FCC 47 CFR PART 15 Subpart C

TEST REPORT

For

ZigBee Door Windows Sensor

Model SZ-DWS02xxxxxxxx (x = 0~9, A~Z, Blank or any Character)

Trade Name: SerComm

Issued to

SerComm Corporation
8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.

Issued by

Compliance Certification Services Inc.
No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township,
Taoyuan County 33841,Taiwan, R.O.C.
TEL: 886-3-324-0332 FAX: 886-3-324-5235
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Testing Laboratory
0363

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		July 17, 2012		Initial Issue	ALL	Jill Shiau

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1. TEST RESULT CERTIFICATION

Applicant:	**SerComm Corporation** 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.
Manufacturer:	**SerComm Corporation** 8F, No. 3-1, YuanQu St., NanKang, Taipei 115, Taiwan, R.O.C.
Equipment Under Test:	ZigBee Door Windows Sensor
Trade Name:	SerComm
Model:	SZ-DWS02xxxxxxxx (x = 0~9, A~Z, Blank or any Character)
Date of Test:	July 12 ~ 13, 2012

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: 2009 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 15.207, 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:***

Stan Lin
Section Manager

Jill Shiau
Section Manager

2. EUT DESCRIPTION

Product	ZigBee Door Windows Sensor
Model	SZ-DWS02xxxxxxxx (x = 0~9, A~Z, Blank or any Character)
Brand	SerComm
Model Discrepancy	1. The mean of "xxxxxxxx (x = 0~9, A~Z, Blank or any Character)" on model number, just for marketing purpose only 2. Client consigns only one sample to test (model number: SZ-DWS02). Therefore, the testing Lab. just guarantees the unit, which has been tested.
EUT Power Rating	3VDC from Battery
Operating Frequency Range	2405 ~ 2480MHz
Output Power	93.32dBuV/m
Modulation Technique	OPQSK (Offset Quadrature Phase Shift Keyed)
Number of Channels	16 Channels
Antenna Designation	PCB Antenna / Gain: 3.16dBi

Remark:

1. *The sample selected for test was production product and was provided by manufacturer.*
2. *This test report is intended for FCC ID: **P27SZDWS02** to comply with 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 (2009) and FCC CFR 47 Part 2, Part 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 15.207, 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 (2009) 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 (2009).

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: SZ-DWS02) had been tested under operating condition.

Test program used to control the EUT for staying in continuous transmitting mode was programmed.

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 transmitting mode only.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

Channel Low (2405MHz), Channel Mid (2445MHz) and Channel High (2480MHz) 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 Emission Test Site				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY48250064	12/25/2012
Spectrum Analyzer	R&S	FSEB	825829/011	12/18/2012
Power meter	Anritsu	ML2495A	1033009	08/18/2012
Power Sensor	Anritsu	MA2411B	0917221	08/18/2012

3M Semi Anechoic Chamber				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY48250064	12/25/2012
Pre-Amplifier	HP	8447D	2944A06530	01/03/2013
Pre-Amplifier	HP	8449B	3008A01738	04/17/2013
Pre-Amplifier	MITEQ	AMF-6F-26040 0-40-8P	985646	05/20/2013
EMI Test Receiver	SCHAFFNER	SCR 3501	430	01/11/2013
Loop Antenna	EMCO	6502	2356	06/11/2013
Bilog Antenna	SCHWAZBECK	VULB9160	3084	10/03/2012
Horn Antenna	EMCO	3115	9602-4659	06/14/2013
Horn Antenna	EMCO	3116	00026370	10/04/2012
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Test S/W	LabVIEW 6.1 (Wugu Chamber EMI Teat V1_4.5.3)			

4.3 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Powerline Conducted Emission	N/A
3M Semi Anechoic Chamber / 30MHz ~ 1GHz	±4.0474
3M Semi Anechoic Chamber / Above 1GHz	±3.8967

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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., Lujhu Township, Taoyuan County 33841,Taiwan, R.O.C.
Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7 (1992), ANSI C63.4 (2009) 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	CFR 47, FCC Part15/18, CISPR 22, EN 55022, ICES-003, AS/NZS CISPR 22, VCCI V-3, EN 55011, CISPR 11, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 61000-6-1/2/3/4, EN 55024, CISPR 24, AS/NZS CISPR 24, AS/NZS 61000.6.2, EN 55014-1/-2, ETSI EN 300 386 v1.3.2/v1.3.3, IEC/EN 61000-3-2, AS/NZS 61000.3.2, IEC/EN 61000-3-3, AS/NZS 61000.3.3	A2LA ACCREDITED TESTING CERT #0824.01
USA	FCC MRA	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	FC TW1026
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	VCCI R-2882/2541/2798/725/1868 C-402/747/912 T-1930/1646
Taiwan	TAF	EN 55014-1, CISPR 14, CNS 13781-1, EN 55013, CISPR 13, CNS 13439, EN 55011, CISPR 11, CNS 13803, PLMN09, IS2045-0, LP0002 FCC Part 27/90, Part 15B/C/D/E, RSS-192/193/210/310 ETSI EN 300 328/ 300 220-1/ 300 220-2/ 301 893/ 301 489-01/ 301 489-03/ 301 489-07 / 301 489-17/ 300 440-1/ 300 440-2 AS/NZS 4268, AS/NZS 4771 CISPR 22, EN 55022, CNS 13438, AS/NZS CISPR 22, VCCI, IEC/EN 61000-4-2/3/4/5/6/8/11, CNS 14676-2/3/4/5/6/8, CNS 14934-2/3, CNS 13783-1, CNS 13439, CNS 13803	ilac-MRA TAF Testing Laboratory 0363
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	SL2-IS-E-0014 / IN-E-0014 /A1-E-0014 /R1-E-0014 /R2-E-0014 /L1-E-0014
Canada	Industry Canada	RSS-Gen Issue 3	Canada IC 2324C-5

Note: *No part of this report may be used to claim or imply product endorsement by A2LA, TAF or other government agency.*

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

No any support equipment during the test.

