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FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

**RealEase Limited
SHOGO Remote Controller**

Model: FRC00, FRC01

Trade Name: SHOGO

Prepared for

**RealEase Limited
15/F, Morrison Commercial Building, 31 Morrison Hill Road,
Wanchai Hong Kong**

Prepared by

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1. TEST RESULT CERTIFICATION

Applicant: RealEase Limited
15/F, Morrison Commercial Building, 31 Morrison Hill Road,
Wanchai, Hong Kong

Equipment Under Test: SHOGO Remote Controller

Trade Name: SHOGO

Model: FRC00, FRC01

Date of Test: Nov2 ~27, 2007

Report No. : ST0710038

FCC ID : VTXFRC0

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

We hereby certify that:

The above equipment was tested by SINTEK laboratory co., ltd. 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: 2001 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.231.

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

Approved by:

Reviewed by:



2. EUT DESCRIPTION

Product	SHOGO Remote controller
Trade Name	SHOGO
Model Number	FRC00, FRC01
Model Discrepancy	It is different just for model number, except that they are identical.
Power Supply	DC 12V by Battery
Frequency Range	433 MHz
Number of Channels	1 Channels
Antenna Specification	The EUT'S antenna is permanently mounted on RF board

Note: This submittal(s) (test report) is intended for FCC ID: VTXFRC0 filing to comply with Section 15.231 of the 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, and 15.231.

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 15.231 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: 2001, 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 max emission, the relative positions of this hand-held transmitter (EUT) were rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4: 2001.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

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

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

² Above 38.6

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 has been tested under operating condition.



4. 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.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at No. 7, Xinshidai industrial, Guantian Village, Shiyan Town, Baoan District Shenzhen, China.

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, bi-conical, 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 LABORATORY ACCREDITATIONS AND LISTING

Site on file with the FCC: The certificate registration number is 963441 for 3&10M OATS

Site listed with the VCCI: The certificate registration number is R-2023 and C-2178 for 3&10M OATS



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						

Notes:

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

7. FCC PART 15.231 REQUIREMENTS

7.1 BANDWIDTH OF EMISSION

APPLICABLE STANDARD

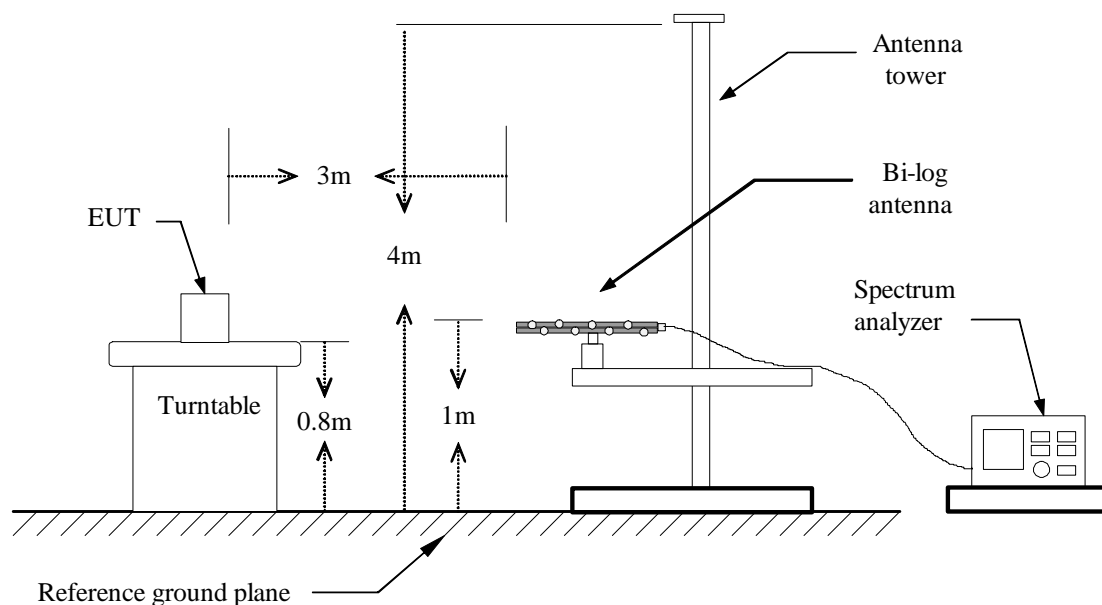
Per FCC rule &15.231©, the permitted emission bandwidth is no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date
Spectrum Analyzer	ADVANTEST	R3132	140301570	06/12/2007
Turn Table	SINTEK	N/A	N/A	N.C.R
Antenna Tower	SINTEK	N/A	N/A	N.C.R
Controller	SINTEK	N/A	N/A	N.C.R
Bilog Antenna	SCHAFFNER	CBL6111C	2775	06/12/2007
Pre-Amplifier	COM-POWER	PA-103	161062	06/12/2007

