

FCC TEST REPORT

For

Remote controller

Model Number: RC900N

FCC ID: QQ7EGUARDRC900N

Report Number : WT108004909

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Test report declaration

Applicant : Shenzhen ronghua electric Co., Ltd
Address : 3rd floor, 524th building, Bagualing, Futian, Shenzhen
Manufacturer : Shenzhen ronghua electric Co., Ltd
Address : 3rd floor, 524th building, Bagualing, Futian, Shenzhen
EUT : Remote controller
Description :
Model No : RC900N
FCC ID : QQ7EGUARDRC900N

Test Standards:

FCC Part 15 15.31, 15.35, 15.203, 15.205, 15.209, 15.223

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. 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 FCC Rules Part 15.203, 15.205, 15.207, 15.209 and 15.223.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

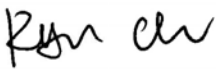

Project Engineer:  Date: Jan.21,2011
(Ryan Chen)
Checked by:  Date: Jan.21,2011
(Dewelly Yang)
Approved by:  Date: Jan.21,2011
(Peter Lin)

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1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	15.207	N/A
Occupied Bandwidth	15.223	Pass
Radiated Disturbance	15.35, 15.205, 15.209, 15.223	Pass
Antenna Requirement	15.203	Pass

Remark: "N/A" means "Not applicable."

2. GENERAL INFORMATION

2.1. Report information

- 2.1.1. This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.
- 2.1.2. The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.
- 2.1.3. Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:

China National Accreditation Service for Conformity Assessment (CNAS) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is CNAS L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number are 97379(open area test site) and 274801(semi anechoic chamber).

The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (VCCI), and the registration number are R-1974(open area test site), R-1966(semi anechoic chamber), C-2117(mains ports conducted interference measurement) and T-180(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (IC), and the registration number is IC4174.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is E2024086Z02.

2.3.Measurement Uncertainty

Conducted Emission

9kHz~30MHz 3.5dB

Radiated Emission

30MHz~1000MHz 4.5dB

1GHz~18GHz 4.6dB

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description : Remote controller
Manufacturer : Shenzhen ronghua electric Co., Ltd
Model Number : RC900N
Operate Frequency : 8.0MHz
Antenna Designation : Integral
Power supply : DC 3V (two AAA size batteries)

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: QQ7EGUARDRC900N filing to comply with Section 15.203, 15.205, 15.209, 15.223 of the FCC Part 15, Subpart C Rules.

3.3. Block Diagram of EUT Configuration



Figure 1 EUT setup of test

3.4. Operating Condition of EUT

Test Mode 1: Transmitting

3.5. Support Equipment List

Table 2 Support Equipment List

Name	Model No	S/N	Manufacturer
--	--	--	--

3.6. Test Conditions

Date of test: Dec.25-Dec.31, 2009
Date of EUT Receive: Dec.21, 2009
Temperature: 23-25 °C
Relative Humidity: 54-58%

3.7. Special Accessories

Not available for this EUT intended for grant.

3.8. Equipment Modifications

Not available for this EUT intended for grant.

4. TEST EQUIPMENT USED

Table 3 Test Equipment

No.	Equipment	Model No.	Manufacturer	LAST CALIB	Period
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.22,2010	1 Year
SB3955	Broadband antenna	SCHWARZB ECK	VULB9163	Jan.22,2010	1 Year
SB3345	Loop Field Strength Antenna	SCHWARZB ECK	FMZB1516	Jan.23,2010	2 Years
SB3450/01	3m Semi-anechoic chamber	Albatross Projects	9X6X6	Oct.21, 2010	2 Years
SB6152	Spectrum Analyzer	FSL6	R&S	May.25, 2010	1 Year

5. CONDUCTED DISTURBANCE TEST

5.1. Test Standard and Limit

5.1.1. Test Standard

FCC Part 15 15.207

5.1.2. Test Limit

Table 4 Conducted Disturbance Test Limit

Frequency	Maximum RF Line Voltage (dB μ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

* Decreasing linearly with logarithm of the frequency

* The lower limit shall apply at the transition frequency.

5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 10cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

5.4. Test Data

The EUT is power supply with AAA size battery, conducted disturbance test not applicable.

