

TEST REPORT

Applicant: HUANG QI TOYS CO.,LTD

Address of Applicant: 13 New 1 Lane,Xinxiang Village,Guangyi Road, Chenghai Area, Shantou 515800, China

Manufacturer: HUANG QI TOYS CO.,LTD

Address of Manufacturer: 13 New 1 Lane,Xinxiang Village,Guangyi Road, Chenghai Area, Shantou 515800, China

Equipment Under Test (EUT)

Product Name: REMOTE CONTROL CAR

Model No.: MT1041, 9802M

FCC ID: 2ATZW1041

Applicable standards: FCC CFR Title 47 Part 15 Subpart C Section 15.235

Date of sample receipt: September 20, 2023

Date of Test: September 21, 2023-November 06, 2023

Date of report issued: November 07, 2023

Test Result : PASS *

Authorized Signature:



Robinson Luo

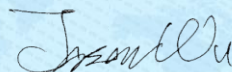
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
01	November 07, 2023	Original

Prepared By:

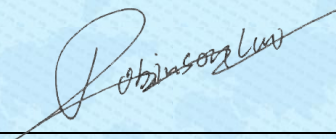


Date:

November 07, 2023

Project Engineer

Check By:



Date:

November 07, 2023

Reviewer

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4 Test Summary

Radio Spectrum Technical Requirement			
Item	Standard	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C 15.235	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part			
Item	Standard	Requirement	Result
20dB Bandwidth	47 CFR Part 15, Subpart C 15.235	47 CFR Part 15, Subpart C 15.215	Pass
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C 15.235	47 CFR Part 15, Subpart C 15.235(a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart C 15.235	47 CFR Part 15, Subpart C 15.235(b) & 15.209	Pass

Remark:

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	REMOTE CONTROL CAR
Model No.:	MT1041, 9802M
Test Model No:	MT1041
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.	
Serial No.:	080123
Test sample(s) ID:	GTS2023090196-1
Sample(s) Status:	Normal sample
Operation Frequency:	49.86MHz
Channel Number:	1
Modulation:	AM
Antenna type:	Spring antenna
Antenna gain:	3dBi
Power supply:	TX: DC 3.0V (2*1.5V Size "AA" Batteries)

Remark:

1. Antenna gain information provided by the customer
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.
3. The report is for TX device only.

5.2 Test mode

Transmitter mode	Keep the EUT in continuously transmitting.		
Remark: new battery is used during all test.			
Pre-test mode.			
GTS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:			
Axis	X	Y	Z
Field Strength(dBuV/m)	51.47	52.53	50.14
Final Test Mode:			
According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup”: Y axis (see the test setup photo)			

5.3 Description of Support Units

None.

5.4 Test Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC—Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. ● ISED—Registration No.: 9079A CAB identifier: CN0091 The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing ● NVLAP (LAB CODE:600179-0) Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).
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5.5 Test Location

All tests were performed at:
<p>Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960</p>

6 Equipment List

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 14, 2023	April 13, 2024
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 29, 2022	Nov. 28, 2023
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 14, 2023	April 13, 2024
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 14, 2023	April 13, 2024
11	Horn Antenna (18-26.5GHz)	/	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024
13	FSV-Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 13, 2023	March 12, 2024
14	Amplifier	/	LNA-1000-30S	GTS650	April 14, 2023	April 13, 2024
15	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS668	Dec. 20, 2022	Dec.19, 2023
16	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	April 14, 2023	April 13, 2024
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 19, 2023	April 18, 2024
18	RE cable 1	GTS	N/A	GTS675	July 31. 2023	July 30. 2024
19	RE cable 2	GTS	N/A	GTS676	July 31. 2023	July 30. 2024
20	RE cable 3	GTS	N/A	GTS677	July 31. 2023	July 30. 2024
21	RE cable 4	GTS	N/A	GTS678	July 31. 2023	July 30. 2024
22	RE cable 5	GTS	N/A	GTS679	July 31. 2023	July 30. 2024
23	RE cable 6	GTS	N/A	GTS680	July 31. 2023	July 30. 2024
24	RE cable 7	GTS	N/A	GTS681	July 31. 2023	July 30. 2024
25	RE cable 8	GTS	N/A	GTS682	July 31. 2023	July 30. 2024