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

Test Configuration





TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set the spectrum analyzer as RBW = 100kHz, VBW = RBW, Span = 20MHz, Sweep = auto.

PLOT GRAPHIC OF BANDWIDTH

The emission bandwidth limit for this transmitter is:

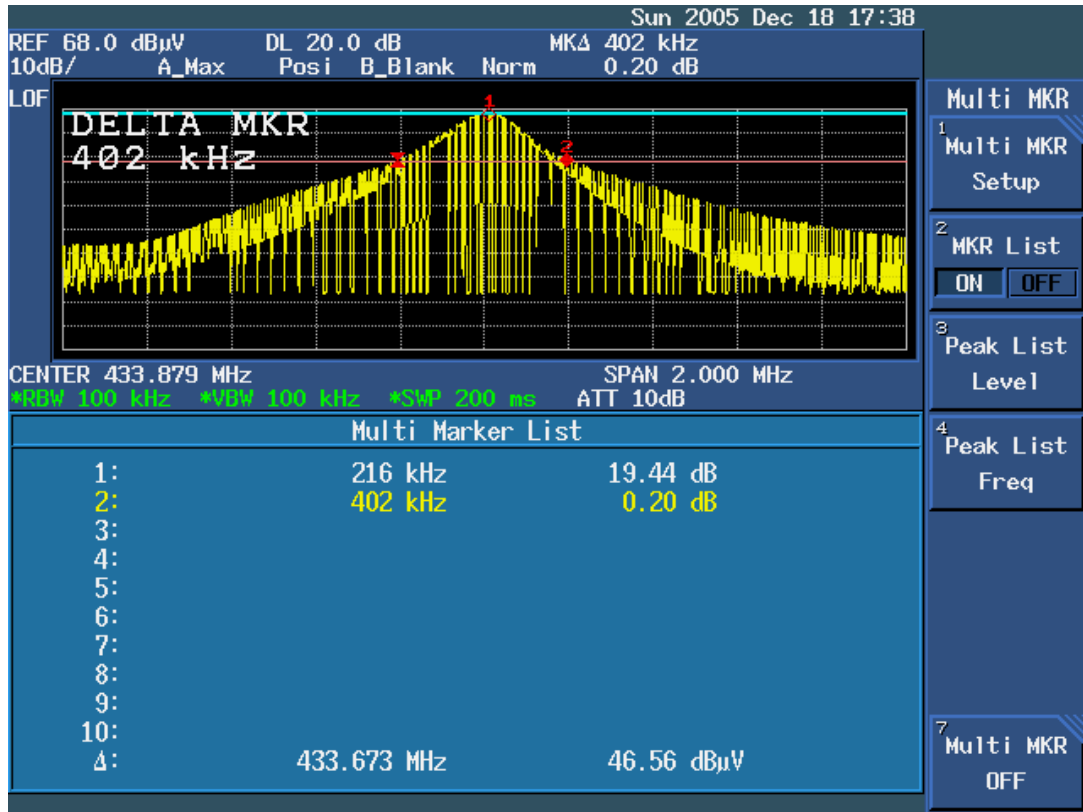
$$433.00\text{MHz} \times 0.25\% = 1.08\text{MHz}$$

$$20 \text{ dB bandwidth} = 402\text{KHz}$$

TEST RESULTS

No non-compliance noted

Test Plot



7.2 RADIATED EMISSIONS

LIMIT

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:

FCC PART 15 subpart C section 15.209 :

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

Note: 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.

