NVLAP TESTING
NVLAP LAB CODE 600341-0

BACL Bay Area Compliance Labs Corp.

TEST REPORT

Applicant:	**ALLIED VANTAGE INTERNATIONAL LIMITED**
Address:	**Unit 1805, 18/F., Stelux House,698 Prince Edward Road East,San Po Kong, Kowloon, Hong Kong China**
Product Name:	**C7011F Charger**
FCC ID:	**2BEED-C7011F**
Standard(s):	**47 CFR Part 15, Subpart C(15.249) ANSI C63.10-2020**
Report Number:	**2502P43079E-RF-00A**
Report Date:	**2025/3/10**

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:	**Pedro Yun**
Title:	Project Engineer
Approved By:	**Gavin Xu**
Title:	RF Supervisor

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2502P43079E-RF-00A	Original Report	2025/3/10

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	C7011F Charger
EUT Model:	C7011F
Multiple Models:	C7011FA1, C7011FB1, C7011FC1, C7011FD1
Operation Frequency:	24083-24117 MHz
Modulation Type:	CW
Rated Input Voltage:	DC 12V or DC 5V
Serial Number:	2XXY-1(For AC Line Conducted Emission and Radiated Emission Above 1G test) 2XXY-5(For Radiated Emission Below 1G test)
EUT Received Date:	2025/1/25
EUT Received Status:	Good
Note: The multiple models are electrically identical with the test model. The difference is only the model name. Please refer to the declaration letter for more detail, which was provided by manufacturer.	

1.2 Accessory Information

Accessory Description	Manufacturer	Model	Parameters
/	/	/	/

1.3 Antenna Information Detail▲:

Antenna Type	Frequency Range	Antenna Gain
Array	24~24.25GHz	2.37dBi
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)/Rule(s)	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	AC Line Conducted Emission	Compliant
15.205, §15.209, §15.249	Radiated Emissions	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant
§1.1310 & §2.1091	RF Exposure	Compliant
Note 1: For AC line conducted emissions, the maximum output power mode and channel was tested. Note 2: For Radiated Spurious Emissions 9kHz~1GHz, the maximum output power mode and channel was tested. Note 3: Per 15B report, Powered by DC 12V was the worst for AC Line Conducted Emissions and Radiated Spurious Emissions Below 1GHz, so only performed it.		

3. DESCRIPTION OF TEST CONFIGURATION

3.1 EUT Operation Condition

The device built in a Radar module, which operates in the frequency range: 24083-24117MHz:

The below frequencies were test:	
Low Channel	24083MHz
Middle Channel	24111MHz
High Channel	24117MHz

3.2 EUT Exercise Software

The system was configured for testing in Engineering Mode, which was provided by the manufacturer.

3.3 Support Equipment List and Details

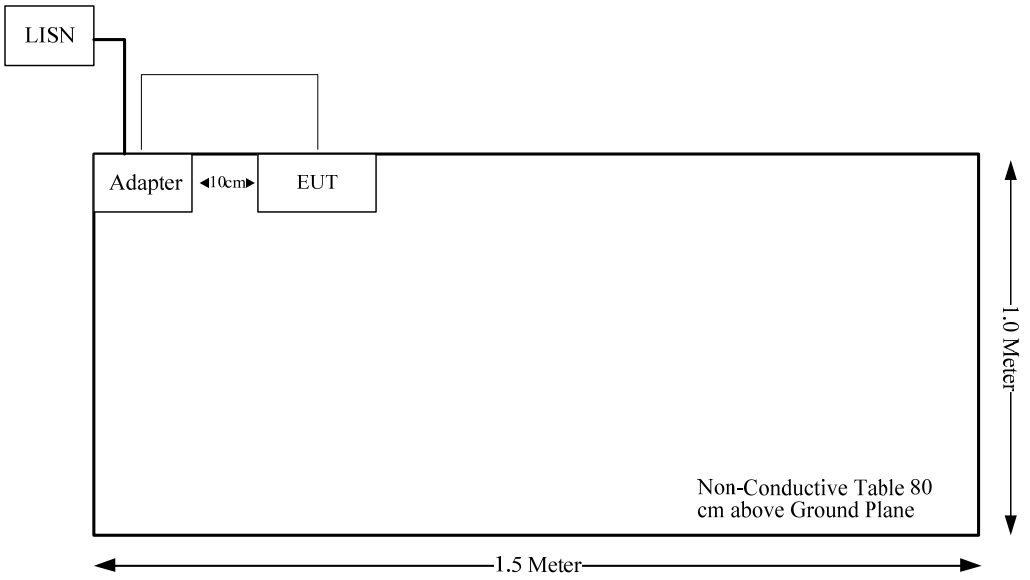
Manufacturer	Description	Model	Serial Number
DTECH	Adapter(DC 12V)	FJ-SW1260502000DC	N/A

3.4 Support Cable List and Details

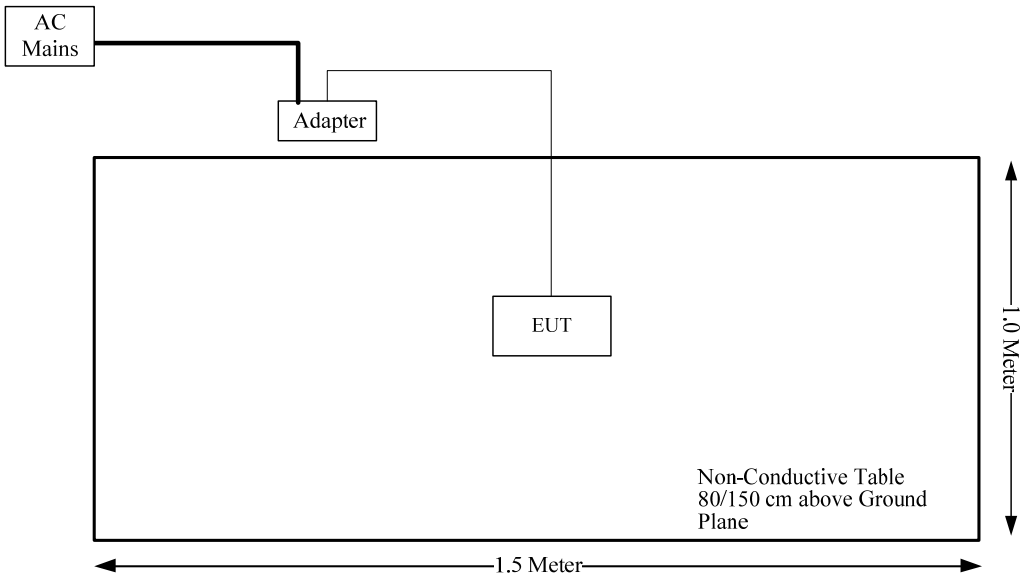
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
Power cable	No	No	1.5	Adapter(DC 12V)	EUT

3.5 Block Diagram of Test Setup

AC Line Conducted emissions:



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 %
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 40~60G: 4.83dB, 60G~90G: 4.94dB, 90G-140G: 5.46dB, 140G-220G: 6.00dB, 220G-325G: 7.35dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
AC Power Lines Conducted Emission	3.11 dB (150 kHz to 30 MHz)

4. REQUIREMENTS AND TEST RESULTS

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 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

*Decreases with the logarithm of the frequency.

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

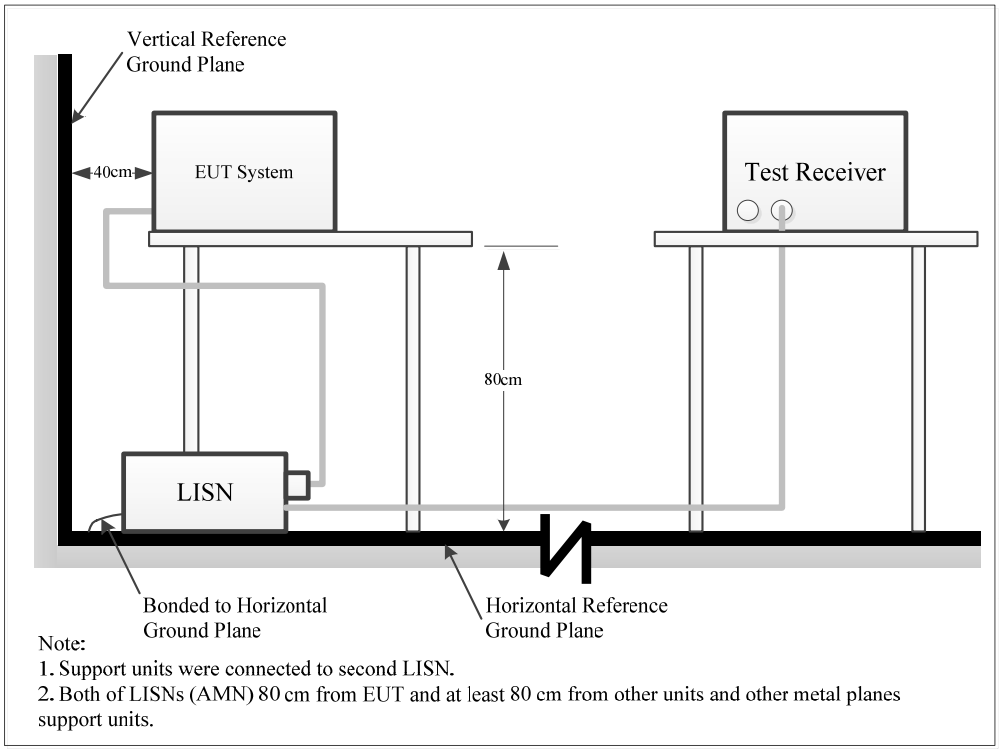
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

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

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

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

4.1.2 EUT Setup



Note:
1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at 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 limits.

