中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant:	**Shenzhen Qianyan Technology LTD**
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FCC ID:	**2A7VD-H6176**
IC:	**28789-H6176**
Product Name:	**Govee Outdoor Strip Light**
Standard(s):	**47 CFR Part 15, Subpart C(15.247)** **RSS-247 Issue 3，August 2023** **RSS-Gen, Issue 5, February 2021 Amendment 2** **ANSI C63.10-2013** **KDB 558074 D01 15.247 Meas Guidance v05r02**

The above device has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

Report Number: **CR230846894-00A**

Date Of Issue: **2023/12/18**

Reviewed By: **Calvin Chen**

Title: RF Engineer

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Title: Manager

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Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 442868, the FCC Designation No. : CN1314.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0123.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230846894-00A	Original Report	2023/12/18

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Govee Outdoor Strip Light
EUT Model:	H6176
Multiple Model:	H6175, H6173
HVIN:	H6176, H6175, H6173A
Operation Frequency:	2402-2480MHz
Maximum Peak Output Power (Conducted):	-0.69dBm
Modulation Type:	GFSK
Rated Input Voltage:	DC 36V from adapter
Serial Number:	RF: 29TB-3, RE Above 1GHz: 29TB-1 CE/RE Below 1GHz: 29TB-1(H6176), 29TB-6 (H6175) , 29TB-7 (H6173)
EUT Received Date:	2023/08/29
EUT Received Status:	Good
Note: The multiple models are electrically identical with the main tested model; the difference among them is just the length of the string of lights. Please refer to the declaration letter for more detail, which was provided by manufacturer.	

Operation Frequency Detail:
For BLE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
…	…	…	…
…	…	…	…
…	…	…	…
18	2438	38	2478
19	2440	39	2480

Per section 15.31(m) /RSS-Gen, the below frequencies were performed the test as below:

Test Channel	Frequency (MHz)
Lowest	2402
Middle	2440
Highest	2480

Antenna Information Detail▲:

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
Shenzhen Qianyan Technology LTD	PCB	50	2.4~2.5GHz	3.23dBi

The Method of §15.203 Compliance:
☒Antenna was permanently attached to the unit.
☐Antenna use a unique type of connector to attach to the EUT.
☐Unit was professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
Adapter 1 (For model H6176)	ShenZhen SQY Technology Co., Ltd	SOY-3600200US-306	Input: 100-240V~50/60Hz, 1.8A Output: 36.0V, 2.0A 72.0W
Adapter 2 (For model H6176)	Dong Guan Royal Intelligent Co., Ltd	BI72A-360200-U2	Input: 100-240V~50/60Hz, 1.8A Output: 36V, 2A
Adapter (For model H6175)	Dong Guan Royal Intelligent Co., Ltd	BI36G-360100-AdU(IP44)	Input: 100-240V~50/60Hz, 1.2A Output: 36V, 1A
Adapter (For model H6173)	Dong Guan Royal Intelligent Co., Ltd	BI54G-360150-AdU(IP44)	Input: 100-240V~50/60Hz, 1.4A Output: 36V, 1.5A

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

For BLE:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer.
Equipment Modifications:	No
EUT Exercise Software:	sscom v5.13.1.exe

The software was provided by manufacturer. The maximum power was configured as below, that was provided by the manufacturer▲:

Test Modes	Power Level Setting		
	Lowest Channel	Middle Channel	Highest Channel
1Mbps	9	9	9

1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
/	/	/	/

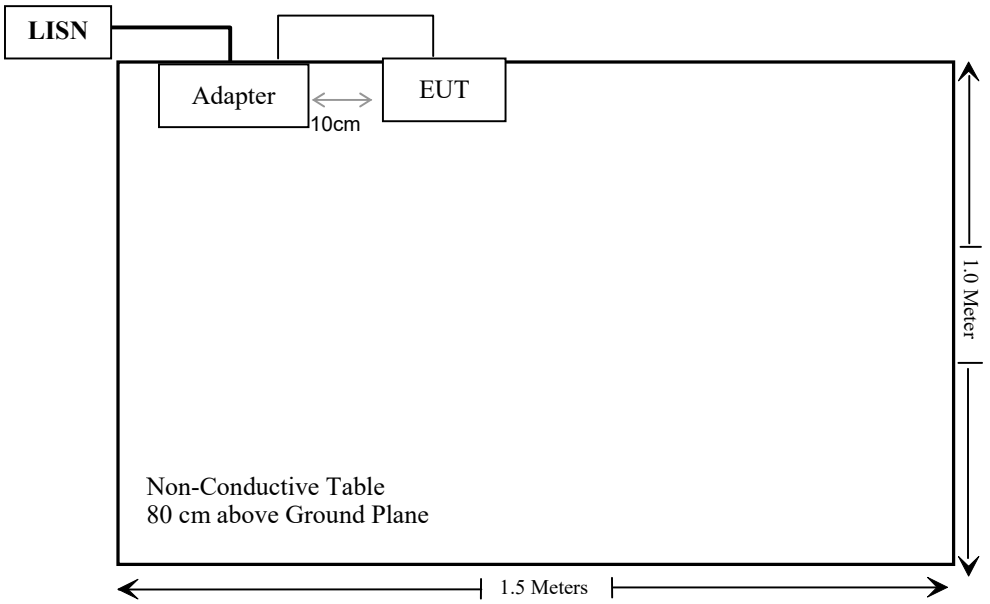
1.2.3 Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
AC Cable	No	No	1.0	Adapter 1/2	LISN/AC Mains
DC Cable	No	No	2.5	Adapter 2	EUT
DC Cable	No	Yes	1.2	Adapter 1	EUT
AC Cable	No	No	1.2	Receptacle	LISN/AC Mains
DC Cable	No	No	2.5	Adapter for Model H6175/ H6173	EUT

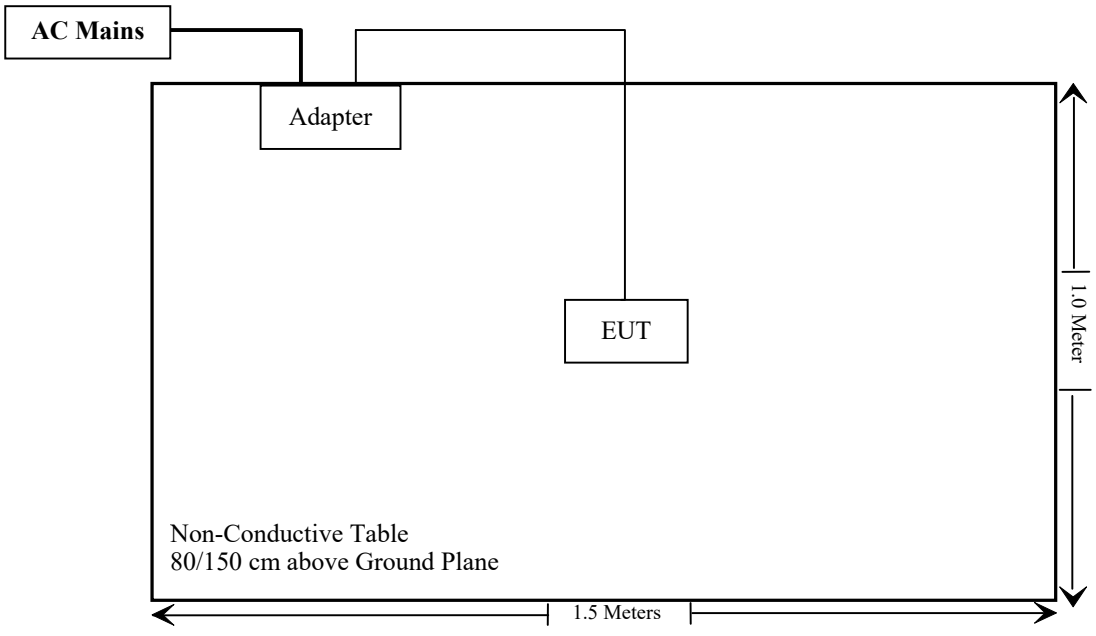
1.2.4 Block Diagram of Test Setup

For Model H6176:

AC line conducted emissions:

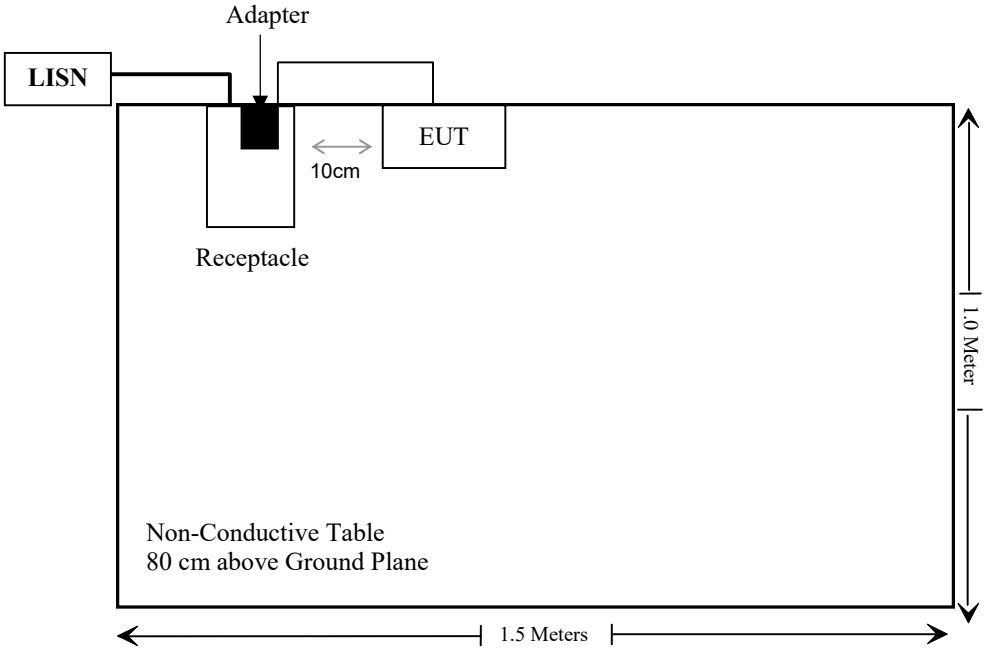


Radiated Spurious Emissions:

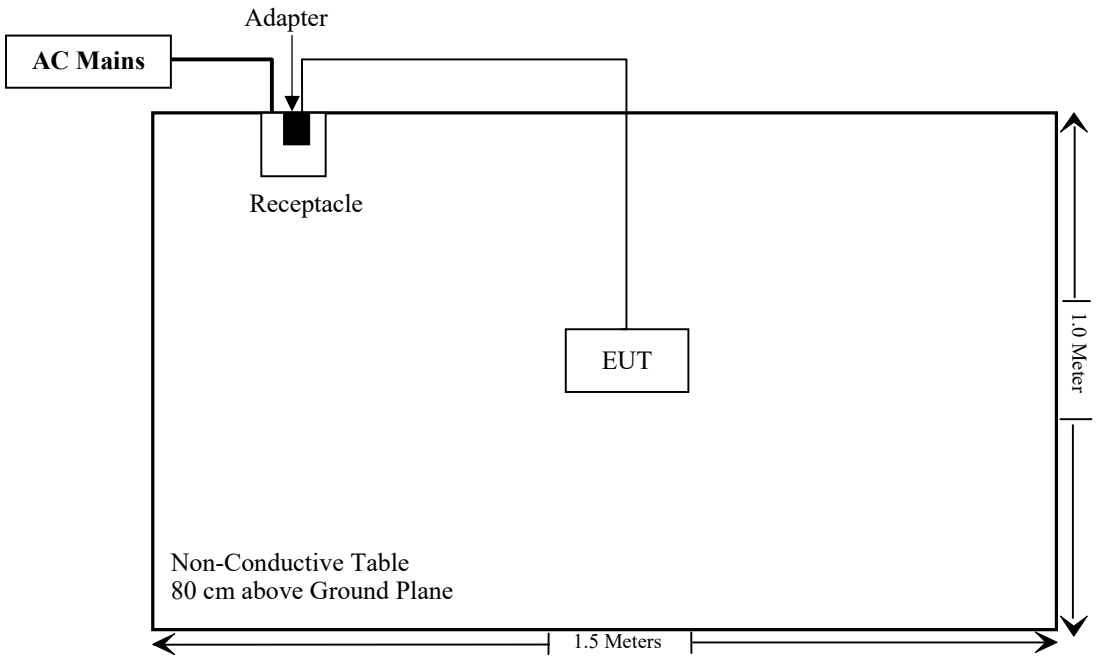


For Model H6175/ H6173:

AC line conducted emissions:



Radiated Spurious Emissions:



1.3 Measurement Uncertainty

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	9kHz~30MHz: 4.12dB, 30M~200MHz: 4.15 dB, 200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions, conducted	±1.26 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

