

TEST REPORT

Applicant: Fujian Newland Payment Technology Co.,Ltd.

Address: No. B602, Building #1, Haixia Jingmao Plaza, Fuzhou Bonded Area 350015, Fujian, China

Product Name: Multi-mode Smart LTE Module

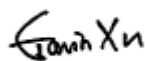
FCC ID: 2AM6U-SC200ENA

Standard(s): 47 CFR Part 15, Subpart C(15.247)
ANSI C63.10-2013
KDB 558074 D01 15.247 Meas Guidance v05r02

Report Number: 2402U80022E-RF-00B

Report Date: 2024/7/26

The above device has been tested and found compliant with the requirement of the relative standards by Bay Area Compliance Laboratories Corp. (Dongguan).



Reviewed By: Gavin Xu
Title: RF Engineer



Approved By: Ivan Cao
Title: EMC Manager

Bay Area Compliance Laboratories Corp. (Dongguan)
No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China

Tel: +86-769-86858888

Fax: +86-769-86858891

www.baclcorp.com.cn

Note: The information marked ▲ is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report cannot be reproduced except in full, without prior written approval of the Company. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0. This report may contain data that are not covered by the accreditation scope and shall be marked with ★. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

CONTENTS

DOCUMENT REVISION HISTORY	4
1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 ACCESSORY INFORMATION	5
1.3 ANTENNA INFORMATION DETAIL▲	5
1.4 EQUIPMENT MODIFICATIONS	5
2. SUMMARY OF TEST RESULTS	6
3. DESCRIPTION OF TEST CONFIGURATION	7
3.1 OPERATION FREQUENCY DETAIL	7
3.2 EUT OPERATION CONDITION	7
3.3 SUPPORT EQUIPMENT LIST AND DETAILS	7
3.4 SUPPORT CABLE LIST AND DETAILS	8
3.5 BLOCK DIAGRAM OF TEST SETUP	9
3.6 TEST FACILITY	10
3.7 MEASUREMENT UNCERTAINTY	10
4. REQUIREMENTS AND TEST PROCEDURES	11
4.1 AC LINE CONDUCTED EMISSIONS	11
4.1.1 Applicable Standard	11
4.1.2 EUT Setup	12
4.1.3 EMI Test Receiver Setup	12
4.1.4 Test Procedure	13
4.1.5 Corrected Amplitude & Margin Calculation	13
4.1.6 Test Result	13
4.2 RADIATION SPURIOUS EMISSIONS	14
4.2.1 Applicable Standard	14
4.2.2 EUT Setup	14
4.2.3 EMI Test Receiver & Spectrum Analyzer Setup	16
4.2.4 Test Procedure	16
4.2.5 Corrected Result & Margin Calculation	16
4.2.6 Test Result	16
4.3 MAXIMUM CONDUCTED OUTPUT POWER	17
4.3.1 Applicable Standard	17
4.3.2 EUT Setup	17
4.3.3 Test Procedure	17
4.3.4 Test Result	17
4.4 DUTY CYCLE	18
4.4.1 EUT Setup	18
4.4.2 Test Procedure	18
4.4.3 Judgment	18
4.5 ANTENNA REQUIREMENT	19

4.5.1 Applicable Standard	19
4.5.2 Judgment	19
5. Test DATA AND RESULTS	20
5.1 AC LINE CONDUCTED EMISSIONS.....	20
5.2 RADIATION SPURIOUS EMISSIONS.....	23
5.3 SPOT CHECK WITH MAXIMUM CONDUCTED OUTPUT POWER	34
5.4 DUTY CYCLE:	35
APPENDIX A - EUT PHOTOGRAPHS	37
APPENDIX B - TEST SETUP PHOTOGRAPHS	38

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2402U80022E-RF-00B	Original Report	2024/7/26

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Multi-mode Smart LTE Module
EUT Model:	SC200E-NA
Operation Frequency:	2412-2462MHz (802.11b/g/n ht20) 2422-2452 MHz(802.11n ht40)
Maximum Peak Output Power (Conducted):	23.34 dBm
Modulation Type:	802.11b:DSSS-DBPSK, DQPSK, CCK 802.11g/n: OFDM-BPSK, QPSK, 16QAM, 64QAM
Rated Input Voltage:	DC 3.8V
Serial Number:	2MO7-2 (Radiated Spurious Emission and AC Line Conducted Emission Test) 2MO7-1(RF Conducted Test)
EUT Received Date:	2024/6/15
EUT Received Status:	Good

1.2 Accessory Information

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

1.3 Antenna Information Detail ▲

Antenna Manufacturer	Antenna Type	input impedance (Ohm)	Frequency Range	Antenna Gain
sunnyway	PIFA	50	2.4~2.5GHz	-1.48 dBi
The design of compliance with §15.203:				
☒ Unit uses a permanently attached antenna.				
☐ Unit uses a unique coupling to the intentional radiator.				
☐ Unit was professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.				

1.4 Equipment Modifications

No modifications are made to the EUT during all test items.

2. SUMMARY OF TEST RESULTS

Standard(s) Section	Test Items	Result	Note
§15.207(a)	AC Line Conducted Emissions	Compliant	/
§15.205, §15.209, §15.247(d)	Radiated Spurious Emissions	Compliant	/
§15.247 (a)(2)	Minimum 6 dB Bandwidth	/	*
§15.247(b)(3)	Maximum Conducted Output Power	Reporting	/
§15.247(d)	100 kHz Bandwidth Of Frequency Band Edge	/	*
§15.247(e)	Power Spectral Density	/	*
§15.203	Antenna Requirement	Compliant	/
Note 1: This is Class II permissive change application based on the Change ID device, model: SC200E-NA, FCC ID: 2AM6U-SC200ENA. The Change ID device based on the original device, model: SC200E-NA, FCC ID:XMR2022SC200ENA, which was tested by SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. The change between the original equipment and the current equipment is stated and guaranteed by the applicant, as following: 1. Change the antenna. 2. Change on NPT-04's components. Per Spot check with RF output power, the RF parameters are identical with the original device. Therefore, AC line conducted emissions and Radiated Spurious Emissions was tested based on the change. *:Please refer to Report No: SEWA2205000012RG04. The Bay Area Compliance Laboratories Corp. (Dongguan) is responsible for all the information provided in this report, except when information is provided by the customer as identified in this report. Note 2: For AC line conducted emissions, the maximum output power channel was tested. Note 3: For Radiated Spurious Emissions 9kHz~ 1GHz, the maximum output power channel was tested.			

3. DESCRIPTION OF TEST CONFIGURATION

3.1 Operation Frequency Detail For 802.11b/g/n ht20:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	/	/

For 802.11n ht40:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437	/	/

3.2 EUT Operation Condition

The system was configured for testing in Engineering Mode, which was provided by the manufacturer. The EUT configuration as below:

EUT Exercise Software:		QCA Radio Control Toolkit		
The software was provided by manufacturer. The maximum power was configured as below, that was provided by the manufacturer▲:				
Test Modes	Data Rate	Power Level Setting		
		Low Channel	Middle Channel	High Channel
802.11b	1Mbps	22	22	22
802.11g	6Mbps	22	22	22
802.11n ht20	MCS0	22	22	22
802.11n ht40	MCS0	22	22	22
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.				

