FCC Test Report

for

Interactive Pen

Brand Name : Qisda

Model No. : LBW

FCC ID : VRSLBW

IC : 8729A-LBW

Report Number : RF-Q045-1006-307

Date of Receipt : June 23, 2010

Date of Report : Aug. 4, 2010

Prepared for

Qisda Corporation

157 Shan-Ying Road, Gueishan, Taoyuan 333, 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

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Verification of Compliance

Brand Name : Qisda

Equipment under Test: Interactive Pen

Model No. : LBW

FCC ID : VRSLBW

IC : 8729A-LBW

Manufacturer : Qisda Corporation

Applicant : Qisda Corporation

Address : 157 Shan-Ying Road, Gueishan, Taoyuan 333, Taiwan,

R.O.C.

Applicable Standards : 47 CFR part 15, Subpart C

RSS 210 Issue 7

Date of Testing : July 7~10, 2010

Deviation : N/A

Condition of Test Sample : Prototype

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

DATE

My 4, 2010

Report No.: RF- Q045-1006-307

APPROVED BY

· DATE :

Aug. 4, 20/0

(Tsun-Yu Shih/General Manager)

(Cathy Chen/ Technical Manager)

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Attachment 2 – External Photographs of EUT

Attachment 3 –Internal Photographs of EUT

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1 General Description

1.1 General Description of EUT

Equipment under Test : Interactive Pen

Model No. : LBW

Power in : 3.7Vdc internal Battery

Test Voltage : 120Vac/50Hz to the notebook

Manufacturer : Qisda Corporation

Channel Numbers : 28

Frequency Range : 2401MHz~2481MHz

Channel :

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
	(MHz)		(MHz)		(MHz)		(MHz)
0	2401	8	2427	15	2448	22	2473
1	2402	9	2428	16	2458	23	2476
2	2403	10	2432	17	2462	24	2477
3	2407	11	2433	18	2463	25	2478
4	2408	12	2442	19	2467	26	2479
5	2417	13	2442	20	2468	27	2480
6	2422	14	2447	21	2472	28	2481
7	2423						

Modulation : MSK

Function Description :

The EUT is used to transmit and receive both control command and data. Please refer to the user's manual for the details.

The devices (supplied by the manufacturer) installed inside the EUT are listed below

Items	Model Number
Antenna Chip	BT-5020
RF chip	CC2500
Main Board	5E.14817

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

Test Mode	Description
Mode 1	Power supplied by the battery.
Mode 2	Power supplied by the notebook with 3m USB cable.
Mode 3	Power supplied by the adapter with 5m USB cable.

According to the preliminary test, it was found that Mode 2 is the worst mode. It was taken as the representative condition for testing and its data are recorded in the present document.

Since the EUT is considered a portable unit, it was pre-tested on the positioned of each 3 axes. There for only the test configuration of the worse case- X axis was used for Radiated test.

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Applied standards 1.2

(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)			
Frequency of Emission (MHZ)	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) Field strength of emissions

According to 15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental	Field Strength	Field Strength
Frequency	of Fundamental	of Harmonics
	(millivolts/meter)	(microvolts/meter)
902 - 928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

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(3) Radiated Emission Requirement

According to 15.249(d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

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.

(4) Occupied Bandwidth

The device must be designed to ensure that the 99% bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates..

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(5) 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.

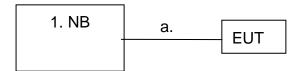
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² Above 38.6

1.3 The Support Units

No.	Unit	Model No./ Serial No.	Trade Name	Power Cord	Supported by lab.
1.	Notebook	LATITUDE D400/5FL891S	DELL	0.8m	V

1.4 Layout of Setup



Connecting Cables:

No.	Cable	Length	Shielded	Core	Shielded Backshell	Supported by lab.	Note
a.	USB Cable	3m		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. Measurement was performed under the conduction that a computer program was excited to simulate data communication of EUT, and the transmission rate was setup maximum allowed by EUT.

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, middle and highest channels by transmitting mode.

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1.5 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 site	Type of Test site	Descriptions	
TR1	10m semi-anechoic chamber	Complying with the NSA requirements in	
IKI	(23m×14m×9m)	documents CISPR 22 and ANSI	
TD44	3m semi-anechoic chamber	C63.4:2003 for the radiated emission	
TR11	$(9m \times 6m \times 6m)$	measurement.	
TR13	Took Cito	For the RF conducted emission	
11(13	Test Site	measurement.	
TR5	Shielding Room	For the conducted emission massurement	
IKS	(8m×5m×4m)	For the conducted emission measurement	

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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
	USA	NVLAP	200575-0	ISO/IEC 17025
	R.O.C.	TAF	0905	ISO/IEC 17025
Accreditation	(Taiwan)	IAF	0905	130/IEC 17025
Certificate			SL2-IN-E-0033,	
Certificate	R.O.C.	BSMI	SL2-IS-E-0033,	ISO/IEC 17025
	(Taiwan)	DOIVII	SL2-R1/R2-E-0033,	130/IEC 17025
			SL2-A1-E-0033	
	USA	FCC	474046 TW1052	Test facility list
	USA		474046, TW1053	& NSA Data
Site Filing	Canada	IC	4600 \ 1 2	Test facility list
Document	Canada	IC	4699A-1, -3	& NSA Data
	lonon	VCCI	R-1527,C-1609,T-131,T-1441,	Test facility list
	Japan	VCCI	G-10	& NSA Data
Authorization	Germany	TUV	10021687-2010	ISO/IEC 17025
Certificate	Norway	Nemko	ELA212	ISO/IEC 17025

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

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1.6 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 3.5dB; Vertical 4.0 dB				
Radiated Emission: (200MHz~1GHz)	Horizontal 4.2dB; Vertical 3.9dB				
Radiated Emission: (1GHz~18GHz)	Horizontal 2.5dB; Vertical 2.5dB				
Radiated Emission: (18GHz~26.5GHz)	Horizontal 4.0dB; Vertical 4.0dB				
Line Conducted Emission	ESH2-Z5	3.1dB			
Line conducted Linission	ENV 4200	3.8dB			

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2 Field Strength of Fundamental

Result: Pass

2.1 Applied standard

Fundamental Frequency	Peak	Average
□ 902 – 928 MHz	500mV/m (114dBuV/m)	50mV/m (94dBuV/m)
☑ 2400 – 2483.5 MHz	500 mV/m (114dBuV/m)	50 mV/m (94dBuV/m)
□ 5725 – 5875 MHz	500 mV/m (114dBuV/m)	50 mV/m (94dBuV/m)
□ 24.0 – 24.25 GHz	2500 mV/m (128dBuV/m)	250 mV/m (108dBuV/m)

2.2 Test Instruments

Test Site and	Manufacturer	Model No./	Last	Calibration
Equipment		Serial No.	Calibration Date	Due Date
Spectrum Analyzer	Agilent	E4407B/ MY45106795	2010/5/4	2011/5/3
Antenna	EMCO	3117/57416	2010/3/5	2011/3/4
RF Cable	Cable N/A N/A/C0083+C00		2010/5/28	2011/5/27
Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	2010/4/20	2011/4/19

Note:

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

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Instrument Setting

RBW	VBW	Detector	Trace	Comment
1MHz	1MHz	Peak	Maxhold	Peak
1MHz	10Hz	Peak	Maxhold	Average

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Climatic Condition

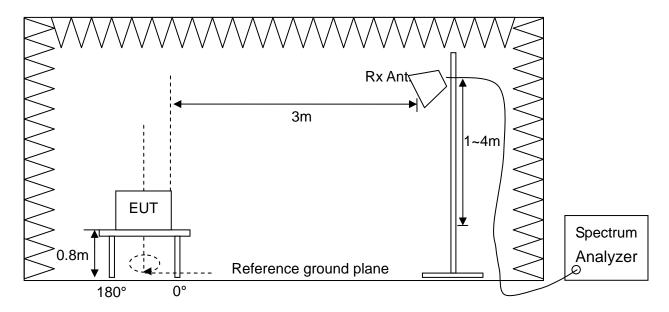
Ambient Temperature: 24°C Relative Humidity: 54%

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 wooden 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 higher emission level and record it.
- g. Then measure 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. Set the spectrum detector to be Peak or Average to find out the maximum level occurred.
- i. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna 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.