2. SUMMARY OF TEST RESULTS

Standard(s) Section	Test Items	Result
§15.207(a) RSS-Gen Clause 8.8	AC line conducted emissions	Compliant
§15.205, §15.209, §15.247(d) RSS-Gen Clause 8.10	Radiated Spurious Emissions	Compliant
§15.247 (a)(2) RSS-247 Clause 5.2 a)	Minimum 6 dB Bandwidth	Compliant
RSS-Gen Clause 6.7	99% Occupied Bandwidth	Compliant
§15.247(b)(3) RSS-247 Clause 5.4 d)	Maximum Conducted Output Power	Compliant
§15.247(d) RSS-247 Clause5.5	100 kHz Bandwidth Of Frequency Band Edge	Compliant
§15.247(e) RSS-247 Clause5.2 b)	Power Spectral Density	Compliant
§15.203 RSS-GEN Clause 6.8	Antenna Requirement	Compliant
§15.247 (i) & §1.1307	RF Exposure Evaluation	Compliant
RSS-102 Clause 2.5.2	Exemption Limits For Routine Evaluation-RF Exposure Evaluation	Compliant

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 Applicable Standard

FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that 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 the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

	Conducted limit (dBμV)	
Frequency of emission (MHz)	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μV within the frequency band 535-1705 kHz, as measured using a 50 μH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits in §15.205, §15.209, §15.221, §15.223, or §15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provisions for, the use of battery chargers which permit operating while charging, AC adapters or battery eliminators or that connect to the AC power lines indirectly, obtainig their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

RSS-Gen Clause 8.8

Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 μH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.
For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 – AC power-line conducted emissions limits

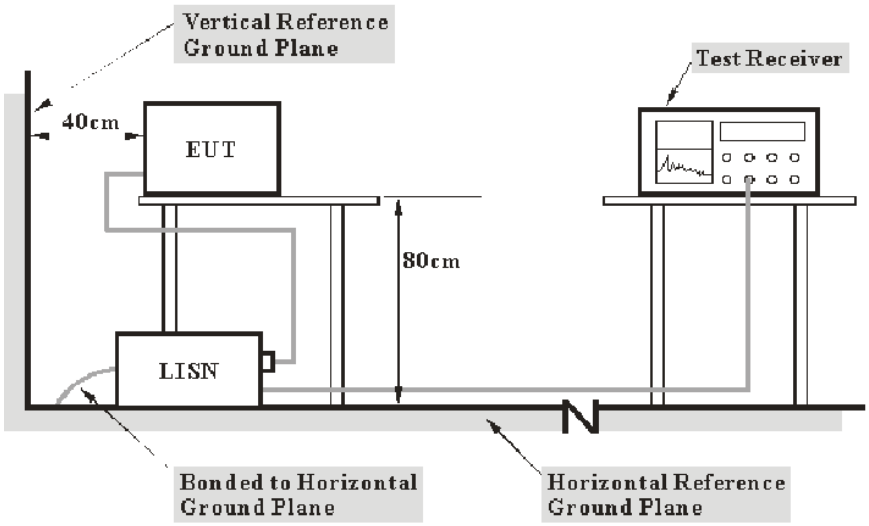
Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56[1]	56 to 46[1]
0.5 – 5	56	46
5 – 30	60	50

Note 1: The level decreases linearly with the logarithm of the frequency.

For an EUT with a permanent or detachable antenna operating between 150 kHz and 30 MHz, the AC power-line conducted emissions must be measured using the following configurations:
(a) Perform the AC power-line conducted emissions test with the antenna connected to determine compliance with the limits of table 4 outside the transmitter's fundamental emission band.

(b) Retest with a dummy load instead of the antenna to determine compliance with the limits of table 4 within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network that simulates the antenna in the fundamental frequency band.

3.1.2 EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207,RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

3.1.3 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

3.1.4 Test Procedure

The frequency and amplitude of the six highest ac power-line conducted emissions relative to the limit, measured over all the current-carrying conductors of the EUT power cords, and the operating frequency or frequency to which the EUT is tuned (if appropriate), should be reported, unless such emissions are more than 20 dB below the limit. AC power-line conducted emissions measurements are to be separately carried out only on each of the phase ("hot") line(s) and (if used) on the neutral line(s), but not on the ground [protective earth] line(s). If less than six emission frequencies are within 20 dB of the limit, then the noise level of the measuring instrument at representative frequencies should be reported. The specific conductor of the power-line cord for each of the reported emissions should be identified. Measure the six highest emissions with respect to the limit on each current-carrying conductor of each power cord associated with the EUT (but not the power cords of associated or peripheral equipment that are part of the test configuration). Then, report the six highest emissions with respect to the limit from among all the measurements identifying the frequency and specific current-carrying conductor identified with the emission. The six highest emissions should be reported for each of the current-carrying conductors, or the six highest emissions may be reported over all the current-carrying conductors.

3.1.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = attenuation caused by cable loss + voltage division factor of AMN

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

3.2 Radiation Spurious Emissions

3.2.1 Applicable Standard

FCC §15.247 (d);

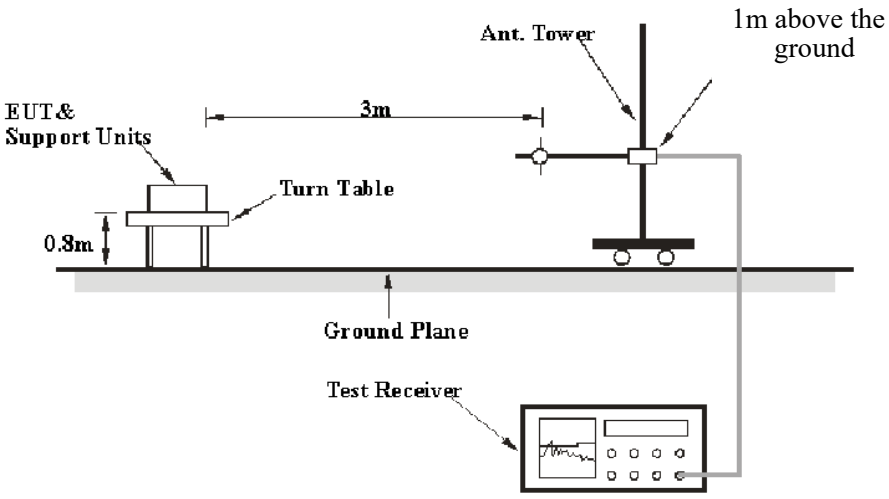
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

RSS-247 Clause 5.5

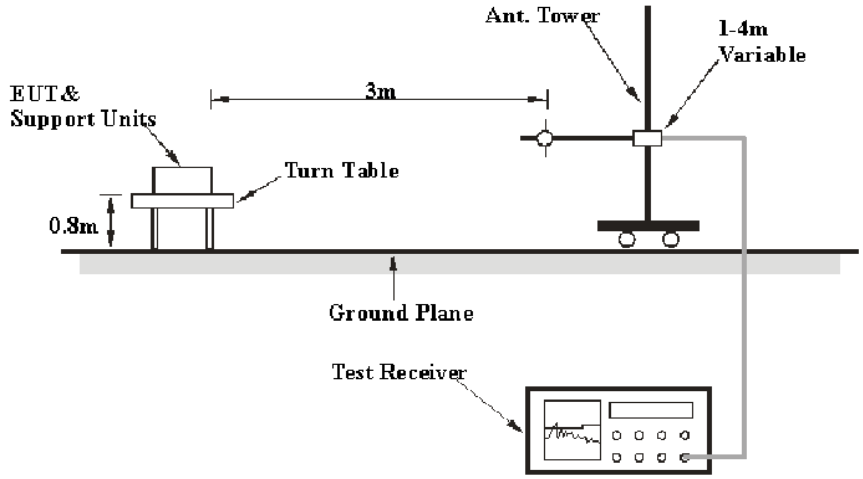
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required

3.2.2 EUT Setup

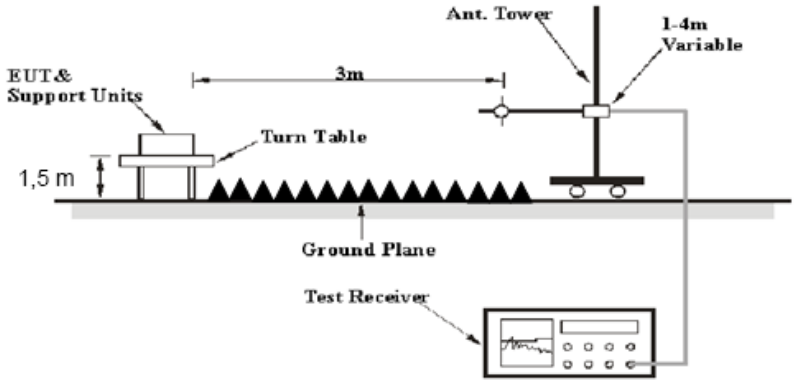
9 kHz-30MHz:



30MHz-1GHz:



Above 1GHz:



The radiated emissions were performed in the 3 meters distance, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247,RSS-247,RSS-Gen limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

3.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

9 kHz -1000 MHz:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	/	/	200 Hz	QP
	300 Hz	1 kHz	/	PK
150 kHz – 30 MHz	/	/	9 kHz	QP
	10 kHz	30 kHz	/	PK
30 MHz – 1000 MHz	/	/	120 kHz	QP
	100 kHz	300 kHz	/	PK

1GHz- 25GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
AV	>98%	1MHz	10 Hz
	<98%	1MHz	≥1/T

Note: T is minimum transmission duration

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

3.2.4 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

3.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor
Factor = Antenna Factor + Cable Loss- Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. The equation for margin calculation is as follows:

Margin = Limit – Result

3.3 6 dB Emission Bandwidth:

3.3.1 Applicable Standard

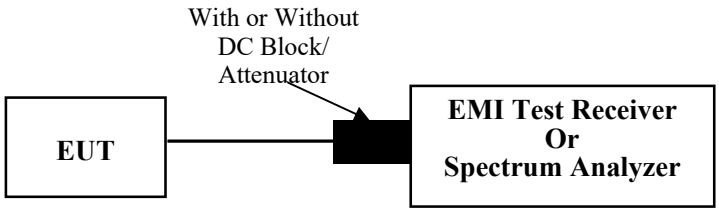
FCC §15.247 (a)(2)

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

RSS-247 Clause 5.2 a

The minimum 6 dB bandwidth shall be 500 kHz.

3.3.2 EUT Setup



3.3.3 Test Procedure

According to ANSI C63.10-2013 Section 11.8

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3×RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.4 99% Occupied Bandwidth:

3.4.1 Applicable Standard

RSS-Gen Clause 6.7

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

In some cases, the "x dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.

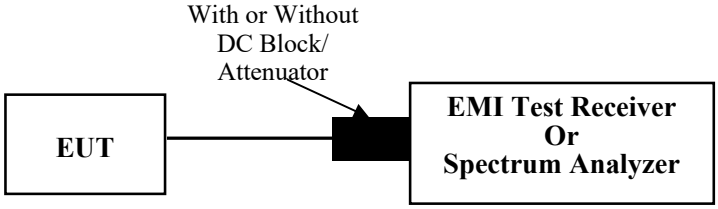
The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.
- The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

3.4.2 EUT Setup



3.4.3 Test Procedure

According to ANSI C63.10-2013 Section 6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
The following procedure shall be used for measuring 99% power bandwidth:
a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.
d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.
g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

3.5 Maximum Conducted Output Power:

3.5.1 Applicable Standard

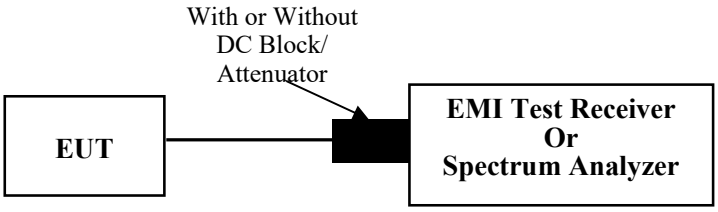
FCC §15.247 (b)(3)

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

RSS-247 Clause 5.4 d

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e).

3.5.2 EUT Setup



3.5.3 Test Procedure

According to ANSI C63.10-2013 Section 11.9.1.1

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:
a) Set the RBW ≥ DTS bandwidth.
b) Set VBW ≥ [3 × RBW].
c) Set span ≥ [3 × 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.