3.3 Support Equipment List and Details

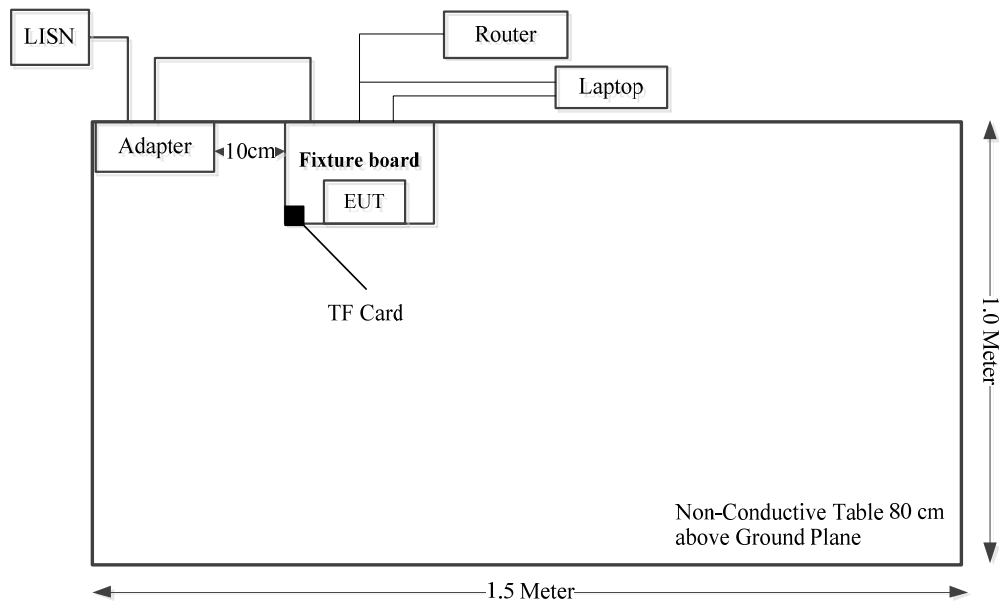
Manufacturer	Description	Model	Serial Number
SanDisk	TF Card	UHS-I-16G	9292DVDSV0XZ
ZIONCOM	Router	MB-R210-00	EMZBWR21103004
Lenovo	Laptop	T430	00331-10000-00001-AA887_02
SHENZHEN HONOR ELECTRONIC CO.,LTD	Adapter	ADS-25SGP-12 09023E	Unknown
Fujian Newland Payment Technology Co.,Ltd.	Fixture board	Unknown	Unknown

3.4 Support Cable List and Details

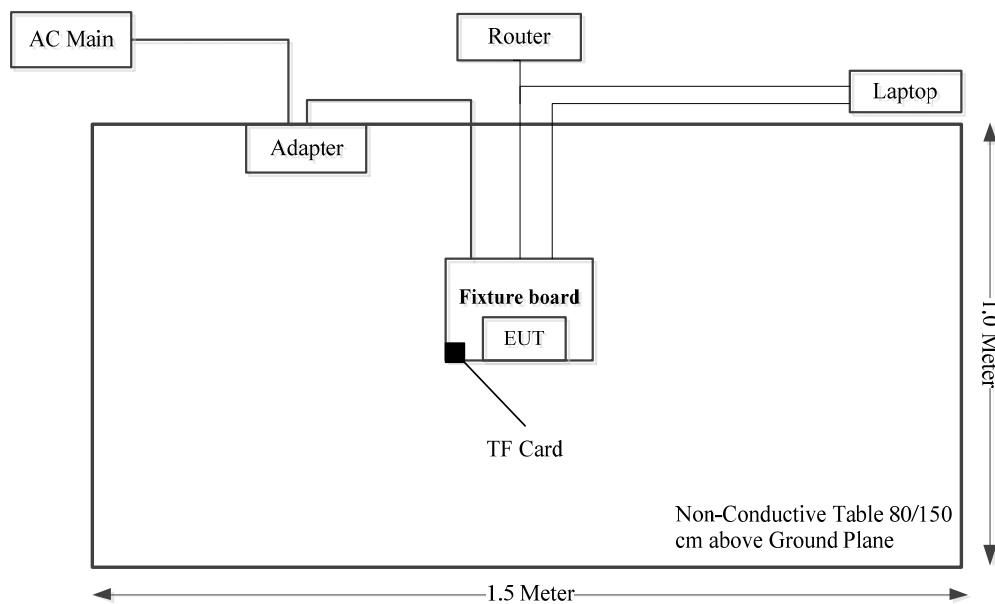
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
DC Cable	no	no	2.8	Adapter	EUT
RJ45 Cable	yes	no	2.3	EUT	Router
RS232 Cable	no	no	2.8	EUT	Laptop
USB Cable	no	no	2.3	EUT	Laptop
RJ45 Cable	yes	no	1.2	Router	Laptop

3.5 Block Diagram of Test Setup

AC Power Lines Conducted Emission:



Radiated Spurious Emissions:



3.6 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia 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. : 829273, the FCC Designation No. : CN5044.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

3.7 Measurement Uncertainty

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

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	9kHz~30MHz: 3.3dB, 30MHz~200MHz: 4.55 dB, 200MHz~1GHz: 5.92 dB, 1GHz~6GHz: 4.98 dB, 6GHz~18GHz: 5.89 dB, 18GHz~26.5GHz:5.47 dB, 26.5GHz~40GHz:5.63 dB
Unwanted Emissions, conducted	±2.47 dB
Temperature	±1 °C
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.11 dB (150 kHz to 30 MHz)

4. REQUIREMENTS AND TEST PROCEDURES

4.1 AC Line Conducted Emissions

4.1.1 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 μ H/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.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	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:

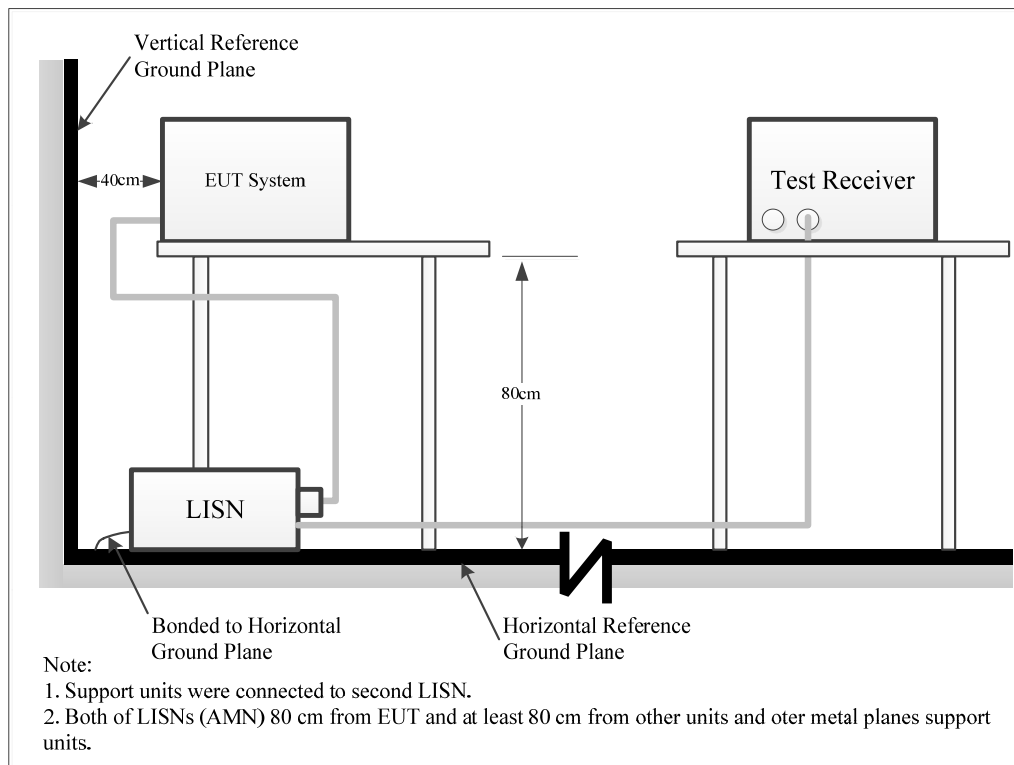
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 μ V within the frequency band 535-1705 kHz, as measured using a 50 μ H/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, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

4.1.2 EUT Setup



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

4.1.3 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

4.1.4 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.

4.1.5 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

4.1.6 Test Result

Please refer to section 5.1.

