

**RJ Brands LLC**

# RF TEST REPORT

**Report Type:**

FCC Part 15.247 & ISSED RSS-247 RF report

**Model:**

CQ60-PRC-01, CQ60-PRC-02,  
CQ60-PRC-03, CQ60-PRC-04

**REPORT NUMBER:**

2410B1270SHA-001

**ISSUE DATE:**

December 5, 2024

**DOCUMENT CONTROL NUMBER:**

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**Applicant:** RJ Brands LLC  
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**Manufacturer:** RJ Brands LLC  
200 Performance Drive, Mahwah, NJ 07495 USA

**Manufacturer Site:** Chefman Smart Tech (Hangzhou) Co., Ltd  
Dalu Industrial Park, Hangzhou City, Zhejiang Province

**Product Name:** Smart Thermometer CHEF PROBE

**Type/Model:** CQ60-PRC-01, CQ60-PRC-02, CQ60-PRC-03, CQ60-PRC-04

**FCC ID:** 2A2YP-CQ60QPROBE

**IC:** 27740-CQ60QPROBE

**SUMMARY:**

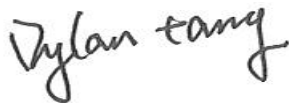
The equipment complies with the requirements according to the following standard(s) or Specification:

**47CFR Part 15 (2023):** Radio Frequency Devices (Subpart C)

**ANSI C63.10 (2020):** American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

**RSS-247 Issue 3 (August 2023):** Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

**RSS-Gen Issue 5 (February 2021) Amendment 2:** General Requirements for Compliance of Radio Apparatus

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## TEST REPORT

### Content

<b>REVISION HISTORY.....</b>	<b>4</b>
<b>MEASUREMENT RESULT SUMMARY .....</b>	<b>5</b>
<b>1 GENERAL INFORMATION .....</b>	<b>6</b>
1.1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) .....	6
1.2 TECHNICAL SPECIFICATION.....	6
1.3 DESCRIPTION OF TEST FACILITY.....	7
<b>2 TEST SPECIFICATIONS.....</b>	<b>8</b>
2.1 STANDARDS OR SPECIFICATION .....	8
2.2 MODE OF OPERATION DURING THE TEST .....	8
2.3 TEST SOFTWARE LIST .....	9
2.4 TEST PERIPHERALS LIST.....	9
2.5 TEST ENVIRONMENT CONDITION: .....	9
2.6 INSTRUMENT LIST .....	10
2.7 MEASUREMENT UNCERTAINTY.....	11
<b>3 MAXIMUM CONDUCTED OUTPUT POWER AND E.I.R.P.....</b>	<b>12</b>
3.1 LIMIT .....	12
3.2 MEASUREMENT PROCEDURE .....	12
3.3 TEST CONFIGURATION .....	13
3.4 TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER.....	13
<b>4 RADIATED EMISSIONS IN RESTRICTED FREQUENCY BANDS.....</b>	<b>15</b>
4.1 LIMIT .....	15
4.2 MEASUREMENT PROCEDURE .....	15
4.3 TEST CONFIGURATION .....	17
4.4 TEST RESULTS OF RADIATED EMISSIONS .....	19
<b>5 ANTENNA REQUIREMENT.....</b>	<b>21</b>

## Revision History

Report No.	Version	Description	Issued Date
2410B1270SHA-001	Rev. 01	Initial issue of report	December 5, 2024

## Measurement result summary

TEST ITEM	FCC REFERENCE	IC REFERENCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-247 Issue 3 Clause 5.2	NA
Maximum conducted output power and e.i.r.p.	15.247(b)(3)	RSS-247 Issue 3 Clause 5.4	Pass
Power spectrum density	15.247(e)	RSS-247 Issue 3 Clause 5.2	NA
Emission outside the frequency band	15.247(d)	RSS-247 Issue 3 Clause 5.5	Pass
Radiated Emissions in restricted frequency bands	15.247(d), 15.205&15.209	RSS-Gen Issue 5 Clause 8.9&8.10	NA
Power line conducted emission	15.207(a)	RSS-Gen Issue 5 Clause 8.8	NA
Occupied bandwidth	-	RSS-Gen Issue 5 Clause 6.6	NA
Antenna requirement	15.203	-	NA