3.6 Maximum power spectral density:

3.6.1 Applicable Standard

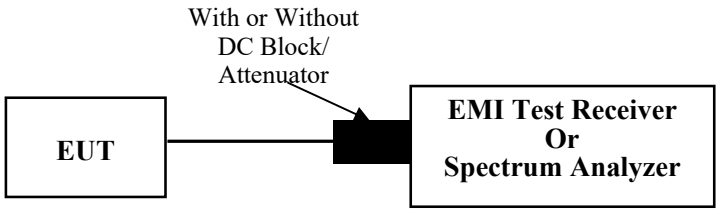
FCC §15.247 (e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

RSS-247 Clause5.2 b

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of section 5.4(d), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

3.6.2 EUT Setup



3.6.3 Test Procedure

According to ANSI C63.10-2013 Section 11.10.2

a) Set analyzer center frequency to DTS channel center frequency.
b) Set the span to 1.5 times the DTS bandwidth.
c) Set the RBW to 3 kHz ≤ RBW ≤ 100 kHz.
d) Set the VBW ≥ [3 × RBW].
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.
j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

3.7 100 kHz Bandwidth of Frequency Band Edge:

3.7.1 Applicable Standard

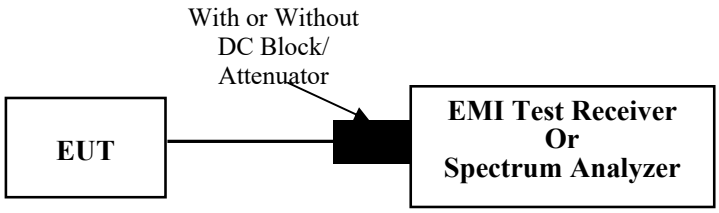
FCC §15.247 (d);

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

RSS-247 Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required

3.7.2 EUT Setup



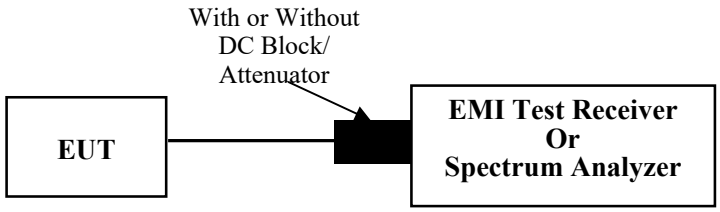
3.7.3 Test Procedure

According to ANSI C63.10-2013 Section 11.11

a) Set the center frequency and span to encompass frequency range to be measured.
b) Set the RBW = 100 kHz.
c) Set the VBW ≥ [3 × RBW].
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use the peak marker function to determine the maximum amplitude level.
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

3.8 Duty Cycle:

3.8.1 EUT Setup



3.8.2 Test Procedure

According to ANSI C63.10-2013 Section 11.6

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:
1) Set the center frequency of the instrument to the center frequency of the transmission.
2) Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value.
3) Set VBW ≥ RBW. Set detector = peak or average.
4) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring the duty cycle shall not be used if T ≤ 16.7 μs.)

3.9 Antenna Requirement

3.9.1 Applicable Standard

FCC §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. 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. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

RSS-GEN Clause 6.8

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).
When measurements at the antenna port are used to determine the RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna's manufacturer.
The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.
For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:
This radio transmitter [enter the device's ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

3.9.2 Judgment

Compliant. Please refer to the Antenna Information detail in Section 1.

4. Test DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	29TB-1, 29TB-6, 29TB-7	Test Date:	2023/09/11
Test Site:	CE	Test Mode:	Transmitting maximum output power mode BLE 1M bps low channel
Tester:	Vic Du	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	24.8	Relative Humidity: (%)	52	ATM Pressure: (kPa)	100.1

Test Equipment List and Details:

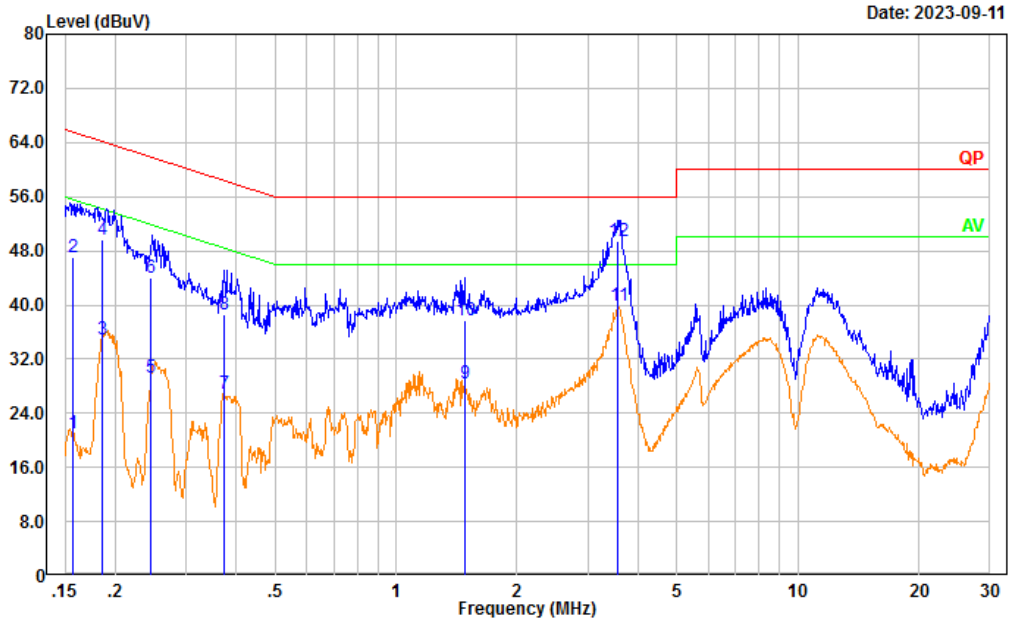
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101134	2023/03/31	2024/03/30
R&S	EMI Test Receiver	ESR3	102726	2023/03/31	2024/03/30
MICRO-COAX	Coaxial Cable	UTIFLEX	C-0200-01	2023/08/06	2024/08/05
Audix	Test Software	E3	190306 (V9)	N/A	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

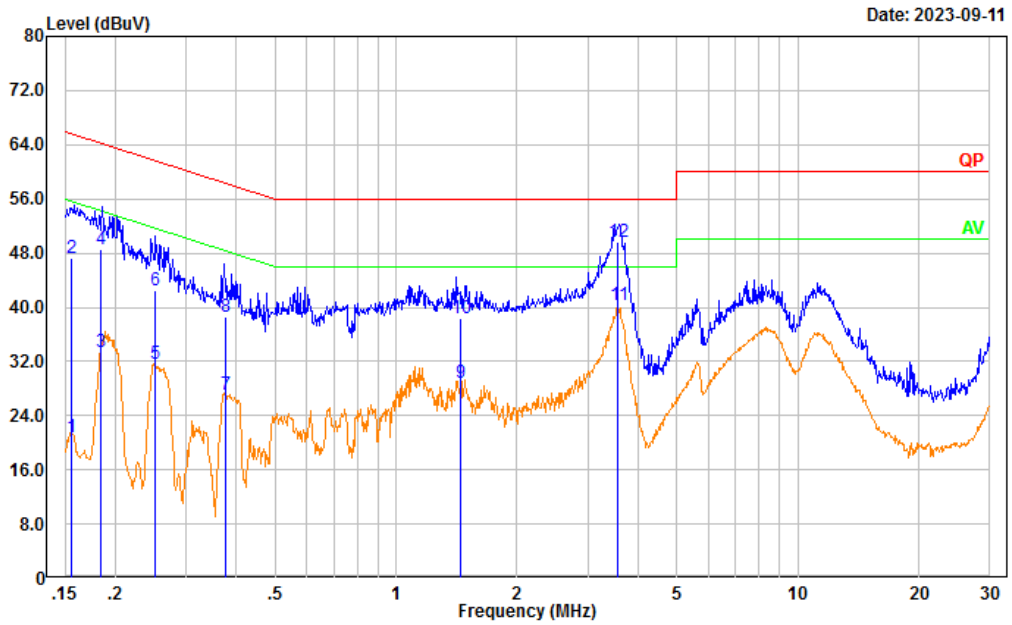
For Model: H6176 (Adapter 1)

Project No.: CR230846894-RF
Tester: Vic Du
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.157	11.31	9.61	20.92	55.65	34.73	Average
2	0.157	37.41	9.61	47.02	65.65	18.63	QP
3	0.186	25.28	9.61	34.89	54.20	19.31	Average
4	0.186	40.07	9.61	49.68	64.20	14.52	QP
5	0.246	19.59	9.61	29.20	51.90	22.70	Average
6	0.246	34.48	9.61	44.09	61.90	17.81	QP
7	0.372	17.35	9.61	26.96	48.45	21.49	Average
8	0.372	29.02	9.61	38.63	58.45	19.82	QP
9	1.482	18.71	9.62	28.33	46.00	17.67	Average
10	1.482	28.02	9.62	37.64	56.00	18.36	QP
11	3.566	30.20	9.65	39.85	46.00	6.15	Average
12	3.566	39.67	9.65	49.32	56.00	6.68	QP

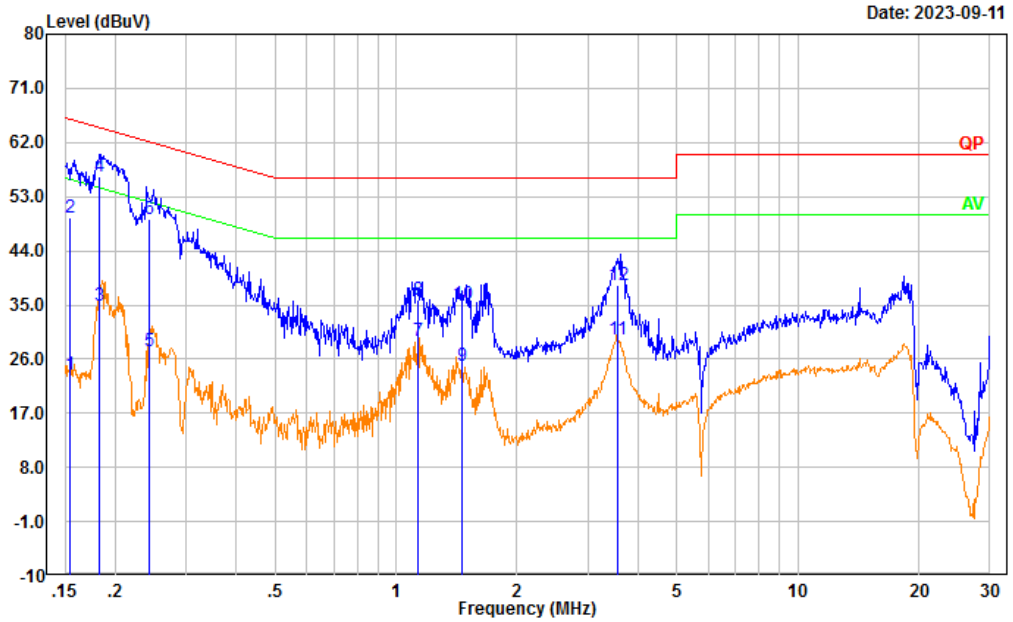
Project No.: CR230846894-RF
Tester: Vic Du
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.155	11.24	9.61	20.85	55.72	34.87	Average
2	0.155	37.73	9.61	47.34	65.72	18.38	QP
3	0.184	23.72	9.61	33.33	54.28	20.95	Average
4	0.184	39.06	9.61	48.67	64.28	15.61	QP
5	0.251	21.96	9.61	31.57	51.71	20.14	Average
6	0.251	32.91	9.61	42.52	61.71	19.19	QP
7	0.376	17.41	9.61	27.02	48.38	21.36	Average
8	0.376	29.02	9.61	38.63	58.38	19.75	QP
9	1.442	19.11	9.62	28.73	46.00	17.27	Average
10	1.442	28.69	9.62	38.31	56.00	17.69	QP
11	3.570	30.60	9.65	40.25	46.00	5.75	Average
12	3.570	40.04	9.65	49.69	56.00	6.31	QP

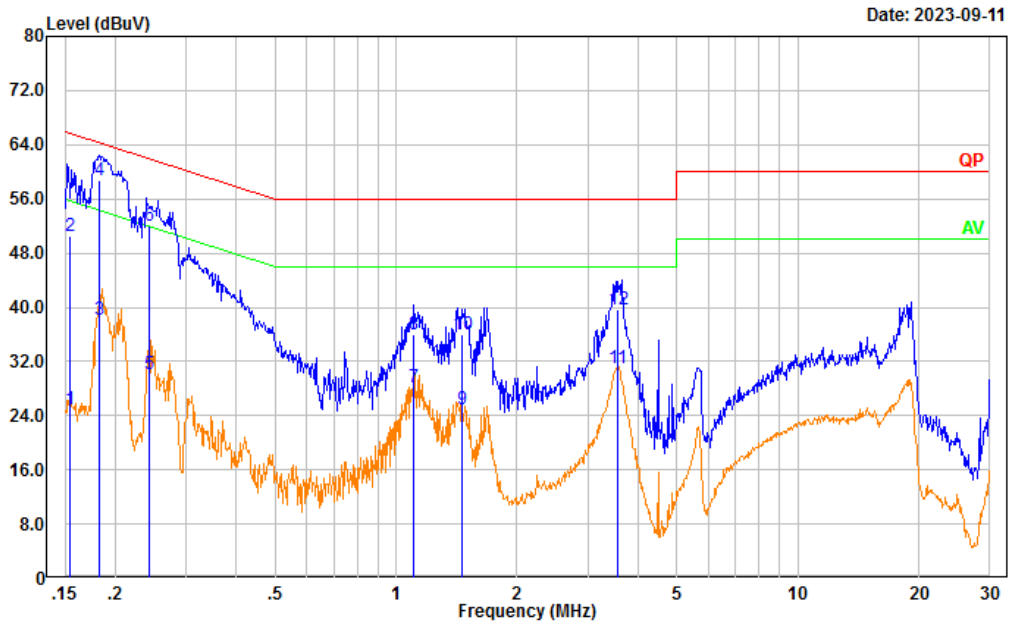
For Model: H6176 (Adapter 2)

Project No.: CR230846894-RF
Tester: Vic Du
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.154	13.89	9.61	23.50	55.76	32.26	Average
2	0.154	40.02	9.61	49.63	65.76	16.13	QP
3	0.183	25.25	9.61	34.86	54.34	19.48	Average
4	0.183	46.69	9.61	56.30	64.34	8.04	QP
5	0.244	17.60	9.61	27.21	51.97	24.76	Average
6	0.244	39.75	9.61	49.36	61.97	12.61	QP
7	1.131	19.39	9.62	29.01	46.00	16.99	Average
8	1.131	26.30	9.62	35.92	56.00	20.08	QP
9	1.458	15.15	9.62	24.77	46.00	21.23	Average
10	1.458	25.46	9.62	35.08	56.00	20.92	QP
11	3.559	19.62	9.65	29.27	46.00	16.73	Average
12	3.559	28.56	9.65	38.21	56.00	17.79	QP