6. OCCUPIED BANDWIDTH

6.1. Test Standard and Limit

6.1.1. Test Standard

FCC Part 15 15.223

For the purposes of this Section, bandwidth is determined at the points 6 dB down from the modulated carrier.

6.2. Test Procedure

1. Set EUT as normal operation
2. Set EMI test receiver (ESIB26) Center Frequency = fundamental frequency,
3. RBW=10kHz, VBW \geq RBW.
4. Set EMI test receiver (ESIB26) to maxhold mode, mark the points 6dB down from the modulated carrier

6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

6.4. Test Data

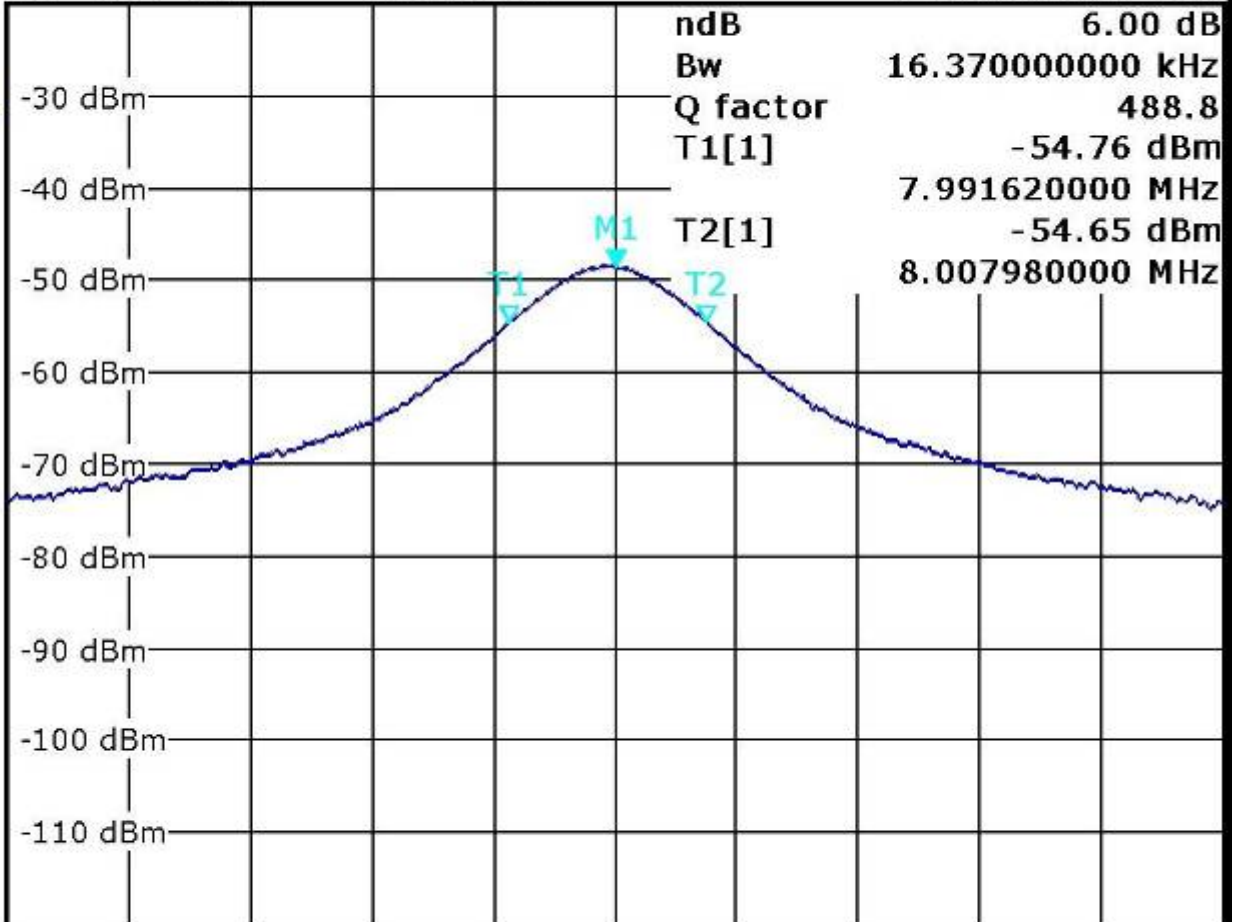
6dB bandwidth is 0.01637MHz

0.01637MHz/8.0MHz=0.205%



Att 0 dB * RBW 10 kHz
Ref -20.0 dBm * VBW 30 kHz M1[1] -48.65 dBm
SWT 2.5ms 8.000400000 MHz