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Test configuration 2.4



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2.5 Test Data

Test Mode : Continuous Transmitting Tester : Bill

Frequency (MHz)	Polarization	/AD\/\		Factor	Output Field Strength (dBµV/m)		Limit (dBµV/m)		Margin (dB)	
()		PK	AV	(dB/m)	PK	AV	PK	AV	PK	AV
0.404.0	V	93.92 54.92 4.25		4.25	98.17	59.17	114	94	15.83	34.83
2401.2	Н	92.74	54.32	4.25	96.99	58.57	114	94	17.01	35.43
2447.20	V	90.57	54.06	4.21	94.78	58.27	114	94	19.22	35.73
2447.20	Н	91.32	54.42	4.21	95.53	58.63	114	94	18.47	35.37
0404.40	V	90.06	53.61	4.18	94.24	57.79	114	94	19.76	36.21
2481.10	Н	90.66	55.30	4.18	94.84	59.48	114	94	19.16	34.52

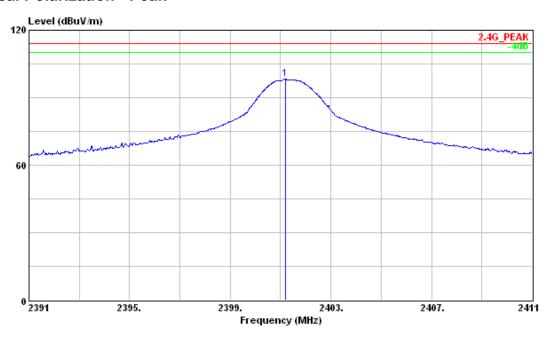
Note:

- 1. Correction Factor (dB/m) = Cable Loss + Antenna Factor
- 2. Output Field Strength (dBuV/m) = Reading Data + Correction Factor
- 3. Margin (dB) = Limit Output Field Strength

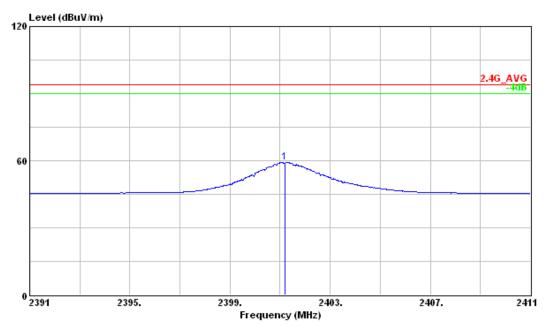
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2401MHz **Vertical Polarization - Peak**

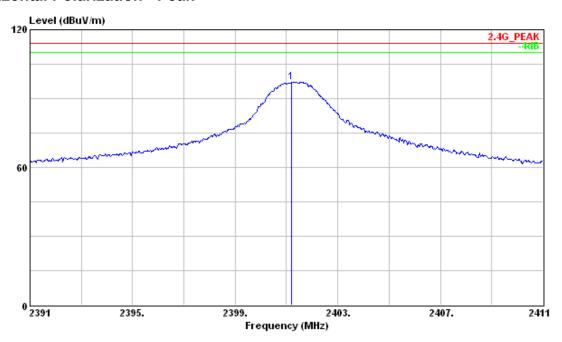


Vertical Polarization - Average

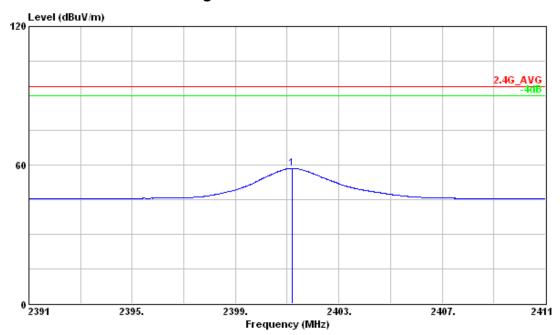


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Horizontal Polarization - Peak

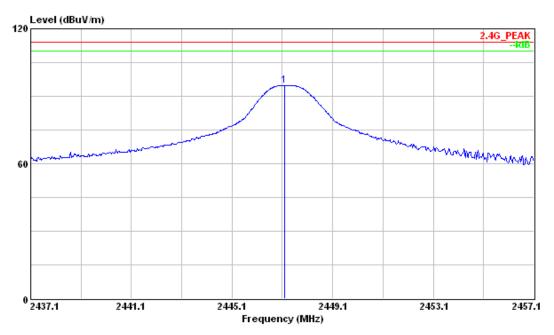


Horizontal Polarization - Average

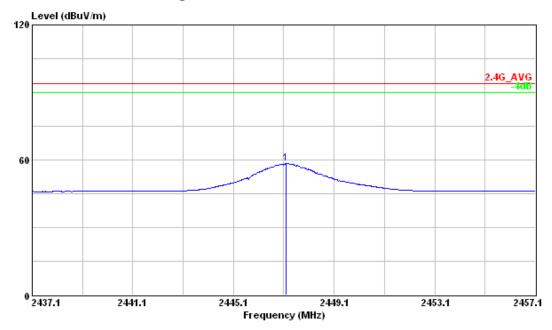


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2447MHz **Vertical Polarization - Peak**

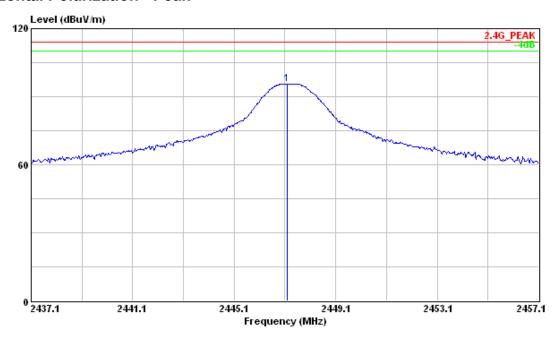


Vertical Polarization - Average

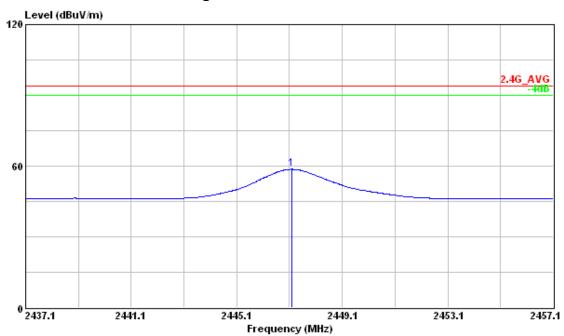


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Horizontal Polarization - Peak

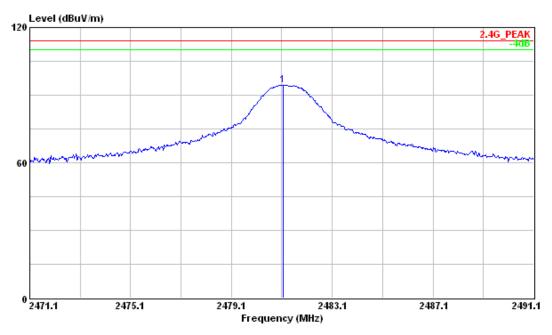


Horizontal Polarization - Average

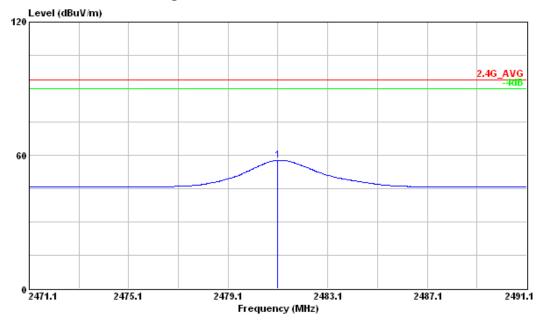


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2481MHz **Vertical Polarization - Peak**



