FCC 47 CFR PART 15 SUBPART C

Report No: SZ120328B05-RP

TEST REPORT

For

315 MHz Wireless Remote Control Model: 87338, 87339, 87440 Brand: Gemmy

Test Report Number: SZ120328B05-RP

Issued for

GEMMY INDUSTRIES (HK)LIMITED BVI Unit No.301 on 3rd Floor, East Ocean Centre, No.98 Granville Road, Kowloon, Hong Kong

Issued By

Compliance Certification Services (Shenzhen) Inc.

No.10-1 Mingkeda Logistics park, No.18 Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China

TEL: 86-755-28055000

FAX: 86-755-28055221 Issued Date: March 31, 2012



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1. TEST RESULT CERTIFICATION

Product	315 MHz Wireless Remote Control
Model	87338, 87339, 87440
Brand	Gemmy
Tested	March 28~30, 2012
Applicant	GEMMY INDUSTRIES (HK)LIMITED BVI Unit No.301 on 3 rd Floor, East Ocean Centre, No.98 Granville Road, Kowloon, Hong Kong
Manufacturer	(1)Shenzhen Lighting Opto-Electronic Technology Co., Ltd. Egongling Village, Pinghu Town, Longgang Dist. Shenzhen City. China (2) XingYu Electronic(Hui Zhou) Co., LTD Hengjiangwei Village, Yihe Town, Boluo County, Huizhou City, Guangdong Province, China

APPLICABLE STANDARDS						
STANDARD TEST RESULT						
FCC 47 CFR Part 15 Subpart C	No non-compliance noted					
DEVIATION FROM APPLICABLE STANDARD						
None						

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 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.209 and Part 15.231.

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

Approved by:

Reviewed by:

Tom Gan

Supervisor of EMC Dept.

Compliance Certification Service Inc.

Aven Zhou

Supervisor of Report Dept.

Compliance Certification Service Inc.

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2. EUT DESCRIPTION

Product	315 MHz Wireless Remote Control
Model	87338, 87339, 87440
Brand	Gemmy
Model Difference	The model are identical only the name are different
Power Supply	DC3.0V supplied by the battery
Frequency Range	315 MHz
Transmit Power	Peak: 84.22dBuV/m (Max.) Average: 69.31dBuV/m (Max.)
Modulation Technique	AM
Number of Channels	1 Channels
Antenna Designation	Internally installed spring antenna with 3dBi
Temperature Range	-20°C ~ +85°C

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Remark: This submittal(s) (test report) is intended for FCC ID: <u>GPO87338</u> filing to comply with Section 15.209 and 15.231 of the FCC Part 15, Subpart C Rules.

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3. TEST METHODOLOGY

3.1 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

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The following test mode(s) were scanned during the preliminary test below 1G:

Test Item	Test mode	Worse mode
Conducted Emission	Not applicable since the EUT supplied by the battery.	
Radiated Emission	Mode 1: TX	

Above 1G, TX mode with the highest data rate (worst case) are chosen for full testing.

The field strength of spurious radiation emission was measured in the following position: EUT stand-up position (Y mode) and lie-down position (X, Z mode) The following data show only the worst case setup.

The worst case (Y axis) was reported.

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4. FACILITIES AND ACCREDITATIONS

4.1 FACILITIES

All measurement facilities used to collect the measurement data are located at No.10-1, Mingkeda Logistics Park, No.18, Huanguan South Rd., Guan Lan Town, Baoan District, Shenzhen, China

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The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI The sites are constructed in conformance with the requirements of ANSI C63.4:2003, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

4.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

USA A2LA China CNAS

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

USA FCC

Japan VCCI(C-3478, R-3135, T-652)

Canada INDUSTRY CANADA

Taiwan BSMI Norway Nemko

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

4.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

F						
Measurement	Frequency	Uncertainty				
Conducted emissions	9kHz~30MHz	+/- 3.18dB				
	30MHz ~ 200MHz	+/- 3.79dB				
Radiated emissions	200MHz ~1000MHz	+/- 3.62dB				
	Above 1000MHz	+/- 5.04dB				

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

The measured result is above (below) the specification limit by a margin less than the measurement uncertainty; it is therefore not possible to state compliance based on the 95% level of confidence. However, the result indicates that compliance (non-compliance) is more probable than non-compliance) with the specification limit.

