FCC 47 CFR PART 15 Subpart C

TEST REPORT

For

USB DUNGLE

Model Number: RECEIVER001

Trade Name: CAN

Issued to

CAN TECHNOLOGY CO., LTD.
NO. 827, SEC.1, JUNG HUA RD., JUNG LI CITY,
TAOYUAN HSIEN, TAIWAN, R.O.C.

Issued by

Compliance Certification Services Inc.
No. 81-1, Lane 210, Bade Rd. 2, Luchu Hsiang,
Taoyuan Hsien, (338) Taiwan, R.O.C.
http://www.ccsemc.com.tw
service@tw.ccsemc.com

Testing Laboratory
0363

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION

Applicant: CAN TECHNOLOGY CO., LTD.
NO. 827, SEC.1, JUNG HUA RD., JUNG LI CITY,
TAOYUAN HSIEN, TAIWAN, R.O.C.

Equipment Under Test: USB DUNGLE

Trade Name: CAN

Model Number: RECEIVER001

Date of Test: January 5 ~ 9, 2008

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements emission limits of FCC Rules Part 15.107, 15.109,15.207, 15.209 and 15.249.
The test results of this report relate only to the tested sample identified in this report.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

S.C. Wang
Executive Vice President
Compliance Certification Services Inc.

Reviewed by:

Miller Lee
Deputy Manager of Linkou Laboratory
Compliance Certification Services Inc.

2. EUT DESCRIPTION

Product	USB DUNGLE
Trade Name	CAN
Model Number	RECEIVER001
Model Discrepancy	N/A
Power Supply	5VDC from PC
Frequency Range	2405~2477 MHz
Modulation Technique	GFSK
Antenna Specification	Monopole Antenna：Gain: 0.6dBi PCB Antenna is disabled.

Remark:

1. *The sample selected for test was production product and was provided by manufacturer.*
2. *This submittal(s) (test report) is intended for FCC ID: IZICAN61977 filing to comply with Section 15.107 & 15.109 (FCC Part 15, Subpart B) and Section 15.207, 15.209, 15.249 (FCC Part 15, Subpart C Rules.)*

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.249.

3.1EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.107 and 15.109 under the FCC Rules Part 15 Subpart B and Section 15.207, 15.209,15.249 under the FCC Rules Part 15 Subpart C.

3.3GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.

3.4FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
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 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

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

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5DESCRIPTION OF TEST MODES

The EUT (model: RECEIVER001) had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only, and powerline conducted emission below 30MHz, which worst case was in normal link mode with charging only.

Channel Low (2405MHz), Channel Mid (2438MHz) and Channel High (2477MHz) were chosen for the final testing.

4. INSTRUMENT CALIBRATION

4.1MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Remark: *Each piece of equipment is scheduled for calibration once a year.*

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008
Spectrum Analyzer	R&S	FSEB	825829/011	10/11/2008
Pre-Amplifier	Anritsu	MH648A	M89145	07/20/2008
Pre-Amplifier	Agilent	8449B	3008A01738	04/11/2008
Bilog Antenna	FRANKONIA	BTA-M	030003M	N.C.R
Horn Antenna	EMCO	3115	00022257	12/18/2008
Antenna Tower	HD	AS620E	N/A	N.C.R
Controller	HD	HD100	N/A	N.C.R
Turn Table	HD	DT-K312	N/A	N.C.R
Test S/W	LabVIEW 6.1 (Wugu Chamber EMI Teat V1_4.5.3)			

Remark: *The measurement uncertainty is less than +/-2.0065dB (30MHz ~ 1GHz), +/-3.0958dB (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

Open Area Test Site # 3				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilnet	E4411B	MY41440314	01/30/2008
Spectrum Analyzer	R&S	FSP30	100112	10/14/2008
EMI Test Receiver	R&S	ESVS30	828488/004	03/12/2008
Pre-Amplifier	Anritsu	MH648A	M18767	09/09/2008
Pre-Amplifier	Agilent	8449B	3008A01738	04/11/2008
Bilog Antenna	SCHWAZBECK	VULB9163	144	03/30/2008
Horn Antenna	EMCO	3115	00022250	05/03/2008
Loop Antenna	EMCO	6502	2356	05/28/2010
Turn Table	Chance Most	CM-T003-1	T807-6	N.C.R
Antenna Tower	Chance Most	CM-A003-1	A807-6	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Site NSA	CCS	N/A	N/A	05/18/2008
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.6)			

Remark: *The measurement uncertainty is less than +/- 2.16dB, which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.*

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No. 199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.
Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☐ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan
Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☒ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, EIC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	ACCREDITED 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	Testing Laboratory 0363
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 3991-3, IC 3991-4) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	IC 2324C-3 IC 2324C-5 IC 6106

** No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Notebook Computer (Remote)	SONY	PDG-6GFP	J000YXJM	FCC DoC	N/A	AC I/P: Unshielded, 1.8m O/P: Unshielded, 1.8m

Remark: *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*

7. FCC PART 15.249 REQUIREMENTS

7.1 BAND EDGES MEASUREMENT

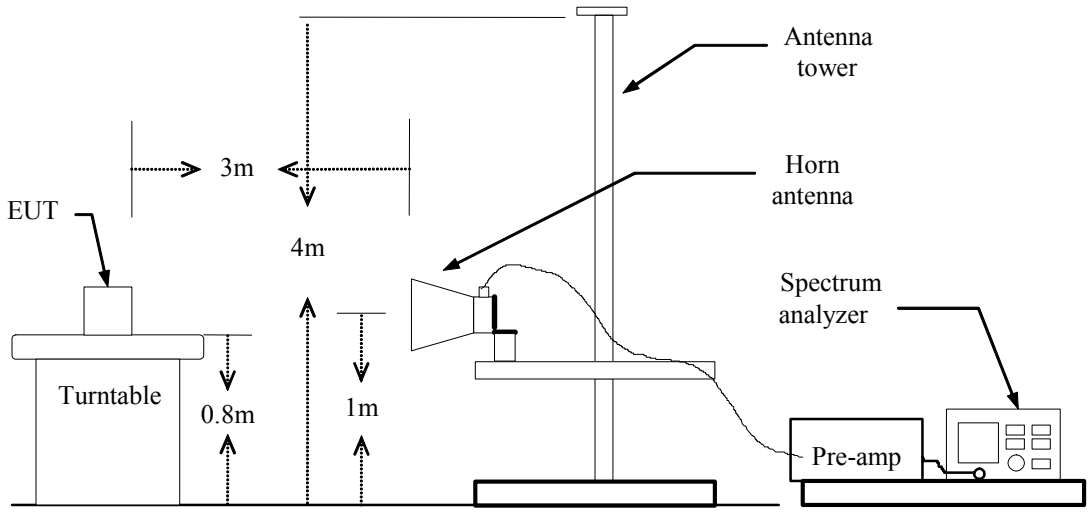
LIMIT

1. In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Test Configuration



TEST PROCEDURE

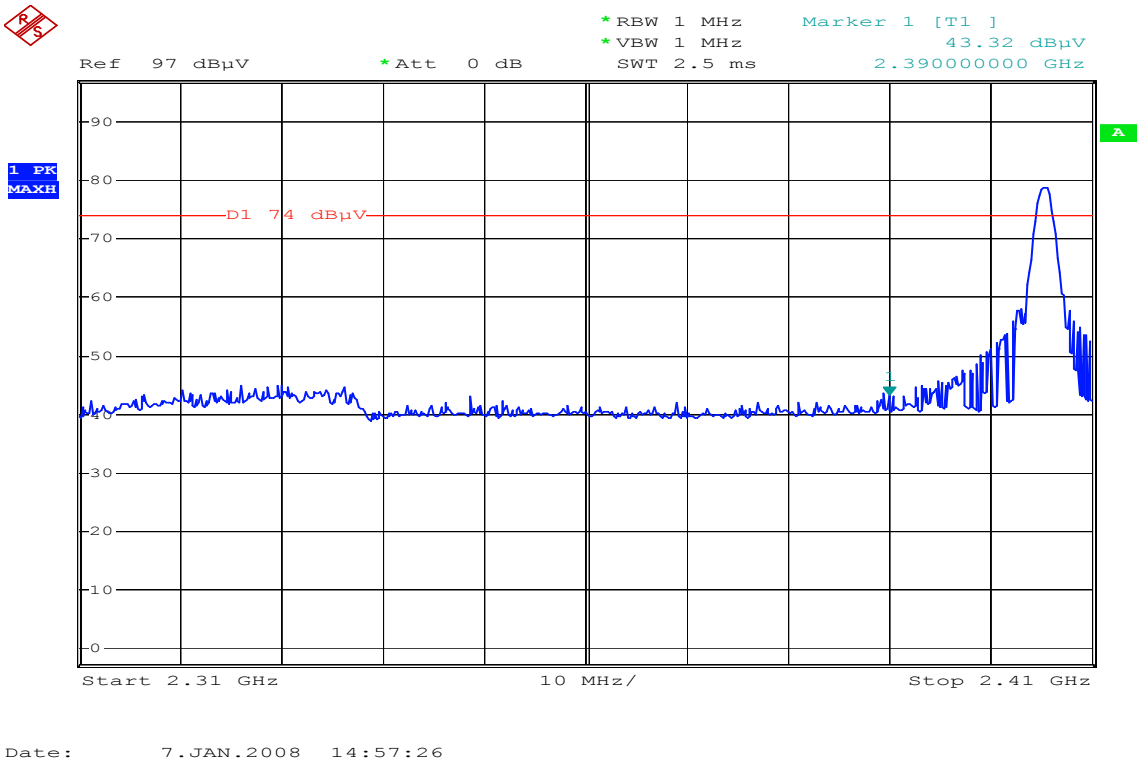
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