1Av
View



ndB 6.00 dB
Bw 16.370000000 kHz
Q factor 488.8
T1[1] 7.991620000 MHz
T2[1] 8.007980000 MHz

CF 8.0004 MHz Span 100.0 kHz

7. RADIATED DISTURBANCE TEST

7.1. Test Standard and Limit

7.1.1. Test Standard

FCC Part 15 15.31, 15.33, 15.209

7.1.2. Test Limit

(a) The field strength of any emission within the band 1.705-10.0 MHz shall not exceed 100 microvolts/meter at a distance of 30 meters. However, if the bandwidth of the emission is less than 10% of the center frequency, the field strength shall not exceed 15 microvolts/meter or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) microvolts/meter at a distance of 30 meters, whichever is the higher level. For the purposes of this Section, bandwidth is determined at the points 6 dB down from the modulated carrier. The emission limits in this paragraph are based on measurement instrumentation employing an average detector. The provisions in Section 15.35(b) for limiting peak emissions apply.

(b) The field strength of emissions outside of the band 1.705-10.0 MHz shall not exceed the general radiated emission limits in Section 15.209.

Table 5 Radiated Disturbance Test Limit (15.209)

FREQUENCY MHz	FIELD STRENGTHS LIMITS ($\mu\text{V}/\text{m}$)	FIELD STRENGTHS LIMITS dB ($\mu\text{V}/\text{m}$) (3m)
0.009 ~ 0.490	$2400/F(\text{kHz})(300\text{m})$	$67.6-20*\log F+40*\log(300/3)$
0.490 ~ 1.705	$24000/F(\text{kHz})(30\text{m})$	$87.6-20*\log F+40*\log(300/3)$
1.705 ~ 30	30(30m)	69.5
30 ~ 88	100(3m)	40.0
88 ~ 216	150(3m)	43.5
216 ~ 960	200(3m)	46.0
Above 960	500(3m)	54.0

* The lower limit shall apply at the transition frequency.

* The test distance is 3m.

At frequencies below 30 MHz, using the square of an inverse linear distance extrapolation factor (40 dB/decade).

The bandwidth of the emission is less than 10% of the center frequency, the field strength shall not exceed 15 microvolts/meter or (the bandwidth of the device in kHz) divided by (the center frequency of the device in MHz) microvolts/meter at a distance of 30 meters, whichever is the higher level. The limit is 83.5 $\mu\text{V}/\text{m}$ at a distance of 30 meters (78.5dBuV/m at a distance of 3 meters).

Restricted Band Radiation Emission Measurement Limits According to Section 15.205 and Section 15.209

7.2. Test Procedure

The EUT is placed on a turntable, which is 0.1 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find out the max Emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.

Radiated test was performed on the frequency range from 30MHz to 25GHz. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz, $VBW \geq RBW$. All readings above 1 GHz are AV and PK values. $RBW=1MHz$ and $VBW=10Hz$ for AV value, $RBW=1MHz$ and $VBW \geq RBW$ for peak value. Measurements were made at 3 meters

7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture, and the test data which was shown in the follow.