The spacing between the peripherals was 10cm.

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 30MHz.

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

Serial Number:	2XXY-1	Test Date:	2025/3/10
Test Site:	CE	Test Mode:	Transmitting
Tester:	Yukin Qiu	Test Result:	Pass

Environmental Conditions:

Temperature: (℃)	21.7	Relative Humidity: (%)	59	ATM Pressure: (kPa)	101.4

Test Equipment List and Details:

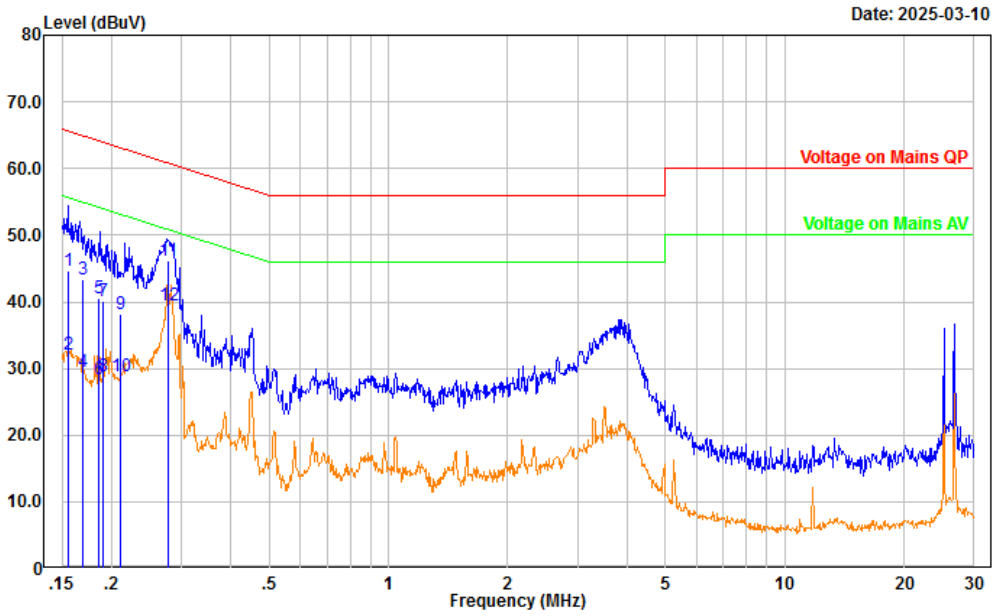
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV216	101614	2024/9/5	2025/9/4
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2024/9/5	2025/9/4
R&S	EMI Test Receiver	ESCI	101121	2024/9/5	2025/9/4
Audix	Test Software	E3	191218 V9	N/A	N/A

** 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:
High channel was tested.

Project No.: 2502P43079E-RF
Port: Line
Test Mode: Transmitting
IF B/W 9kHz PK/AV

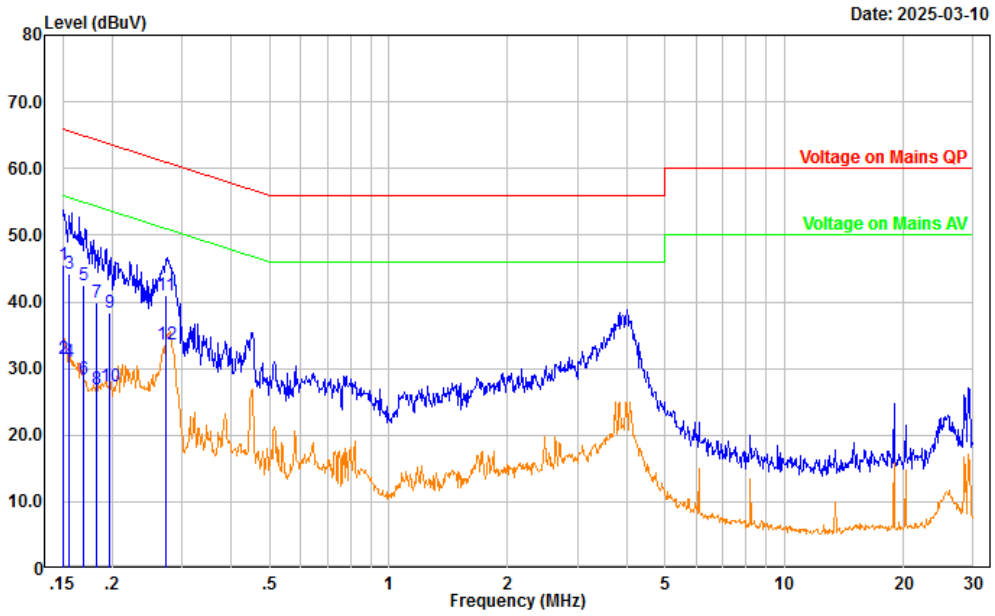
Serial No.: 2XXY-1
Tester: Yukin Qiu



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.156	33.97	10.76	44.73	65.69	20.96	QP
2	0.156	21.22	10.76	31.98	55.69	23.71	Average
3	0.169	32.56	10.79	43.35	65.01	21.66	QP
4	0.169	18.78	10.79	29.57	55.01	25.44	Average
5	0.186	29.71	10.82	40.53	64.20	23.67	QP
6	0.186	17.59	10.82	28.41	54.20	25.79	Average
7	0.191	29.38	10.83	40.21	63.99	23.78	QP
8	0.191	17.99	10.83	28.82	53.99	25.17	Average
9	0.211	27.30	10.85	38.15	63.16	25.01	QP
10	0.211	17.96	10.85	28.81	53.16	24.35	Average
11	0.278	35.42	10.83	46.25	60.89	14.64	QP
12	0.278	28.54	10.83	39.37	50.89	11.52	Average

Project No.: 2502P43079E-RF
Port: neutral
Test Mode: Transmitting
IF B/W 9kHz PK/AV

Serial No.: 2XXY-1
Tester: Yukin Qiu



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB)	Result (dBµV)	Limit (dBµV)	Margin (dB)	Detector
1	0.150	34.58	10.85	45.43	65.98	20.55	QP
2	0.150	20.56	10.85	31.41	55.98	24.57	Average
3	0.156	33.46	10.85	44.31	65.68	21.37	QP
4	0.156	20.13	10.85	30.98	55.68	24.70	Average
5	0.169	31.69	10.85	42.54	65.01	22.47	QP
6	0.169	17.51	10.85	28.36	55.01	26.65	Average
7	0.183	29.08	10.85	39.93	64.34	24.41	QP
8	0.183	15.97	10.85	26.82	54.34	27.52	Average
9	0.197	27.55	10.85	38.40	63.75	25.35	QP
10	0.197	16.40	10.85	27.25	53.75	26.50	Average
11	0.274	30.17	10.81	40.98	61.00	20.02	QP
12	0.274	22.75	10.81	33.56	51.00	17.44	Average

4.2 Radiated Emissions

4.2.1 Applicable Standard

As per FCC§15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

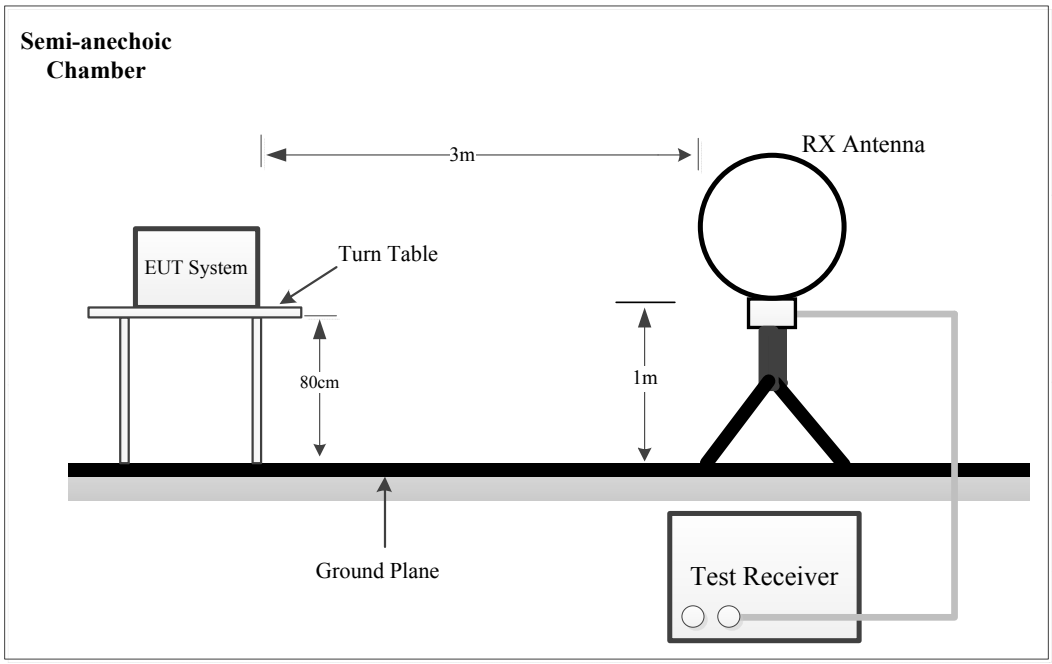
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per FCC§15.249 (c), Field strength limits are specified at a distance of 3 meters.