Notes: 1: NA =Not Applicable

## 1 GENERAL INFORMATION

### 1.1 Description of Equipment Under Test (EUT)

Product name:	Smart Thermometer CHEF PROBE
Type/Model:	CQ60-PRC-01, CQ60-PRC-02, CQ60-PRC-03, CQ60-PRC-04
Description of EUT:	The EUT is Smart Thermometer CHEF PROBE, it supports Bluetooth function. The differences between CQ60-PRC-01, CQ60-PRC-02, CQ60-PRC-03 and CQ60-PRC-04 is that the decal number/color on the ceramic handle. The models PCB layout and circuit design is the same. So choose CQ60-PRC-01 to test as representative.
Rating:	DC 3V, 0.03A
Category of EUT:	Class B
EUT type:	<input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing
Product Marketing Name:	CQ60-PRC-01, CQ60-PRC-02, CQ60-PRC-03, CQ60-PRC-04
HVIN:	CQ60-PRC-01, CQ60-PRC-02, CQ60-PRC-03, CQ60-PRC-04
Software Version:	V2.0.0
Hardware Version:	B
Sample received date:	November 10, 2024
Date of test:	November 10, 2024 ~ December 2, 2024

### 1.2 Technical Specification

Frequency Range:	2402-2480MHz
Support Standards:	IEEE 802.15.1
Type of Modulation:	GFSK
Channel Number:	3
Data Rate:	1Mbps
Antenna Information:	-13.71dBi, Metal antenna

## TEST REPORT

### 1.3 Description of Test Facility

Name:	Intertek Testing Services (Shanghai FTZ) Co., Ltd.
Address:	Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone:	86 21 61278200
Telefax:	86 21 54262353

The test facility is recognized, certified, or accredited by these organizations:	CNAS Accreditation Lab Registration No. CNAS L21189
	FCC Accredited Lab Designation Number: CN0175
	IC Registration Lab CAB identifier.: CN0014
	VCCI Registration Lab Registration No.: R-4243, G-845, C-4723, T-2252
	NVLAP Accreditation Lab NVLAP LAB CODE: 200849-0
	A2LA Accreditation Lab Certificate Number: 3309.02

## 2 TEST SPECIFICATIONS

### 2.1 Standards or specification

47CFR Part 15 (2023)

ANSI C63.10 (2020)

RSS-247 Issue 3 (August 2023)

RSS-Gen Issue 5 (April 2018)

KDB 558074 (v05)

### 2.2 Mode of operation during the test

The lowest, middle and highest channel were tested as representatives.

Frequency Band (MHz)				2402 ~ 2480			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	38	2426	39	2480	-	-

#### Data rate VS Power:

The test setting software is offered by the manufactory. The pre-scan for the conducted power with all rates in each modulation and bands was used, and the worst case was found and used in all test cases.

Test software and Power Setting parameter			
Test Software	-		
Working Mode	BLE		
Test Channel	2402MHz	2426MHz	2480MHz
Power Setting	default	default	default



## TEST REPORT

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

Radiated test mode: EUT transmitted signal with BT antenna;

Conducted test mode: EUT transmitted signal from BT RF port connected to SPA directly;

### 2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

### 2.4 Test peripherals list

Item No.	Name	Band and Model	Description
-	-	-	-

### 2.5 Test environment condition:

Test items	Temperature	Humidity
Minimum 6dB Bandwidth	23°C	52% RH
Maximum conducted output power and e.i.r.p.		
Power spectrum density		
Emission outside the frequency band		
Occupied bandwidth		
Radiated Emissions in restricted frequency bands	22°C	55% RH
Power line conducted emission	21°C	52% RH

## TEST REPORT

### 2.6 Instrument list

Conducted Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input type="checkbox"/>	Test Receiver	R&S	ESR7	EC 6194	2024-02-08
<input type="checkbox"/>	A.M.N.	R&S	ESH2-Z5	EC 3119	2023-11-09
<input type="checkbox"/>	A.M.N.	R&S	ENV4200	EC 3558	2024-06-05
<input type="checkbox"/>	Attenuator	Hua Xiang	Ts5-10db-6g	EC 6194-1	2023-12-07
<input type="checkbox"/>	Shielded room	Zhongyu	-	EC 2838	2024-01-11
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Test Receiver	R&S	ESIB 26	EC 3045	2023-07-18
<input checked="" type="checkbox"/>	Bilog Antenna	TESEQ	CBL 6112B	EC 6411	2023-08-23
<input type="checkbox"/>	Pre-amplifier	R&S	AFS42-00101800-25-S-42	EC 5262	2024-06-15
<input type="checkbox"/>	Pre-amplifier	Tonscend	tap01018050	EC 6432-1	2023-12-07
<input type="checkbox"/>	Horn antenna	Tonscend	bha9120d	EC 6432-2	2024-02-15
<input type="checkbox"/>	Horn antenna	ETS	3116c	EC 5955	2024-06-16
<input checked="" type="checkbox"/>	Semi-anechoic chamber	Albatross project	-	EC 3048	2023-07-08
RF test					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030A	EC 5338	2024-03-05
<input type="checkbox"/>	PXA Signal Analyzer	Keysight	N9030B	EC 6078	2024-06-15
<input type="checkbox"/>	Vector Signal Generator	Agilent	N5182B	EC 5175	2024-03-05
<input type="checkbox"/>	MXG Analog Signal Generator	Agilent	N5181A	EC 5338-2	2024-03-05
<input type="checkbox"/>	Test Receiver	R&S	ESCI 7	EC 4501	2024-03-05
<input type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	EC 6209	2024-01-30
<input type="checkbox"/>	Universal Radio Communication Tester	R&S	CMW500	EC5944	2024-03-05
<input type="checkbox"/>	Signal generator	Agilent	N5182A	EC 6172	2023-08-09
<input type="checkbox"/>	Signal generator	Agilent	N5181A	EC 6171	2023-08-09
<input type="checkbox"/>	Climate chamber	GWS	MT3065	EC 6021	2024-03-06
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
<input checked="" type="checkbox"/>	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2024-03-24
<input checked="" type="checkbox"/>	Pressure meter	YM3	Shanghai Mengde	EC 4620	2023-09-13