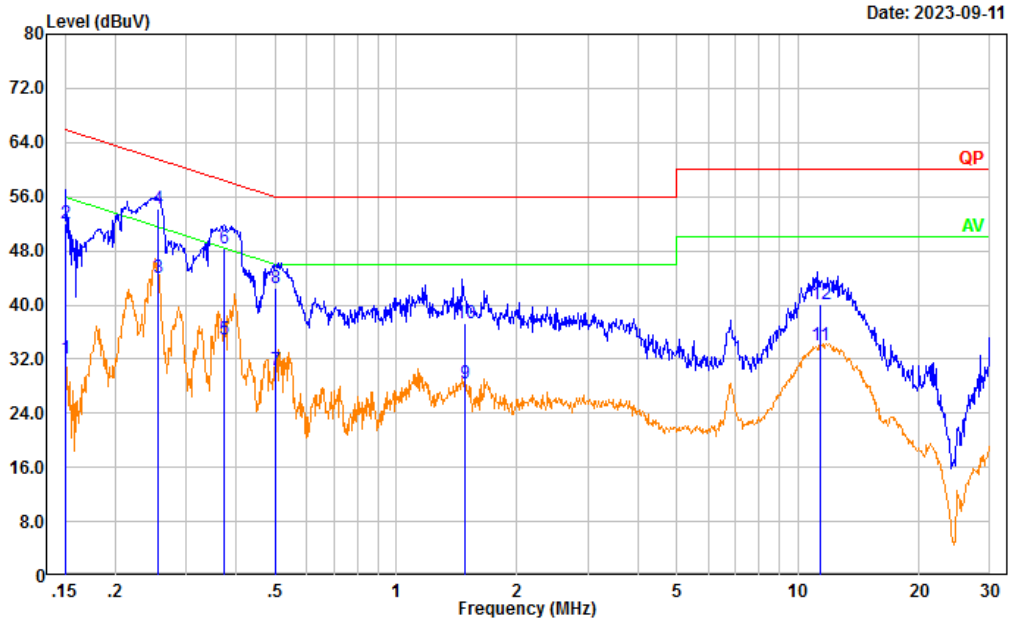
Project No.: CR230846894-RF
Tester: Vic Du
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.155	15.25	9.61	24.86	55.75	30.89	Average
2	0.155	41.01	9.61	50.62	65.75	15.13	QP
3	0.183	28.60	9.61	38.21	54.35	16.14	Average
4	0.183	49.24	9.61	58.85	64.35	5.50	QP
5	0.242	20.57	9.61	30.18	52.01	21.83	Average
6	0.242	42.40	9.61	52.01	62.01	10.00	QP
7	1.108	18.59	9.62	28.21	46.00	17.79	Average
8	1.108	26.27	9.62	35.89	56.00	20.11	QP
9	1.458	15.26	9.62	24.88	46.00	21.12	Average
10	1.458	26.26	9.62	35.88	56.00	20.12	QP
11	3.552	21.36	9.65	31.01	46.00	14.99	Average
12	3.552	30.08	9.65	39.73	56.00	16.27	QP

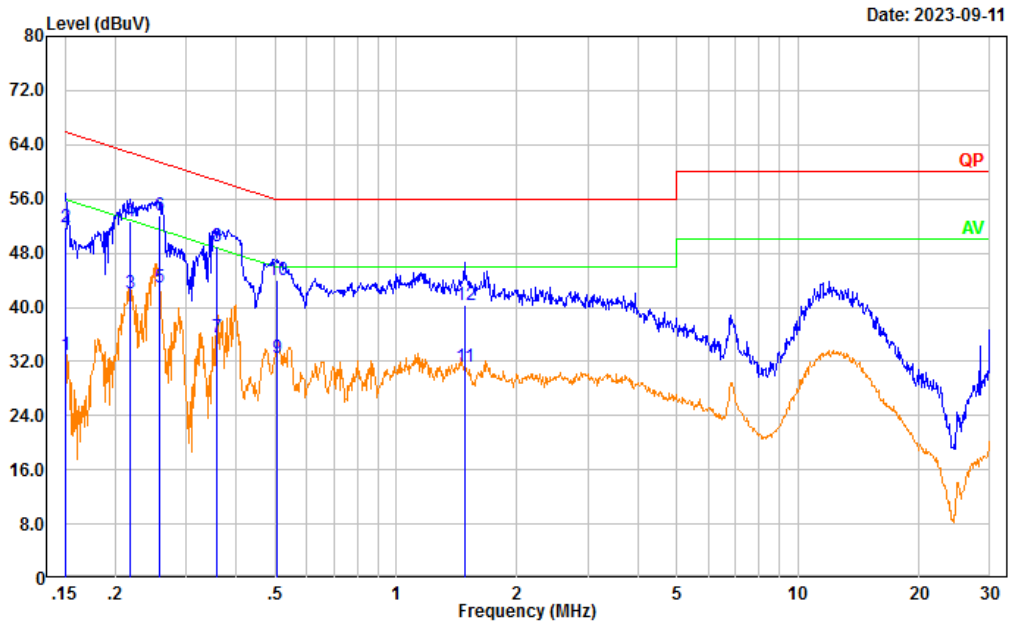
For Model: H6175

Project No.: CR230846894-RF
Tester: Vic Du
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.150	22.48	9.61	32.09	56.00	23.91	Average
2	0.150	42.39	9.61	52.00	66.00	14.00	QP
3	0.256	34.35	9.61	43.96	51.55	7.59	Average
4	0.256	44.51	9.61	54.12	61.55	7.43	QP
5	0.372	25.32	9.61	34.93	48.45	13.52	Average
6	0.372	38.82	9.61	48.43	58.45	10.02	QP
7	0.500	20.75	9.61	30.36	46.00	15.64	Average
8	0.500	32.87	9.61	42.48	56.00	13.52	QP
9	1.482	18.80	9.62	28.42	46.00	17.58	Average
10	1.482	27.61	9.62	37.23	56.00	18.77	QP
11	11.364	24.46	9.67	34.13	50.00	15.87	Average
12	11.364	30.45	9.67	40.12	60.00	19.88	QP

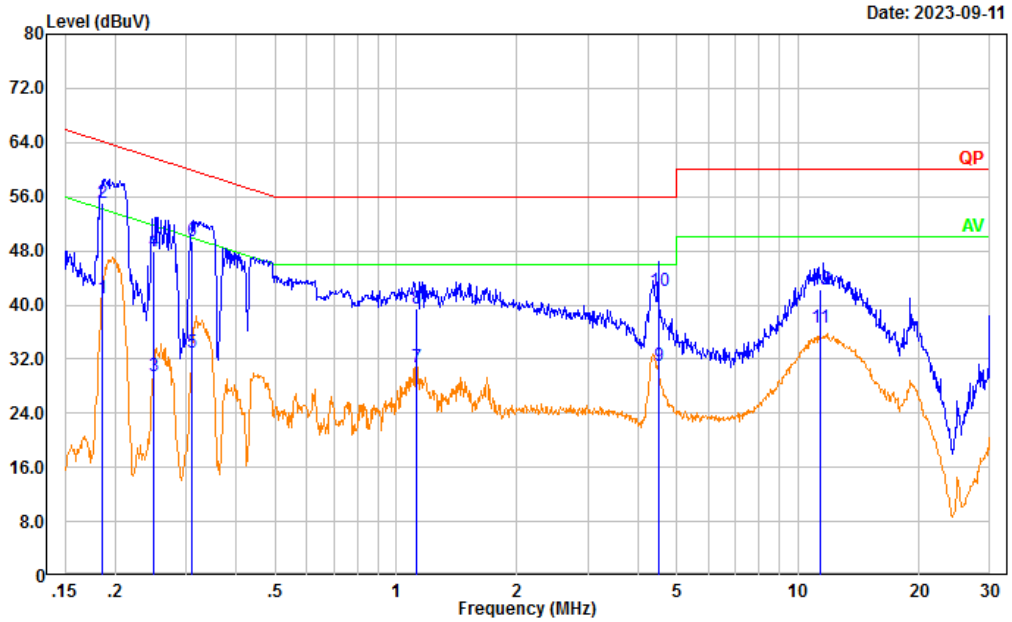
Project No.: CR230846894-RF
Tester: Vic Du
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.151	23.24	9.61	32.85	55.97	23.12	Average
2	0.151	42.21	9.61	51.82	65.97	14.15	QP
3	0.217	32.55	9.61	42.16	52.93	10.77	Average
4	0.217	43.13	9.61	52.74	62.93	10.19	QP
5	0.258	33.31	9.61	42.92	51.50	8.58	Average
6	0.258	44.04	9.61	53.65	61.50	7.85	QP
7	0.358	26.01	9.61	35.62	48.77	13.15	Average
8	0.358	39.37	9.61	48.98	58.77	9.79	QP
9	0.505	22.94	9.61	32.55	46.00	13.45	Average
10	0.505	34.40	9.61	44.01	56.00	11.99	QP
11	1.481	21.58	9.62	31.20	46.00	14.80	Average
12	1.481	30.61	9.62	40.23	56.00	15.77	QP

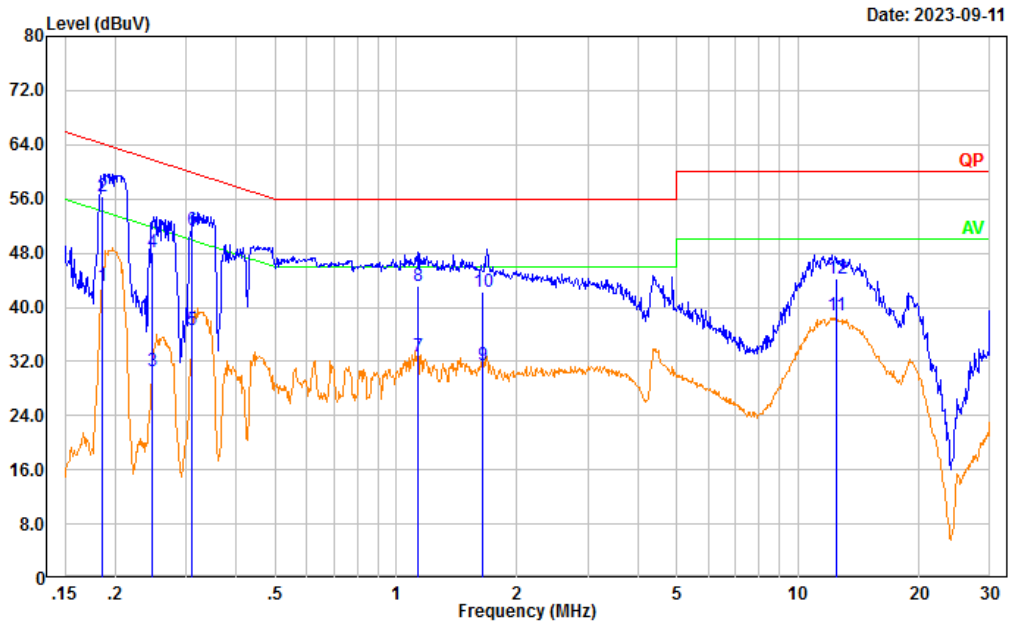
For Model: H6173

Project No.: CR230846894-RF
Tester: Vic Du
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.186	31.37	9.61	40.98	54.22	13.24	Average
2	0.186	45.44	9.61	55.05	64.22	9.17	QP
3	0.249	19.94	9.61	29.55	51.80	22.25	Average
4	0.249	38.38	9.61	47.99	61.80	13.81	QP
5	0.310	23.28	9.61	32.89	49.97	17.08	Average
6	0.310	39.73	9.61	49.34	59.97	10.63	QP
7	1.120	21.14	9.62	30.76	46.00	15.24	Average
8	1.120	29.88	9.62	39.50	56.00	16.50	QP
9	4.500	21.30	9.66	30.96	46.00	15.04	Average
10	4.500	32.41	9.66	42.07	56.00	13.93	QP
11	11.349	26.91	9.67	36.58	50.00	13.42	Average
12	11.349	32.67	9.67	42.34	60.00	17.66	QP

Project No.: CR230846894-RF
Tester: Vic Du
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.186	33.45	9.61	43.06	54.22	11.16	Average
2	0.186	46.85	9.61	56.46	64.22	7.76	QP
3	0.248	21.01	9.61	30.62	51.83	21.21	Average
4	0.248	38.58	9.61	48.19	61.83	13.64	QP
5	0.311	27.12	9.61	36.73	49.95	13.22	Average
6	0.311	41.84	9.61	51.45	59.95	8.50	QP
7	1.132	23.16	9.62	32.78	46.00	13.22	Average
8	1.132	33.44	9.62	43.06	56.00	12.94	QP
9	1.648	21.84	9.63	31.47	46.00	14.53	Average
10	1.648	32.71	9.63	42.34	56.00	13.66	QP
11	12.468	29.09	9.67	38.76	50.00	11.24	Average
12	12.468	34.58	9.67	44.25	60.00	15.75	QP