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5. SETUP OF EQUIPMENT UNDER TEST

5.1 SETUP CONFIGURATION OF EUT

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

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5.2 SUPPORT EQUIPMENT

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

Remark:

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

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6. FCC PART 15.231 REQUIREMENTS

6.1 20 DB BANDWIDTH

<u>LIMIT</u>

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

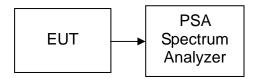
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MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

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

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10 kHz and VBW is set 30kHz.

TEST RESULTS

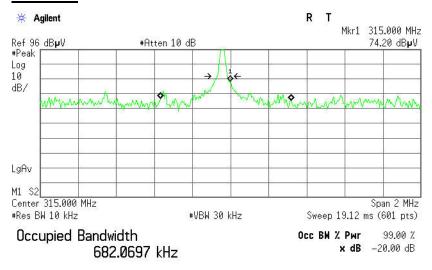
No non-compliance noted.

Test Data

Frequency (MHz)	20 dB Bandwidth (MHz)	Limit (MHz)	Result	
315.00	0.0513	0.7875	PASS	

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Test Plot



-24.578 kHz 51.264 kHz Transmit Freq Error x dB Bandwidth

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6.2 LIMIT OF TRANSMISSION TIME

LIMIT

According to 15.231 (a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

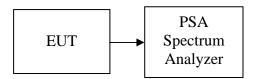
Report No: SZ120328B05-RP

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013

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

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW and VBW are set to 1MHz.

TEST RESULTS

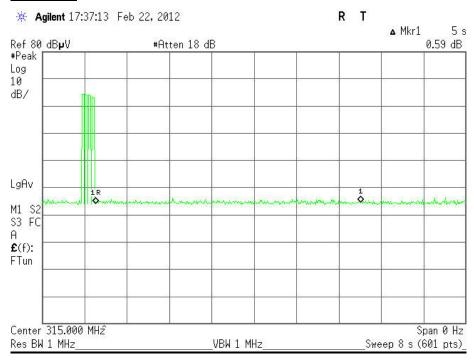
No non-compliance noted

Test Data

Frequency (MHz)	Limit (Second)	Result
315.00	5.00	PASS

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Test Plot



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6.3 DUTY CYCLE

LIMIT

Nil (No dedicated limit specified in the Rules)

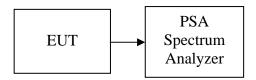
MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Last Calibration	Due Calibration
Spectrum Analyzer	Agilent	E4446A	US44300399	03/21/2011	03/21/2012

Report No: SZ120328B05-RP

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

Test Configuration



TEST PROCEDURE

- 1. Place the EUT on the table and set it in 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 center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=100KHz, Span = 0Hz, Adjust Sweep = 50ms
- 5. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

No non-compliance noted

Test Data

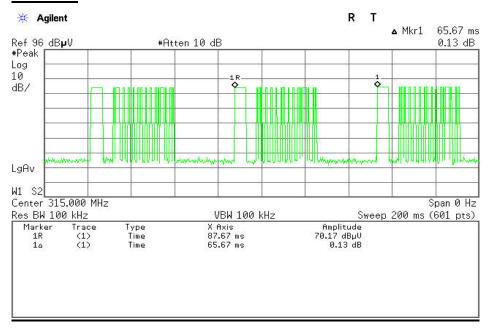
Ton+off = 65.67ms

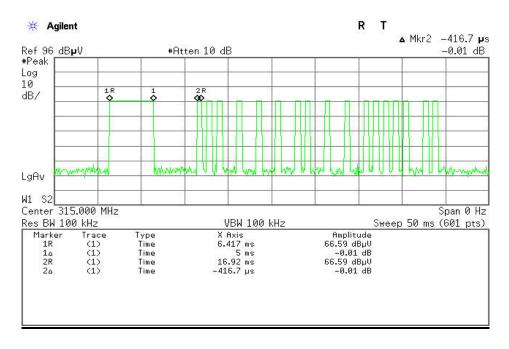
Ton =5.0+0.4*17=11.8ms

Duty Cycle Correction Factor = 20* log (Ton / Ton + off) = 20* log (11.8/65.67) = -14.91 dB

