



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Wireless USB dongle

Model Number: M969TUL III

Trade Name: BTC, EMPREX

Issued to

**BEHAVIOR TECH COMPUTER CORP.
20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City,
Taipei County 22102, Taiwan(R.O.C.)**

Issued by

**Compliance Certification Services Inc.
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1. TEST RESULT CERTIFICATION

Applicant: BEHAVIOR TECH COMPUTER CORP.
20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City,
Taipei County 22102, Taiwan(R.O.C.)

Equipment Under Test: Wireless USB dongle

Trade Name: BTC, EMPREX

Model Number: M969TUL III

Date of Test: August 22 ~ September 4, 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.

Approved by:

Reviewed by:

Rex Lai
Section Manager
Compliance Certification Services Inc.

Amanda Wu
Section Manager
Compliance Certification Services Inc.



2. EUT DESCRIPTION

Product	Wireless USB dongle
Trade Name	BTC, EMPREX
Model Number	M969TUL III
Model Discrepancy	N/A
Power Supply	Powered by host device
Frequency Range	2402~2479MHz
Frequency Spacing	1MHz
Frequency Number	78 channels
Modulation Technique	GFSK
Antenna Gain	-0.32 dBi
Antenna Designation	Printed Antenna

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: **E5XRXM969TUL3** filing to comply with Section 15.107, 15.109, 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.

3.1 EUT 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.

3.2 EUT 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.

3.3 GENERAL 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.



3.4 FCC 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.

3.5 DESCRIPTION OF TEST MODES

The EUT (model: M969TUL III) had been tested under operating condition.

The USB slot could be in vertical and horizontal manner. 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.

Channel Low(2402MHz), Channel Mid(2441MHz) and Channel High(2479MHz) were chosen for the final testing.



4. INSTRUMENT CALIBRATION

4.1 MEASURING 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.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	02/24/2009

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	09/10/2009
Spectrum Analyzer	Rohde&Schwarz	FSEK30	100264	03/20/2009
Test Receiver	Rohde&Schwarz	ESCI	100064	11/03/2008
Switch Controller	TRC	Switch Controller	SC94050010	05/02/2009
4 Port Switch	TRC	4 Port Switch	SC94050020	05/02/2009
Horn-Antenna	TRC	HA-0502	06	07/06/2009
Horn-Antenna	TRC	HA-0801	04	05/02/2009
Horn-Antenna	TRC	HA-1201A	01	07/01/2009
Horn-Antenna	TRC	HA-1301A	01	07/01/2009
Loop Antenna	EMCO	6502	8905/2356	05/31/2009
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/07/2009
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC: 965860 IC: IC 6106	09/24/2009
Test S/W	LABVIEW (V 6.1)			

Remark: The measurement uncertainty is less than $\pm 3.7046\text{dB}$ (30MHz ~ 1GHz), $\pm 3.0958\text{dB}$ (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.



Powerline Conducted Emissions Test Site # 4				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	100782	06/01/2009
LISN	R&S	ENV216	100066	05/11/2009
LISN	R&S	ENV 4200	830326/016	04/10/2009
ISN	FCC	FCC-TLISN-T4-02	20396	06/03/2009
ISN	FCC	FCC-TLISN-T8-02	20148	03/26/2009
Current Probe	FCC	F-35	506	06/19/2009
Test S/W	LabVIEW 6.1 (CCS Conduction Test SW Version_01)			

Remark: The measurement uncertainty is less than +/- 1.80dB, 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, Auerbach / Opf GERMANY

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."

**5.3 TABLE 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 TESTING CERT #0824.01
USA	FCC	3M Semi Anechoic Chamber (965860 and 898658) to perform FCC Part 15/18 measurements	 965860, 898658
Taiwan	TAF	LP0002, RTTE01, FCC Method-47 CFR Part 15 Subpart C, D, E, RSS-210, RSS-310 IDA TS SRD, AS/NZS 4268, AS/NZS 4771, TS 12.1 & 12.2, ETSI EN 300 440-1, ETSI EN 300 440-2, ETSI EN 300 328, ETSI EN 300 220-1, ETSI EN 300 220-2, ETSI EN 301 893, ETSI EN 301 489-1/3/7/17 FCC OET Bulletin 65 + Supplement C, EN 50360, EN 50361, EN 50371, RSS 102, EN 50383, EN 50385, EN 50392, IEC 62209, CNS 14958-1, CNS 14959 FCC Method -47 CFR Part 15 Subpart B IEC / EN 61000-3-2, IEC / EN 61000-3-3, IEC / EN 61000-4-2/3/4/5/6/8/11	 Testing Laboratory 1309
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 6106 & IC 6106A-2) to perform RSS 212 Issue 1	 IC 6106 IC 6106A-2

* 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

6.1 SETUP CONFIGURATION OF EUT

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

SUPPORT EQUIPMENT

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	PC	DX-6120	SGH5330GK7	FCC DoC	HP	N/A	Unshielded, 1.8m
2	Notebook PC	1525AP	1V31LDLZ20PG	FCC DoC	COMPAQ	N/A	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
3.	Notebook PC	M5200AE	5BN0AG019631	PD9WM3B2100	ASUS	N/A	AC I/P: Unshielded, 1.8m with a core DC O/P: Unshielded, 1.8m
4.	LCD Monitor	2405FPW	CN-0M6754-46633-56 R-03NS	FCC DoC	DELL	Shielded, 1.2m	Unshielded, 1.8m
5	Printer	STYLUS C60	DR3K042012	FCC DoC	EPSON	Shielded, 1.5m	Unshielded, 1.8m
6	Modem	DM-1414	304012261	IFAXDM1414	ACEEX	Shielded, 1m	Unshielded, 1.2m
7	PS/2 Keyboard	Y-SP29	SYU30272817	FCC DoC	Logitech	Unshielded, 1.8m	N/A
8	Wireless Mouse	M969TUL III	N/A	E5XMSM969TUL3	EMPREX	N/A	N/A
9	Test kit for Mouse	N/A	N/A	N/A	N/A	N/A	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