7.4. Test Data

Table 6 Radiated Disturbance Test Data

Frequency(MHz)	Polarization	Reading Value (dB μ V)	Correction Factor (dB)	Antenna Factor (dB/m)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Note
7.999	---	29.6	0.5	20	50.1	98.5	Fundamental PK
8.191	---	21.9	0.5	20	42.4	78.5	Fundamental AV

Note: The other emission levels were less than the limit 20dB

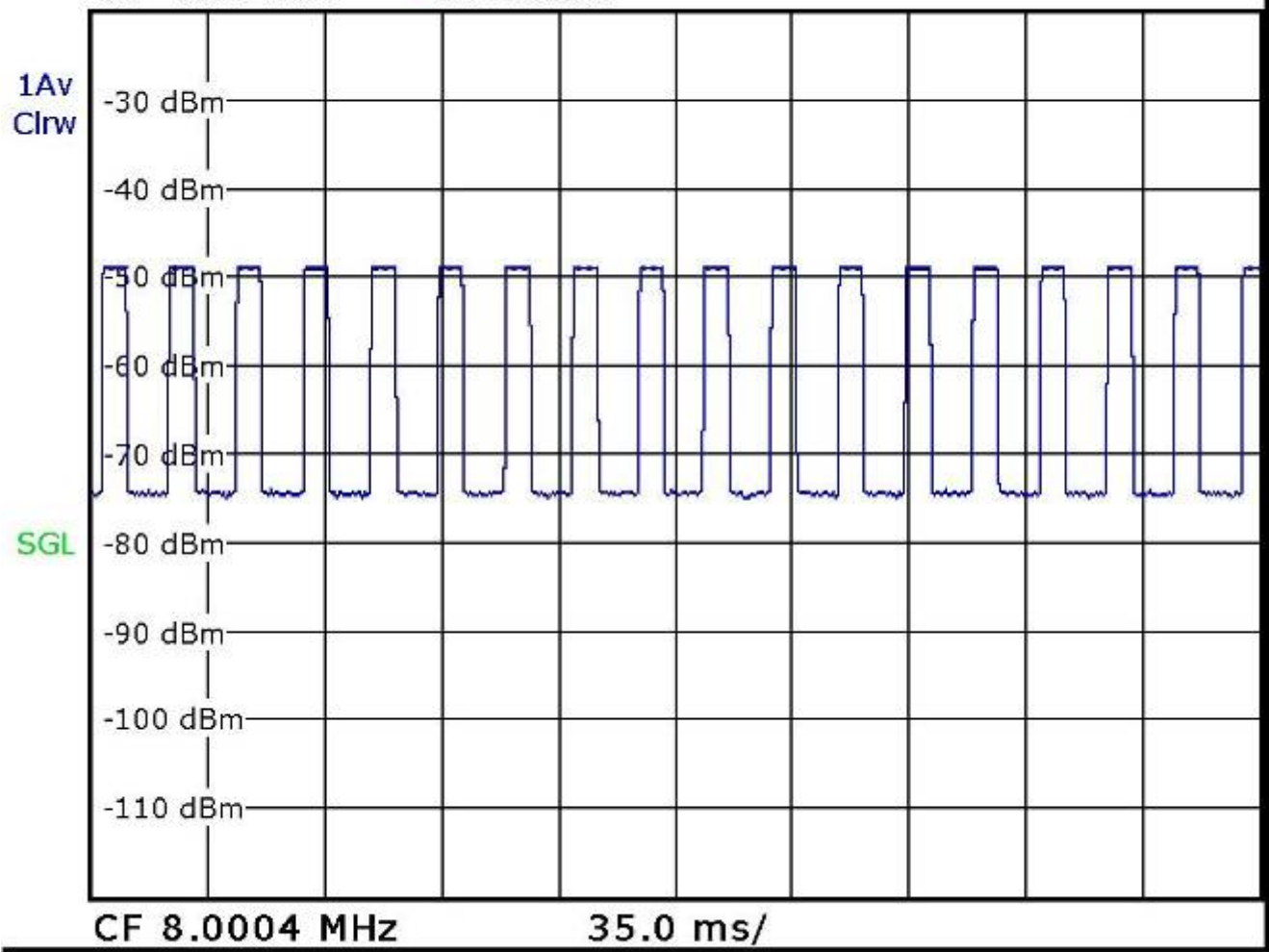
- Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB)+Antenna Factor (dB/m)
 2. Correction Factor(dB) = Cable Factor (dB)+Amplifier Factor(dB)
 3. The other emission levels were less than the limit 20dB
 5. duty cycle=0.413
 6. AV factor=20log duty cycle=20*log0.413=-7.7dB
 7. AV=peak-AV factor

