TEST REPORT

Applicant Name:	Shenzhen Ulefone Technology Co., Ltd.
Address(FCC):	7A01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China
Address(IC):	7A01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District Shenzhen City Guangdong 518110 China
Report Number:	2504Y12371E-RFD
FCC ID	2AT9T-8002
IC:	28620-8002

Test Standard (s)

FCC PART 15.407; RSS-GEN ISSUE 5, FEBRUARY 2021 AMENDMENT 2
RSS-247 ISSUE 4, JULY 24, 2025

Sample Description

Product Name:	Tablet
Model No.(FCC):	RugKing Pad 2 Pro, GQ8002, RugKing Pad 2, RugKing Pad 2 Ultra, RugKing Pad 2E, RugKing Pad 2S, RugKing Pad 2 Lite, RugKing Pad 2 Pro+, RugKing Pad 2s, RugKing Pad 2s Pro
Model No.(IC):	RugKing Pad 2 Pro
Trade Mark:	ulefone
Date Received:	2025-10-30
Report Date:	2026-01-27

Test Result:	The EUT complied with the standards above.

Prepared and Checked By:

Amanda Wei

Amanda Wei
EMC Engineer

Approved By:

Bob. Liao

Bob.Liao
EMC Engineer

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
Rev.00	2504Y12371E-RFD	Original Report	2026-01-27

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Name	Tablet
Tested Model (FCC&IC)	RugKing Pad 2 Pro
Multiple Model (FCC)	GQ8002, RugKing Pad 2, RugKing Pad 2 Ultra, RugKing Pad 2E, RugKing Pad 2S, RugKing Pad 2 Lite, RugKing Pad 2 Pro+, RugKing Pad 2s,RugKing Pad 2s Pro
Model Difference# (FCC)	The differences between the above models are in the model name and the sales channels. Please refer to DOS letter for details. The applicant provided model “RugKing Pad 2 Pro” for testing.
HVIN	GQ8002
Voltage Range#	DC 5V/9V from adapter DC 5V from desktop charger DC 3.87V from rechargeable battery
Adapter Information#	Model:HJ-PD18W-US Input:100-240 V~ 50/60Hz 0.8A Output:5.0V ⎓3.0A 15.0W OR 9.0V ⎓2.0A 18.0W OR 12.0V ⎓1.5A 18.0W (Note: The manufacturer claims that EUT only support 5/9V for charging.)
EUT Manufacture Information#	Company Name: Shenzhen Gotron Electronic CO.,Ltd. Address: 7B01, Building A, Block 1, Anhongji Tianyao Plaza, Longhua District, Shenzhen City, Guangdong Province China.

Frequency Range	5G Wi-Fi: 5150-5250MHz; 5250-5350MHz 5470-5725MHz; 5725-5850MHz
Mode	802.11 a/n20/ac20
Maximum Conducted Average Output Power (actual test result)	5150-5250MHz: 15.34 dBm
	5250-5350MHz: 13.15 dBm
	5470-5725MHz: 14.82 dBm
	5725-5850MHz: 15.75 dBm
Modulation Technique	OFDM
Antenna Specification#	FPC Antenna (It is provided by the applicant.)
	5150-5250MHz: -2.4 dBi
	5250-5350MHz: -2.4 dBi
	5470-5725MHz: -2.4 dBi
	5725-5850MHz: -2.4 dBi
Sample Serial Number	For CE&RE Test: 3C1Q-4 For RF Conducted Test: 3C1Q-5 (Assigned by ATC, Shenzhen)
Sample/EUT Status	Good condition

Objective

This type approval report is in accordance with Part 2-Subpart J, Part 15-Subparts A and E of the Federal Communication Commissions rules, RSS-GEN Issue 5, Feb. 2021 Amendment 2 and RSS-247 Issue 4, July 24, 2025 of the Innovation, Science and Economic Development Canada rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, section 15.203, 15.205, 15.207, 15.209 and 15.407 rules. RSS-GEN Issue 5, Feb. 2021 Amendment 2 and RSS-247 Issue 4, July 24, 2025.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2020+Cor. 1-2023+ C63.10a-2024+Errata to C63.10a-2024▲, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices, RSS-GEN Issue 5, Feb. 2021 Amendment 2 and RSS-247 Issue 4, July 24, 2025.

Unless otherwise stated there are no any additions to, deviations, or exclusions from the method.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the Floor 1, KuMaKe Building, Dongzhou Community, Guangming Street, Guangming District, Shenzhen, Guangdong, China.

Accredited by American Association for Laboratory Accreditation (A2LA). The Certificate Number is 4297.01.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements. The Registration Number is 30241.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5 %
RF Frequency		$0.064*10^{-7}$
RF output power, conducted		0.3 dB
Unwanted Emission, conducted		1.2 dB
AC Power Lines Conducted Emissions		2.7 dB
Radiated Emissions	9kHz - 30MHz	2.1 dB
	30MHz - 1GHz	4.3 dB
	1GHz - 18GHz	4.9 dB
	18GHz - 26.5GHz	5.2 dB
	26.5GHz - 40GHz	4.6 dB
Temperature		1 ℃
Humidity		7 %
Supply voltages		0.4 %

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

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in the engineering mode.

The device supports 802.11a/n20/ac20 modes. The 802.11n20 modes were reduced since the identical parameters with 802.11ac20.

For 5150-5250MHz, 4 channels are provided to testing:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
36	5180	40	5200	44	5220	48	5240

For 802.11a/ac20, Channel 36, 40 and 48 were tested.

For 5250-5350MHz, 4 channels are provided to testing:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
52	5260	56	5280	60	5300	64	5320

For 802.11a/ac20, Channel 52, 60 and 64 were tested.

For 5470-5725MHz, 11 channels are provided to testing:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
100	5500	104	5520	108	5540	112	5560
116	5580	120	5600	124	5620	128	5640
132	5660	136	5680	140	5700	/	/

For 802.11a/ac20, Channel 100, 116 and 140 and additional Channel 136 were tested.

For 5725-5850MHz, 5 channels are provided to testing:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
149	5745	153	5765	157	5785	161	5805
165	5825	/	/	/	/	/	/

For 802.11a/ac20, Channel 149, 157 and 165 were tested.

Note 1: The device has two charging methods: adapter charging and dock charging. According to the BT report's test results, the worst-case is adapter charging. In this report, both AC Line Conducted Emissions and Radiated Spurious Emissions(Below 1GHz) were tested using an adapter charging method.

Test Mode 1: Charging by Adapter + 5G WIFI Transmitting

Note 2: The test used the maximum antenna gain.

EUT Exercise Software and Power Level

Exercise Software:	Testing in the engineering mode.			
For 5150-5250MHz:				
Mode	**Data Rate**	**Power Level**		
		Lowest Channel	**Middle Channel**	**Highest Channel**
802.11 a	6Mbps	16	16	16
802.11 ac20	MCS0	16	16	16
For 5250-5350MHz:				
Mode	**Data Rate**	**Power Level**		
		Lowest Channel	**Middle Channel**	**Highest Channel**
802.11 a	6Mbps	14	14	14
802.11 ac20	MCS0	14	14	14

For 5470-5725MHz:					
Mode	**Data Rate**	**Power Level**			
		Lowest Channel	**Middle Channel**	**Additional Channel**	**Highest Channel**
802.11 a	6Mbps	14	14	14	9
802.11 ac20	MCS0	14	14	14	9

For 5725-5850MHz:				
Mode	**Data Rate**	**Power Level**		
		Lowest Channel	**Middle Channel**	**Highest Channel**
802.11 a	6Mbps	16	16	16
802.11 ac20	MCS0	16	16	16

Note 1: The information in the above table is provided by the applicant.
Note 2: The worse-case data rates are determined to be as above for each mode based upon investigations by measuring the output power and PSD across all data rates, bandwidths and modulations.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Unknown	SIM card	Unknown	Unknown
Kingston	TF card	64G	Unknown
Unknown	Earphone	Unknown	Unknown