4.2 Radiation Spurious Emissions

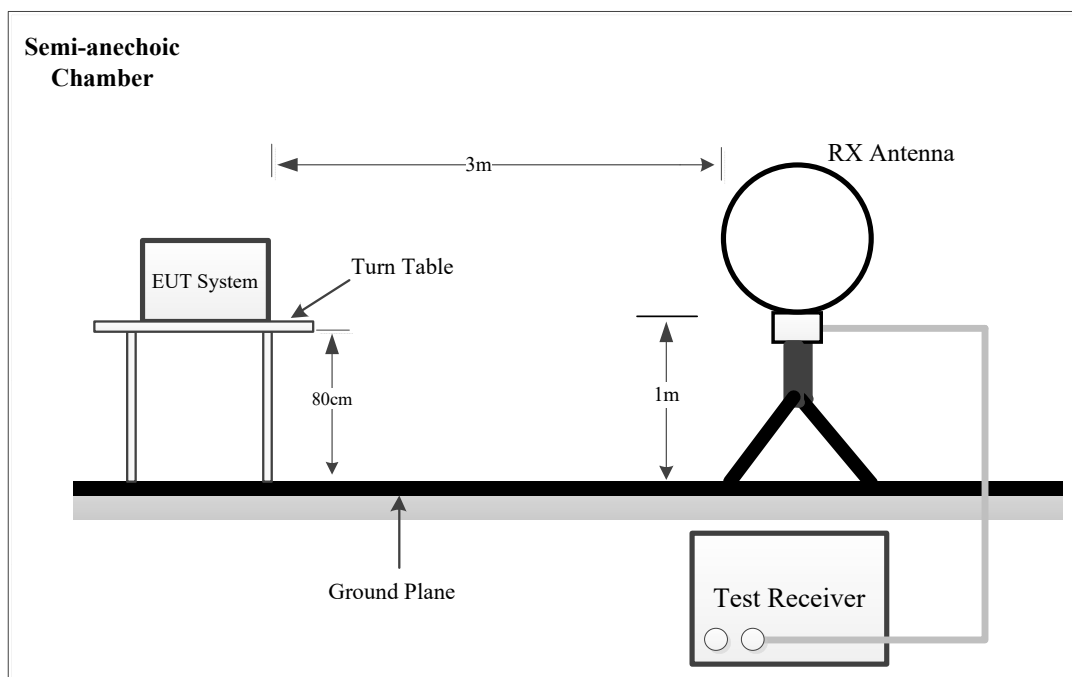
4.2.1 Applicable Standard

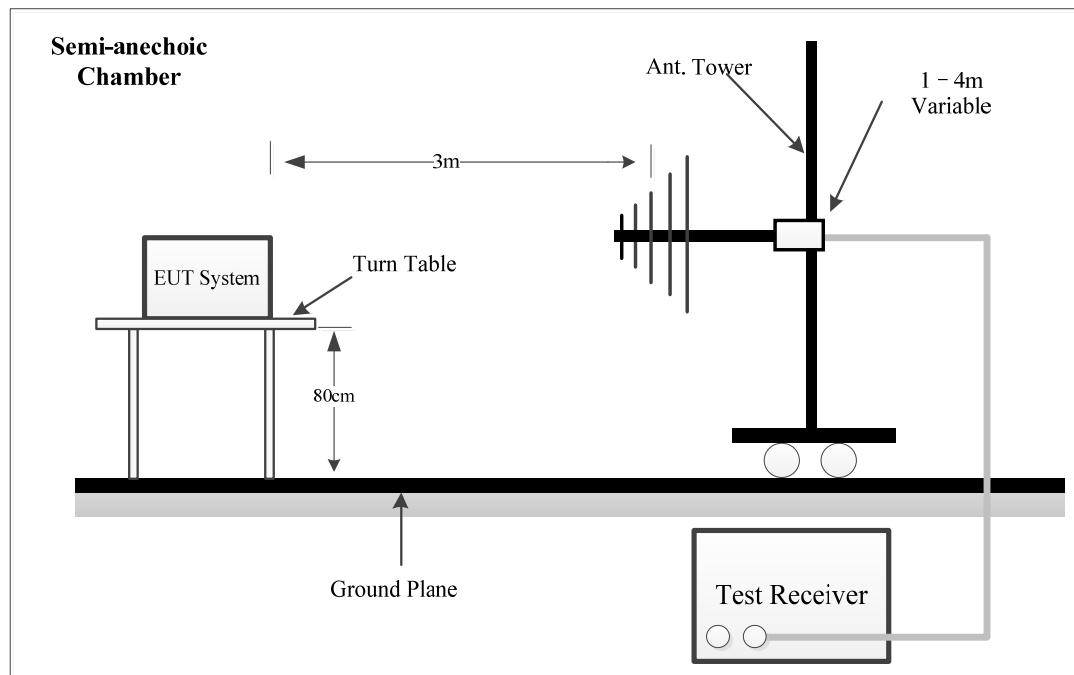
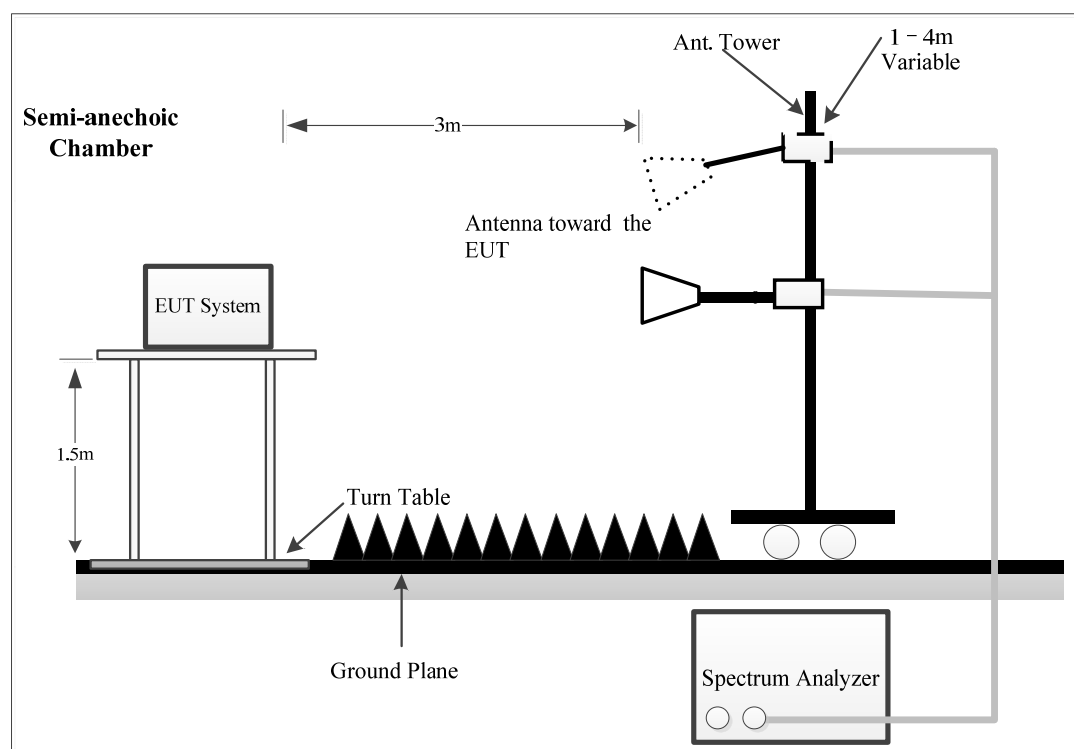
FCC §15.247 (d);

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

4.2.2 EUT Setup

9kHz~30MHz:



30MHz~1GHz:**Above 1GHz:**

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

For 9kHz-30MHz test, the lowest height of the magnetic antenna shall be 1 m above the ground and three antenna orientations (parallel, perpendicular, and ground-parallel) shall be measured.

4.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 25 GHz.

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

9kHz-1000MHz:

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

1GHz- 25GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
Ave.	>98%	1MHz	10 Hz
	<98%	1MHz	$\geq 1/T$

Note: T is minimum transmission duration

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

If the maximized peak measured value complies with under the Average limit, then it is unnecessary to perform an Average measurement.

4.2.4 Test Procedure

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

Data was recorded in Quasi-peak detection mode for frequency range of 9 kHz -1 GHz, except 9-90 kHz, 110-490 kHz, employing an average detector, peak and Average detection modes for frequencies above 1 GHz.

4.2.5 Corrected Result & Margin Calculation

The basic equation is as follows:

Result = Reading + Factor

Factor = Antenna Factor + Cable Loss- Amplifier Gain

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

Margin = Limit – Result

4.2.6 Test Result

Please refer to section 5.2.

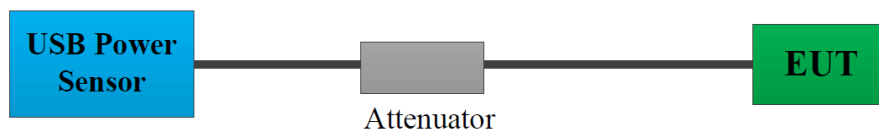
4.3 Maximum Conducted Output Power

4.3.1 Applicable Standard

FCC §15.247 (b)(3)

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

4.3.2 EUT Setup



A short RF cable with low cable loss connected to the EUT antenna port, which was provided by manufacturer. The cable loss of this RF cable was offset into the setting of test equipment, which was provided by manufacturer▲.

