NVLAP LAB CODE 600341-0

TEST REPORT

Applicant:	**FCC: Sportsgear Outdoor Products LLC** **IC: Sportsgear Outdoor Products llC, dBa Athlon Optics**
Address:	**FCC:10817 Renner Blvd Lenexa Kansas United States** **IC: 10817 Renner Blvd Lenexa US 66219 United States Of America**
Product Name:	**Velocity Pro Radar Chronograph**
FCC ID:	**2BHXQ7073C1**
IC:	**33727-7073C1**
HVIN:	**707301**
Standard(s):	**47 CFR Part 15, Subpart C(15.245)** **RSS-210 Issue 11, June 25, 2024** **RSS-Gen, Issue 5, February 2021 Amendment 2** **ANSI C63.10-2020**
Report Number:	**2502Q43833E-RF-00B**
Report Date:	**2025/4/25**

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

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	2502Q43833E-RF-00B	Original Report	2025/4/25

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Velocity Pro Radar Chronograph
EUT Model:	707301
Operation Frequency:	24079.95-24169.95MHz
Modulation Type:	CW
Rated Input Voltage:	DC 3.8V from battery or DC 5V from USB
Serial Number:	2YAT-2 (For RF Conducted and Radiated Spurious Emission Above 1G test) 2YAT-3 (For AC Line Conducted Emissions and Radiated Spurious Emission Below 1G test)
EUT Received Date:	2025/2/13
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
Sportsgear Outdoor Products LLC	microstrip patch	50	24-24.25GHz	14.7dBi
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 RSS-Gen Clause 6.8	Antenna Requirement	Compliant
§15.207(a) RSS-Gen Clause 8.8	Conduction Emissions	Compliant
15.205, §15.209, §15.245 RSS-Gen Clause 8.10 RSS-210 Annex F F.2	Radiated Emissions	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant
RSS-Gen Clause 6.7	99% Occupied Bandwidth	Compliant
RSS-210 Annex F F.2	Frequency Stability	Compliant
FCC §1.1310&§2.1091	Maximum Permissible Exposure (MPE)	Compliant
RSS-102 Clause 5.3.2	Exemption Limits For Routine Evaluation-RF Exposure Evaluation	Compliant
Note : For Radiated Spurious Emissions 9kHz~1GHz, the maximum output power mode and channel was tested.		

3. DESCRIPTION OF TEST CONFIGURATION

3.1 EUT Operation Condition

The device built in a Radar module, which operates in the frequency range: 24079.95-24169.95MHz:

The below frequencies were test:	
Low Channel	24079.95MHz
Middle Channel	24125MHz
High Channel	24169.95MHz

3.2 Support Equipment List and Details

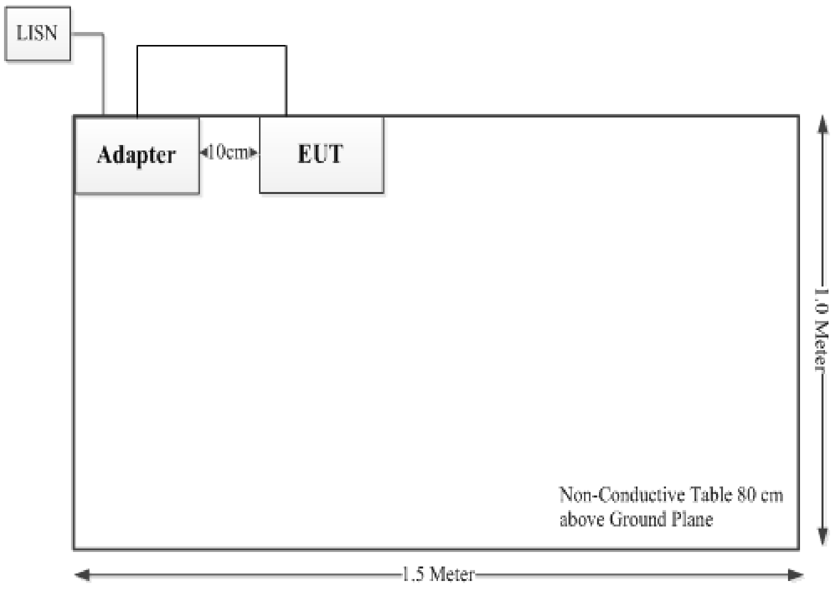
Manufacturer	Description	Model	Serial Number
HONOR	Adapter(USB)	ADS-12EA-0505010E	EA1320505