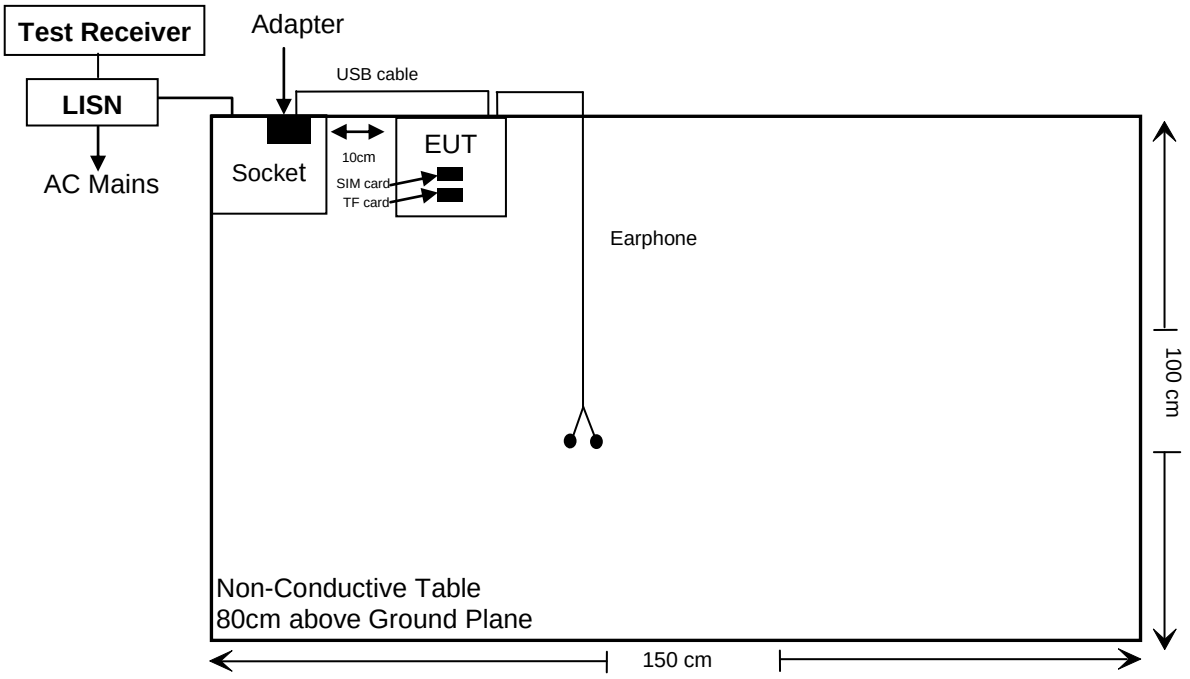
External I/O Cable

Cable Description	Shielding Type	Length (m)	From Port	To
USB Cable	NO	1.0	Adapter	EUT
Earphone cable	NO	1.2	EUT	Earphone

Block Diagram of Test Setup

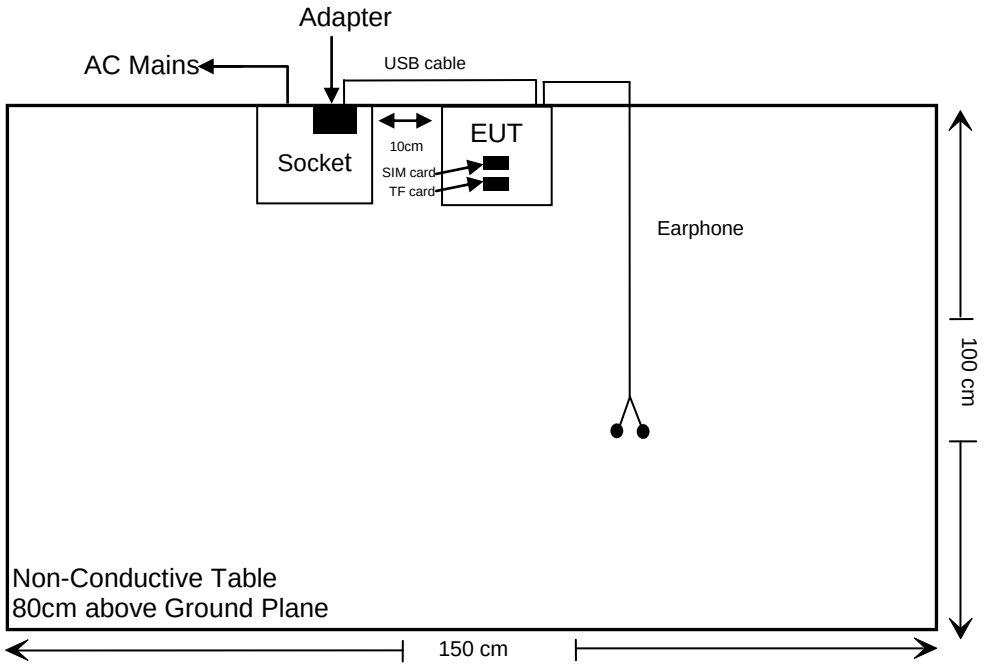
For Conducted Emission:

Test mode 1

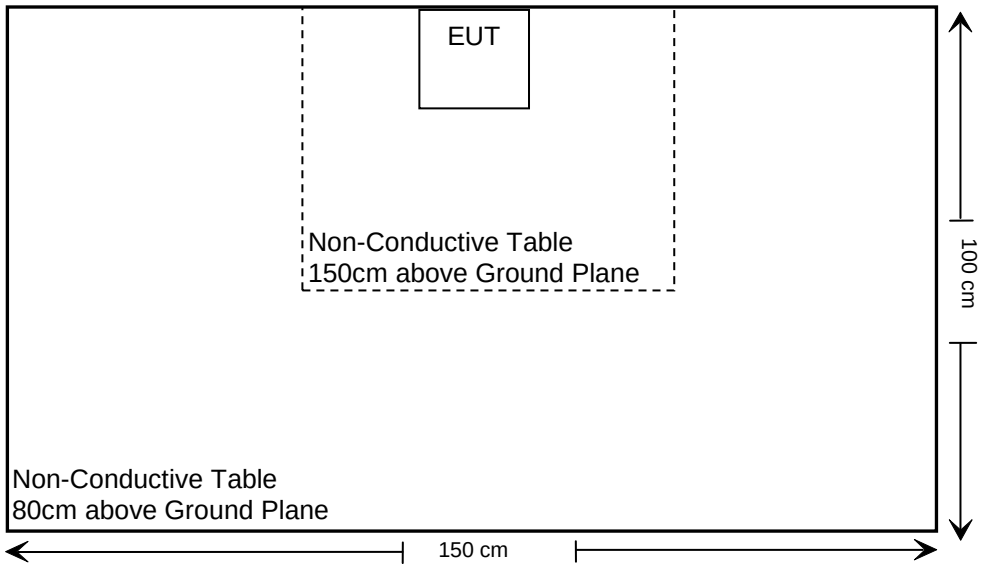


For Radiated Emission Below 1GHz:

Test mode 1



For Radiated Emission Above 1GHz:



SUMMARY OF TEST RESULTS

FCC Rules	ISED Rules	Description of Test	Result
§2.1093	RSS-102	RF Exposure(SAR)	Compliance
§15.203	RSS-Gen §6.8	Antenna Requirement	Compliance
§15.407(b)(9) & §15.207(a)	RSS-Gen §8.8	AC Power Lines Conducted Emission	Compliance
§15.205 & §15.209 & §15.407(b)	RSS-Gen §8.10 RSS-247 §7.3.1.3 RSS-247 §7.3.2.3 RSS-247 §7.3.3.3 RSS-247 §7.3.4.4	Undesirable Emission & Restricted Bands	Compliance
§15.407(a)	RSS-247 §7.3.1.2 RSS-247 §7.3.2.2 RSS-247 §7.3.3.2 RSS-247 §7.3.4.3	Transmitter Output Power	Compliance
§15.407(a),(e)	RSS-Gen §6.7, RSS-247 §7.3	Emission Bandwidth	Compliance
§15.407(a)	RSS-247 §7.3.1.2 RSS-247 §7.3.2.2 RSS-247 §7.3.3.2 RSS-247 §7.3.4.3	Power Spectral Density	Compliance
§15.407(h)(1)	/	Transmit Power Control (TPC)	Not Applicable
§15.407(h)(2)	RSS-247 §7.3.6	Dynamic Frequency Selection	Compliance*
/	RSS-247 §7.3.7	Additional Requirement	Compliance

Not Applicable: The device does not support this function.