4.2 Radiation Spurious Emissions

Serial Number:	29TB-1, 29TB-6, 29TB-7	Test Date:	2023/9/07 for below1 GHz 2023/10/27 for above 1 GHz
Test Site:	966-1/966-2	Test Mode:	Transmitting
Tester:	Vic Du, Tao Zhu	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.1~26.5	Relative Humidity: (%)	60~65	ATM Pressure: (kPa)	100~100.8

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2020/10/19	2023/10/18
TESEQ	HF Loop Antenna	HLA6120	33561	2021/2/3	2024/2/2
R&S	EMI Test Receiver	ESR3	102724	2023/3/31	2024/3/30
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2023/7/16	2024/7/15
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2023/7/16	2024/7/15
Sonoma	Amplifier	310N	186165	2023/7/16	2024/7/15
Audix	Test Software	E3	201021 (V9)	N/A	N/A
AH	Double Ridge Guide Horn Antenna	SAS-571	1394	2023/2/22	2026/2/21
R&S	Spectrum Analyzer	FSV40	101591	2023/3/31	2024/3/30
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2023/8/6	2024/8/5
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2023/8/6	2024/8/5
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2022/11/9	2023/11/8
Audix	Test Software	E3	201021 (V9)	N/A	N/A
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2021/2/5	2024/2/4
Quinstar	Preamplifier	QLW-18405536-JO	15964001005	2023/9/15	2024/9/14
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2023/8/6	2024/8/5
E-Microwave	Band Rejection Filter	2400-2483.5MHz	OE01902424	2023/8/6	2024/8/5
Mini Circuits	High Pass Filter	VHF-6010+	31119	2023/8/6	2024/8/5

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

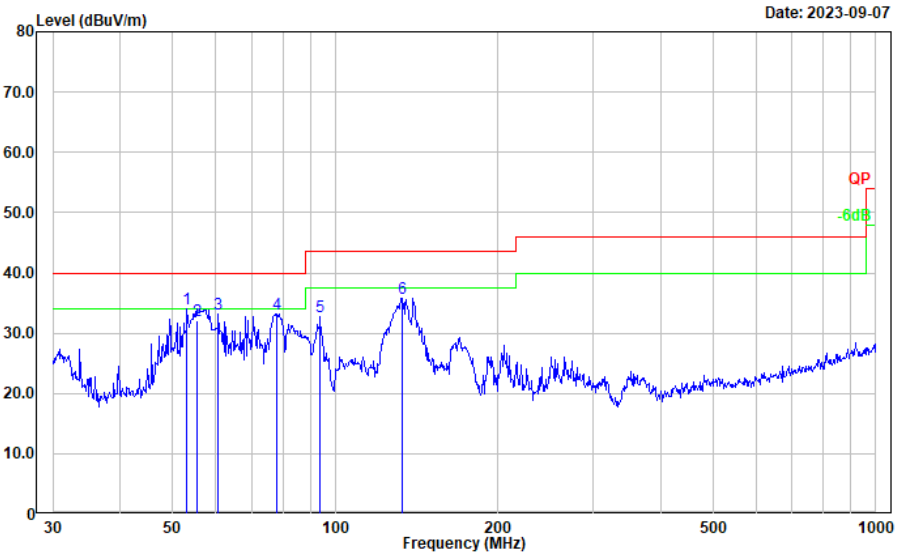
Please refer to the below table and plots.

After pre-scan in the X, Y and Z axes of orientation, the worst case is below:

The data of 9 kHz-30 MHz test is below the 20 dB limit or noise floor which is not recorded.

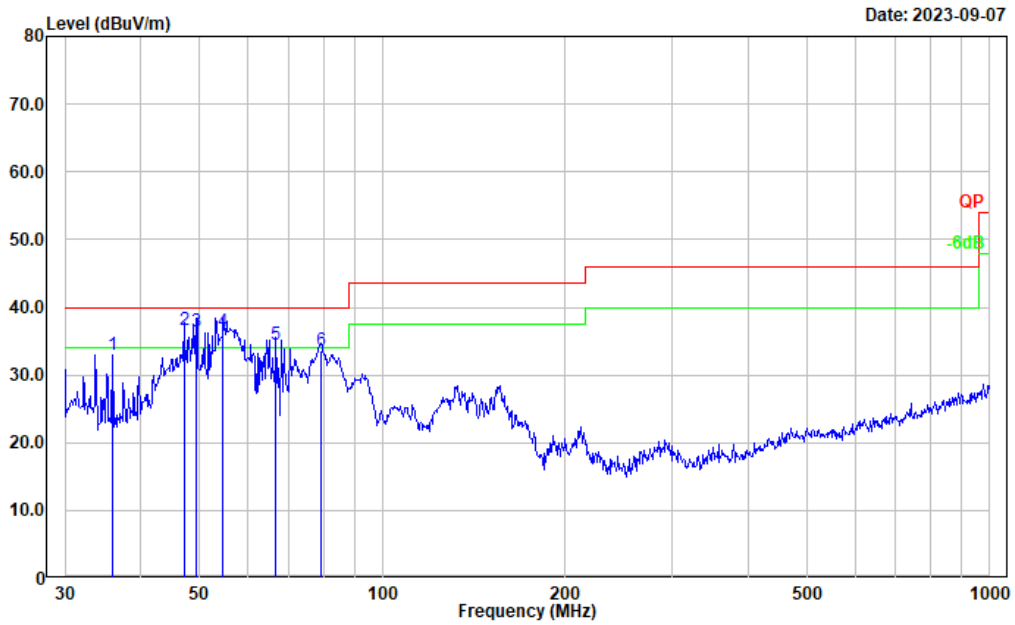
1) 30MHz-1GHz： Maximum output power mode (Low channel)
For Model: H6176 (Adapter 1)

Project No.: CR230846894-RF
Tester: Vic Du
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	53.131	51.16	-17.23	33.93	40.00	6.07	Peak
2	55.415	49.37	-17.29	32.08	40.00	7.92	QP
3	60.704	50.65	-17.38	33.27	40.00	6.73	Peak
4	77.865	50.52	-17.25	33.27	40.00	6.73	Peak
5	93.768	48.73	-15.98	32.75	43.50	10.75	Peak
6	132.685	47.34	-11.48	35.86	43.50	7.64	Peak

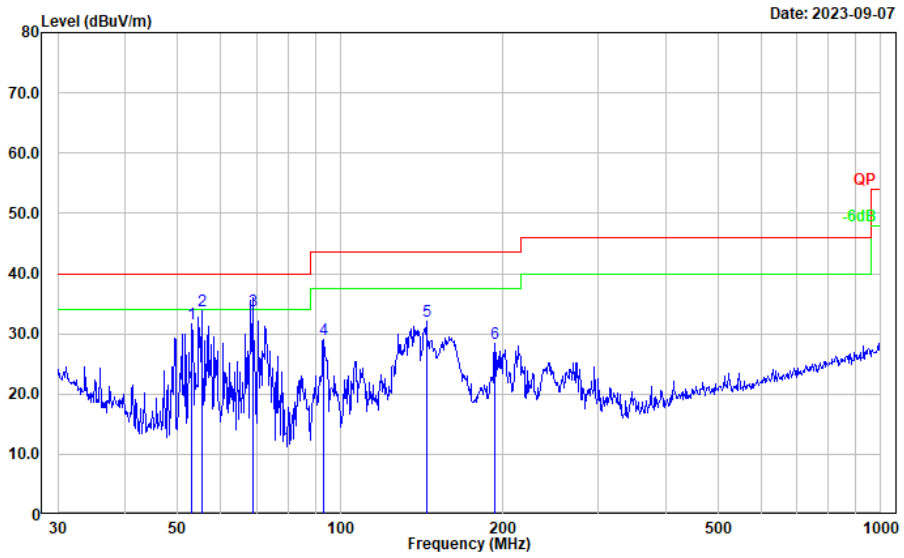
Project No.: CR230846894-RF
Tester: Vic Du
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	36.001	41.28	-8.24	33.04	40.00	6.96	Peak
2	47.160	52.20	-15.52	36.68	40.00	3.32	QP
3	49.359	53.16	-16.80	36.36	40.00	3.64	QP
4	54.643	53.68	-17.27	36.41	40.00	3.59	QP
5	66.733	51.27	-16.79	34.48	40.00	5.52	QP
6	79.243	51.00	-17.37	33.63	40.00	6.37	QP

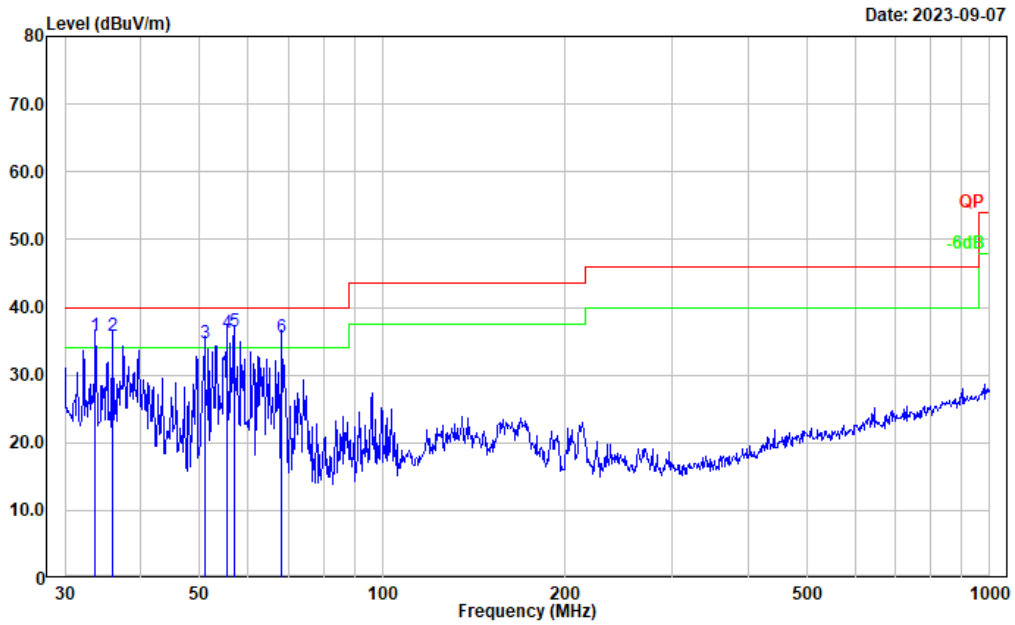
For Model: H6176 (Adapter 2)

Project No.: CR230846894-RF
Tester: Vic Du
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	53.131	48.93	-17.23	31.70	40.00	8.30	Peak
2	55.415	51.04	-17.29	33.75	40.00	6.25	Peak
3	68.872	50.52	-16.61	33.91	40.00	6.09	QP
4	93.113	45.08	-16.12	28.96	43.50	14.54	Peak
5	144.335	44.01	-11.96	32.05	43.50	11.45	Peak
6	193.095	41.51	-13.04	28.47	43.50	15.03	Peak

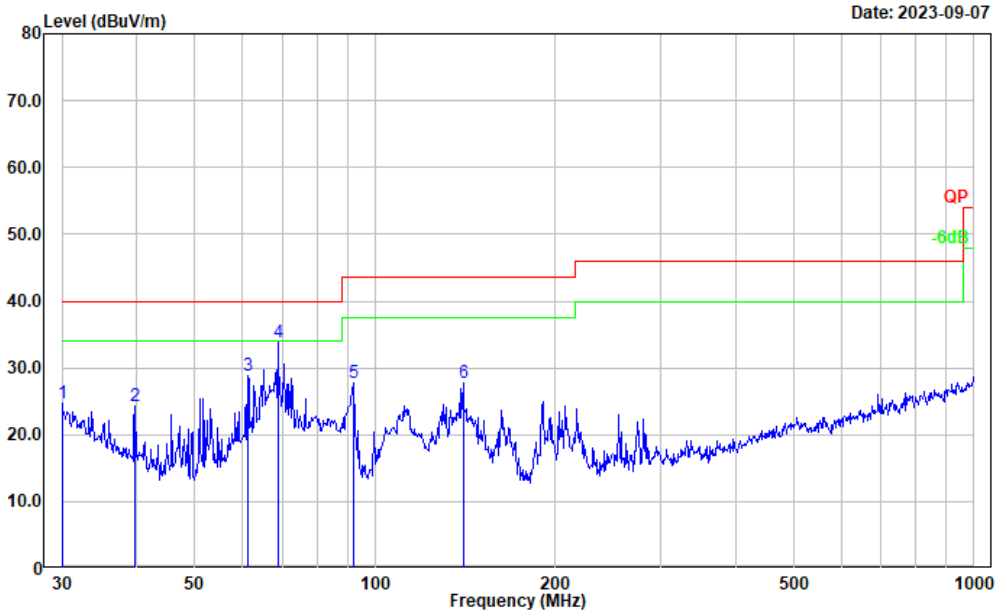
Project No.: CR230846894-RF
Tester: Vic Du
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	33.680	42.16	-6.43	35.73	40.00	4.27	QP
2	35.875	43.89	-8.14	35.75	40.00	4.25	QP
3	50.942	51.91	-17.21	34.70	40.00	5.30	QP
4	55.415	53.60	-17.29	36.31	40.00	3.69	QP
5	56.991	53.70	-17.32	36.38	40.00	3.62	QP
6	68.151	52.32	-16.67	35.65	40.00	4.35	QP

