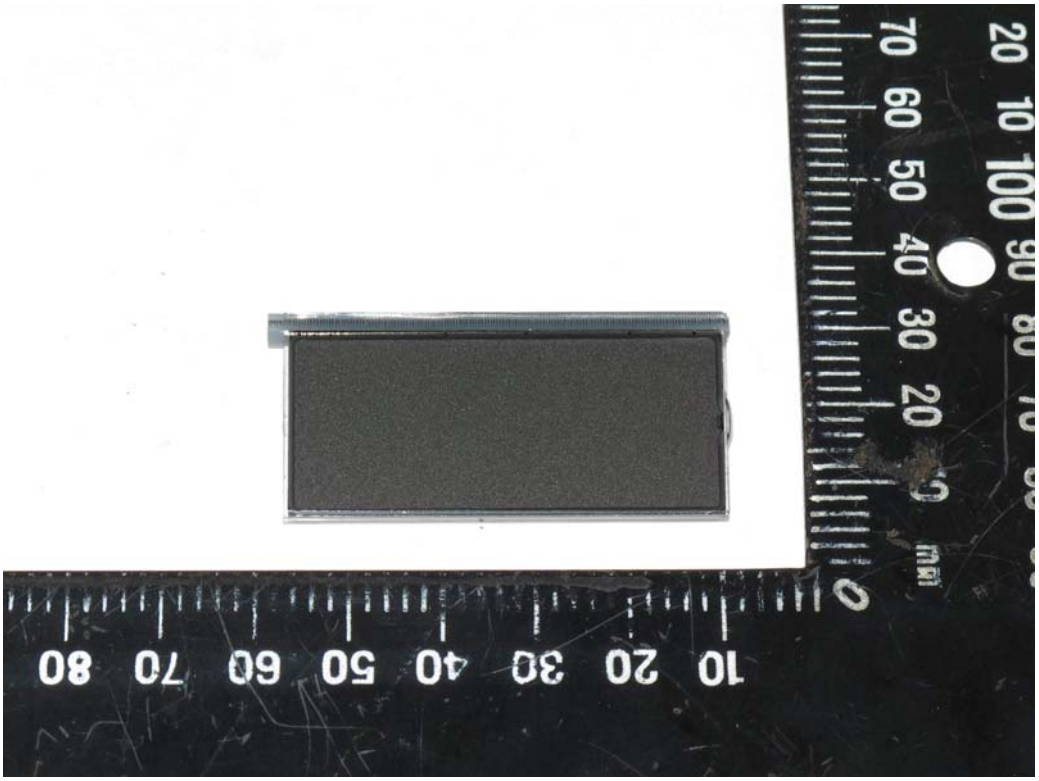


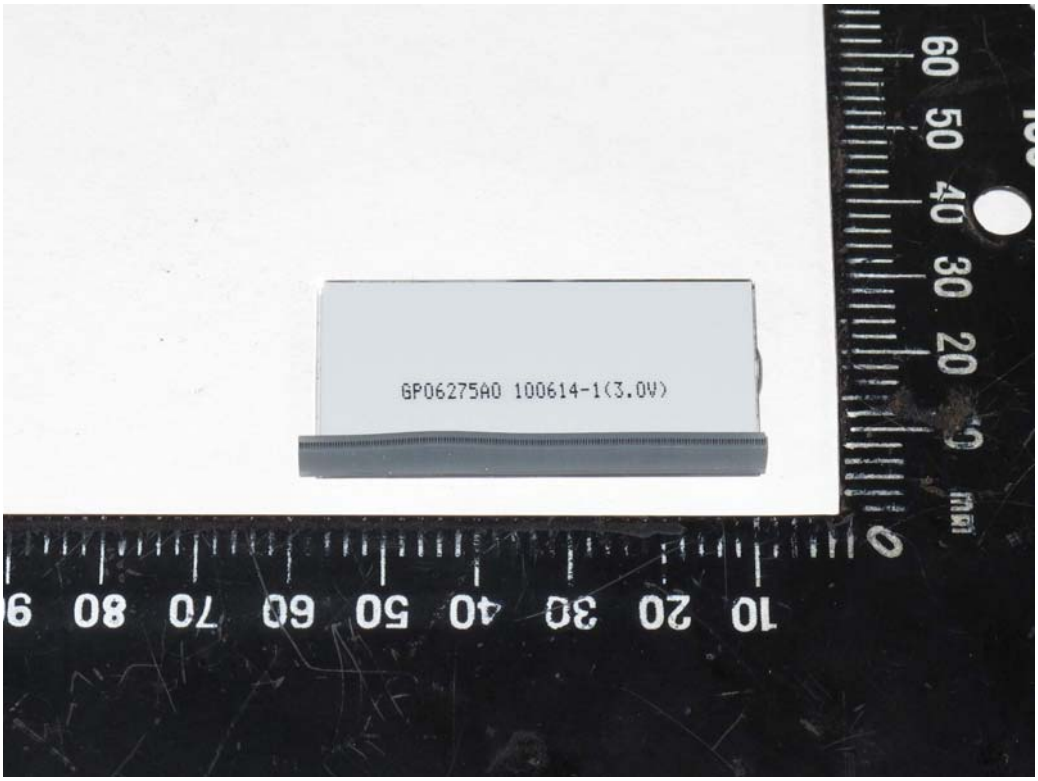
CENTRAL RESEARCH TECHNOLOGY CO.
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.
TEL. : 886-2-25984542
FAX. : 886-2-25984546