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

Frequency (Hz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

FCC PART 15 subpart C section 15.231:

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, $\mu\text{V/m}$ at 3 meters = $56.81818(F) - 6136.3636$; for the band 260-470 MHz, $\mu\text{V/m}$ at 3 meters = $41.6667(F) - 7083.3333$. The maximum permitted unwanted emission level is 20 dB below the maximum permitted fundamental level.]



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

Frequency (MHz)	Field Strength				Measurement Distance (m)
	Fundamental(mV/m)		Harmonies(μV/m)		
	PK	AVG	PK	AVG	
433	100.79	80.79	80.79	60.79	3

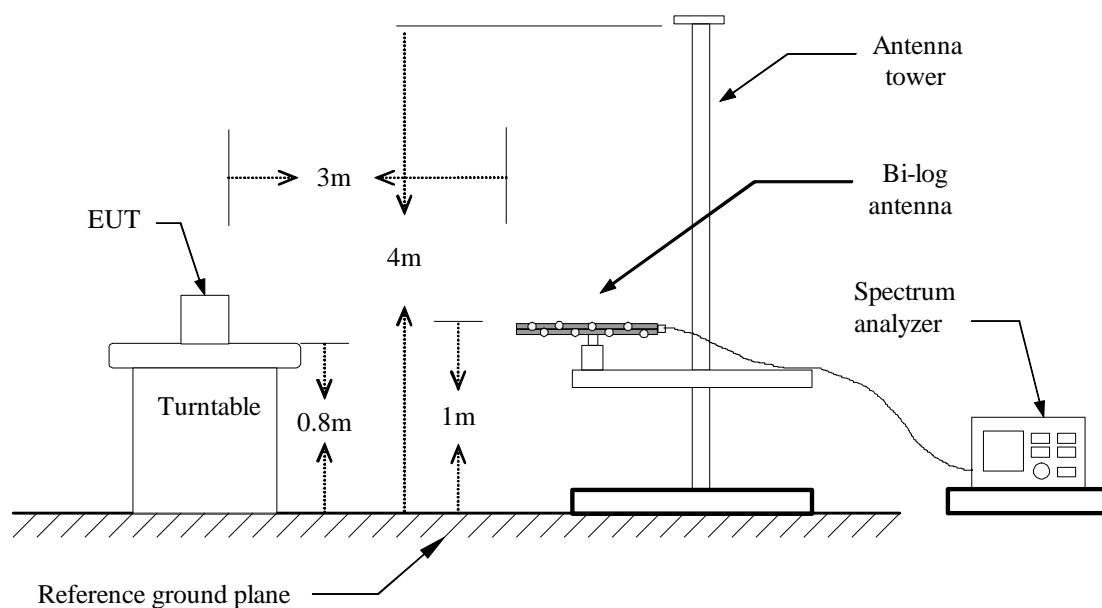
MEASUREMENT EQUIPMENT USED

Open Area Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date
Spectrum Analyzer	ADVANTEST	R3271A	85060231	06/12/2007
Spectrum Analyzer	ADVANTEST	R3132	140301570	06/12/2007
EMI Test Receiver	SCHAFFNER	SCR3501	464	06/12/2007
Pre-Amplifier	COM-POWER	PA-103	161062	06/12/2007
Bilog Antenna	SCHAFFNER	CBL6111C	2775	06/12/2007
Turn Table	SINTEK	N/A	N/A	N.C.R
Antenna Tower	SINTEK	N/A	N/A	N.C.R
Controller	SINTEK	N/A	N/A	N.C.R
RF Switch	ANRITSU	MP59B	M53867	N.C.R
Horn antenna	EMCO	3115	9602-4659	06/12/2007
Pre-Amplifier	HP	8449B	3008B00965	06/12/2007

