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

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **YEALINK(XIAMEN) NETWORK TECHNOLOGY CO.,LTD.**
Address: No.666 Hu'an Rd. Huli District Xiamen City, Fujian, P.R. China

FCC ID: **T2C-RPP**
IC: **10741A-RPP**
HVIN: **RoomPanel Plus**
FVIN: **RoomPanel Plus**
Product Name: **Room Scheduling Panel**

Standard(s): **47 CFR Part 15, Subpart E(15.407)**
RSS-247 Issue 2, February 2017
RSS-Gen, Issue 5, February 2021 Amendment 2
ANSI C63.10-2013
KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

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

Report Number: **CR230419456-00D**

Date Of Issue: **2023/10/17**

Reviewed By: **Calvin Chen**
Title: RF Engineer

Approved By: **Sun Zhong**
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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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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230419456-00D	Original Report	2023/10/17

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Room Scheduling Panel
EUT Model:	RoomPanel Plus
Trade Mark:	Yealink
Operation Frequency:	5180-5240MHz (802.11a/n ht20/ac vht20) 5190-5230MHz(802.11n ht40/ac vht40) 5210MHz(802.11ac vht80) 5260-5320MHz (802.11a/n ht20/ac vht2) 5270-5310MHz(802.11n ht40/ac vht40) 5290MHz(802.11ac vht80) 5500-5700MHz (802.11a/n ht20/ac vht20) 5510-5670MHz(802.11n ht40/ac vht40) 5530-5610MHz(802.11ac vht80) 5745-5825MHz (802.11a/n ht20/ac vht20) 5755-5795MHz(802.11n ht40/ac vht40) 5775MHz(802.11ac vht80)
Maximum Average Output Power (Conducted):	15.76dBm (5150-5250 MHz) 16.12dBm (5250-5350 MHz) 16.28dBm(5470-5725MHz) 15.93dBm (5725-5850 MHz)
Modulation Type:	802.11a/n/ac: OFDM-BPSK, QPSK, 16QAM, 64QAM
Rated Input Voltage:	DC 12V from adapter or DC 48V from POE
Serial Number:	24OY_1
EUT Received Date:	2023/4/20
EUT Received Status:	Good
Note: 5600-5650 MHz was disabled by manufacturer by software for Canada.	

1.1.2 Operation Frequency Detail:

For 802.11a/n ht20/ac vht20:

5150-5250MHz Band		5250-5350 MHz Band		5470-5725 MHz Band		5725-5850MHz Band	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
36	**5180**	**52**	**5260**	**100**	**5500**	**149**	**5745**
40	**5200**	**56**	**5280**	104	5520	153	5765
44	5220	60	5300	108	5540	**157**	**5785**
48	**5240**	**64**	**5320**	112	5560	161	5805
/	/	/	/	**116**	**5580**	**165**	**5825**
/	/	/	/	120	5600	/	/
/	/	/	/	124	5620	/	/
/	/	/	/	128	5640	/	/
/	/	/	/	132	5660	/	/
/	/	/	/	136	5680	/	/
/	/	/	/	**140**	**5700**	/	/
Per section 15.31(m)/RSS-Gen, the above in bold frequencies were performed the test. Channel 120-128 were disabled by manufacturer by software for Canada.							

For 802.11n ht40/ac vht40:

5150-5250MHz Band		5250-5350 MHz Band		5470-5725 MHz Band		5725-5850MHz Band	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
38	**5190**	**54**	**5270**	**102**	**5510**	**151**	**5755**
46	**5230**	**62**	**5310**	**110**	**5550**	**159**	**5795**
/	/	/	/	118	5590	/	/
/	/	/	/	126	5630	/	/
/	/	/	/	**134**	**5670**	/	/
Per section 15.31(m)/RSS-Gen, the above in bold frequencies were performed the test. Channel 118-126 were disabled by manufacturer by software for Canada.							

For 802.11ac vht80:

5150-5250MHz Band		5250-5350 MHz Band		5470-5725 MHz Band		5725-5850MHz Band	
Channel	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
42	**5210**	**58**	**5290**	**106**	**5530**	**155**	**5775**
/	/	/	/	**122**	**5610**	/	/
Per section 15.31(m)/RSS-Gen, the above in bold frequencies were performed the test. Channel 122 was disabled by manufacturer by software for Canada.							

1.1.3 Antenna Information Detail▲:

Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
FPC	50	5150~5850MHz	1.97dBi

The Method of §15.203 Compliance:

☒Antenna must be permanently attached to the unit.

☐Antenna must use a unique type of connector to attach to the EUT.

☐Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

1.1.4 Accessory Information:

Accessory Description	Manufacturer	Model	Parameters
Adapter	Yealink	YLPS121250C1-US	Input: AC 100-240V, 50/60Hz, 0.5A Output: DC 12V, 1.25A

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition:

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer. For Radiated emission below 1GHz, according to the test result of DSS report, the worst case is powered by adapter, so this mode was performed in this report.
Equipment Modifications:	No
EUT Exercise Software:	Authentication Tool_1.2.16.0.exe

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

5150-5250 MHz Band:

Test Modes	Test Channels	Test Frequency (MHz)	Data rate	Power Level Setting
802.11a	Lowest	5180	6Mbps	**16**
	Middle	5200	6Mbps	**16**
	Highest	5240	6Mbps	**16**
802.11ac vht20	Lowest	5180	MCS0	**16**
	Middle	5200	MCS0	**16**
	Highest	5240	MCS0	**16**
802.11ac vht40	Lowest	5190	MCS0	**16**
	Highest	5230	MCS0	**16**
802.11ac vht80	Middle	5210	MCS0	**16**

5250-5350 MHz Band:

Test Modes	Test Channels	Test Frequency (MHz)	Data rate	Power Level Setting
802.11a	Lowest	5260	6Mbps	**16**
	Middle	5280	6Mbps	**16**
	Highest	5320	6Mbps	**16**
802.11ac vht20	Lowest	5260	MCS0	**16**
	Middle	5280	MCS0	**16**
	Highest	5320	MCS0	**16**
802.11ac vht40	Lowest	5270	MCS0	**16**
	Highest	5310	MCS0	**16**
802.11ac vht80	Middle	5290	MCS0	**16**

5470-5725MHz Band:				
Test Modes	**Test Channels**	**Test Frequency (MHz)**	**Data rate**	**Power Level Setting**
802.11a	Lowest	5500	6Mbps	**16**
	Middle	5580	6Mbps	**16**
	Highest	5700	6Mbps	**16**
802.11ac vht20	Lowest	5500	MCS0	**16**
	Middle	5580	MCS0	**16**
	Highest	5700	MCS0	**16**
802.11ac vht40	Lowest	5510	MCS0	**16**
	Highest	5550	MCS0	**16**
	Lowest	5670	MCS0	**16**
802.11ac vht80	Lowest	5530	MCS0	**16**
	Middle	5610	MCS0	**16**
5725-5850 MHz Band:				
Test Modes	**Test Channels**	**Test Frequency (MHz)**	**Data rate**	**Power Level Setting**
802.11a	Lowest	5745	6Mbps	**16**
	Middle	5785	6Mbps	**16**
	Highest	5825	6Mbps	**16**
802.11ac vht20	Lowest	5745	MCS0	**16**
	Middle	5785	MCS0	**16**
	Highest	5825	MCS0	**16**
802.11ac vht40	Lowest	5755	MCS0	**16**
	Highest	5795	MCS0	**16**
802.11ac vht80	Middle	5775	MCS0	**16**

Note:
The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40/ ac vht80, the ac vht20/vht40 were reduced since the identical parameters with 802.11n ht20 and ht40.
The above are the worst-case data rates, which are determined for each mode based upon investigations by measuring the average power and PSD across all data rates, bandwidths, and modulations.

1.2.2 Support Equipment List and Details

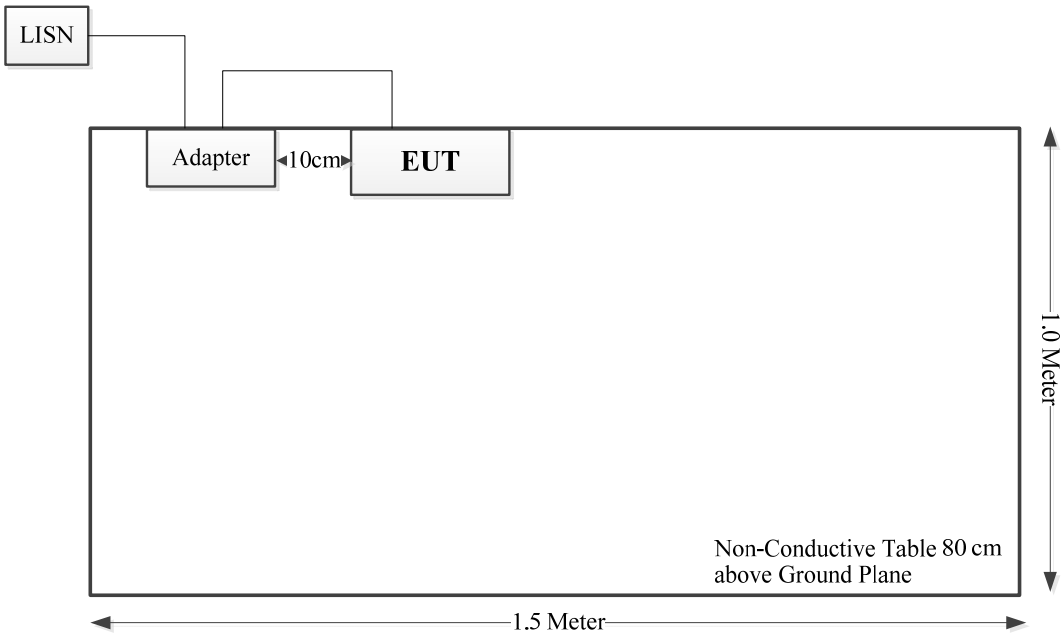
Manufacturer	Description	Model	Serial Number
Yealink	POE	YLPOE30	N/A