4.3.3 Test Procedure

According to ANSI C63.10-2013 Section 11.9.1.3

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.

- Set the EUT in transmitting mode.
- Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to test equipment.
- Add a correction factor to the display.
- Set the power meter to test peak output power, record the result.

According to ANSI C63.10-2013 Section 11.9.2.3.2

Method AVGPM-G is a measurement using a gated RF average power meter.

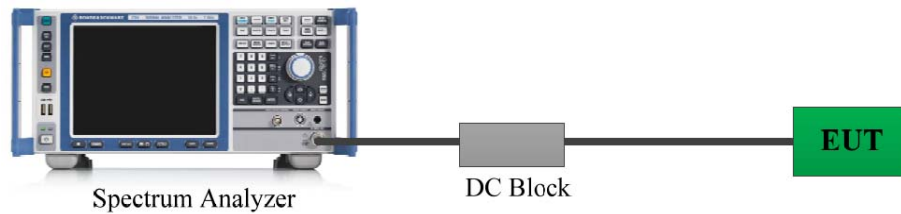
Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter,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

4.3.4 Test Result

Please refer to section 5.3.

4.4 Duty Cycle

4.4.1 EUT Setup



A short RF cable with low cable loss connected to the EUT antenna port, which was provided by manufacturer.

4.4.2 Test Procedure

According to ANSI C63.10-2013 Section 11.6

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the ON and OFF times of the transmitted signal:

- 1) Set the center frequency of the instrument to the center frequency of the transmission.
- 2) Set $RBW \geq OBW$ if possible; otherwise, set RBW to the largest available value.
- 3) Set $VBW \geq RBW$. 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 $T \leq 16.7 \mu s$.)

4.4.3 Judgment

Report Only. Please refer to section 5.4.

4.5 Antenna Requirement

4.5.1 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.

4.5.2 Judgment

Compliant. Please refer to the Antenna Information detail in Section 1.3.

5. Test DATA AND RESULTS

5.1 AC Line Conducted Emissions

Serial Number:	2MO7-2	Test Date:	2024/7/2
Test Site:	CE	Test Mode:	Transmitting
Tester:	Lane Sun	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	25.3	Relative Humidity: (%)	61	ATM Pressure: (kPa)	100.6
----------------------	------	------------------------------	----	------------------------	-------

Test Equipment List and Details:

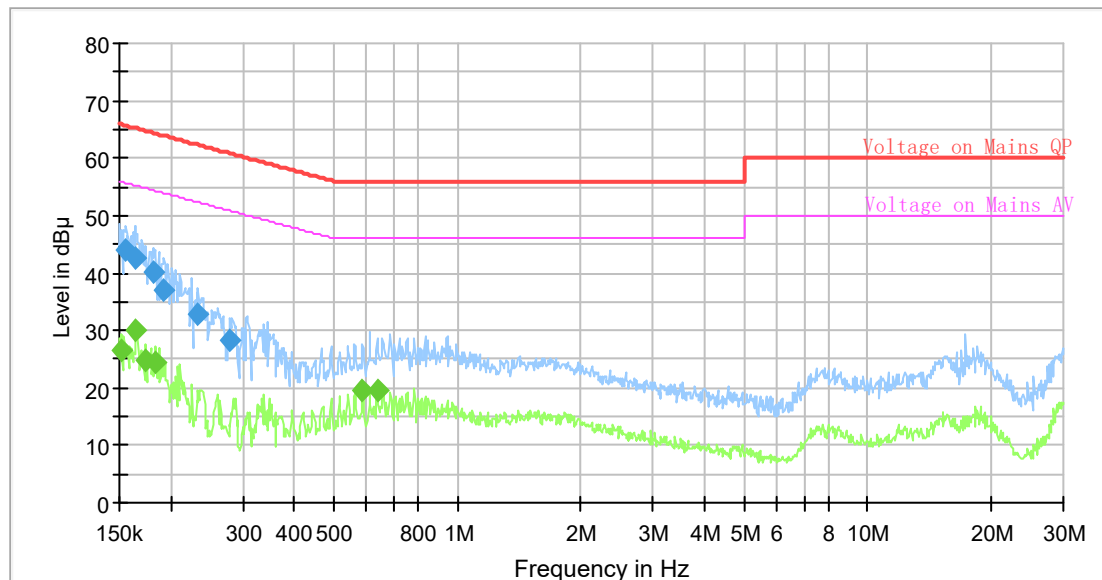
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101614	2023/10/18	2024/10/17
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2023/9/5	2024/9/4
R&S	EMI Test Receiver	ESCI	100035	2023/8/18	2024/8/17
R&S	Test Software	EMC32	V9.10.00	N/A	N/A

** Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Note: the maximum output power channel was tested.

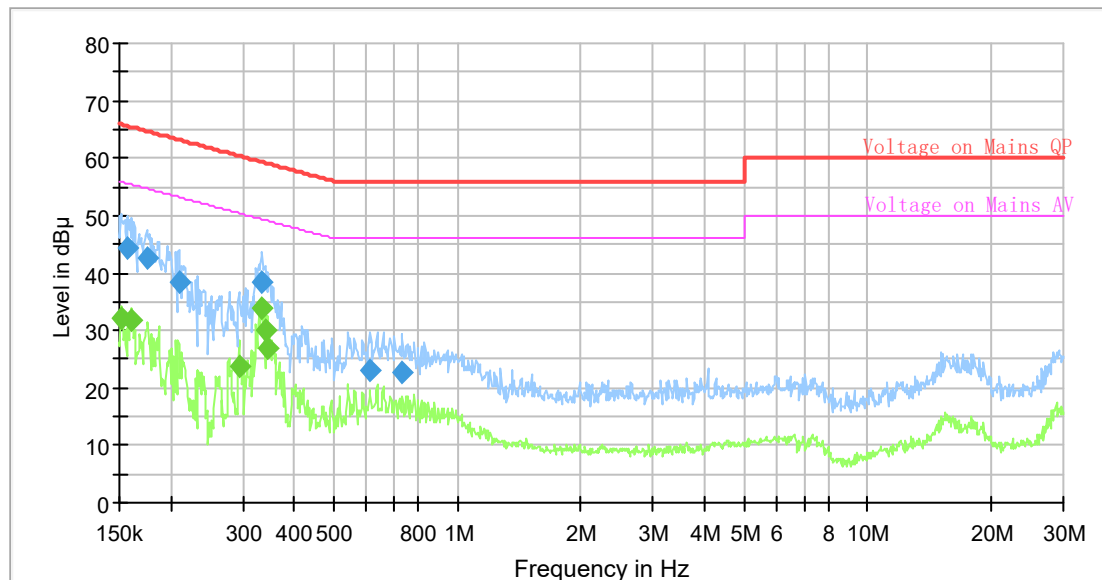
Project No: 2402U80022E-RF
Test Engineer: Lane Sun
Test Date: 2024-7-2
Port: L
Test Mode: Transmitting
Power Source: AC 120V/60Hz
Note: 802.11g Low channel



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.151504	---	26.43	55.92	29.49	9.000	L1	10.8
0.155329	44.06	---	65.71	21.65	9.000	L1	10.8
0.164089	42.70	---	65.25	22.55	9.000	L1	10.8
0.164910	---	30.13	55.21	25.08	9.000	L1	10.8
0.174210	---	24.85	54.76	29.91	9.000	L1	10.8
0.181302	40.31	---	64.43	24.12	9.000	L1	10.8
0.184035	---	24.49	54.30	29.81	9.000	L1	10.8
0.192484	37.13	---	63.93	26.80	9.000	L1	10.8
0.233814	32.70	---	62.31	29.61	9.000	L1	10.8
0.279801	28.32	---	60.82	32.50	9.000	L1	10.8
0.588291	---	19.62	46.00	26.38	9.000	L1	10.8
0.637161	---	19.56	46.00	26.44	9.000	L1	10.8

Project No: 2402U80022E-RF
Test Engineer: Lane Sun
Test Date: 2024-7-2
Port: N
Test Mode: Transmitting
Power Source: AC 120V/60Hz
Note: 802.11g Low channel



Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.151504	---	32.23	55.92	23.69	9.000	N	10.9
0.156887	44.24	---	65.63	21.39	9.000	N	10.9
0.160848	---	31.66	55.42	23.76	9.000	N	10.9
0.175081	42.63	---	64.72	22.09	9.000	N	10.9
0.209516	38.41	---	63.22	24.81	9.000	N	10.8
0.294110	---	23.81	50.41	26.60	9.000	N	10.8
0.334832	38.41	---	59.33	20.92	9.000	N	10.8
0.334832	---	33.83	49.33	15.50	9.000	N	10.8
0.341579	---	30.08	49.16	19.08	9.000	N	10.8
0.345004	---	26.83	49.08	22.25	9.000	N	10.8
0.615300	23.13	---	56.00	32.87	9.000	N	10.7
0.732654	22.83	---	56.00	33.17	9.000	N	10.8

5.2 Radiation Spurious Emissions

Serial Number:	2MO7-2	Test Date:	2024/6/24
Test Site:	Chamber A	Test Mode:	Transmitting
Tester:	Jayce Wang	Test Result:	Pass

Environmental Conditions:					
Temperature: (°C)	29.1	Relative Humidity: (%)	39	ATM Pressure: (kPa)	100.7

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Hybrid Antenna	JB3	A060611-3	2024/1/12	2027/1/11
Wilson	Coaxial Attenuator	859936	F-08-EM014	2024/1/12	2027/1/11
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2023/7/1	2024/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2023/7/1	2024/6/30
Sonoma	Amplifier	310N	372193	2023/7/1	2024/6/30
R&S	EMI Test Receiver	ESR3	102453	2023/8/18	2024/8/17
Audix	Test Software	E3	191218 (V9)	N/A	N/A
EMCO	Passive Loop Antenna	6512	9706-1206	2023/10/21	2026/10/20

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

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

1) 9kHz~30MHz

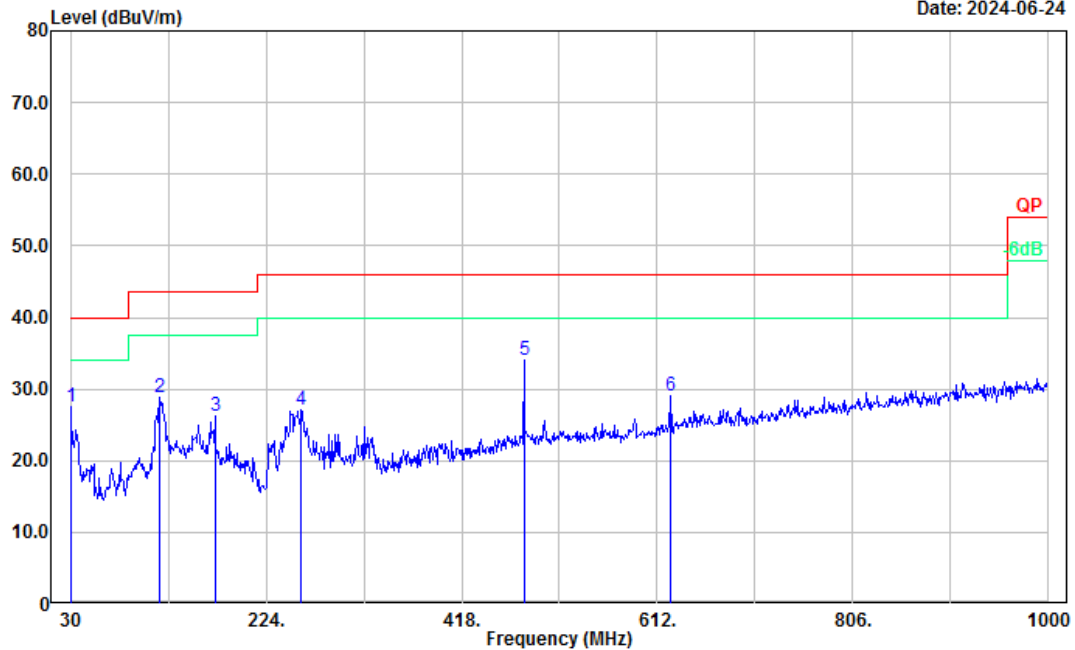
802.11g Low channel was tested. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

1) 30MHz-1GHz

Project No.: 2402U80022E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: 802.11g low channel

Serial No.: 2M07-2
Tester: Jayce Wang

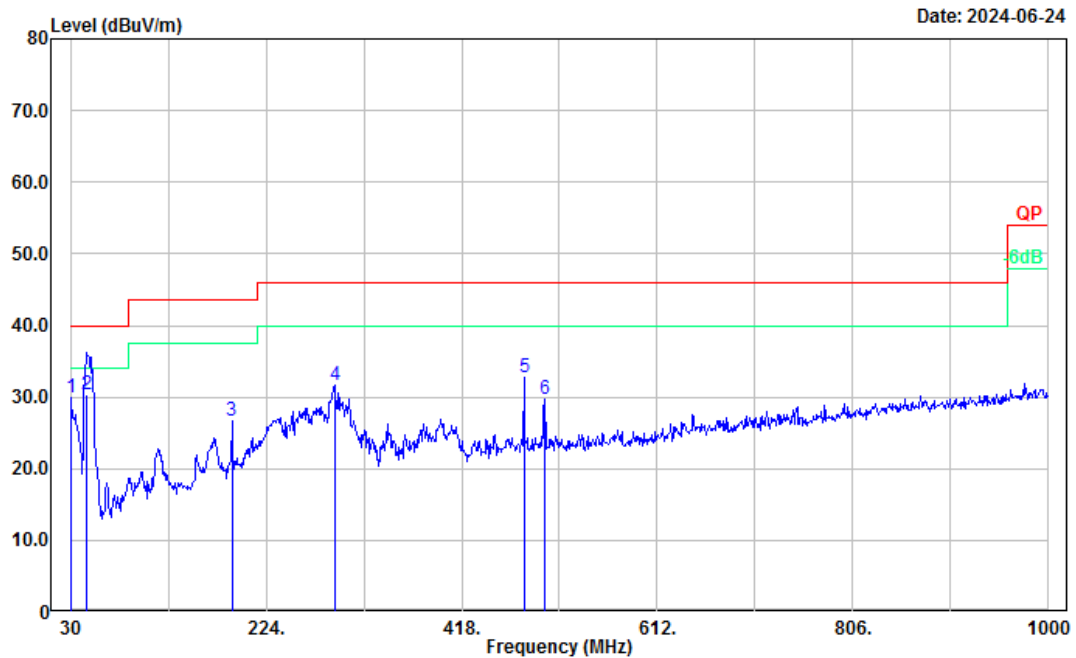
Date: 2024-06-24



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.00	30.47	-2.99	27.48	40.00	12.52	Peak
2	118.27	39.08	-10.27	28.81	43.50	14.69	Peak
3	173.56	38.00	-11.83	26.17	43.50	17.33	Peak
4	258.92	37.81	-10.61	27.20	46.00	18.80	Peak
5	480.08	38.12	-4.06	34.06	46.00	11.94	Peak
6	625.58	30.99	-1.95	29.04	46.00	16.96	Peak

Project No.: 2402U80022E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: 802.11g low channel

Serial No.: 2M07-2
Tester: Jayce Wang



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.00	32.81	-2.99	29.82	40.00	10.18	Peak
2	46.49	44.41	-14.04	30.37	40.00	9.63	QP
3	190.05	38.56	-11.79	26.77	43.50	16.73	Peak
4	291.90	40.64	-9.09	31.55	46.00	14.45	Peak
5	480.08	36.84	-4.06	32.78	46.00	13.22	Peak
6	500.45	33.22	-3.61	29.61	46.00	16.39	Peak

2) 1-25GHz:

Serial Number:	2MO7-2	Test Date:	2024/7/3
Test Site:	Chamber B	Test Mode:	Transmitting
Tester:	Leo Xiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	27	Relative Humidity: %	52	ATM Pressure: (kPa)	100.4
------------------------	----	-------------------------	----	---------------------------	-------