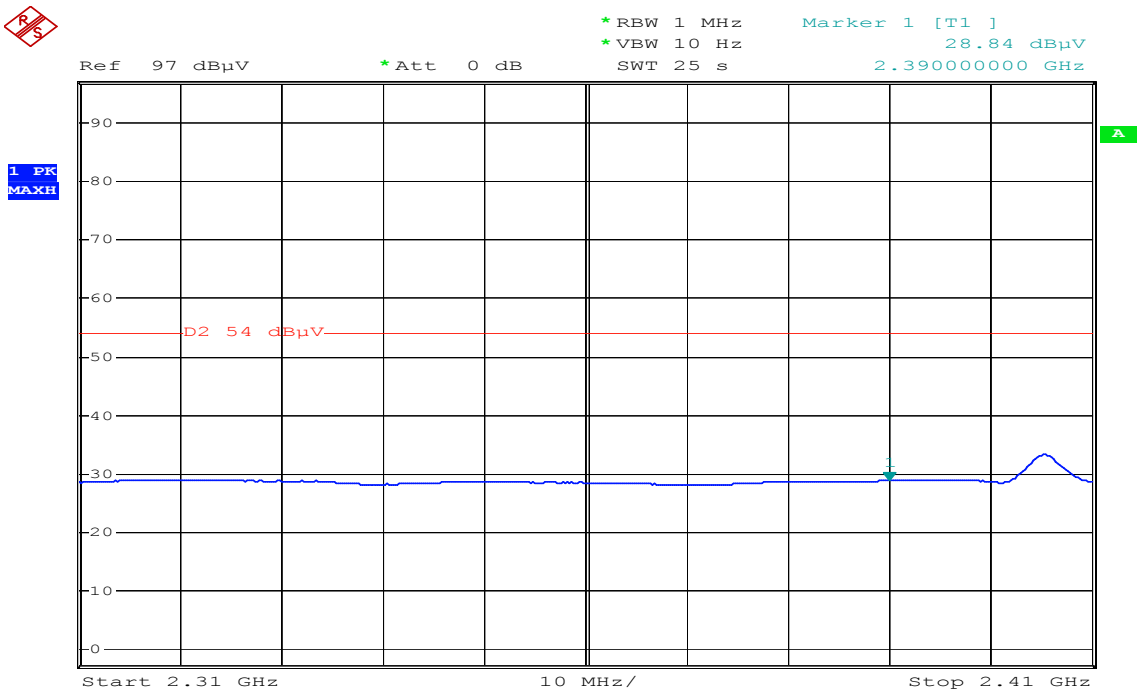
Band Edges (CH Low)

Detector mode: Peak Polarity: Vertical



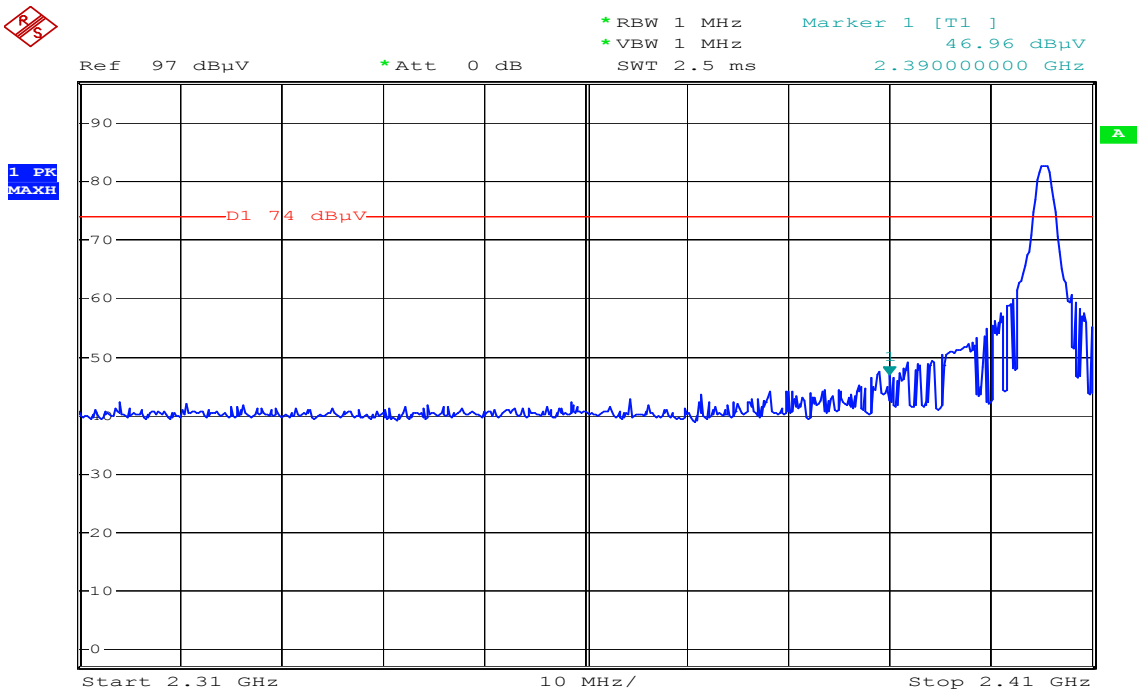
Date: 7.JAN.2008 14:57:26

Detector mode: Average Polarity: Vertical



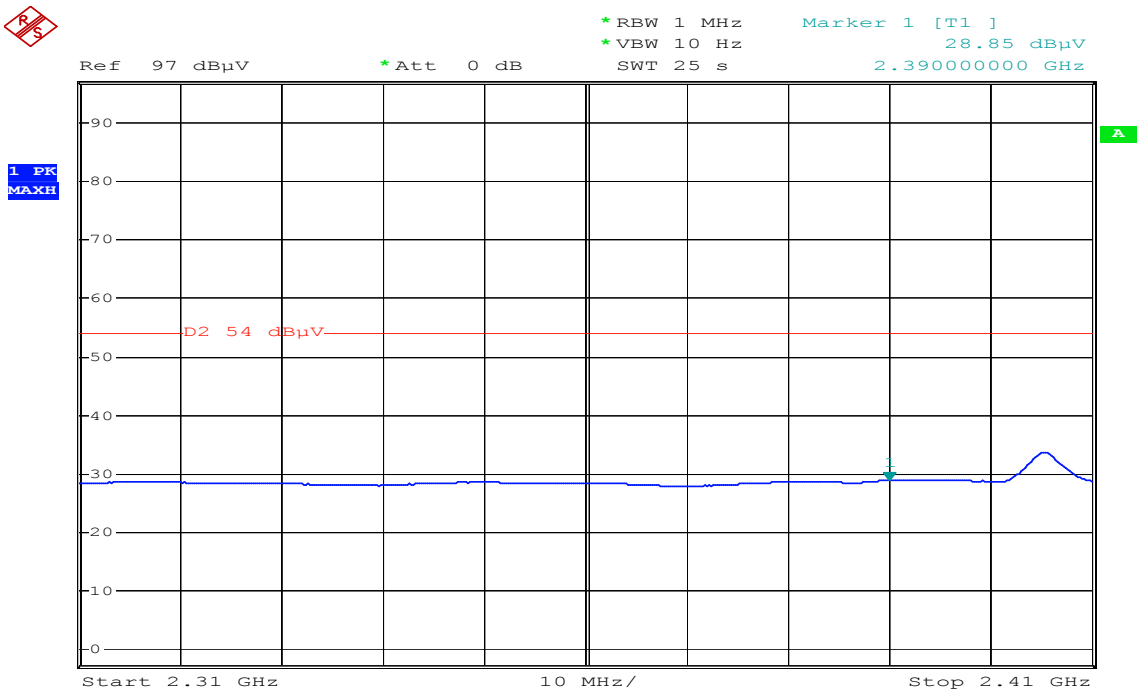
Date: 7.JAN.2008 14:59:37

Detector mode: Peak Polarity: Horizontal



Date: 7.JAN.2008 14:53:33

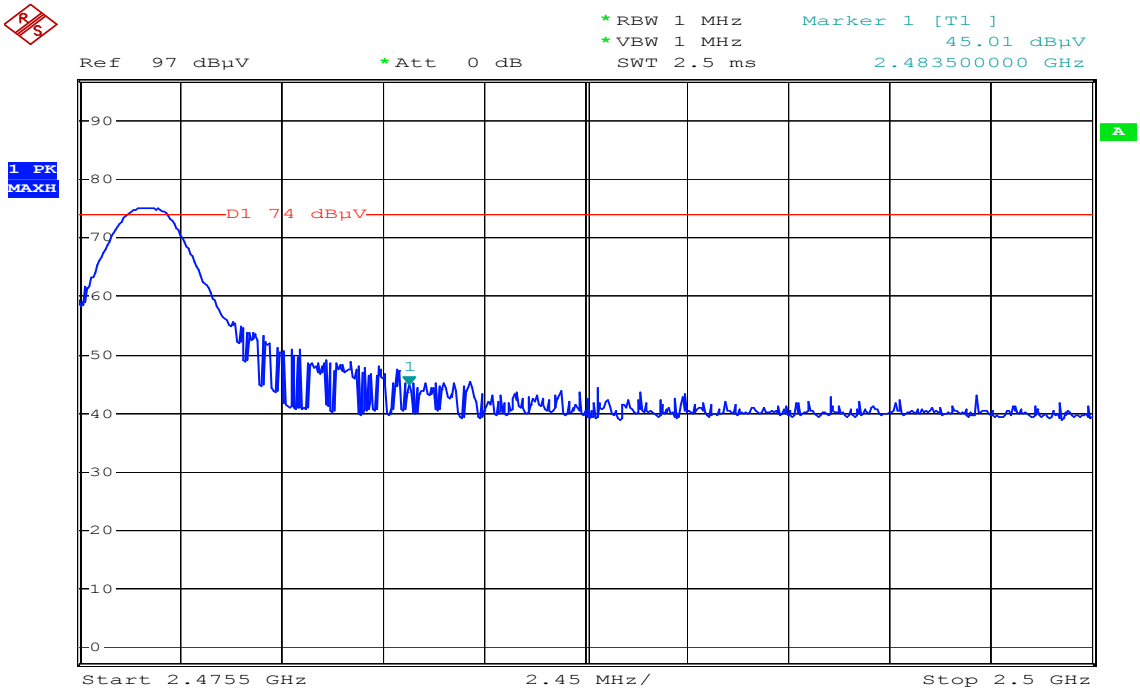
Detector mode: Average Polarity: Horizontal