3.3 Support Cable List and Details

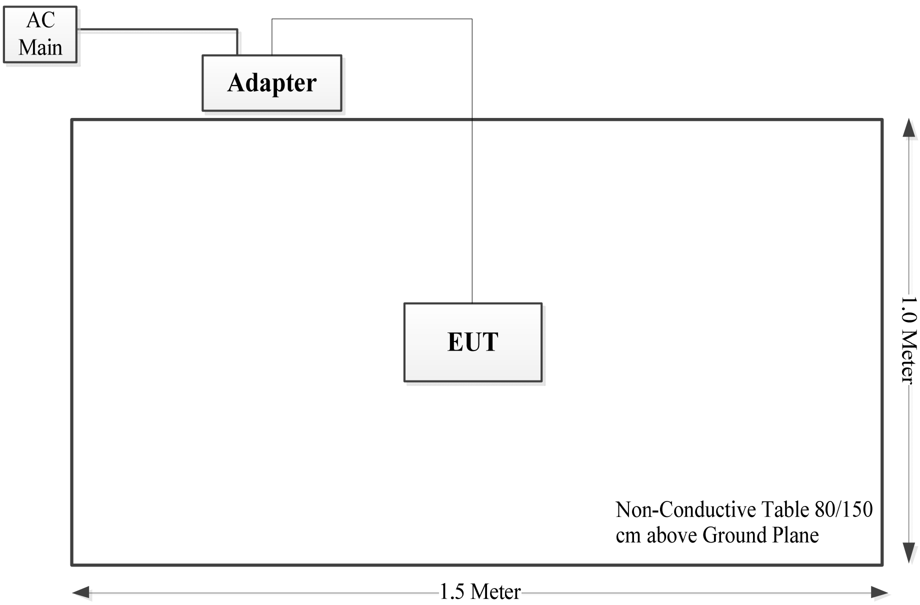
Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1.3	Adapter	EUT

3.4 Block Diagram of Test Setup

AC line conducted emissions:



Spurious Emissions:



3.5 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.

3.6 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.

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

*Decreases with the logarithm of the frequency.

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

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

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

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

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

RSS-Gen Clause 8.8

Unless stated otherwise in the applicable RSS, for radio apparatus that are designed to be connected to the public utility AC power network, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the range 150 kHz to 30 MHz shall not exceed the limits in table 4, as measured using a 50 µH / 50 Ω line impedance stabilization network. This requirement applies for the radio frequency voltage measured between each power line and the ground terminal of each AC power-line mains cable of the EUT.
For an EUT that connects to the AC power lines indirectly, through another device, the requirement for compliance with the limits in table 4 shall apply at the terminals of the AC power-line mains cable of a representative support device, while it provides power to the EUT. The lower limit applies at the boundary between the frequency ranges. The device used to power the EUT shall be representative of typical applications.

Table 4 – AC power-line conducted emissions limits

Frequency (MHz)	Conducted limit (dBµV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56[1]	56 to 46[1]
0.5 – 5	56	46
5 – 30	60	50