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

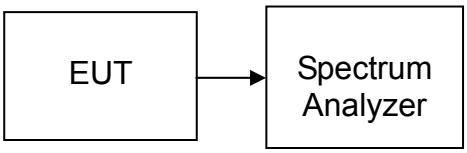
7. FCC PART 15.249 REQUIREMENTS

7.1 20dB BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST CONFIGURATION



TEST PROCEDURE

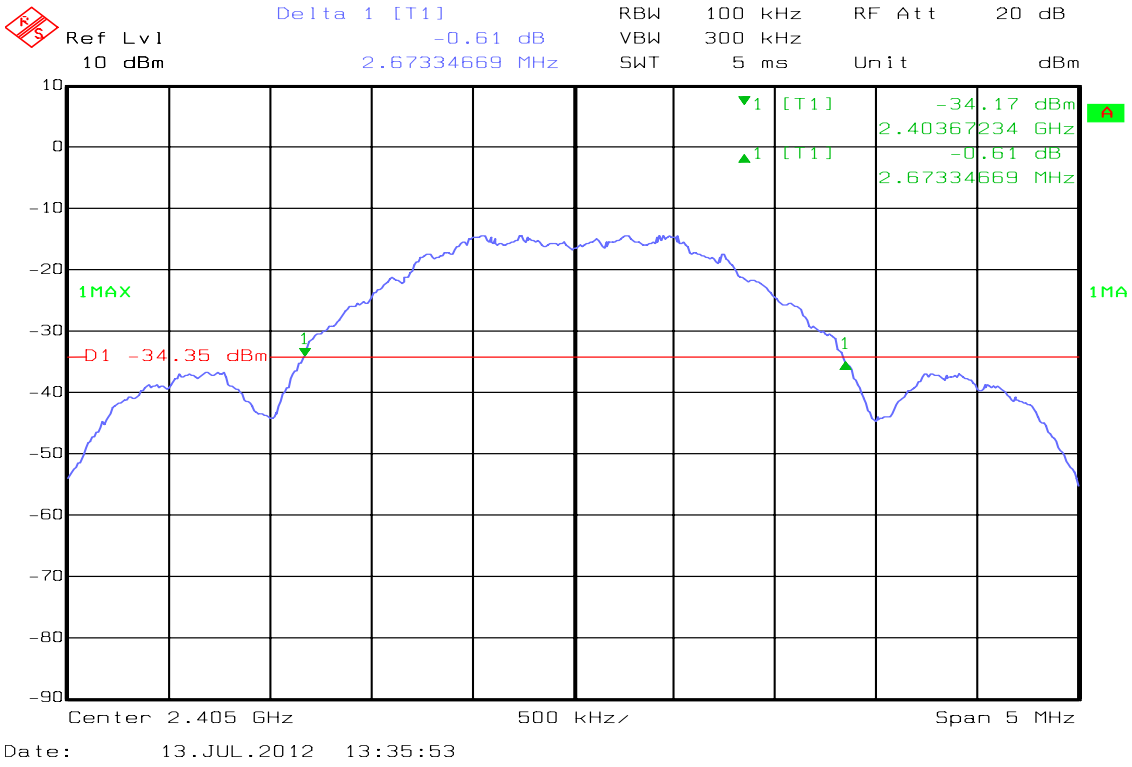
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100 kHz, VBW = 300 kHz, Span = 3MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