Vertical Polarization - Average

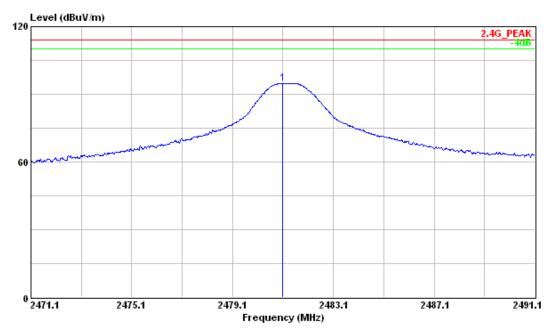


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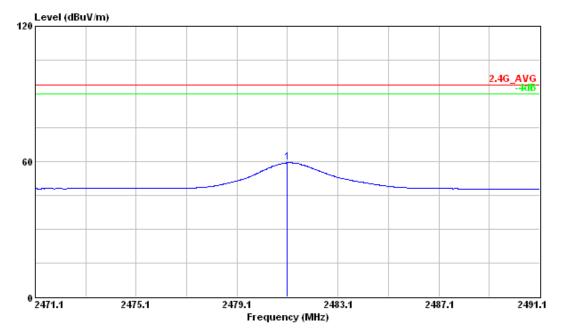
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Horizontal Polarization - Peak



Horizontal Polarization - Average



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3 Radiated Emission Measurement

Result: PASS

3.1 Limit for Radiated Emission Measurement

Limit for Harmonics Radiation Emission Measurement

Fundamental Frequency	Field Strength of Harmonics
□ 902 – 928 MHz	500 uV/m (54dBuV/m)
☑ 2400 – 2483.5 MHz	500 uV/m (54dBuV/m)
□ 5725 – 5875 MHz	500 uV/m (54dBuV/m)
□ 24.0 – 24.25 GHz	2500 uV/m(68dBuV/m)

Limit for Other Emissions except Harmonics

Frequency (MHz)	Quasi-peak (dBμV/m)					
30 to 88	4	40				
88 to 216	43.5					
216 to 960	46					
960 to 1000	5	4				
Frequency (MHz)	Peak (dΒμV/m) Average (dΒμV					
Above 1000	74	54				

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

Note 2- Additional provisions may be required for cases where interference occurs.

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3.2 Test Instruments

Test Site and	Manufacturer	Manufacturer Model No./		Calibration	
Equipment		Serial No.	Calibration Date	Due Date	
Spectrum Analyzer	Agilent	E4407B/	2010/5/4	2011/5/3	
opectrum Analyzer	, ig	MY45106795	2010/3/4	2011/3/3	
EMI Test Receiver	R&S	ESCI/100019	2009/11/30	2010/11/29	
Broadband Antenna	Broadband Antenna EMCO 3142C/		2009/7/22	2010/7/21	
Antenna EMCO		3117/57416	2010/3/5	2011/3/4	
PRE-AMPLIFIER	-AMPLIFIER MITEQ AFS6-02007 -10P-6/94		2009/9/11	2010/09/10	
Pre-Amplifier	Mini Circuit	ZKL-2/004	2010/8/8	2010/8/7	
Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	2010/4/20	2011/4/19	

Note:

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

Instrument Setting

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

Climatic Condition

Ambient Temperature: 23°C; Relative Humidity: 52%

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3.3 Test Procedures

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 wooden 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.

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.

I. 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

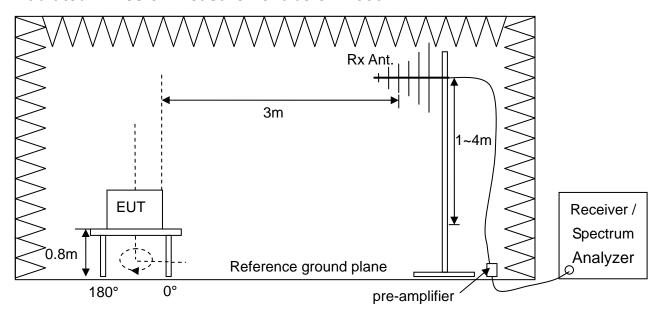
specified, then the emission values presented will be the peak value only. Otherwise, accurate

A.V. value will be measured and presented.

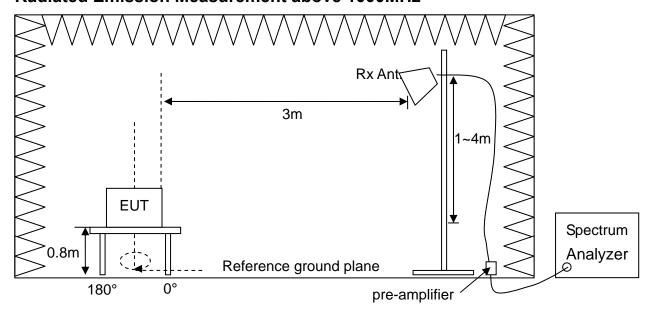
FAX.: 886-2-25984546

3.4 Test Configuration

Radiated Emission Measurement below 1000MHz



Radiated Emission Measurement above 1000MHz



No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Band Edge

3.5 Test Results

Test Mode : Continuous Transmitting

Test Distance : 3m Tester : Bill

Test Range	Polarization	olarization Frequency (MHz)		ding dBuV)	Correction Factor	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
		(*****	PK.	AV.	(dB/m)	PK.	AV.	PK.	AV.	PK.	AV.
Lowest	V	2388.90	88.63	62.04	-29.48	59.15	32.56	74	54	14.85	21.44
Lowest	Н	2388.90	86.17	62.07	-29.48	56.69	32.59	74	54	17.31	21.41
Highoot	V	2483.5	95.02	63.33	-29.53	65.49	33.80	74	54	8.51	20.20
Highest	Н	2483.5	96.76	69.16	-29.53	67.23	39.63	74	54	6.77	14.37

Report No.: RF- Q045-1006-307

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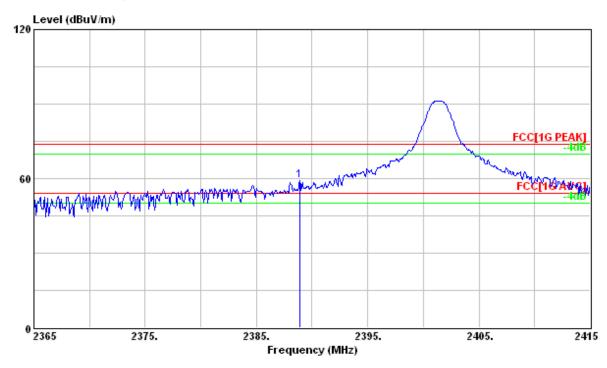
Note:

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

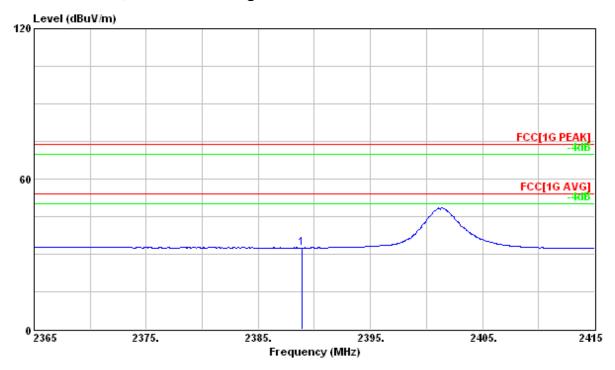
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Lowest Channel, Vertical - Peak



