NVLAP TESTING
NVLAP LAB CODE 600341-0

BACL Bay Area Compliance Labs Corp.

TEST REPORT

Applicant:	**Q Global Solutions (Xiamen) Electronics Corp.**
Address:	**Floor 3,4,5,No 195 Simingyuan, Tong an Collective Industrial Park, Tong an District, Xiamen, Fujian, China**
Product Name:	**Front radar**
FCC ID:	**2BDTH-QRM-GTP**
Standard(s):	**47 CFR Part 95, Subpart M KDB 653005 D01 76-81 GHz Radars v01r02 ANSI C63.26-2015**
Report Number:	**2502A89456E-RF-00A**
Report Date:	**2026/1/17**

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

Alice Tan

Reviewed By: **Alice Tan**
Title: **RF Engineer**

Pedro Yun

Approved By: **Pedro Yun**
Title: **RF Supervisor**

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CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2502A89456E-RF-00A	Original Report	2026/1/17

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Front radar
EUT Model:	QRM-GTP
Operation Frequency Range▲:	77-81 GHz
Maximum Peak Output Power (EIRP):	34.06dBm
Modulation Type:	FMCW
Emission Designator:	N0N
Chirp Time▲:	40 μs
Rated Input Voltage:	DC 12/24V
Serial Number:	3E3P-1
EUT Received Date:	2025/12/10
EUT Received Status:	Good
Note: 1.Test was performed at DC 12V except frequency stability test was performed with the operation voltage, which was declared by manufacturer.	

1.2 Accessory Information

Accessory Description	Manufacturer	Model	Parameters
Three-color visual alarm	Q Global Solutions (Xiamen) Electronics Corp.	Unknown	Unknown
Triangular LED display 1#	Q Global Solutions (Xiamen) Electronics Corp.	Unknown	Unknown
Triangular LED display 2#	Q Global Solutions (Xiamen) Electronics Corp.	Unknown	Unknown

1.3 Antenna Information Detail▲

Radar module	Antenna Type	Antenna Connector	Antenna Gain /Frequency Range
Radar module 1	Patch	Integrated	6dBi/76-81GHz
Radar module 2	Patch	Integrated	21dBi/77-81GHz

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
FCC§2.1046, §95.3367 KDB 653005 D01 76-81 GHz Radars v01r02	Equivalent Isotropically Radiated Power (EIRP)	Compliant
FCC§2.1053, §95.3379	Unwanted Emissions	Compliant
FCC§2.1055(d), §95.3379	Frequency Stability	Compliant
FCC§2.1049	Occupied Bandwidth	Compliant
FCC§1.1310, §2.1091, §95.3385	RF exposure evaluation	Compliant

3 DESCRIPTION OF TEST CONFIGURATION

3.1 EUT Operation Condition

The system was configured for testing in production version, which was provided by the manufacturer. According to KDB 653005 D01 76-81 GHz Radars v01r02, the device tested at Swept mode for FMCW modulation.

The device built in two Radar modules, each module support 4TX4RX. All antennas transmits simultaneously and each module was tested separately except radiation emissions below 40GHz test simultaneously.

3.2 EUT Exercise Software

No software was used during test. The maximum power was configured default setting.

3.3 Support Equipment List and Details

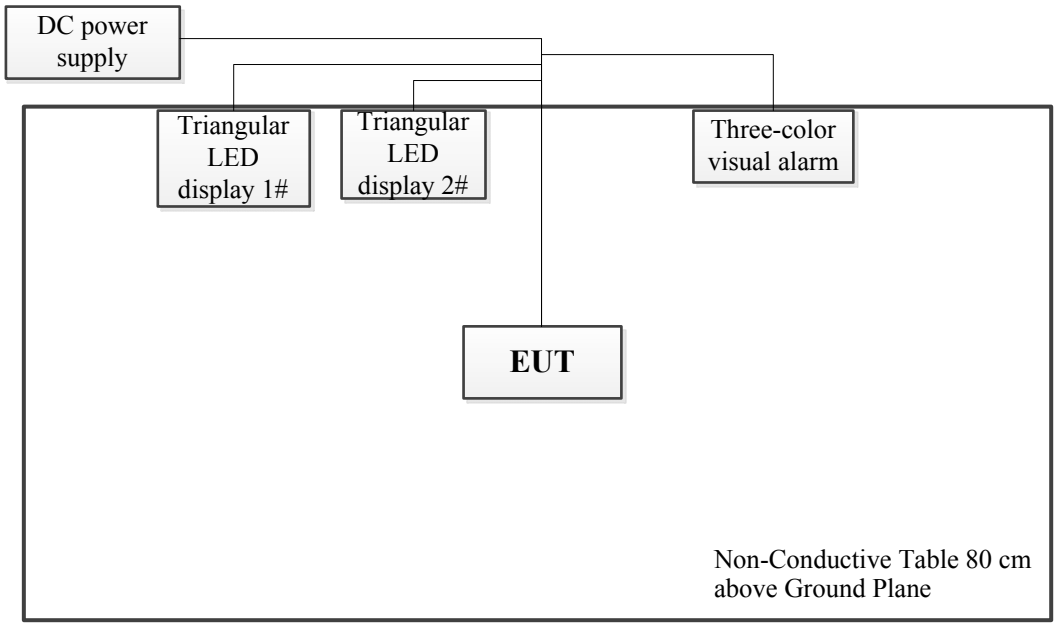
Manufacturer	Description	Model	Serial Number
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386

3.4 Support Cable List and Details

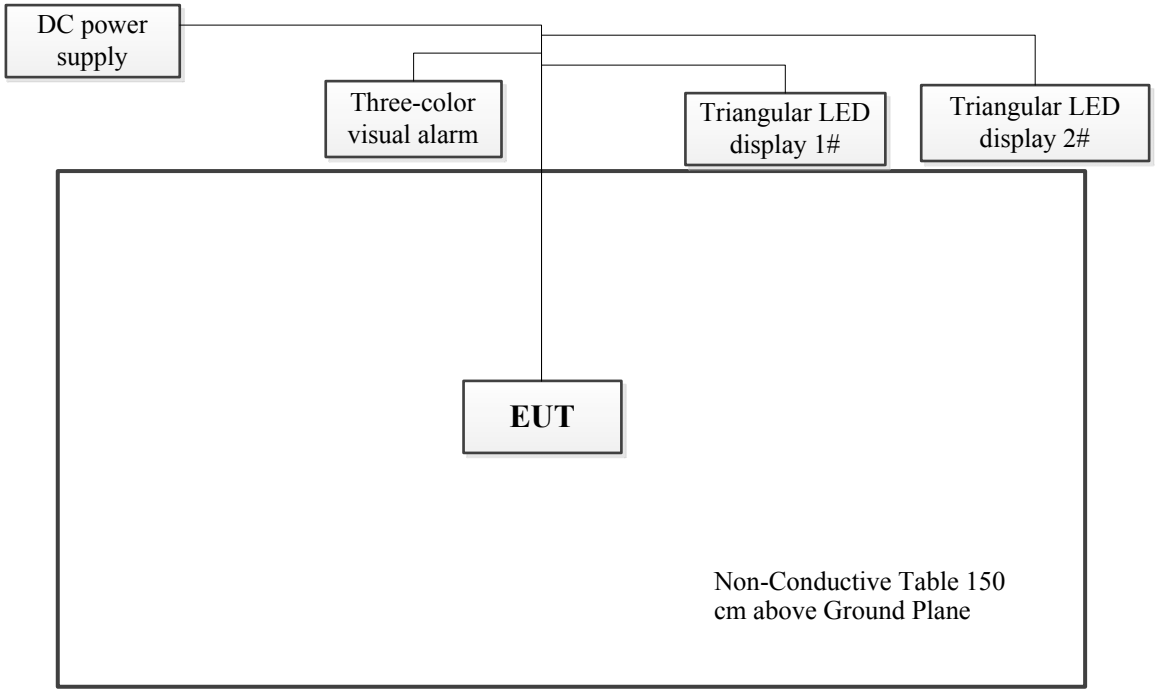
Cable Description	Shielding Type	Ferrite Core	Length(m)	From Port	To
4-in-1 Data Cable	No	No	3.5	Three-color visual alarm	EUT
	No	No	3.5	Triangular LED display 1#	
	No	No	3.5	Triangular LED display 2#	
	No	No	1.5	DC Power Supply	

3.5 Block Diagram of Test Setup

Radiated Spurious Emissions:
Below 1G:



Above 1G:



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: 3.06dB, 30MHz~1GHz: 6.13 dB,1GHz~6GHz: 4.79 dB, 6GHz~18GHz: 4.63 dB, 18GHz~26.5GHz:4.79 dB, 26.5GHz~40GHz:4.63 dB, 40~60G: 5.65dB, 60G~90G: 5.62dB, 90G-140G: 5.62dB, 140G-220G: 5.62dB, 220G-325G: 5.62dB
EIRP	4.94dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	2.83 dB (150 kHz to 30 MHz)

4. REQUIREMENTS AND TEST RESULTS

4.1 Equivalent Isotropically Radiated Power (EIRP)

4.1.1 Applicable Standard

FCC §2.1046, §95.3367;