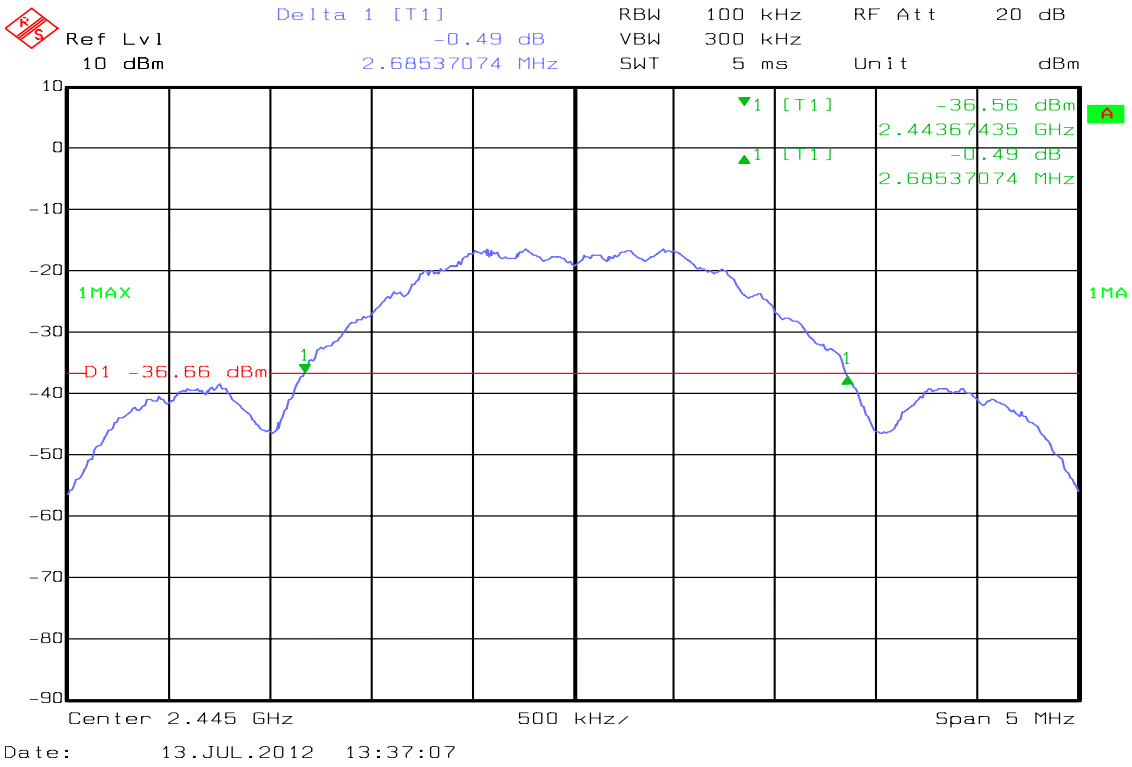
No non-compliance noted

TEST PLOT

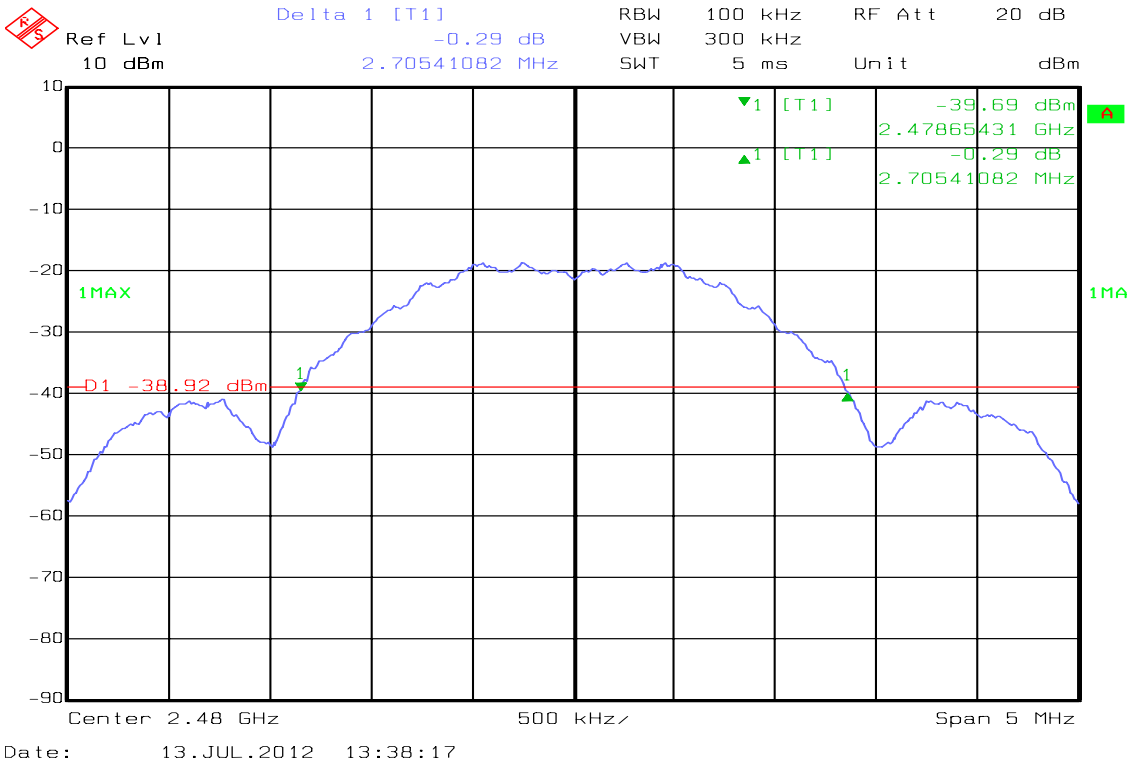
20dB Bandwidth (CH Low)



20dB Bandwidth (CH Mid)



20dB Bandwidth (CH High)



7.2 BAND EDGES MEASUREMENT

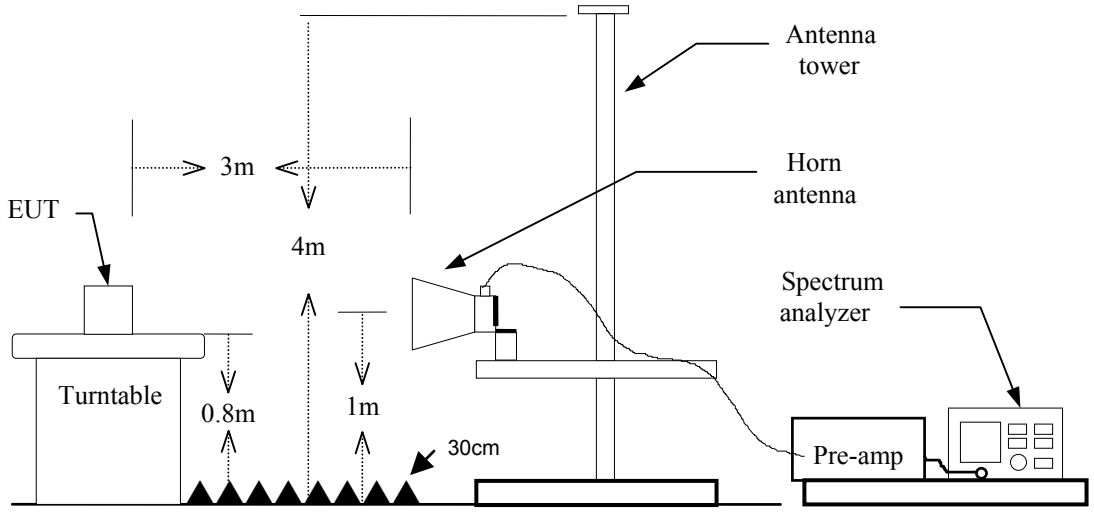
LIMIT

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.