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ETS-Lindgren	Horn Antenna	3115	000 527 35	2023/9/7	2024/9/6
R&S	Spectrum Analyzer	FSV40	101944	2023/10/18	2024/10/17
Xinhang Macrowave	Coaxial Cable	XH750A-N/J-SMA/J-10M	20231117004 #0001	2023/11/17	2024/11/16
Audix	Test Software	E3	191218 (V9)	N/A	N/A
AH	Preamplifier	PAM-0118P	469	2023/8/19	2024/8/18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-03 1304	2023/2/22	2026/2/21
Xinhang Macrowave	Coaxial Cable	XH360A-2.92/J-2.92/J-6M-A	20231208001 #0001	2023/12/11	2024/12/10
AH	Preamplifier	PAM-1840VH	191	2023/9/7	2024/9/6
E-Microwave	Band Rejection Filter	OBSF-2400-2483.5-S	OE01601525	2024/2/21	2025/2/20
Micro-tronics	High Pass Filter	HPM50111	G217	2023/12/1	2024/11/30

* Statement of Traceability: Bay Area Compliance Laboratories Corp.(Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

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

802.11b

Frequency	Reading	Detector	Polar	Factor	Corrected Amplitude	Limit	Margin
MHz	dBμV	PK/QP/AV	H/V	dB/m	dBμV/m	dBμV/m	dB
Low channel 2412 MHz							
2390.00	28.62	PK	H	28.57	57.19	74.00	16.81
2390.00	19.97	AV	H	28.57	48.54	54.00	5.46
2390.00	27.64	PK	V	28.57	56.21	74.00	17.79
2390.00	18.69	AV	V	28.57	47.26	54.00	6.74
2388.16	30.27	PK	H	28.56	58.83	74.00	15.17
2388.16	21.93	AV	H	28.56	50.49	54.00	3.51
2388.46	30.17	PK	V	28.56	58.73	74.00	15.27
2388.46	20.28	AV	V	28.56	48.84	54.00	5.16
4824.00	54.54	PK	H	-10.09	44.45	74.00	29.55
4824.00	52.40	AV	H	-10.09	42.31	54.00	11.69
4824.00	58.21	PK	V	-10.09	48.12	74.00	25.88
4824.00	55.74	AV	V	-10.09	45.65	54.00	8.35
7236.00	48.21	PK	H	-5.38	42.83	74.00	31.17
7236.00	39.11	AV	H	-5.38	33.73	54.00	20.27
7236.00	49.21	PK	V	-5.38	43.83	74.00	30.17
7236.00	40.77	AV	V	-5.38	35.39	54.00	18.61
Middle channel 2437 MHz							
4874.00	54.21	PK	H	-10.02	44.19	74.00	29.81
4874.00	52.11	AV	H	-10.02	42.09	54.00	11.91
4874.00	55.34	PK	V	-10.02	45.32	74.00	28.68
4874.00	53.18	AV	V	-10.02	43.16	54.00	10.84
7311.00	48.68	PK	H	-5.05	43.63	74.00	30.37
7311.00	39.83	AV	H	-5.05	34.78	54.00	19.22
7311.00	48.72	PK	V	-5.05	43.67	74.00	30.33
7311.00	39.23	AV	V	-5.05	34.18	54.00	19.82
High channel 2462 MHz							
2483.50	29.91	PK	H	28.95	58.86	74.00	15.14
2483.50	22.03	AV	H	28.95	50.98	54.00	3.02
2483.50	28.64	PK	V	28.95	57.59	74.00	16.41
2483.50	19.74	AV	V	28.95	48.69	54.00	5.31
4924.00	54.64	PK	H	-9.99	44.65	74.00	29.35
4924.00	52.32	AV	H	-9.99	42.33	54.00	11.67
4924.00	55.73	PK	V	-9.99	45.74	74.00	28.26
4924.00	54.45	AV	V	-9.99	44.46	54.00	9.54
7386.00	49.18	PK	H	-4.74	44.44	74.00	29.56
7386.00	40.50	AV	H	-4.74	35.76	54.00	18.24
7386.00	48.68	PK	V	-4.74	43.94	74.00	30.06
7386.00	39.46	AV	V	-4.74	34.72	54.00	19.28

802.11g

MHz	Reading	Detector	Polar	Factor	Corrected Amplitude	Limit	Margin
MHz	dBμV	PK/QP/AV	H/V	dB/m	dBμV/m	dBμV/m	dB
Low channel 2412 MHz							
2390.00	30.25	PK	H	28.57	58.82	74.00	15.18
2390.00	18.84	AV	H	28.57	47.41	54.00	6.59
2390.00	27.17	PK	V	28.57	55.74	74.00	18.26
2390.00	18.32	AV	V	28.57	46.89	54.00	7.11
4824.00	49.07	PK	H	-10.09	38.98	74.00	35.02
4824.00	41.26	AV	H	-10.09	31.17	54.00	22.83
4824.00	49.53	PK	V	-10.09	39.44	74.00	34.56
4824.00	41.15	AV	V	-10.09	31.06	54.00	22.94
7236.00	47.40	PK	H	-5.38	42.02	74.00	31.98
7236.00	38.83	AV	H	-5.38	33.45	54.00	20.55
7236.00	48.45	PK	V	-5.38	43.07	74.00	30.93
7236.00	39.63	AV	V	-5.38	34.25	54.00	19.75
Middle channel 2437 MHz							
4874.00	48.35	PK	H	-10.02	38.33	74.00	35.67
4874.00	40.76	AV	H	-10.02	30.74	54.00	23.26
4874.00	48.62	PK	V	-10.02	38.60	74.00	35.40
4874.00	40.60	AV	V	-10.02	30.58	54.00	23.42
7311.00	48.44	PK	H	-5.05	43.39	74.00	30.61
7311.00	39.46	AV	H	-5.05	34.41	54.00	19.59
7311.00	48.19	PK	V	-5.05	43.14	74.00	30.86
7311.00	39.58	AV	V	-5.05	34.53	54.00	19.47
High channel 2462 MHz							
2483.50	29.19	PK	H	28.95	58.14	74.00	15.86
2483.50	19.55	AV	H	28.95	48.50	54.00	5.50
2483.50	28.28	PK	V	28.95	57.23	74.00	16.77
2483.50	18.45	AV	V	28.95	47.40	54.00	6.60
4924.00	48.61	PK	H	-9.99	38.62	74.00	35.38
4924.00	40.32	AV	H	-9.99	30.33	54.00	23.67
4924.00	48.71	PK	V	-9.99	38.72	74.00	35.28
4924.00	40.62	AV	V	-9.99	30.63	54.00	23.37
7386.00	48.45	PK	H	-4.74	43.71	74.00	30.29
7386.00	39.27	AV	H	-4.74	34.53	54.00	19.47
7386.00	50.04	PK	V	-4.74	45.30	74.00	28.70
7386.00	41.37	AV	V	-4.74	36.63	54.00	17.37

802.11n20

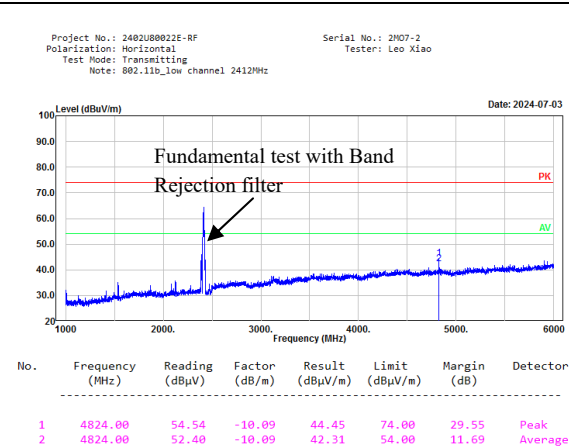
MHz	Reading	Detector	Polar	Factor	Corrected Amplitude	Limit	Margin
MHz	dBμV	PK/QP/AV	H/V	dB/m	dBμV/m	dBμV/m	dB
Low channel 2412 MHz							
2390.00	29.09	PK	H	28.57	57.66	74.00	16.34
2390.00	19.82	AV	H	28.57	48.39	54.00	5.61
2390.00	27.97	PK	V	28.57	56.54	74.00	17.46
2390.00	18.79	AV	V	28.57	47.36	54.00	6.64
4824.00	50.09	PK	H	-10.09	40.00	74.00	34.00
4824.00	42.02	AV	H	-10.09	31.93	54.00	22.07
4824.00	49.89	PK	V	-10.09	39.80	74.00	34.20
4824.00	41.62	AV	V	-10.09	31.53	54.00	22.47
7236.00	48.39	PK	H	-5.38	43.01	74.00	30.99
7236.00	39.93	AV	H	-5.38	34.55	54.00	19.45
7236.00	49.01	PK	V	-5.38	43.63	74.00	30.37
7236.00	40.59	AV	V	-5.38	35.21	54.00	18.79
Middle channel 2437 MHz							
4874.00	48.43	PK	H	-10.02	38.41	74.00	35.59
4874.00	40.59	AV	H	-10.02	30.57	54.00	23.43
4874.00	48.54	PK	V	-10.02	38.52	74.00	35.48
4874.00	40.38	AV	V	-10.02	30.36	54.00	23.64
7311.00	48.46	PK	H	-5.05	43.41	74.00	30.59
7311.00	39.49	AV	H	-5.05	34.44	54.00	19.56
7311.00	48.55	PK	V	-5.05	43.50	74.00	30.50
7311.00	39.60	AV	V	-5.05	34.55	54.00	19.45
High channel 2462 MHz							
2483.50	31.08	PK	H	28.95	60.03	74.00	13.97
2483.50	19.74	AV	H	28.95	48.69	54.00	5.31
2483.50	29.48	PK	V	28.95	58.43	74.00	15.57
2483.50	18.47	AV	V	28.95	47.42	54.00	6.58
4924.00	47.71	PK	H	-9.99	37.72	74.00	36.28
4924.00	39.52	AV	H	-9.99	29.53	54.00	24.47
4924.00	48.56	PK	V	-9.99	38.57	74.00	35.43
4924.00	40.73	AV	V	-9.99	30.74	54.00	23.26
7386.00	49.27	PK	H	-4.74	44.53	74.00	29.47
7386.00	40.44	AV	H	-4.74	35.70	54.00	18.30
7386.00	48.85	PK	V	-4.74	44.11	74.00	29.89
7386.00	39.38	AV	V	-4.74	34.64	54.00	19.36