The fundamental radiated emission limits within the 76-81 GHz band are expressed in terms of Equivalent Isotropically Radiated Power (EIRP) and are as follows:

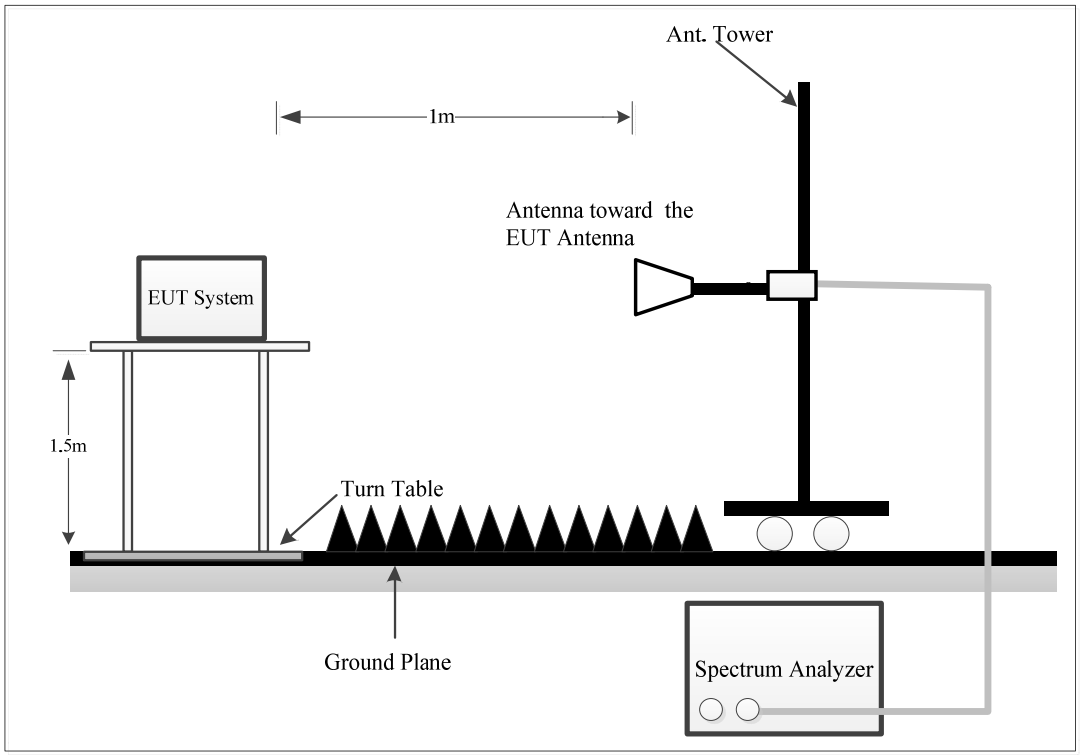
(a) The maximum power (EIRP) within the 76-81 GHz band shall not exceed 50 dBm based on measurements employing a power averaging detector with a 1 MHz Resolution Bandwidth (RBW).

(b) The maximum peak power (EIRP) within the 76-81 GHz band shall not exceed 55 dBm based on measurements employing a peak detector with a 1 MHz RBW.

KDB 653005 D01 76-81 GHz Radars v01r02, Clause 4 b):

The maximum fundamental emission power (EIRP) shall be measured using a power averaging (rms) detector with a 1 MHz resolution bandwidth (RBW) and integrated over the full 99% occupied bandwidth (OBW) to obtain the data necessary to demonstrate compliance to the 50 dBm limit.

4.1.2 EUT Setup



Place the measurement antenna at a measurement distance that is in the far-field of the measurement antenna, in the far-field of the EUT antenna. The EIRP test was performed at 1m distance, which was larger than the minimum test distance, please refer to section 4.2.4 for more detail.

Place the measurement antenna in the main beam of the EUT then maximize the fundamental emission, noting that multiple peaks can be found at different beam orientations and/or polarizations.

Correct the power reading from the spectrum analyzer for any external gain and/or attenuation between the measurement antenna and the spectrum analyzer.

4.1.3 Test Procedure

Refer to ANSI C63.26-2015 Clause 5.2.7, KDB 653005 D01 76-81 GHz Radars v01r02

Connect the test antenna for the fundamental frequency band to a spectrum analyzer via an external mixer.

Set spectrum analyzer RBW, VBW, detector, span, and so on, to the proper values.

Maximize the fundamental emission, noting that multiple peaks may be found at different beam orientations and/or polarizations

A pulse desensitization factor must be applied to the measured peak pulse power amplitude.

Consult the relevant instrumentation manufacturers' Application Note(s) for more detailed information, including how to determine the magnitude of the FMCW- and pulse-desensitization factors.

Calculate the EIRP from the measured field strength using equation as follows:

$EIRP\ (dBm) = E\ (dB\mu V/m) + 20\log(D) - 104.8$

EIRP is the equivalent isotropically radiated power
E is the field strength of the emission at the measurement distance
D is the measurement distance

For Peak Measurement:
$E\ (dB\mu V/m) = Reading(dB\mu V) + Factor(dB/m) + Chirps\ Correction\ Factor$

For Average Measurement:
$E\ (dB\mu V/m) = Reading(dB\mu V) + Factor(dB/m)$

Note: Factor includes the antenna and mixer factor, which was calibrated together.

4.1.4 Test Data and Result

Serial Number:	3E3P-1	Test Date:	2026/1/8-2026/1/13
Test Site:	Chamber B	Test Mode:	Transmitting
Tester:	Willem Qiu, Alan Xie	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	18.1-20.4	Relative Humidity: (%)	26-44	ATM Pressure: (kPa)	101.4-102.1

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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
Talent Microwave	Low Noise Amplifier	TMLA-050075-3845-15	24060304	2025/9/30	2028/9/29
Resenberger	Coaxial Cable	LU7-022-1000	0031	2025/2/28	2026/2/27
R&S	Spectrum Analyzer	FSV40	101944	2025/8/8	2026/8/7

** 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:
Module 1:
Peak EIRP:

Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	E-Field@1m (dBμV/m)	Chirps Correction Factor (dB)	EIRP (dBm)	Limit (dBm)
	Reading (dBμV)	Detector						
79.109	80.03	PK	H	43.72	123.75	15.11	34.06	55.00

Refer to Application Note 1EF107-1E Rohde &Schwarz Peak and Mean Power measurements on wideband FMCW radar signals. The chirps correction factor was calculated using the formula:

$$CF_{chirp} = 5 * \log\left(1 + K * \left(\frac{Span}{t * RBW^2}\right)^2\right)$$

K = a correction factor for the settling process of the gaussian shaped filter (0.1947)
t = the length of the chirp,

Average EIRP:

Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	E-Field@1m (dBμV/m)	Chirps Correction Factor (dB)	EIRP (dBm)	Limit (dBm)
	Reading (dBμV)	Detector						
79.109	89.57	AV	H	43.72	133.29	/	28.49	50.00

The maximum fundamental emission power (EIRP) was measured using a power averaging (rms) detector with a 1 MHz resolution bandwidth (RBW) and integrated over the full 99% occupied bandwidth (OBW).

Chirps Correction Factor Calculation:

Chirp Time▲ (μs)	Span (MHz)	Chirps Correction Factor (dB)
40	2938.00	15.11

Module 2:
Peak EIRP:

Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	E-Field@1m (dBμV/m)	Chirps Correction Factor (dB)	EIRP (dBm)	Limit (dBm)
	Reading (dBμV)	Detector						
79.1	78.11	PK	H	43.76	121.87	15.15	32.22	55.00

Refer to Application Note 1EF107-1E Rohde &Schwarz Peak and Mean Power measurements on wideband FMCW radar signals. The chirps correction factor was calculated using the formula:

$$CF_{chirp} = 5 * \log\left(1 + K * \left(\frac{Span}{t * RBW^2}\right)^2\right)$$

K = a correction factor for the settling process of the gaussian shaped filter (0.1947)
t = the length of the chirp,

Average EIRP:

Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	E-Field@1m (dBμV/m)	Chirps Correction Factor (dB)	EIRP (dBm)	Limit (dBm)
	Reading (dBμV)	Detector						
79.1	89.89	AV	H	43.76	133.65	/	28.85	50.00

The maximum fundamental emission power (EIRP) was measured using a power averaging (rms) detector with a 1 MHz resolution bandwidth (RBW) and integrated over the full 99% occupied bandwidth (OBW).