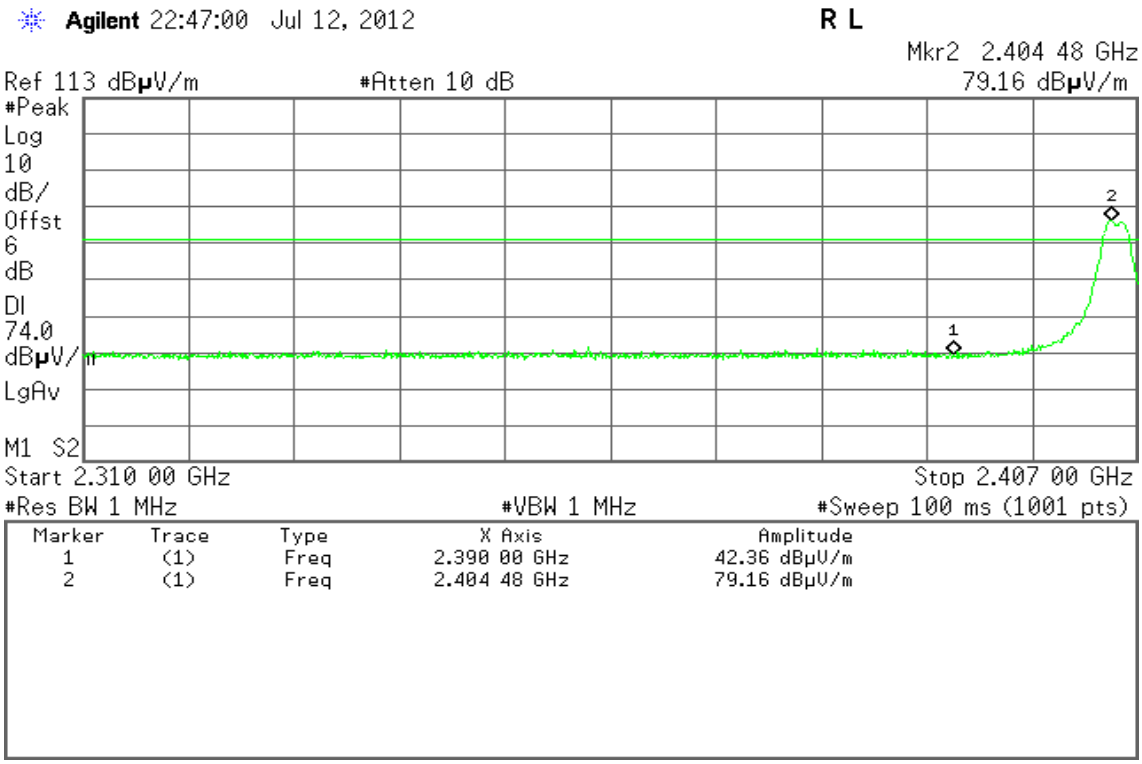
TEST RESULTS

Refer to attach spectrum analyzer data chart.

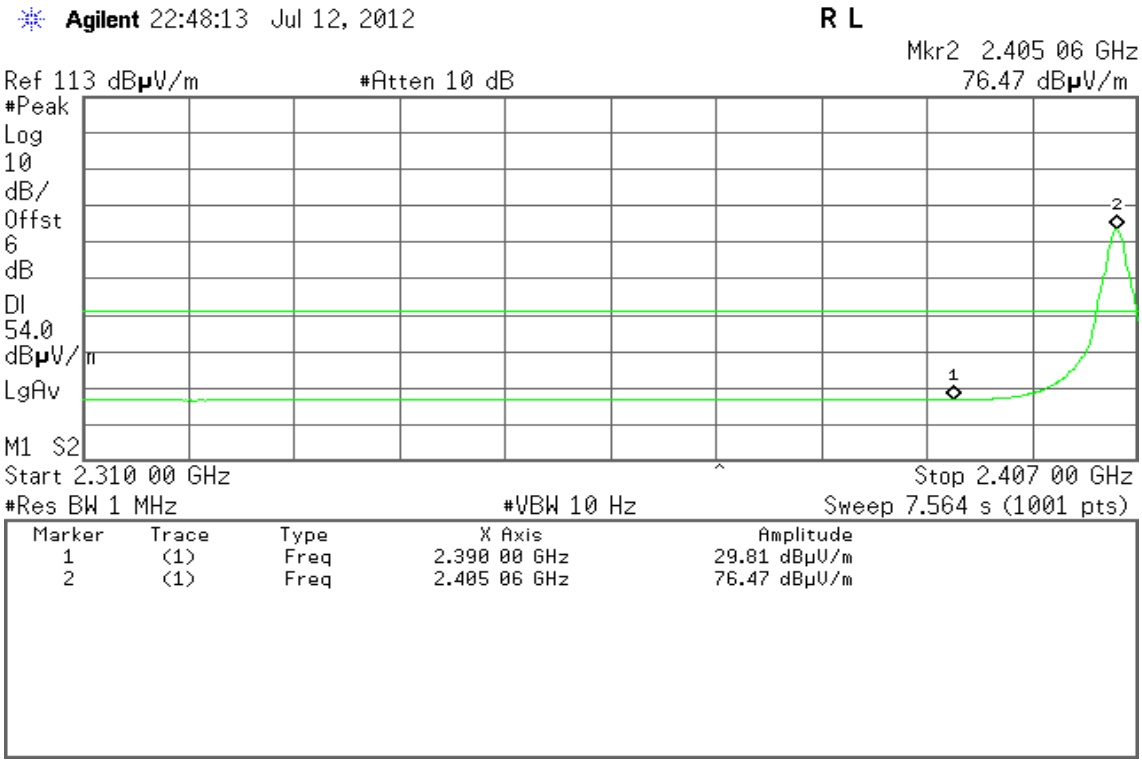
TEST PLOT

Band Edges (CH Low)