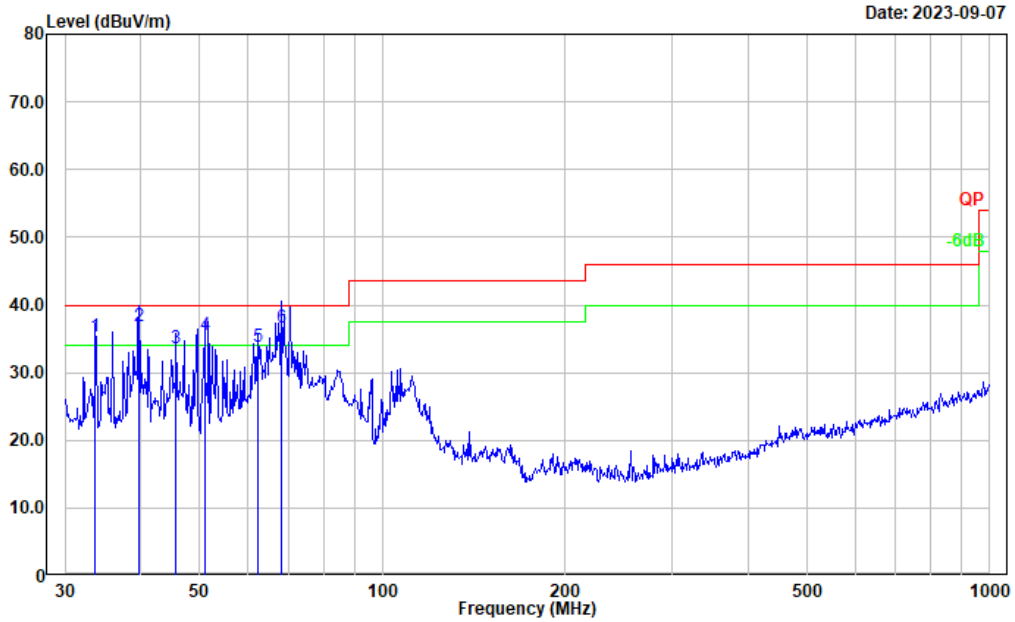
For Model: H6175

Project No.: CR230846894-RF
Tester: Vic Du
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.000	28.35	-3.60	24.75	40.00	15.25	Peak
2	39.715	35.26	-11.09	24.17	40.00	15.83	Peak
3	61.346	46.06	-17.32	28.74	40.00	11.26	Peak
4	68.872	50.47	-16.61	33.86	40.00	6.14	Peak
5	92.139	44.20	-16.41	27.79	43.50	15.71	Peak
6	140.342	39.74	-11.89	27.85	43.50	15.65	Peak

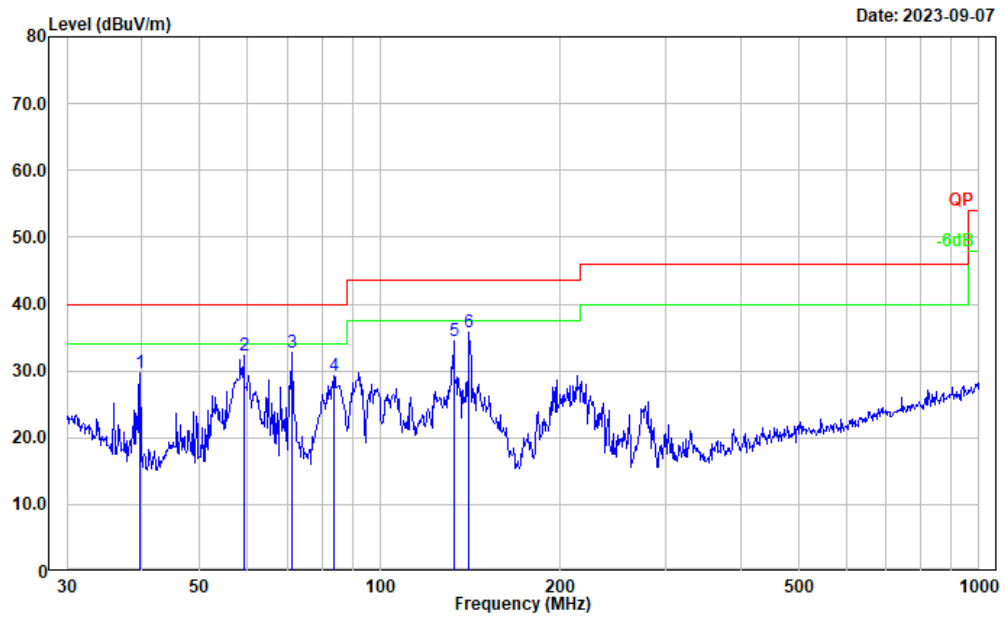
Project No.: CR230846894-RF
Tester: Vic Du
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	33.680	41.71	-6.43	35.28	40.00	4.72	QP
2	39.715	47.90	-11.09	36.81	40.00	3.19	QP
3	45.695	48.31	-14.64	33.67	40.00	6.33	QP
4	50.942	52.77	-17.21	35.56	40.00	4.44	QP
5	62.213	51.07	-17.22	33.85	40.00	6.15	QP
6	68.151	53.23	-16.67	36.56	40.00	3.44	QP

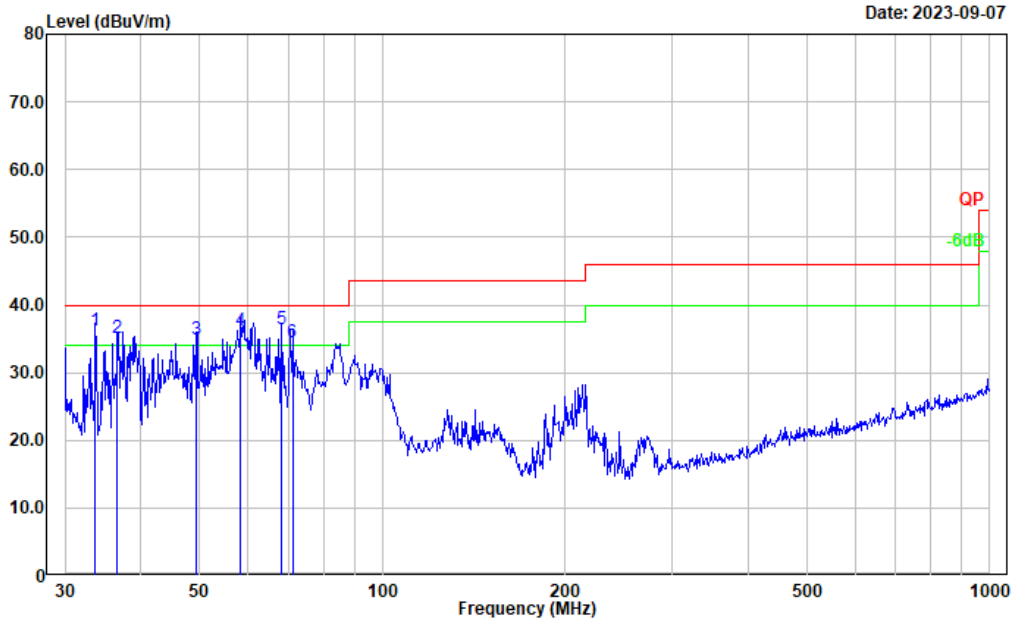
For Model: H6173

Project No.: CR230846894-RF
Tester: Vic Du
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	39.715	40.79	-11.09	29.70	40.00	10.30	Peak
2	59.232	49.71	-17.42	32.29	40.00	7.71	Peak
3	71.330	49.27	-16.61	32.66	40.00	7.34	Peak
4	83.816	46.60	-17.24	29.36	40.00	10.64	Peak
5	132.685	45.97	-11.48	34.49	43.50	9.01	Peak
6	140.835	47.69	-11.93	35.76	43.50	7.74	Peak

Project No.: CR230846894-RF
Tester: Vic Du
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	33.680	42.62	-6.43	36.19	40.00	3.81	QP
2	36.637	43.80	-8.73	35.07	40.00	4.93	QP
3	49.359	51.81	-16.80	35.01	40.00	4.99	QP
4	58.407	53.59	-17.38	36.21	40.00	3.79	QP
5	68.151	53.01	-16.67	36.34	40.00	3.66	QP
6	71.080	50.97	-16.59	34.38	40.00	5.62	QP

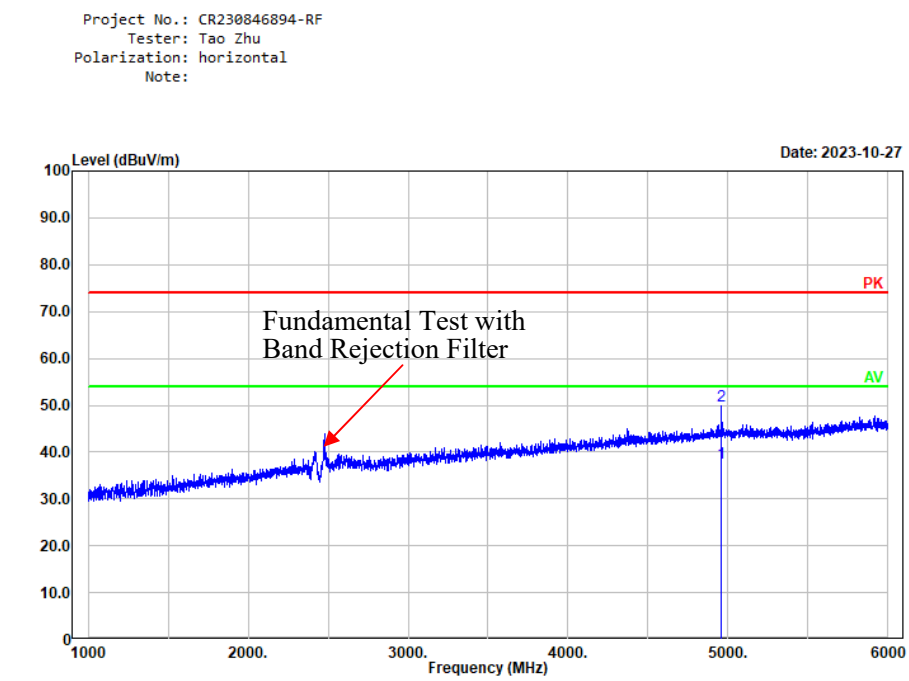
2) 1-25GHz (for model H6176 (Adapter 1)):

BLE 1Mbps:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 2402 MHz							
2390.000	27.21	PK	H	31.71	58.92	74.00	15.08
2390.000	15.13	AV	H	31.71	46.84	54.00	7.16
2390.000	26.60	PK	V	31.71	58.31	74.00	15.69
2390.000	15.49	AV	V	31.71	47.2	54.00	6.80
4804.000	37.37	PK	H	11.19	48.56	74.00	25.44
4804.000	23.85	AV	H	11.19	35.04	54.00	18.96
4804.000	36.73	PK	V	11.19	47.92	74.00	26.08
4804.000	23.69	AV	V	11.19	34.88	54.00	19.12
Middle Channel: 2440 MHz							
4880.000	37.36	PK	H	11.48	48.84	74.00	25.16
4880.000	25.17	AV	H	11.48	36.65	54.00	17.35
4880.000	36.93	PK	V	11.48	48.41	74.00	25.59
4880.000	24.48	AV	V	11.48	35.96	54.00	18.04
High Channel: 2480 MHz							
2483.500	27.13	PK	H	32.19	59.32	74.00	14.68
2483.500	14.52	AV	H	32.19	46.71	54.00	7.29
2483.500	27.72	PK	V	32.19	59.91	74.00	14.09
2483.500	14.92	AV	V	32.19	47.11	54.00	6.89
4960.000	38.16	PK	H	11.77	49.93	74.00	24.07
4960.000	26.02	AV	H	11.77	37.79	54.00	16.21
4960.000	38.08	PK	V	11.77	49.85	74.00	24.15
4960.000	25.59	AV	V	11.77	37.36	54.00	16.64

Listed with the worst harmonic margin test plot (BLE 1Mbps high channel)

Horizontal	
1-6GHz	

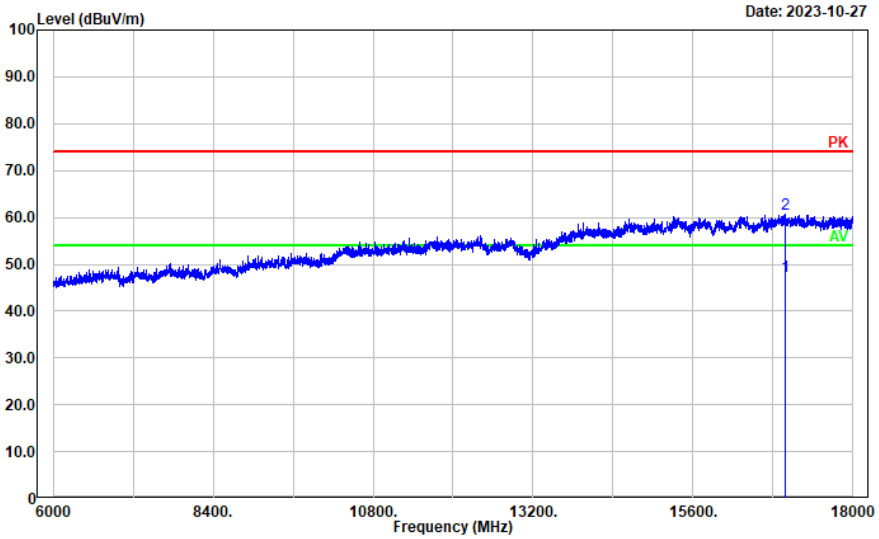


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	4960.000	26.02	11.77	37.79	54.00	16.21	Average
2	4960.000	38.16	11.77	49.93	74.00	24.07	Peak