Compliance*: Please refer to the IC DFS report: 2504Y12371E-RF-08E and FCC DFS report: 2504Y12371E-RF-00E.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde & Schwarz	EMI Test Receiver	ESCI	100784	2025/09/17	2026/09/16
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2025/09/17	2026/09/16
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2025/09/18	2026/09/17
Rohde & Schwarz	Pulse Limiter	ESH3-Z2	100312	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.17	N0350	2025/05/30	2026/05/29
Test Software: e3 191218 (V9)					
Radiated Spurious Emission Test (Below 1GHz)					
Rohde & Schwarz	Test Receiver	ESR	102725	2025/09/18	2026/09/17
SONOMA INSTRUMENT	Amplifier	310N	186131	2025/03/26	2026/03/25
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2024/08/08	2027/08/07
Unknown	RF Coaxial Cable	No.12	N040	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.13	N300	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.14	N800	2025/05/30	2026/05/29
BACL	LOOP ANTENNA	1313-1A	3110711	2024/01/16	2027/01/15
Test Software: e3 191218 (V9)					
Radiated Spurious Emission Test (Above 1GHz)					
Rohde & Schwarz	Spectrum Analyzer	FSV40	101949	2025/09/17	2026/09/16
Decentest	Filter Switch Unit	DT7220FSU	DQ77927	2025/09/18	2026/09/17
Decentest	Multiplex Switch Test Control Set	DT7220CSU	DQ77924	2025/09/18	2026/09/17
A.H. Systems, inc.	Preamplifier	PAM-0118	226	2025/03/20	2026/03/19
Schwarzbeck	Horn Antenna	BBHA9120D	837	2023/02/22	2026/02/21
Unknown	RF Coaxial Cable	No.10	N050	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.11	N1000	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.19	N500	2025/05/30	2026/05/29
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2023/12/12	2026/12/11
BACL	Amplifier	BACL-1313-A1840	4012521	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.15	N600	2025/05/30	2026/05/29
Unknown	RF Coaxial Cable	No.16	N650	2025/05/30	2026/05/29
Test Software: e3 191218 (V9)					
RF Conducted Test					
Rohde & Schwarz	Spectrum Analyzer	FSV-40	101590	2025/09/17	2026/09/16
Anritsu	Microwave Peak Power Sensor	MA24418A	12619	2025/03/26	2026/03/25
WEINSCHEL	10dB Attenuator	5324	AU 3842	2025/03/26	2026/03/25
Test Software: JDAutoTestSystem V1.0.0					

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

According to RSS-102 §5.2.2 table 3, SAR basic restrictions limits (100 kHz to 6 GHz).

Body region	Uncontrolled environment average SAR (W/kg)	Controlled environment average SAR (W/kg)	Averaging time (minutes)	Averaging mass (g)
Whole body	0.08	0.4	6	whole body
Localized head, neck and trunk	1.6	8	6	1
Localized limbs	4	20	6	10

Measurement Result: Compliance.

Please refer to FCC SAR Report: 2504Y12371E-SAA and IC SAR Report: 2504Y12371E-SAB.

ANTENNA REQUIREMENT

Applicable Standard

According to 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

And according to FCC 47 CFR section 15.407 (a), if the transmitting antennas of directional gain greater than 6dBi are used, the transmit power and power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to RSS-GEN §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.

Antenna Connector Construction

The EUT has one internal antenna arrangements for 5G Wi-Fi, which were permanently attached. Please refer to the EUT photos.

Frequency Range	Type	Antenna Gain#	Impedance
5150-5250MHz	FPC	-2.4 dBi	50Ω
5250-5350MHz	FPC	-2.4 dBi	50Ω
5470-5725MHz	FPC	-2.4 dBi	50Ω
5725-5850MHz	FPC	-2.4 dBi	50Ω

Result: Compliance

AC POWER LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.207, §15.407(b) (9) and RSS-GEN §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 Lines Conducted Emission Limits		
Frequency range (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

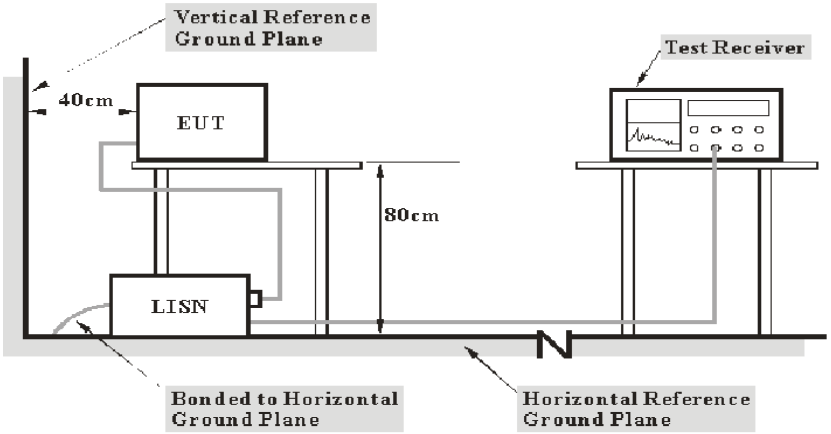
Note 1: The level decreases linearly with the logarithm of the frequency.

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.

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 C63.10-2020 measurement procedure. The specification used was with the FCC Part 15.207 and 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.

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

Test Procedure

During the conducted emission test, the adapter was connected to the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

Factor = LISN VDF + Cable Loss + 10dB Attenuation(Limiter)

The "**Over limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

Over Limit = Level - Limit
Level = Read Level + Factor

Test Data

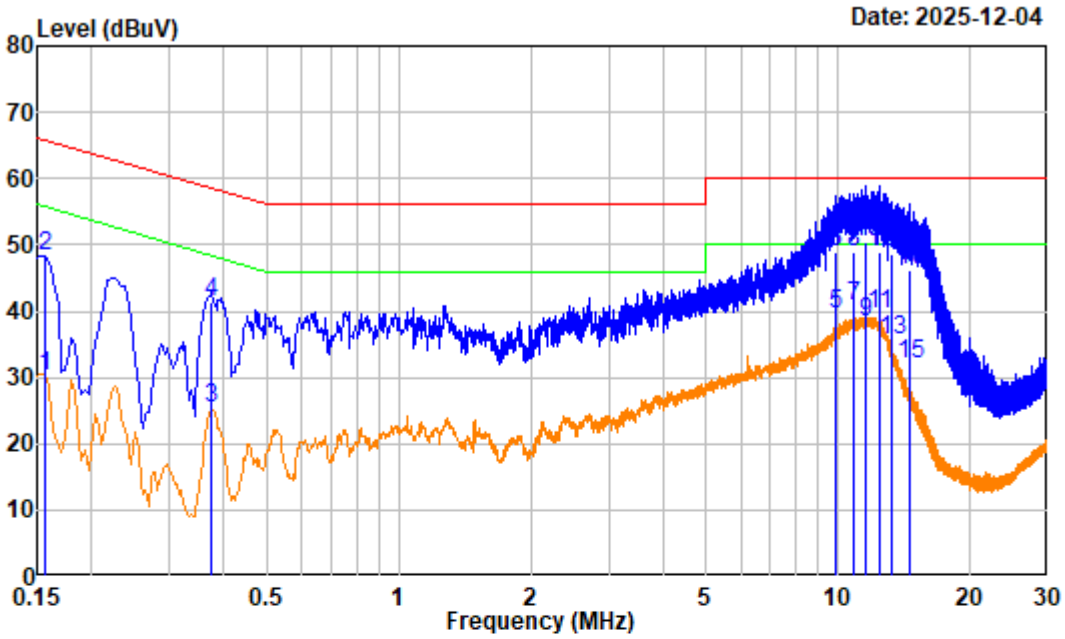
Environmental Conditions

Temperature:	23. 6℃
Relative Humidity:	35 %
ATM Pressure:	100.9 kPa
Test Engineer:	Jason Fan
Test Date:	2025-12-04
EUT Operation Mode:	5G WIFI Transmitting

Test Result: Compliance, please refer to the below data.