1.2.3 Support Cable List and Details

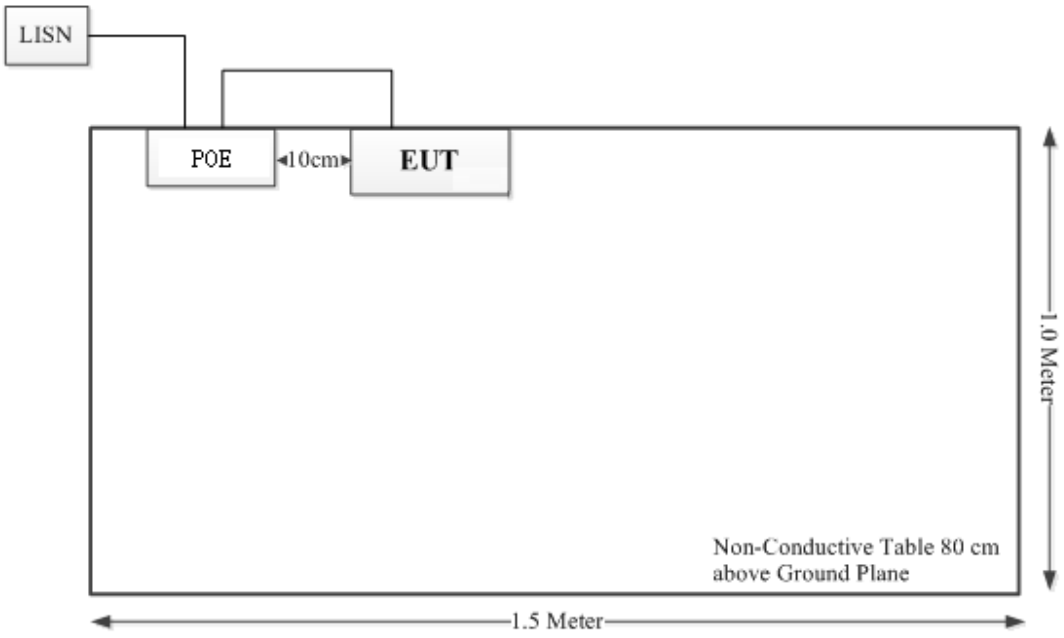
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
RJ45 Cable	NO	NO	1	POE	EUT

1.2.4 Block Diagram of Test Setup

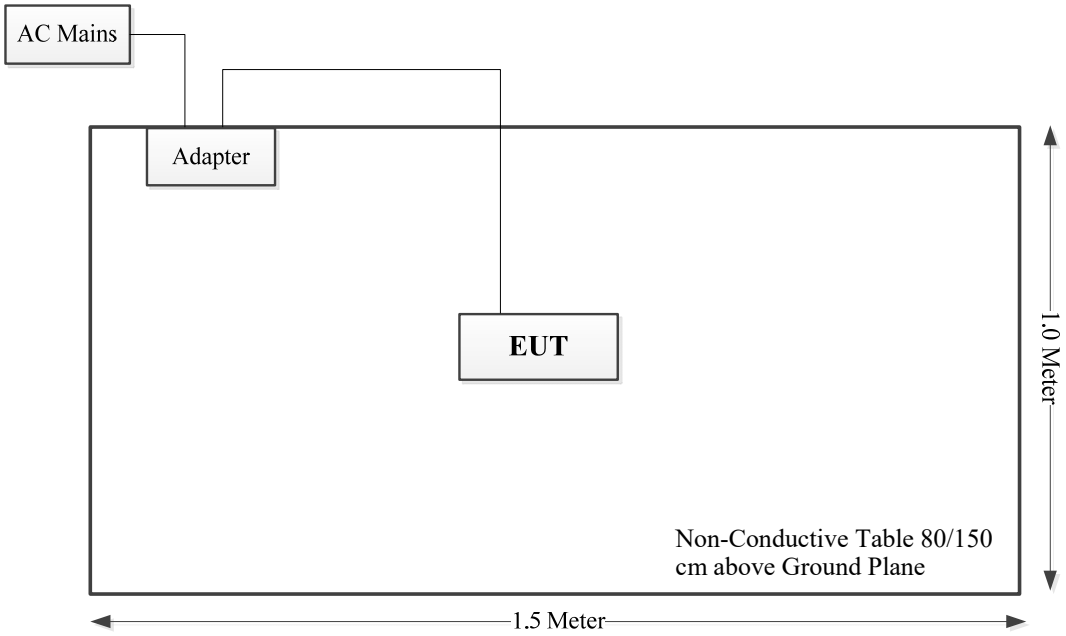
AC line conducted emissions (adapter):



AC Line Conducted Emissions (POE):



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	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	Remark
§15.207(a) RSS-Gen Clause 8.8	AC line conducted emissions	Compliant	/
FCC§15.205& §15.209 &§15.407(b) RSS-247 Clause 6.2	Undesirable Emission& Restricted Bands	Compliant	/
RSS-247 Clause 6.2.1.2	26dB attenuated below the channel power	/	See Note
FCC§15.407(a) (e) RSS-247 Clause 6.2 RSS-Gen Clause 6.7	Emission Bandwidth	/	See Note
FCC§15.407(a) RSS-247 Clause 6.2	Maximum Conducted Output Power	/	See Note
FCC§15.407 (a) RSS-247 Clause 6.2	Power Spectral Density	/	See Note
FCC§15.407 (h) RSS-247 Clause 6.3	Dynamic Frequency Selection (DFS)	/	See Note
§15.203 RSS-GEN Clause 6.8	Antenna Requirement	Compliant	/
RSS-247 Clause 6.4	Additional requirements	Compliant	/
§1.1310 & §2.1091	RF Exposure	Compliant	/
RSS-102 Clause 2.5.2	Exemption Limits For Routine Evaluation-RF Exposure Evaluation	Compliant	/

Note:
1. The RF module inside the product have been certified, FCC ID: T2C-YL43456, granted on 09/26/2023, IC: 10741A-YL43456, granted on 05/14/2023, the applicant declared the RF parameters identical with the RF module, the test result please refer to the module report: FCC022022-06244RF2 & FCC022022-06244RF2A & IC022022-06245RF2 & IC022022-06245RF2A.
2. The applicant declared the DFS operational mode of the device is Client without Radar detection.
3. CCICT is responsible for all the information provided in this report, except when information is provided by the customer as identified in this report.

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

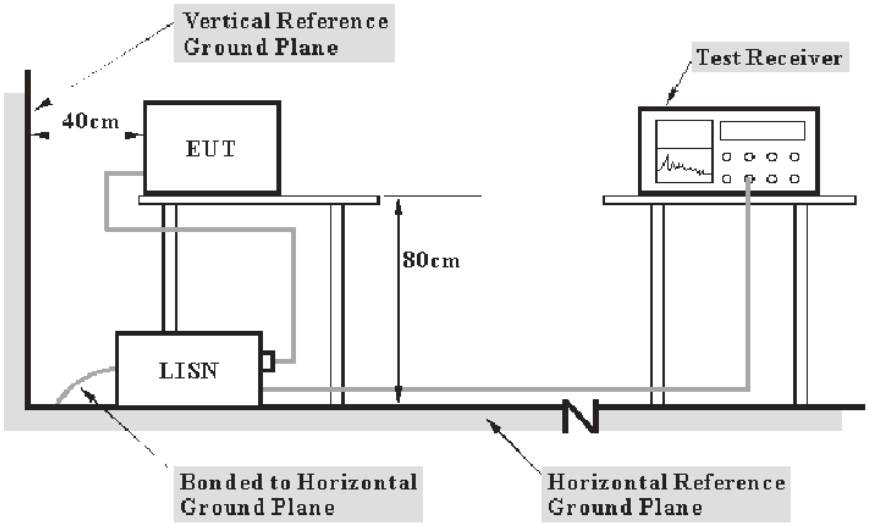
Note 1: The level decreases linearly with the logarithm of the frequency.

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 §15.407 (b);

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.
(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of – 27 dBm/MHz.
(4) For transmitters operating solely in the 5.725-5.850 GHz band:
(i) All emissions shall be limited to a level of – 27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in § 15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in § 15.247(d), but manufacturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.
(8) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.
(9) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in § 15.207.
(10) The provisions of § 15.205 apply to intentional radiators operating under this section.
(11) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the upper and lower frequency band edges as the design of the equipment permits.
(c) The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

Frequency band 5150-5250 MHz:

RSS-247 Clause 6.2.1.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Frequency band 5250-5350 MHz:

RSS-247 Clause 6.2.2.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

Frequency bands 5470-5600 MHz and 5650-5725 MHz:

RSS-247 Clause 6.2.3.2

Emissions outside the band 5470-5600 MHz and 5650-5725 MHz shall not exceed -27 dBm/MHz e.i.r.p. However, devices with bandwidth overlapping the band edge of 5725 MHz can meet the emission limit of -27 dBm/MHz e.i.r.p. at 5850 MHz instead of 5725 MHz.

Frequency band 5725-5850 MHz

RSS-247 Clause 6.2.4.2

Devices operating in the band 5725-5850 MHz with antenna gain greater than 10 dBi can have unwanted emissions that comply with either the limits in this section or in section 5.5 until six (6) months after the publication date of this standard for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2018.
Devices operating in the band 5725-5850 MHz with antenna gain of 10 dBi or less can have unwanted emissions that comply with either the limits in this section or in section 5.5 until April 1, 2018 for certification. Certified devices that do not comply with emission limits in this section shall not be manufactured, imported, distributed, leased, offered for sale or sold after April 1, 2020.
Devices operating in the band 5725-5850 MHz shall have e.i.r.p. of unwanted emissions comply with the following:
a) 27 dBm/MHz at frequencies from the band edges decreasing linearly to 15.6 dBm/MHz at 5 MHz above or below the band edges;