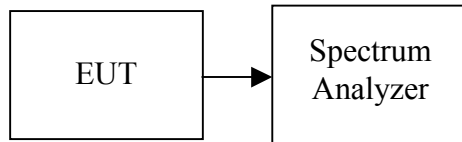
7. FCC PART 15.249 REQUIREMENTS

7.120 DB BANDWIDTH

LIMIT

None; for reporting purposes only.

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=20kHz, VBW = 62 kHz, Span = 2MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted

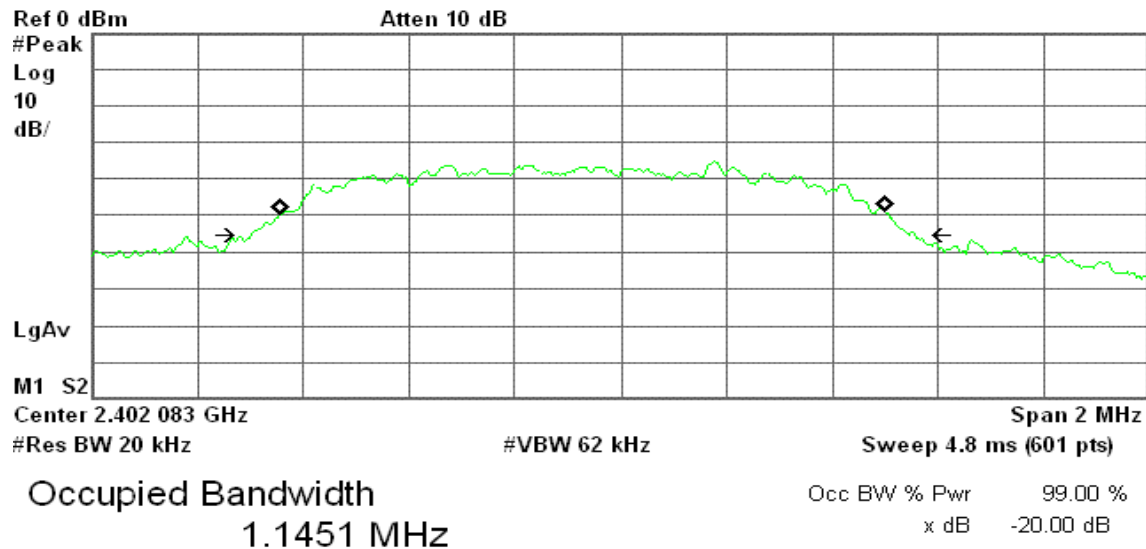


Test Plot

CH Low

Agilent 16:36:11 Aug 25, 2008

R T

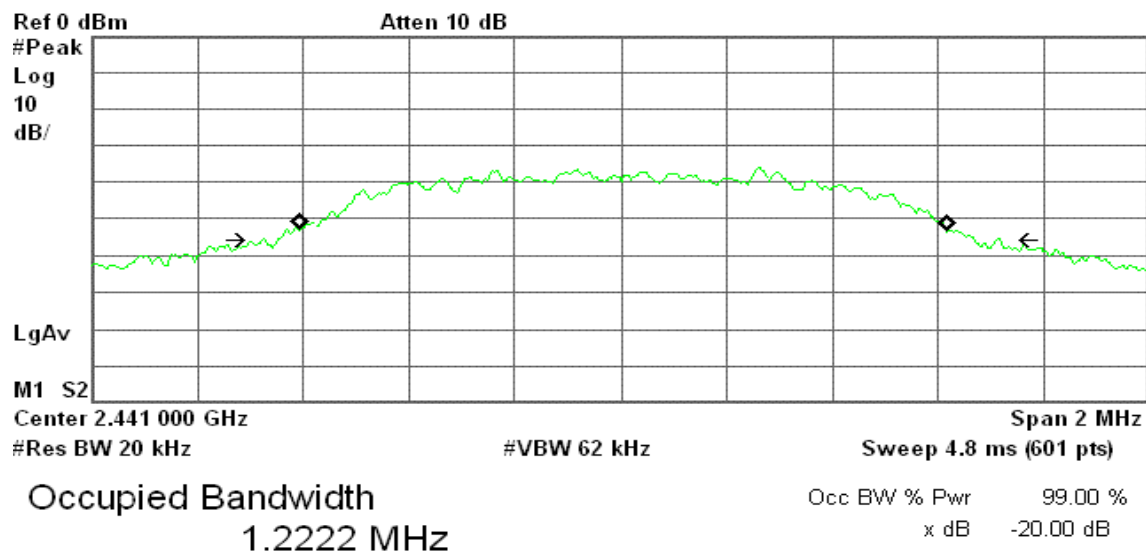


Transmit Freq Error -71.132 kHz
x dB Bandwidth 1.255 MHz

CH Mid

Agilent 16:39:13 Aug 25, 2008

R T



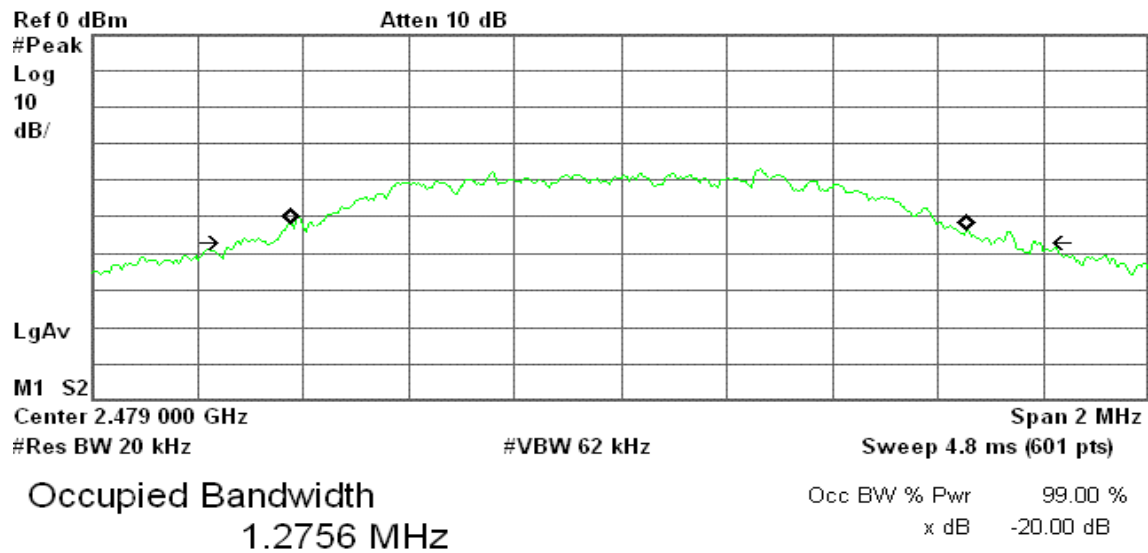
Transmit Freq Error 5.213 kHz
x dB Bandwidth 1.395 MHz



CH High

Agilent 16:42:39 Aug 25, 2008

R T



Transmit Freq Error 15.396 kHz
x dB Bandwidth 1.511 MHz

7.2BAND EDGES MEASUREMENT

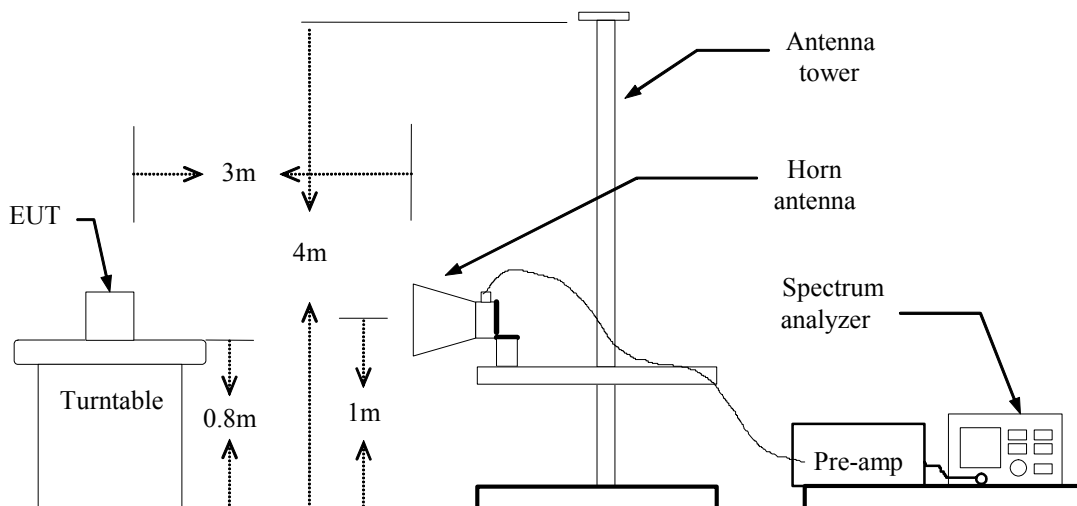
LIMIT

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

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3-meter)	Field Strength ($\text{dB}\mu\text{V}/\text{m}$ 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

Agilent

R T

Mkr1 2.390 00 GHz
57.73 dB μ V

Ref 113 dB μ V

#Atten 16 dB

Peak
Log
10
dB/

DI
74.0
dB μ V
LgAv

M1 S2
S3 FC
A
£(f):
FTun
Swp

Start 2.310 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.402 00 GHz
#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Vertical

Agilent

R T

Mkr1 2.390 00 GHz
33.61 dB μ V

Ref 113 dB μ V

#Atten 16 dB

Peak
Log
10
dB/

DI
54.0
dB μ V
LgAv

M1 S2
S3 FC
A
£(f):
FTun
Swp

Start 2.310 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.402 00 GHz
#Sweep 7.174 s (601 pts)



Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 00 GHz
62.68 dB μ V

Ref 113 dB μ V

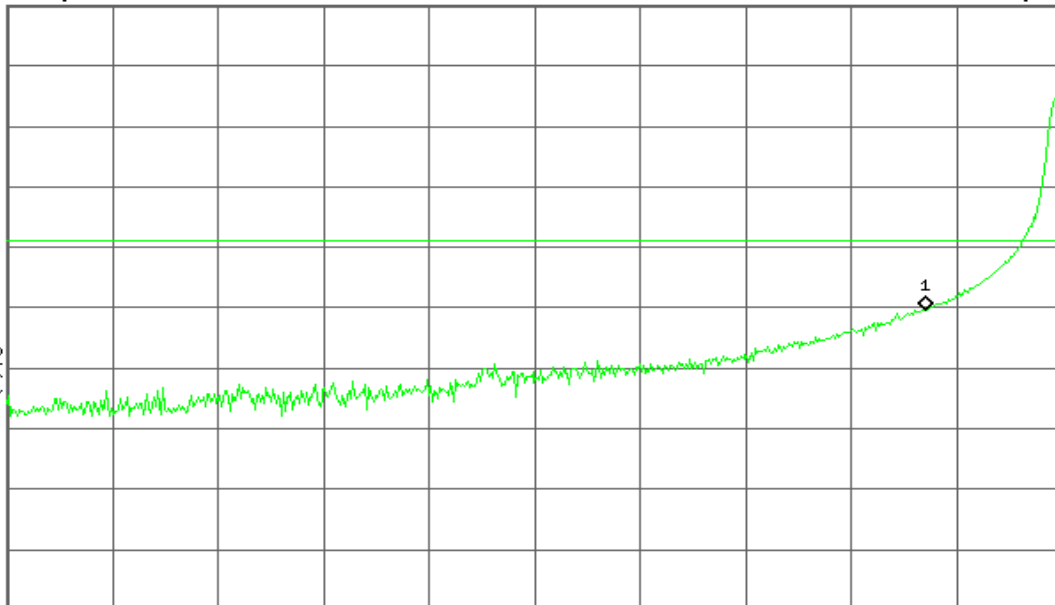
#Atten 16 dB

Peak
Log
10
dB/

DI
74.0
dB μ V
LgAv

M1 S2
S3 FC
A

$\mathcal{E}(f)$:
FTun
Swp



Start 2.310 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.402 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.390 00 GHz
33.88 dB μ V

Ref 113 dB μ V

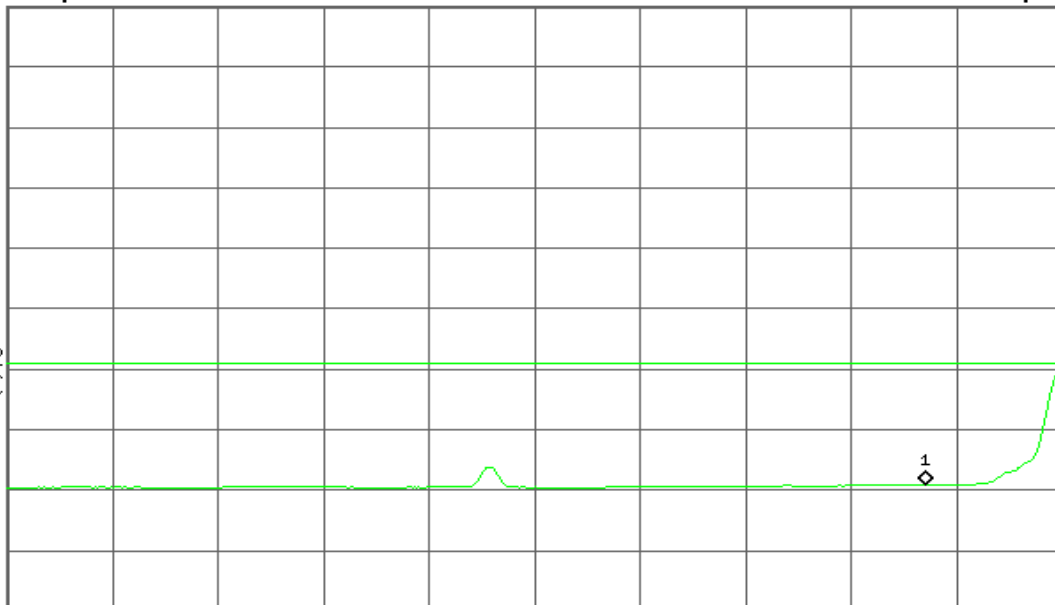
#Atten 16 dB

Peak
Log
10
dB/

DI
54.0
dB μ V
LgAv

M1 S2
S3 FC
A

$\mathcal{E}(f)$:
FTun
Swp



Start 2.310 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

Stop 2.402 00 GHz

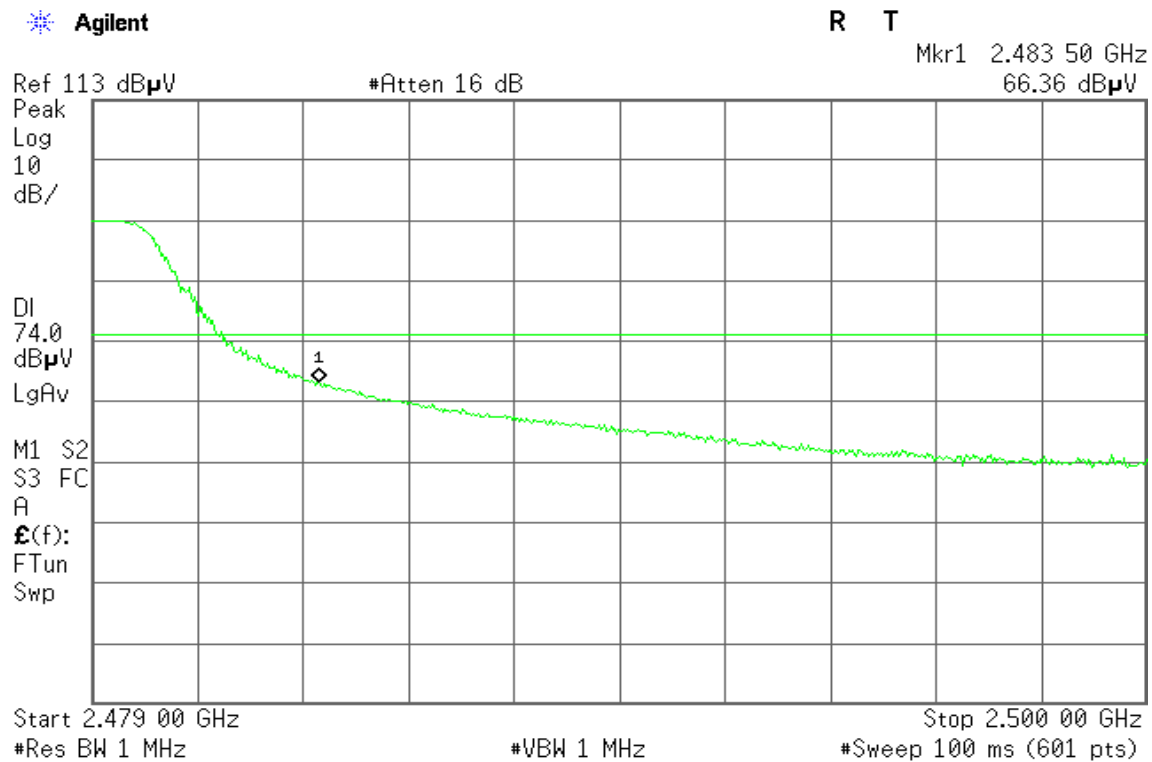
Sweep 7.174 s (601 pts)