Date: 7.JAN.2008 14:55:10

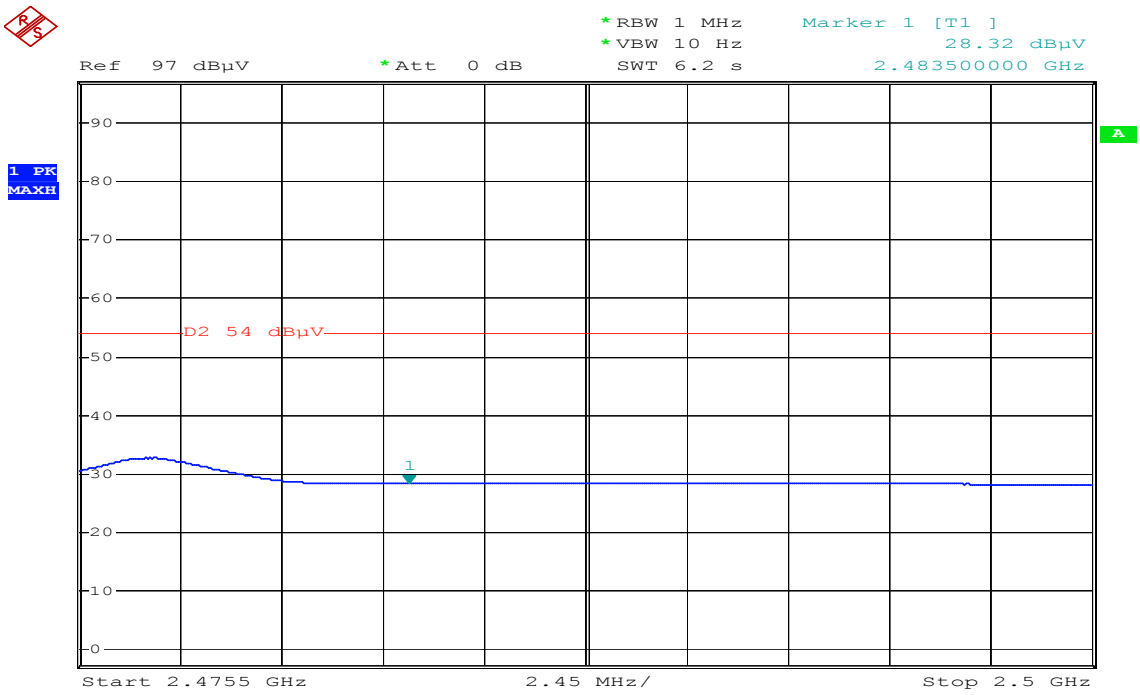
Band Edges (CH High)

Detector mode: Peak Polarity: Vertical



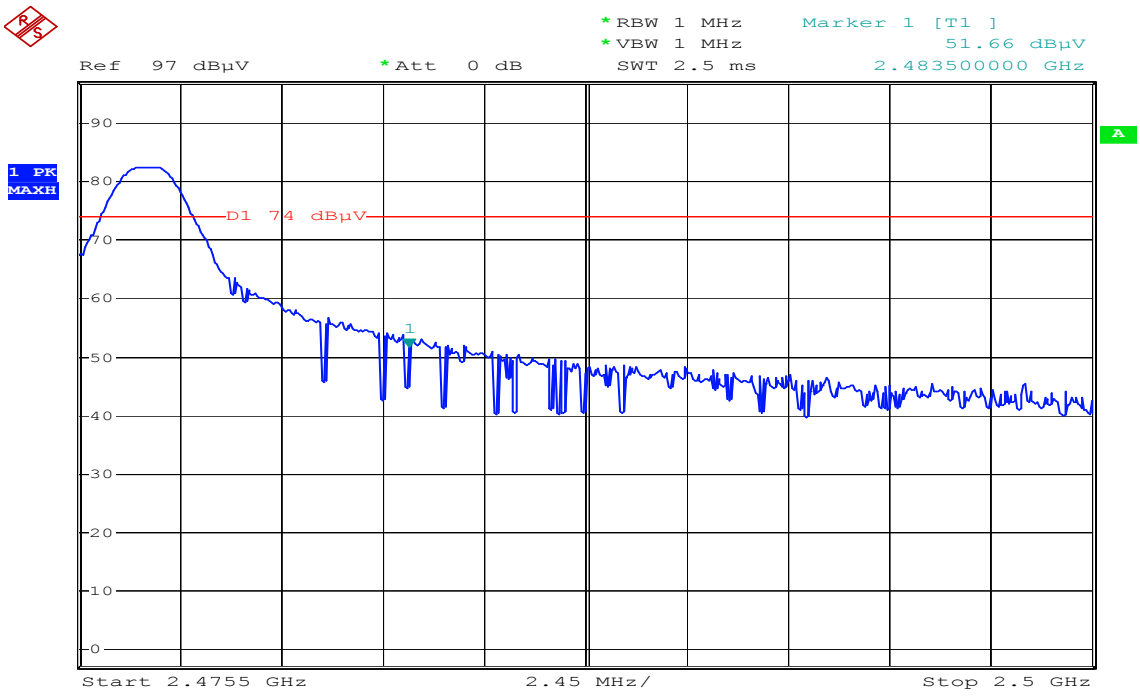
Date: 7.JAN.2008 14:43:41

Detector mode: Average Polarity: Vertical



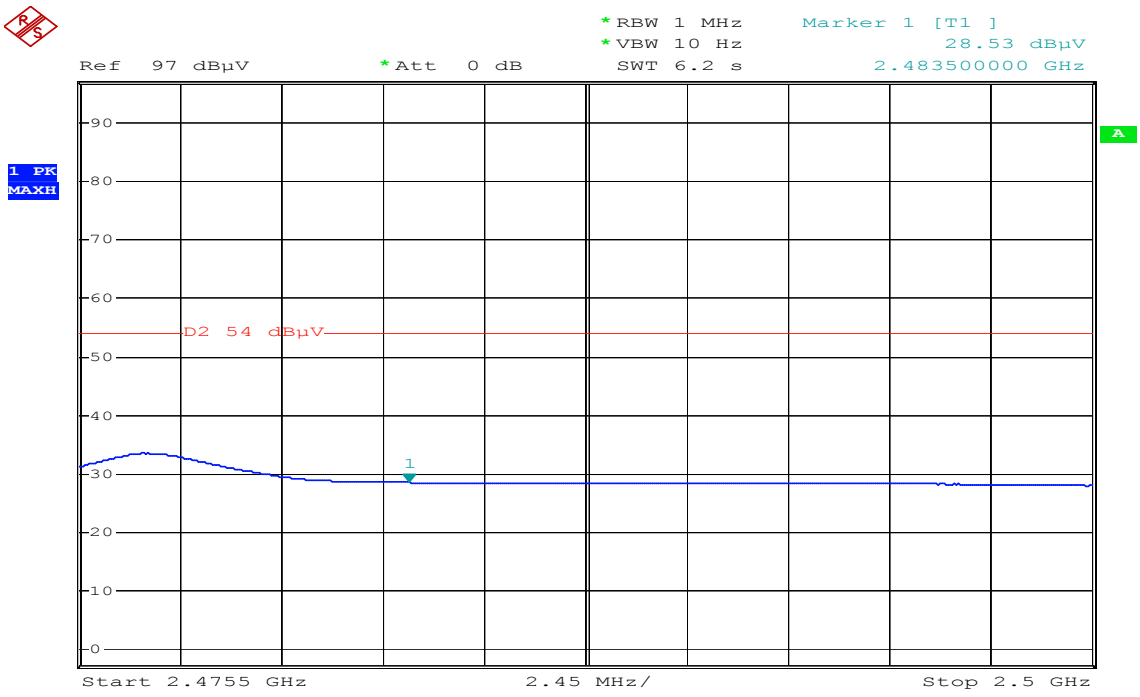
Date: 7.JAN.2008 14:44:15

Detector mode: Peak Polarity: Horizontal



Date: 7.JAN.2008 14:42:18

Detector mode: Average Polarity: Horizontal



Date: 7.JAN.2008 14:41:12

7.2SPURIOUS EMISSION

LIMIT

1. In the section 15.249(a):
   Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

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

2. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

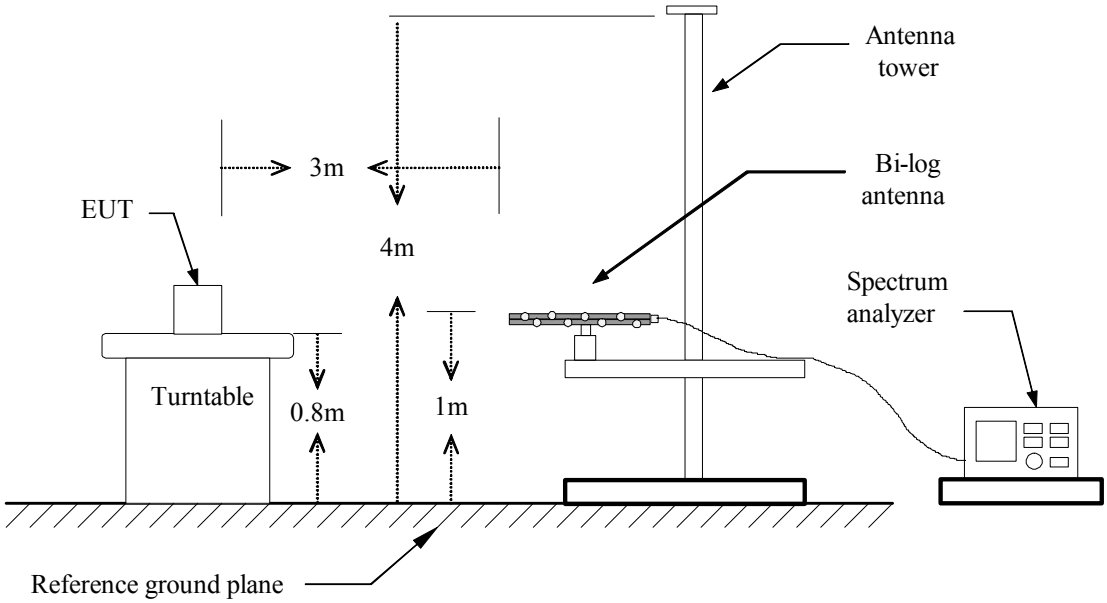
Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