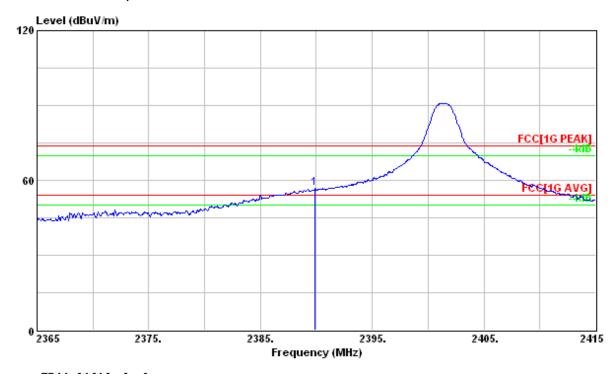
Lowest Channel, Vertical - Average



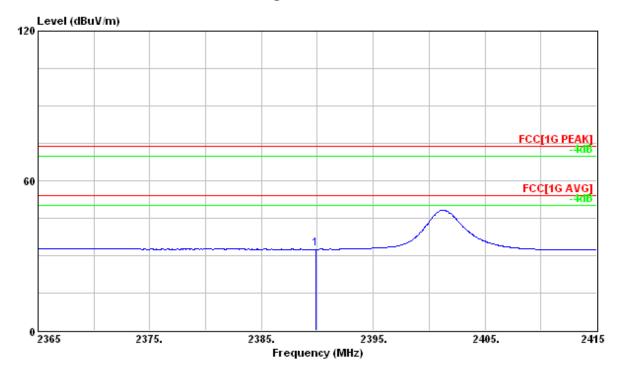
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Lowest Channel, Horizontal - Peak



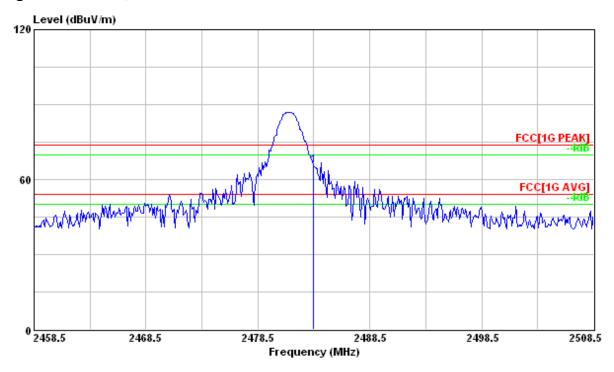
Lowest Channel, Horizontal - Average



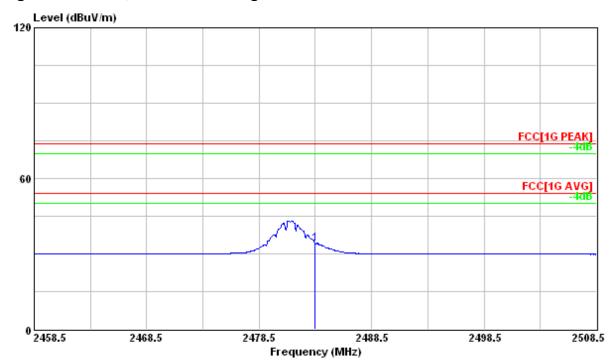
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Highest Channel, Vertical - Peak



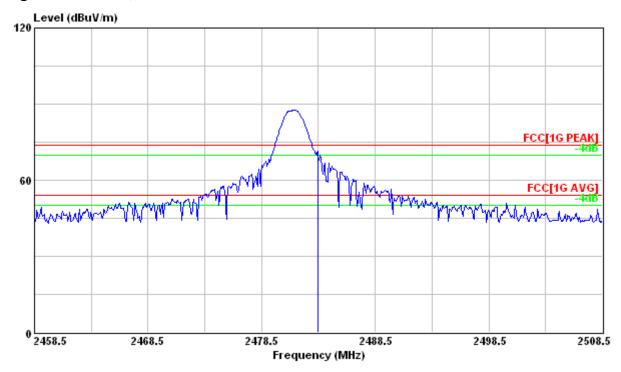
Highest Channel, Vertical - Average



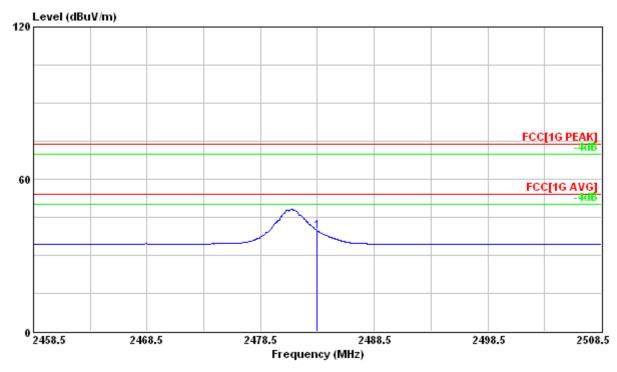
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Highest Channel, Horizontal - Peak



Highest Channel, Horizontal - Average



No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

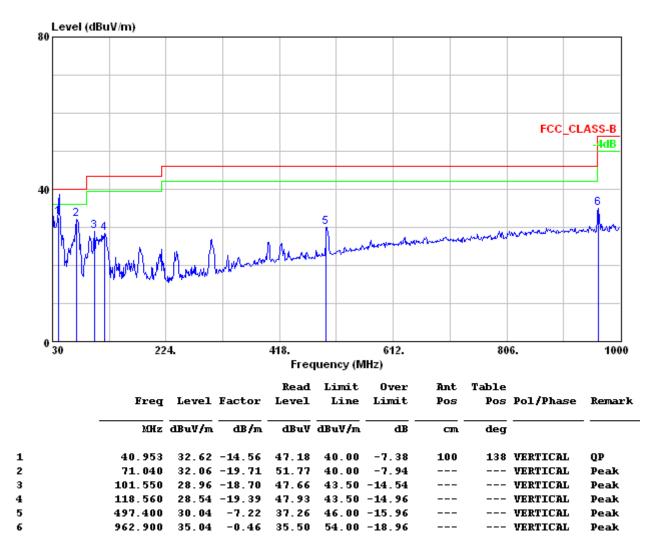
Transmitter Radiated Emission Measurement

Below 1000MHz

Test Mode : Continuous Transmitting, 2401MHz

Test Distance : 3m Tester : Bill

Polarization: Vertical Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

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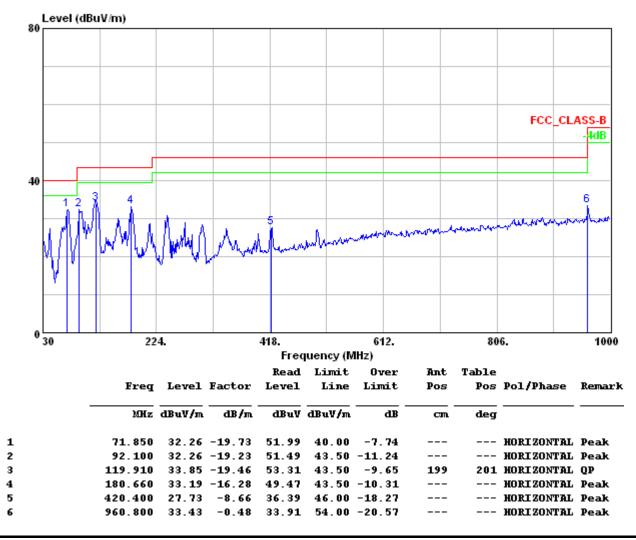
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous Transmitting, 2401MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 30MHz~1000MHz