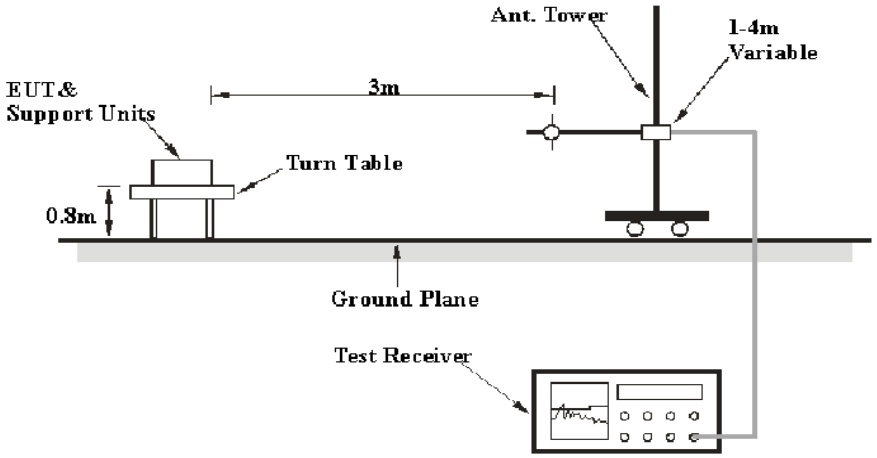
b) 15.6 dBm/MHz at 5 MHz above or below the band edges decreasing linearly to 10 dBm/MHz at 25 MHz above or below the band edges;

c) 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and

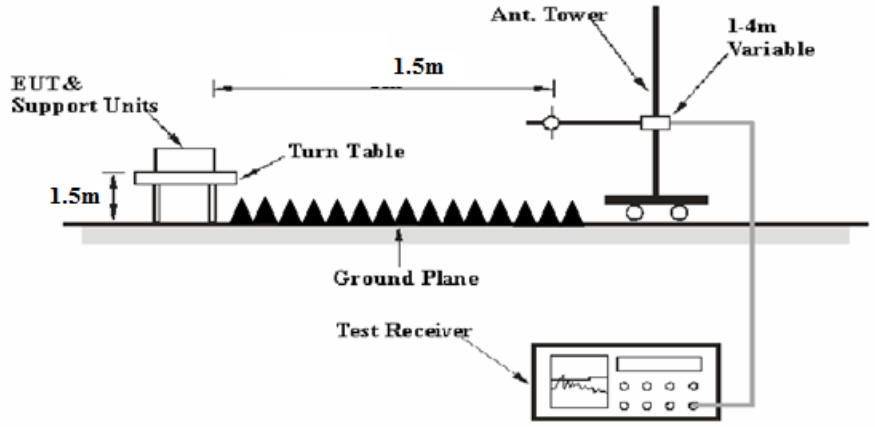
d) -27 dBm/MHz at frequencies more than 75 MHz above or below the band edges.

3.2.2 EUT Setup

Below 1GHz:



1-40 GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was FCC 15.209, FCC 15.407, 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 30 MHz to 40 GHz.

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

30-1000MHz:

Detector	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 40GHz:

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

During the radiated emission test, the adapter was connected to the first AC floor outlet.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.5m
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

3.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Factor = Antenna Factor + Cable Loss- Amplifier Gain

For 30MHz-1GHz:
Result = Reading + Factor

For 1GHz-40GHz
Result = Reading + Factor- Distance extrapolation Factor

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

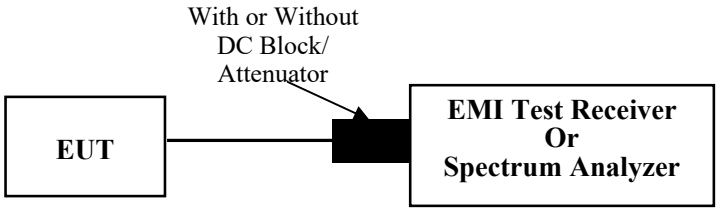
3.3 26dB Attenuated Below The Channel Power

3.3.1 Applicable Standard

RSS-247 Clause 6.2.1.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

3.3.2 EUT Setup



3.3.3 Test Procedure

a) Set RBW = 1%~5% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = RMS.
d) Trace mode = max hold
e) Measure the emission attenuated below the channel power

3.4 Emission Bandwidth

3.4.1 Applicable Standard

FCC §15.407 (a)

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407 (e)

Within the 5.725-5.850 GHz and 5.850-5.895 GHz bands, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

FCC §15.407 (h)

(h)(2) Radar Detection Function of Dynamic Frequency Selection (DFS). U-NII devices operating with any part of its 26 dB emission bandwidth in the 5.25-5.35 GHz and 5.47-5.725 GHz bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

RSS-247 Clause 6.2.1.2

For transmitters with operating frequencies in the band 5150-5250 MHz, all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz e.i.r.p. Any unwanted emissions that fall into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz. The 26 dB bandwidth may fall into the 5250-5350 MHz band; however, if the occupied bandwidth also falls within the 5250-5350 MHz band, the transmission is considered as intentional and the devices shall comply with all requirements in the band 5250-5350 MHz including implementing dynamic frequency selection (DFS) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

RSS-247 Clause 6.2.2.1

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

RSS-247 Clause 6.2.3.1

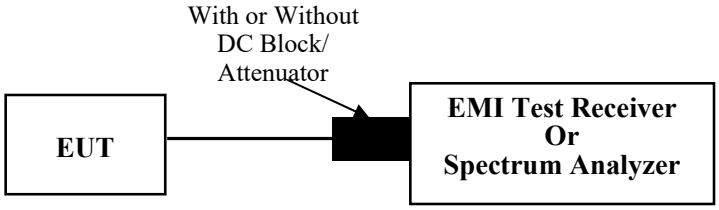
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

RSS-247 Clause 6.2.4.1

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

3.4.2 EUT Setup



3.4.3 Test Procedure

26dB Emission Bandwidth:

According to ANSI C63.10-2013 Section 12.4.1

a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = peak.
d) Trace mode = max hold
e) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the instrument. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

6 dB emission bandwidth:

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

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.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described in this section. For devices that use channel aggregation refer to III.A and III.C for determining emission bandwidth.

99% Occupied Bandwidth:

According to ANSI C63.10-2013 Section 12.4.2&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 §15.407(a) (1)

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (2)
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (3)(i)
For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

RSS-247 Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

RSS-247 Clause 6.2.2.1

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

RSS-247 Clause 6.2.3.1

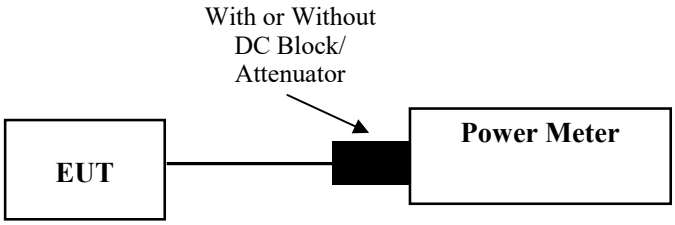
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

RSS-247 Clause 6.2.4.1

The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint[3] systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

3.5.2 EUT Setup



3.5.3 Test Procedure

According to ANSI C63.10-2013 Section 12.3.3.2

Method PM-G is measurement using a gated RF average power meter.
Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.6 Maximum Power Spectral Density

3.6.1 Applicable Standard

FCC §15.407(a) (1)

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (2)

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

FCC §15.407(a) (3)(i)

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

RSS-247 Clause 6.2.1.1

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or 1.76 + 10 $\log_{10}$B, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or 10 + 10 $\log_{10}$B, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

RSS-247 Clause 6.2.2.1

Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

RSS-247 Clause 6.2.3.1

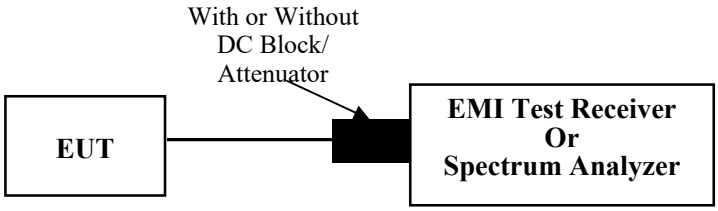
The maximum conducted output power shall not exceed 250 mW or 11 + 10 $\log_{10}$B, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 $\log_{10}$B, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

RSS-247 Clause 6.2.4.1

The maximum conducted output power shall not exceed 1 W. The output power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed point-to-point operations exclude the use of point-to-multipoint3 systems, omnidirectional applications and multiple collocated transmitters transmitting the same information.

3.6.2 EUT Setup



3.6.3 Test Procedure

According to ANSI C63.10-2013Section 12.3.2

Duty cycle ⩾98%

Method SA-1 was used.

Duty cycle <98%, duty cycle variations are less than ±2%

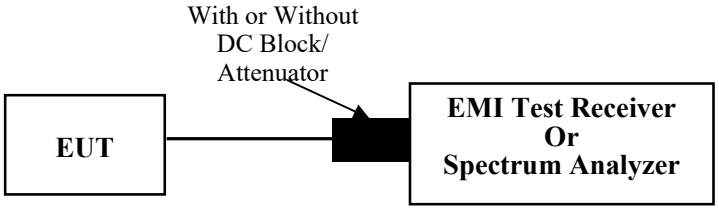
Method SA-2 was used.

Duty cycle <98%, duty cycle variations exceed ±2%

Method SA-3 was used.

3.7 Duty Cycle

3.7.1 EUT Setup



3.7.2 Test Procedure

According to ANSI C63.10-2013 Section 12.2

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.)

3.8 Antenna Requirement

3.8.1 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.

3.8.2 Judgment

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

3.9 Additional requirement

3.9.1 Applicable Standard

According to RSS-247 Clause 6.4 Additional requirement

The following requirements shall apply:

a) The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

b) All LE-LAN devices must contain security features to protect against modification of software by unauthorized parties.

Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the frequency ranges within the 5 GHz band, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification.

Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the LE-LAN device.

c) The user manual for LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:

i. the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;[4]

ii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

iii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate; and

iv. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

3.9.2 Judgment

RSS-247 Clause 6.4 a):

The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. Please refer to the declaration

RSS-247 Clause 6.4 b):

The devices must contain security features to protect against modification of software by unauthorized parties. Please refer to the declaration

RSS-247 Clause 6.4 c):

i). The device operates on 5150-5250MHz is only for indoor use.

ii). The device operates on5250-5350MHz/5470-5725MHz, the EIRP meet the requirement.

iii). The antenna permanently attached to the unit, and all the EIPR compliance with RSS-247 requirement. Please refer to the conducted output power test result.

iv). Compliant, please refer to the antenna information and output power section.