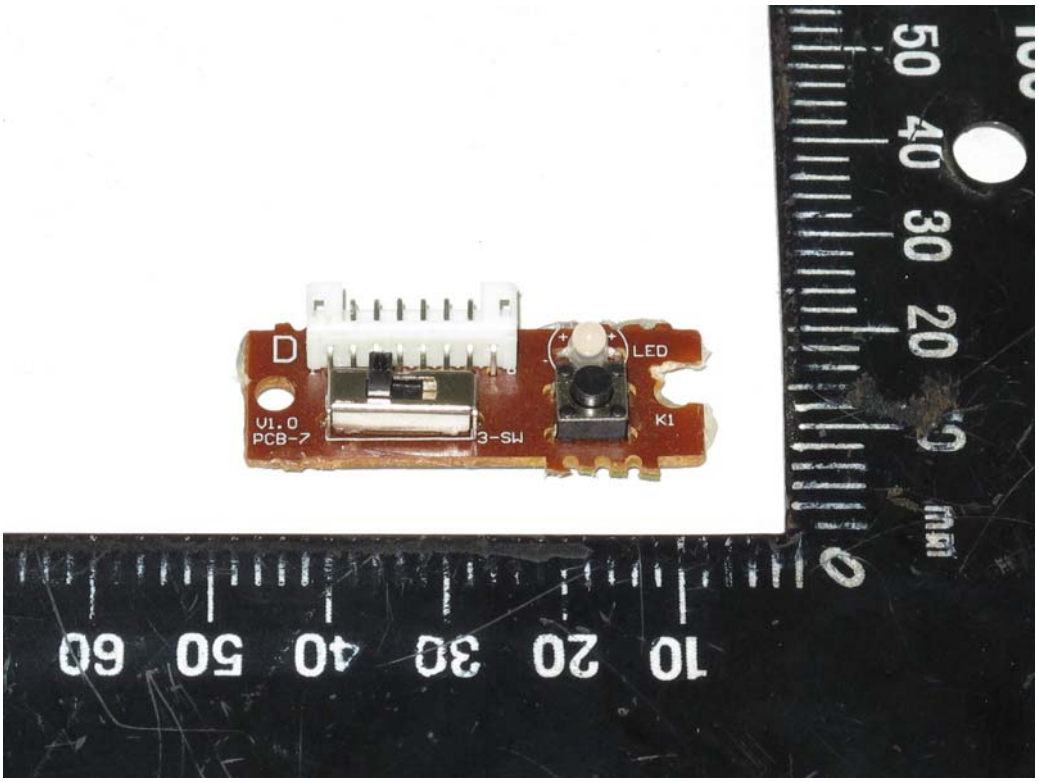

KEY

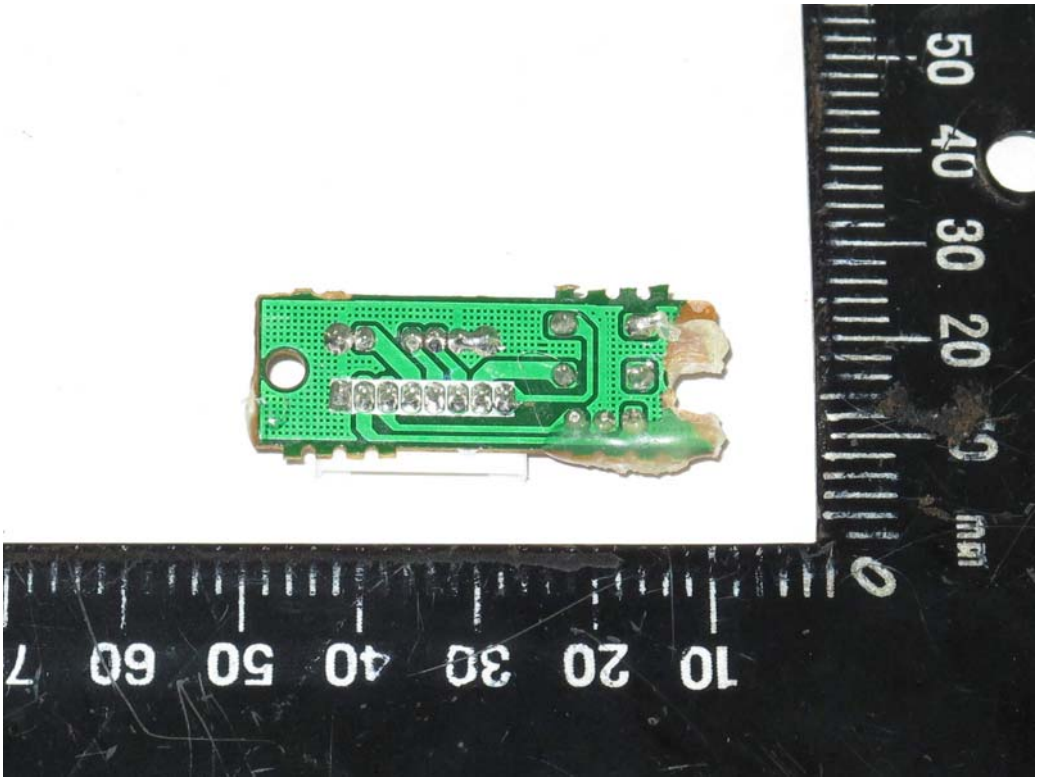

H3PU2
10 20 30 40 50