Horizontal

6-18GHz

Project No.: CR230846894-RF
Tester: Tao Zhu
Polarization: horizontal
Note:

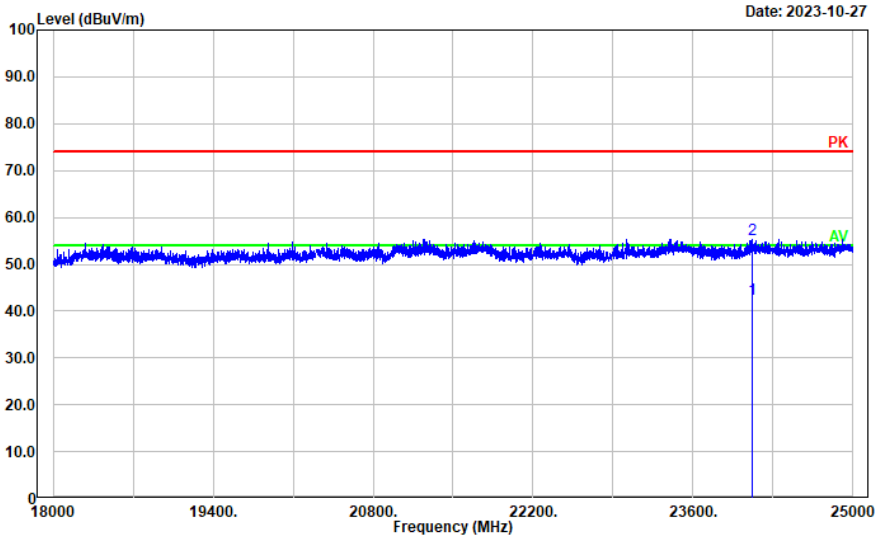


No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	16979.800	19.54	28.01	47.55	54.00	6.45	Average
2	16979.800	32.71	28.01	60.72	74.00	13.28	Peak

Horizontal

18-25GHz

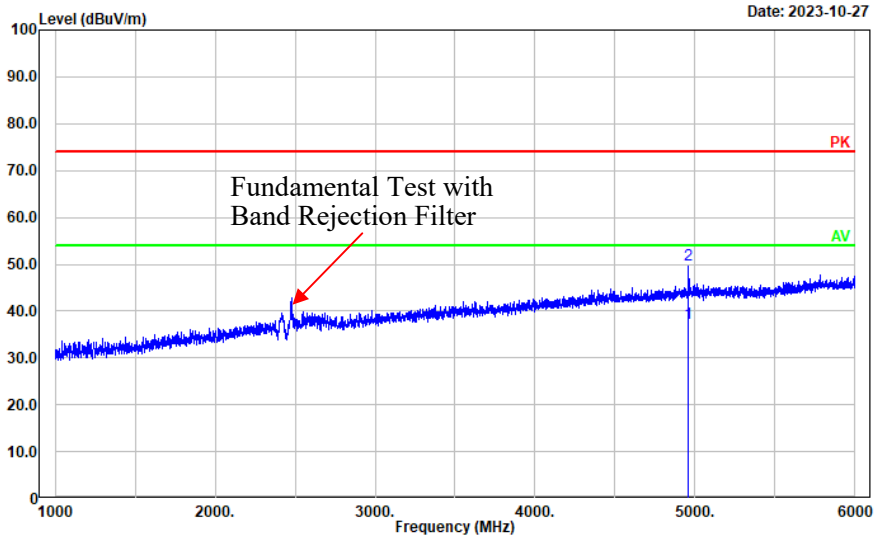
Project No.: CR230846894-RF
Tester: Tao Zhu
Polarization: Horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	24113.620	37.70	4.85	42.55	54.00	11.45	Average
2	24113.620	50.46	4.85	55.31	74.00	18.69	Peak

Vertical	
1-6GHz	

Project No.: CR230846894-RF
Tester: Tao Zhu
Polarization: vertical
Note:

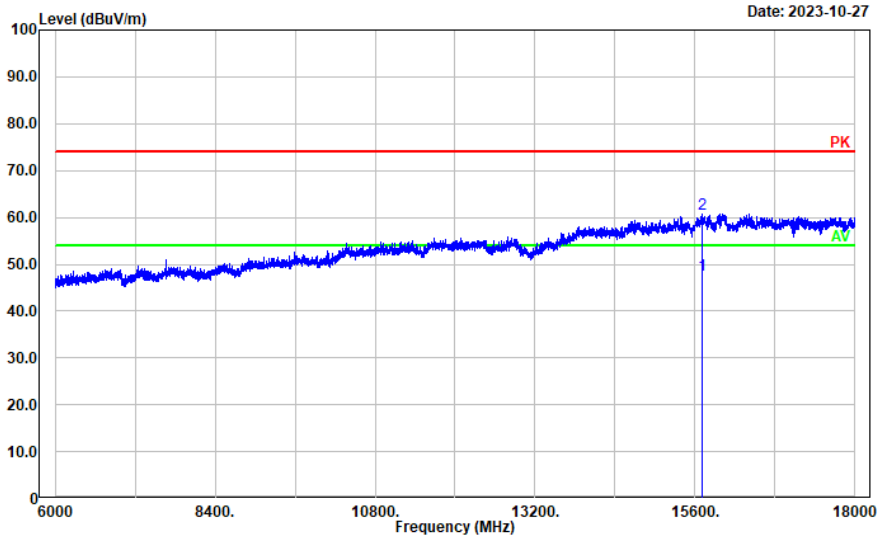


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	4960.000	25.59	11.77	37.36	54.00	16.64	Average
2	4960.000	38.08	11.77	49.85	74.00	24.15	Peak

Vertical

6-18GHz

Project No.: CR230846894-RF
Tester: Tao Zhu
Polarization: vertical
Note:

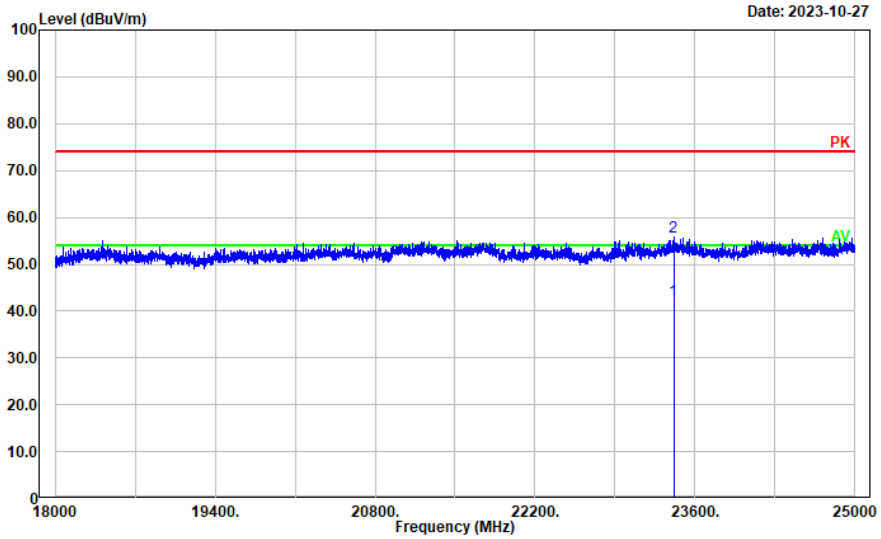


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	15697.940	22.88	24.78	47.66	54.00	6.34	Average
2	15697.940	35.98	24.78	60.76	74.00	13.24	Peak

Vertical

18-25GHz

Project No.: CR230846894-RF
Tester: Tao Zhu
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23412.080	36.99	5.40	42.39	54.00	11.61	Average
2	23412.080	50.42	5.40	55.82	74.00	18.18	Peak

4.3 Minimum 6 dB Bandwidth:

Serial Number:	29TB-3	Test Date:	2023/10/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.8	Relative Humidity: (%)	51	ATM Pressure: (kPa)	101

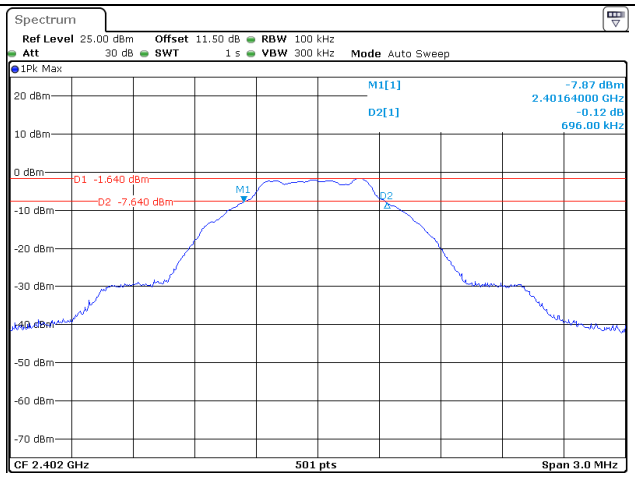
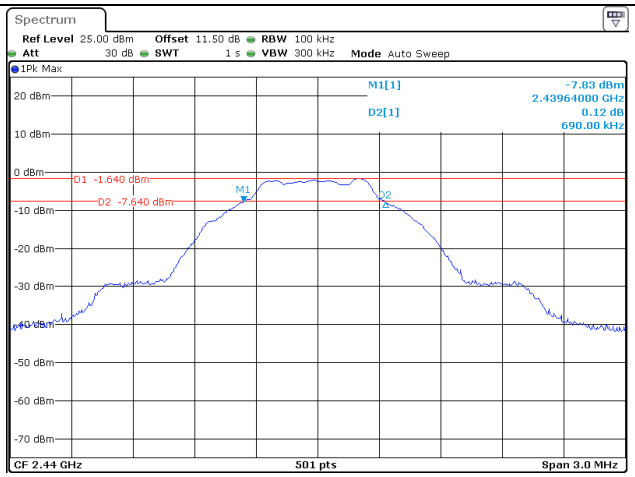
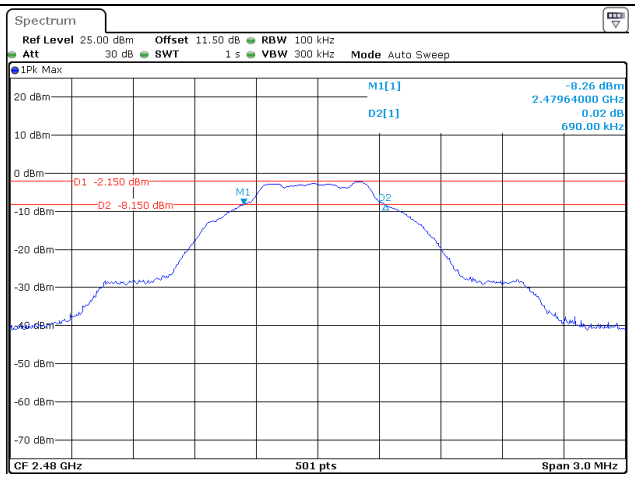
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40-N	102259	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Modes	Test Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)
BLE 1Mbps	2402	0.696	≥0.5
	2440	0.690	≥0.5
	2480	0.690	≥0.5

6dB Emission Bandwidth	
BLE 1Mbps Lowest Channel	
BLE 1Mbps Middle Channel	
BLE 1Mbps Highest Channel	

4.4 99% Occupied Bandwidth:

Serial Number:	29TB-3	Test Date:	2023/10/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	N/A

Environmental Conditions:					
Temperature: (℃)	25.8	Relative Humidity: (%)	51	ATM Pressure: (kPa)	101