3. In the above emission table, the tighter limit applies at the band edges.

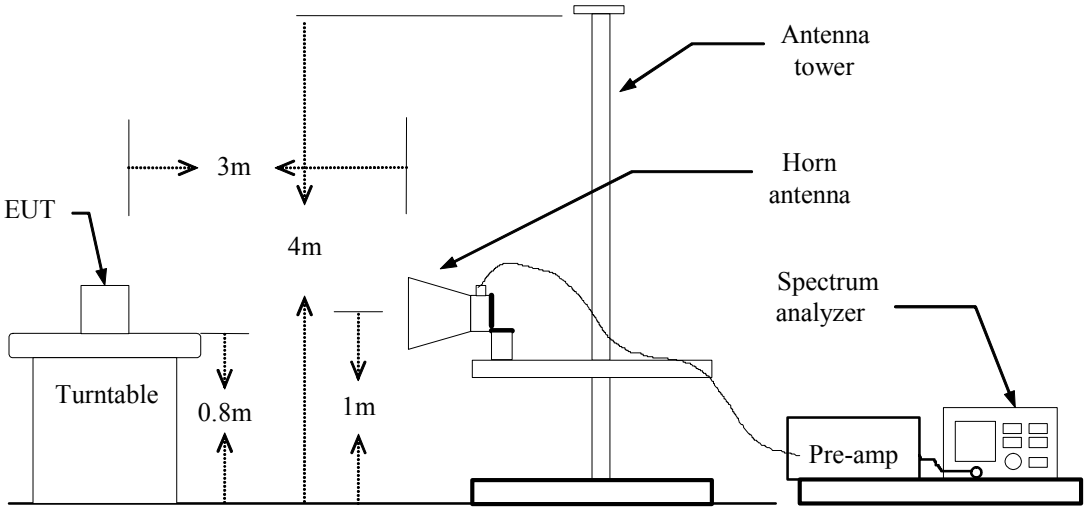
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

Test Configuration

Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

Operation Mode: Normal Link **Test Date:** January 5, 2008

Temperature: 26°C **Tested by:** Kevin Wang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
250.19	V	13.59	14.27	27.87	46.00	-18.13	QP
280.26	V	17.29	14.85	32.14	46.00	-13.86	QP
329.73	V	13.80	16.20	30.00	46.00	-16.00	QP
488.66	V	10.69	19.31	30.00	46.00	-16.00	QP
583.38	V	5.68	21.31	26.99	46.00	-19.01	QP
619.64	V	7.77	21.84	29.61	46.00	-16.39	QP
249.22	H	8.89	14.24	23.13	46.00	-22.87	QP
277.35	H	20.42	14.78	35.20	46.00	-10.80	QP
332.64	H	9.38	16.29	25.67	46.00	-20.33	QP
359.80	H	12.98	16.97	29.95	46.00	-16.05	QP
585.81	H	2.40	21.36	23.76	46.00	-22.24	QP
621.70	H	2.98	21.86	24.84	46.00	-21.16	QP

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using peak/quasi-peak detector mode.*
3. *Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.*
4. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
5. *Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).*

Above 1 GHz

Operation Mode: Tx / CH Low **Test Date:** January 5, 2008

Temperature: 26°C **Tested by:** Kevin Wang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2405.00	V	83.49	38.70	-5.53	77.96	33.17	113.97	93.97	-60.80	AVG
1084.00	V	46.48	---	-10.31	36.17	---	74.00	54.00	-37.83	Peak
1372.00	V	51.17	---	-8.98	42.19	---	74.00	54.00	-31.81	Peak
1776.00	V	46.98	---	-6.81	40.17	---	74.00	54.00	-33.83	Peak
4810.00	V	48.09	---	1.84	49.93	---	74.00	54.00	-24.07	Peak
N/A										
2405.00	H	88.53	39.06	-5.53	83.00	33.53	113.97	93.97	-60.44	AVG
1080.00	H	48.71	---	-10.33	38.38	---	74.00	54.00	-35.62	Peak
1596.00	H	46.01	---	-7.84	38.17	---	74.00	54.00	-35.83	Peak
1784.00	H	45.55	---	-6.77	38.79	---	74.00	54.00	-35.21	Peak
4810.00	H	60.69	32.83	1.84	62.53	34.67	74.00	54.00	-19.33	AVG
5290.00	H	49.09	27.12	2.96	52.05	30.08	74.00	54.00	-23.29	AVG
7220.00	H	47.10	26.88	6.38	53.48	33.26	74.00	54.00	-20.74	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m).*

Operation Mode: Tx / CH Mid **Test Date:** January 5, 2008

Temperature: 26°C **Tested by:** Kevin Wang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2438.00	V	82.07	37.94	-5.14	76.93	32.80	113.97	93.97	-61.17	AVG
1188.00	V	47.38	---	-9.83	37.54	---	74.00	54.00	-36.46	Peak
1496.00	V	46.47	---	-8.41	38.06	---	74.00	54.00	-35.94	Peak
1784.00	V	48.96	---	-6.77	42.20	---	74.00	54.00	-31.80	Peak
4880.00	V	49.14	---	2.05	51.18	---	74.00	54.00	-2.82	Peak
N/A										
2438.00	H	87.34	38.47	-5.14	82.20	33.33	113.97	93.97	-60.64	AVG
1084.00	H	49.00	---	-10.31	38.68	---	74.00	54.00	-35.32	Peak
1596.00	H	49.41	---	-7.84	41.57	---	74.00	54.00	-32.43	Peak
1776.00	H	45.77	---	-6.81	38.96	---	74.00	54.00	-35.04	Peak
4750.00	H	46.61	27.97	1.67	48.27	29.64	74.00	54.00	-24.36	AVG
4880.00	H	59.57	30.80	2.05	61.61	32.85	74.00	54.00	-21.15	AVG
4930.00	H	47.09	---	2.19	49.29	---	74.00	54.00	-24.71	Peak
5290.00	H	47.84	---	2.96	50.80	---	74.00	54.00	-23.20	Peak
7320.00	H	47.29	28.82	6.65	53.94	35.47	74.00	54.00	-18.53	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m). Peak detector mode and average detector mode of the emission shown in Result column.*

Operation Mode: Tx / CH High **Test Date:** January 5, 2008

Temperature: 26°C **Tested by:** Kevin Wang

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
2477.00	V	79.97	37.47	-4.57	75.40	32.90	113.97	93.97	-31.58	AVG
1084.00	V	47.69	---	-10.31	37.38	---	74.00	54.00	-36.62	Peak
1192.00	V	47.22	---	-9.81	37.41	---	74.00	54.00	-36.59	Peak
1500.00	V	46.79	---	-8.39	38.40	---	74.00	54.00	-35.60	Peak
1576.00	V	45.21	---	-7.96	37.26	---	74.00	54.00	-36.74	Peak
1792.00	V	48.32	---	-6.72	41.60	---	74.00	54.00	-32.40	Peak
4950.00	V	51.30	30.17	2.25	53.56	32.42	74.00	54.00	-21.58	Peak
7440.00	V	44.52	---	6.97	51.49	---	74.00	54.00	-22.51	Peak
2477.00	H	86.96	37.54	-4.57	82.39	32.97	113.97	93.97	-61.00	AVG
1020.00	H	49.57	---	-10.61	38.97	---	74.00	54.00	-35.03	Peak
1196.00	H	47.59	---	-9.79	37.80	---	74.00	54.00	-36.20	Peak
1392.00	H	45.73	---	-8.89	36.84	---	74.00	54.00	-37.16	Peak
1792.00	H	45.29	---	-6.72	38.57	---	74.00	54.00	-35.43	Peak
2744.00	H	43.15	---	-3.28	39.87	---	74.00	54.00	-34.13	Peak
4950.00	H	62.17	31.31	2.25	64.42	33.56	74.00	54.00	-20.44	AVG
5110.00	H	50.33	28.72	2.61	52.94	31.33	74.00	54.00	-22.67	AVG
5290.00	H	52.28	28.12	2.96	55.25	31.08	74.00	54.00	-22.92	AVG
7440.00	H	45.78	27.84	6.97	52.75	34.81	74.00	54.00	-19.19	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
5. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
6. *Margin (dB) = Remark result (dBuV/m) – Average limit (dBuV/m). Peak detector mode and average detector mode of the emission shown in Result column.*

Operation Mode: Rx **Test Date:** January 5, 2008

Temperature: 26°C **Tested by:** Arno Hsieh

Humidity: 55% RH **Polarity:** Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Result		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1076.00	V	48.40	---	-10.35	38.05	---	74.00	54.00	-15.95	Peak
1160.00	V	49.67	---	-9.96	39.71	---	74.00	54.00	-14.29	Peak
1492.00	V	46.48	---	-8.43	38.05	---	74.00	54.00	-15.95	Peak
1788.00	V	48.70	---	-6.74	41.95	---	74.00	54.00	-12.05	Peak
3190.00	V	41.08	---	-1.54	39.54	---	74.00	54.00	-14.46	Peak
4750.00	V	45.00	---	1.67	46.66	---	74.00	54.00	-7.34	Peak
5290.00	V	45.58	---	2.96	48.54	---	74.00	54.00	-5.46	Peak
1080.00	H	50.87	---	-10.33	40.54	---	74.00	54.00	-13.46	Peak
1192.00	H	49.48	---	-9.81	39.66	---	74.00	54.00	-14.34	Peak
1596.00	H	47.46	---	-7.84	39.62	---	74.00	54.00	-14.38	Peak
4810.00	H	52.06	---	1.84	53.90	---	74.00	54.00	-0.10	Peak
5290.00	H	52.12	---	2.96	55.08	---	74.00	54.00	1.08	*Peak
N/A										