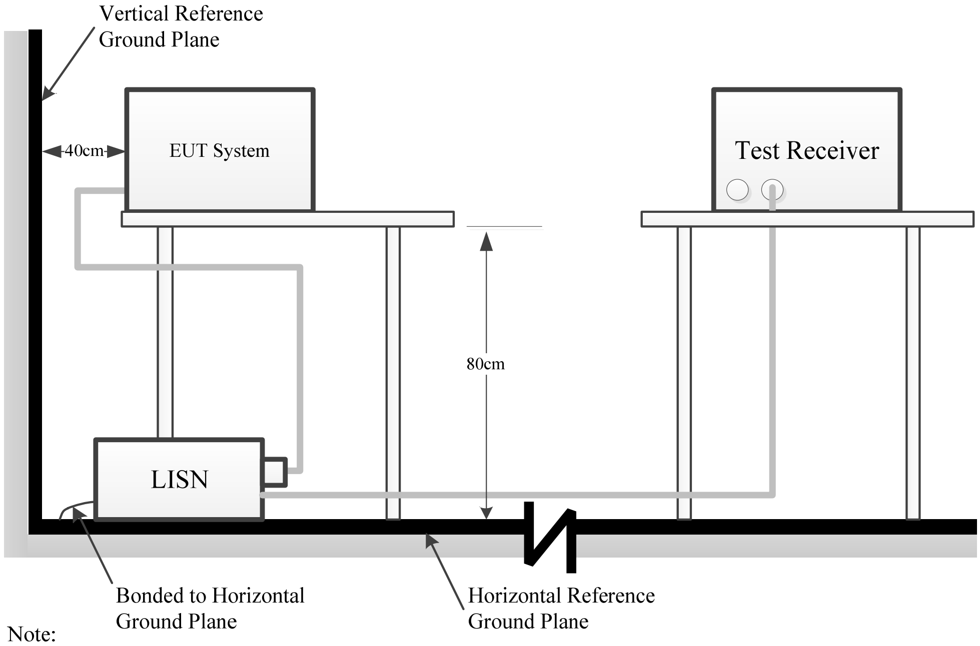
Note 1: The level decreases linearly with the logarithm of the frequency.

For an EUT with a permanent or detachable antenna operating between 150 kHz and 30 MHz, the AC power-line conducted emissions must be measured using the following configurations:

(a) Perform the AC power-line conducted emissions test with the antenna connected to determine compliance with the limits of table 4 outside the transmitter's fundamental emission band.

(b) Retest with a dummy load instead of the antenna to determine compliance with the limits of table 4 within the transmitter's fundamental emission band. For a detachable antenna, remove the antenna and connect a suitable dummy load to the antenna connector. For a permanent antenna, remove the antenna and terminate the RF output with a dummy load or network that simulates the antenna in the fundamental frequency band.

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 oter 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, RSS-Gen limits.

The spacing between the peripherals was 10 cm.

The adapter or EUT was connected to the main LISN with a 120 V/60 Hz AC power source.

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

Serial Number:	2YAT-3	Test Date:	2025/03/31
Test Site:	CE	Test Mode:	Transmitting
Tester:	Yolo Fan	Test Result:	Pass

Environmental Conditions:

Temperature: (℃)	20.4	Relative Humidity: (%)	48	ATM Pressure: (kPa)	101.5

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

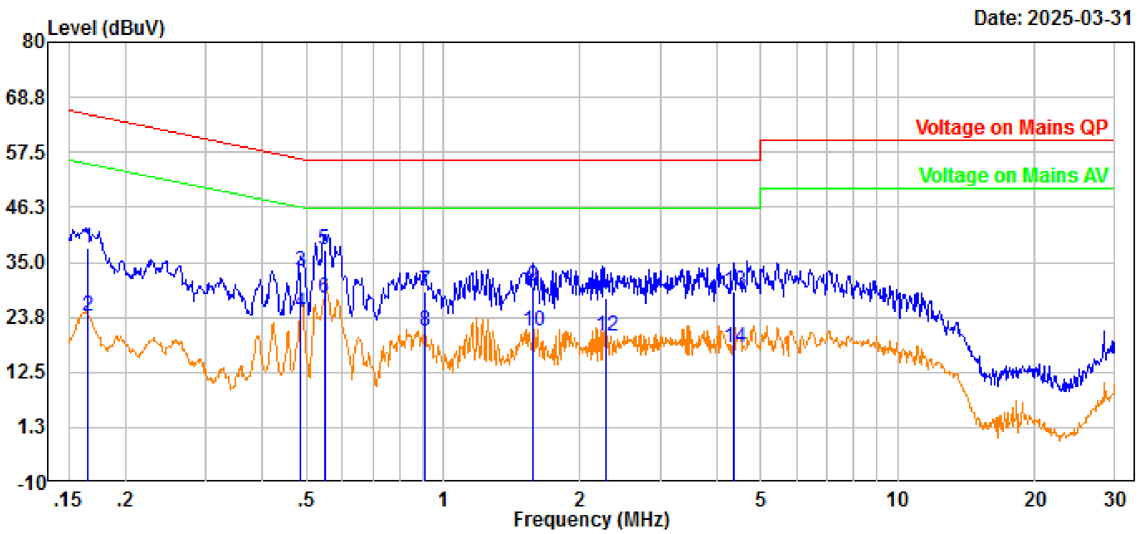
** Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Note: High channel was tested.