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 14, 2023	April 13, 2024
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 14, 2023	April 13, 2024
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 14, 2023	April 13, 2024
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 14, 2023	April 13, 2024
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 14, 2023	April 13, 2024
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 14, 2023	April 13, 2024
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 14, 2023	April 13, 2024
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 19, 2023	April 18, 2024

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	April 19, 2023	April 18, 2024

7 Radio Spectrum Technical Requirement

7.1 Antenna Requirement

7.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

7.1.2 Conclusion

Standard Requirement:

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. The use of a antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is spring antenna, reference to the appendix II for details.

8 Radio Spectrum Matter Test Results

8.1 20dB Bandwidth

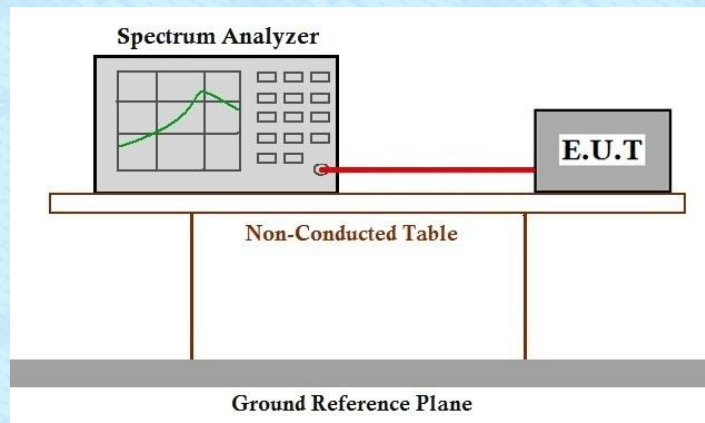
Test Requirement 47 CFR Part 15, Subpart C 15.215
 Test Method: ANSI C63.10 (2013) Section 6.9

8.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar
 Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

8.1.2 Test Setup Diagram



8.1.3 Measurement Procedure and Data

Mode	Frequency (MHz)	-20dB Bandwidth (KHz)	Limit	Conclusion
TX	49.86	16.35	N/A	Pass

Test plot as follows:



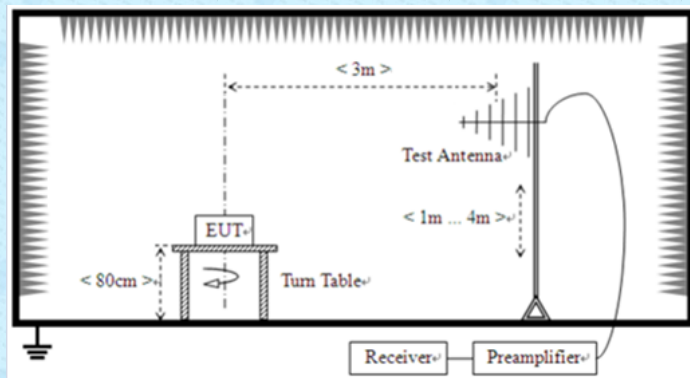
8.2 Field Strength of the Fundamental Signal

Test Requirement	47 CFR Part 15, Subpart C 15.235(a)
Test Method:	ANSI C63.10 (2013) Section 6.4
Measurement Distance:	3m
Limit:	≤ 10000 microvolts/meter at 3 meters, the emission limit is based on measurement instrumentation employing an average Detector. The provisions in §15.35 for limiting peak emissions apply.

8.2.1 E.U.T. Operation

Operating Environment:			
Temperature:	25 °C	Humidity:	55 % RH
		Atmospheric Pressure:	1000 mbar
Test mode	TX mode_Keep the EUT in transmitting with modulation mode.		