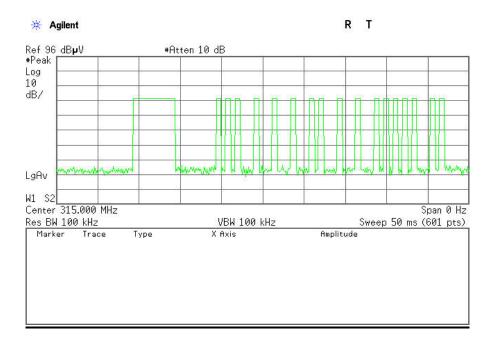
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Test Plot





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6.4 RADIATED EMISSIONS

LIMIT

 According to §15.231(b), In addition to the provisions of Section 15.205, the field strength of emissions from intentional radiators operated under this Section shall not exceed the following: Fundamental Field Strength of Field Strength of Frequency Fundamental Spurious Emissions (MHz) (microvolts/meter) (microvolts/meter)

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Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 – 40.70	2,250	225
70 – 130	1,250	125
130 – 174	1,250 to 3,750 **	125 to 375 **
174 – 260	3,750	375
260 – 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12,500	1,250

^{**} linear interpolations

[Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]

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 (mV/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 (Hz)	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

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MEASUREMENT EQUIPMENT USED

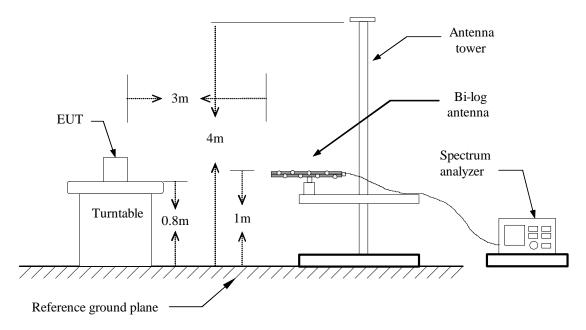
Radiated Emission Test Site 966 (2)								
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration			
PSA Series Spectrum Analyzer	Agilent	E4446A	US44300399	03/19/2012	03/19/2013			
Amplifier	MITEQ	AM-1604-3000	1411843	03/18/2012	03/18/2013			
Turn Table	EMCO	2081-1.21	N/A	N.C.R	N.C.R			
Controller	СТ	N/A	N/A	N.C.R	N.C.R			
High Noise Amplifier	Agilent	8449B	3008A01838	03/18/2012	03/18/2013			
Bilog Antenna	SCHAFFNER	CBL6143	5082	03/17/2012	03/17/2013			
Horn Antenna	SCHWARZBECK	BBHA9120	D286	03/17/2012	03/17/2013			
Loop Antenna	A、R、A	PLA-1030/B	1029	03/19/2012	03/19/2013			
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/31/2012	03/31/2013			
Antenna Tower	SUNOL	TLT2	N/A	N.C.R	N.C.R			
Test S/W	FARAD	LZ-RF / CCS-SZ-3A2						

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

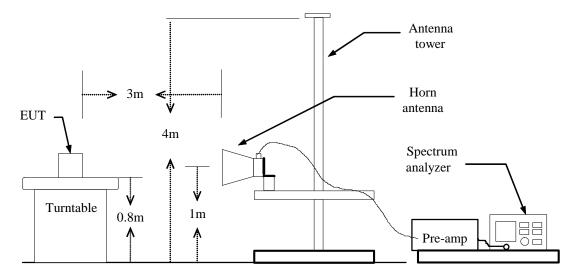
Test Configuration

Below 1 GHz



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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.

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TEST RESULTS

Operation Mode: TX Test Date: May 25, 2012

Temperature: 24°C **Tested by:** Sunday Hu

Humidity: 52 % RH **Polarity:** Ver. / Hor.