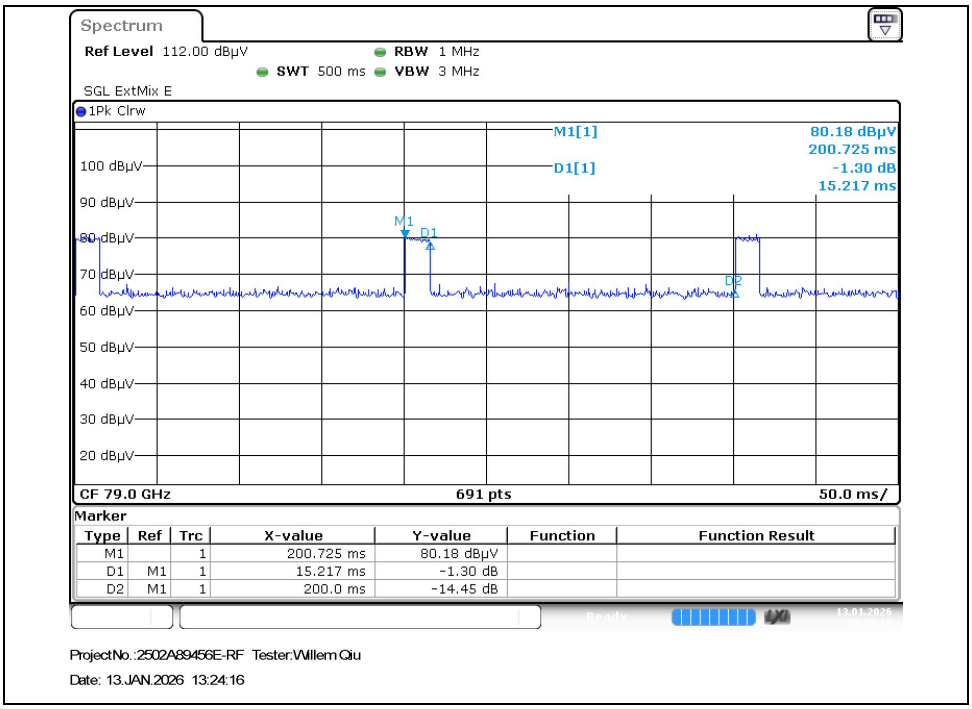
Chirps Correction Factor Calculation:

Chirp Time▲ (μs)	Span (MHz)	Chirps Correction Factor (dB)
40	2964.00	15.15

Module 1:

Power duty cycle:

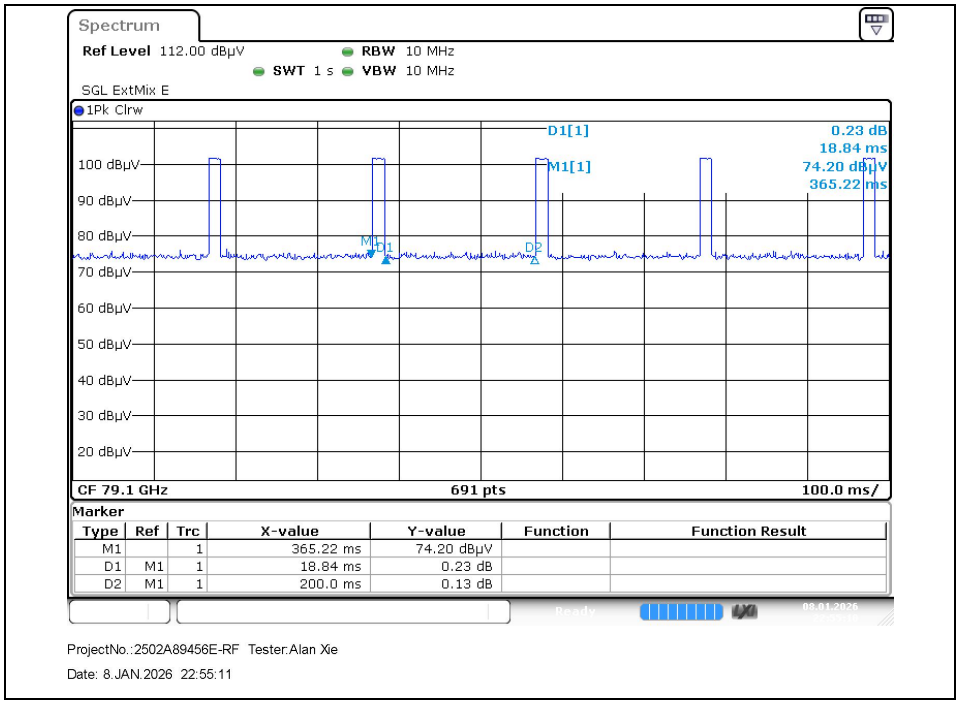
Ton (ms)	Ton+off (ms)	Duty cycle (%)
15.22	200.00	7.61



Module 2:

Power duty cycle:

Ton (ms)	Ton+off (ms)	Duty cycle (%)
18.84	200.00	9.42



4.2 Unwanted Emissions

4.2.1 Applicable Standard

FCC §2.1053 and §95.3379;

(a) The power density of any emissions outside the 76-81 GHz band shall consist solely of spurious emissions and shall not exceed the following:

(1) Radiated emissions below 40 GHz shall not exceed the field strength as shown in the following emissions table.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

(i) In the emissions table in paragraph (a)(1) of this section, the tighter limit applies at the band edges.

(ii) The limits in the table in paragraph (a)(1) of this section are based on the frequency of the unwanted emissions and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(iii) The emissions limits shown in the table in paragraph (a)(1) of this section are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9.0-90.0 kHz, 110.0-490.0 kHz, and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector with a 1 MHz RBW.

(2) The power density of radiated emissions outside the 76-81 GHz band above 40.0 GHz shall not exceed the following, based on measurements employing an average detector with a 1 MHz RBW:

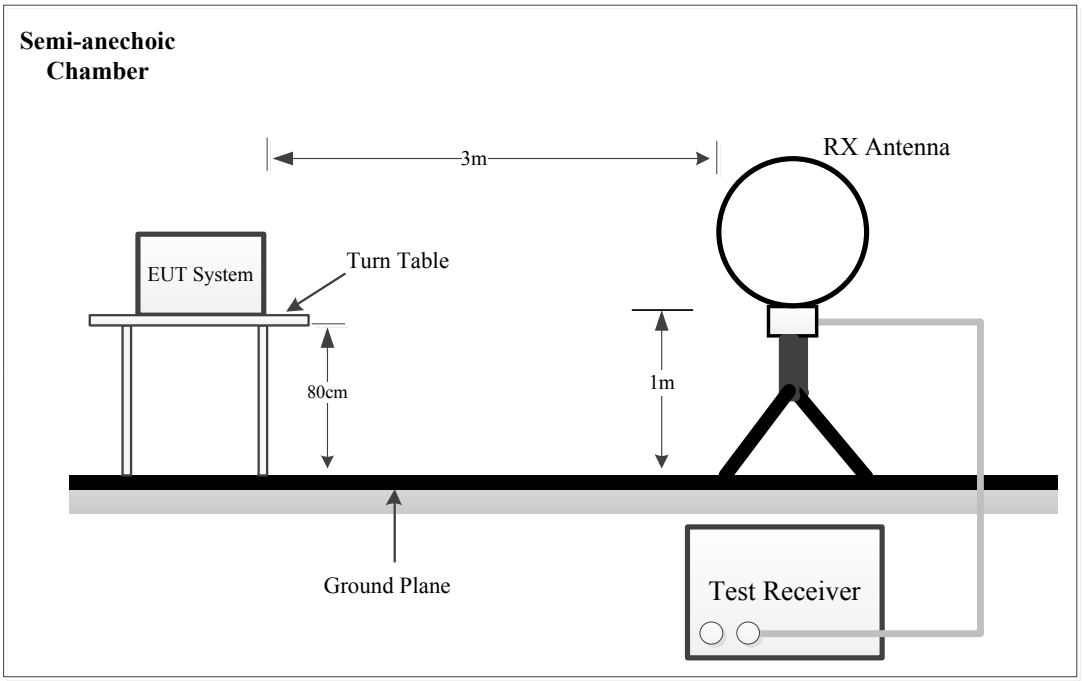
(i) For radiated emissions outside the 76-81 GHz band between 40 GHz and 200 GHz from field disturbance sensors and radar systems operating in the 76-81 GHz band: 600 pW/cm^2 at a distance of 3 meters from the exterior surface of the radiating structure.

(ii) For radiated emissions above 200 GHz from field disturbance sensors and radar systems operating in the 76-81 GHz band: 1000 pW/cm^2 at a distance of 3 meters from the exterior surface of the radiating structure.

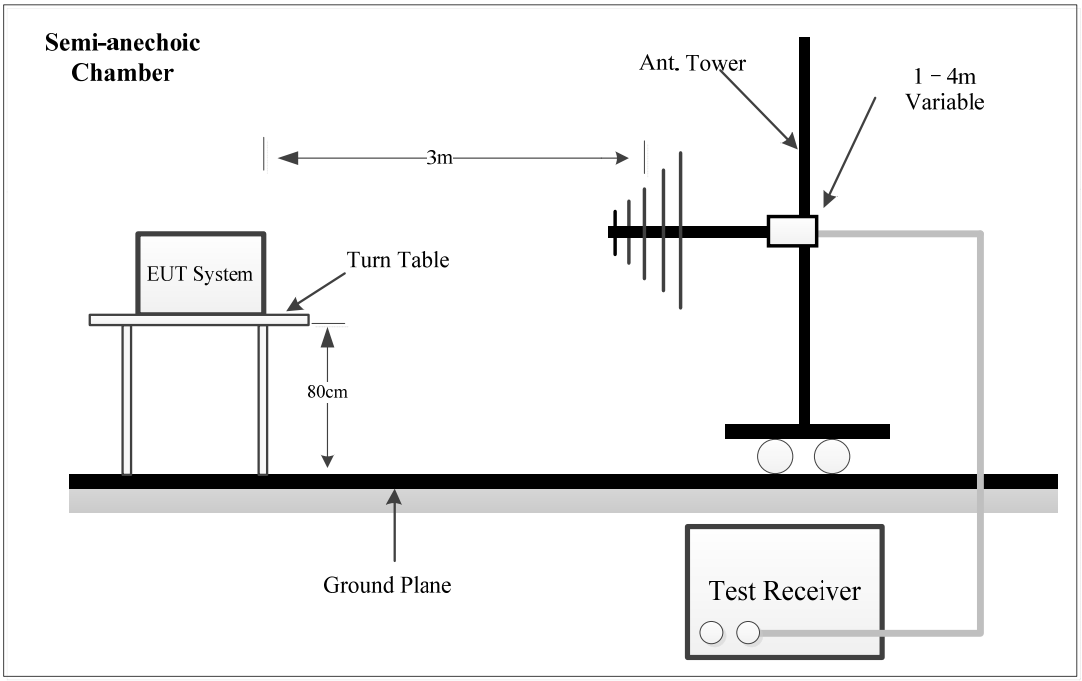
(3) For field disturbance sensors and radar systems operating in the 76-81 GHz band, the spectrum shall be investigated up to 231.0 GHz.