Remark:

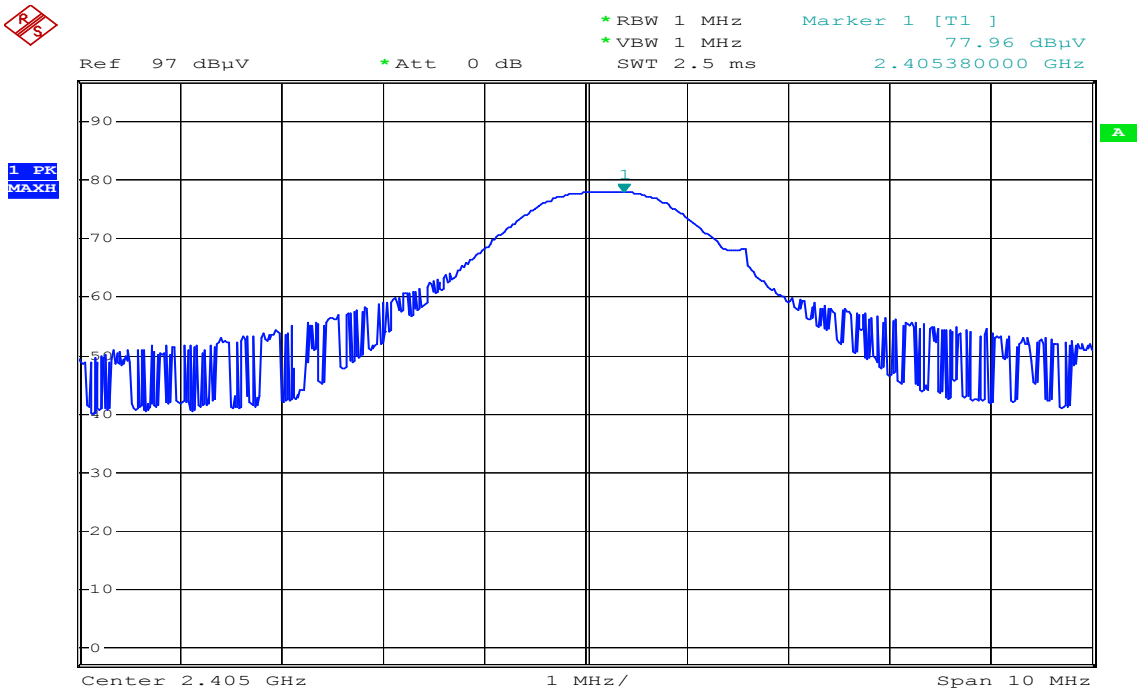
1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using peak/average detector mode.*
3. *Average test would be performed if the peak result were greater than the average limit or as required by the applicant.*
4. *Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

Measurements above show only up to 6 maximum emissions noted, or would be lesser, with "N/A" no emission measured remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.