Note: The pre-scan maximum output power mode and channel: 5G WiFi B4 802.a Low Channel was tested.

AC 120V/60Hz, Line:

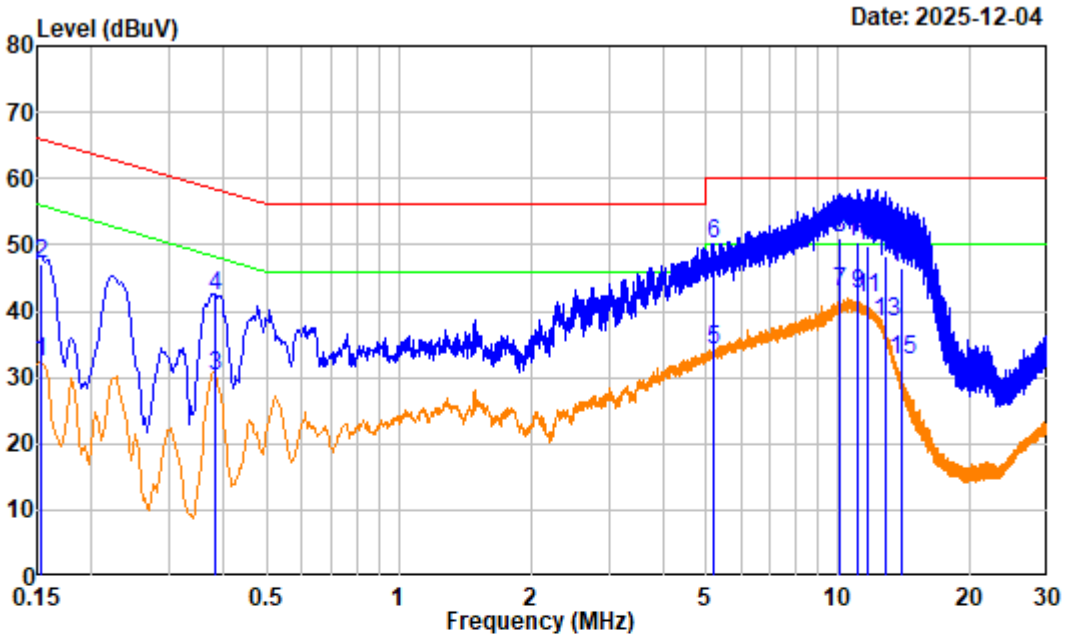


Site : Shielding Room
Condition : Line
Job No. : 2504Y12371E-RF
Test Mode : Test mode 1
Tester : Jason Fan
Receiver Setting: IF B/W 9kHz PK/AV

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.156	19.94	10.39	30.33	55.67	-25.34	Average
2	0.156	19.94	28.33	48.27	65.67	-17.40	QP
3	0.375	20.04	5.39	25.43	48.39	-22.96	Average
4	0.375	20.04	21.33	41.37	58.39	-17.02	QP
5	9.825	22.74	16.68	39.42	50.00	-10.58	Average
6	9.825	22.74	26.25	48.99	60.00	-11.01	QP
7	10.851	22.92	17.79	40.71	50.00	-9.29	Average
8	10.851	22.92	26.04	48.96	60.00	-11.04	QP
9	11.550	23.02	15.39	38.41	50.00	-11.59	Average
10	11.550	23.02	27.33	50.35	60.00	-9.65	QP
11	12.441	23.15	16.45	39.60	50.00	-10.40	Average
12	12.441	23.15	25.90	49.05	60.00	-10.95	QP
13	13.182	23.25	12.38	35.63	50.00	-14.37	Average
14	13.182	23.25	25.33	48.58	60.00	-11.42	QP
15	14.610	23.43	8.68	32.11	50.00	-17.89	Average

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
16	14.610	23.43	22.62	46.05	60.00	-13.95	QP

AC 120V/60Hz, Neutral:



Site : Shielding Room
Condition : neutral
Job No. : 2504Y12371E-RF
Test Mode : Test mode 1
Tester : Jason Fan
Receiver Setting: IF B/W 9kHz PK/AV

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.153	19.87	12.38	32.25	55.84	-23.59	Average
2	0.153	19.87	27.33	47.20	65.84	-18.64	QP
3	0.381	19.95	10.39	30.34	48.26	-17.92	Average
4	0.381	19.95	22.33	42.28	58.26	-15.98	QP
5	5.181	21.75	12.38	34.13	50.00	-15.87	Average
6	5.181	21.75	28.33	50.08	60.00	-9.92	QP
7	10.044	22.91	19.99	42.90	50.00	-7.10	Average
8	10.044	22.91	28.20	51.11	60.00	-8.89	QP
9	11.055	23.07	19.55	42.62	50.00	-7.38	Average
10	11.055	23.07	27.32	50.39	60.00	-9.61	QP
11	11.658	23.15	18.82	41.97	50.00	-8.03	Average
12	11.658	23.15	26.53	49.68	60.00	-10.32	QP
13	12.795	23.30	15.01	38.31	50.00	-11.69	Average
14	12.795	23.30	24.94	48.24	60.00	-11.76	QP
15	13.890	23.43	9.15	32.58	50.00	-17.42	Average

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
16	13.890	23.43	23.14	46.57	60.00	-13.43	QP

UNWANTED EMISSION FREQUENCIES AND RESTRICTED BANDS

Applicable Standard

According to FCC §15.407 (b); §15.209; §15.205,

(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 in the 5.725-5.85 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.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209.

According to RSS-GEN §8.10 & RSS-247 §7.3

7.3.1.3 Unwanted emission limits, frequency band 5150-5250 MHz

a. all emissions outside the 5150-5350 MHz band shall not exceed -27 dBm/MHz peak e.i.r.p. spectral density;

b. any unwanted emissions that falls between the upper edge of the 26 dB bandwidth and 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.

c. 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 DFS (see section 7.3.6) and TPC, on the portion of the emission that resides in the 5250-5350 MHz band.

7.3.2.3 Unwanted emission limits, frequency band 5250-5350 MHz

Devices shall comply with the following:

a. all emissions outside the band 5150-5350 MHz shall not exceed -27 dBm/MHz peak e.i.r.p spectral density.

b. all emissions inside the band 5150-5250 MHz shall either:

i. not exceed -27 dBm/MHz peak e.i.r.p spectral density, or

ii. comply with the power spectral density for operation in section 7.3.1.2.

7.3.3.3 Unwanted emission limits, Frequency band 5470-5725 MHz

Equipment operating in the bands 5470-5725 MHz shall comply with the following unwanted emission limits:

a. for devices with fundamental emissions fully contained within the 5470-5725 MHz band, all unwanted emissions outside the band 5470-5725 MHz shall not exceed -27 dBm/MHz peak e.i.r.p. spectral density.

b. for devices with bandwidth overlapping the band edge of 5725 MHz, all unwanted emissions shall not exceed -27 dBm/MHz peak e.i.r.p. spectral density at 5850 MHz instead of 5725 MHz.