802.11n40

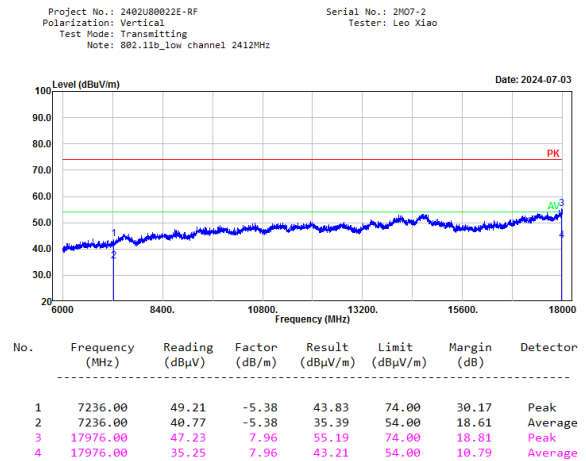
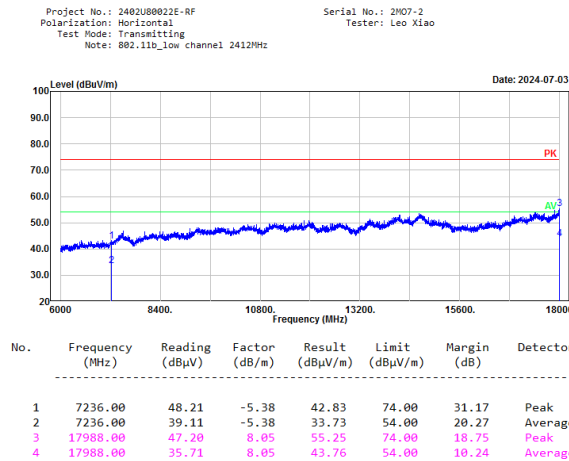
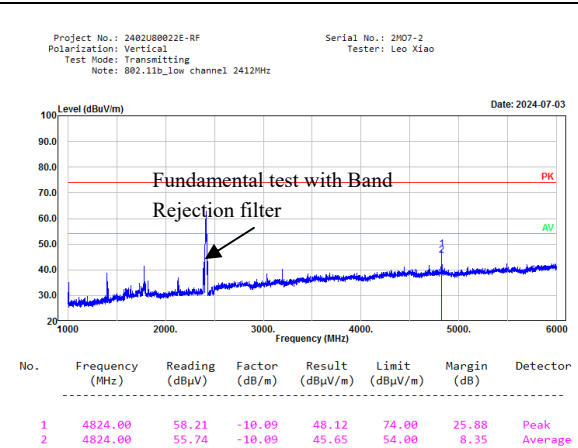
MHz	Reading	Detector	Polar	Factor	Corrected Amplitude	Limit	Margin
MHz	dBμV	PK/QP/AV	H/V	dB/m	dBμV/m	dBμV/m	dB
Low channel 2422 MHz							
2390.00	28.76	PK	H	28.57	57.33	74.00	16.67
2390.00	20.32	AV	H	28.57	48.89	54.00	5.11
2390.00	28.84	PK	V	28.57	57.41	74.00	16.59
2390.00	19.45	AV	V	28.57	48.02	54.00	5.98
4844.00	48.60	PK	H	-10.05	38.55	74.00	35.45
4844.00	40.51	AV	H	-10.05	30.46	54.00	23.54
4844.00	49.11	PK	V	-10.05	39.06	74.00	34.94
4844.00	41.46	AV	V	-10.05	31.41	54.00	22.59
7266.00	47.99	PK	H	-5.25	42.74	74.00	31.26
7266.00	38.52	AV	H	-5.25	33.27	54.00	20.73
7266.00	49.97	PK	V	-5.25	44.72	74.00	29.28
7266.00	40.72	AV	V	-5.25	35.47	54.00	18.53
Middle channel 2437 MHz							
4874.00	48.25	PK	H	-10.02	38.23	74.00	35.77
4874.00	40.37	AV	H	-10.02	30.35	54.00	23.65
4874.00	48.76	PK	V	-10.02	38.74	74.00	35.26
4874.00	40.62	AV	V	-10.02	30.60	54.00	23.40
7311.00	48.24	PK	H	-5.05	43.19	74.00	30.81
7311.00	39.48	AV	H	-5.05	34.43	54.00	19.57
7311.00	48.17	PK	V	-5.05	43.12	74.00	30.88
7311.00	39.58	AV	V	-5.05	34.53	54.00	19.47
High channel 2452 MHz							
2483.50	29.86	PK	H	28.95	58.81	74.00	15.19
2483.50	21.67	AV	H	28.95	50.62	54.00	3.38
2483.50	27.57	PK	V	28.95	56.52	74.00	17.48
2483.50	18.47	AV	V	28.95	47.42	54.00	6.58
4904.00	47.70	PK	H	-9.99	37.71	74.00	36.29
4904.00	39.95	AV	H	-9.99	29.96	54.00	24.04
4904.00	47.44	PK	V	-9.99	37.45	74.00	36.55
4904.00	39.50	AV	V	-9.99	29.51	54.00	24.49
7356.00	48.79	PK	H	-4.87	43.92	74.00	30.08
7356.00	39.40	AV	H	-4.87	34.53	54.00	19.47
7356.00	48.78	PK	V	-4.87	43.91	74.00	30.09
7356.00	39.79	AV	V	-4.87	34.92	54.00	19.08

Worst Channel Test plots:

802.11b mode, Low Channel, Horizontal



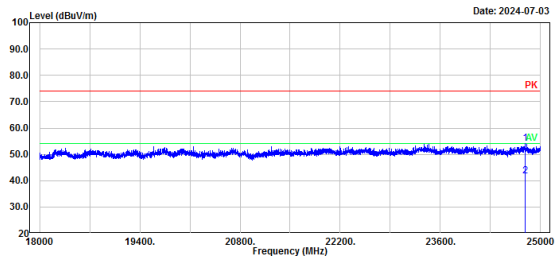
802.11b mode, Low Channel, Vertical



Horizontal

Project No.: 2402U80022E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: 802.11b_low channel 2412MHz

Serial No.: 2M07-2
Tester: Leo Xiao

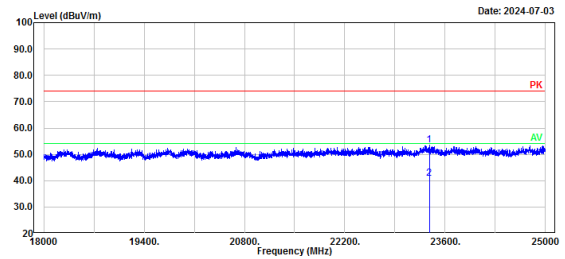


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	24785.80	44.71	9.37	54.08	74.00	19.92	Peak
2	24785.80	32.41	9.37	41.78	54.00	12.22	Average