Band Edges (CH High)

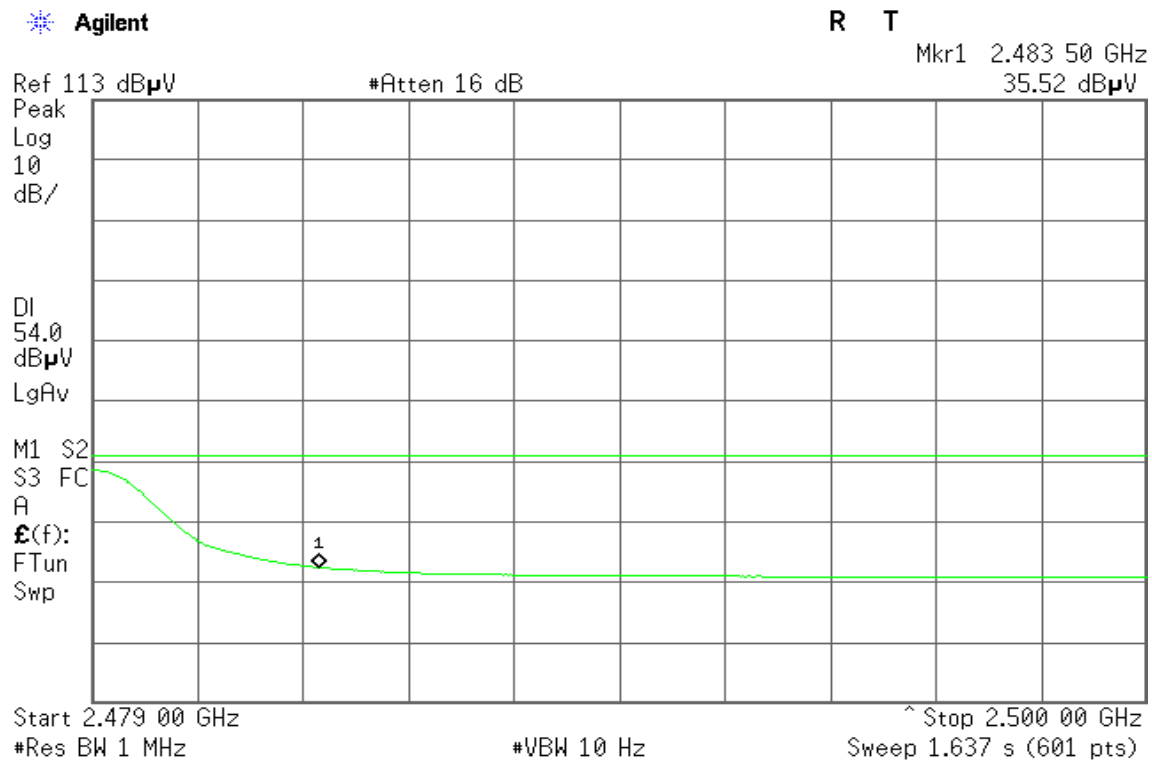
Detector mode: Peak

Polarity: Vertical



Detector mode: Average

Polarity: Vertical





Detector mode: Peak

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
67.55 dB μ V

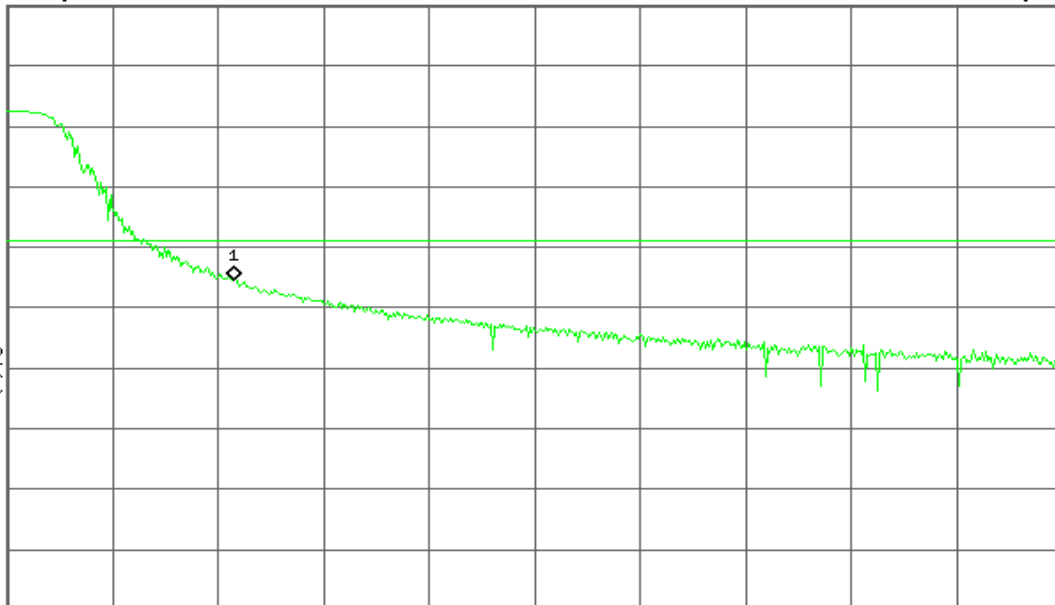
Ref 113 dB μ V

#Atten 16 dB

Peak
Log
10
dB/

DI
74.0
dB μ V
LgAv

M1 S2
S3 FC
A
£(f):
FTun
Swp



Start 2.479 00 GHz

#Res BW 1 MHz

#VBW 1 MHz

Stop 2.500 00 GHz

#Sweep 100 ms (601 pts)