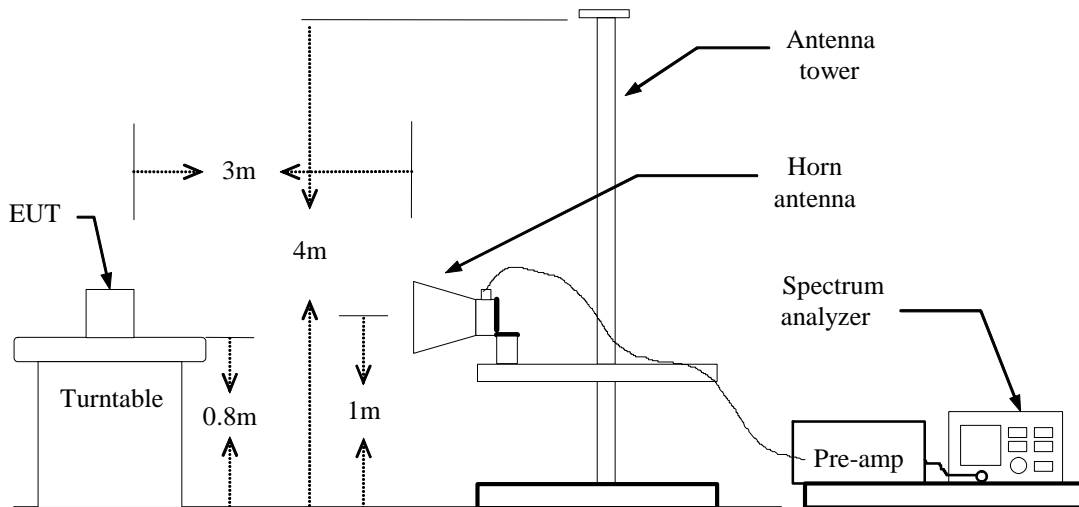
Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration

Below 1 GHz



Above 1 GHz



TEST PROCEDURE

The EUT is placed on a turntable, which is 0.8m above ground plane.

The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.

Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

Operation Mode: NORMAL

Test Date: Nov 23, 2007

Temperature: 25°C

Tested by: poppy

Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant.Pol. H/V	Detector Mode (PK/QP)	Reading (dBuV)	Factor (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Safe Margin (dB)
433.52	V	Peak	48.29	19.00	67.29	80.79	-13.50
867.11	V	Peak	18.08	27.6	45.68	60.79	-15.11
80.44	V	Peak	2.51	15.92	18.43	40.00	-21.57
93.05	V	Peak	-0.91	17.96	17.05	43.50	-26.45
121.18	V	Peak	8.04	11.12	19.16	43.50	-24.34
209.45	V	Peak	7.22	16.18	23.4	43.50	-20.10
433.52	H	Peak	38.70	22.00	60.74	80.79	-20.05
867.11	H	Peak	12.32	27.6	39.92	60.79	-20.87
53.28	H	Peak	12.23	5.93	18.16	40.00	-21.84
60.07	H	Peak	5.98	5.53	11.51	40.00	-28.49
66.86	H	Peak	12.69	6.55	19.24	40.00	-20.76
209.45	H	Peak	6.83	10.24	17.07	43.5	-26.43

Notes:

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: NORMAL

Test Date: Nov 23, 2007

Temperature: 25°C

Tested by: poppy

Humidity: 70 % RH

Polarity: Ver. / Hor.

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1299.91	V	37.1	---	-6.8	30.3	---	74.00	54.00	-23.70	Peak
N/A										
N/A										
N/A										
N/A										
N/A										
N/A										
1299.91	H	36.48	---	-6.8	29.68	---	74.00	54.00	-24.32	Peak
N/A										
N/A										
N/A										
N/A										
N/A										

Notes:

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. Peak Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 1MHz, Sweep time = 200 ms.
 - b. AV Setting 1GHz - 26GHz, RBW = 1MHz, VBW = 10Hz, Sweep time = 200 ms.

7.3 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:

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

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

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date
EMI Test Receiver	SCHAFFNER	SCR3501	464	06/12/2007
Spectrum Analyzer	ADVANTEST	R3132	140301570	06/12/2007
LISN	COM-POWER	LI115	2027	06/12/2007
LISN	COM-POWER	LI115	2029	06/12/2007

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



Test Configuration

The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4: 2001

The EUT was plug-in the host PC via USB port. The host PC system was placed on the center of the back edge on the test table. The peripherals like modem, monitor printer, K/B, and mouse were placed on the side of the host PC system. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.