8.2.2 Test Setup Diagram

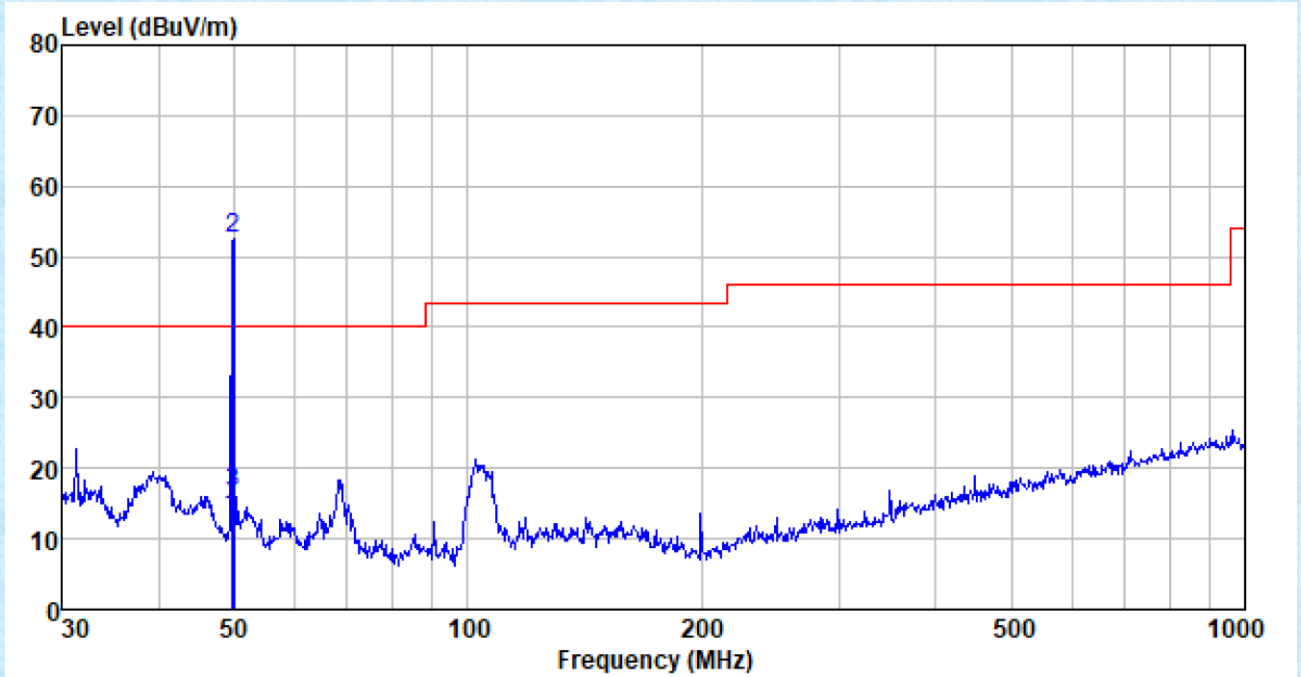


8.2.3 Measurement Procedure and Data

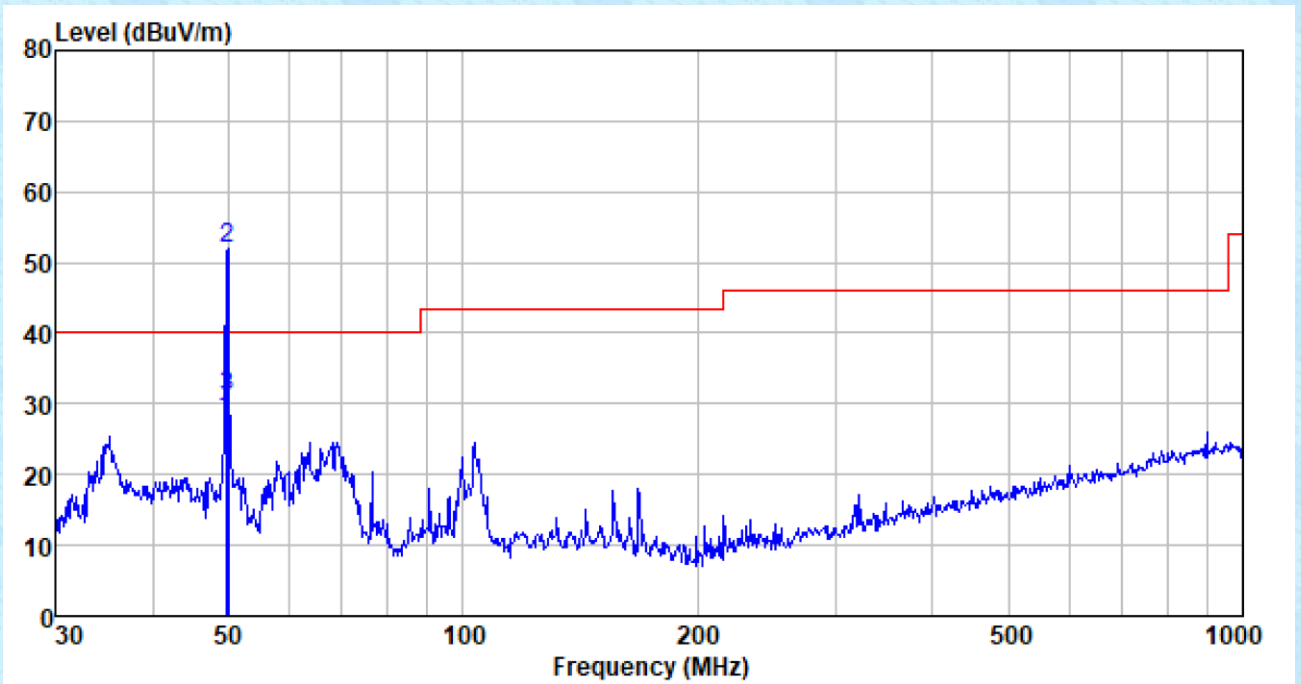
1. The EUT was placed on the top of a rotating table (0.8 meters for below 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.(RBW 100KHz VBW 300KHz for PK detector , RBW 120KHz for QP detector)

Measurement data:

Horizontal:



Vertical:



Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
49.86	68.56	13.20	0.77	30.00	52.53	100.00	-47.47	Horizontal
49.86	67.97	13.20	0.77	30.00	51.94	100.00	-48.06	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
49.86	52.53	13.20	0.77	30.00	36.50	80.00	-43.50	Horizontal
49.86	51.94	13.20	0.77	30.00	35.91	80.00	-44.09	Vertical

QP value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
49.82	29.10	13.20	0.77	30.00	13.07	40.00	-26.93	Horizontal
49.90	32.70	13.20	0.77	30.00	16.67	40.00	-23.33	Horizontal