4.2.2 EUT Setup

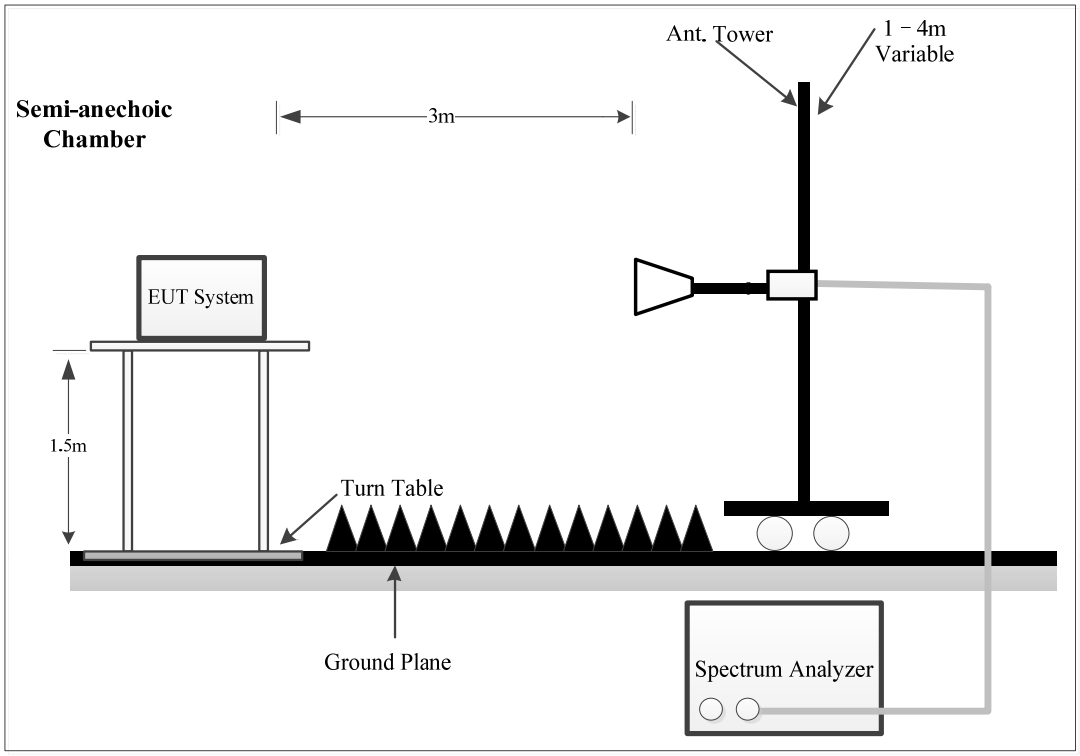
9kHz~30MHz:



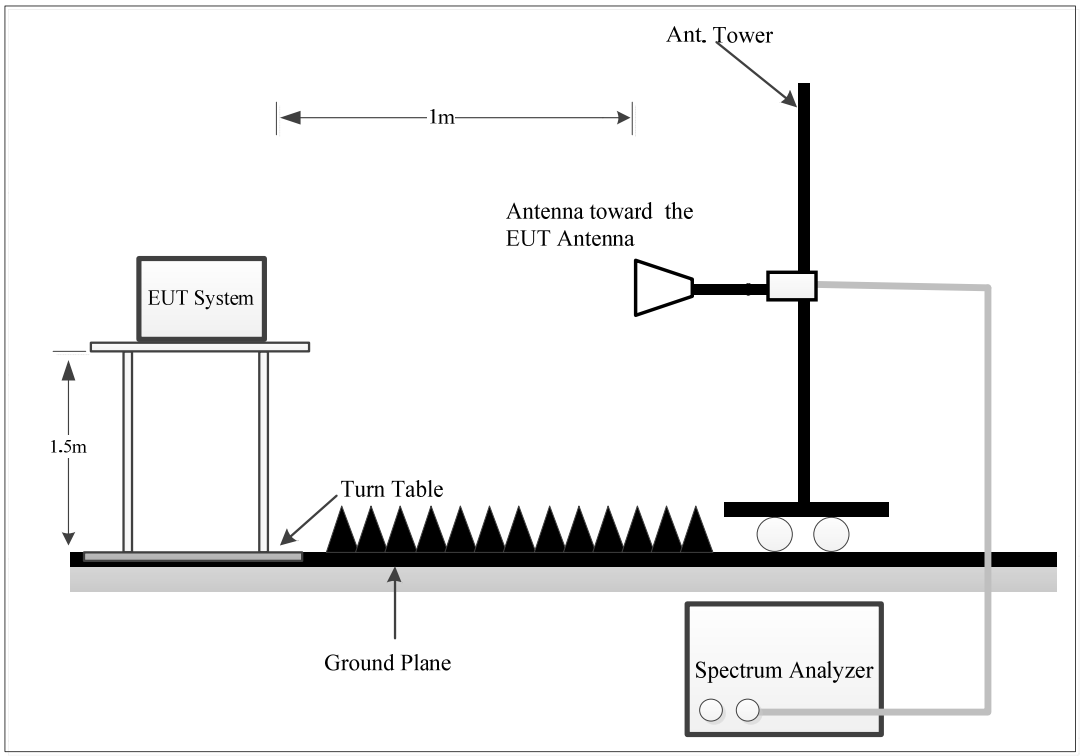
30MHz- 1GHz:



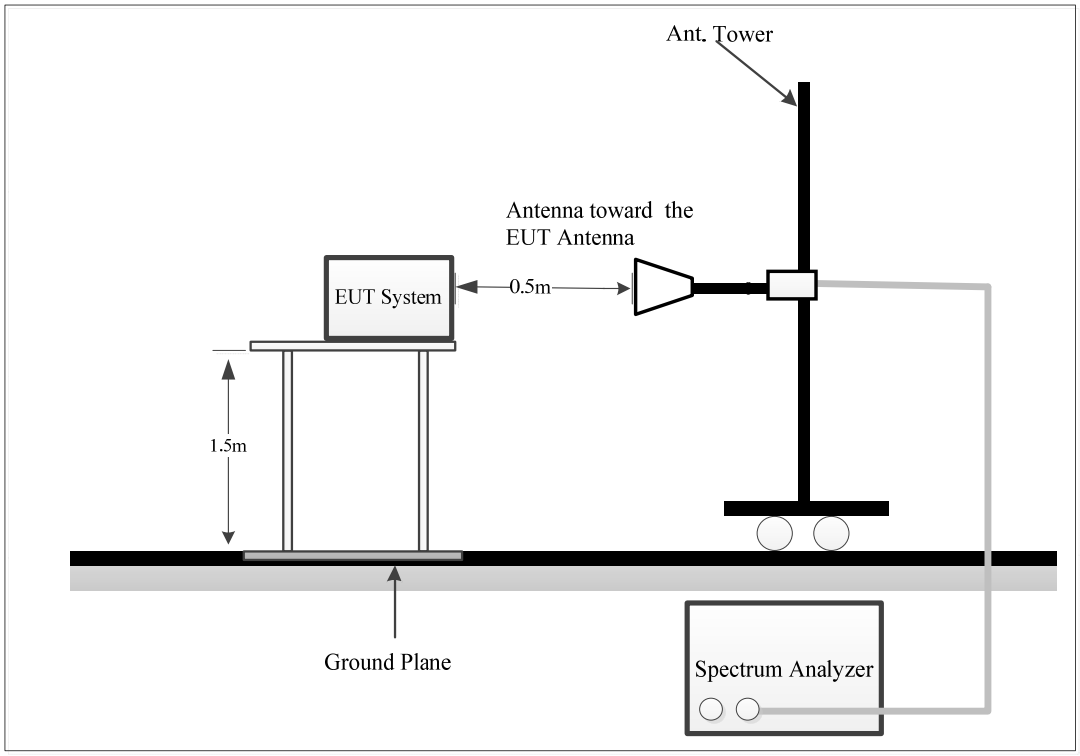
1-18 GHz:



18-90 GHz:



90-231 GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.26-2015. The specification used was the FCC 95.3379 limits.