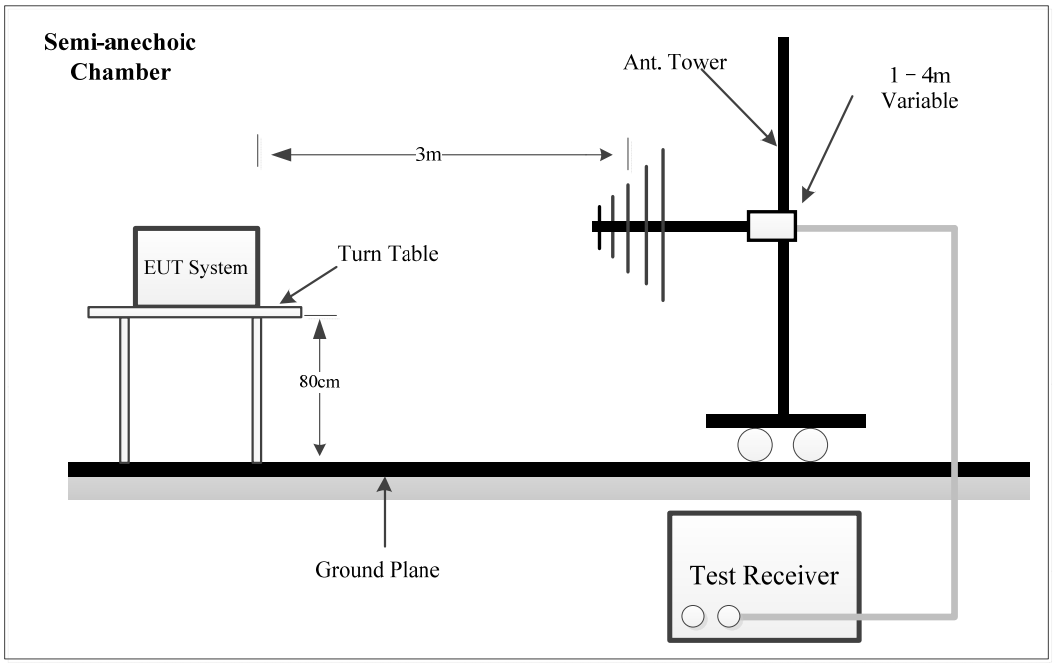
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

4.2.2 EUT Setup

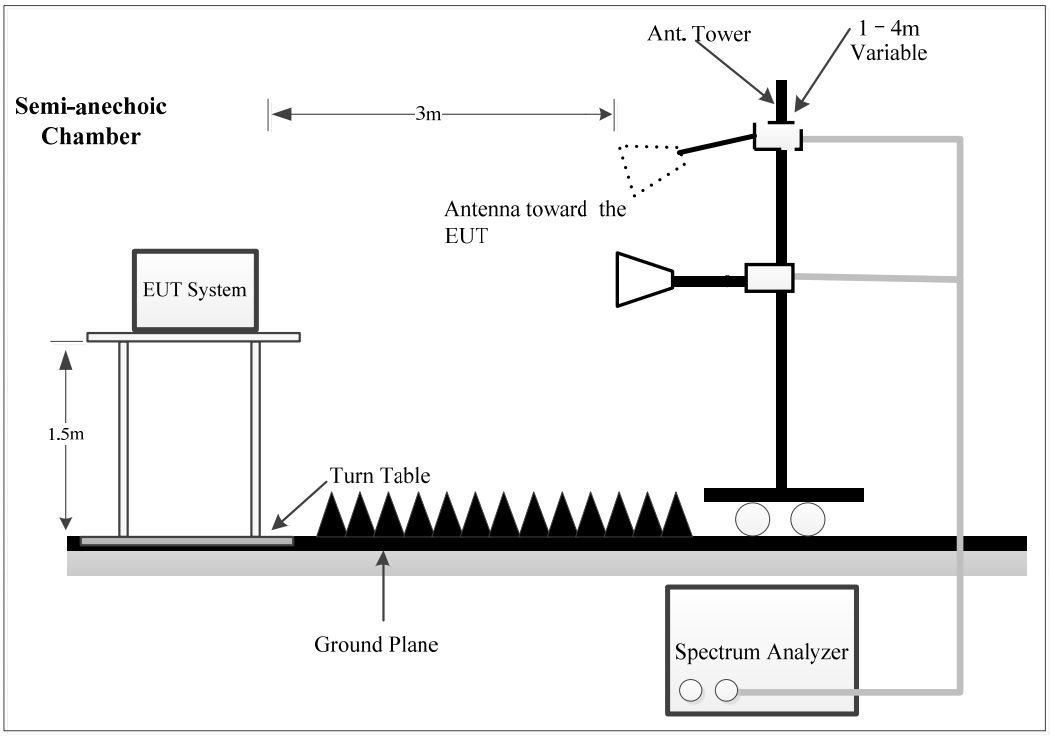
9kHz~30MHz:



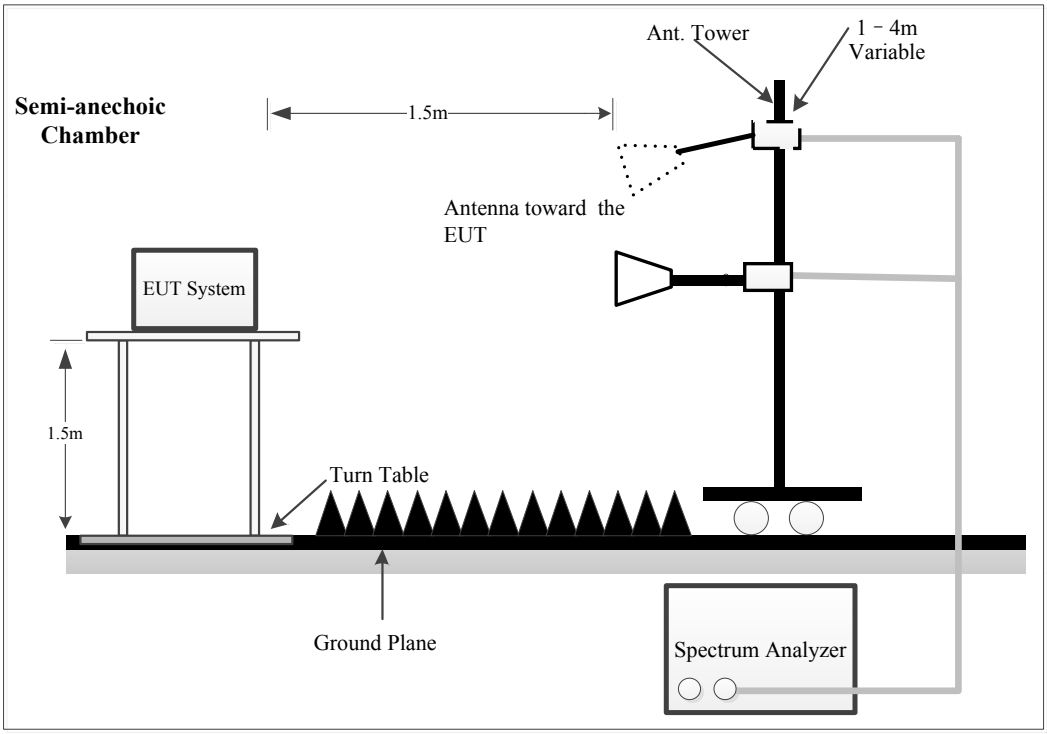
30MHz-1GHz:



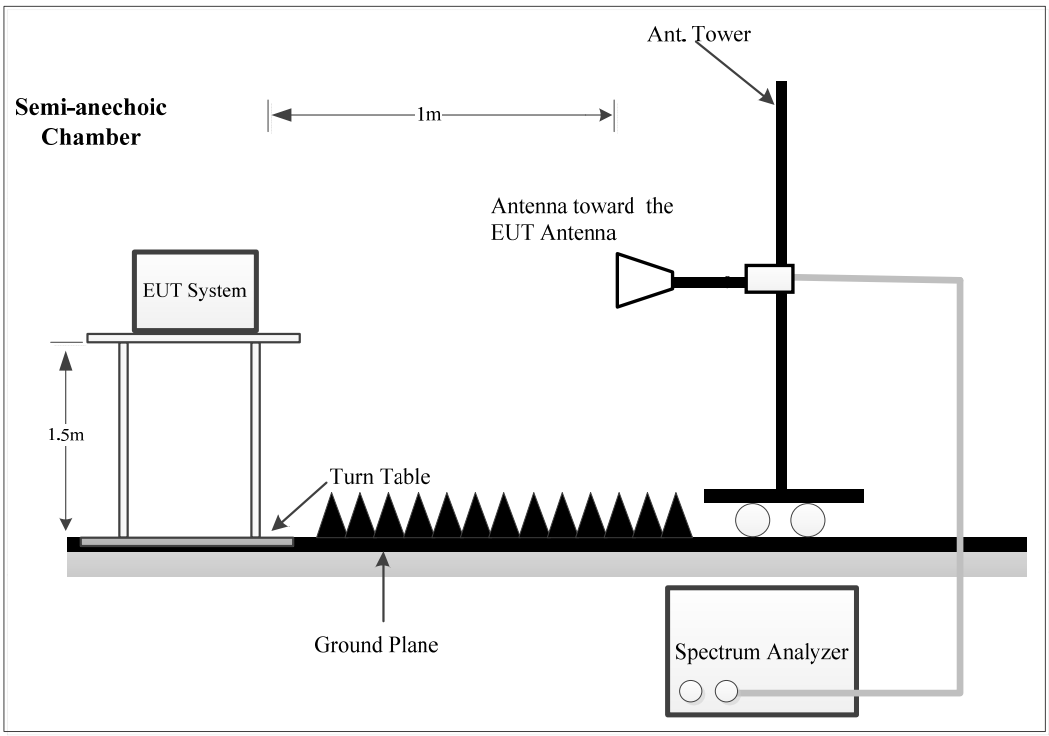
1GHz-26.5 GHz:



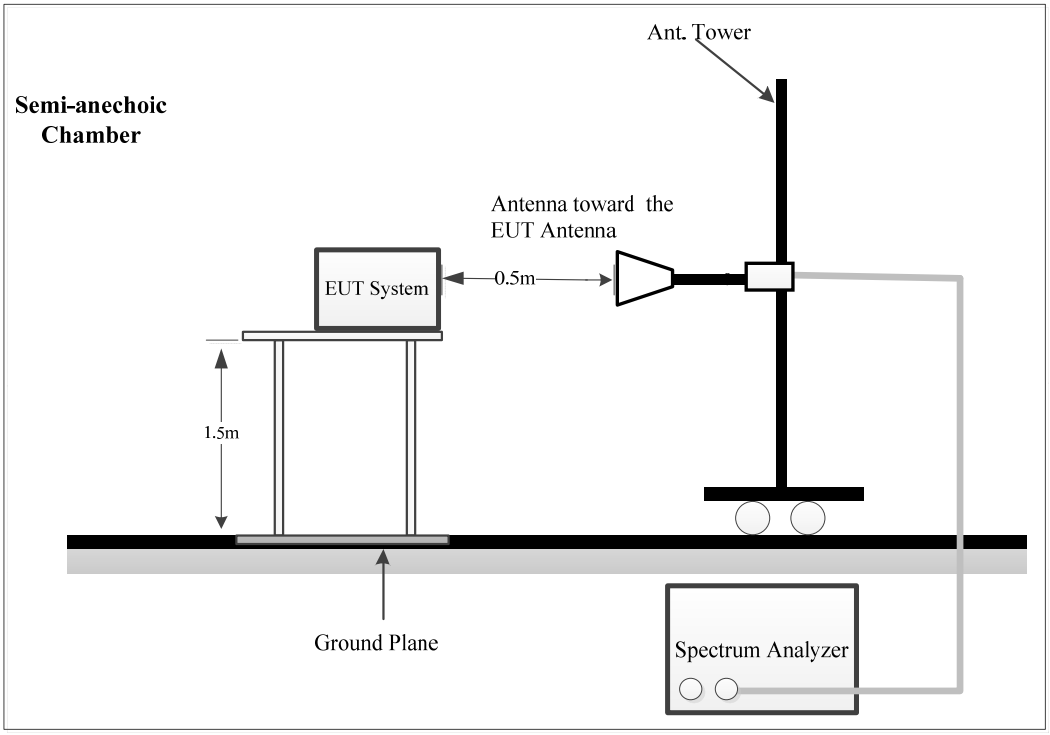
26.5-40GHz:



40~90 GHz:



90~100 GHz:



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.

For above 40GHz: The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations, at the distance of 1.0 m from 40 GHz to 90 GHz, and 0.5 m from 90 GHz to 100 GHz.

The radiated emission test was performed in the 3 meters chamber, using the setup accordance with the ANSI C63.10-2020. The specification used was the FCC 15.209/15.205,FCC 15.249 limits.

4.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9 kHz to 100 GHz.

9kHz-1000MHz:

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

Above 1GHz:
Pre-scan:

Frequency Range	Measurement	RBW	Video B/W	Detector
Above 1 GHz	Peak	1MHz	3 MHz	PK
	AV	1MHz	5kHz	PK

Final measurement for emission identified during the pre-scan:

Frequency Range	Measurement	RBW	Video B/W	Detector
Above 1 GHz	Peak	1MHz	3 MHz	PK
	AV	1MHz	10 Hz	PK

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 required in Quasi-peak measurement for frequency range of 9 kHz-1 GHz except 9-90 kHz, 110-490 kHz, employing an average measurement, peak and Average measurement for frequencies above 1 GHz.

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

For Radiated 26.5-40GHz test:
Which was performed at 1.5 m distance, according to C63.10, the test result shall be extrapolated to the specified distance using an extrapolation Factor of 20dB/decade from 3m to 1.5m
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.0 dB

For 40-90GHz:
Test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1m.

Distance extrapolation factor =20 log (specific distance [3m]/test distance [1m]) dB= 9.54 dB.

For 90-100GHz:
Test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 0.5m.

Distance extrapolation factor =20 log (specific distance [3m]/test distance [0.5m]) dB=15.56 dB.

External harmonic mixers are utilized. The antenna is scanned around the entire perimeter surface of the EUT, in both horizontal and vertical polarizations. The Mixers and it`s RF cables is compose a system for calibration, the conversion factor was added into the test Spectrum Analyzer in testing.

The far-field boundary is given in ANSI C63.10-2020:

$$R_m = 2D^2 / \lambda$$

Where:
D is the largest dimension of the antenna aperture in m and
λ is the free-space wavelength in m at the frequency of measurement.

The minimum test distance for the frequency range 40GHz-100GHz determine as below:

Model	Frequency Range (GHz)	Largest Dimension of the Horn Antenna (mm)	Minimum Test Distance R_m (m)
M19RH	40-60	46.3	0.86
M12RH	60-90	30.02	0.55
M08RH	90-140	19.7	0.39

Note: the test distances used were 1.0 m from 40 GHz to 90 GHz, and 0.5 m from 90 GHz to 100GHz, it can be seen that the EUT was always in the Far-field of the Receive Antenna during all Radiated Emissions Tests.

4.2.5 Corrected Amplitude & Margin Calculation

The basic equation except 26.5-100GHz test is as follows:
Factor = Antenna Factor + Cable Loss- Amplifier Gain

For Radiated 26.5-100GHz test:
Factor = Antenna Factor + Cable Loss- Distance extrapolation Factor

Result = Reading + Factor

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

Margin = Limit – Result

4.2.6 Test Result

Serial Number:	2XXY-1, 2XXY-5	Test Date:	Below 1GHz: 2025/2/21 Above 1GHz: 2025/3/6
Test Site:	Chamber B, Chamber10m	Test Mode:	Transmitting
Tester:	Colin Yang, Leesin Xiang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.3~22.6	Relative Humidity: (%)	53~61	ATM Pressure: (kPa)	101.5~101.6

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
9kHz~1000MHz					
EMCO	Passive Loop Antenna	6512	9706-1206	2023/10/25	2026/10/24
Sunol Sciences	Hybrid Antenna	JB3	A060611-1	2023/9/6	2026/9/5
Narda	Coaxial Attenuator	779-6dB	04269	2023/9/6	2026/9/5
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-04	2024/7/1	2025/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2024/7/1	2025/6/30
Sonoma	Amplifier	310N	185914	2024/8/26	2025/8/25
R&S	EMI Test Receiver	ESCI	100224	2024/8/26	2025/8/25
Audix	Test Software	E3	191218 V9	N/A	N/A
Above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2023/9/7	2026/9/6
Xinhang Macrowave	Coaxial Cable	XH750A-N/J-SMA/J-10M	20231117004 #0001	2024/11/17	2025/11/16
AH	Preamplifier	PAM-0118P	469	2024/4/15	2025/4/14
Audix	Test Software	E3	191218 V9	N/A	N/A
R&S	Spectrum Analyzer	FSV40	101944	2024/9/6	2025/9/5
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2023/2/22	2026/2/21
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2023/2/22	2026/2/21
Xinhang Macrowave	Coaxial Cable	XH360A-2.92/J-2.92/J-6M-A	20231208001 #0001	2024/12/9	2025/12/8
AH	Preamplifier	PAM-1840VH	191	2024/9/5	2025/9/4
Decentest	Multiplex Switch Test Control Set & Filter Switch Unit	DT7220SCU& DT7220FCU	DC79902& DC79905	2024/8/27	2025/8/26
OML	Waveguide Mixer	WR19/M19HWD	U60313-1	2023/2/16	2026/2/15
OML	Horn Antenna	M19RH	11648-01	2023/2/27	2026/2/26
OML	Waveguide Mixer	WR12/M12HWD	E60120-1	2023/2/16	2026/2/15
OML	Horn Antenna	M12RH	E60120-2	2023/2/27	2026/2/26
OML	Waveguide Mixer	WR08/M08HWD	F60313-1	2023/2/16	2026/2/15
OML	Horn Antenna	M08RH	F60313-2	2023/2/27	2026/2/26