49.82	43.80	13.20	0.77	30.00	27.77	40.00	-12.23	Vertical
49.90	47.00	13.20	0.77	30.00	30.97	40.00	-9.03	Vertical

Remark:

- 1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. the basic equation with a sample calculation is as follows:

$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Pre-amplifier Factor}$$

8.3 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.235(b) & C 15.209
 Test Method: ANSI C63.10 (2013) Section 6.4&6.5
 Measurement Distance: 3m
 Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz and 110-490kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for above 1000MHz. Radiated emission limits above 1000MHz is based on measurements employing an average detector.

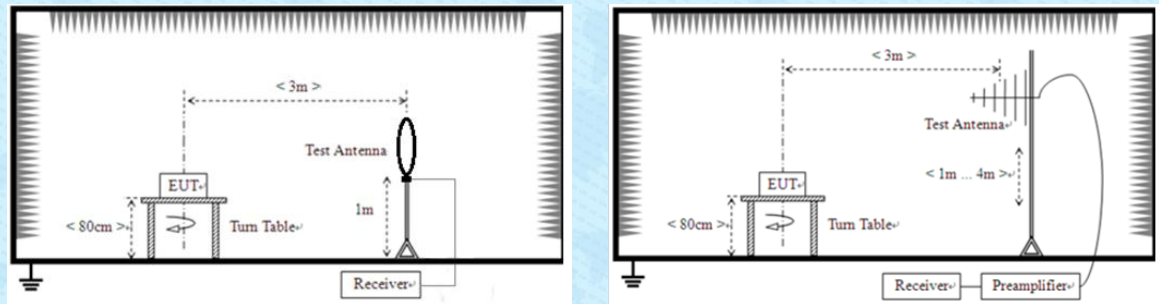
8.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1000 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