Test Plots

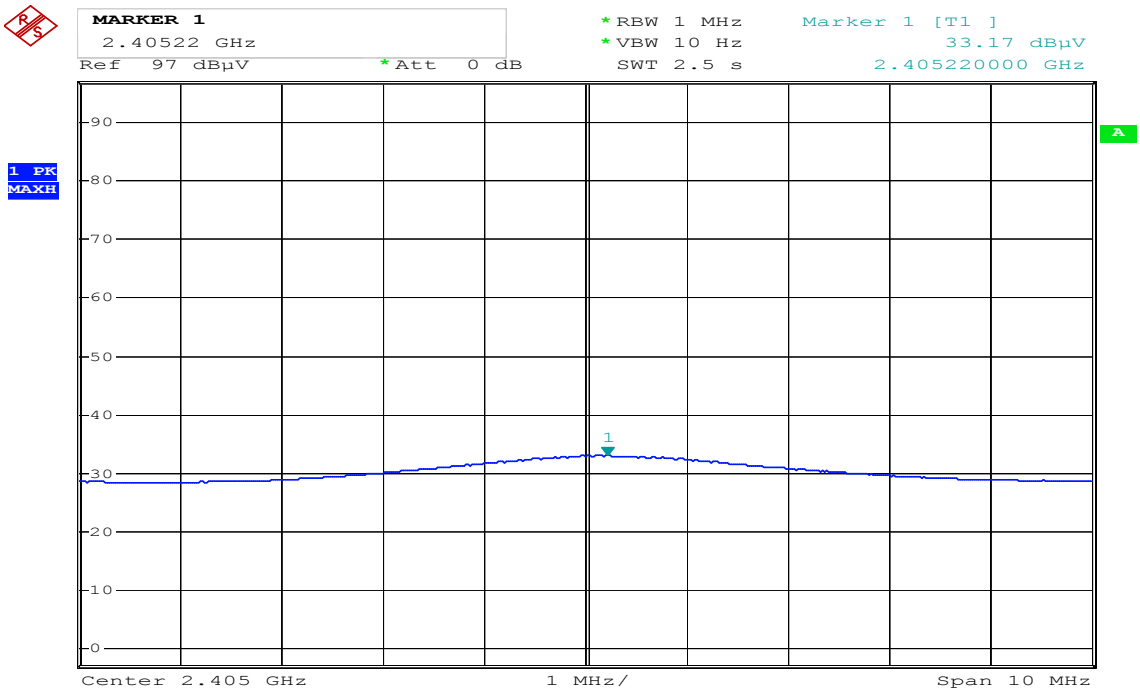
CH Low

Detector mode: Peak Polarity: Vertical



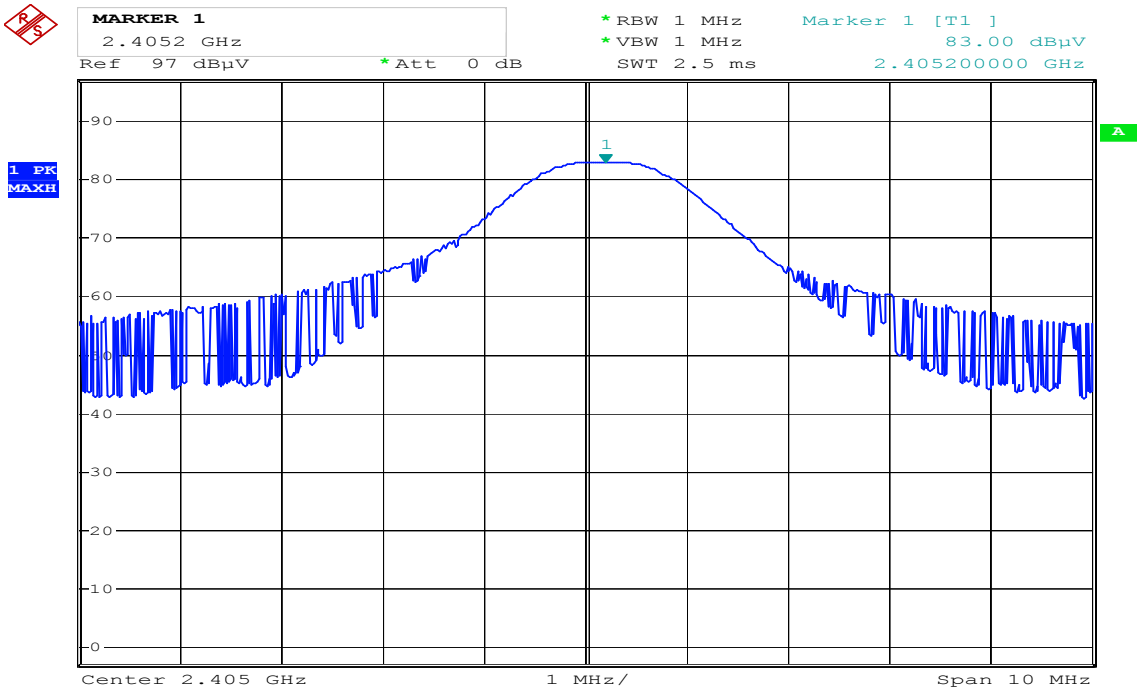
Date: 7.JAN.2008 15:07:55

Detector mode: Average Polarity: Vertical



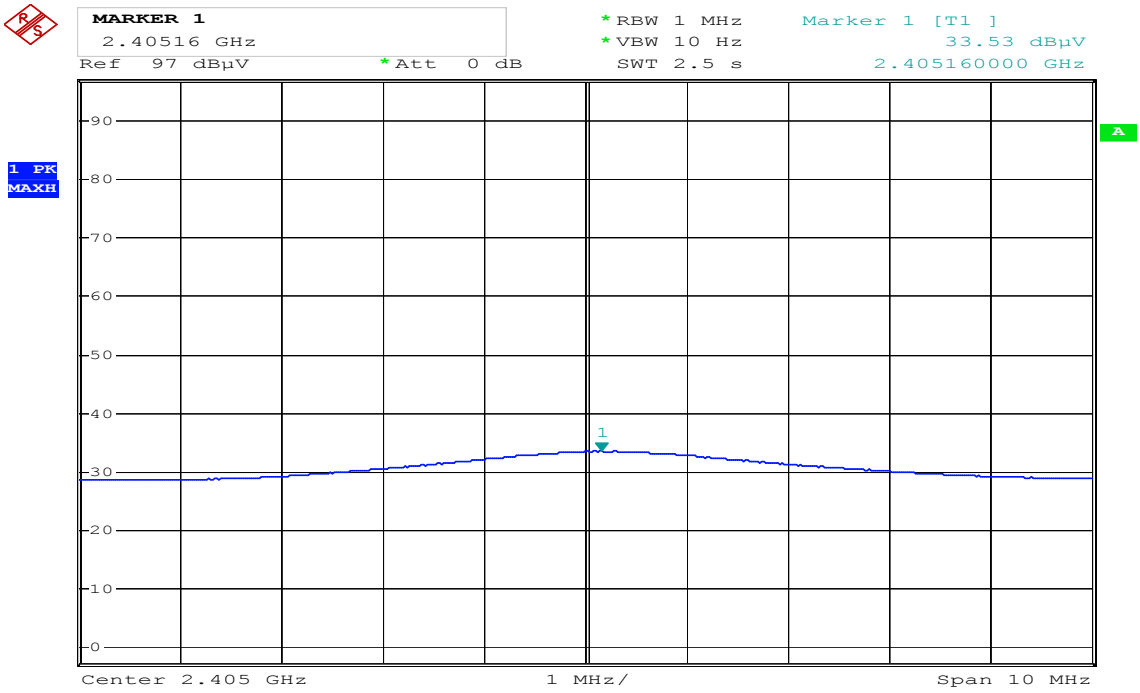
Date: 7.JAN.2008 13:31:34

Detector mode: Peak Polarity: Horizontal



Date: 7.JAN.2008 13:25:15

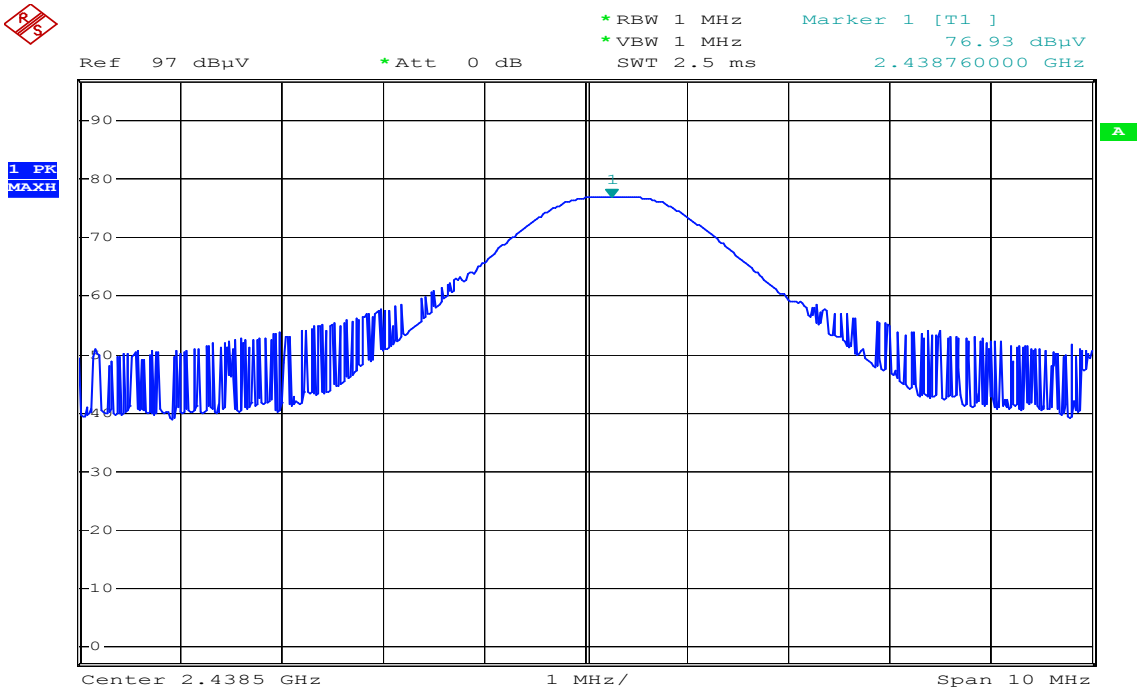
Detector mode: Average Polarity: Horizontal