7.3.4.4 Unwanted emission limits, Frequency band 5725-5850 MHz

Equipment operating in the band 5725-5850 MHz shall comply with the following peak e.i.r.p. spectral density limits:

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;

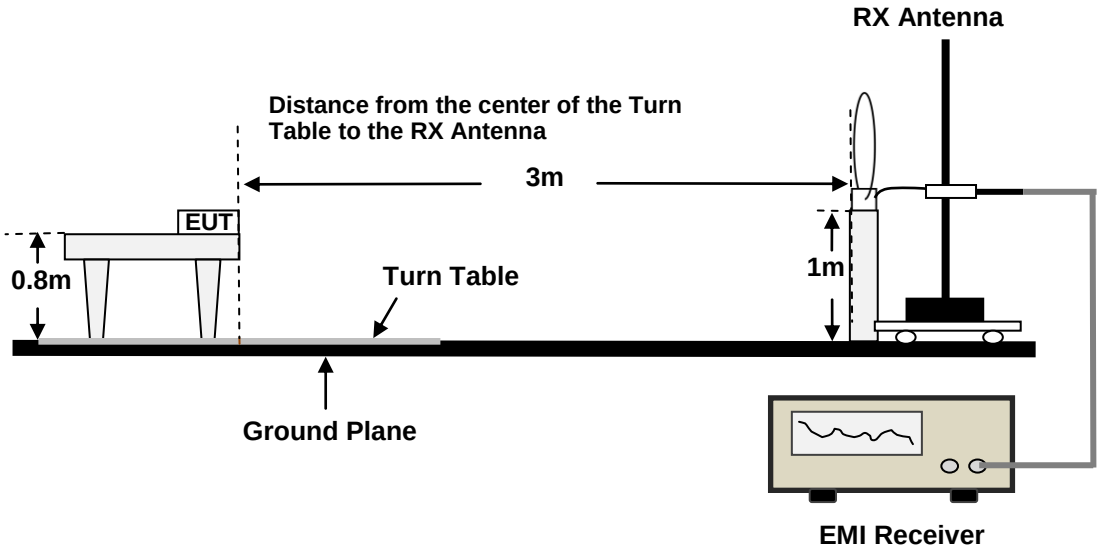
c. 10 dBm/MHz at 25 MHz above or below the band edges decreasing linearly to -27 dBm/MHz at 75 MHz above or below the band edges; and

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

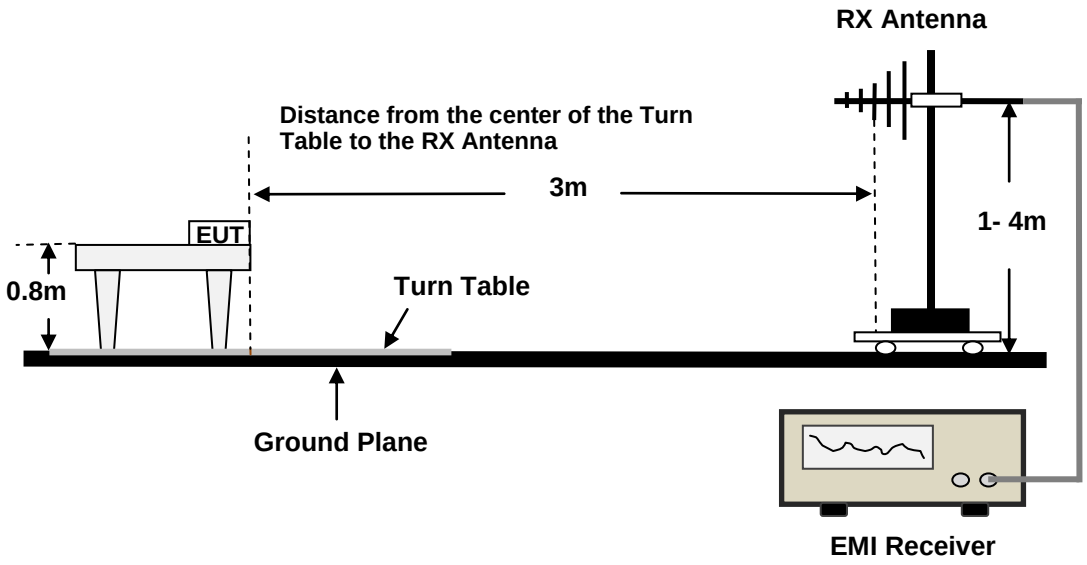
For the spurious emission below 30MHz, the unit of final result on the test plots are dBμV/m, so the limit should be added by 51,5 dB from dBμA/m to dBμV/m.

EUT Setup

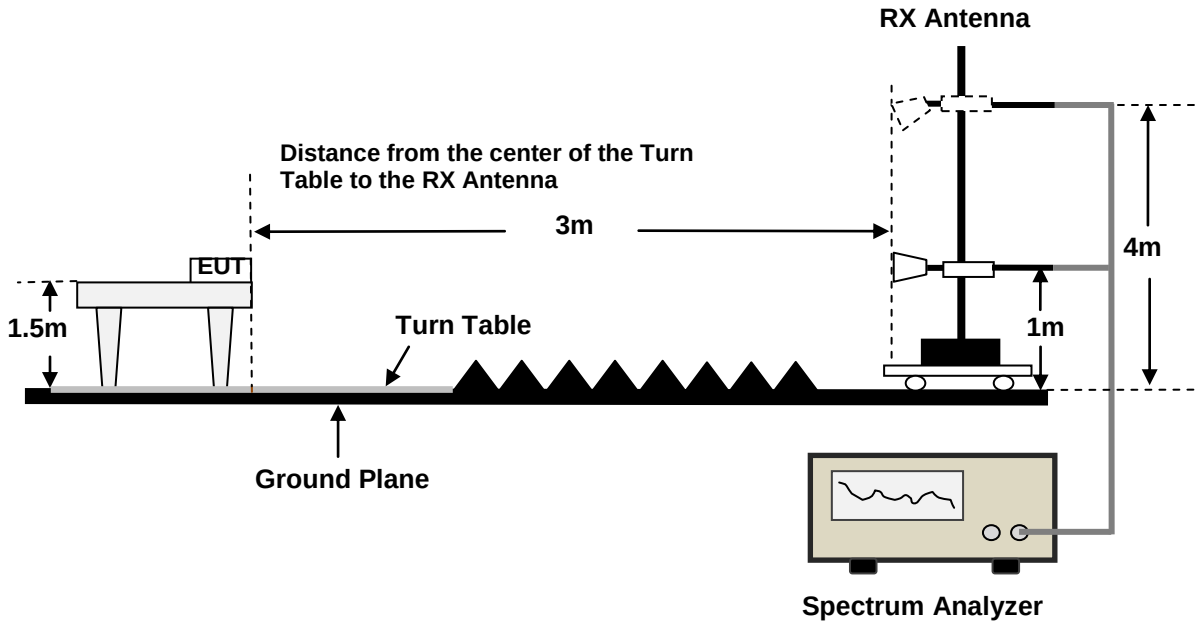
9kHz - 30MHz:



30MHz - 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209, FCC 15.407, RSS-Gen and RSS-247 limits.

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

EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9kHz to 40GHz.

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

9kHz - 1000MHz:

Frequency Range	Measurement	RBW	Video B/W	IF B/W	Detector
9kHz - 150kHz	PK	0.3kHz	1kHz	/	PK
	QP/AV	/	/	200Hz	QP/AV
150kHz - 30MHz	PK	10kHz	30kHz	/	PK
	QP/AV	/	/	9kHz	QP/AV
30MHz - 1000MHz	PK	100kHz	300kHz	/	PK
	QP	/	/	120kHz	QP

1GHz - 40GHz:
Pre-scan:

Measurement	Detector	Duty cycle	RBW	Video B/W
PK	Peak	Any	1MHz	3MHz
Ave.	Peak	>98%	1MHz	3kHz/5kHz
		<98%	1MHz	≥1/T, no less than 3kHz

Final measurement for emission identified during the pre-scan:

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

Note 1: T is minimum transmission duration
Note 2: The 1GHz-18GHz testing use the notch filter.
Note 3: The band edge testing use 10dB attenuator.
Note 4: The filters and attenuators are all integrated within the filter switch unit.

Test Procedure

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

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

Note 1: If the maximized peak measured value is under the QP/Average limit by more than 6dB, then it is unnecessary to perform an QP/Average measurement.
Note 2: For above 1GHz, the test result of peak was 20dB below to the limit of peak, which can be compliant to the average limit, so just peak value was recorded.

Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

For Radiated Spurious Emissions, after pre-scan in the X, Y and Z axes of orientation, the worst case as setup photos was recorded.