## 2.7 Measurement uncertainty

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

Test item	Measurement uncertainty
Maximum peak output power	$\pm 0.74\text{dB}$
Radiated Emissions in restricted frequency bands below 1GHz	$\pm 4.90\text{dB}$
Radiated Emissions in restricted frequency bands above 1GHz	$\pm 5.02\text{dB}$
Emission outside the frequency band	$\pm 2.89\text{dB}$

**TEST REPORT****3 Maximum conducted output power and e.i.r.p.****Test result: Pass****3.1 Limit**

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 W. (The e.i.r.p. shall not exceed 4 W)

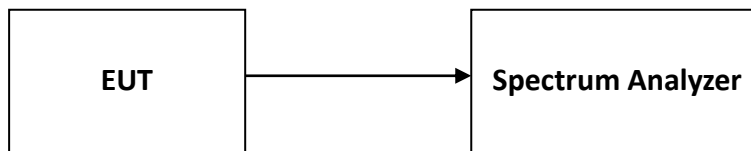
If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 30dBm and 30+ (6 –antenna gain-beam forming gain).

**3.2 Measurement Procedure**

- a) Set the RBW  $\geq$  DTS bandwidth.
- b) Set VBW  $\geq 3 \times$  RBW.
- c) Set span  $\geq 3 \times$  RBW
- d) Sweep time = auto couple.
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

## TEST REPORT

### 3.3 Test Configuration



### 3.4 Test Results of Maximum conducted output power

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	EIRP[dBm]	EIRP Limit[dBm]	Verdict
BLE_1M	Ant1	2402	-16.26	≤30	-29.97	≤36	PASS
BLE_1M	Ant1	2426	-12.24	≤30	-25.95	≤36	PASS
BLE_1M	Ant1	2480	-13.27	≤30	-26.98	≤36	PASS





BLE\_1M-Ant1-2426-PASS



BLE\_1M-Ant1-2480-PASS

## 4 Radiated Emissions in restricted frequency bands

**Test result:** Pass

### 4.1 Limit

The radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified showed as below:

Frequencies (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
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

### 4.2 Measurement Procedure

#### For Radiated emission below 30MHz:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Both X and Y axes of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

#### NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

**TEST REPORT****For Radiated emission above 30MHz:**

- a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

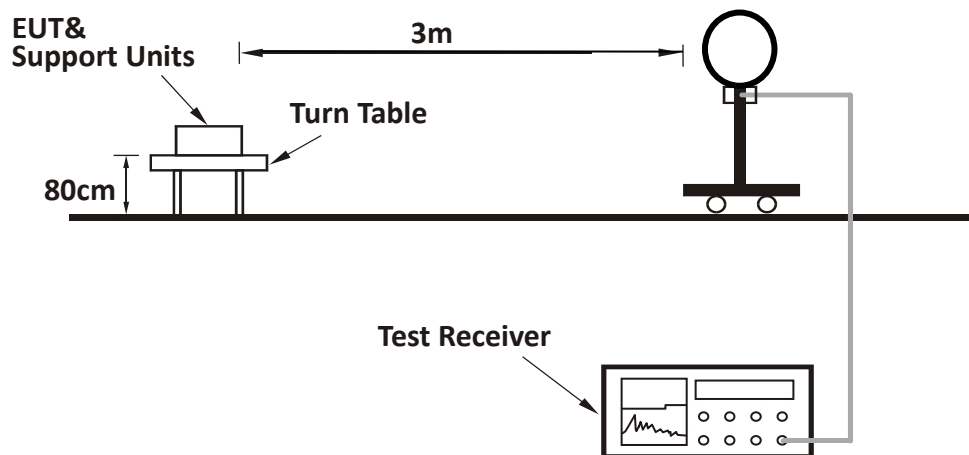
**Note:**

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 3 x RBW (Duty cycle  $\geq$  98%) for Average detection (AV) at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported

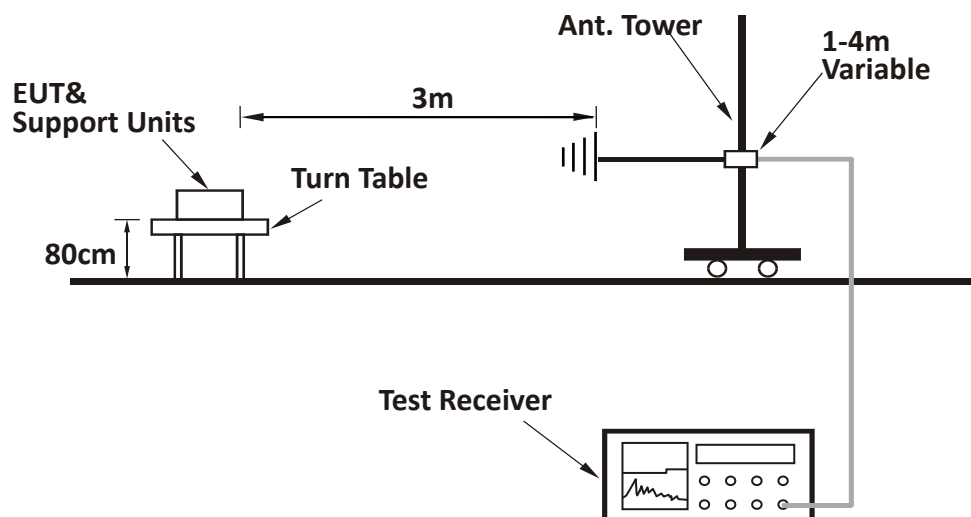


### 4.3 Test Configuration

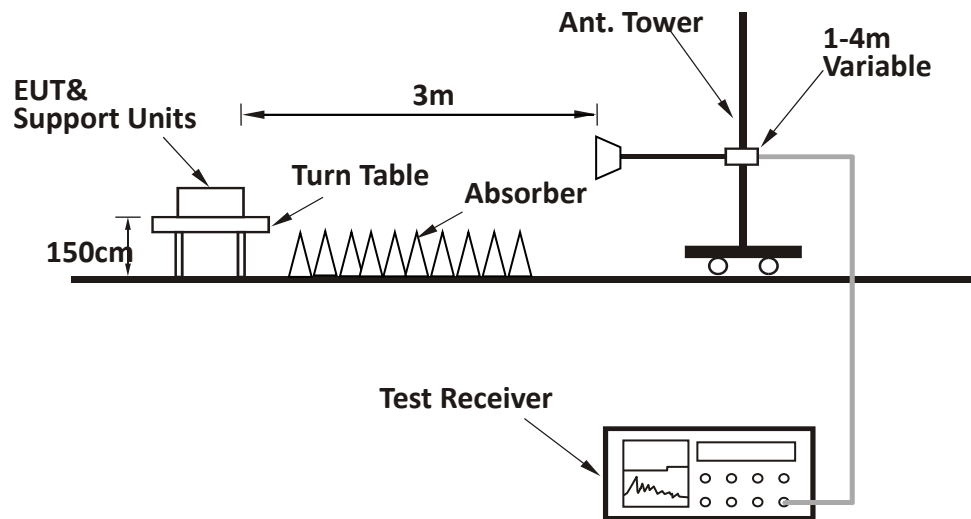
For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