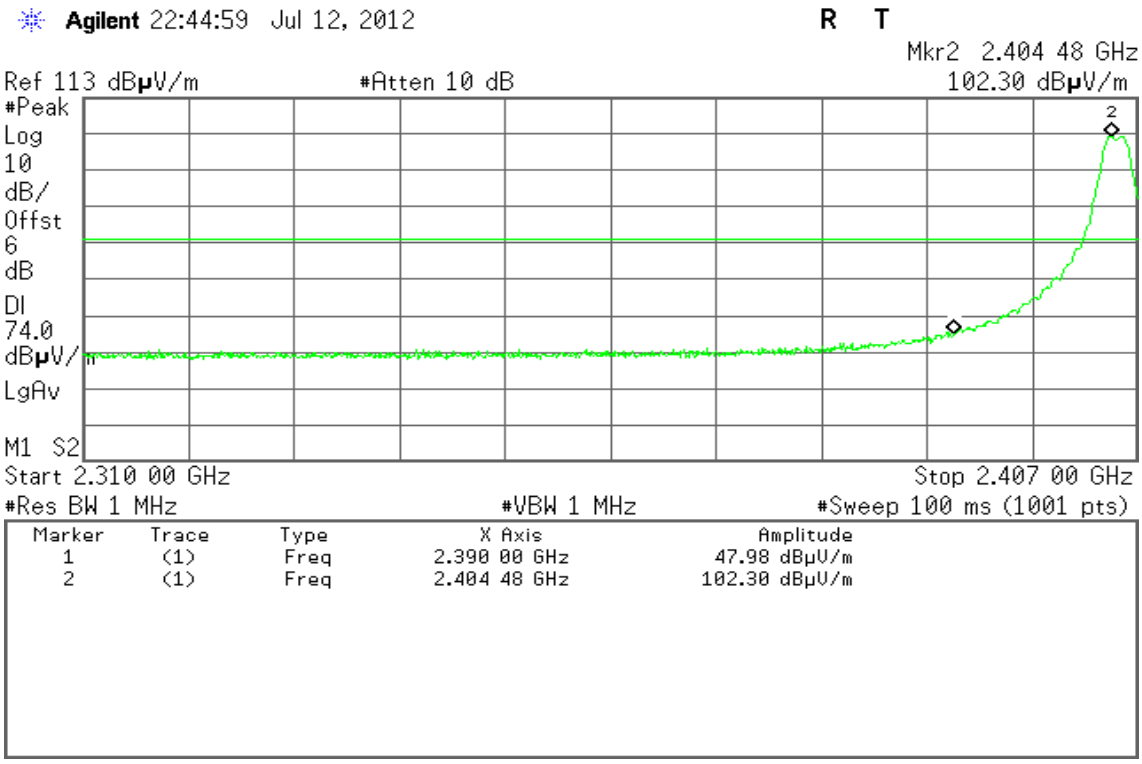
Detector mode: Peak Polarity: Vertical



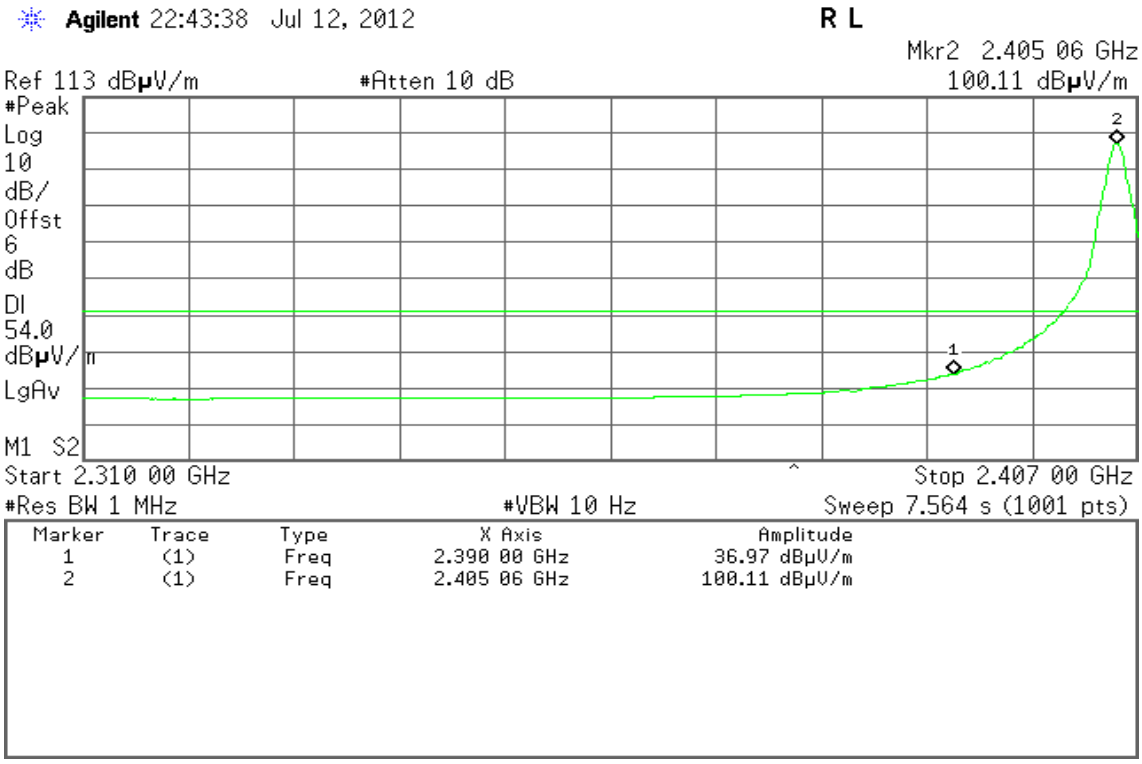
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