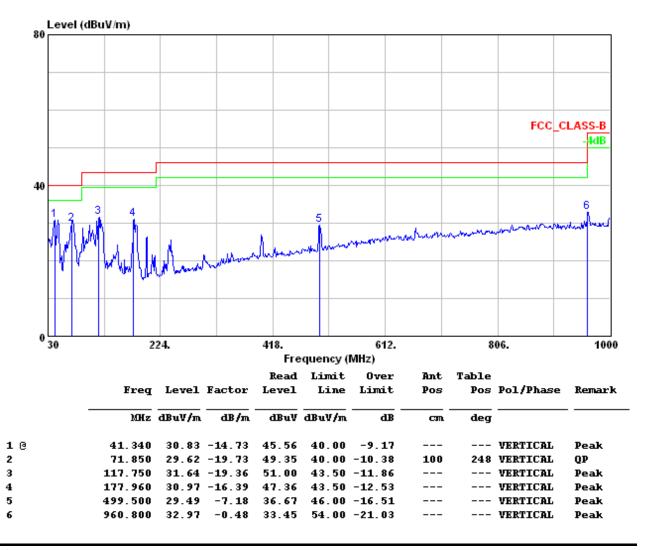
Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

Test Mode : Continuous Transmitting, 2447MHz

Test Distance : 3m Tester : Bill

Polarization: Vertical Frequency Range: 30MHz~1000MHz



Note:

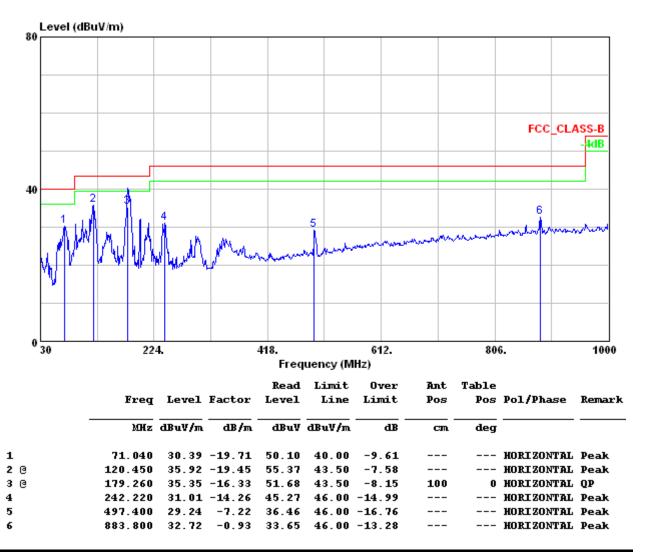
- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous Transmitting, 2447MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

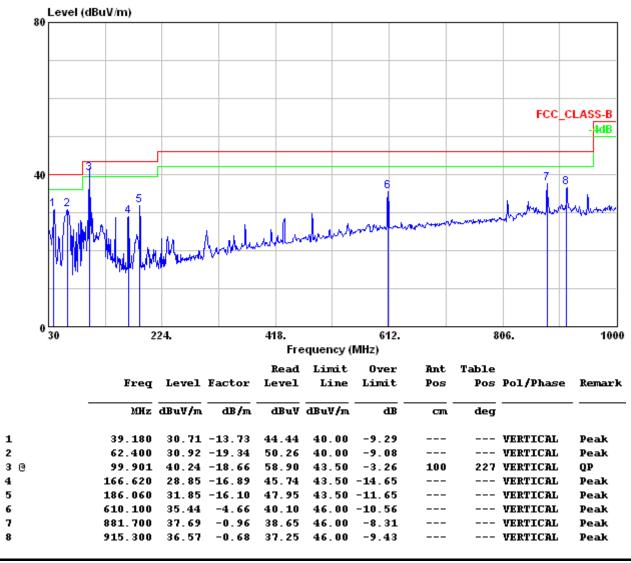
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous Transmitting, 2481MHz

Test Distance : 3m Tester : Bill

Polarization: Vertical Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

CENTRAL RESEARCH TECHNOLOGY CO.

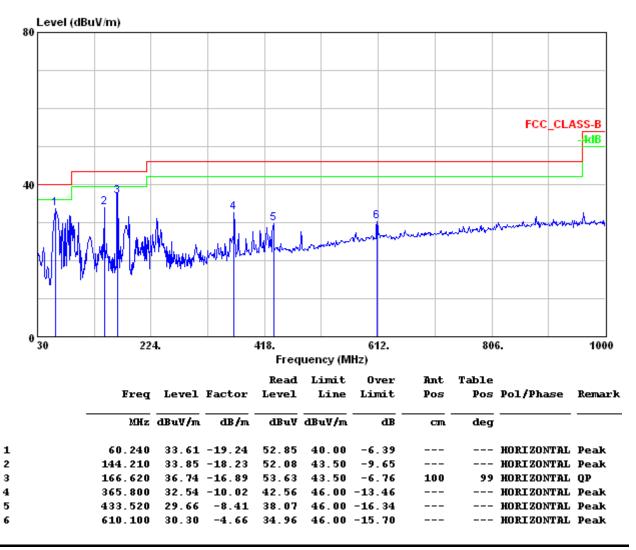
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous Transmitting, 2481MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

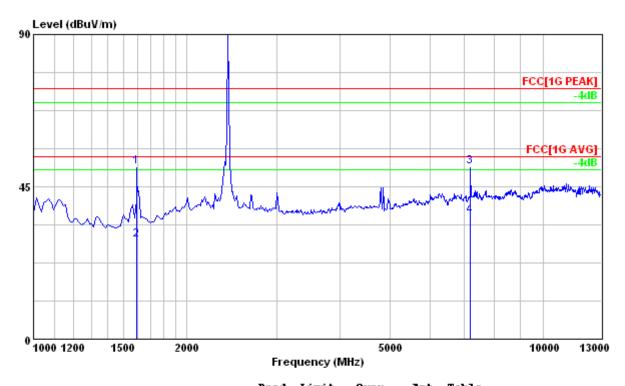
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Above 1000MHz

Test Mode : Continuous transmitting, 2401MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 1GHz ~ 25GHz



	Freq	Level	Factor	Kead Level			Ant Pos		Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dВ	cm	deg		
1	1596.980	50.99	-33.37	84.36	74.00	-23.01	130	298	VERTICAL	Peak
2	1596.980	29.32	-33.37	62.69	54.00	-24.68	130	298	VERTICAL	Average
3	7203.500	50.98	-23.96	74.94	74.00	-23.02	100	18	VERTICAL	Peak
4 0	7203.500	36.54	-23.96	60.50	54.00	-17.46	100	18	VERTICAL	Average

Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

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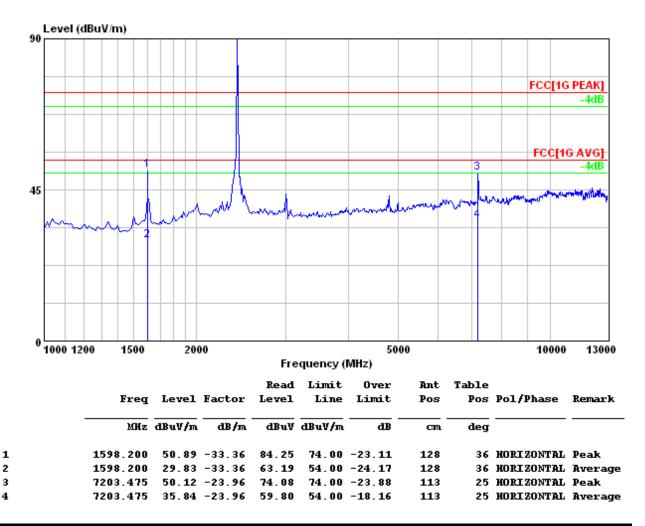
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous transmitting, 2401MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