Detector mode: Average

Polarity: Horizontal

Agilent

R T

Mkr1 2.483 50 GHz
35.90 dB μ V

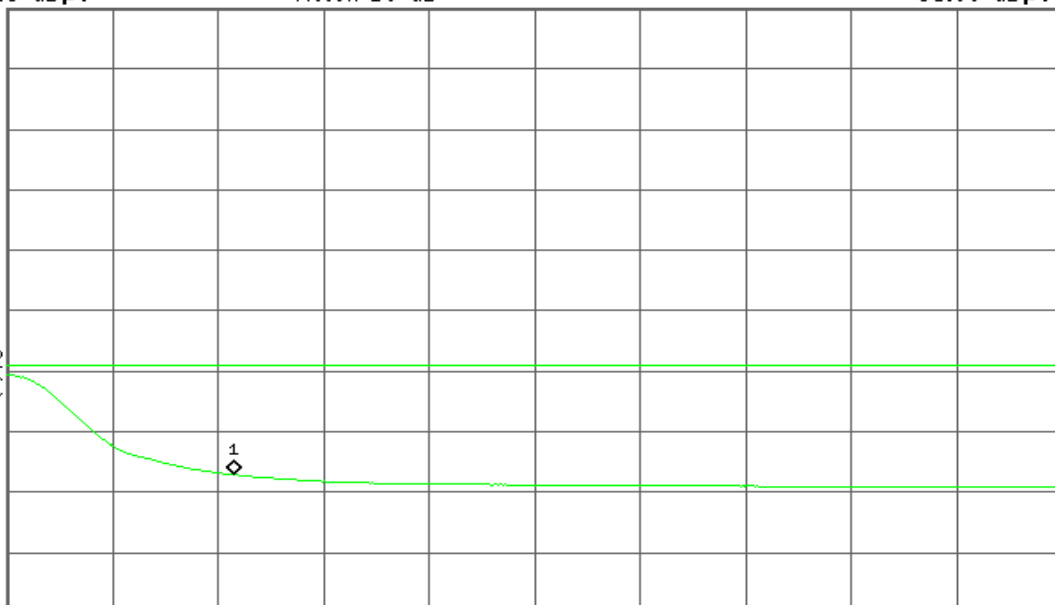
Ref 113 dB μ V

#Atten 16 dB

Peak
Log
10
dB/

DI
54.0
dB μ V
LgAv

M1 S2
S3 FC
A
£(f):
FTun
Swp



Start 2.479 00 GHz

#Res BW 1 MHz

#VBW 10 Hz

^ Stop 2.500 00 GHz

Sweep 1.637 s (601 pts)



7.3 SPURIOUS 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

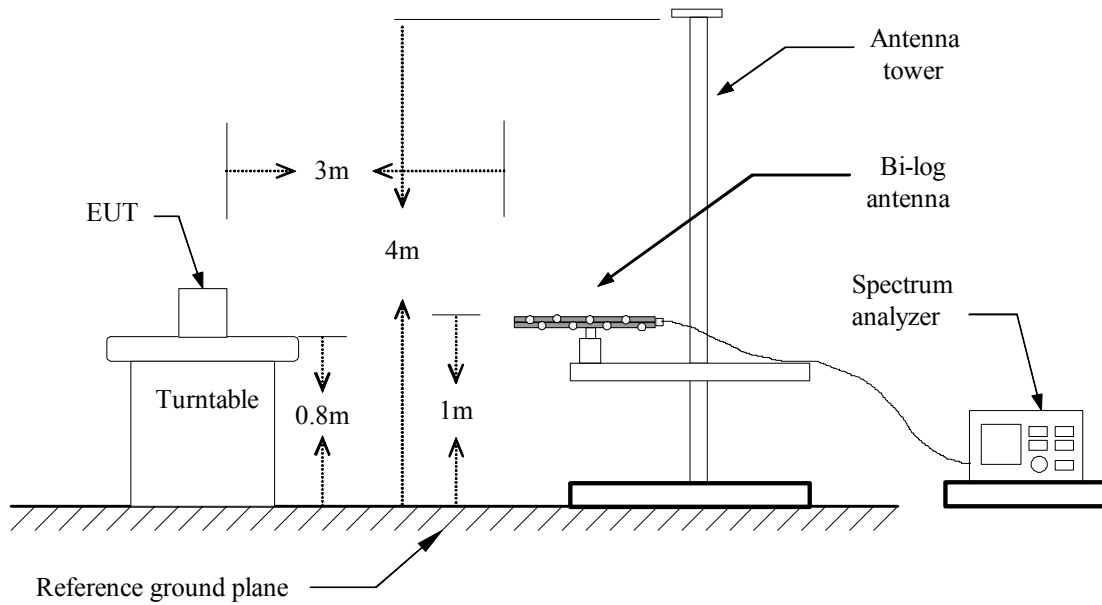
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