Project No.: 2502Q43833E-RF
Port: Line
Test Mode: Transmitting
IF B/W 9KHz PK/AV

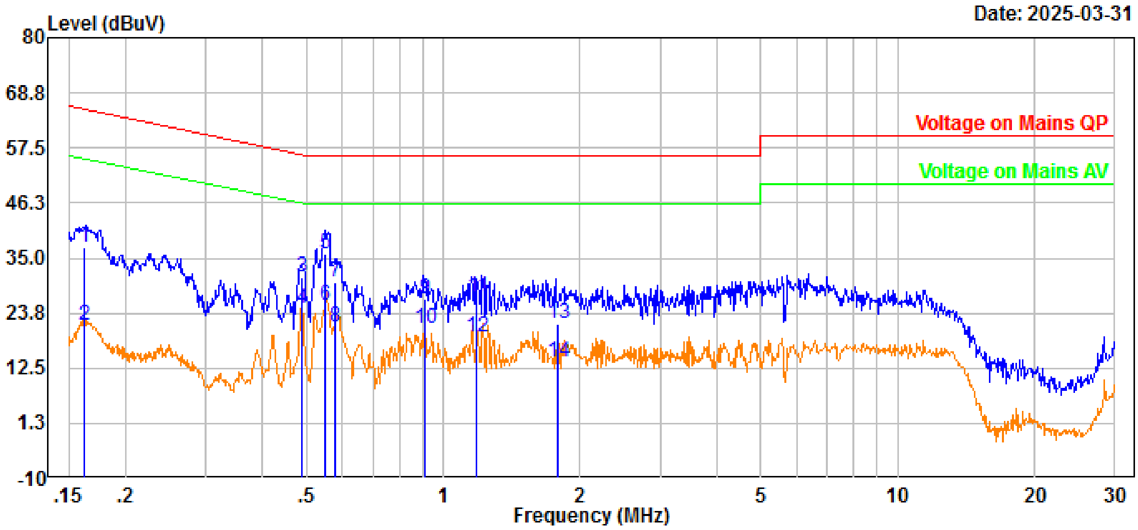
Serial No.: 2YAT-3
Tester: Yolo Fan



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Measurement
1	0.16	27.02	10.78	37.80	65.22	27.42	QP
2	0.16	13.05	10.78	23.83	55.22	31.39	Average
3	0.48	22.41	10.84	33.25	56.27	23.02	QP
4	0.48	13.81	10.84	24.65	46.27	21.62	Average
5	0.55	26.74	10.83	37.57	56.00	18.43	QP
6	0.55	16.84	10.83	27.67	46.00	18.33	Average
7	0.91	18.32	10.86	29.18	56.00	26.82	QP
8	0.91	10.13	10.86	20.99	46.00	25.01	Average
9	1.57	19.33	10.83	30.16	56.00	25.84	QP
10	1.57	9.98	10.83	20.81	46.00	25.19	Average
11	2.27	16.85	10.82	27.67	56.00	28.33	QP
12	2.27	9.04	10.82	19.86	46.00	26.14	Average
13	4.36	18.30	10.77	29.07	56.00	26.93	QP
14	4.36	6.63	10.77	17.40	46.00	28.60	Average

Project No.: 2502Q43833E-RF
Port: neutral
Test Mode: Transmitting
IF B/W 9KHz PK/AV

Serial No.: 2YAT-3
Tester: Yolo Fan



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)	Measurement
1	0.16	26.42	10.85	37.27	65.33	28.06	QP
2	0.16	10.46	10.85	21.31	55.33	34.02	Average
3	0.49	20.37	10.74	31.11	56.22	25.11	QP
4	0.49	14.02	10.74	24.76	46.22	21.46	Average
5	0.55	25.13	10.73	35.86	56.00	20.14	QP
6	0.55	14.74	10.73	25.47	46.00	20.53	Average
7	0.58	19.39	10.72	30.11	56.00	25.89	QP
8	0.58	10.13	10.72	20.85	46.00	25.15	Average
9	0.91	15.88	10.83	26.71	56.00	29.29	QP
10	0.91	9.75	10.83	20.58	46.00	25.42	Average
11	1.19	16.30	10.86	27.16	56.00	28.84	QP
12	1.19	8.08	10.86	18.94	46.00	27.06	Average
13	1.79	10.60	10.91	21.51	56.00	34.49	QP
14	1.79	3.03	10.91	13.94	46.00	32.06	Average