9kHz-1GHz

Environmental Conditions

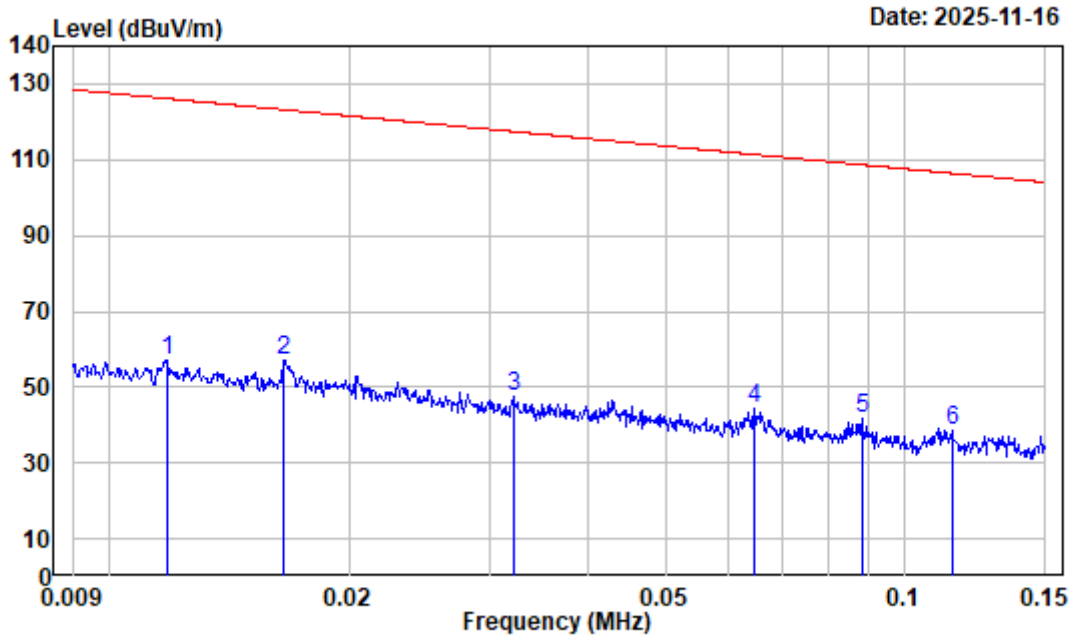
Temperature:	24.8 ℃
Relative Humidity:	55 %
ATM Pressure:	101.1 kPa
Test Engineer:	Colin Lin
Test Date:	2025-11-16
EUT Operation Mode:	5G WIFI Transmitting

Test Result: Compliance, please refer to the below data.

Note 1: The Loop Antenna were tested in parallel, perpendicular, and ground-parallel. The worst orientation was parallel and the data was recorded in report.

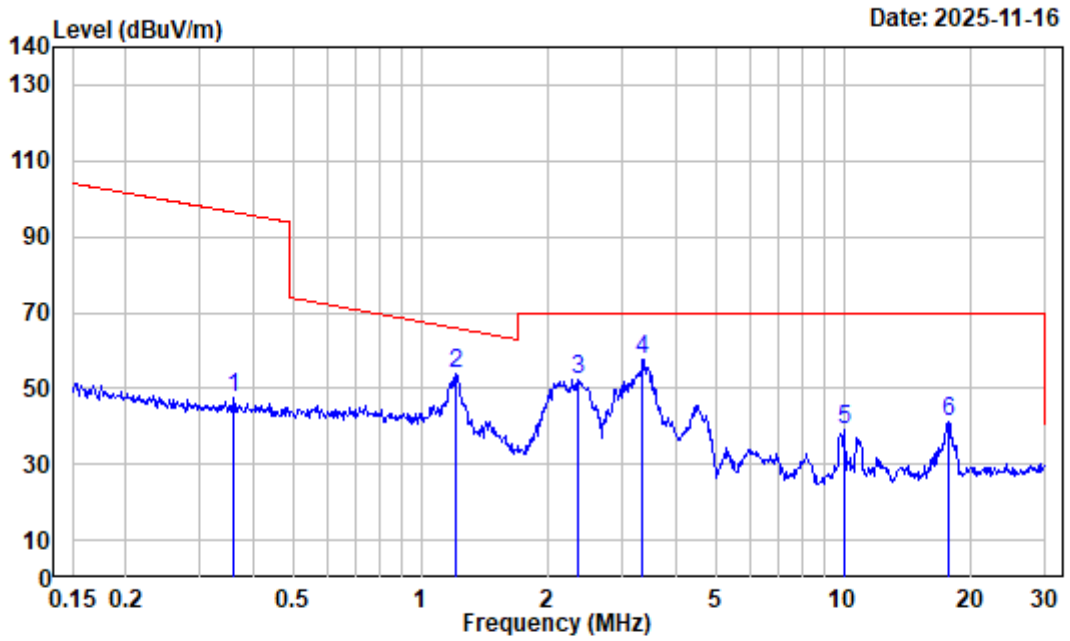
Note 2: The pre-scan maximum output power mode and channel: 5G WiFi B4 802.a Low Channel 5745MHz was tested.

9kHz~30MHz:



Site : Chamber
Condition : 3m
Job No. : 2504Y12371E-RF
Polarization : Parallel Tester: Colin Lin
Test Mode : Test Mode 1
Receiver Setting: RBW:300Hz VBW:1kHz

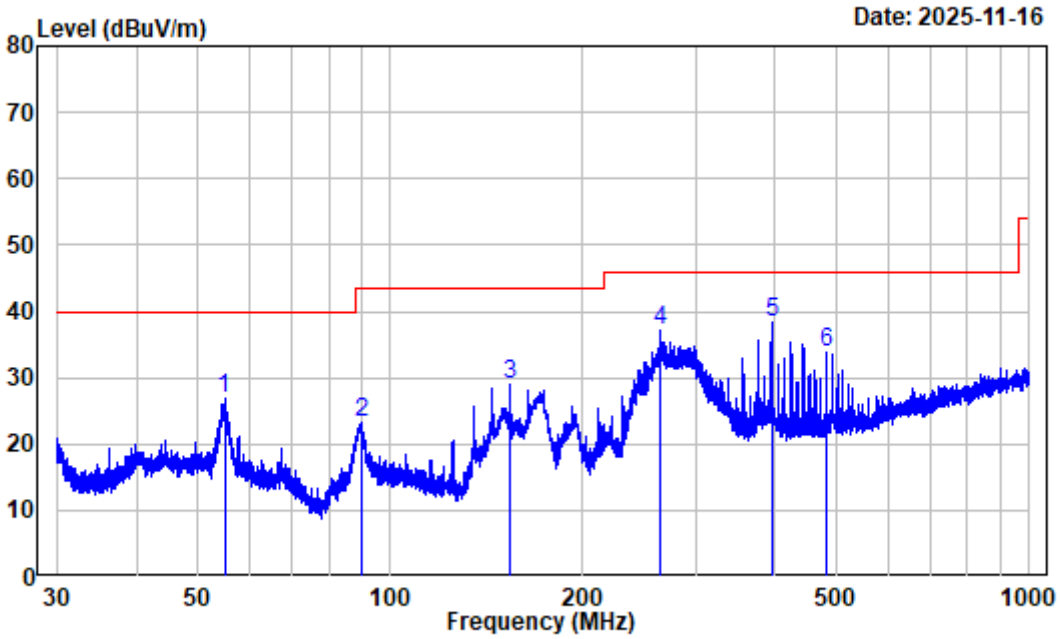
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.012	35.02	22.05	57.07	126.15	-69.08	Peak
2	0.017	32.92	24.14	57.06	123.22	-66.16	Peak
3	0.032	26.50	20.87	47.37	117.45	-70.08	Peak
4	0.065	20.72	23.77	44.49	111.39	-66.90	Peak
5	0.088	17.65	23.88	41.53	108.68	-67.15	Peak
6	0.114	15.78	22.74	38.52	106.43	-67.91	Peak



Site : Chamber
Condition : 3m
Job No. : 2504Y12371E-RF
Polarization : Parallel Tester: Colin Lin
Test Mode : Test Mode 1
Receiver Setting: RBW:10kHz VBW:30kHz