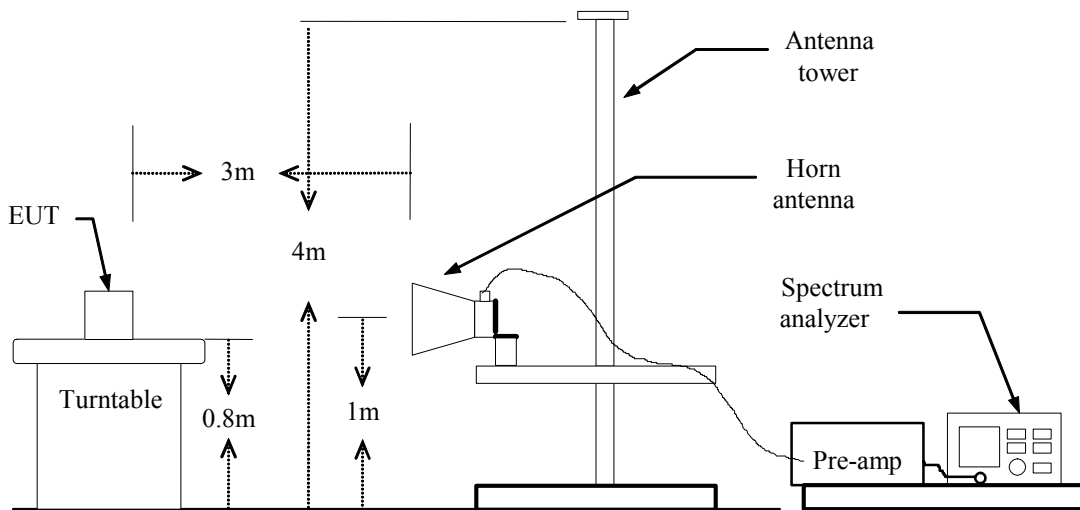
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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.

**Below 1 GHz****Operation Mode:** Normal Link**Test Date:** September 3, 2008**Temperature:** 23°C**Tested by:** Mimic Yang**Humidity:** 53% RH**Polarity:** Ver. / Hor.

Frequency (MHz)	Ant.Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
36.47	V	Peak	41.73	-6.69	35.04	40.00	-4.96
165.80	V	Peak	49.34	-9.39	39.95	43.50	-3.55
464.88	V	Peak	33.56	-1.93	31.63	46.00	-14.37
565.12	V	Peak	34.22	0.90	35.12	46.00	-10.88
767.20	V	Peak	30.92	4.63	35.55	46.00	-10.45
799.53	V	Peak	30.94	5.12	36.06	46.00	-9.94
128.62	H	Peak	41.05	-8.01	33.04	43.50	-10.46
172.27	H	Peak	45.23	-9.55	35.68	43.50	-7.82
398.60	H	Peak	39.93	-3.44	36.49	46.00	-9.51
434.17	H	Peak	37.40	-2.77	34.63	46.00	-11.37
498.83	H	Peak	39.12	-0.67	38.45	46.00	-7.55
599.07	H	Peak	36.66	1.30	37.96	46.00	-8.04

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:** September 4, 2008**Temperature:** 25°C**Tested by:** Jerry Lin**Humidity:** 50% 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)				
2402.00	V	95.66	---	-2.93	92.73	---	114.00	94.00	-21.27	Peak
4575.00	V	49.91	---	0.90	50.81	---	74.00	54.00	-3.19	Peak
7158.33	V	50.02	39.57	2.98	53.00	42.55	74.00	54.00	-11.45	AVG
N/A										
2402.00	H	98.56	---	-2.93	95.63	---	114.00	94.00	-18.37	Peak
4458.33	H	49.64	---	1.04	50.68	---	74.00	54.00	-3.32	Peak
7125.00	H	49.99	40.11	2.99	52.97	43.1	74.00	54.00	-10.9	AVG
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.
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 Mid**Test Date:** September 4, 2008**Temperature:** 25°C**Tested by:** Jerry Lin**Humidity:** 50% 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)				
2441.00	V	95.90	---	-2.82	93.08	---	114.00	94.00	-20.92	Peak
5308.33	V	51.24	37.12	0.22	51.46	37.34	74.00	54.00	-16.66	Peak
7608.33	V	51.80	38.52	3.18	54.97	41.70	74.00	54.00	-12.30	AVG
N/A										
2441.00	H	98.85	---	-2.82	96.04	---	114.00	94.00	-17.96	Peak
5425.00	H	50.34	---	0.32	50.65	---	74.00	54.00	-3.35	Peak
7466.67	H	50.61	40.63	2.91	53.52	43.54	74.00	54.00	-10.46	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.
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:** September 4, 2008**Temperature:** 25°C**Tested by:** Jerry Lin**Humidity:** 50% 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)				
2479.00	V	93.22	---	-2.69	90.52	---	114.00	94.00	-23.48	Peak
4491.67	V	49.45	---	1.06	50.51	---	74.00	54.00	-3.49	Peak
7125.00	V	50.07	36.98	2.99	53.06	39.97	74.00	54.00	-14.03	AVG
N/A										
2479.00	H	98.91	---	-2.69	96.22	---	114.00	94.00	-17.78	Peak
4800.00	H	50.19	---	0.40	50.59	---	74.00	54.00	-3.41	Peak
6125.00	H	50.82	38.59	1.31	52.14	39.9	74.00	54.00	-14.1	AVG
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.
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.