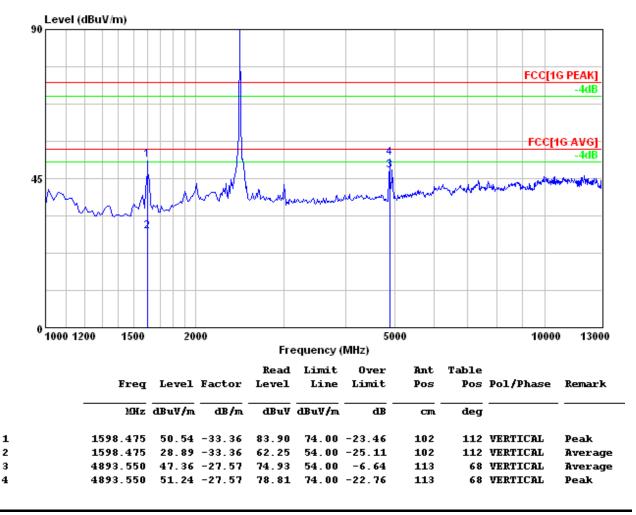
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous transmitting, 2447MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

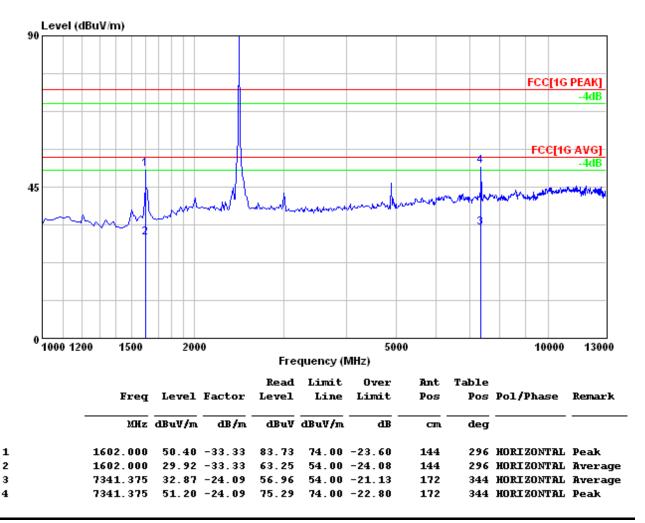
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous transmitting, 2447MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

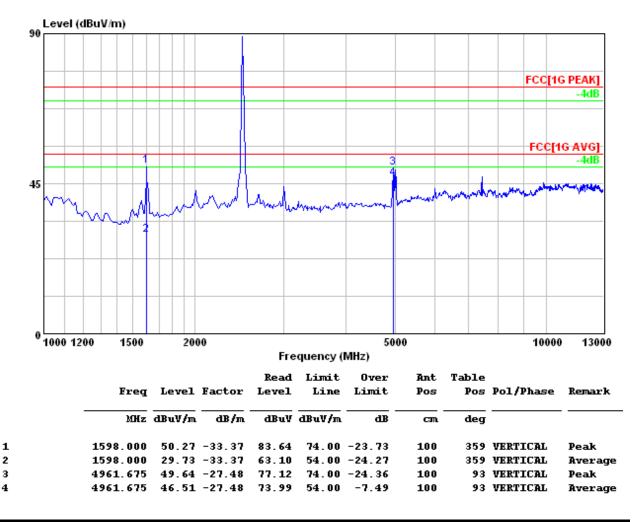
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous transmitting, 2481MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

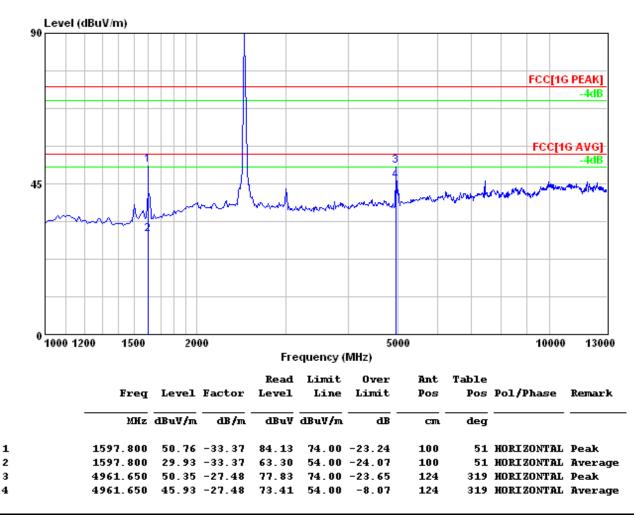
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous transmitting, 2481MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

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No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

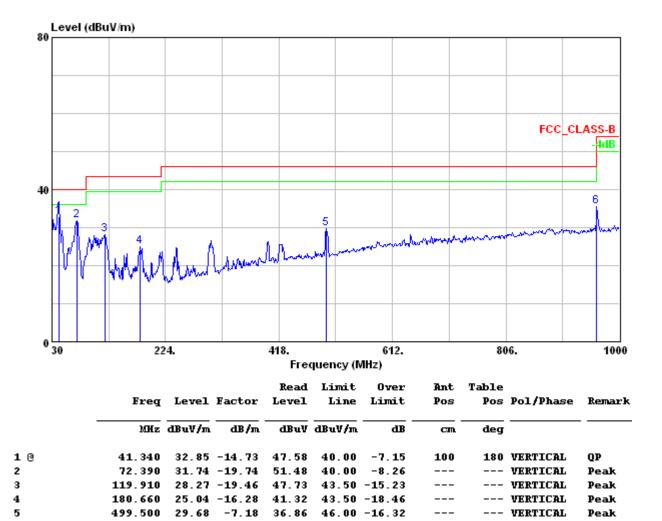
Receiver Radiated Emission Measurement

Below 1000MHz

Test Mode : Continuous receiving, 2401MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 30MHz~1000MHz



Note:

1. Emission Level = reading value + correction factor.

35.52

2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

-0.48

36.00

54.00 -18.48

--- VERTICAL

Peak

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3. Q.P is abbreviation of quasi-peak.

960.800

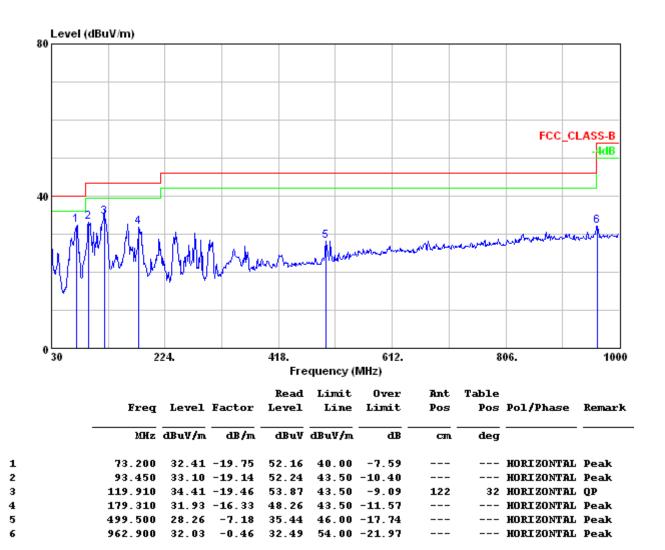
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous receiving, 2401MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