4. Test DATA AND RESULTS

4.1 AC Line Conducted Emissions

Serial Number:	24OY_1	Test Date:	2023/09/13
Test Site:	CE	Test Mode:	Transmitting maximum output power mode(802.11a mode 5500MHz)
Tester:	David Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	25.2	Relative Humidity: (%)	57	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

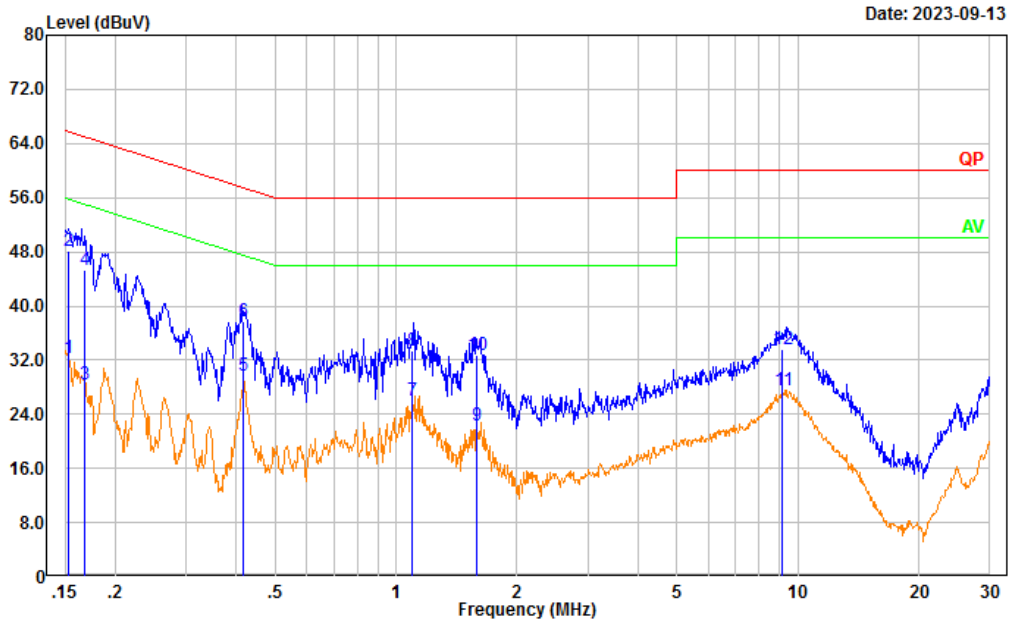
** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Please refer to the below table and plots.

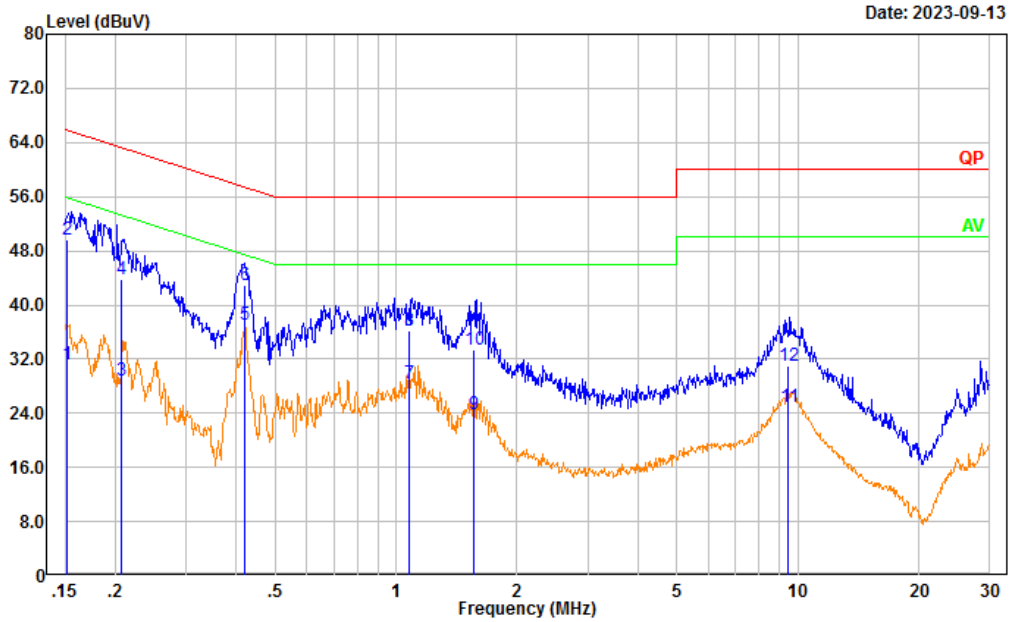
Adapter:

Project No.: CR230419456-RF
Tester: David Huang
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.153	22.75	9.61	32.36	55.86	23.50	Average
2	0.153	38.45	9.61	48.06	65.86	17.80	QP
3	0.167	18.84	9.61	28.45	55.09	26.64	Average
4	0.167	35.71	9.61	45.32	65.09	19.77	QP
5	0.418	20.13	9.61	29.74	47.49	17.75	Average
6	0.418	28.13	9.61	37.74	57.49	19.75	QP
7	1.096	16.44	9.62	26.06	46.00	19.94	Average
8	1.096	23.77	9.62	33.39	56.00	22.61	QP
9	1.589	12.64	9.63	22.27	46.00	23.73	Average
10	1.589	23.05	9.63	32.68	56.00	23.32	QP
11	9.167	17.95	9.67	27.62	50.00	22.38	Average
12	9.167	23.92	9.67	33.59	60.00	26.41	QP

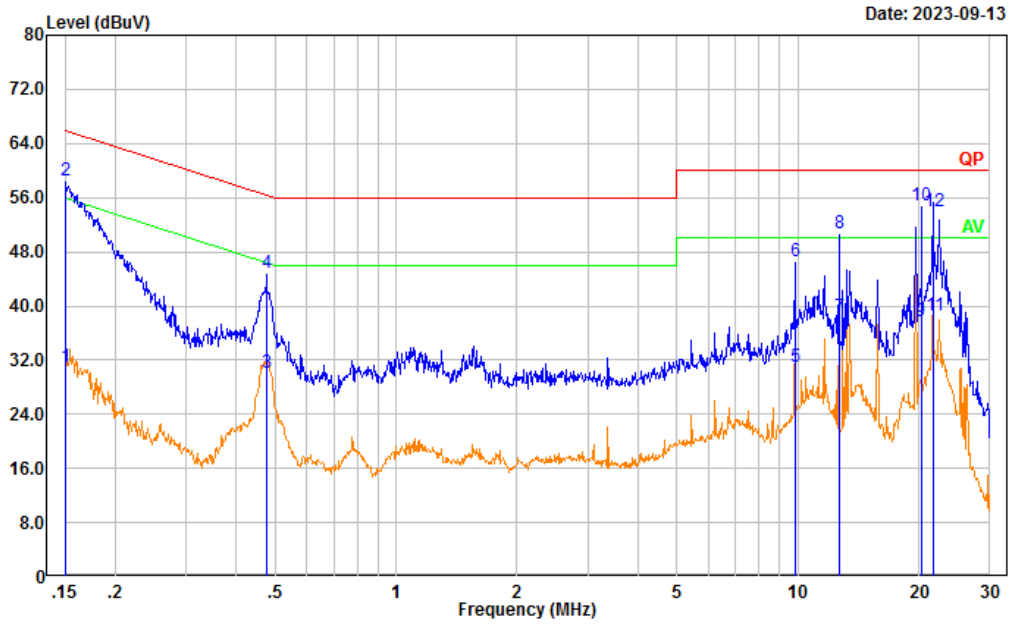
Project No.: CR230419456-RF
Tester: David Huang
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.152	21.71	9.61	31.32	55.90	24.58	Average
2	0.152	39.97	9.61	49.58	65.90	16.32	QP
3	0.207	19.25	9.61	28.86	53.33	24.47	Average
4	0.207	34.22	9.61	43.83	63.33	19.50	QP
5	0.421	27.53	9.61	37.14	47.44	10.30	Average
6	0.421	33.27	9.61	42.88	57.44	14.56	QP
7	1.081	18.75	9.62	28.37	46.00	17.63	Average
8	1.081	26.56	9.62	36.18	56.00	19.82	QP
9	1.560	14.32	9.63	23.95	46.00	22.05	Average
10	1.560	23.70	9.63	33.33	56.00	22.67	QP
11	9.465	15.36	9.67	25.03	50.00	24.97	Average
12	9.465	21.37	9.67	31.04	60.00	28.96	QP

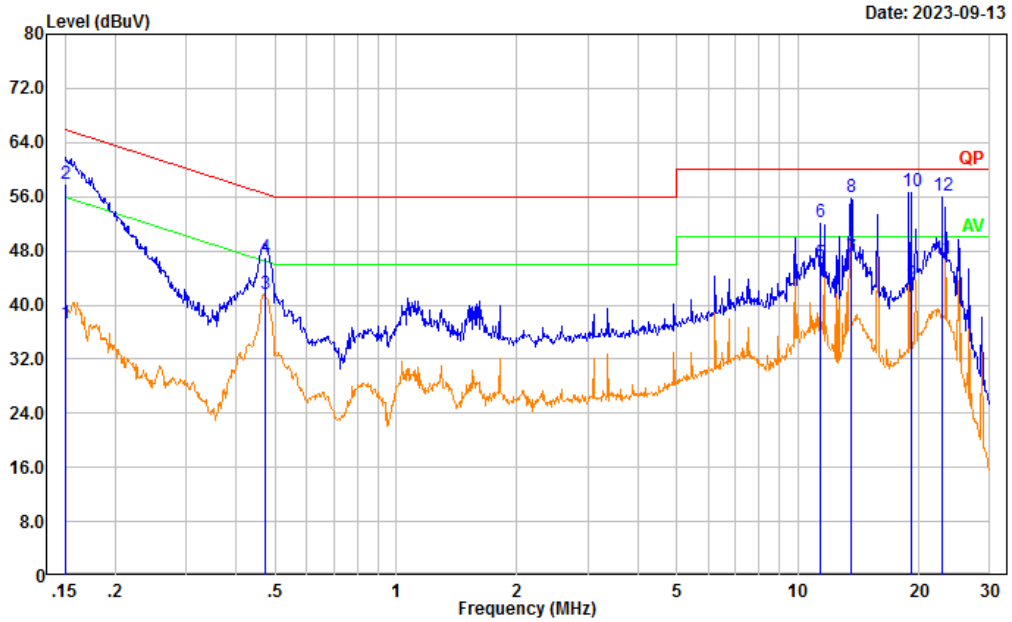
PoE:

Project No.: CR230419456-RF
Tester: David Huang
Port: Line
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.150	21.33	9.61	30.94	55.99	25.05	Average
2	0.150	48.93	9.61	58.54	65.99	7.45	QP
3	0.477	20.52	9.61	30.13	46.40	16.27	Average
4	0.477	35.23	9.61	44.84	56.40	11.56	QP
5	9.855	21.43	9.67	31.10	50.00	18.90	Average
6	9.855	36.97	9.67	46.64	60.00	13.36	QP
7	12.705	28.63	9.68	38.31	50.00	11.69	Average
8	12.705	41.07	9.68	50.75	60.00	9.25	QP
9	20.224	28.03	9.80	37.83	50.00	12.17	Average
10	20.224	45.14	9.80	54.94	60.00	5.06	QP
11	21.781	28.80	9.81	38.61	50.00	11.39	Average
12	21.781	44.13	9.81	53.94	60.00	6.06	QP

Project No.: CR230419456-RF
Tester: David Huang
Port: neutral
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.151	27.77	9.61	37.38	55.96	18.58	Average
2	0.151	48.27	9.61	57.88	65.96	8.08	QP
3	0.474	31.98	9.61	41.59	46.44	4.85	Average
4	0.474	37.46	9.61	47.07	56.44	9.37	QP
5	11.409	36.44	9.67	46.11	50.00	3.89	Average
6	11.409	42.53	9.67	52.20	60.00	7.80	QP
7	13.560	37.30	9.68	46.98	50.00	3.02	Average
8	13.560	46.24	9.68	55.92	60.00	4.08	QP
9	19.188	33.56	9.69	43.25	50.00	6.75	Average
10	19.188	47.15	9.69	56.84	60.00	3.16	QP
11	22.820	37.05	9.74	46.79	50.00	3.21	Average
12	22.820	46.44	9.74	56.18	60.00	3.82	QP

4.2 Radiation Spurious Emissions

Serial Number:	24OZ_2	Test Date:	2023/9/25~2023/9/29
Test Site:	966-1, 966-2	Test Mode:	Transmitting
Tester:	Vic Du, Mack Huang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	26.3~26.7	Relative Humidity: (%)	53~57	ATM Pressure: (kPa)	100.3~100.6

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
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
ETS-Lindgren	Horn Antenna	3115	9912-5985	2020/10/13	2023/10/12
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	5150-5850MHz	OE01902423	2023/8/6	2024/8/5
Mini Circuits	High Pass Filter	VHF-6010+	31119	2023/8/6	2024/8/5
PASTERNACK	Horn Antenna	PE9850/2F-20	072001	2021/2/5	2024/2/4

** 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).*

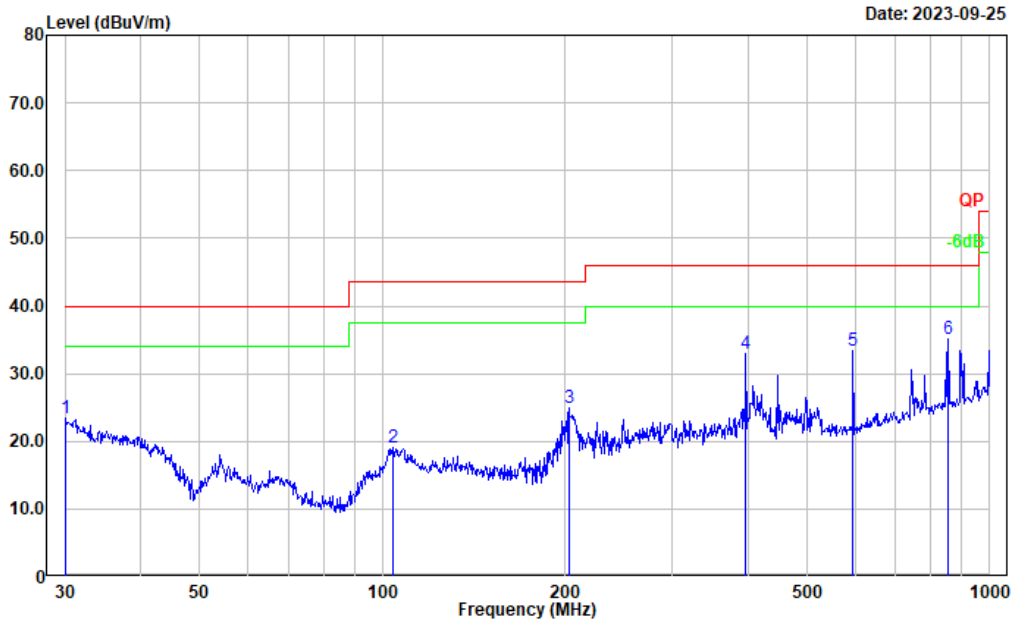
Test Data:

Please refer to the below table and plots.

After pre-scan in the X, Y and Z axes of orientation, the worst case is refer to plots.

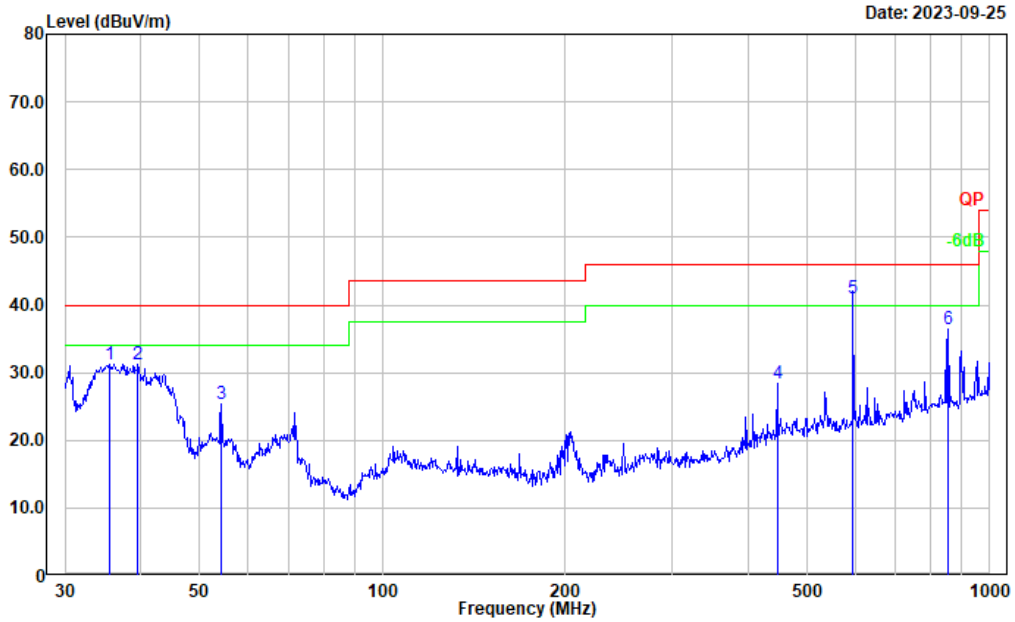
1) 30MHz-1GHz: (maximum output power mode(802.11a mode, 5500MHz))

Project No.: CR230419456-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	27.05	-3.60	23.45	40.00	16.55	Peak
2	103.806	32.56	-13.58	18.98	43.50	24.52	Peak
3	202.810	37.18	-12.29	24.89	43.50	18.61	Peak
4	396.242	41.83	-8.81	33.02	46.00	12.98	Peak
5	595.133	38.56	-5.15	33.41	46.00	12.59	Peak
6	854.025	36.52	-1.41	35.11	46.00	10.89	Peak

Project No.: CR230419456-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	35.624	39.13	-7.96	31.17	40.00	8.83	Peak
2	39.576	42.27	-10.98	31.29	40.00	8.71	Peak
3	54.261	42.62	-17.27	25.35	40.00	14.65	Peak
4	446.414	35.42	-7.08	28.34	46.00	17.66	Peak
5	595.133	46.11	-5.15	40.96	46.00	5.04	QP
6	854.025	37.88	-1.41	36.47	46.00	9.53	Peak

2) 1GHz-40GHz:

5150-5250MHz:

802.11a Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5180 MHz							
5150.000	31.95	PK	H	32.83	64.78	74.00	9.22
5150.000	17.73	AV	H	32.83	50.56	54.00	3.44
5150.000	32.22	PK	V	32.83	65.05	74.00	8.95
5150.000	17.88	AV	V	32.83	50.71	54.00	3.29
10360.000	46.06	PK	H	14.45	60.51	68.20	7.69
10360.000	45.77	PK	V	14.45	60.22	68.20	7.98
Middle Channel: 5200 MHz							
10400.000	45.82	PK	H	14.52	60.34	68.20	7.86
10400.000	45.57	PK	V	14.52	60.09	68.20	8.11
High Channel: 5240 MHz							
5350.000	29.49	PK	H	32.70	62.19	74.00	11.81
5350.000	14.15	AV	H	32.70	46.85	54.00	7.15
5350.000	29.60	PK	V	32.70	62.30	74.00	11.70
5350.000	14.28	AV	V	32.70	46.98	54.00	7.02
10480.000	45.92	PK	H	14.40	60.32	68.20	7.88
10480.000	45.81	PK	V	14.40	60.21	68.20	7.99

802.11ac ht20 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5180 MHz							
5150.000	32.34	PK	H	32.83	65.17	74.00	8.83
5150.000	17.92	AV	H	32.83	50.75	54.00	3.25
5150.000	32.50	PK	V	32.83	65.33	74.00	8.67
5150.000	18.06	AV	V	32.83	50.89	54.00	3.11
10360.000	46.24	PK	H	14.45	60.69	68.20	7.51
10360.000	45.86	PK	V	14.45	60.31	68.20	7.89
Middle Channel: 5200 MHz							
10400.000	45.91	PK	H	14.52	60.43	68.20	7.77
10400.000	45.73	PK	V	14.52	60.25	68.20	7.95
High Channel: 5240 MHz							
5350.000	29.68	PK	H	32.70	62.38	74.00	11.62
5350.000	14.31	AV	H	32.70	47.01	54.00	6.99
5350.000	29.82	PK	V	32.70	62.52	74.00	11.48
5350.000	14.46	AV	V	32.70	47.16	54.00	6.84
10480.000	46.05	PK	H	14.40	60.45	68.20	7.75
10480.000	45.92	PK	V	14.40	60.32	68.20	7.88