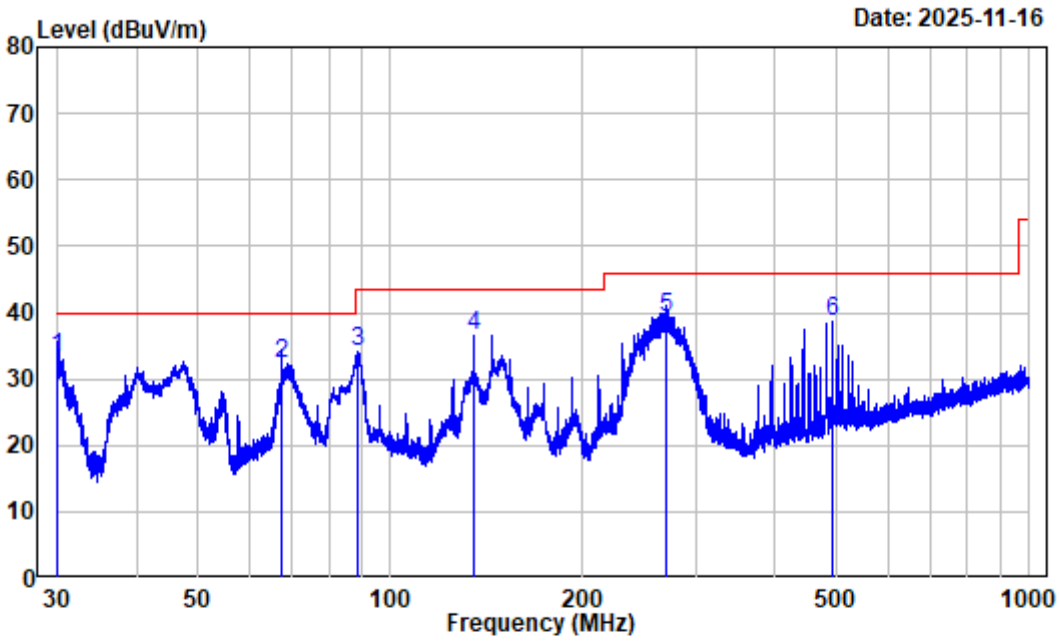
	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	0.361	6.04	41.55	47.59	96.44	-48.85	Peak
2	1.210	-2.58	56.67	54.09	65.78	-11.69	Peak
3	2.346	-5.53	57.77	52.24	69.54	-17.30	Peak
4	3.346	-5.99	63.55	57.56	69.54	-11.98	Peak
5	10.072	-5.33	44.25	38.92	69.54	-30.62	Peak
6	17.661	-3.82	44.89	41.07	69.54	-28.47	Peak

30MHz~1GHz:



Site : Chamber
Condition : 3m HORIZONTAL
Job No. : 2504Y12371E-RF Tester: Colin Lin
Test Mode : Test Mode 1
Receiver Setting: RBW:100kHz VBW:300kHz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	54.955	-10.69	37.64	26.95	40.00	-13.05	Peak
2	90.023	-13.65	36.80	23.15	43.50	-20.35	Peak
3	154.076	-14.55	43.58	29.03	43.50	-14.47	Peak
4	264.746	-9.96	47.12	37.16	46.00	-8.84	Peak
5	394.855	-6.18	44.41	38.23	46.00	-7.77	Peak
6	481.582	-4.33	38.16	33.83	46.00	-12.17	Peak



Site : Chamber
Condition : 3m VERTICAL
Job No. : 2504Y12371E-RF Tester: Colin Lin
Test Mode : Test Mode 1
Receiver Setting: RBW:100kHz VBW:300kHz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	30.066	-11.78	45.08	33.30	40.00	-6.70	QP
2	67.379	-13.44	45.78	32.34	40.00	-7.66	QP
3	88.730	-14.08	48.24	34.16	43.50	-9.34	Peak
4	134.854	-14.45	51.05	36.60	43.50	-6.90	Peak
5	270.612	-9.70	48.84	39.14	46.00	-6.86	QP
6	491.175	-3.97	42.63	38.66	46.00	-7.34	Peak

About 1GHz-40GHz test data, please refer to the Attachment of "2504Y12371E-RFD-Appendix A".

EMISSON BANDWIDTH

Applicable Standard

According to FCC §15.407(a),

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

According to FCC §15.407(e),

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

According to RSS-GEN §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.

According to RSS-247 §7.3,

Equipment is required to comply with the provisions outlined in RSS-Gen regarding emissions that fall within restricted frequency bands, as specified in that document. If the transmission is in bursts, the provisions of RSS-Gen for pulsed operation shall apply.

Unwanted emissions shall be measured using the outermost carrier frequencies or channels, and the center frequencies of these carriers or channels must be clearly identified in the test report.

According to RSS-247 §7.3.4.2,

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

Test Procedure

According to ANSI C63.10-2020 §12.5,

12.5.1 Emission bandwidth for the band 5.725 GHz to 5.85 GHz

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max-hold.
e) Sweep = No faster than coupled (auto) time.
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 above.

12.5.2 Emission bandwidth for all other bands

a) Set RBW = shall be in the range of 1% to 5% 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 in the range of 1% to 5%.

NOTE-The automatic bandwidth measurement capability of a spectrum analyzer or an EMI receiver may be employed if it implements the functionality described in the preceding items.

12.5.3 Occupied bandwidth

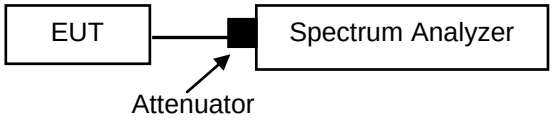
See 6.9.3 for the measurement procedure for OBW. (as below)
The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission.
The following procedure shall be used for 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 at least 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 4.1.6.2.
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 spectral 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).

According to RSS-GEN § 6.7,

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).



Note: Offset = RF cable loss(1.0dB[#]) + Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Attachment of “2504Y12371E-RFD-Appendix B”.

TRANSMITTER OUTPUT POWER

Applicable Standard

According to FCC §15.407(a),

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.

For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

For an outdoor 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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.

For the band 5.725-5.85 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.

According to RSS-247 §7.3,

7.3.1.2 Power limits, frequency band 5150-5250 MHz

(1) For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed the lesser of:

30 mW; or 1.76 + 10 $\log_{10}$B, dBm.

(2) OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 mW shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

(3) For all other devices the maximum e.i.r.p. spectral density shall not exceed 10 dBm/MHz. The maximum e.i.r.p. shall not exceed the lesser of:

200 mW; or 10 + 10 $\log_{10}$B, dBm.

7.3.2.2 Power limits, frequency band 5250-5350 MHz

(1) For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed the lesser of:

30 mW; or 1.76 + 10 $\log_{10}$B, dBm.

(2) OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 mW shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

(3) All other devices shall comply with the following:

a. the maximum power spectral density shall not exceed 11 dBm/MHz and the maximum conducted output power shall not exceed the lesser of:

250 mW; or 11 + 10 $\log_{10}$B, dBm.

b. the maximum e.i.r.p. shall not exceed the lesser of:

1.0 W; or 17 + 10 log10B, dBm.

c. 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.

7.3.3.2 Power limits, frequency band 5470-5725 MHz

Equipment operating in the band 5470-5725 MHz band shall comply with the following power limits:

a. the maximum conducted output power shall not exceed the lesser of:

250 mW; or 11 + 10 $\log_{10}$B, dBm.

b. the maximum power spectral density shall not exceed 11 dBm/MHz.

c. the maximum e.i.r.p. shall not exceed the lesser of:

1.0 W; or 7 + 10 $\log_{10}$B, dBm.

d. equipment 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.

7.3.4.3 Power limits, frequency band 5725-5850 MHz

Equipment operating in the band 5725-5850 shall comply with the following power limits:

a. the maximum conducted output power shall not exceed 1 W; and

b. the maximum output power spectral density shall not exceed 30 dBm/500 kHz.

When using transmitting antennas with a directional gain exceeding 6 dBi, 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.

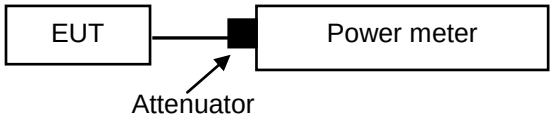
However, FPTP devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter maximum conducted output power and the power spectral density. FPTP operations exclude the use of PTMP systems, omnidirectional applications and multiple collocated transmitters transmitting the same information. However, remote stations of PTMP systems shall be permitted to operate at e.i.r.p. greater than 4 W under the same conditions as for FPTP systems.