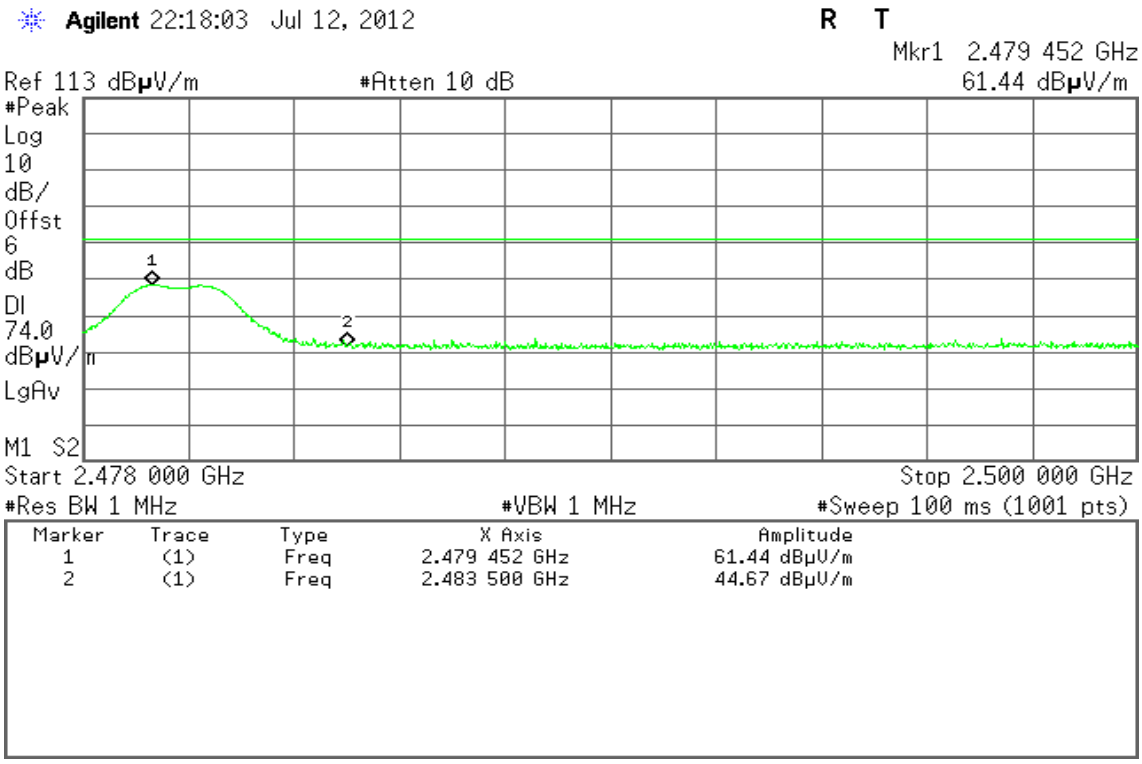


Detector mode: Average **Polarity: Horizontal**

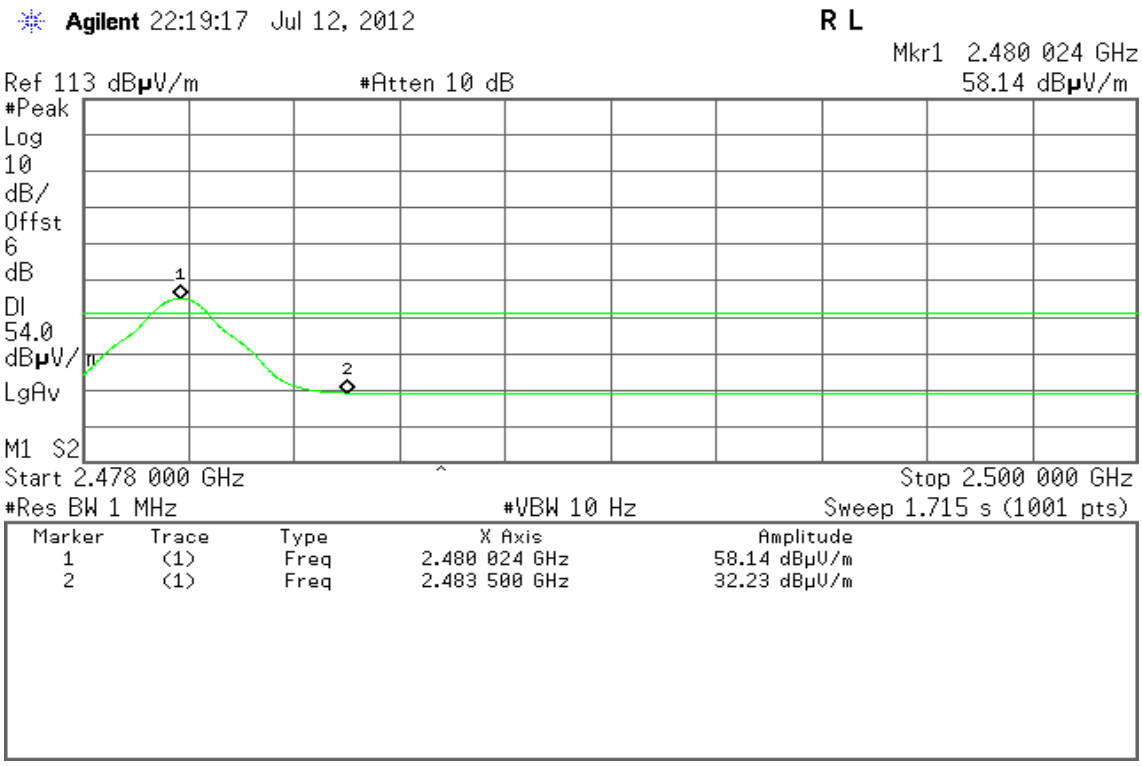


Band Edges (CH High)