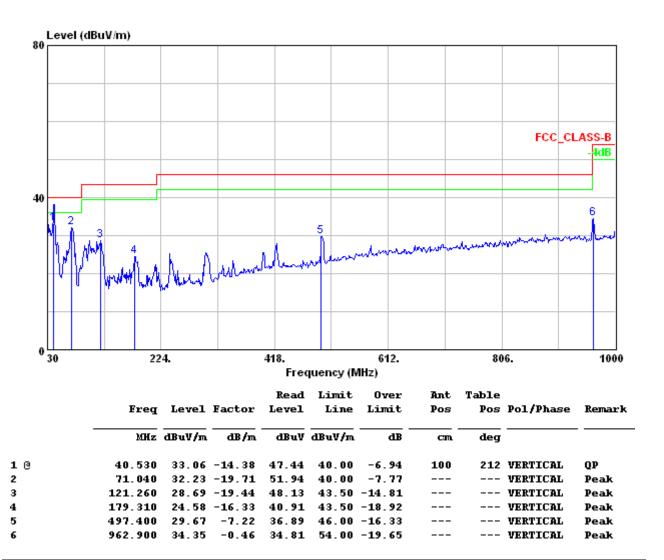
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous receiving, 2447MHz

Test Distance : 3m Tester : Bill

Polarization: Vertical Frequency Range: 30MHz~1000MHz



Note:

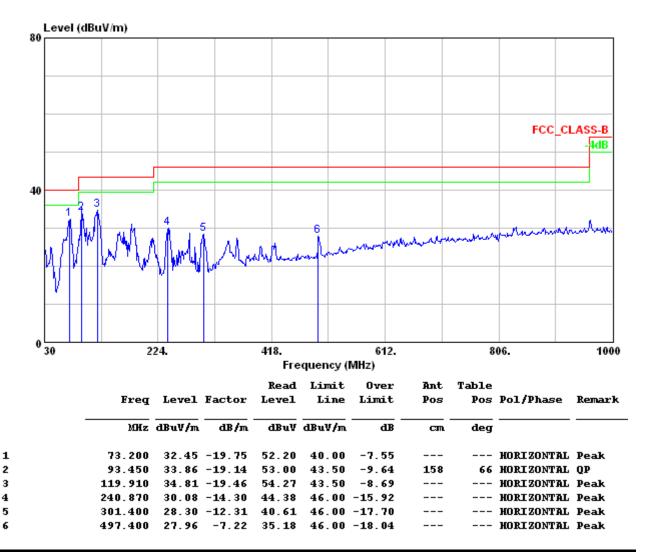
- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous receiving, 2447MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

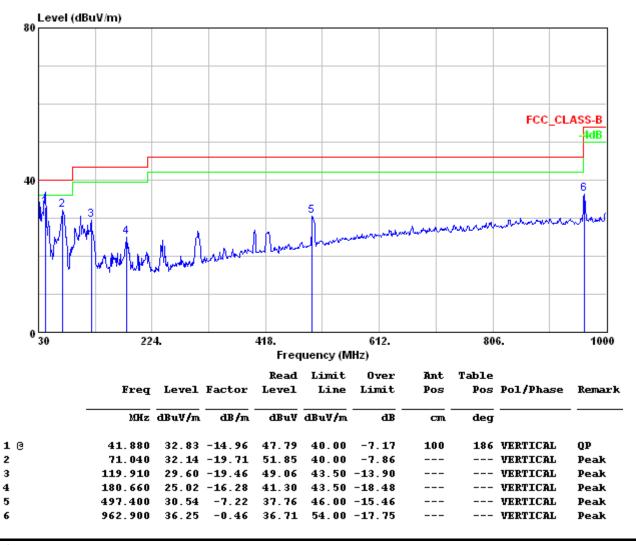
CENTRAL RESEARCH TECHNOLOGY CO.

No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous receiving, 2481MHz

Test Distance : 3m Tester : Bill

Polarization: Vertical Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

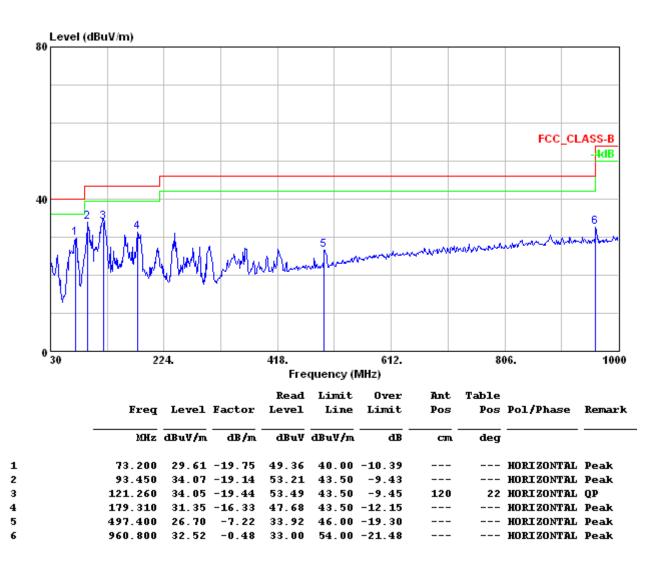
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous receiving, 2481MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 30MHz~1000MHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.
- 3. Q.P is abbreviation of quasi-peak.

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No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

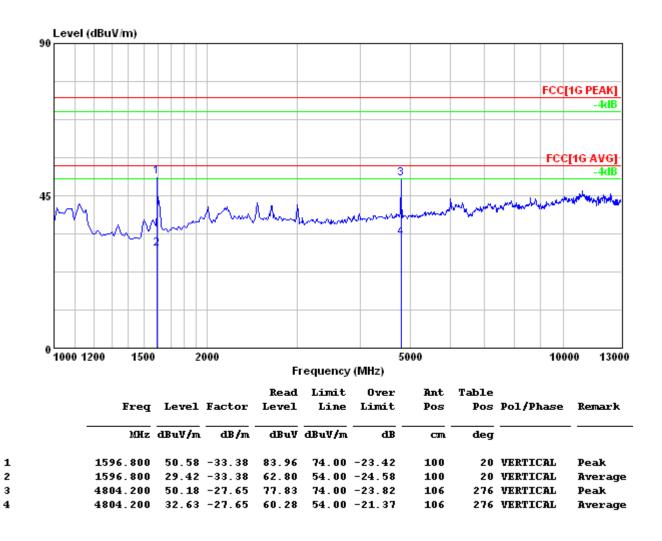
Page: 50/60

Above 1000MHz

Test Mode : Continuous receiving, 2401MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

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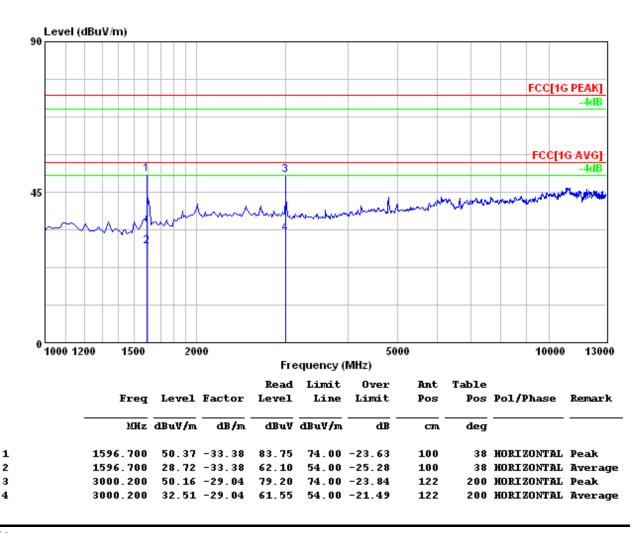
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous receiving, 2401MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

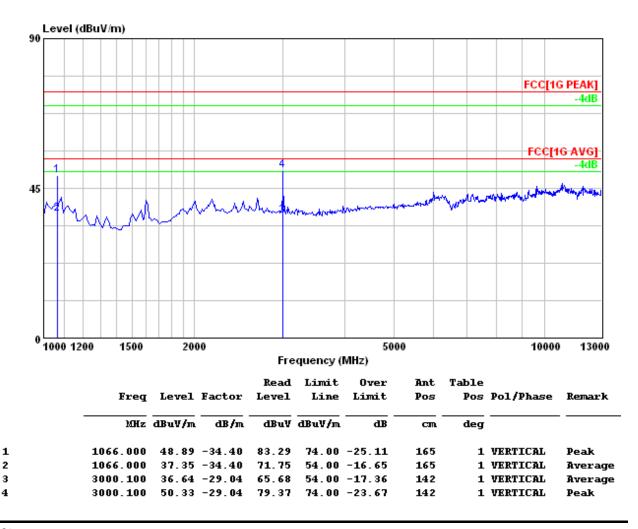
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous receiving, 2447MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