0 10 20 30 mm

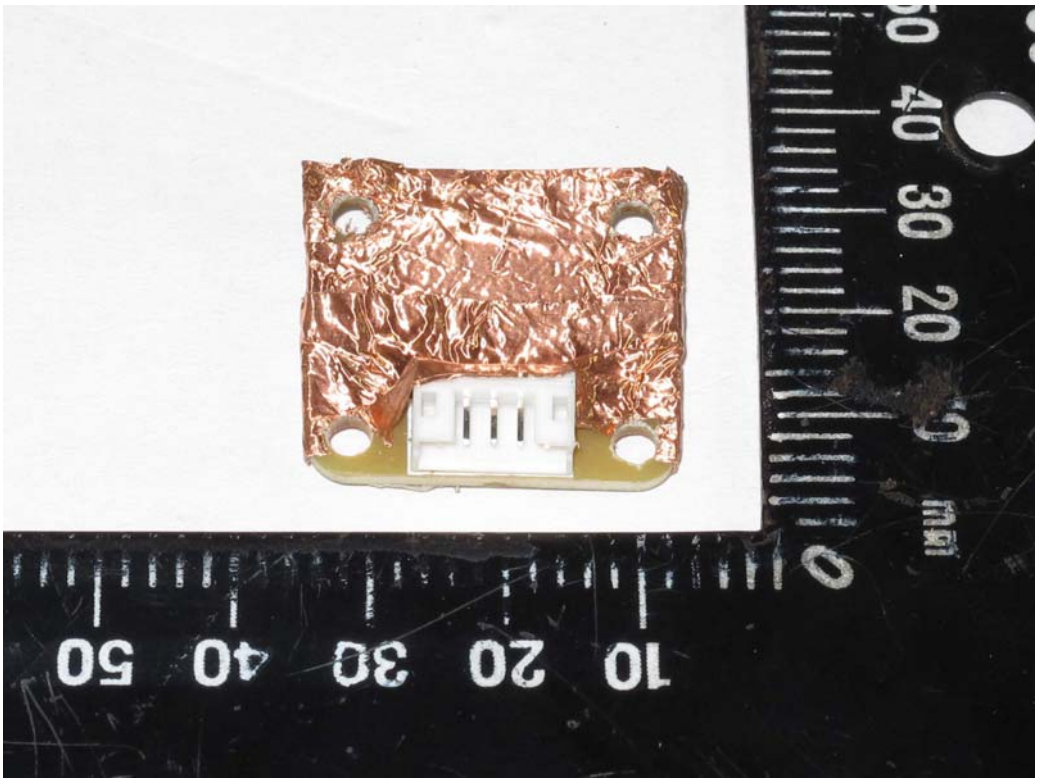


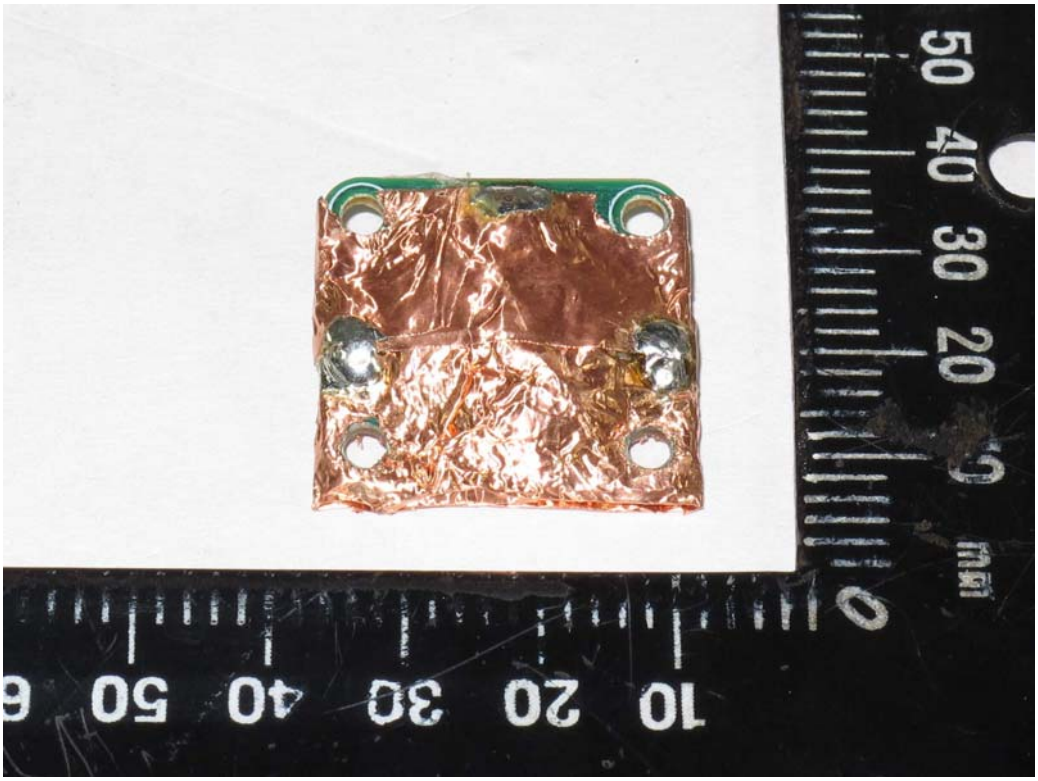