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 40-231 GHz:
Place the measurement antenna in the main beam of the EUT then maximize the fundamental emission, noting that multiple peaks can be found at different beam orientations and/or polarizations.

4.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 9kHz to 231 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	Detector
9 kHz-150 kHz	QP/AV	200 Hz	1 kHz	200 Hz	QP/AV
150 kHz-30 MHz	QP/AV	9 kHz	30 kHz	9 kHz	QP/AV
30 MHz-1000 MHz	Peak	120 kHz	500 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

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.

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.

For above 40GHz:

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 C63.26-2015:

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

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-231GHz 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	0.54
M08RH	90-140	19.7	0.36
M05RH	140-220	12.5	0.23
M03RH	220-325	8.36	0.10

Note: the test distances used were 1.0 m from 40 GHz to 90 GHz, and 0.5 m from 90 GHz to 231GHz, 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 is as follows:

For 9kHz-18GHz:
Result = Reading + Factor

For 18GHz-40GHz
Result = Reading + Factor-Distance extrapolation Factor

Note: the antenna JB3 was calibrated with 6dB Attenuator, the antenna factor includes the insertion loss of the Attenuator.

For Above 40GHz:

Field Strength = Reading + Factor
EIRP (dBm) = Field Strength (dBμV/m) + 20log(D) − 104.8

D is the measurement distance

$$EIRP_{Linear} = 10^{\left[(EIRP_{Log} - 30)/10\right]}$$

where

$EIRP_{Linear}$ is the equivalent isotropically radiated power, in watts
$EIRP_{Log}$ is the equivalent isotropically radiated power, in dBm

$$PD = \frac{EIRP_{Linear}}{4\pi d^2}$$

where

PD is the power density at the distance specified by the limit, in W/m^2
$EIRP_{Linear}$ is the equivalent isotropically radiated power, in watts
d is the distance at which the power density limit is specified, in m

The Specified distance is 3m.

Note: Factor includes the antenna and mixer factor, which was calibrated together.

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 Data and Result

Serial Number:	3E3P-1	Test Date:	Below 1GHz: 2025/12/20 Above 1GHz: 2025/12/22
Test Site:	Chamber A, Chamber B	Test Mode:	Transmitting
Tester:	Jayce Wang, Alan Xie	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.2~24.5	Relative Humidity: (%)	44~55	ATM Pressure: (kPa)	101.4

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	A060611-2	2024/4/16	2027/4/15
Narda	Coaxial Attenuator	757C-6dB	34010	2024/4/16	2027/4/15
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2025/7/1	2026/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2025/7/1	2026/6/30
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2025/7/1	2026/6/30
Sonoma	Amplifier	310N	372193	2025/7/30	2026/7/29
R&S	EMI Test Receiver	ESCI	100035	2025/6/25	2026/6/24
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
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2023/2/22	2026/2/21
Ducommun Technologies	Horn Antenna	ARH-2823-02	1007726-01 1302	2023/2/22	2026/2/21
Xinhang Macrowave	Coaxial Cable	XH750A-N/J-SMA/J-10M	20231117004 #0001	2025/11/17	2026/11/16
Xinhang Macrowave	Coaxial Cable	XH360A-2.92/J-2.92/J-6M-A	20231208001 #0001	2025/11/14	2026/11/13
AH	Preamplifier	PAM-0118P	469	2025/4/11	2026/4/10
AH	Preamplifier	PAM-1840VH	191	2025/7/31	2026/7/30
R&S	Spectrum Analyzer	FSV40	101944	2025/8/8	2026/8/7
Audix	Test Software	E3	191218 V9	N/A	N/A
OML	Waveguide Mixer	WR19/M19HWD	U60313-1	2023/9/11	2026/9/10
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
OML	Waveguide Mixer	WR05/M05HWD	G60106-1	2023/2/16	2026/2/15
OML	Horn Antenna	M05RH	G60106-2	2023/2/27	2026/2/26
Resenberger	Coaxial Cable	LU7-022-1000	0031	2025/2/28	2026/2/27
Talent Microwave	U-Band Low Noise Amplifier	TMLA-040060-4550-19-N	24060296	2025/9/30	2028/9/29
Talent Microwave	Low Noise Amplifier	TMLA-050075-3845-15	24060304	2025/9/30	2028/9/29
Talent Microwave	Low Noise Amplifier	TMLA-060090-3840-12	24060299	2025/9/30	2028/9/29

Talent Microwave	Low Noise Amplifier	TMLA-090140-4045-08	24060353	2025/9/30	2028/9/29
Talent Microwave	Low Noise Amplifier	TMLA-140220-1860-05	24060361	2025/9/30	2028/9/29
** 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).*					

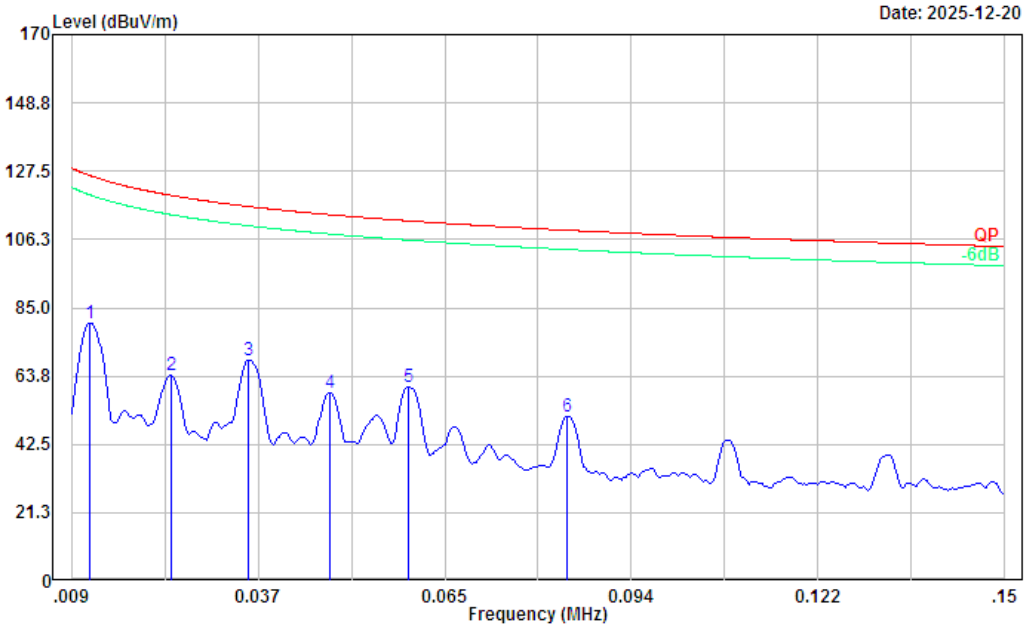
Test Data:

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(All Radar Modules and all antennas transmit simultaneously)
(pretest parallel, perpendicular, and ground-parallel, the worst is below**):**

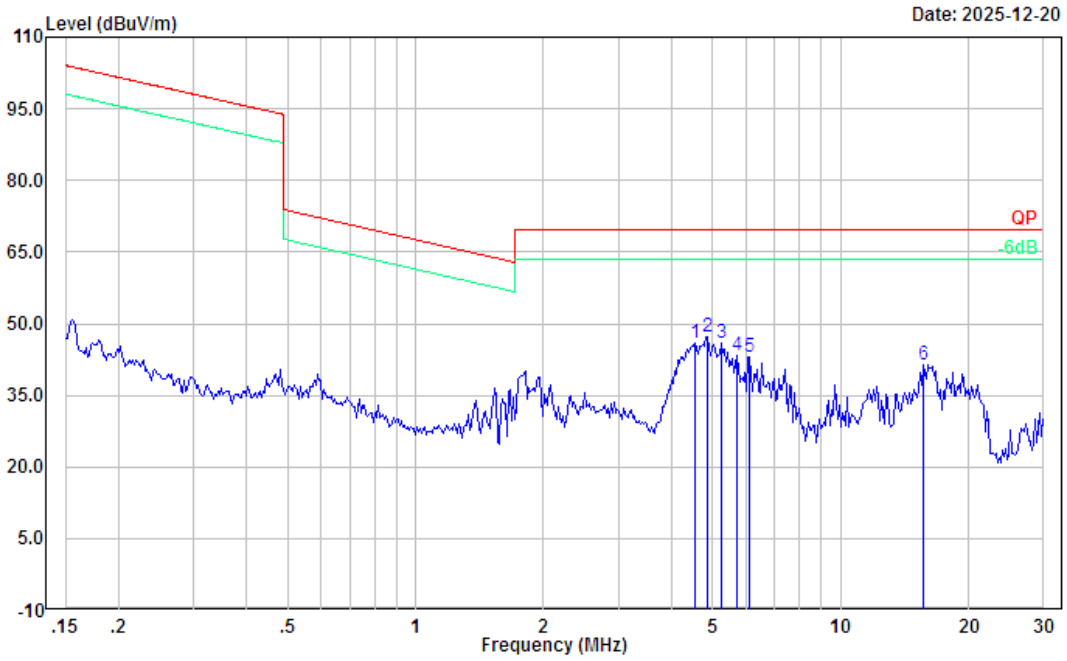
```
 Project No.: 2502A89456E-RF                Serial No.: 3E3P-1
Polarization: Parallel                          Tester: Jayce Wang
   Test Mode: Transmitting
        Note: RBW:200Hz,VBW:1kHz
```