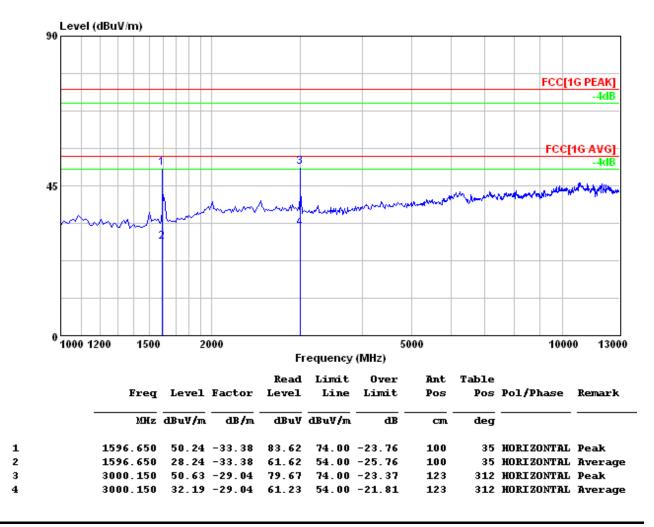
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous receiving, 2447MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

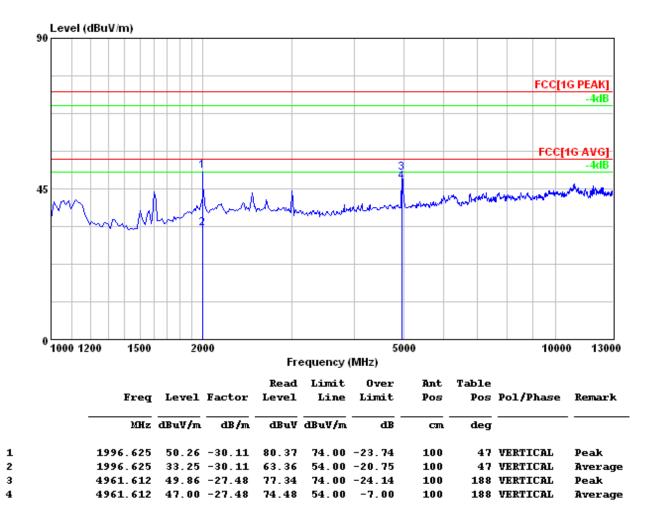
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous receiving, 2481MHz

Test Distance : 3m Tester : Bill

Polarization : Vertical Frequency Range : 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

CENTRAL RESEARCH TECHNOLOGY CO.

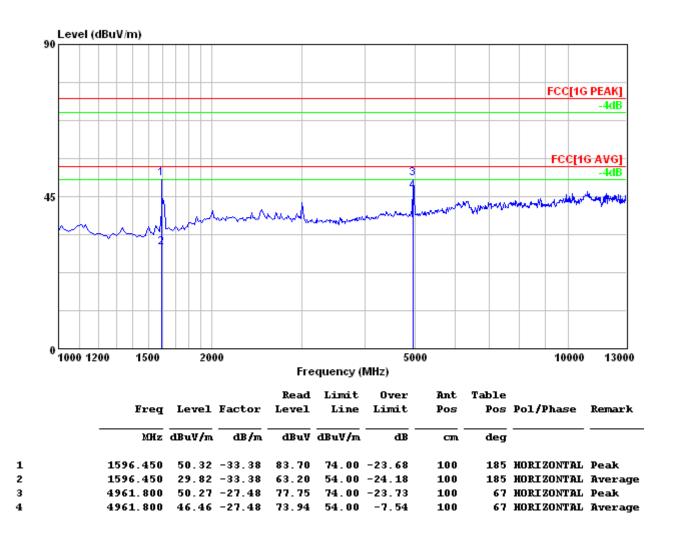
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

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Test Mode : Continuous receiving, 2481MHz

Test Distance : 3m Tester : Bill

Polarization: Horizontal Frequency Range: 1GHz ~ 25GHz



Note:

- 1. Emission Level = reading value + correction factor.
- 2. Correction factor = cable loss + antenna factor gain of pre-amplifier.

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

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Occupied Bandwidth

Result: Pass

4.1 Applied Standard

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

4.2 Test Instruments

Test Site and	Manufacturer	Model No./	Last	Calibration
Equipment	Wallulacturer	Serial No.	Calibration Date	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.
- NCR: No Calibration Required. 2.

Instrument Setting

RBW	VBW	Detector	Trace	Comment
100kHz	300kHz	Sample	Maxhold	

Climatic Condition

Ambient Temperature : 24°C; Relative Humidity : 55%

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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 described in the user's manual supported by the manufacturer in test site.
- b. Measure the 99% bandwidth by using the spectrum analyzer and following the test conditions described in RSS-Gen.
- c. Record the frequency and bandwidth.

4.4 Test Configuration



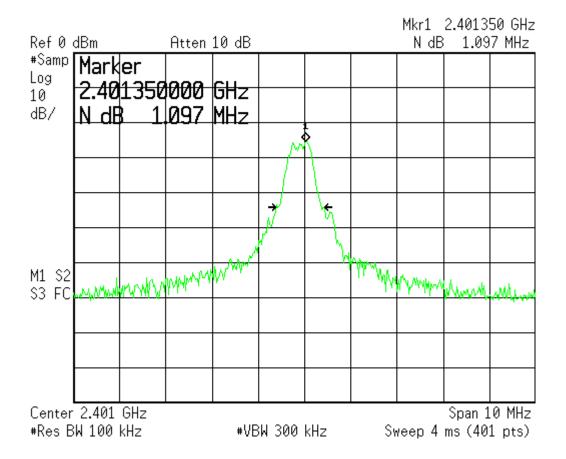
CENTRAL RESEARCH TECHNOLOGY CO.
No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

4.5 Test Data

Test Mode : Continuous transmitting, 2401MHz

Tester : Bill

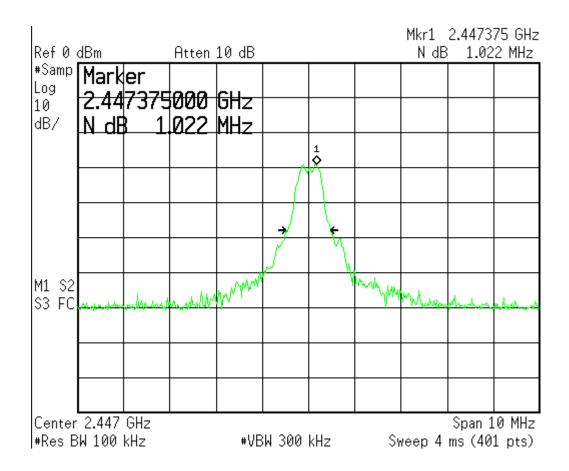
Operating Frequency	Measured Valued	Limit
(MHz)	(MHz)	(kHz)
2401.35	1.097	



Test Mode : Continuous transmitting, 2447MHz

Tester : Bill

Operating Frequency	Measured Valued	Limit
(MHz)	(MHz)	(kHz)
2447.38	1.022	_



No. 11, Lane 41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Test Mode : Continuous transmitting, 2481MHz

Tester : Bill

Operating Frequency	Measured Valued	Limit
(MHz)	(MHz)	(kHz)
2481.33	0.997	