8.3.2 Test Setup Diagram



8.3.3 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Spurious Emissions:

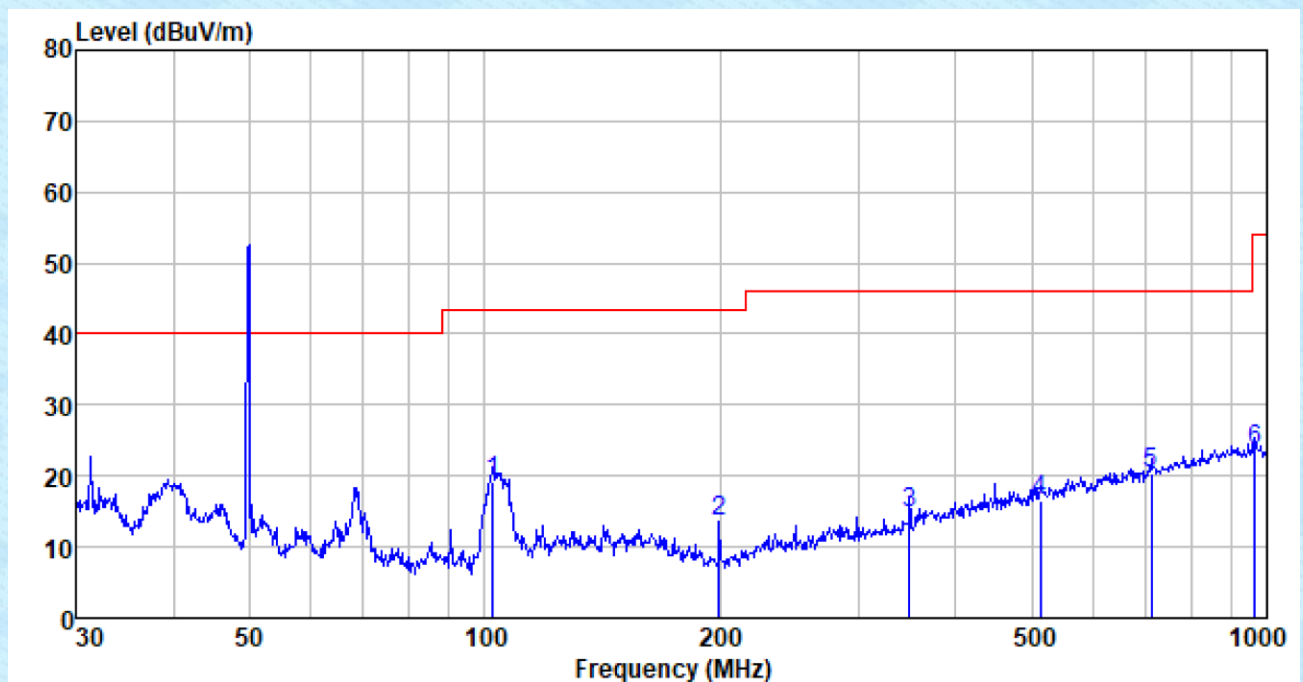
Measurement data:

9 kHz ~ 30 MHz

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

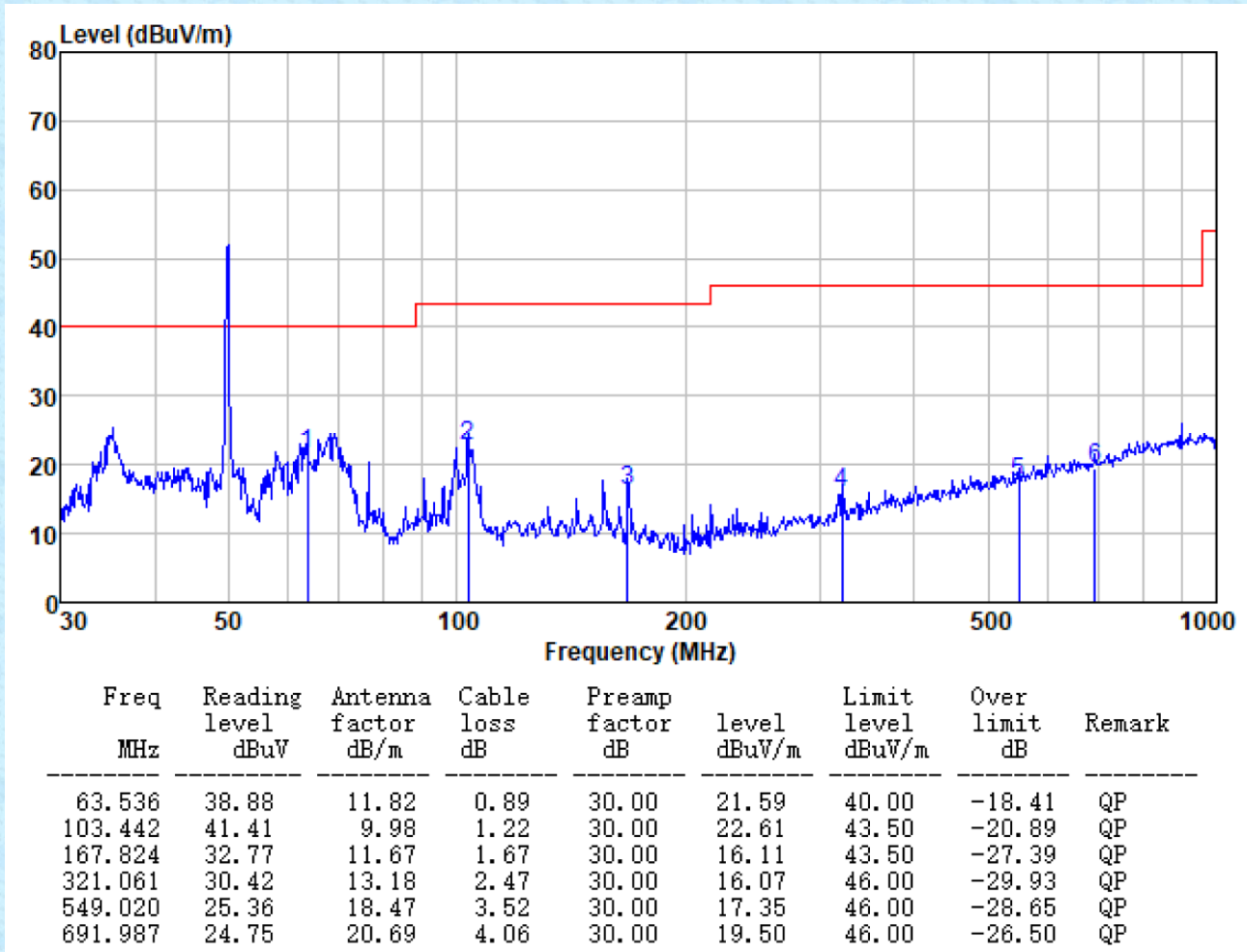
■ **30MHz~1GHz**

Mode:	Transmitting mode	Polarization:	Horizontal
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
102.360	38.21	9.89	1.21	30.00	19.31	43.50	-24.19	QP
199.286	32.53	9.24	1.84	30.00	13.61	43.50	-29.89	QP
349.250	28.02	14.14	2.62	30.00	14.78	46.00	-31.22	QP
513.633	25.26	17.85	3.36	30.00	16.47	46.00	-29.53	QP
711.674	25.13	21.04	4.13	30.00	20.30	46.00	-25.70	QP
965.542	24.00	24.43	5.09	30.00	23.52	54.00	-30.48	QP

Mode:	Transmitting mode	Polarization:	Vertical
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Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Pre-amplifier. The basic equation with a sample calculation is as follows:

$$\text{Final Level} = \text{Receiver Read level} + \text{Antenna Factor} + \text{Cable Loss} - \text{Pre-amplifier Factor}$$

9 Test Setup Photo

Reference to the **appendix I** for details.

10 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----