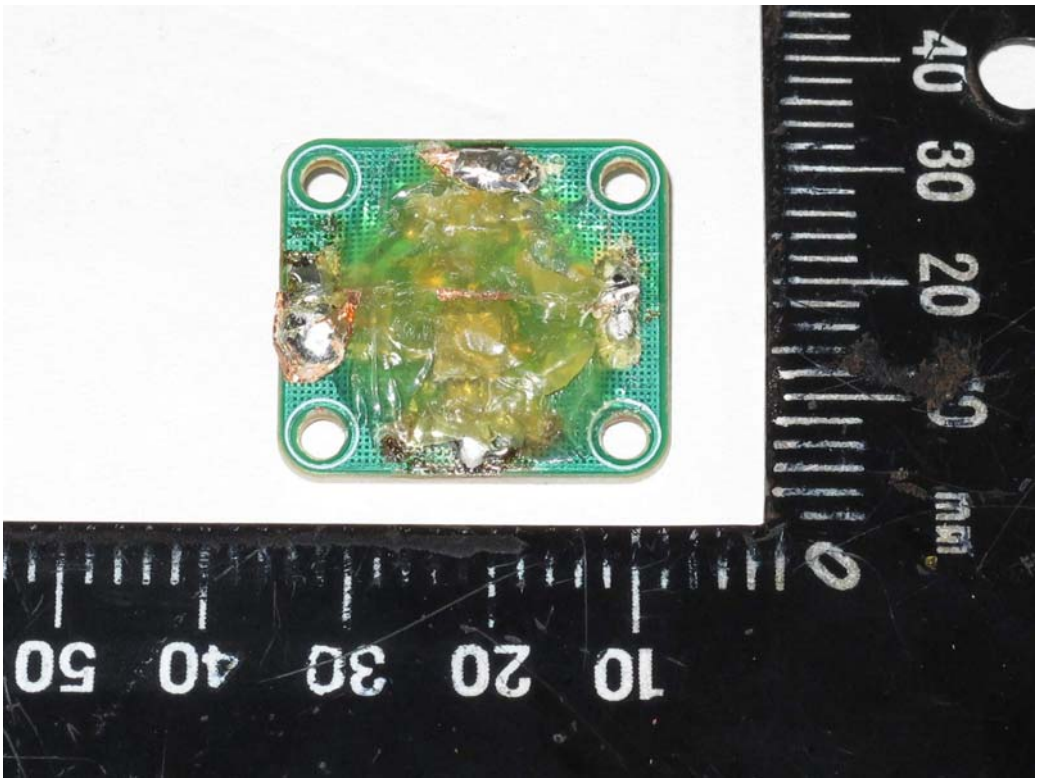

GP06275A0 100614-1(3.0V)

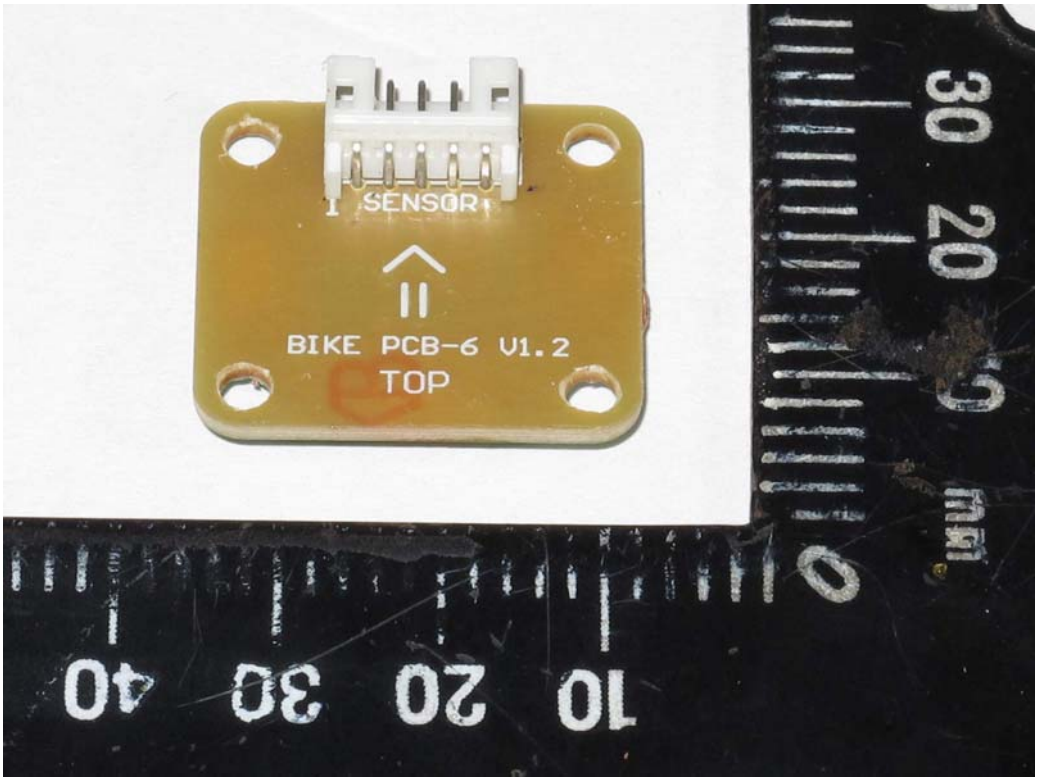

D
LED
K1
V1.0
PCB-7
3-SW






50 40 30 20 10 0
10 20 30 40 50


40 30 20 10 0
10 20 30 40 50


SENSOR
BIKE PCB-6 V1.2
TOP