7.4 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 μ H/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 (dB μ V)	
	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 I 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.

Test Data

Operation Mode: Normal Link**Test Date:** August 23, 2008**Temperature:** 25°C**Tested by:** Stan Lin**Humidity:** 58% RH

Freq. (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.1831	42.40	36.36	9.62	52.02	45.98	64.34	54.34	-12.32	-8.36	L1
0.2432	33.06	26.43	9.60	42.66	36.03	61.99	51.99	-19.33	-15.96	L1
0.3041	28.95	23.17	9.60	38.55	32.77	60.13	50.13	-21.58	-17.36	L1
8.1001	41.12	33.28	9.91	51.03	43.19	60.00	50.00	-8.97	-6.81	L1
8.3422	41.37	32.88	9.93	51.30	42.81	60.00	50.00	-8.70	-7.19	L1
12.3024	36.93	28.81	10.15	47.08	38.96	60.00	50.00	-12.92	-11.04	L1
0.1823	41.72	36.31	9.62	51.34	45.93	64.38	54.38	-13.04	-8.45	L2
0.2433	35.31	29.33	9.60	44.91	38.93	61.98	51.98	-17.07	-13.05	L2
0.3044	30.91	26.98	9.60	40.51	36.58	60.12	50.12	-19.61	-13.54	L2
8.1607	41.37	32.99	9.92	51.29	42.91	60.00	50.00	-8.71	-7.09	L2
12.1774	34.91	26.55	10.18	45.09	36.73	60.00	50.00	-14.91	-13.27	L2
13.2128	36.06	29.63	10.22	46.28	39.85	60.00	50.00	-13.72	-10.15	L2

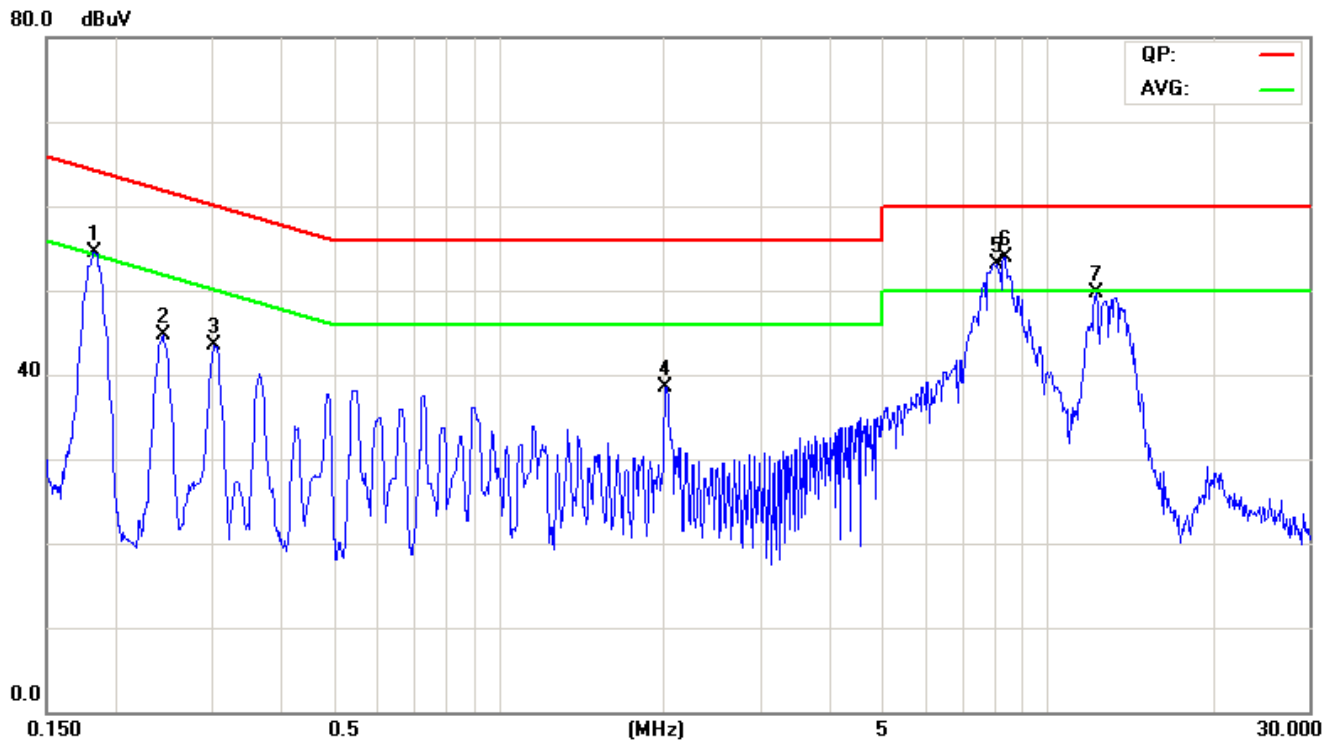
Remark:

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. The IF bandwidth of SPN between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)



Test Plots

Conducted emissions (Line 1)



Conducted emissions (Line 2)