802.11ac ht40 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel:				5190	MHz		
5150.000	32.68	PK	H	32.83	65.51	74.00	8.49
5150.000	19.09	AV	H	32.83	51.92	54.00	2.08
5150.000	33.01	PK	V	32.83	65.84	74.00	8.16
5150.000	19.32	AV	V	32.83	52.15	54.00	1.85
10380.000	45.95	PK	H	14.49	60.44	68.20	7.76
10380.000	45.70	PK	V	14.49	60.19	68.20	8.01
High Channel:				5230	MHz		
5350.000	29.43	PK	H	32.70	62.13	74.00	11.87
5350.000	14.81	AV	H	32.70	47.51	54.00	6.49
5350.000	29.55	PK	V	32.70	62.25	74.00	11.75
5350.000	14.92	AV	V	32.70	47.62	54.00	6.38
10460.000	45.99	PK	H	14.43	60.42	68.20	7.78
10460.000	45.82	PK	V	14.43	60.25	68.20	7.95

802.11ac80 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Middle Channel:				5210	MHz		
5150.000	32.02	PK	H	32.83	64.85	74.00	9.15
5150.000	19.15	AV	H	32.83	51.98	54.00	2.02
5150.000	32.24	PK	V	32.83	65.07	74.00	8.93
5150.000	19.41	AV	V	32.83	52.24	54.00	1.76
5350.000	30.11	PK	H	32.70	62.81	74.00	11.19
5350.000	15.66	AV	H	32.70	48.36	54.00	5.64
5350.000	30.29	PK	V	32.70	62.99	74.00	11.01
5350.000	15.82	AV	V	32.70	48.52	54.00	5.48
10420.000	45.90	PK	H	14.49	60.39	68.20	7.81
10420.000	45.67	PK	V	14.49	60.16	68.20	8.04

5250-5350MHz

802.11a Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5260 MHz							
5150.000	31.06	PK	H	32.83	63.89	74.00	10.11
5150.000	17.73	AV	H	32.83	50.56	54.00	3.44
5150.000	31.22	PK	V	32.83	64.05	74.00	9.95
5150.000	17.85	AV	V	32.83	50.68	54.00	3.32
10520.000	46.23	PK	H	14.51	60.74	68.20	7.46
10520.000	46.05	PK	V	14.51	60.56	68.20	7.64
Middle Channel: 5280 MHz							
10560.000	46.47	PK	H	14.79	61.26	68.20	6.94
10560.000	46.30	PK	V	14.79	61.09	68.20	7.11
High Channel: 5320 MHz							
5350.000	33.10	PK	H	32.70	65.80	74.00	8.20
5350.000	18.55	AV	H	32.70	51.25	54.00	2.75
5350.000	33.36	PK	V	32.70	66.06	74.00	7.94
5350.000	18.83	AV	V	32.70	51.53	54.00	2.47
10640.000	46.44	PK	H	15.11	61.55	74.00	12.45
10640.000	33.21	AV	H	15.11	48.32	54.00	5.68
10640.000	46.28	PK	V	15.11	61.39	74.00	12.61
10640.000	33.02	AV	V	15.11	48.13	54.00	5.87

802.11ac ht20 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5260 MHz							
5150.000	31.51	PK	H	32.83	64.34	74.00	9.66
5150.000	17.86	AV	H	32.83	50.69	54.00	3.31
5150.000	31.69	PK	V	32.83	64.52	74.00	9.48
5150.000	18.00	AV	V	32.83	50.83	54.00	3.17
10520.000	45.95	PK	H	14.51	60.46	68.20	7.74
10520.000	45.73	PK	V	14.51	60.24	68.20	7.96
Middle Channel: 5280 MHz							
10560.000	46.66	PK	H	14.79	61.45	68.20	6.75
10560.000	46.42	PK	V	14.79	61.21	68.20	6.99
High Channel: 5320 MHz							
5350.000	32.10	PK	H	32.70	64.80	74.00	9.20
5350.000	17.02	AV	H	32.70	49.72	54.00	4.28
5350.000	32.38	PK	V	32.70	65.08	74.00	8.92
5350.000	17.17	AV	V	32.70	49.87	54.00	4.13
10640.000	46.70	PK	H	15.11	61.81	74.00	12.19
10640.000	33.22	AV	H	15.11	48.33	54.00	5.67
10640.000	46.48	PK	V	15.11	61.59	74.00	12.41
10640.000	33.05	AV	V	15.11	48.16	54.00	5.84

802.11ac ht40 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel:				5270	MHz		
5150.000	31.53	PK	H	32.83	64.36	74.00	9.64
5150.000	17.96	AV	H	32.83	50.79	54.00	3.21
5150.000	31.78	PK	V	32.83	64.61	74.00	9.39
5150.000	18.13	AV	V	32.83	50.96	54.00	3.04
10540.000	46.18	PK	H	14.66	60.84	68.20	7.36
10540.000	45.95	PK	V	14.66	60.61	68.20	7.59
High Channel:				5310	MHz		
5350.000	35.83	PK	H	32.70	68.53	74.00	5.47
5350.000	19.29	AV	H	32.70	51.99	54.00	2.01
5350.000	37.98	PK	V	32.70	70.68	74.00	3.32
5350.000	19.62	AV	V	32.70	52.32	54.00	1.68
10620.000	46.54	PK	H	15.09	61.63	74.00	12.37
10620.000	33.65	AV	H	15.09	48.74	54.00	5.26
10620.000	46.33	PK	V	15.09	61.42	74.00	12.58
10620.000	33.41	AV	V	15.09	48.50	54.00	5.50

802.11ac80 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Middle Channel:				5290	MHz		
5150.000	31.34	PK	H	32.83	64.17	74.00	9.83
5150.000	18.91	AV	H	32.83	51.74	54.00	2.26
5150.000	31.49	PK	V	32.83	64.32	74.00	9.68
5150.000	19.15	AV	V	32.83	51.98	54.00	2.02
5350.000	32.53	PK	H	32.70	65.23	74.00	8.77
5350.000	19.41	AV	H	32.70	52.11	54.00	1.89
5350.000	32.82	PK	V	32.70	65.52	74.00	8.48
5350.000	19.65	AV	V	32.70	52.35	54.00	1.65
10580.000	46.31	PK	H	14.94	61.25	68.20	6.95
10580.000	46.08	PK	V	14.94	61.02	68.20	7.18

5470-5725MHz

802.11a Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5500 MHz							
5470.000	33.24	PK	H	32.62	65.86	68.20	2.34
5470.000	34.02	PK	V	32.62	66.64	68.20	1.56
11000.000	45.16	PK	H	15.51	60.67	74.00	13.33
11000.000	31.64	AV	H	15.51	47.15	54.00	6.85
11000.000	45.00	PK	V	15.51	60.51	74.00	13.49
11000.000	31.43	AV	V	15.51	46.94	54.00	7.06
Middle Channel: 5580 MHz							
11160.000	45.68	PK	H	15.36	61.04	74.00	12.96
11160.000	32.05	AV	H	15.36	47.41	54.00	6.59
11160.000	45.47	PK	V	15.36	60.83	74.00	13.17
11160.000	31.83	AV	V	15.36	47.19	54.00	6.81
High Channel: 5700 MHz							
5725.000	32.71	PK	H	33.03	65.74	68.20	2.46
5725.000	32.96	PK	V	33.03	65.99	68.20	2.21
11400.000	45.53	PK	H	15.89	61.42	74.00	12.58
11400.000	31.98	AV	H	15.89	47.87	54.00	6.13
11400.000	45.31	PK	V	15.89	61.20	74.00	12.80
11400.000	31.79	AV	V	15.89	47.68	54.00	6.32

802.11ac ht20 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5500 MHz							
5470.000	33.41	PK	H	32.62	66.03	68.20	2.17
5470.000	34.12	PK	V	32.62	66.74	68.20	1.46
11000.000	45.31	PK	H	15.51	60.82	74.00	13.18
11000.000	31.70	AV	H	15.51	47.21	54.00	6.79
11000.000	45.09	PK	V	15.51	60.60	74.00	13.40
11000.000	31.52	AV	V	15.51	47.03	54.00	6.97
Middle Channel: 5580 MHz							
11160.000	45.53	PK	H	15.36	60.89	74.00	13.11
11160.000	31.92	AV	H	15.36	47.28	54.00	6.72
11160.000	45.38	PK	V	15.36	60.74	74.00	13.26
11160.000	31.73	AV	V	15.36	47.09	54.00	6.91
High Channel: 5700 MHz							
5725.000	32.84	PK	H	33.03	65.87	68.20	2.33
5725.000	33.19	PK	V	33.03	66.22	68.20	1.98
11400.000	45.21	PK	H	15.89	61.10	74.00	12.90
11400.000	31.88	AV	H	15.89	47.77	54.00	6.23
11400.000	45.06	PK	V	15.89	60.95	74.00	13.05
11400.000	31.72	AV	V	15.89	47.61	54.00	6.39

802.11ac ht40 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel:				5510	MHz		
5470.000	33.59	PK	H	32.62	66.21	68.20	1.99
5470.000	34.23	PK	V	32.62	66.85	68.20	1.35
11020.000	45.44	PK	H	15.50	60.94	74.00	13.06
11020.000	32.01	AV	H	15.50	47.51	54.00	6.49
11020.000	45.25	PK	V	15.50	60.75	74.00	13.25
11020.000	31.83	AV	V	15.50	47.33	54.00	6.67
Middle Channel:				5550	MHz		
11100.000	45.22	PK	H	15.45	60.67	74.00	13.33
11100.000	31.89	AV	H	15.45	47.34	54.00	6.66
11100.000	45.01	PK	V	15.45	60.46	74.00	13.54
11100.000	31.70	AV	V	15.45	47.15	54.00	6.85
High Channel:				5670	MHz		
5725.000	31.89	PK	H	33.03	64.92	68.20	3.28
5725.000	32.16	PK	V	33.03	65.19	68.20	3.01
11340.000	45.17	PK	H	15.84	61.01	74.00	12.99
11340.000	32.05	AV	H	15.84	47.89	54.00	6.11
11340.000	44.99	PK	V	15.84	60.83	74.00	13.17
11340.000	31.82	AV	V	15.84	47.66	54.00	6.34