Vertical

Project No.: 2402U80022E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: 802.11b_low channel 2412MHz

Serial No.: 2M07-2
Tester: Leo Xiao

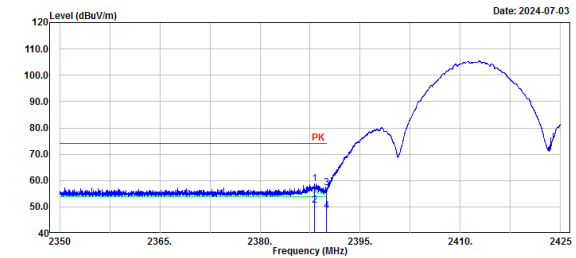


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	23378.80	44.69	8.70	53.39	74.00	20.61	Peak
2	23378.80	32.10	8.70	40.80	54.00	13.20	Average

802.11b mode, Low Channel, Bandedge, Horizontal

Project No.: 2402U80022E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: 802.11b_low channel 2412MHz

Serial No.: 2M07-2
Tester: Leo Xiao

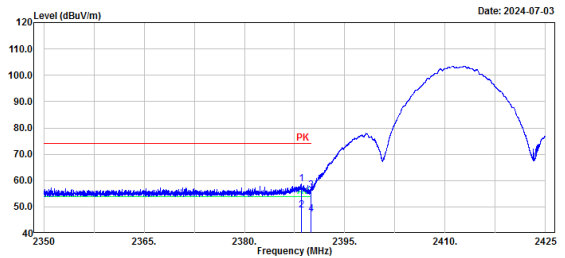


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2388.16	30.27	28.56	58.83	74.00	15.17	Peak
2	2388.16	21.93	28.56	50.49	54.00	3.51	Average
3	2390.00	28.62	28.57	57.19	74.00	16.81	Peak
4	2390.00	19.97	28.57	48.54	54.00	5.46	Average

802.11b mode, Low Channel, Bandedge, Vertical

Project No.: 2402U80022E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: 802.11b_low channel 2412MHz

Serial No.: 2M07-2
Tester: Leo Xiao



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	2388.46	30.17	28.56	58.73	74.00	15.27	Peak
2	2388.46	20.28	28.56	48.84	54.00	5.16	Average
3	2390.00	27.64	28.57	56.21	74.00	17.79	Peak
4	2390.00	18.69	28.57	47.26	54.00	6.74	Average

5.3 Spot Check With Maximum Conducted Output Power

Serial No.:	2MO7-1	Test Date:	2024/6/24
Test Site:	RF	Test Mode:	Transmitting
Tester:	Roy Xiao	Test Result:	Pass

Environmental Conditions:

Temperature: (°C)	26.7	Relative Humidity: (%)	47	ATM Pressure: (kPa)	100.7
----------------------	------	------------------------------	----	---------------------------	-------

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Anritsu	Microwave Peak Power Sensor	MA24418A	12618	2023/9/4	2024/9/3
Eastsheep	Coaxial Attenuator	5W-N-JK-6G-10dB	F-08-EM488	2023/9/10	2024/9/9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data:

Test Modes	Test Frequency (MHz)	Maximum Conducted Peak Output Power (dBm)	Limit (dBm)
802.11b	2412	21.24	30
	2437	21.39	30
	2462	20.81	30
802.11g	2412	23.34	30
	2437	22.44	30
	2462	23.13	30
802.11n ht20	2412	22.44	30
	2437	22.48	30
	2462	21.86	30
802.11n ht40	2422	22.31	30
	2437	22.02	30
	2452	22.01	30

5.4 Duty Cycle:

Serial No.:	2MO7-1	Test Date:	2024/7/25
Test Site:	RF	Test Mode:	Transmitting
Tester:	Roy Xiao	Test Result:	/

Environmental Conditions:

Temperature: (°C)	27	Relative Humidity: (%)	60	ATM Pressure: (kPa)	100.2
----------------------	----	---------------------------	----	------------------------	-------

Test Equipment List and Details:

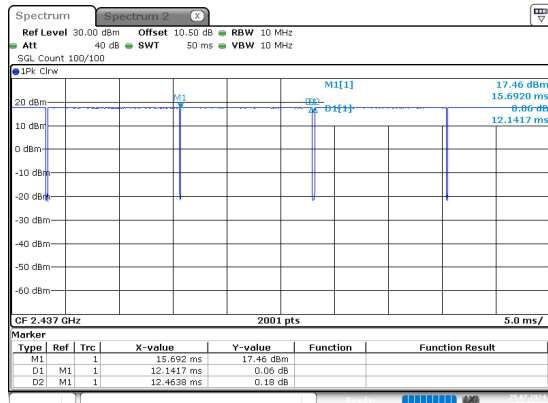
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101589	2023/10/18	2024/10/17
Eastsheep	Coaxial Attenuator	5W-N-JK-6G-10dB	F-08-EM488	2023/9/10	2024/9/9

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

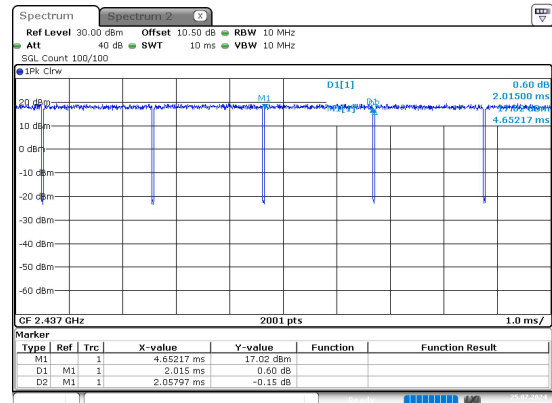
Test Data:

Mode	Ton (ms)	Ton+Toff (ms)	Duty Cycle (%)	1/T (Hz)	VBW Setting (kHz)
b_2437MHz_Chain 0	12.142	12.464	97.42	82	0.10
g_2437MHz_Chain 0	2.015	2.058	97.91	496	0.50
n20_2437MHz_Chain 0	1.89	1.928	98.03	529	0.10
n40_2437MHz_Chain 0	0.926	0.977	94.78	1080	2.00
Duty Cycle = Ton/(Ton+Toff)*100%					

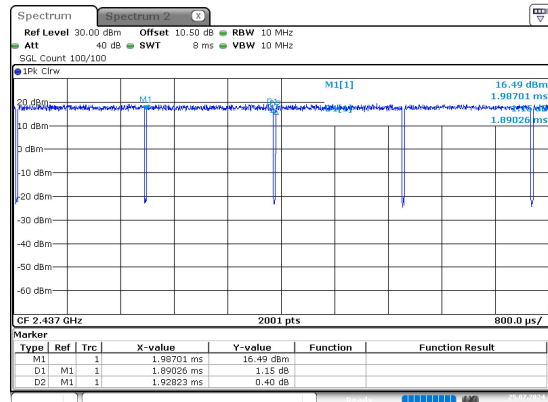
b_2437MHz_Chain 0



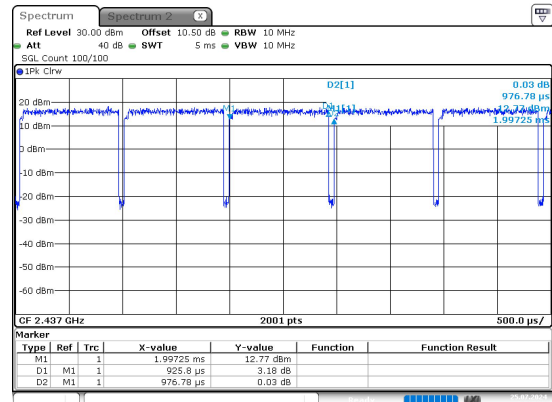
g_2437MHz_Chain 0



n20_2437MHz_Chain 0



n40_2437MHz_Chain 0



APPENDIX A - EUT PHOTOGRAPHS

Please refer to the attachment 2402U80022E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2402U80022E-RF-INP EUT INTERNAL PHOTOGRAPHS.

APPENDIX B - TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2402U80022E-RF-00B-TSP TEST SETUP PHOTOGRAPHS.

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