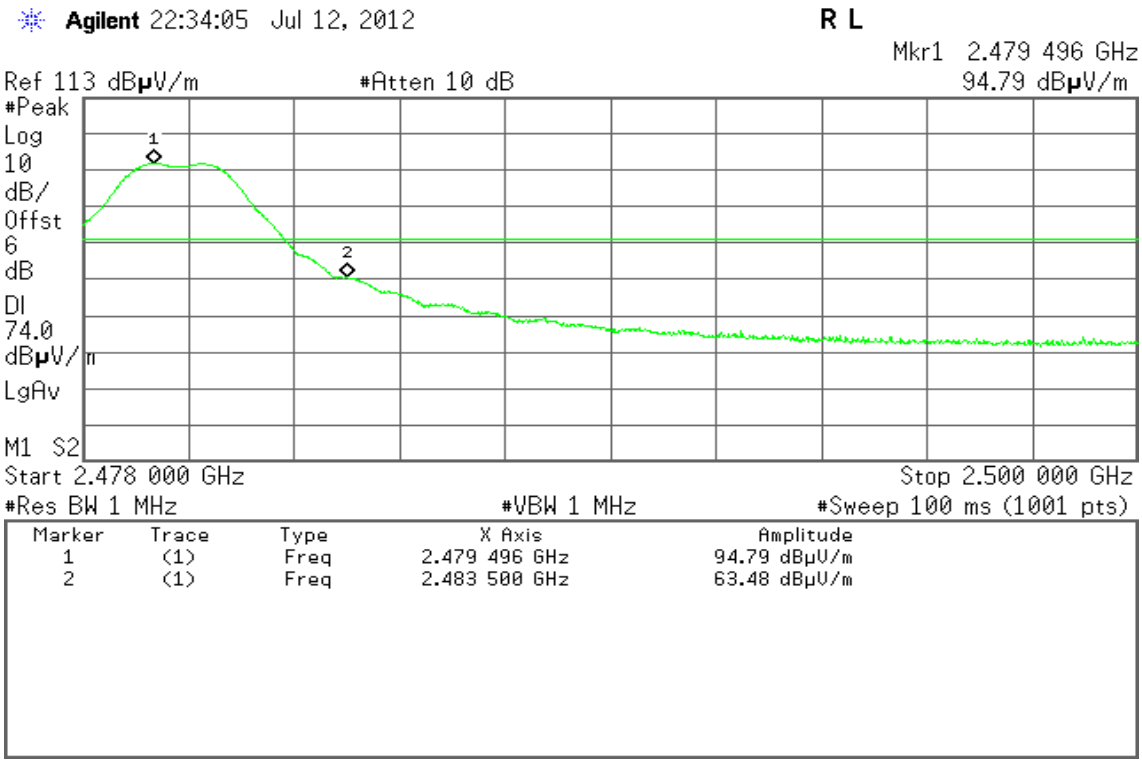
Detector mode: Peak Polarity: Vertical



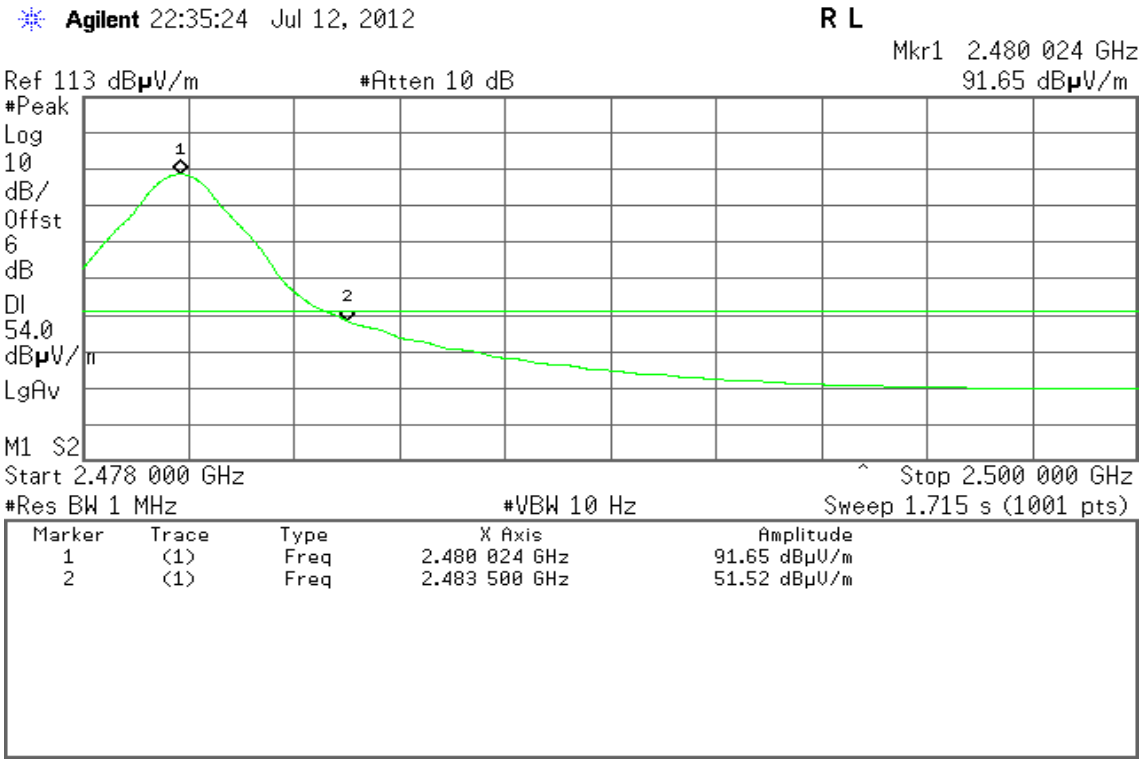
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



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

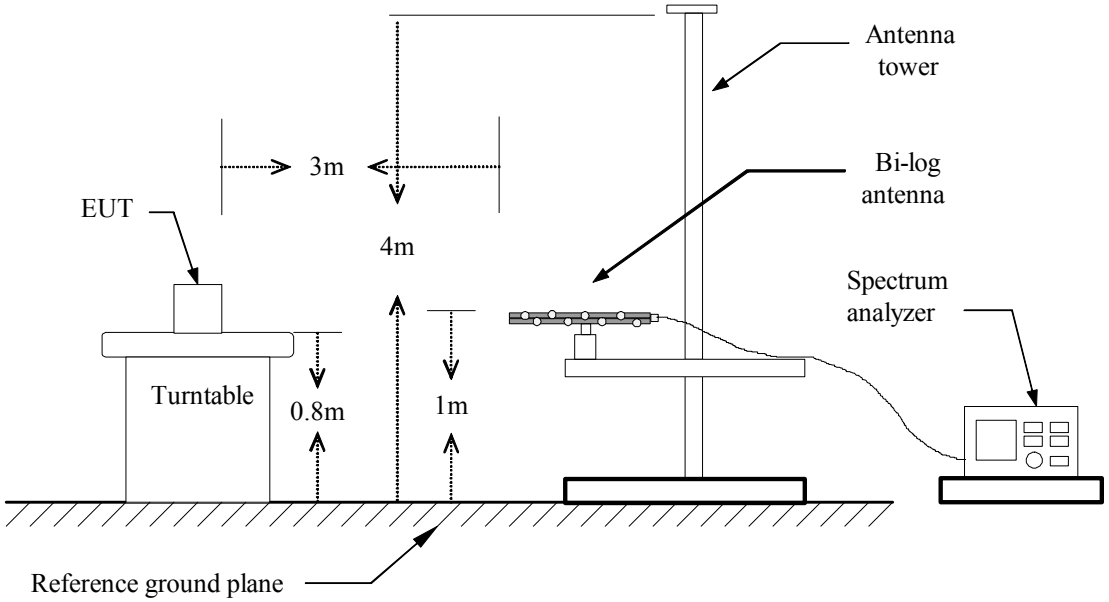
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of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