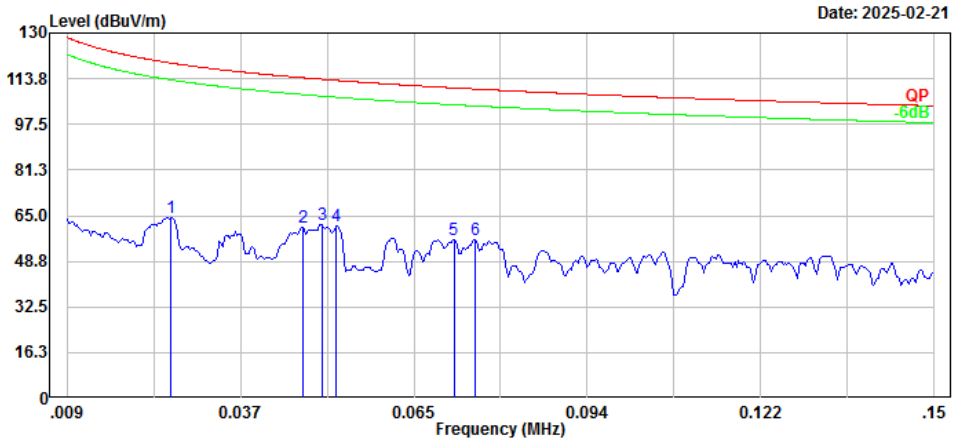
** Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Please refer to the below table and plots.

1) 9kHz~30MHz(High channel was tested)
Three antenna orientations (parallel, perpendicular, and ground-parallel) was measured, the worst orientations was below:

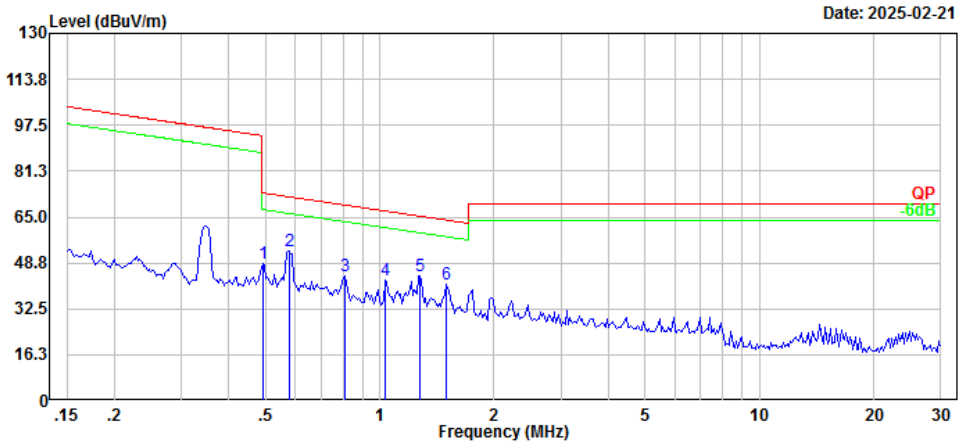
```
Project No.: 2502P43079E-RF                Serial No.: 2XXY-5
Polarization: Parallel                         Tester: Leesin Xiang
   Test Mode: Transmitting
        Note: 12V
              RBW:300Hz VBW:1kHz
```



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.026	15.89	48.57	64.46	119.33	54.87	Peak
2	0.047	16.48	44.50	60.98	114.10	53.12	Peak
3	0.050	17.67	43.97	61.64	113.55	51.91	Peak
4	0.053	17.57	43.59	61.16	113.17	52.01	Peak
5	0.072	15.92	40.27	56.19	110.47	54.28	Peak
6	0.075	16.50	39.71	56.21	110.07	53.86	Peak

Project No.: 2502P43079E-RF
Polarization: Parallel
Test Mode: Transmitting
Note: 12V
RBW:10kHz VBW:30kHz

Serial No.: 2XXY-5
Tester: Leesin Xiang

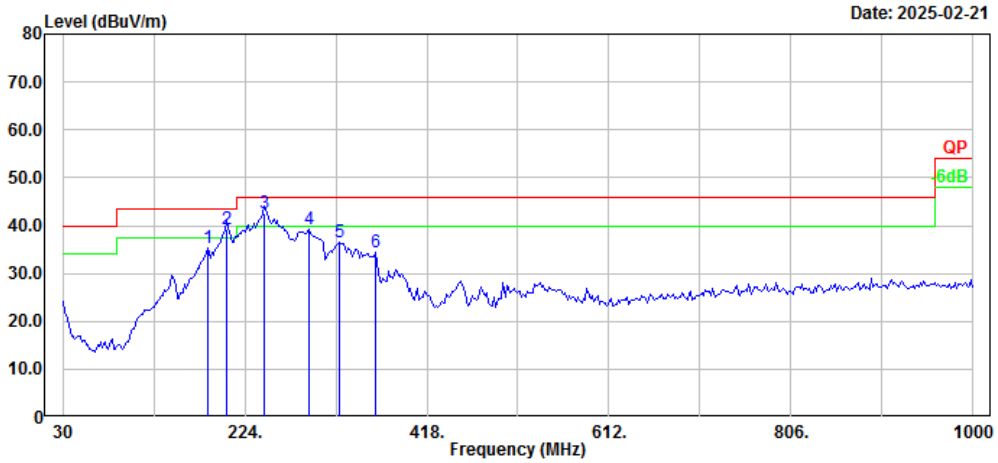


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.492	25.04	23.55	48.59	73.77	25.18	Peak
2	0.576	30.34	22.71	53.05	72.36	19.31	Peak
3	0.809	23.94	20.38	44.32	69.36	25.04	Peak
4	1.032	26.30	16.42	42.72	67.19	24.47	Peak
5	1.276	28.99	15.34	44.33	65.31	20.98	Peak
6	1.495	26.92	14.36	41.28	63.91	22.63	Peak

2) 30MHz-1GHz(High channel was tested)

Project No.: 2502P43079E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: 12V
RBW:100kHz VBW:300kHz

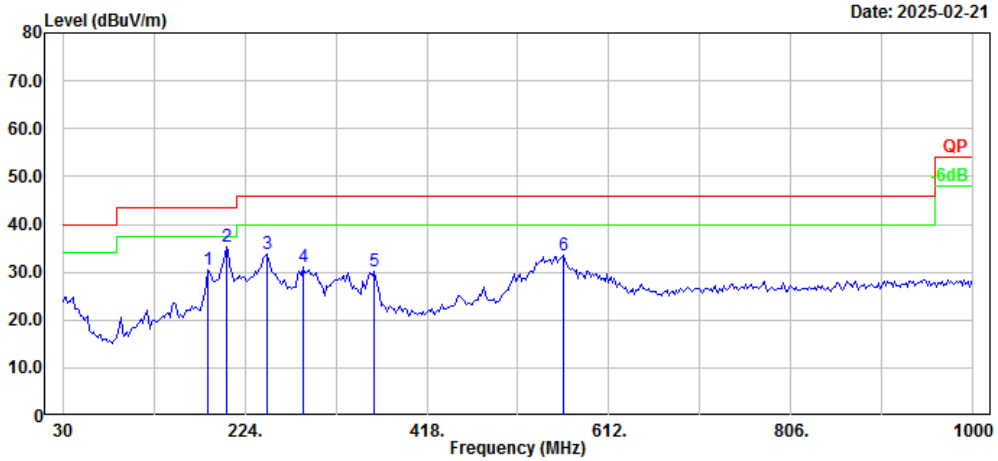
Serial No.: 2XXY-5
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	185.20	47.51	-12.24	35.27	43.50	8.23	Peak
2	204.60	51.30	-12.01	39.29	43.50	4.21	QP
3	245.34	54.09	-11.57	42.52	46.00	3.48	QP
4	291.90	48.68	-9.57	39.11	46.00	6.89	Peak
5	324.88	45.50	-8.97	36.53	46.00	9.47	Peak
6	363.68	42.71	-8.23	34.48	46.00	11.52	Peak