802.11ac80 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5530 MHz							
5470.000	33.14	PK	H	32.62	65.76	68.20	2.44
5470.000	33.65	PK	V	32.62	66.27	68.20	1.93
11060.000	45.12	PK	H	15.47	60.59	74.00	13.41
11060.000	32.93	AV	H	15.47	48.40	54.00	5.60
11060.000	44.96	PK	V	15.47	60.43	74.00	13.57
11060.000	32.80	AV	V	15.47	48.27	54.00	5.73
High Channel: 5610 MHz							
5725.000	31.41	PK	H	33.03	64.44	68.20	3.76
5725.000	31.64	PK	V	33.03	64.67	68.20	3.53
11220.000	46.23	PK	H	15.41	61.64	74.00	12.36
11220.000	33.82	AV	H	15.41	49.23	54.00	4.77
11220.000	46.04	PK	V	15.41	61.45	74.00	12.55
11220.000	33.59	AV	V	15.41	49.00	54.00	5.00

5725-5850MHz

802.11a Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel:				5745	MHz		
5650.000	29.39	PK	H	32.95	62.34	68.20	5.86
5700.000	31.37	PK	H	33.03	64.40	105.20	40.80
5720.000	37.00	PK	H	33.03	70.03	110.80	40.77
5725.000	40.86	PK	H	33.03	73.89	122.20	48.31
5650.000	29.55	PK	V	32.95	62.50	68.20	5.70
5700.000	31.66	PK	V	33.03	64.69	105.20	40.51
5720.000	38.90	PK	V	33.03	71.93	110.80	38.87
5725.000	42.71	PK	V	33.03	75.74	122.20	46.46
11490.000	45.67	PK	H	15.47	61.14	74.00	12.86
11490.000	32.48	AV	H	15.47	47.95	54.00	6.05
11490.000	45.45	PK	V	15.47	60.92	74.00	13.08
11490.000	32.30	AV	V	15.47	47.77	54.00	6.23
Middle Channel:				5785	MHz		
11570.000	45.47	PK	H	15.69	61.16	74.00	12.84
11570.000	32.24	AV	H	15.69	47.93	54.00	6.07
11570.000	45.31	PK	V	15.69	61.00	74.00	13.00
11570.000	32.09	AV	V	15.69	47.78	54.00	6.22
High Channel:				5825	MHz		
5850.000	37.37	PK	H	33.19	70.56	122.20	51.64
5855.000	33.78	PK	H	33.22	67.00	110.80	43.80
5875.000	32.82	PK	H	33.33	66.15	105.20	39.05
5925.000	30.01	PK	H	33.47	63.48	68.20	4.72
5850.000	39.16	PK	V	33.19	72.35	122.20	49.85
5855.000	35.46	PK	V	33.22	68.68	110.80	42.12
5875.000	33.36	PK	V	33.33	66.69	105.20	38.51
5925.000	30.13	PK	V	33.47	63.60	68.20	4.60
11650.000	44.59	PK	H	16.02	60.61	74.00	13.39
11650.000	31.31	AV	H	16.02	47.33	54.00	6.67
11650.000	44.35	PK	V	16.02	60.37	74.00	13.63
11650.000	31.10	AV	V	16.02	47.12	54.00	6.88

802.11ac ht20 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel:				5745	MHz		
5650.000	29.65	PK	H	32.95	62.60	68.20	5.60
5700.000	32.00	PK	H	33.03	65.03	105.20	40.17
5720.000	37.59	PK	H	33.03	70.62	110.80	40.18
5725.000	41.84	PK	H	33.03	74.87	122.20	47.33
5650.000	29.78	PK	V	32.95	62.73	68.20	5.47
5700.000	32.76	PK	V	33.03	65.79	105.20	39.41
5720.000	39.71	PK	V	33.03	72.74	110.80	38.06
5725.000	43.59	PK	V	33.03	76.62	122.20	45.58
11490.000	45.76	PK	H	15.47	61.23	74.00	12.77
11490.000	32.38	AV	H	15.47	47.85	54.00	6.15
11490.000	45.54	PK	V	15.47	61.01	74.00	12.99
11490.000	32.17	AV	V	15.47	47.64	54.00	6.36
Middle Channel:				5785	MHz		
11570.000	45.46	PK	H	15.69	61.15	74.00	12.85
11570.000	32.05	AV	H	15.69	47.74	54.00	6.26
11570.000	45.27	PK	V	15.69	60.96	74.00	13.04
11570.000	31.89	AV	V	15.69	47.58	54.00	6.42
High Channel:				5825	MHz		
5850.000	38.30	PK	H	33.19	71.49	122.20	50.71
5855.000	34.54	PK	H	33.22	67.76	110.80	43.04
5875.000	33.45	PK	H	33.33	66.78	105.20	38.42
5925.000	30.17	PK	H	33.47	63.64	68.20	4.56
5850.000	40.34	PK	V	33.19	73.53	122.20	48.67
5855.000	36.28	PK	V	33.22	69.50	110.80	41.30
5875.000	33.96	PK	V	33.33	67.29	105.20	37.91
5925.000	30.31	PK	V	33.47	63.78	68.20	4.42
11650.000	44.52	PK	H	16.02	60.54	74.00	13.46
11650.000	31.09	AV	H	16.02	47.11	54.00	6.89
11650.000	44.36	PK	V	16.02	60.38	74.00	13.62
11650.000	30.90	AV	V	16.02	46.92	54.00	7.08

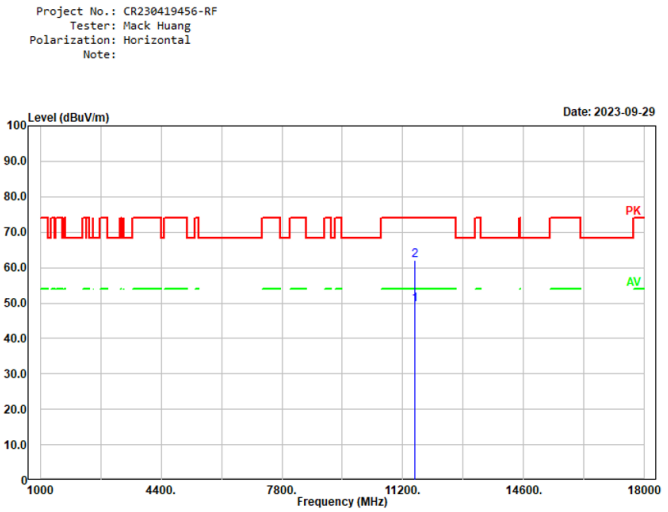
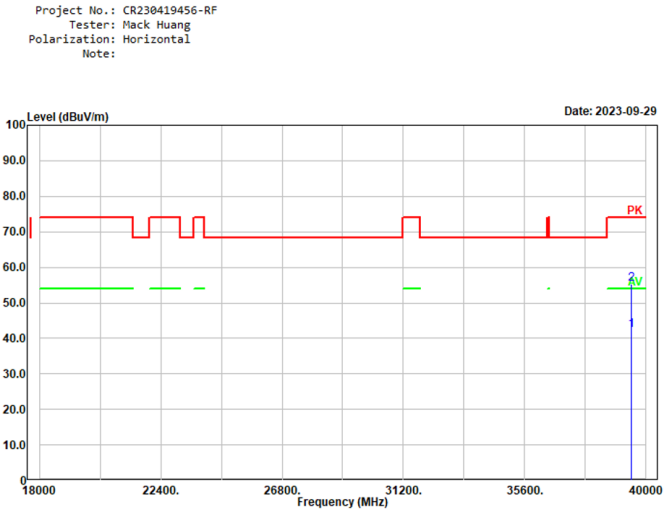
802.11ac ht40 Mode:

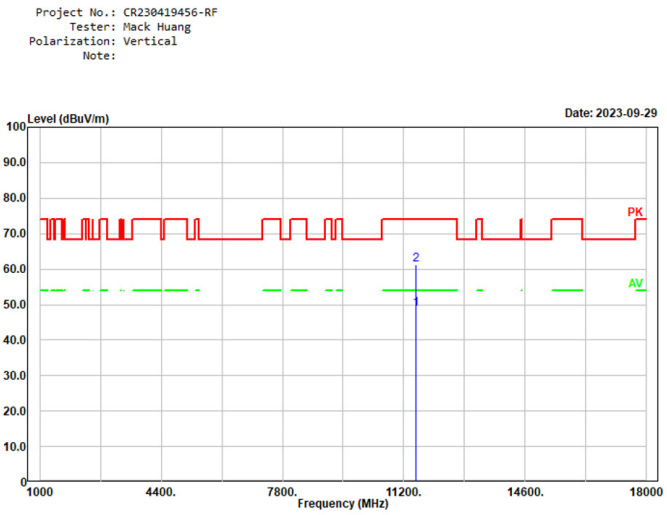
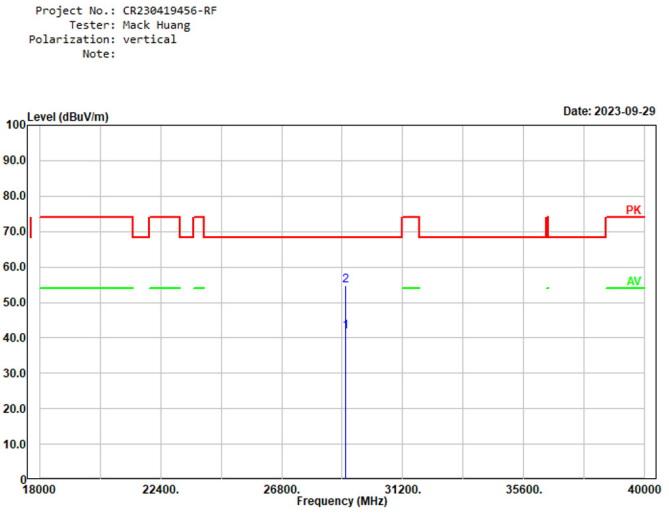
Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel: 5755 MHz							
5650.000	29.69	PK	H	32.95	62.64	68.20	5.56
5700.000	33.06	PK	H	33.03	66.09	105.20	39.11
5720.000	35.28	PK	H	33.03	68.31	110.80	42.49
5725.000	37.65	PK	H	33.03	70.68	122.20	51.52
5650.000	29.82	PK	V	32.95	62.77	68.20	5.43
5700.000	33.67	PK	V	33.03	66.70	105.20	38.50
5720.000	37.10	PK	V	33.03	70.13	110.80	40.67
5725.000	39.59	PK	V	33.03	72.62	122.20	49.58
11510.000	45.50	PK	H	15.46	60.96	74.00	13.04
11510.000	32.56	AV	H	15.46	48.02	54.00	5.98
11510.000	45.31	PK	V	15.46	60.77	74.00	13.23
11510.000	32.38	AV	V	15.46	47.84	54.00	6.16
High Channel: 5795 MHz							
5850.000	35.30	PK	H	33.19	68.49	122.20	53.71
5855.000	33.34	PK	H	33.22	66.56	110.80	44.24
5875.000	32.51	PK	H	33.33	65.84	105.20	39.36
5925.000	30.25	PK	H	33.47	63.72	68.20	4.48
5850.000	36.07	PK	V	33.19	69.26	122.20	52.94
5855.000	33.65	PK	V	33.22	66.87	110.80	43.93
5875.000	33.15	PK	V	33.33	66.48	105.20	38.72
5925.000	30.38	PK	V	33.47	63.85	68.20	4.35
11590.000	45.10	PK	H	15.76	60.86	74.00	13.14
11590.000	32.17	AV	H	15.76	47.93	54.00	6.07
11590.000	44.91	PK	V	15.76	60.67	74.00	13.33
11590.000	31.98	AV	V	15.76	47.74	54.00	6.26