Test Procedure

According to ANSI C63.10-2020 §12.4.3.2 Method PM-G,

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.



Note: Offset = RF cable loss(1.0dB$^{\#}$) + Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Attachment of “2504Y12371E-RFD-Appendix B”.

POWER SPECTRAL DENSITY

Applicable Standard

According to FCC §15.407(a),

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.

For client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

For an outdoor 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

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.

For the band 5.725-5.85 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.

According to RSS-247 §7.3,

7.3.1.2 Power limits, frequency band 5150-5250 MHz

(1) For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed the lesser of:

30 mW; or 1.76 + 10 $\log_{10}$B, dBm.

(2) OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 mW shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

(3) For all other devices the maximum e.i.r.p. spectral density shall not exceed 10 dBm/MHz. The maximum e.i.r.p. shall not exceed the lesser of:

200 mW; or 10 + 10 $\log_{10}$B, dBm.

7.3.2.2 Power limits, frequency band 5250-5350 MHz

(1) For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed the lesser of:

30 mW; or 1.76 + 10 $\log_{10}$B, dBm.

(2) OEM devices installed in vehicles with a maximum e.i.r.p. greater than 15 mW shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

(3) All other devices shall comply with the following:

a. the maximum power spectral density shall not exceed 11 dBm/MHz and the maximum conducted output power shall not exceed the lesser of:

250 mW; or 11 + 10 $\log_{10}$B, dBm.

b. the maximum e.i.r.p. shall not exceed the lesser of:

1.0 W; or 17 + 10 log10B, dBm.

c. 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.

7.3.3.2 Power limits, frequency band 5470-5725 MHz

Equipment operating in the band 5470-5725 MHz band shall comply with the following power limits:

a. the maximum conducted output power shall not exceed the lesser of:

250 mW; or 11 + 10 $\log_{10}$B, dBm.

b. the maximum power spectral density shall not exceed 11 dBm/MHz.

c. the maximum e.i.r.p. shall not exceed the lesser of:

1.0 W; or 7 + 10 $\log_{10}$B, dBm.

d. equipment 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.

7.3.4.3 Power limits, frequency band 5725-5850 MHz

Equipment operating in the band 5725-5850 shall comply with the following power limits:

a. the maximum conducted output power shall not exceed 1 W; and

b. the maximum output power spectral density shall not exceed 30 dBm/500 kHz.

When using transmitting antennas with a directional gain exceeding 6 dBi, 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, FPTP devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter maximum conducted output power and the power spectral density. FPTP operations exclude the use of PTMP systems, omnidirectional applications and multiple collocated transmitters transmitting the same information. However, remote stations of PTMP systems shall be permitted to operate at e.i.r.p. greater than 4 W under the same conditions as for FPTP systems.

Test Procedure

According to ANSI C63.10-2020 §12.6

Notwithstanding that some regulatory requirements refer to peak power spectral density (PPSD), in some cases the intent is to measure the maximum value of the time average of the power spectral density during a period of continuous transmission. The procedure for this method is as follows:

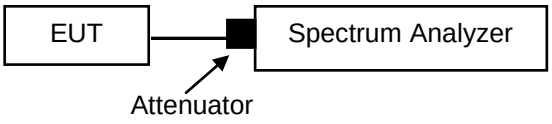
a) Create an average power spectrum for the EUT operating mode being tested by following the instructions in 12.4.2 for measuring maximum conducted output power using a spectrum analyzer or EMI receiver; that is, select the appropriate test method (SA-1, SA-2, SA-3, or their respective alternatives) and apply it up to, but not including, the step labeled, “Compute power….” (This procedure is required even if the maximum conducted output power measurement was performed using the power meter method PM.)

b) Use the peak search function on the instrument to find the peak of the spectrum.

c) Make the following corrections to the peak value of the spectrum, if applicable:
   1) If method SA-2 or SA-2A was used, then add [10 log (1 / D)], where D is the duty cycle, to the peak of the spectrum.
   2) If method SA-3A was used and the linear mode was used in step h) of 12.4.2.7, add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.

d) The result is the PPSD.

e) The procedure in item a) through item c) requires the use of 1 MHz resolution bandwidth to satisfy the 1 MHz measurement bandwidth specified by some regulatory authorities.85 This requirement also permits use of resolution bandwidths less than 1 MHz “provided that the measured power is integrated to show the total power over the measurement bandwidth” (i.e., 1 MHz). If measurements are performed using a reduced resolution bandwidth and integrated over 1 MHz bandwidth, the following adjustments to the procedures apply:
   1) Set RBW ≥ 1 / T, where T is defined in 12.2 a).
   2) Set VBW ≥ [3 × RBW].
   3) Care shall be taken such that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.



Note: Offset=RF cable loss(1.0dB[#])+ Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Attachment of “2504Y12371E-RFD-Appendix B”.

ADDITIONAL REQUIREMENTS

Applicable Standard

According to RSS-247 Clause 7.3.7 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. any devices capable of operating in the band 5150–5250 MHz shall only be used indoors to reduce the potential for harmful interference to co-channel mobile satellite systems (this requirement does not apply to OEM devices installed in vehicles by vehicle manufacturers);

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 7.3.2.4 or 7.3.5.3 shall be clearly indicated.

Result

Pass

(1) RSS-247 Clause 7.3.7 a):
The device shall automatically discontinue transmission in cases of absence of information to transmit, or operation failure. Please refer to declaration.

(2) RSS-247 Clause 7.3.7 b):
The device must contain security features to protect against modification of software by unauthorized parties. Please refer to declaration.

(3) RSS-247 Clause 7.3.7 c):

i). The device capable of operating in the band 5150–5250 MHz shall only be used indoors to reduce the potential for harmful interference to co-channel mobile satellite systems.

ii). The antenna permanently attached to the unit, the device operates on bands 5250-5350 MHz and 5470-5725 MHz, and the EIRP compliance with RSS-247 requirement. Please refer to the conducted output power test result.

iii). The antenna permanently attached to the unit, and all the EIRP 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.

DUTY CYCLE

Test Procedure

According to ANSI C63.10-2020 Section 12.2:

The following procedure shall be used for determining duty cycle, transmission duration, and maximum power control level for U-NII devices:

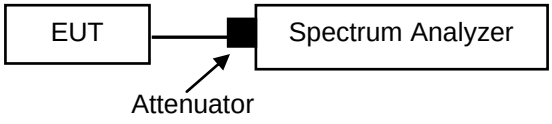
a) All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, D, and maximum-power transmission duration, T, are required for each tested mode of operation:

1) T refers to the minimum transmission duration over which the transmitter is ON and is transmitting at its maximum power control level for the tested mode of operation.
2) Duty cycle (D), as used in this clause, refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level.
3) The term “maximum power control level” is intended to distinguish between operating power levels of the EUT and differences in power levels of individual symbols that occur with some modulation types, such as quadrature amplitude modulation (QAM). During testing, the EUT is not required to transmit continuously with its highest possible symbol power level. Rather, it shall transmit all of the symbols, and shall do so at the highest power control level (i.e., highest operating power level) of the EUT.

b) Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

1) A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the ON and OFF times of the transmitted signal.

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:
i) Set the center frequency of the instrument to the center frequency of the transmission.
ii) Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value.
iii) Set VBW ≥ RBW.
iv) Set detector = peak.
v) The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in item a1) of 12.2, 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 duty cycle shall not be used if T ≤ 16.7 μs.



Note: Offset=RF cable loss(1.0dB#)+ Attenuator(10dB)

Test Data

Test Result: Compliance. Please refer to the Attachment of “2504Y12371E-RFD-Appendix B”.

EXHIBIT A-EUT PHOTOGRAPHS

For FCC, please refer to the Attachment No.1 2504Y12371E-RF-00 EUT External Photos and Attachment No.2 2504Y12371E-RF EUT Internal Photos.

For IC, please refer to the Attachment No.8 2504Y12371E-RF-08 EUT External Photos and Attachment No.2 2504Y12371E-RF EUT Internal Photos.

EXHIBIT B-TEST SETUP PHOTOGRAPHS

Please refer to the Attachment No.4 2504Y12371E-RFB Test Photos.

******* END OF REPORT *******