4.2 Radiated Emissions

4.2.1 Applicable Standard

FCC§15.245 (b);

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency (MHz)	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (millivolts/meter)
902-928	500	1.6
2435-2465	500	1.6
5785-5815	500	1.6
10500-10550	2500	25.0
24075-24175	2500	25.0

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in §15.205, shall not exceed the field strength limits shown in §15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

(i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.

(ii) For all other field disturbance sensors, 7.5 mV/m.

(iii) Field disturbance sensors designed to be used in motor vehicles or aircraft must include features to prevent continuous operation unless their emissions in the restricted bands, other than the second and third harmonics from devices operating in the 24075-24175 MHz band, fully comply with the limits given in §15.209. Continuous operation of field disturbance sensors designed to be used in farm equipment, vehicles such as fork lifts that are intended primarily for use indoors or for very specialized operations, or railroad locomotives, railroad cars and other equipment which travels on fixed tracks is permitted. A field disturbance sensor will be considered not to be operating in a continuous mode if its operation is limited to specific activities of limited duration (e.g., putting a vehicle into reverse gear, activating a turn signal, etc.).

(2) Field strength limits are specified at a distance of 3 meters.

(3) 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) The emission limits shown above are based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

RSS-210, Annex F, F.2

This section sets out the requirements for speed radar meters operating in the frequency bands 10.5-10.55 GHz, 24.075-24.175 GHz and 33.4-36 GHz. Devices shall comply with the following requirements:

(a) The average field strength of fundamental and harmonic emissions measured at the distance of 3 m shall not exceed the limits shown in table F2.

Table F2: Field strength limits for fundamental and harmonic emissions

Fundamental frequency (MHz)	Field strength (mV/m) for fundamental emissions	Field strength (mV/m) for harmonic emissions, but see F.2(b) and F.2(c)
10500-10550	2500	25
24075-24175	2500	25
33400- 36000	2500	80

The field strength shall be measured using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using a CISPR quasi-peak detector.

(b) Harmonic emissions falling into restricted frequency bands listed in RSS-Gen and that are below 17.7 GHz shall meet the general field strength limits specified in RSS-Gen, regardless of the limits given in table F2.

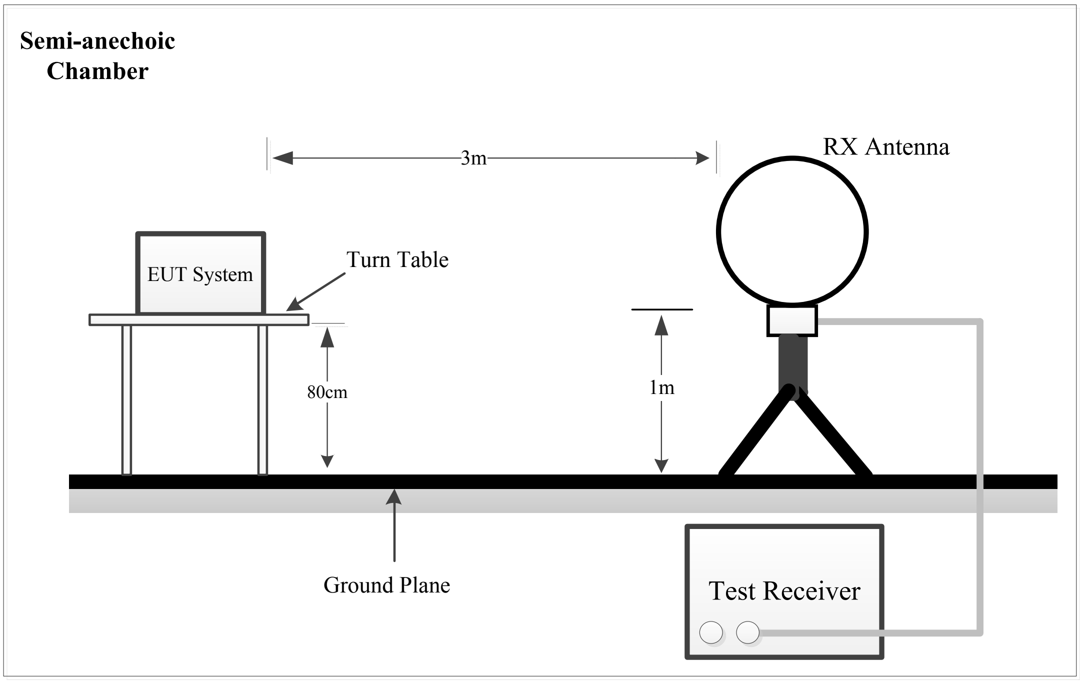
(c) Harmonic emissions falling into restricted frequency bands listed in RSS-Gen and that are at or above 17.7 GHz shall not exceed the following field strength limits measured at a distance of 3 m using an average detector:
(i) 25 mV/m for the second and third harmonic emissions of devices operating in the band 24.075-24.175 GHz and for the second harmonic emission of devices operating in the band 33.4-36.0 GHz
(ii) 7.5 mV/m for all other harmonic emissions of FDS units operating in 24.075-24.175 GHz and 33.4-36.0 GHz bands and for other type of speed radar meters