Fundamental:

Freq. (MHz)	Reading (Peak) (dBuV)	Correction Factor (dB/m)	Result (Peak) (dBuV/m)	Duty Cycle Correction Factor (dB)	Result (Average/ Quasi-peak) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant.Pol (H/V)	Remark
315	84.75	-18.18	66.57			95.62	-29.05	V	Peak
315	84.75	-18.18	66.57	-14.91	51.66	75.62	-23.96	V	Average
315	102.4	-18.18	84.22			95.62	-11.4	Н	Peak
315	102.4	-18.18	84.22	-14.91	69.31	75.62	-6.31	Н	Average

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Remark: Average =Peak result+ Duty cycle correction factor

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
122.1500	47.32	-20.42	26.90	43.50	-16.60	V	Peak
314.5332	86.43	-18.18	68.25	87.66	-19.41	V	Peak
314.5332	66.52	-18.18	48.34	67.66	-19.32	V	AVG
393.7500	44.04	-15.69	28.35	46.00	-17.65	V	Peak
472.9667	35.41	-14.22	21.19	46.00	-24.81	V	Peak
629.7833	61.10	-12.15	48.95	67.66	-18.71	V	Peak
629.7833	41.19	-12.15	29.04	47.66	-18.62	V	AVG
833.4833	36.24	-9.68	26.56	46.00	-19.44	V	Peak
945.0333	55.55	-8.89	46.66	67.66	-21.00	V	Peak
314.5332	101.09	-18.18	82.91	87.66	-4.75	Н	Peak
314.5333	81.18	-18.18	63.00	67.66	-4.66	Н	AVG
393.7500	51.69	-15.69	36.00	46.00	-10.00	Н	Peak
472.9667	41.10	-14.22	26.88	46.00	-19.12	Н	Peak
629.7833	71.70	-12.15	59.55	67.66	-8.11	Н	Peak
629.7833	51.79	-12.15	39.64	47.66	-8.02	Н	AVG
833.4833	45.78	-9.68	36.10	46.00	-9.90	Н	Peak
865.8167	39.58	-9.36	30.22	46.00	-15.78	Н	Peak
945.0333	61.89	-8.89	53.00	67.66	-14.66	Н	Peak
945.0333	41.98	-8.89	33.09	47.66	-14.57	Н	AVG

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 detector mode.
- 3. 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.
- 4. The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.

Above 1 GHz

Operation Mode: TX Test Date: May 29, 2012

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Temperature: 24°C Humidity: 52 % RH

Tested by: Sunday Hu

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Pole (V/H)	Remark
1260.0000	51.22	-11.10	40.12	74.00	-33.88	V	Peak
1575.0000	54.84	-10.31	44.53	74.00	-29.47	V	Peak
1890.0000	50.77	-9.74	41.03	74.00	-32.97	V	Peak
2205.0000	54.59	-9.44	45.15	74.00	-28.85	V	Peak
2835.0000	49.08	-7.08	42.00	74.00	-32.00	V	Peak
3150.0000	48.32	-5.61	42.71	74.00	-31.29	V	Peak
1260.0000	59.51	-11.10	48.41	74.00	-25.59	Н	Peak
1575.0000	61.46	-10.31	51.15	74.00	-22.85	Н	Peak
1890.0000	52.86	-9.74	43.12	74.00	-30.88	Н	Peak
2205.0000	55.28	-9.44	45.84	74.00	-28.16	Н	Peak
2730.0000	47.39	-7.77	39.62	74.00	-34.38	Н	Peak
3010.0000	47.65	-5.94	41.71	74.00	-32.29	Н	Peak

Remark:

- 1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
- 2. Measurements above show only up to 6 maximum emissions noted, or would be lesser 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.
- 3. Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
- 4. Spectrum setting:
 - a. Spectrum Peak Setting 1GHz 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms
 - Spectrum AV Setting 1GH z- 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

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6.5 POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

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Frequency Range (MHz)	Limits (dBμV)				
requeries range (minz)	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			

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Conducted Emission Test Site								
Name of Equipment	Manufacturer	Model Number	Serial Number	Last Calibration	Due Calibration			
ESCI EMI TEST RECEIVE.ESCI	ROHDE&SCHWARZ	ESCI	100783	03/17/2012	03/17/2013			
LISN	SCHAFFNER	NNB42	2001/001	05/26/2011	05/26/2012			
LISN	EMCO	3825/2	8901-1459	03/19/2012	03/19/2013			
Temp. / Humidity Meter	VICTOR	VC230	N/A	03/31/2012	03/31/2013			
Test S/W	FARAD	EZ-EMC/ CCS-3A1-CE						

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

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

Not applicable (Since the EUT is powered by battery)

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