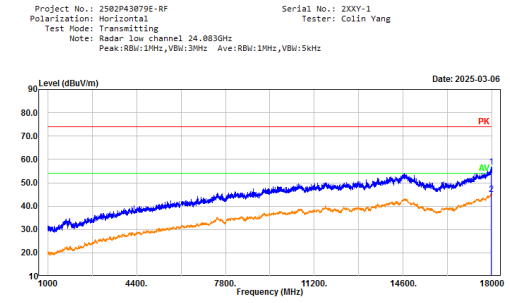
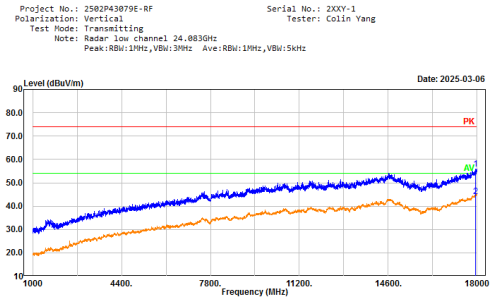
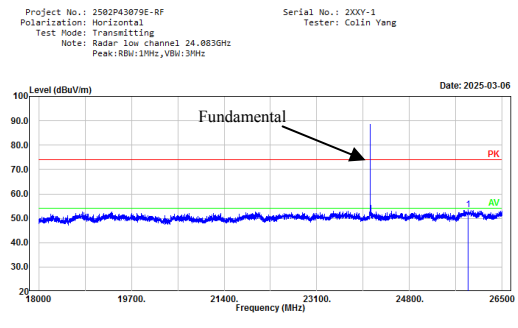
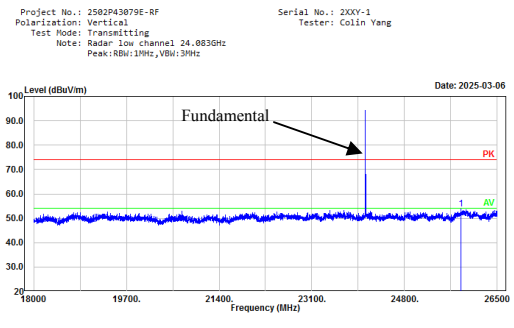
Project No.: 2502P43079E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: 12V
RBW:100kHz VBW:300kHz

Serial No.: 2XXY-5
Tester: Leesin Xiang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	185.20	42.79	-12.24	30.55	43.50	12.95	Peak
2	204.60	47.20	-12.01	35.19	43.50	8.31	Peak
3	247.28	45.38	-11.52	33.86	46.00	12.14	Peak
4	286.08	40.79	-9.63	31.16	46.00	14.84	Peak
5	361.74	38.41	-8.30	30.11	46.00	15.89	Peak
6	563.50	36.85	-3.29	33.56	46.00	12.44	Peak

3) 1-40GHz:

Low Horizontal	Low Vertical
	
	

Project No.: 2502P43079E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: Radar low channel 24.083GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz
Serial No.: 2XXY-1
Tester: Colin Yang
Date: 2025-03-06
Level (dBuV/m)
Frequency (MHz)
PK
AV

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	17955.80	49.10	7.82	56.92	74.00	17.08	Peak
2	17955.80	37.12	7.82	44.94	54.00	9.06	Average

Project No.: 2502P43079E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: Radar low channel 24.083GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz
Serial No.: 2XXY-1
Tester: Colin Yang
Date: 2025-03-06
Level (dBuV/m)
Frequency (MHz)
PK
AV

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	17942.20	48.07	7.72	55.79	74.00	18.21	Peak
2	17942.20	36.43	7.72	44.15	54.00	9.85	Average

Project No.: 2502P43079E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: Radar low channel 24.083GHz
Peak:RBW:1MHz,VBW:3MHz
Serial No.: 2XXY-1
Tester: Colin Yang
Date: 2025-03-06
Level (dBuV/m)
Fundamental
Frequency (MHz)
PK
AV

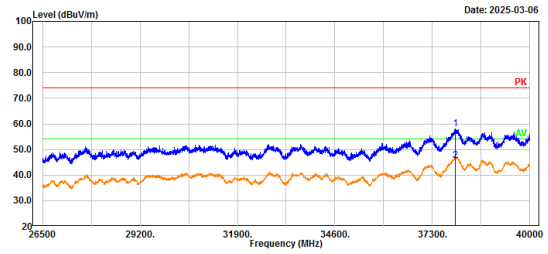
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	25876.10	42.84	10.62	53.46	74.00	20.54	Peak

Project No.: 2502P43079E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: Radar low channel 24.083GHz
Peak:RBW:1MHz,VBW:3MHz
Serial No.: 2XXY-1
Tester: Colin Yang
Date: 2025-03-06
Level (dBuV/m)
Fundamental
Frequency (MHz)
PK
AV

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	25838.70	43.37	10.55	53.92	74.00	20.08	Peak

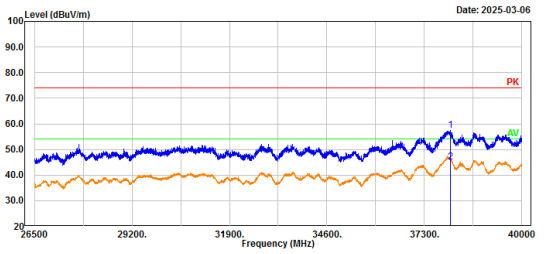
Low Horizontal	Low Vertical

Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.083GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	37942.60	46.28	11.66	57.94	74.00	16.06	Peak
2	37942.60	34.08	11.66	45.74	54.00	8.26	Average

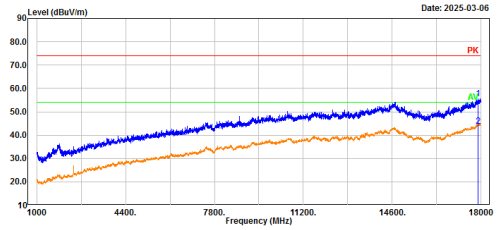
Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.083GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	38010.10	45.51	11.91	57.42	74.00	16.58	Peak
2	38010.10	33.24	11.91	45.15	54.00	8.85	Average

Middle Horizontal

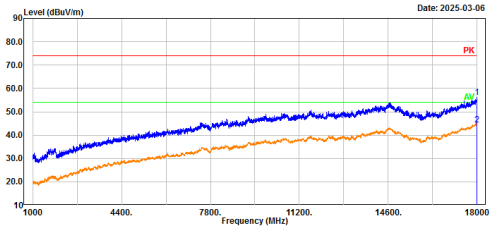
Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.111GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	17894.60	48.22	7.39	55.61	74.00	18.39	Peak
2	17894.60	36.36	7.39	43.75	54.00	10.25	Average

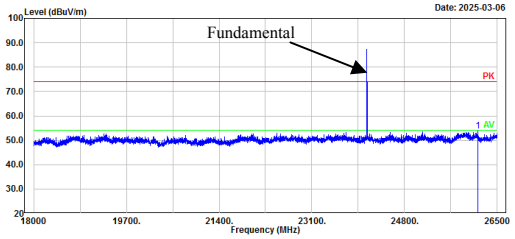
Middle Vertical

Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.111GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



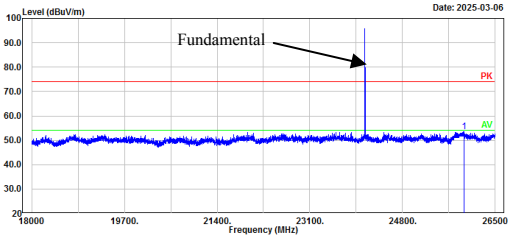
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	17996.60	48.14	8.11	56.25	74.00	17.75	Peak
2	17996.60	36.28	8.11	44.39	54.00	9.61	Average

Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.111GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	26146.40	42.78	10.92	53.70	74.00	20.30	Peak

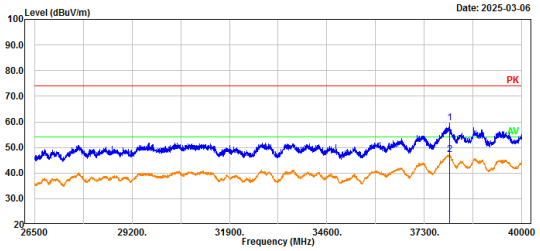
Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.111GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	25933.90	42.92	10.73	53.65	74.00	20.35	Peak

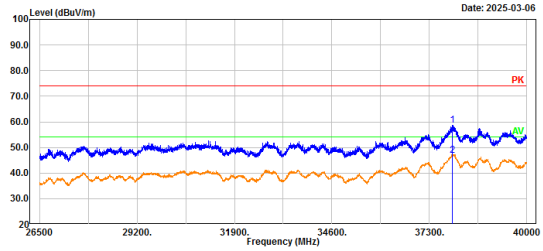
Middle Horizontal	Middle Vertical

Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.111GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz

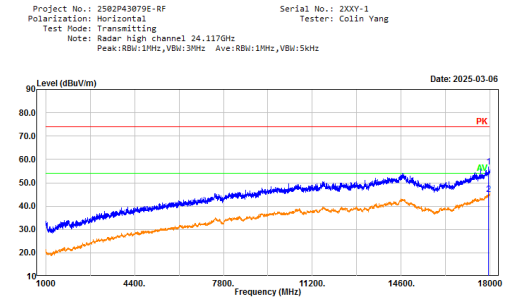
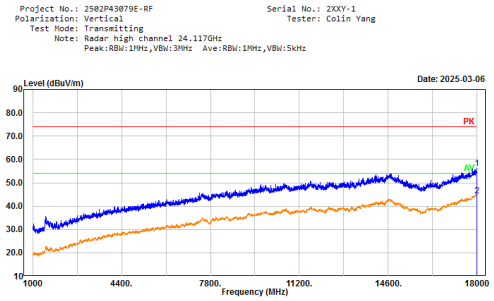
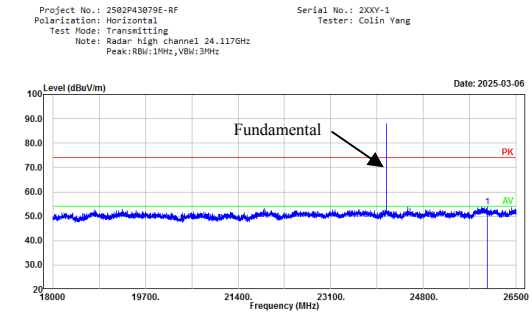
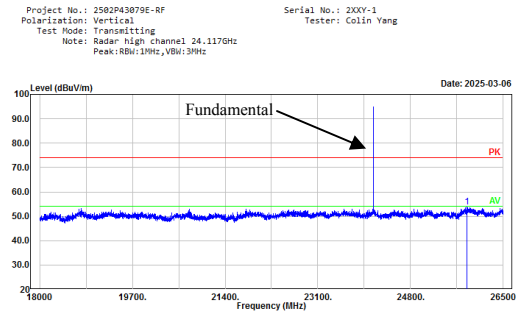


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	37988.50	47.64	11.88	59.52	74.00	14.48	Peak
2	37988.50	35.38	11.88	47.26	54.00	6.74	Average

Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.111GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	37942.60	47.01	11.66	58.67	74.00	15.33	Peak
2	37942.60	35.15	11.66	46.81	54.00	7.19	Average

High Horizontal	High Vertical
	
	

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	17942.20	49.18	7.72	56.90	74.00	17.10	Peak
2	17942.20	37.26	7.72	44.98	54.00	9.02	Average

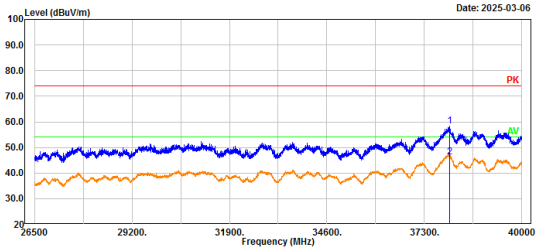
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	17989.80	48.09	8.06	56.15	74.00	17.85	Peak
2	17989.80	36.34	8.06	44.40	54.00	9.60	Average

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	25966.20	42.95	10.79	53.74	74.00	20.26	Peak

No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	25828.50	43.19	10.53	53.72	74.00	20.28	Peak

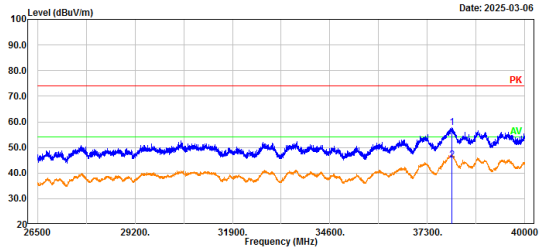
High Horizontal	High Vertical

Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.117GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	38007.40	46.46	11.92	58.38	74.00	15.62	Peak
2	38007.40	34.36	11.92	46.28	54.00	7.72	Average

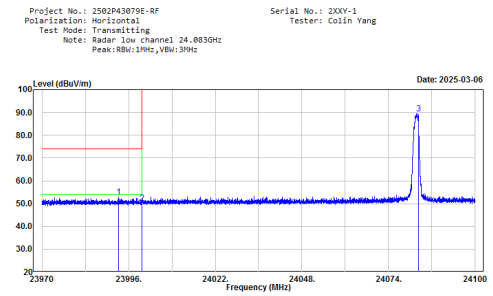
Project No.: 2502P43079E-RF Serial No.: 2XXY-1
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.117GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	37972.30	45.85	11.80	57.65	74.00	16.35	Peak
2	37972.30	33.39	11.80	45.19	54.00	8.81	Average

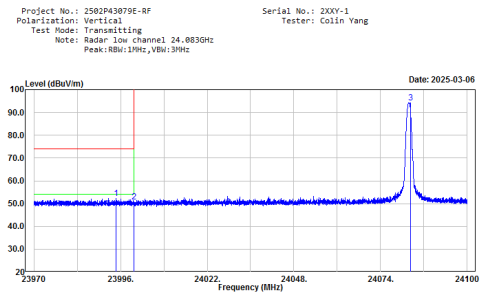
Fundamental strength and Bandedge:

Low Channel, Horizontal



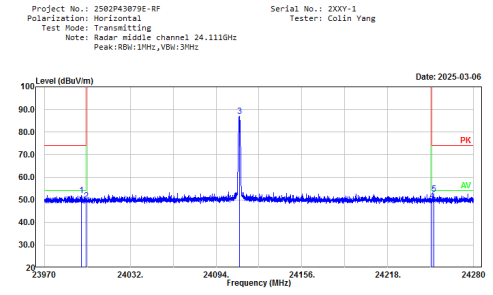
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23993.04	44.17	8.76	52.93	74.00	21.07	Peak
2	24000.00	41.42	8.76	50.18	74.00	23.82	Peak
3	24083.00	80.74	8.81	89.55	127.96	38.41	Peak

Low Channel, Vertical



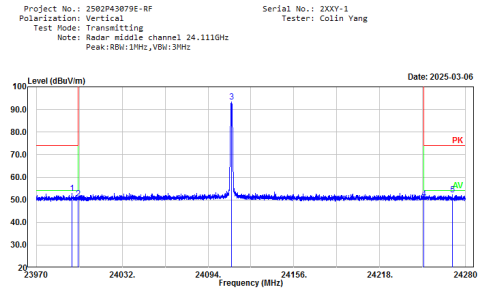
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23994.73	43.49	8.76	52.25	74.00	21.75	Peak
2	24000.00	41.88	8.76	50.64	74.00	23.36	Peak
3	24083.00	85.35	8.81	94.16	127.96	33.80	Peak

Middle Channel, Horizontal

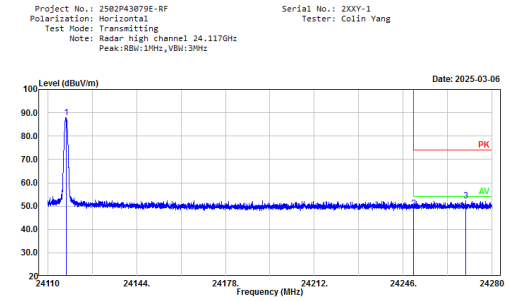
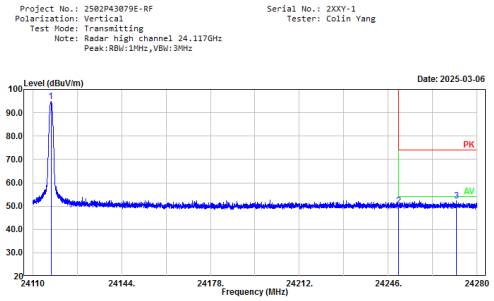


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23996.60	43.20	8.76	51.96	74.00	22.04	Peak
2	24000.00	40.79	8.76	49.55	74.00	24.45	Peak
3	24111.00	78.20	8.83	87.03	127.96	40.93	Peak
4	24250.00	40.68	8.92	49.60	74.00	24.40	Peak
5	24251.11	43.61	8.92	52.53	74.00	21.47	Peak

Middle Channel, Vertical



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23995.98	44.00	8.76	52.76	74.00	21.24	Peak
2	24000.00	41.83	8.76	50.59	74.00	23.41	Peak
3	24111.00	84.49	8.83	93.32	127.96	34.64	Peak
4	24250.00	41.55	8.92	50.47	74.00	23.53	Peak
5	24270.39	43.29	8.92	52.21	74.00	21.79	Peak

High Channel, Horizontal	High Channel, Vertical
	

No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	24117.00	78.97	8.83	87.80	127.96	40.16	Peak
2	24250.00	40.11	8.92	49.03	74.00	24.97	Peak
3	24269.83	43.25	8.92	52.17	74.00	21.83	Peak

No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	24117.00	85.90	8.83	94.73	127.96	33.23	Peak
2	24250.00	41.38	8.92	50.30	74.00	23.70	Peak
3	24271.98	43.48	8.92	52.40	74.00	21.60	Peak

4)40-100GHz:

Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low Channel 24.083 GHz							
48.166	45.63	PK	H	40.06	76.15	87.96	11.81
48.166	33.24	AV	H	40.06	63.76	67.96	4.20
48.166	45.69	PK	V	40.06	76.21	87.96	11.75
48.166	33.13	AV	V	40.06	63.65	67.96	4.31
72.249	42.75	PK	H	43.82	77.03	87.96	10.93
72.249	30.43	AV	H	43.82	64.71	67.96	3.25
72.249	42.51	PK	V	43.82	76.79	87.96	11.17
72.249	30.16	AV	V	43.82	64.44	67.96	3.52
Middle Channel 24.111 GHz							
48.222	45.71	PK	H	40.07	76.24	87.96	11.72
48.222	33.32	AV	H	40.07	63.85	67.96	4.11
48.222	45.98	PK	V	40.07	76.51	87.96	11.45
48.222	33.08	AV	V	40.07	63.61	67.96	4.35
72.333	42.48	PK	H	43.83	76.77	87.96	11.19
72.333	30.16	AV	H	43.83	64.45	67.96	3.51
72.333	42.38	PK	V	43.83	76.67	87.96	11.29
72.333	30.56	AV	V	43.83	64.85	67.96	3.11
High Channel 24.117 GHz							
48.234	45.98	PK	H	40.07	76.51	87.96	11.45
48.234	33.34	AV	H	40.07	63.87	67.96	4.09
48.234	45.18	PK	V	40.07	75.71	87.96	12.25
48.234	33.63	AV	V	40.07	64.16	67.96	3.80
72.351	42.15	PK	H	43.84	76.45	87.96	11.51
72.351	30.42	AV	H	43.84	64.72	67.96	3.24
72.351	42.44	PK	V	43.84	76.74	87.96	11.22
72.351	30.25	AV	V	43.84	64.55	67.96	3.41

Result = Reading + Factor- Distance extrapolation Factor
For 40-90GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1m]) dB= 9.54 dB
For 90-100GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [0.5m]) dB= 15.56 dB

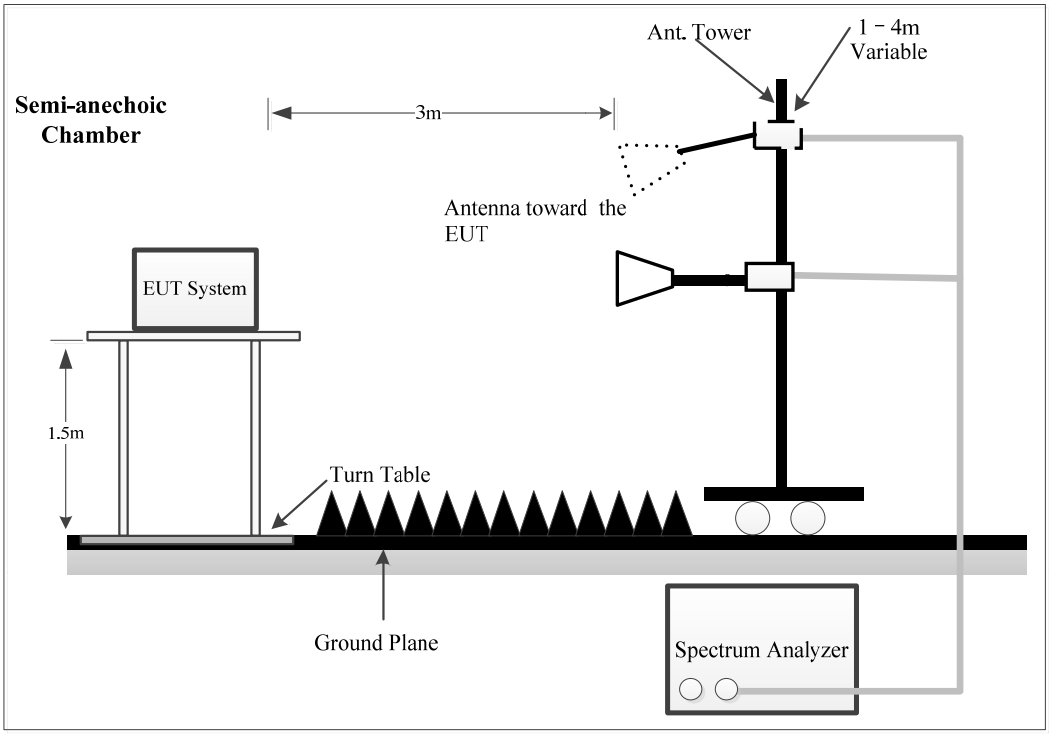
4.3 20 dB Emission Bandwidth

4.3.1 Applicable Standard

FCC §15.215

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

4.3.2 EUT Setup



4.3.3 Test Procedure

According to ANSI C63.10-2020 Section 6.9.2

a) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, unless otherwise specified by the applicable requirement.
b) Set the video bandwidth (VBW) ≥ 3×RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

4.3.4 Test Result

Serial No.:	2XXY-1	**Test Date:**	2025/3/6
Test Site:	Chamber B	**Test Mode:**	Transmitting
Tester:	Colin Yang	**Test Result:**	N/A

Environmental Conditions:

Temperature: (℃)	20.1	**Relative Humidity: (%)**	27	**ATM Pressure: (kPa)**	102.3

Test Equipment List and Details:

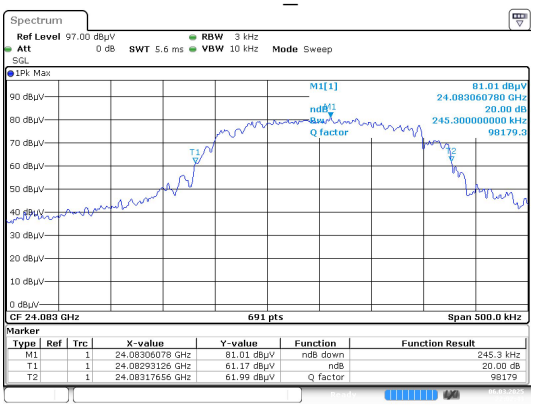
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2023/2/22	2026/2/21
AH	Preamplifier	PAM-1840VH	191	2024/9/5	2025/9/4
Xinhang Macrowave	Coaxial Cable	XH360A-2.92/J-2.92/J-6M-A	20231208001 #0001	2024/12/9	2025/12/8
R&S	Spectrum Analyzer	FSV40	101944	2024/9/6	2025/9/5

** 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:

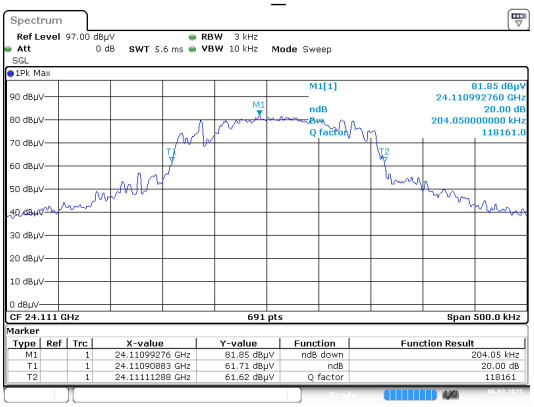
Test Mode	20 dB Bandwidth (kHz)
Low Channel	245.300
Middle Channel	204.050
High Channel	236.300
Note: the 20 dB bandwidth of the emission is contained within the operation frequency band. Please refer to the below plots.	

20 dB Bandwidth_Low Channel



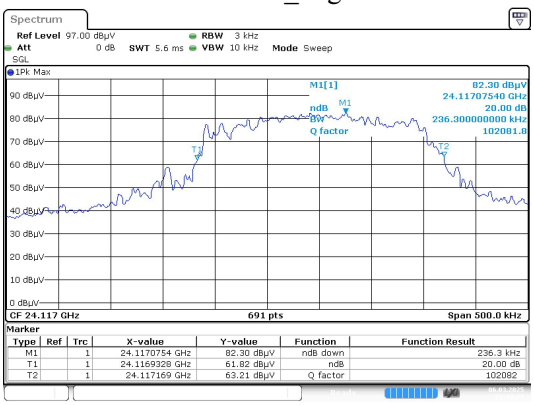
ProjectNo.:2502P43079E-RF Tester:Colin Yang
Date: 6.MAR.2025 22:02:43

20 dB Bandwidth _Middle Channel



ProjectNo.:2502P43079E-RF Tester:Colin Yang
Date: 6.MAR.2025 22:58:35

20 dB Bandwidth _High Channel



ProjectNo.:2502P43079E-RF Tester:Colin Yang
Date: 6.MAR.2025 21:43:27

4.4 Antenna Requirement

4.4.1 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.

4.4.2 Judgment

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

EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the attachment 2502P43079E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2502P43079E-RF-INP EUT INTERNAL PHOTOGRAPHS

EXHIBIT B - TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2502P43079E-RF-00A-TSP TEST SETUP PHOTOGRAPHS.

EXHIBIT C - RF EXPOSURE EVALUATION

Applicable Standard

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

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

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (minutes)**
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

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

Procedure

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

Calculated Result

Operation Modes	**Frequency (MHz)**	**Antenna Gain**		**Conducted output power including Tune-up Tolerance▲**		**Evaluation Distance (cm)**	**Power Density (mW/cm^2)**	**MPE Limit (mW/cm^2)**
		(dBi)	**(numeric)**	**(dBm)**	**(mW)**			
Radar	24083-24117	2.37	1.73	-2.84	0.52	20.00	0.0002	1.0
Fundamental field strength is 94.73BµV/m @ 3m = -0.47 dBm(0.9mW) EIRP. EIRP(dBm)=Field Strength of Fundamental(dBuV/m)-95.2 (dB). Conducted power=-0.47-2.37dBm=-2.84dBm. Conducted power(dBm)= EIRP(dBm)-Antenna Gain(dBi).								

Note: The Conducted Tune-up power was declared by the manufacturer.
Result: The device meet FCC MPE at 20 cm distance.

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