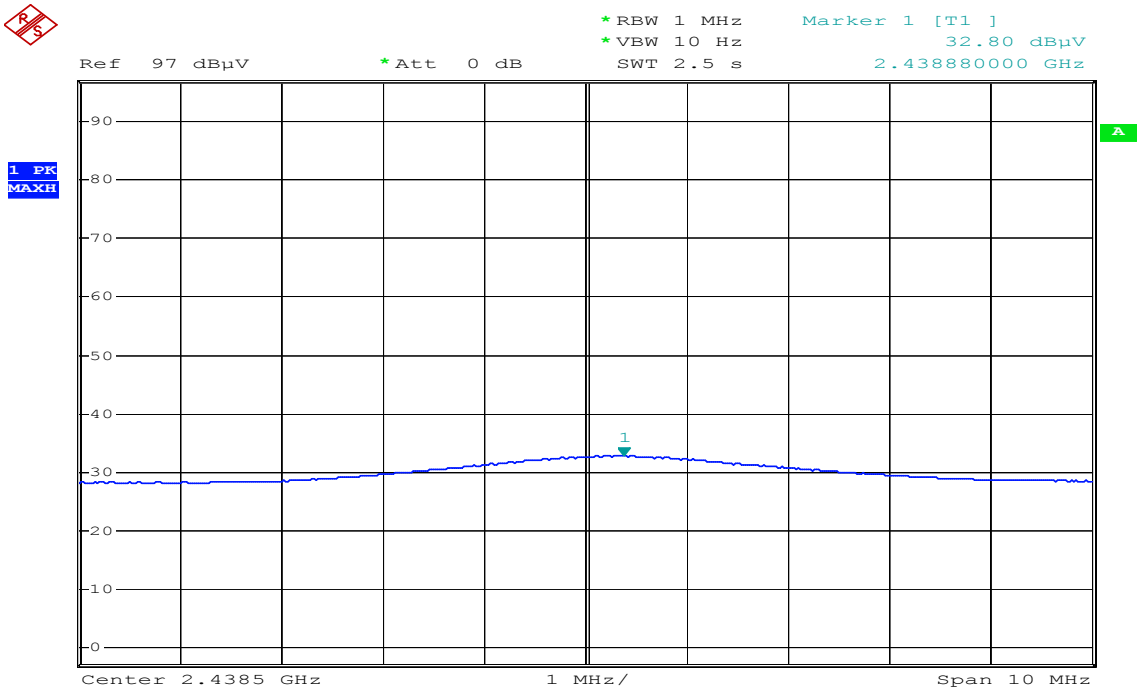
Date: 7.JAN.2008 13:26:33

CH Mid

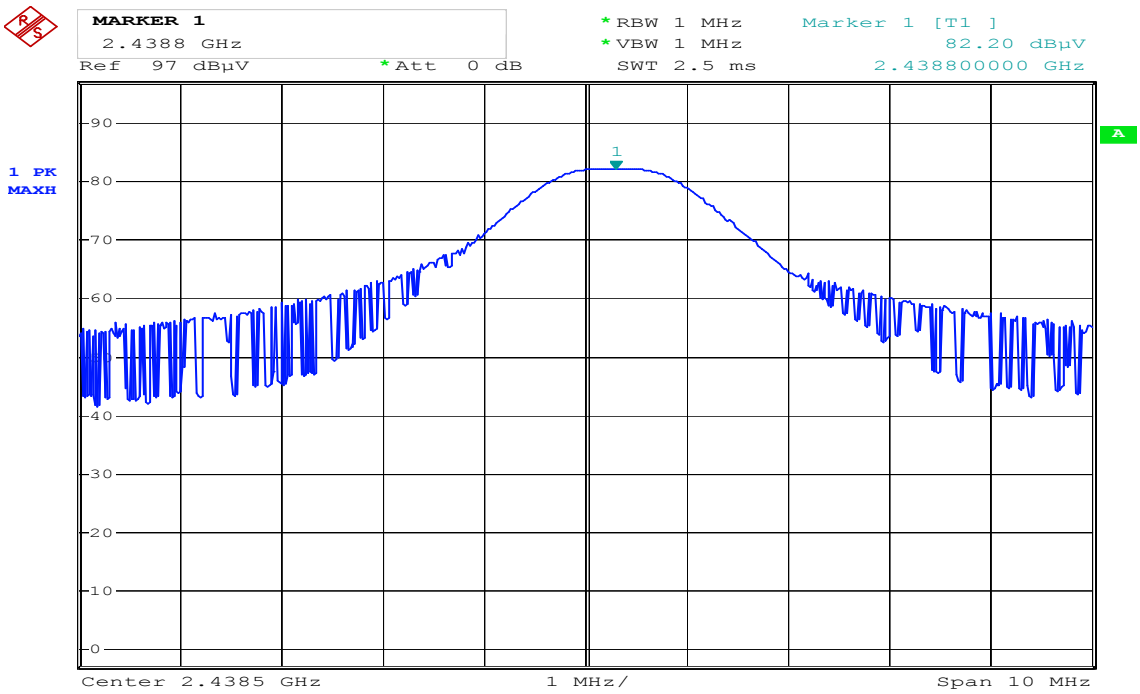
Detector mode: Peak Polarity: Vertical



Detector mode: Average Polarity: Vertical

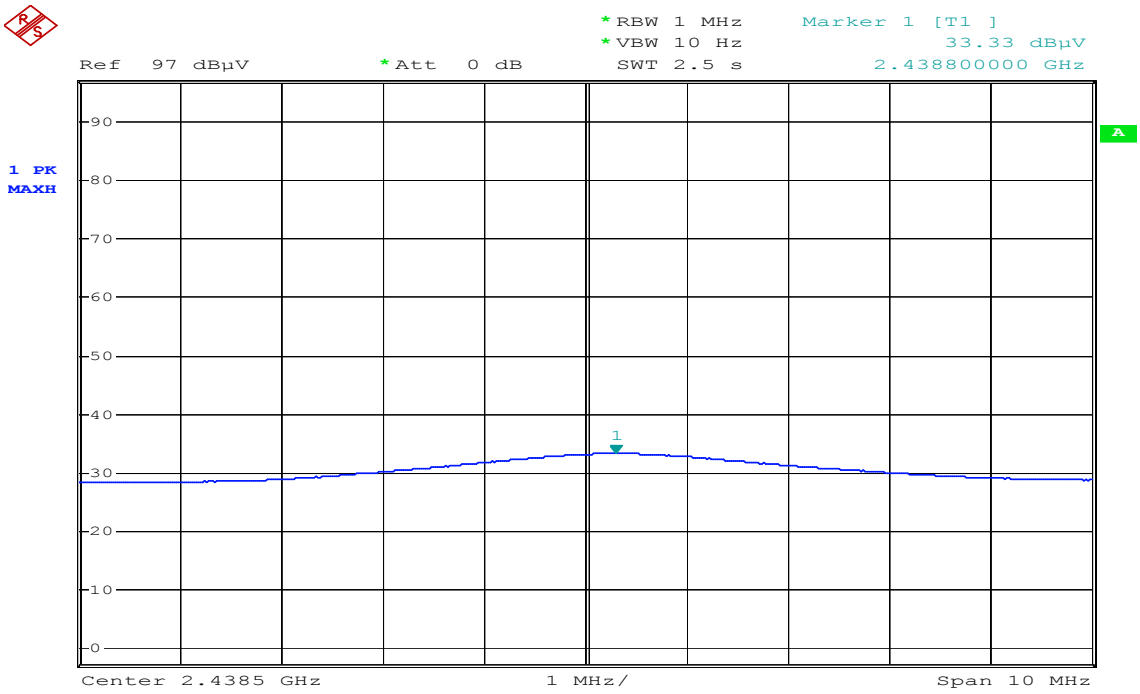


Detector mode: Peak Polarity: Horizontal



Date: 7.JAN.2008 14:28:01

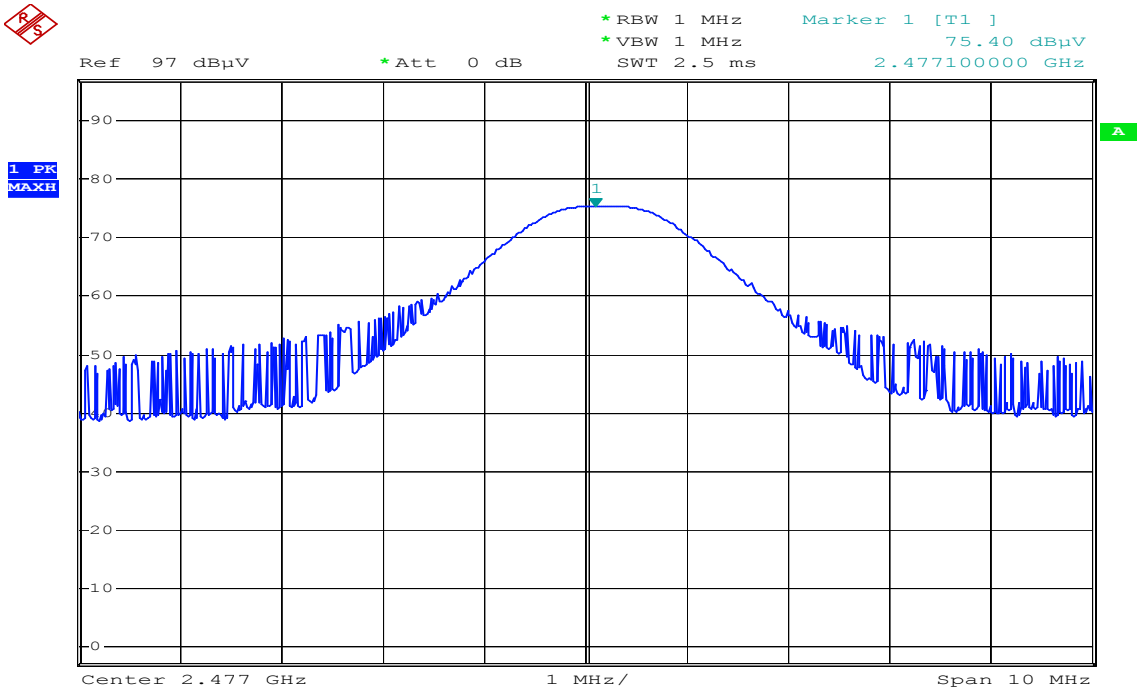
Detector mode: Average Polarity: Horizontal