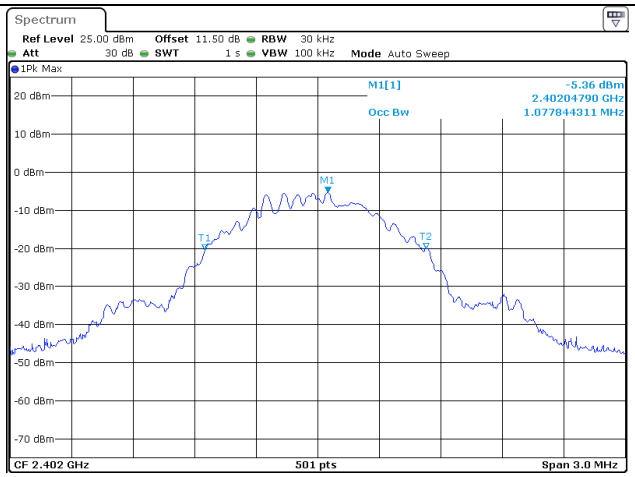
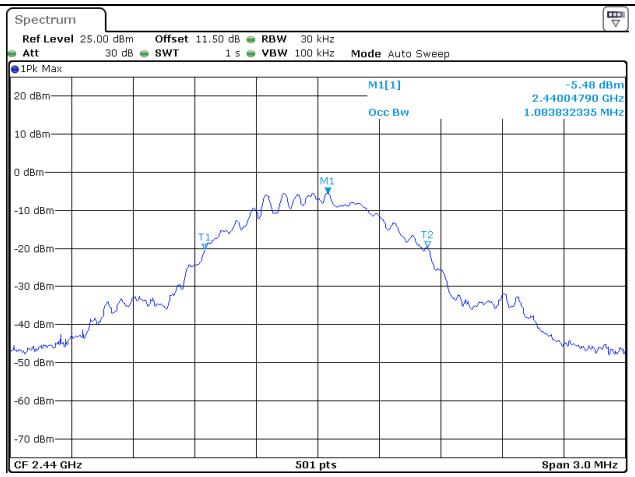
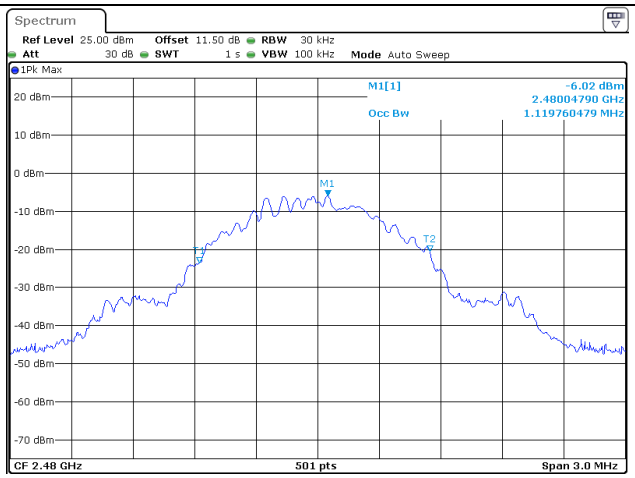
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40-N	102259	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Mode	Test Channel	Test Frequency (MHz)	99% Occupied Bandwidth (MHz)
BLE 1Mbps	Lowest	2402	1.078
	Middle	2440	1.084
	Highest	2480	1.120

99% Occupied Bandwidth	
BLE 1Mbps Lowest Channel	
BLE 1Mbps Middle Channel	
BLE 1Mbps Highest Channel	

4.5 Maximum Conducted Output Power:

Serial Number:	29TB-3	Test Date:	2023/9/6
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	26.3	Relative Humidity: (%)	48	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Anritsu	Power Meter	ML2495A	1106009	2023/8/4	2024/8/3
Anritsu	Pulse Power Sensor	MA2411A	10780	2023/8/4	2024/8/3
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060302	Each time	N/A
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Modes	Test Frequency (MHz)	Maximum Conducted Peak Output Power (dBm)	Limit (dBm)
BLE 1Mbps	2402	-0.69	≤30
	2440	-0.72	≤30
	2480	-1.26	≤30
Max.EIRP:	2.54	dBm	
EIRP Limit for RSS-247:36 dBm			

4.6 Maximum power spectral density:

Serial Number:	29TB-3	Test Date:	2023/10/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.8	Relative Humidity: (%)	51	ATM Pressure: (kPa)	101

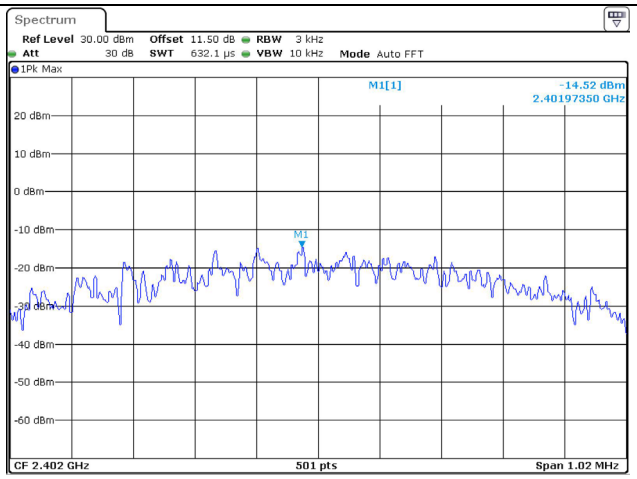
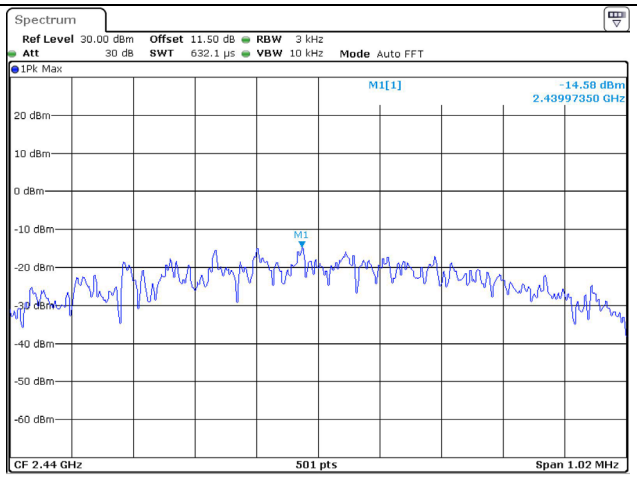
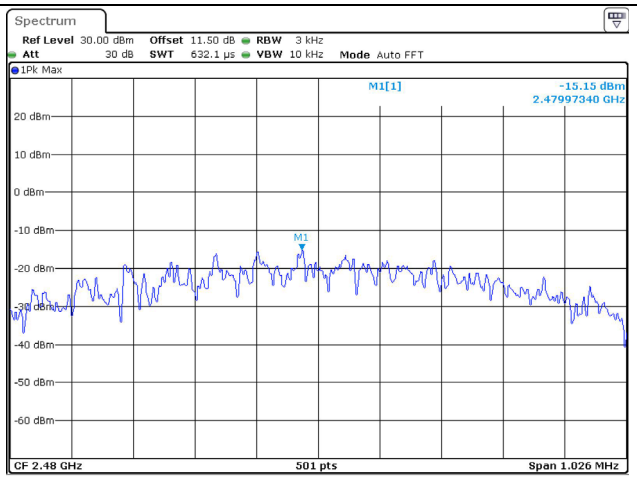
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40-N	102259	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Channel	Test Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
BLE 1Mbps	2402	-14.52	≤8.00
	2440	-14.58	≤8.00
	2480	-15.15	≤8.00

Maximum power spectral density	
BLE 1Mbps Lowest Channel	
BLE 1Mbps Middle Channel	
BLE 1Mbps Highest Channel	

4.7 100 kHz Bandwidth of Frequency Band Edge:

Serial Number:	29TB-3	Test Date:	2023/10/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	Pass

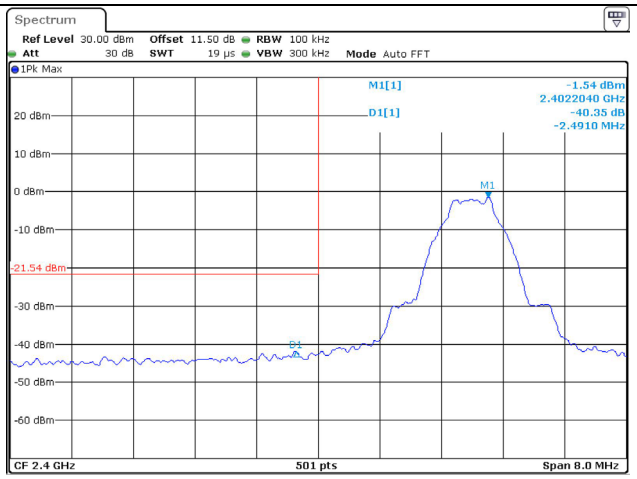
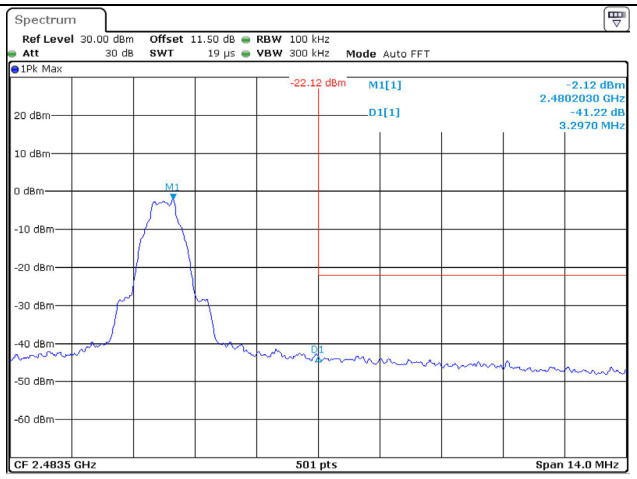
Environmental Conditions:					
Temperature: (℃)	25.8	Relative Humidity: (%)	51	ATM Pressure: (kPa)	101

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40-N	102259	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

100 kHz Bandwidth of Frequency Band Edge	
BLE 1Mbps Lowest Band edge	
BLE 1Mbps Highest Band edge	

4.8 Duty Cycle:

Serial Number:	29TB-3	Test Date:	2023/12/18
Test Site:	RF	Test Mode:	Transmitting
Tester:	Len Huang	Test Result:	N/A

Environmental Conditions:					
Temperature: (℃)	25.8	Relative Humidity: (%)	51	ATM Pressure: (kPa)	101

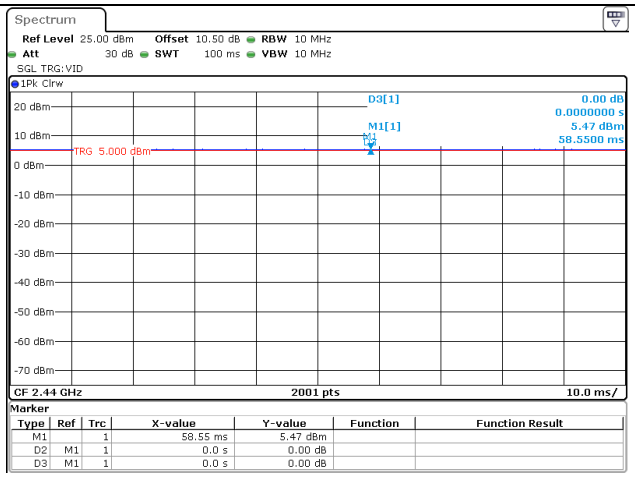
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40-N	102259	2023/4/18	2024/4/17
zhuoxiang	Coaxial Cable	SMA-178	211001	Each time	N/A
eastsheep	Coaxial Attenuator	2W-SMA-JK-18G	21060301	Each time	N/A

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Channel	Test Frequency (MHz)	Ton (ms)	Ton+off (ms)	Duty cycle (%)	1/T (Hz)	VBW Setting (Hz)
Middle	2440	100	100	100.00	/	10

Duty Cycle	
BLE 1Mbps	

5. RF EXPOSURE EVALUATION

5.1 Simultaneous Transmission with both MPE-based

5.1.1 Applicable Standard

According to §1.1307(b)(3)(i)

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1 \qquad (1)$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source *i*.

ERP_j = the ERP of fixed, mobile, or portable RF source *j*.

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source *j*, at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source *k*, as applicable from § 1.1310 of this chapter.

5.1.2 Measurement Result

Operation Modes	Frequency (MHz)	λ/2π (mm)	Distance (mm)	Exemption ERP		Maximum Conducted Power including Tune-up Tolerance (dBm)	Antenna Gain (dBi)	ERP	ERP	MPE-Based Exemption
				(mW)	(dBm)			(dBm)	(mW)	
BLE	2402-2480	19.88	200	768	28.85	0.5	3.23	1.58	1.44	Compliant
2.4G WLAN	2412-2462	19.80	200	768	28.85	14.5	4.42	16.77	47.53	Compliant

Note:
The Maximum Conducted Power including Tune-up Tolerance was declared by manufacturer.
The WLAN 2.4G and BLE can transmission simultaneously.

$$\sum_{i=1}^{a}\frac{P_i}{P_{\mathrm{th},i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{\mathrm{th},j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}$$

$=P_{2.4G} / P_{th} + P_{BLE} / P_{th}$

$=1.44/768 + 47.53/768$

$=0.064$

< 1.0

Result: The device compliant the MPE-Based Exemption at 20cm distances.

5.2 Exemption Limits For Routine Evaluation-RF Exposure Evaluation

5.2.1 Applicable Standard

According to RSS-102 § (2.5.2):

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

5.2.2 Calculated Data:

Mode	Frequency (MHz)	Antenna Gain	Conducted output power including Tune-up Tolerance	EIRP		Exemption limits (mW)	Exemption
		(dBi)	(dBm)	(dBm)	(mW)		
BLE	2402-2480	3.23	0.5	3.73	2.36	2676	Yes
2.4G WLAN	2412-2462	4.42	14.5	18.92	77.98	2684	Yes

Note: *The Maximum Conducted Power including Tune-up Tolerance was declared by manufacturer.*

So the device is compliance exemption from Routine Evaluation Limits –RF exposure Evaluation.

Result: Compliant

6. EUT PHOTOGRAPHS

Please refer to the attachment CR230846894-EXP EUT External Photographs and CR230846894-INP EUT Internal Photographs

7. TEST SETUP PHOTOGRAPHS

Please refer to the attachment CR230846894-00A-TSP Test Setup Photographs.

===== END OF REPORT =====