**For Radiated emission above 1GHz:**

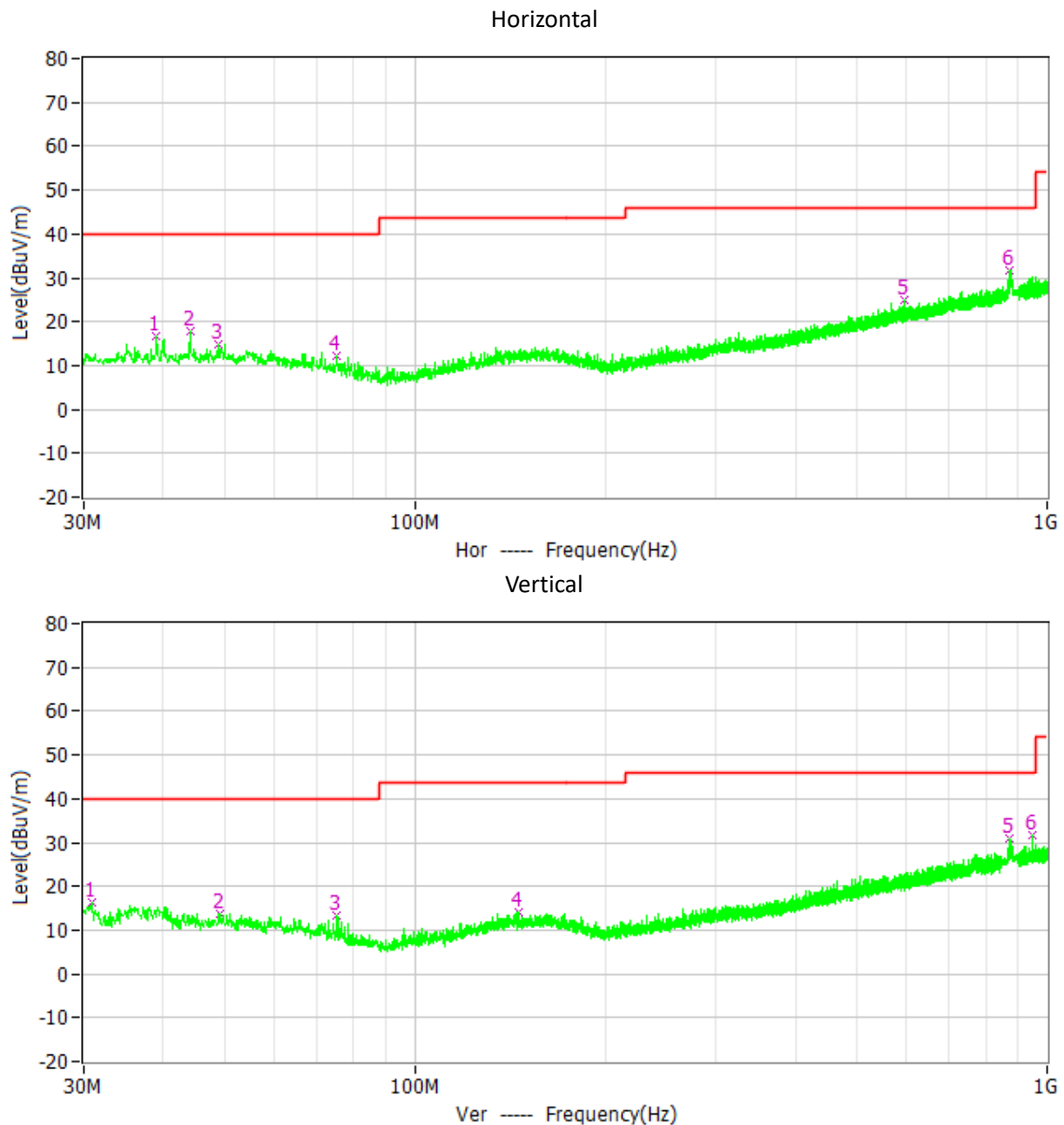


## TEST REPORT

### 4.4 Test Results of Radiated Emissions

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

The worst waveform from 30MHz to 1000MHz is listed as below:



## TEST REPORT

### Test data below 1GHz

Antenna	Frequency (MHz)	Corrected Reading (dBUV/m)	Correct Factor (dB/m)	Limit (dBUV/m)	Margin (dB)	Detector
H	39.118	16.74	13.80	40.00	23.26	QP
H	44.162	17.88	14.21	40.00	22.12	QP
H	48.915	14.92	14.49	40.00	25.08	QP
H	75.396	12.20	11.27	40.00	27.80	QP
H	593.764	24.87	22.48	46.00	21.13	QP
H	869.050	29.53	26.73	46.00	16.47	QP
V	30.873	16.23	12.34	40.00	23.77	QP
V	49.206	13.84	14.51	40.00	26.16	QP
V	75.493	13.17	11.25	40.00	26.83	QP
V	146.206	13.98	14.36	43.50	29.52	QP
V	869.147	30.80	26.73	46.00	15.20	QP
V	948.687	29.53	27.51	46.00	16.47	QP

## 5 Antenna requirement

### 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 permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### Result:

EUT uses permanently attached antenna to the intentional radiator, so it can comply with the provisions of this section.

\*\*\*\*\* END \*\*\*\*\*