Duty cycle

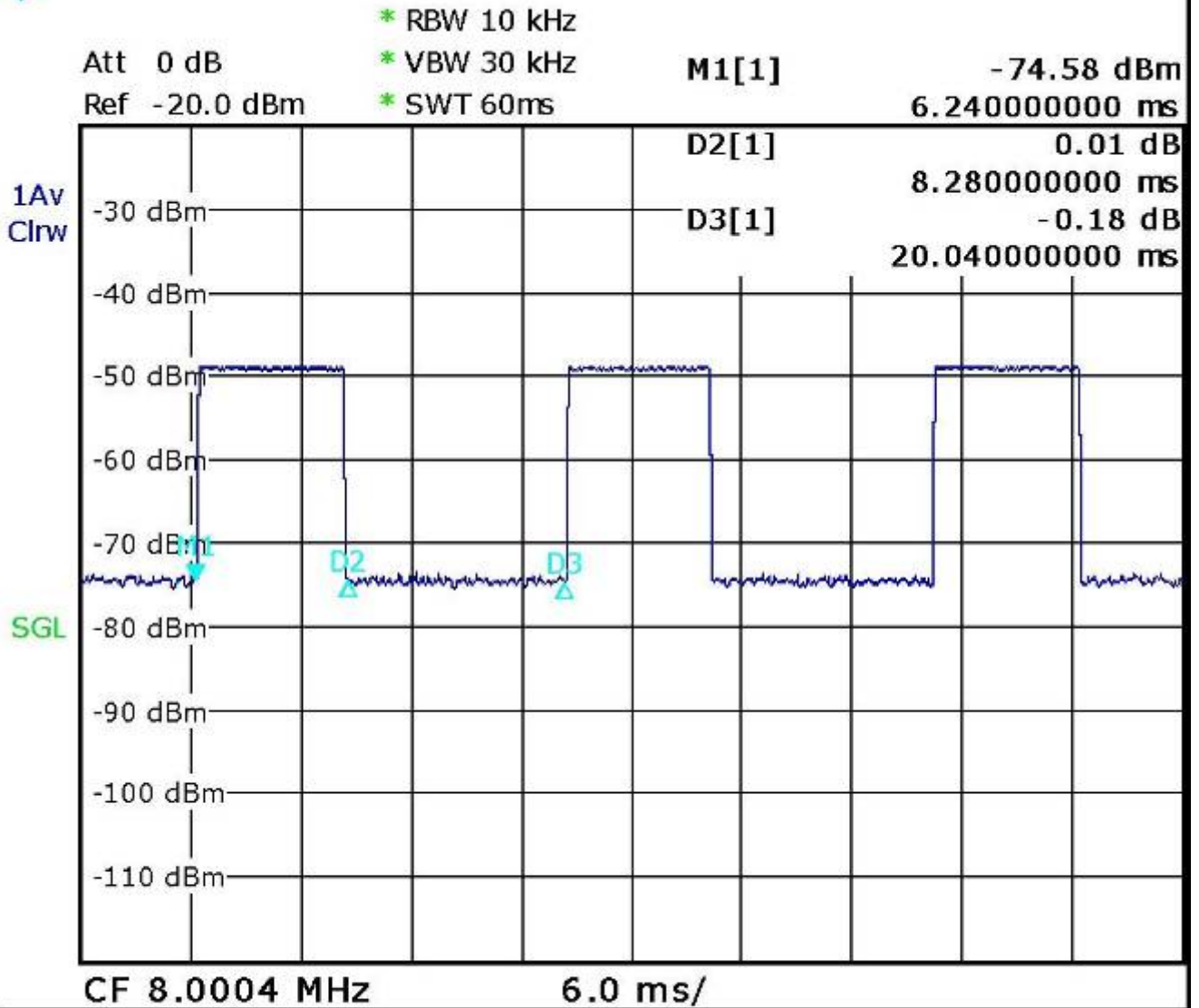


Att 0 dB
Ref -20.0 dBm

* RBW 10 kHz
* VBW 30 kHz
* SWT 350ms

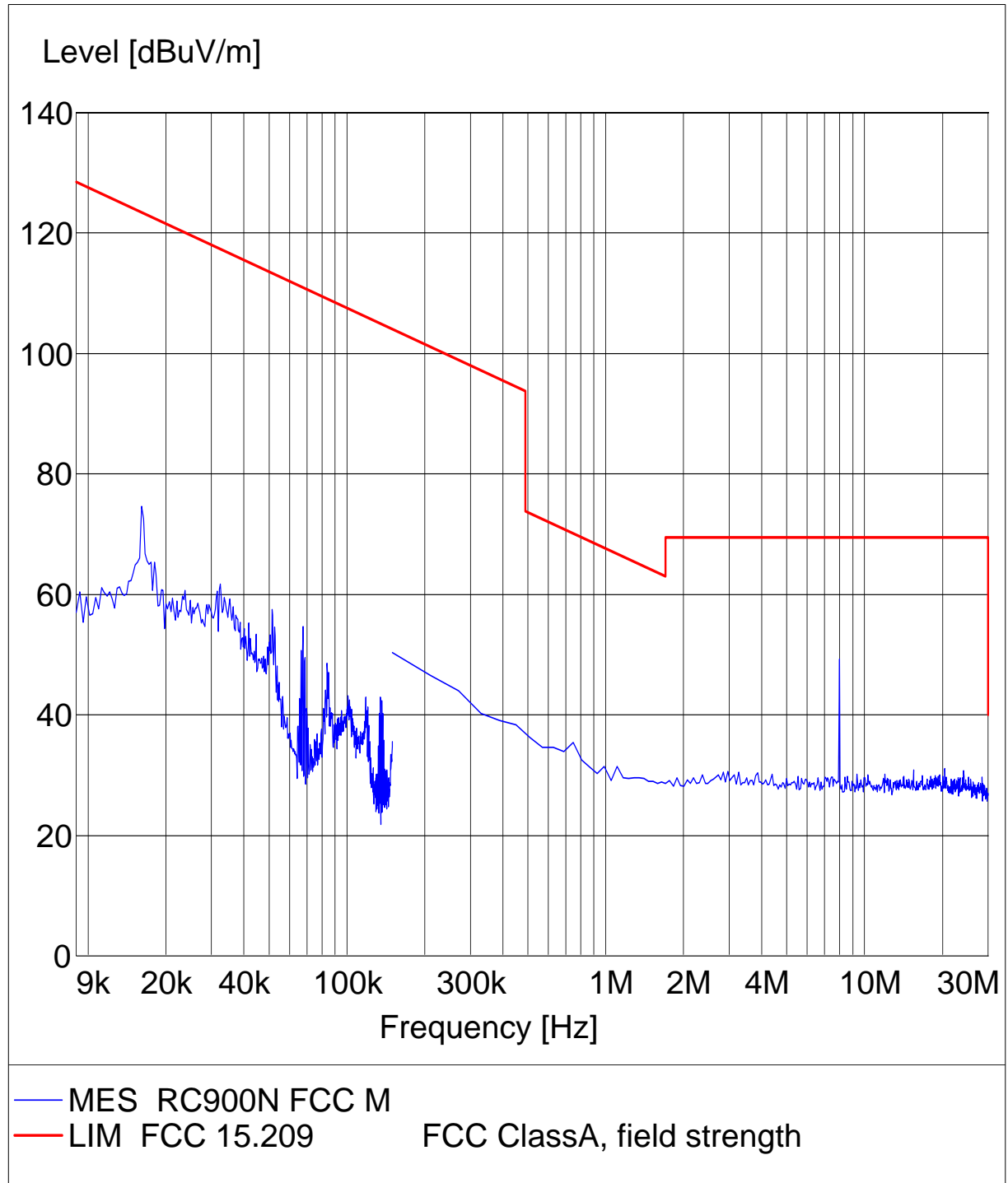


Duty cycle



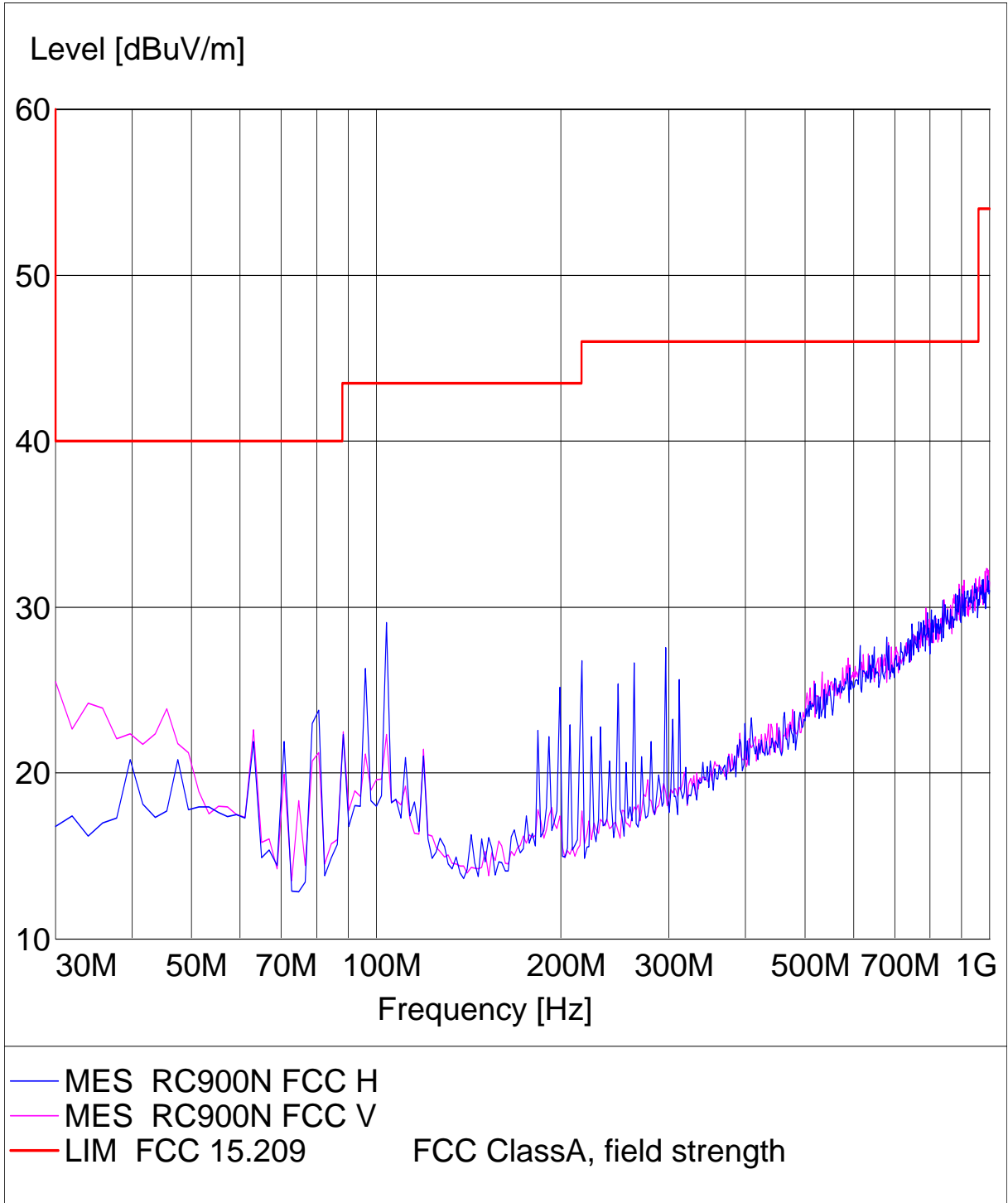
Radiated Emission

EUT: M/N:RC900N
Operating Condition: Transmitting
Test Site: SMQ EMC Lab. SAC
Test Specification:
Comment: AC 120V/60Hz



Radiated Emission

EUT: M/N:RC900N
Operating Condition: Transmitting
Test Site: SMQ EMC Lab. SAC
Test Specification:
Comment: AC 230V/50Hz



8. ANTENNA REQUIREMENT

8.1. STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2. ANTENNA CONNECTED CONSTRUCTION

The EUT has integral antenna, this is permanently attached antenna and meets the requirements of this section.