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	0.012	29.39	50.99	80.38	126.15	45.77	Peak
2	0.024	15.87	48.01	63.88	119.99	56.11	Peak
3	0.036	23.21	45.64	68.85	116.53	47.68	Peak
4	0.048	14.93	43.69	58.62	113.98	55.36	Peak
5	0.060	18.77	41.78	60.55	112.04	51.49	Peak
6	0.084	13.51	37.57	51.08	109.12	58.04	Peak

Project No.: 2502A89456E-RF
Polarization: Parallel
Test Mode: Transmitting
Note: RBW:9kHz,VBW:30kHz

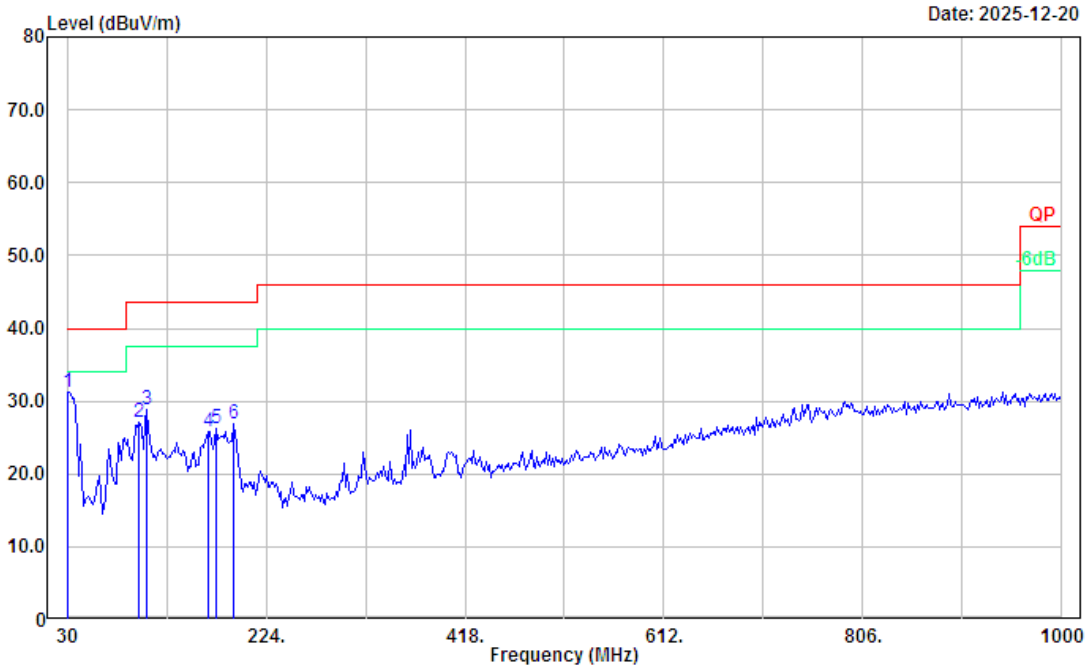
Serial No.: 3E3P-1
Tester: Jayce Wang



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	4.533	39.58	6.20	45.78	69.54	23.76	Peak
2	4.865	41.52	5.75	47.27	69.54	22.27	Peak
3	5.221	40.67	5.42	46.09	69.54	23.45	Peak
4	5.703	38.36	5.09	43.45	69.54	26.09	Peak
5	6.121	38.04	4.87	42.91	69.54	26.63	Peak
6	15.607	37.98	3.52	41.50	69.54	28.04	Peak

2)30MHz-1GHz(All Radar Modules and all antennas transmit simultaneously)

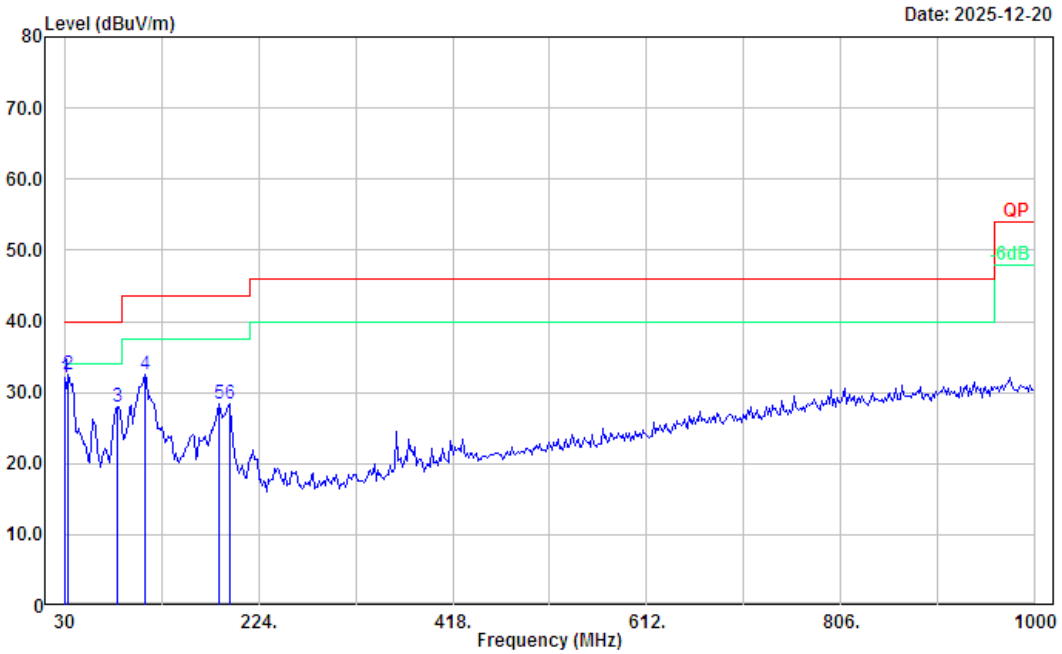
Project No.: 2502A89456E-RF Serial No.: 3E3P-1
Polarization: Horizontal Tester: Jayce Wang
Test Mode: Transmitting
Note: RBW:120kHz,VBW:500kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	30.00	35.05	-3.81	31.24	40.00	8.76	Peak
2	99.52	40.92	-13.89	27.03	43.50	16.47	Peak
3	107.60	40.60	-11.79	28.81	43.50	14.69	Peak
4	167.42	37.60	-11.72	25.88	43.50	17.62	Peak
5	175.50	38.04	-11.91	26.13	43.50	17.37	Peak
6	191.67	38.97	-12.03	26.94	43.50	16.56	Peak

Project No.: 2502A89456E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: RBW:120kHz,VBW:500kHz

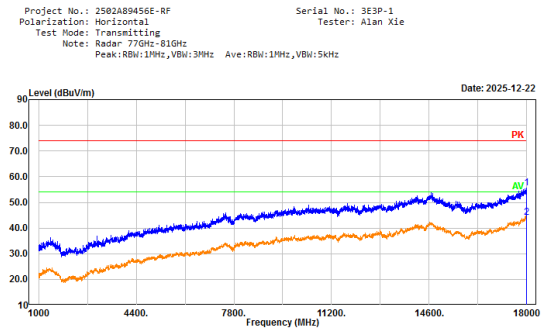
Serial No.: 3E3P-1
Tester: Jayce Wang



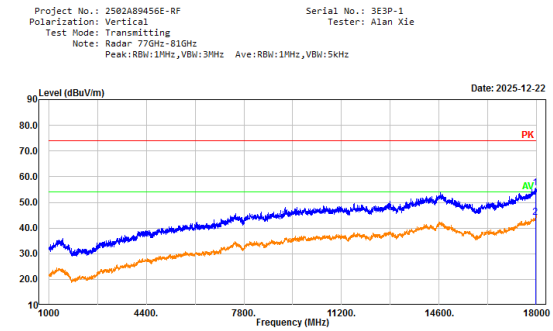
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	30.00	35.98	-3.81	32.17	40.00	7.83	Peak
2	33.23	38.63	-6.10	32.53	40.00	7.47	Peak
3	83.35	44.74	-16.76	27.98	40.00	12.02	Peak
4	110.83	43.68	-11.08	32.60	43.50	10.90	Peak
5	185.20	40.61	-12.13	28.48	43.50	15.02	Peak
6	194.90	40.08	-11.71	28.37	43.50	15.13	Peak

3) 1GHz-40GHz(All Radar Modules and all antennas transmit simultaneously):

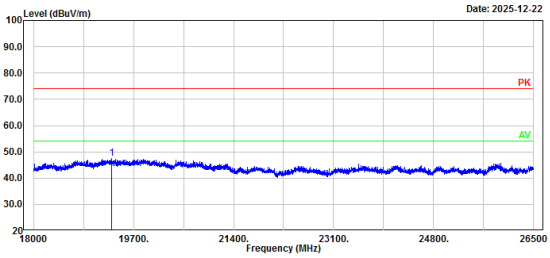
Horizontal	Vertical



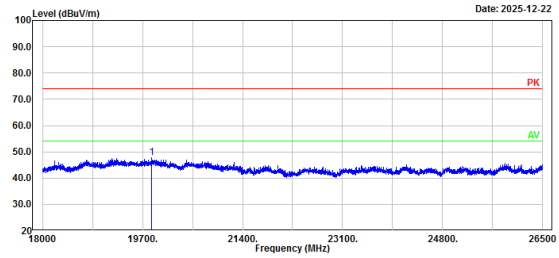
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	17989.80	47.67	7.84	55.51	74.00	18.49	Peak
2	17989.80	36.42	7.84	44.26	54.00	9.74	Average