The keyboard was placed directly in the front of the monitor, flushed with the front tabletop. The mouse was placed next to the Keyboard, flushed with the back of keyboard.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The host PC system was connected with 110Vac/60Hz power source.

The EUT is set to transmit in a continuous mode.

TEST PROCEDURE

The EUT was placed on a table, which is 0.8m above ground plane.

Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

Repeat above procedures until all frequency measured were complete.



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TEST RESULTS

N/A: DC 12V by battery

7.4 TRANSMISSION TIME

LIMIT

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

(2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.

(3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

(4) Intentional radiators which are employed for radio control purposes during emergencies involving fire, security, and safety of life, when activated to signal an alarm, may operate during the pendency of the alarm condition.

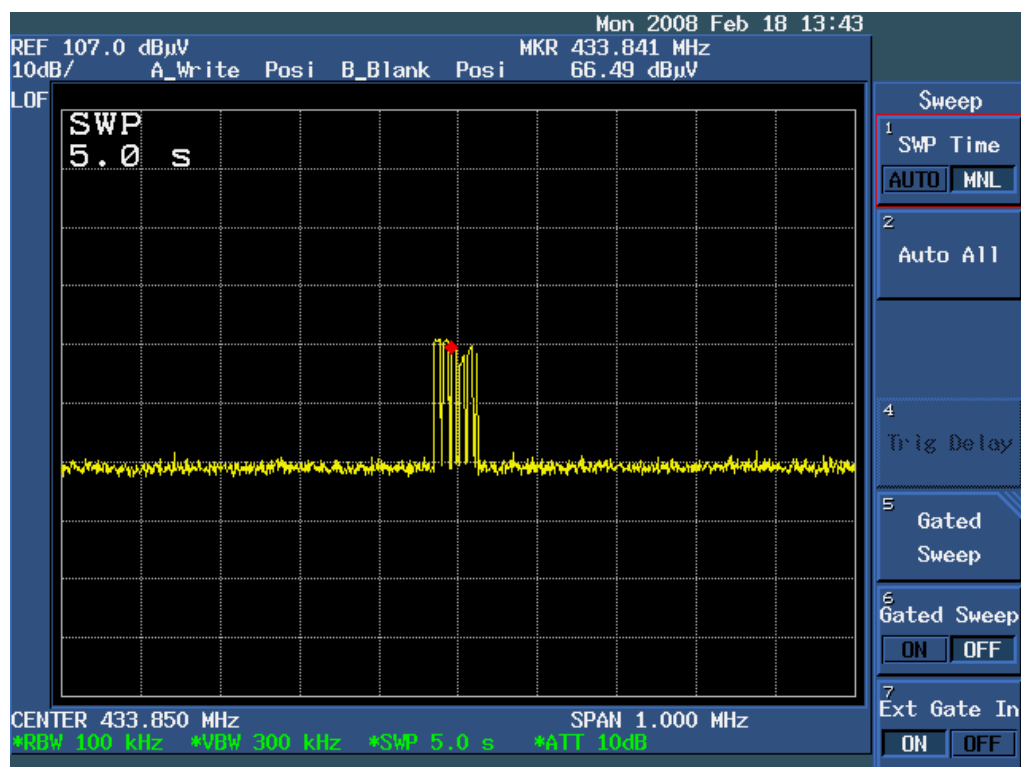
(5) Transmission of set-up information for security systems may exceed the transmission duration limits in paragraphs (a)(1) and (a)(2) of this section, provided such transmission are under the control of a professional installer and do not exceed ten seconds after a manually operated switch is released or a transmitter is activated automatically. Such set-up information may include data.

TEST RESULTS

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.

This EUT is operated manually. It is deactivated within not more than 5 seconds of being released

Refer to attach spectrum analyzer data chart



APPENDIX 1 PHOTOGRPHS OF TEST SETUP

Radiated Emission Set up Photos