Date: 7.JAN.2008 14:28:58

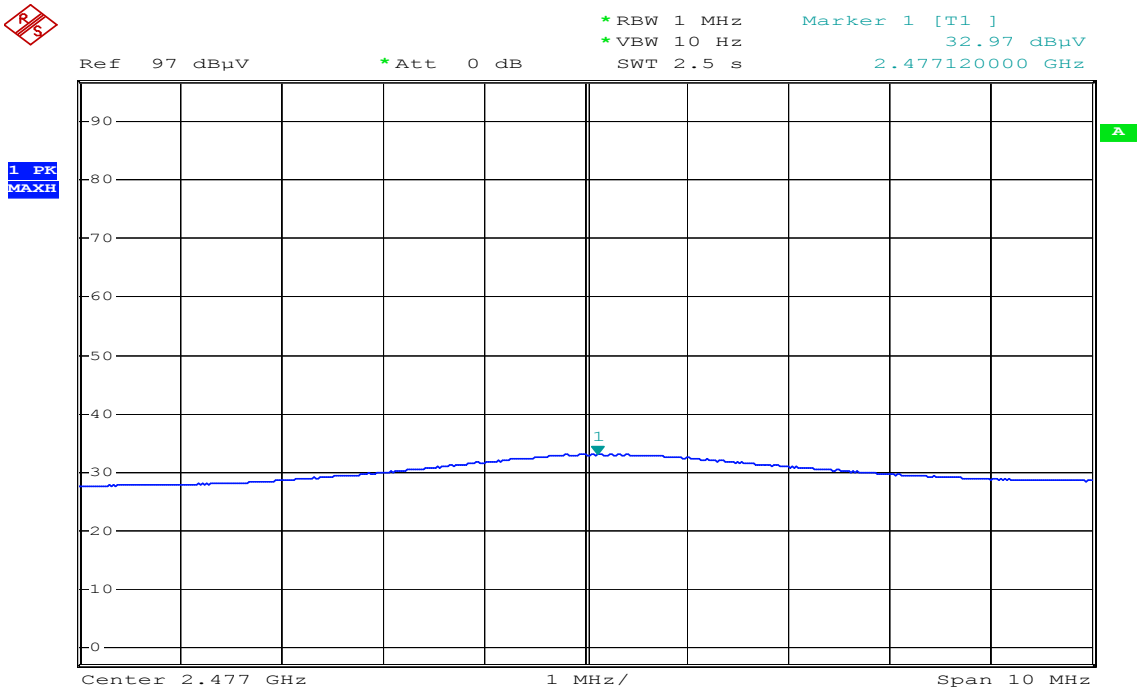
CH High

Detector mode: Peak Polarity: Vertical



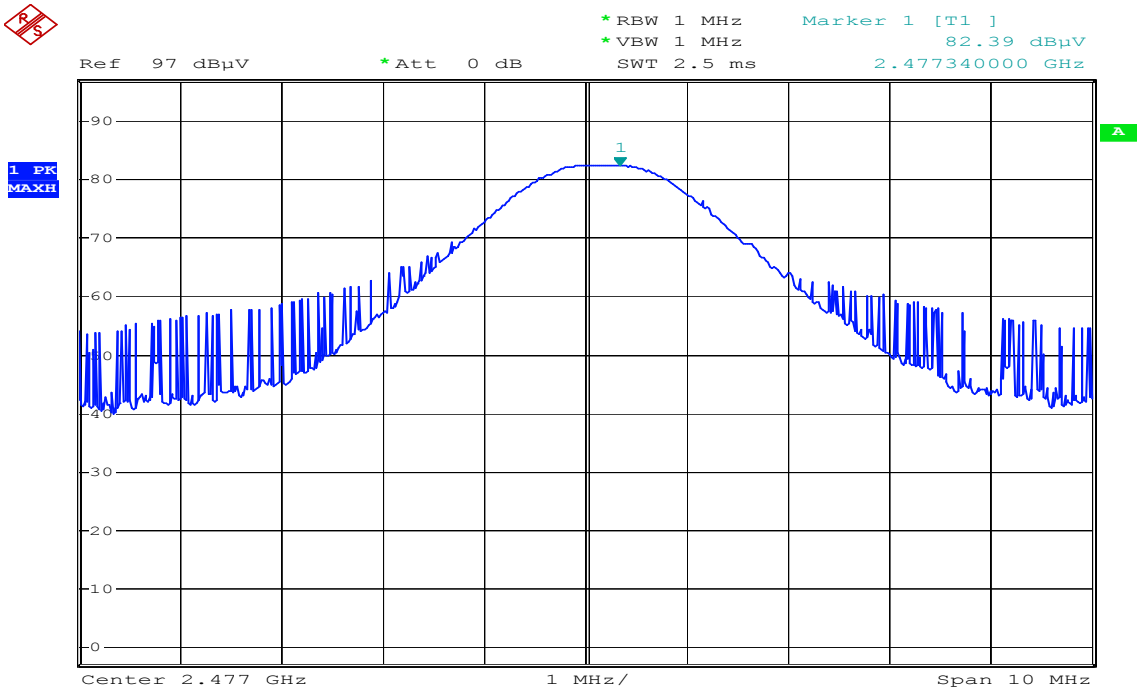
Date: 7.JAN.2008 14:35:42

Detector mode: Average Polarity: Vertical

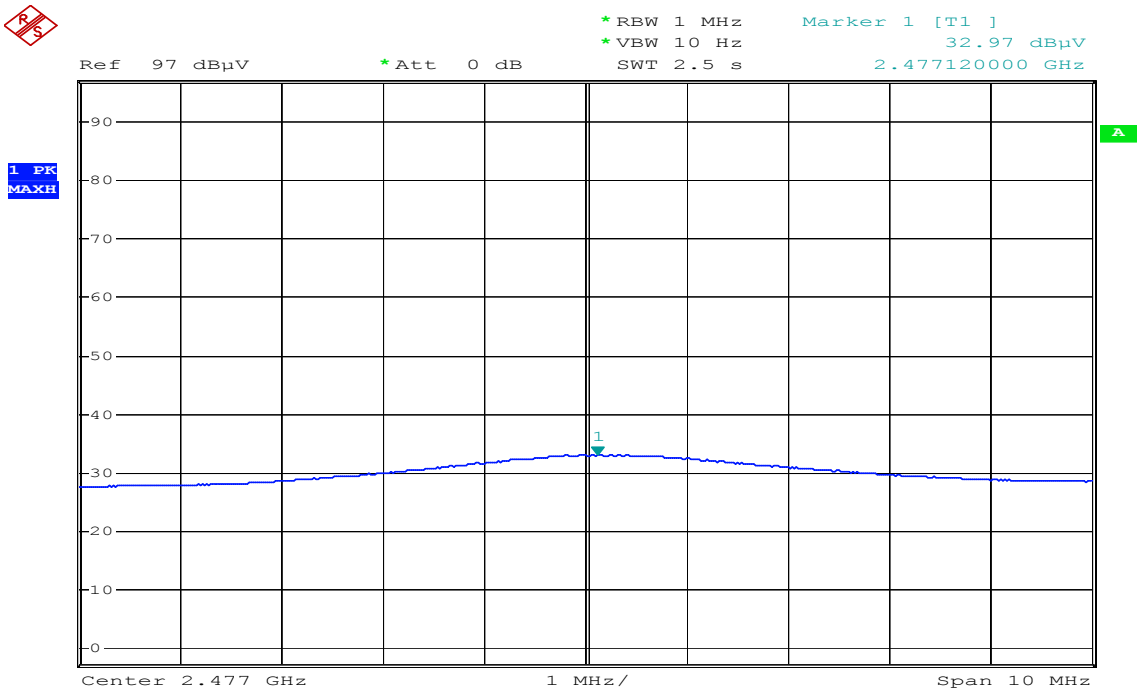


Date: 7.JAN.2008 14:37:40

Detector mode: Peak Polarity: Horizontal



Detector mode: Average Polarity: Horizontal



7.3 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	**Limits (dBμV)**	
	Quasi-peak	**Average**
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

***** *Decreases with the logarithm of the frequency.*

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Operation Mode:	Normal Link	**Test Date:**	January 5, 2008
Temperature:	20°C	**Tested by:**	Kevin Wang
Humidity:	50% RH		

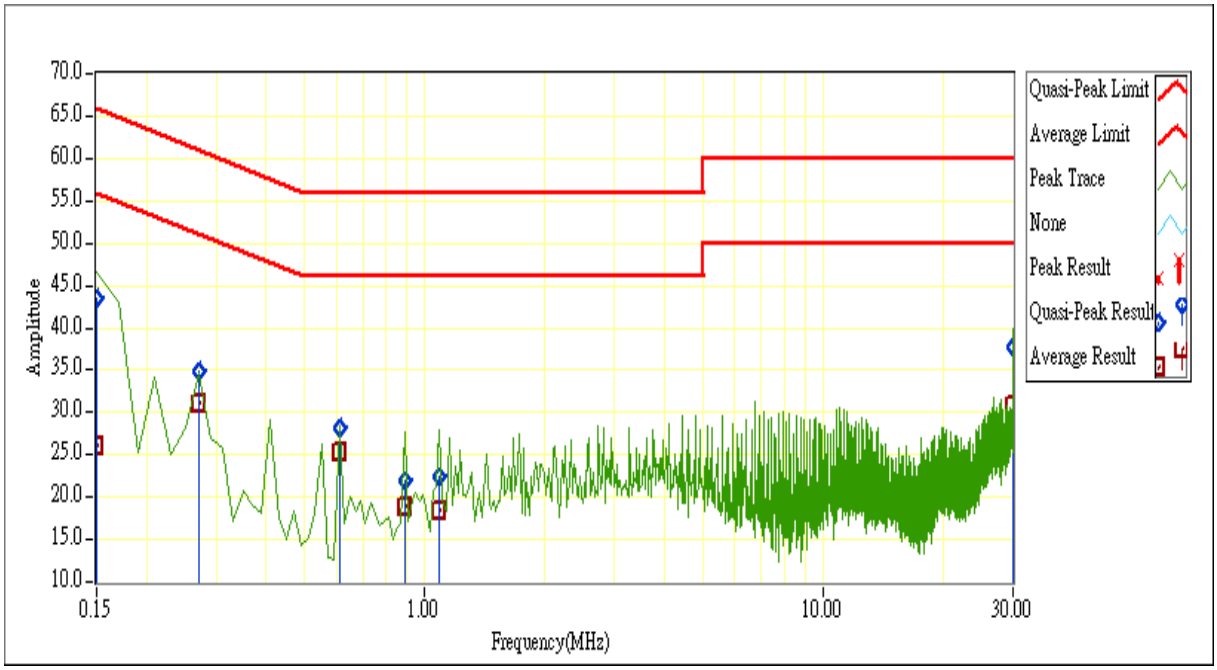
Freq. (MHz)	QP Reading	AV Reading	Corr. factor	QP Result	AV Result	QP Limit	AV Limit	QP Margin	AV Margin	Note
0.15	43.29	25.74	0.20	43.49	25.94	66.00	56.00	-22.51	-30.06	L1
0.27	34.60	30.95	0.20	34.80	31.15	61.12	51.12	-26.32	-19.97	L1
0.61	28.15	25.25	0.10	28.25	25.35	56.00	46.00	-27.75	-20.65	L1
0.89	21.95	18.75	0.10	22.05	18.85	56.00	46.00	-33.95	-27.15	L1
1.09	22.38	18.15	0.11	22.49	18.26	56.00	46.00	-33.51	-27.74	L1
30.00	35.74	28.78	1.90	37.64	30.68	60.00	50.00	-22.36	-19.32	L1
0.17	35.21	9.41	0.20	35.41	9.61	64.96	54.96	-29.55	-45.35	L2
0.31	33.03	12.86	0.20	33.23	13.06	59.97	49.97	-26.74	-36.91	L2
0.61	30.45	26.98	0.10	30.55	27.08	56.00	46.00	-25.45	-18.92	L2
0.99	21.60	3.39	0.10	21.70	3.49	56.00	46.00	-34.30	-42.51	L2
1.77	26.98	23.86	0.18	27.16	24.04	56.00	46.00	-28.84	-21.96	L2
30.00	32.65	25.51	0.00	32.65	25.51	60.00	50.00	-27.35	-24.49	L2

Remark:

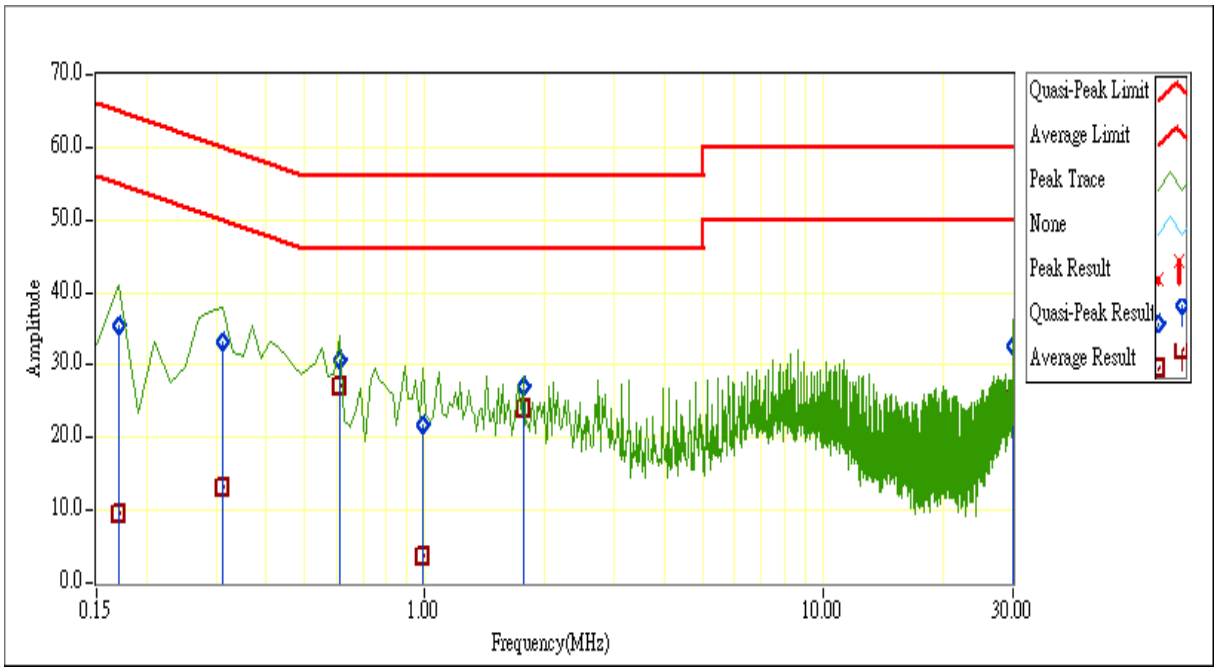
1. *Measuring frequencies from 0.15 MHz to 30MHz.*
2. *The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
3. *"---" denotes the emission level was or more than 2dB below the Average limit*
4. *The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;*
5. *L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*

Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

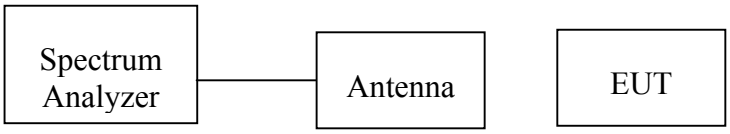


7.4 20 dB BANDWIDTH

LIMIT

N/A

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10kHz, VBW = RBW, Span = 1MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

Refer to attach spectrum analyzer data chart.

Test Plot