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	17949.00	48.13	7.56	55.69	74.00	18.31	Peak
2	17949.00	36.58	7.56	44.14	54.00	9.86	Average



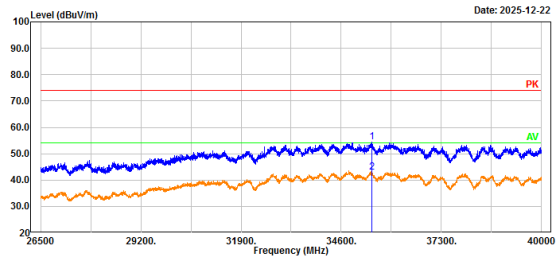
No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	19324.30	47.23	0.16	47.39	74.00	26.61	Peak



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	19859.80	47.45	0.20	47.65	74.00	26.35	Peak

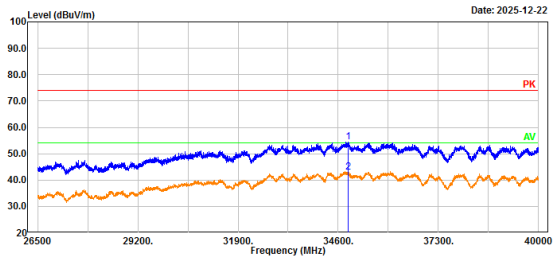
Horizontal	Vertical

Project No.: 2502A89456E-RF Serial No.: 3E3P-1
Polarization: Horizontal Tester: Alan Xie
Test Mode: Transmitting
Note: Radar 77GHz-81GHz
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)	Measurement
1	35431.60	46.85	7.55	54.40	74.00	19.60	Peak
2	35431.60	35.25	7.55	42.80	54.00	11.20	Average

Project No.: 2502A89456E-RF Serial No.: 3E3P-1
Polarization: Vertical Tester: Alan Xie
Test Mode: Transmitting
Note: Radar 77GHz-81GHz
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)	Measurement
1	34872.70	47.16	7.21	54.37	74.00	19.63	Peak
2	34872.70	35.84	7.21	43.05	54.00	10.95	Average

4) 40GHz-231GHz:

Module 1:

Frequency (GHz)	Receiver Reading (dBμV)	Polar (H/V)	Factor (dB/m)	Field Strength (dBμV/m)	Power Density (pW/cm^2)	Limit (pW/cm^2)
40.390	56.57	H	38.85	95.42	101.99	600.00
40.680	57.46	V	38.90	96.36	126.63	600.00
90.730	56.25	H	45.20	101.45	102.21	600.00
90.260	56.53	V	45.14	101.67	107.52	600.00

Module 2:

Frequency (GHz)	Receiver Reading (dBμV)	Polar (H/V)	Factor (dB/m)	Field Strength (dBμV/m)	Power Density (pW/cm^2)	Limit (pW/cm^2)
40.150	57.62	H	38.81	96.43	128.69	600.00
40.370	56.84	V	38.85	95.69	108.53	600.00
90.540	56.52	H	45.17	101.69	108.02	600.00
90.170	56.37	V	45.13	101.50	103.39	600.00

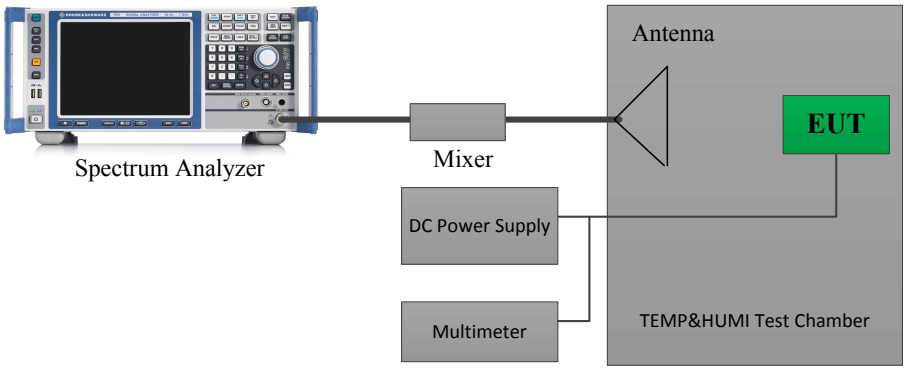
4.3 Frequency Stability:

4.3.1 Applicable Standard

FCC §95.3379 (b)

(b) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

4.3.2 EUT Setup Block Diagram



4.3.3 Test Procedure

C63.26-2015, Clause 5.6

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage. The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency determining circuit element shall be made subsequent to this initial set-up. Frequency stability is tested:
a) At 10 °C intervals of temperatures between −30 °C and +50 °C at the manufacturer's rated supply voltage, and
b) At +20 °C temperature and ±15% supply voltage variations. If a product is specified to operate over a range of input voltage then the −15% variation is applied to the lowermost voltage and the +15% is applied to the uppermost voltage. During the test all necessary settings, adjustments and control of the EUT have to be performed without disturbing the test environment, i.e., without opening the environmental chamber. The frequency stabilities can be maintained to a lesser temperature range provided that the transmitter is automatically inhibited from operating outside the lesser temperature range. For handheld equipment that is only capable of operating from internal batteries and the supply voltage cannot be varied, the frequency stability tests shall be performed at the nominal battery voltage and the battery end point voltage specified by the manufacturer. An external supply voltage can be used and set at the internal battery nominal voltage, and again at the battery operating end point voltage which shall be specified by the equipment manufacturer.
If an unmodulated carrier is not available, the mean frequency of a modulated carrier can be obtained by using a frequency counter with gating time set to an appropriately large multiple of bit periods (gating time depending on the required accuracy). Full details on the choice of values shall be included in the test report.

4.3.4 Test Result

Serial Number:	3E3P-1	Test Date:	2025/12/22
Test Site:	RF	Test Mode:	Transmitting
Tester:	Willem Qiu, Alan Xie	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	24.5	Relative Humidity: (%)	55	ATM Pressure: (kPa)	101.4

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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
Talent Microwave	Low Noise Amplifier	TMLA-050075-3845-15	24060304	2025/9/30	2028/9/29
Resenberger	Coaxial Cable	LU7-022-1000	0031	2025/2/28	2026/2/27
R&S	Spectrum Analyzer	FSV40	101944	2025/8/8	2026/8/7
GLOBAL	TEMP&HUMI Test Chamber	BTH-150-40	30173	2025/8/1	2026/7/31
All-sun	Clamp Meter	EM305A	8348897	2025/8/18	2026/8/17
TDK-Lambda	DC Power Supply	Z+60-14	F-08-EM038-1	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:

Module 1:

Temperature	Voltage	Frequency (GHz)			
℃	V_{DC}	f_L	f_H	f_L Limit	f_H Limit
-20	12	77.63292	80.57103	76	81
-10	12	77.63311	80.57102	76	81
0	12	77.63303	80.57094	76	81
10	12	77.63302	80.57093	76	81
20	12	77.63300	80.57100	76	81
30	12	77.63295	80.57101	76	81
40	12	77.63292	80.57096	76	81
50	12	77.63304	80.57105	76	81
20	24	77.63293	80.57104	76	81

Module 2:

Temperature	Voltage	Frequency (GHz)			
℃	V_{DC}	f_L	f_H	f_L Limit	f_H Limit
-20	12	77.625	80.584	76	81
-10	12	77.628	80.583	76	81
0	12	77.623	80.585	76	81
10	12	77.621	80.588	76	81
20	12	77.622	80.586	76	81
30	12	77.618	80.588	76	81
40	12	77.620	80.587	76	81
50	12	77.623	80.585	76	81
20	24	77.621	80.588	76	81

Note: the operation voltage range was declared by manufacturer.