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

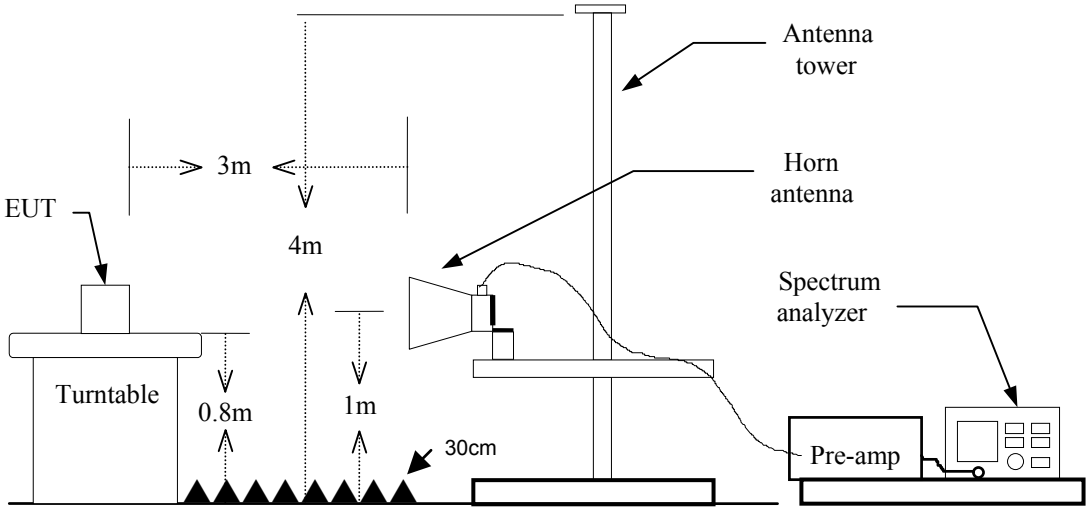
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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 30MHz

RBW=9kHz / VBW=300kHz / Sweep=AUTO

30 ~ 1000MHz:

RBW=120kHz / VBW=3MHz / 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

No non-compliance noted.

TEST DATA

Below 1 GHz

Operation Mode: Transmitting **Test Date:** July 12, 2012

Temperature: 22°C **Tested by:** Clark Su

Humidity: 57% RH **Polarity:** Ver. / Hor.

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pol. (H/V)	Remark
205.0850	41.42	-14.33	27.09	43.50	-16.41	V	QP
272.9849	41.34	-11.33	30.01	46.00	-15.99	V	QP
442.2500	39.32	-7.64	31.68	46.00	-14.32	V	QP
572.2300	38.01	-5.49	32.52	46.00	-13.48	V	QP
624.1250	36.05	-4.48	31.57	46.00	-14.43	V	QP
874.8700	34.71	-0.26	34.45	46.00	-11.55	V	QP
205.0850	44.11	-14.33	29.78	43.50	-13.72	H	QP
357.8599	39.74	-10.30	29.44	46.00	-16.56	H	QP
496.0849	37.58	-6.89	30.69	46.00	-15.31	H	QP
649.8300	34.10	-3.96	30.14	46.00	-15.86	H	QP
722.0949	33.08	-2.88	30.20	46.00	-15.80	H	QP
874.8700	35.49	-0.26	35.23	46.00	-10.77	H	QP

Remark:

1. *No emission found between lowest internal used / generated frequency to 30 MHz. (9kHz ~ 30MHz)*
2. *Measuring frequencies from 9 kHz to the 1GHz.*
3. *Radiated emissions measured in the measured frequency range were made with an instrument using Quasi-peak detector mode.*
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. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

Above 1 GHz

Operation Mode:	Tx / CH Low	**Test Date:**	July 12, 2012
Temperature:	22°C	**Tested by:**	Clark Su
Humidity:	57% 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)				
2405.57	V	76.98	---	-1.63	75.35	---	114.00	94.00	-18.65	Peak
1978.000	V	49.22	---	-1.65	47.57	---	74.00	54.00	-26.43	Peak
2898.000	V	48.53	---	-0.69	47.84	---	74.00	54.00	-26.16	Peak
4810.000	V	45.04	---	2.35	47.39	---	74.00	54.00	-26.61	Peak
N/A										
2405.43	H	92.40	---	-6.21	86.19	---	114.00	94.00	-7.81	Peak
2200.000	H	49.88	---	-3.56	46.32	---	74.00	54.00	-27.68	Peak
2624.000	H	49.06	---	-3.36	45.70	---	74.00	54.00	-28.30	Peak
4810.000	H	47.49	38.78	5.62	53.11	44.40	74.00	54.00	-9.60	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" 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.*

Operation Mode:	Tx / CH Mid	**Test Date:**	July 12, 2012
Temperature:	22°C	**Tested by:**	Clark Su
Humidity:	57% 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)				
2445.48	V	74.97	---	-1.33	73.64	---	114.00	94.00	-20.36	Peak
1960.000	V	49.16	---	-1.93	47.23	---	74.00	54.00	-26.77	Peak
2520.000	V	49.46	---	-1.18	48.28	---	74.00	54.00	-25.72	Peak
4890.000	V	41.95	---	4.15	46.10	---	74.00	54.00	-27.90	Peak
N/A										
2444.52	H	92.29	---	-5.22	87.07	---	114.00	94.00	-6.93	Peak
2120.000	H	49.18	---	-3.74	45.44	---	74.00	54.00	-28.56	Peak
2840.000	H	48.41	---	-2.18	46.23	---	74.00	54.00	-27.77	Peak
4890.000	H	44.68	---	6.98	51.66	---	74.00	54.00	-22.34	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" 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.*

Operation Mode:	Tx / CH High	**Test Date:**	July 12, 2012
Temperature:	22°C	**Tested by:**	Clark Su
Humidity:	57% 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)				
2479.47	V	65.60	---	-1.08	64.52	---	114.00	94.00	-29.48	AVG
2002.000	V	49.79	---	-1.35	48.44	---	74.00	54.00	-25.56	Peak
2924.000	V	48.23	---	-0.81	47.42	---	74.00	54.00	-26.58	Peak
N/A										
2479.50	H	94.84	94.08	-1.52	93.32	92.56	114.00	94.00	-1.44	AVG
2128.000	H	49.26	---	-3.72	45.54	---	74.00	54.00	-28.46	Peak
2826.000	H	48.95	---	-2.29	46.66	---	74.00	54.00	-27.34	Peak
4960.000	H	40.30	---	7.41	47.71	---	74.00	54.00	-26.29	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" 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.*

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 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.

TEST DATA

Not applicable (Since the EUT is powered by battery)