802.11ac80 Mode:

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Middle Channel:				5775	MHz		
5650.000	30.05	PK	H	32.95	63.00	68.20	5.20
5700.000	35.76	PK	H	33.03	68.79	105.20	36.41
5720.000	38.19	PK	H	33.03	71.22	110.80	39.58
5725.000	40.28	PK	H	33.03	73.31	122.20	48.89
5650.000	30.19	PK	V	32.95	63.14	68.20	5.06
5700.000	36.47	PK	V	33.03	69.50	105.20	35.70
5720.000	39.48	PK	V	33.03	72.51	110.80	38.29
5725.000	42.05	PK	V	33.03	75.08	122.20	47.12
5850.000	38.30	PK	H	33.19	71.49	122.20	50.71
5855.000	35.48	PK	H	33.22	68.70	110.80	42.10
5875.000	33.51	PK	H	33.33	66.84	105.20	38.36
5925.000	31.75	PK	H	33.47	65.22	68.20	2.98
5850.000	39.56	PK	V	33.19	72.75	122.20	49.45
5855.000	37.16	PK	V	33.22	70.38	110.80	40.42
5875.000	34.44	PK	V	33.33	67.77	105.20	37.43
5925.000	31.69	PK	V	33.47	65.16	68.20	3.04
11550.000	46.37	PK	H	15.61	61.98	74.00	12.02
11550.000	34.11	AV	H	15.61	49.72	54.00	4.28
11550.000	46.19	PK	V	15.61	61.80	74.00	12.20
11550.000	33.92	AV	V	15.61	49.53	54.00	4.47

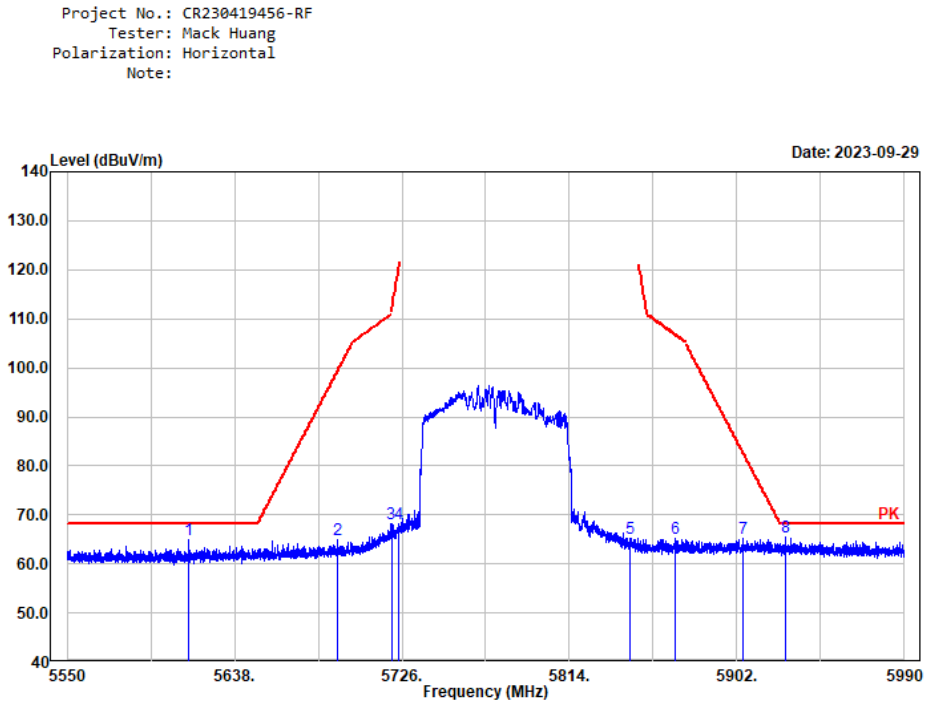
Worst Harmonic Margin Test plots(802.11ac80 5775MHz was the worst)

Horizontal	
1-18GHz	
18-40GHz	

Vertical	
1-18GHz	
18-40GHz	

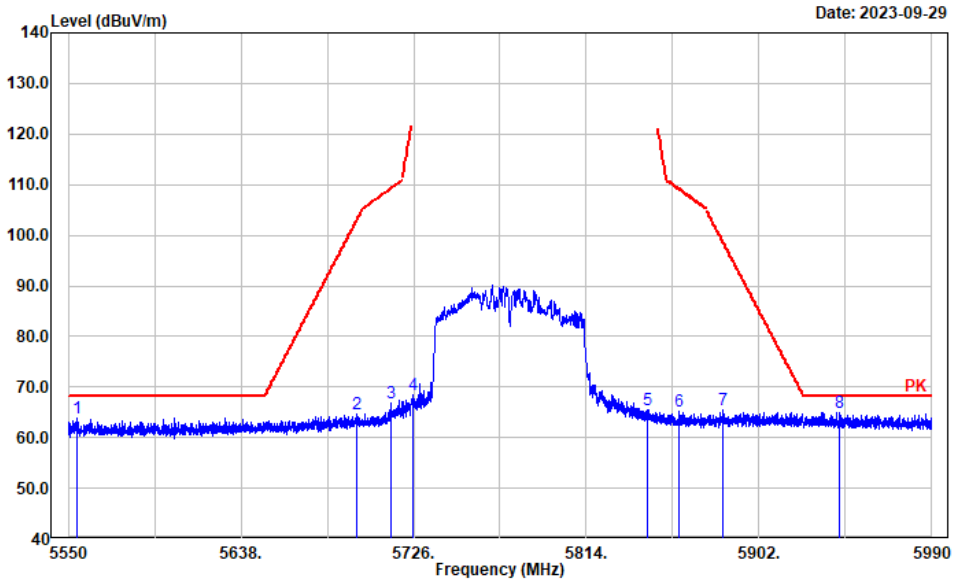
Worst Test plots for Band Edge Measurements (Radiated)

802.11ac vht80			
Test Channel:	**5775MHz**	**Ant. Polar. :**	**Horizontal**



802.11ac vht80			
Test Channel:	**5775MHz**	**Ant. Polar. :**	**Vertical**

Project No.: CR230419456-RF
Tester: Mack Huang
Polarization: vertical
Note:



5. RF EXPOSURE EVALUATION

5.1 FCC SAR test exclusion

5.1.1 Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm^2);
P = power input to the antenna (in appropriate units, e.g., mW);
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

5.2 Measurement Result

Mode	Frequency (MHz)	Antenna Gain		Maximum output power		Evaluation Distance	Power Density	MPE Limit
		(dBi)	(numeric)	(dBm)	(mW)	(cm)	(mW/cm2)	(mW/cm^2)
BDR/EDR	2402-2480	2.36	1.72	7.95	6.24	20	0.0021	1.0
BLE	2402-2480	2.36	1.72	3.53	2.25	20	0.0008	1.0
2.4G Wi-Fi	2412-2462	2.36	1.72	20.71	117.76	20	0.0403	1.0
5G Wi-Fi	5150-5850	1.97	1.57	16.28	42.46	20	0.0133	1.0
NFC	13.26	/	/	/	1.4	20	0.0003	0.98

Note: 1. For BT/2.4G Wi-Fi/5G Wi-Fi, the output power was refer to the reference module report.
2. The antenna gain was provided by applicant
3. For NFC, the maximum E-field strength is 66.70dBuV/m@3m=2.163mV/m@3m
EIRP=(E*r)^2/30=(2.163*3)^2/30=1.40mW
4. NFC is low power transmitter will not influence the simultaneously RF exposure

Result: The device meets FCC MPE at **20 cm** distance

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 Measurement Result:

Mode	Frequency (MHz)	Max. output power	Antenna Gain	EIRP		Evaluation Distance	Exemption Limit
		(dBm)	(dBi)	(dBm)	(mW)	(m)	(W)
BDR/EDR	2402-2480	7.95	2.36	10.31	10.74	0.2	2.68
BLE	2402-2480	3.53	2.36	5.89	3.88	0.2	2.68
2.4G Wi-Fi	2412-2462	20.71	2.36	23.07	202.77	0.2	2.68
5G Wi-Fi	5150-5850	16.28	1.97	18.25	66.83	0.2	4.51
NFC	13.56	/	/	/	0.24	0.2	1

Note: 1. For BT/2.4G Wi-Fi/5G Wi-Fi, the output power was refer to the reference module report.
2. The antenna gain was provided by applicant
3. For NFC, the maximum E-field strength is 66.70dBuV/m@3m=2.163mV/m@3m
EIRP=(E*r)^2/30=(2.163*3)^2/30=1.40mW
4. For NFC, it's a extreme low power transmitter will not influence the RF exposure

Result: Compliant.

6. EUT PHOTOGRAPHS

Please refer to the attachment CR230419456-EXP EUT EXTERNAL PHOTOGRAPHS and CR230419456-INP EUT INTERNAL PHOTOGRAPHS

7. TEST SETUP PHOTOGRAPHS

Please refer to the attachment CR230419456-00D-TSP TEST SETUP PHOTOGRAPHS.

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