4.4 Occupied Bandwidth:

4.4.1 Applicable Standard

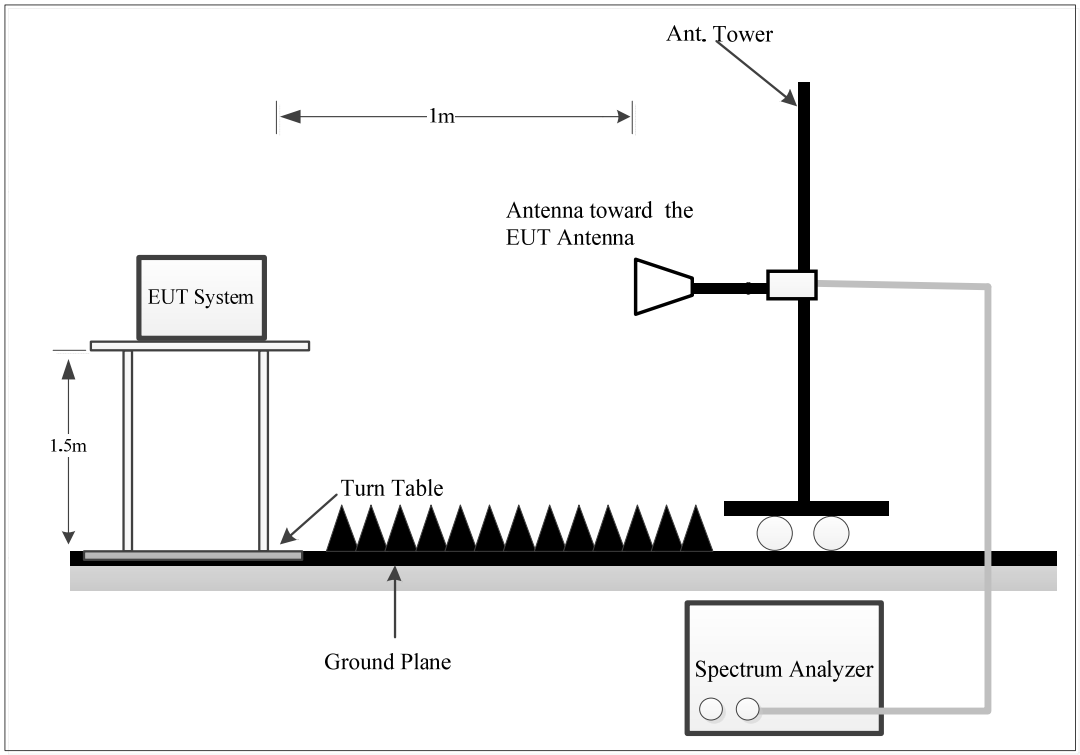
FCC §2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

653005 D01 76-81 GHz Radars v01r02 clause 4 d)

The occupied bandwidth of the radar device shall be measured, reported, and shown to be fully contained within the designated 76-81 GHz frequency band under normal operating conditions as well as under those extreme ambient temperature and input voltage conditions as described in Section 2.1057.

4.4.2 EUT Setup



Place the measurement antenna in the main beam of the EUT then maximize the fundamental emission, noting that multiple peaks can be found at different beam orientations and/or polarizations.

4.4.3 Test Procedure

C63.26-2015, Clause 5.4.4

The OBW 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 spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 × OBW is sufficient).

b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.
NOTE—Step a), step b), and step c) may require iteration to adjust within the specified tolerances.

d) Set the detection mode to peak, and the trace mode to max-hold.
e) If the instrument does not have a 99% OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5% of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5% of the total is reached and record that frequency as the upper OBW frequency. The 99% power OBW can be determined by computing the difference these two frequencies.

f) The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

4.4.4 Test Result

Serial Number:	3E3P-1	Test Date:	2026/1/8-2026/1/13
Test Site:	Chamber B	Test Mode:	Transmitting
Tester:	Willem Qiu, Alan Xie	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	18.1-20.4	Relative Humidity: (%)	26-44	ATM Pressure: (kPa)	101.4-102.1

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
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
Talent Microwave	Low Noise Amplifier	TMLA-050075-3845-15	24060304	2025/9/30	2028/9/29
Resenberger	Coaxial Cable	LU7-022-1000	0031	2025/2/28	2026/2/27
R&S	Spectrum Analyzer	FSV40	101944	2025/8/8	2026/8/7

** 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:

Module 1:

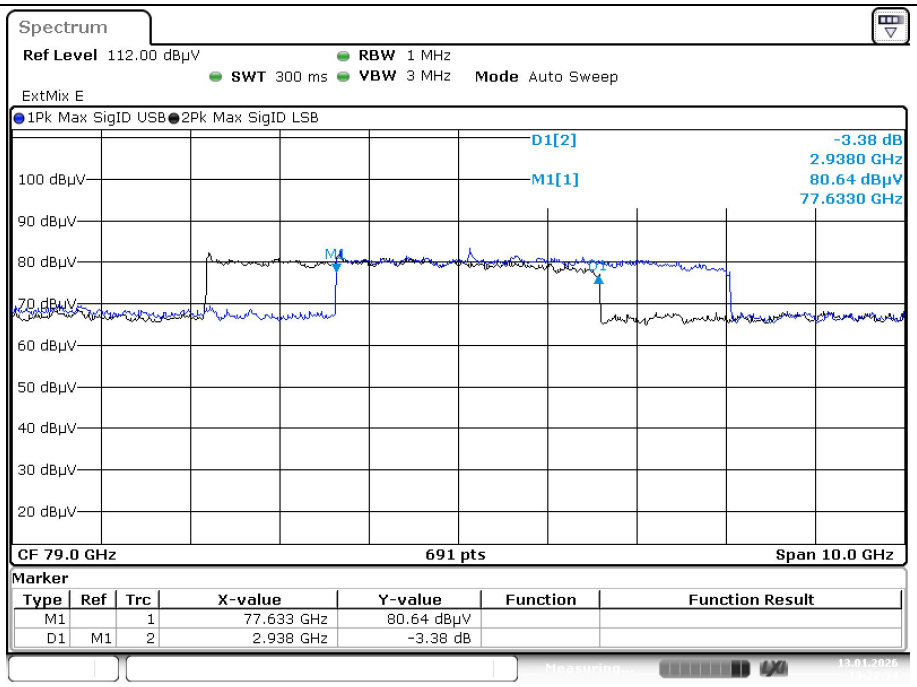
99% Occupied Bandwidth (GHz)	F_L (GHz)	F_L Limit (GHz)	F_H (GHz)	F_H Limit (GHz)
2.938	77.633	76	80.571	81
Note: *F_L is the Low frequency of the 99% Occupied bandwidth.* *F_H is the Upper frequency of the 99% Occupied bandwidth.*				

Module 2:

99% Occupied Bandwidth (GHz)	F_L (GHz)	F_L Limit (GHz)	F_H (GHz)	F_H Limit (GHz)
2.964	77.622	76	80.586	81
Note: *F_L is the Low frequency of the 99% Occupied bandwidth.* *F_H is the Upper frequency of the 99% Occupied bandwidth.*				

Module 1:

99% Emission Bandwidth



Module 2:

99% Emission Bandwidth

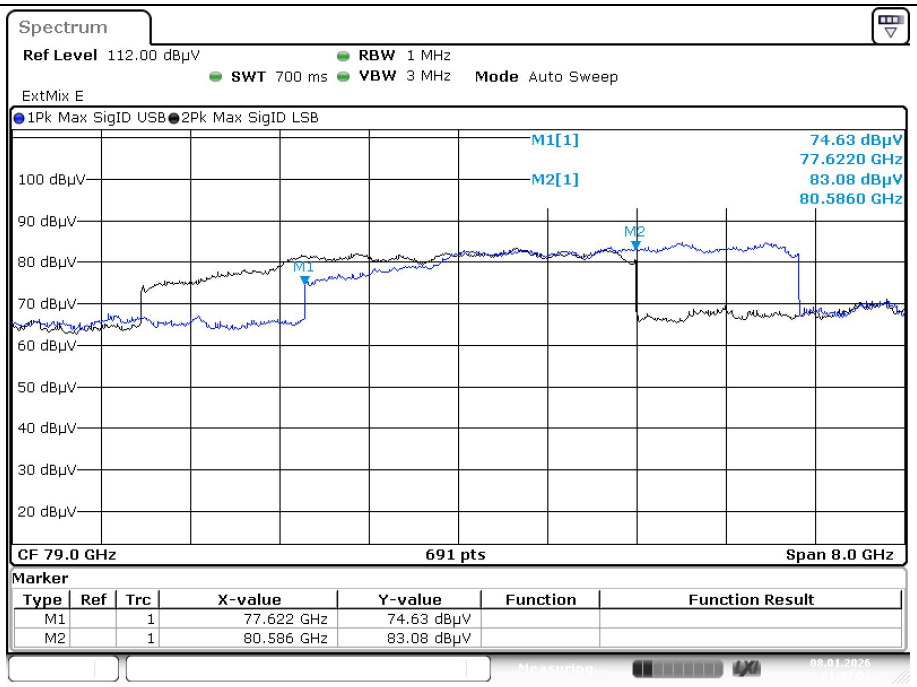


EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the attachment 2502A89456E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2502A89456E-RF-INP EUT INTERNAL PHOTOGRAPHS

EXHIBIT B - TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2502A89456E-RF-TSP TEST SETUP PHOTOGRAPHS.

EXHIBIT C - RF EXPOSURE EVALUATION

Applicable Standard

FCC §95.3385 & §1.1310 & §2.1091

Regardless of the power density levels permitted under this subpart, devices operating under the provisions of this subpart are subject to the radiofrequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

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 levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.

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);

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

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

Measurement Result

Radar module	Frequency (GHz)	EIRP Average Output power▲		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBm)	(mW)			
Radar module 1	77-81	28.49	706.32	20	0.141	1.0
Radar module 2	77-81	28.85	767.36	20	0.153	1.0

Module 1 and Module 2 can transmit simultaneously:

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

$= S_{Module\ 1} / S_{Module\ 1} + S_{Module\ 2}/S_{limit-\ Module\ 2}$

=0.141/1.0+0.153/1.0

=0.294

<1

Result: The device meet FCC MPE at 20 cm distance.

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