(d) Emissions radiated outside of the specified frequency bands, except for harmonic emissions, shall be attenuated by at least 50 dB below the level of the fundamental emissions or the general field strength limits specified in RSS-Gen, whichever is less stringent.

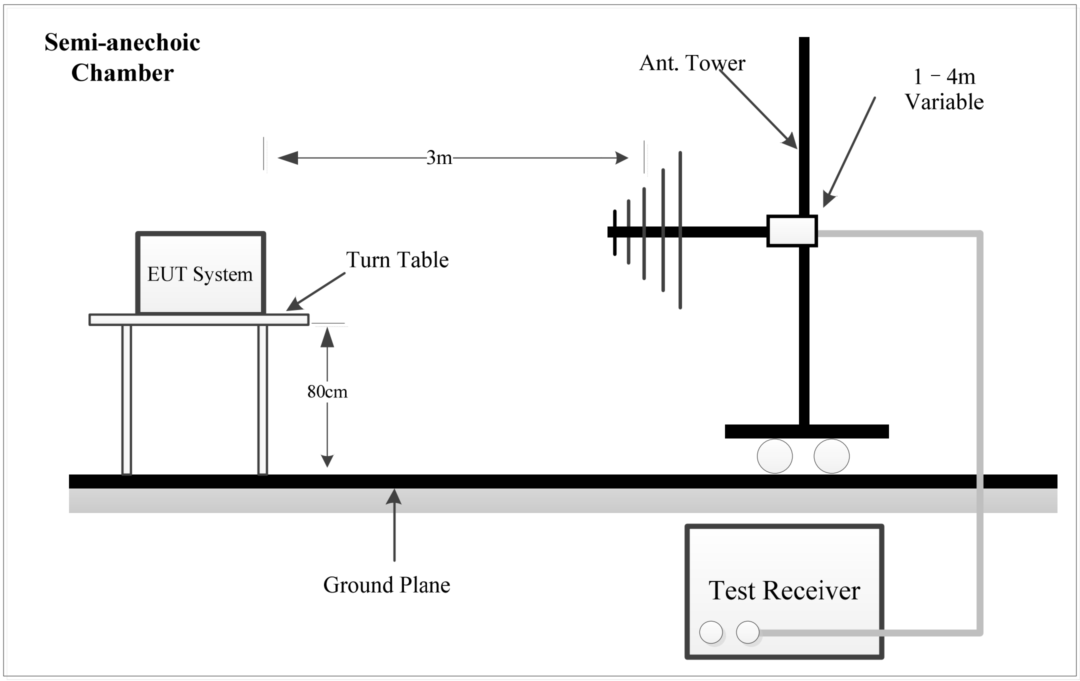
(e) The carrier frequency stability shall be sufficient to ensure that the 40 dB bandwidth stays within the operating frequency band when tested at the temperature and supply voltage variations specified for the frequency stability measurement in RSS-Gen.

4.2.2 EUT Setup

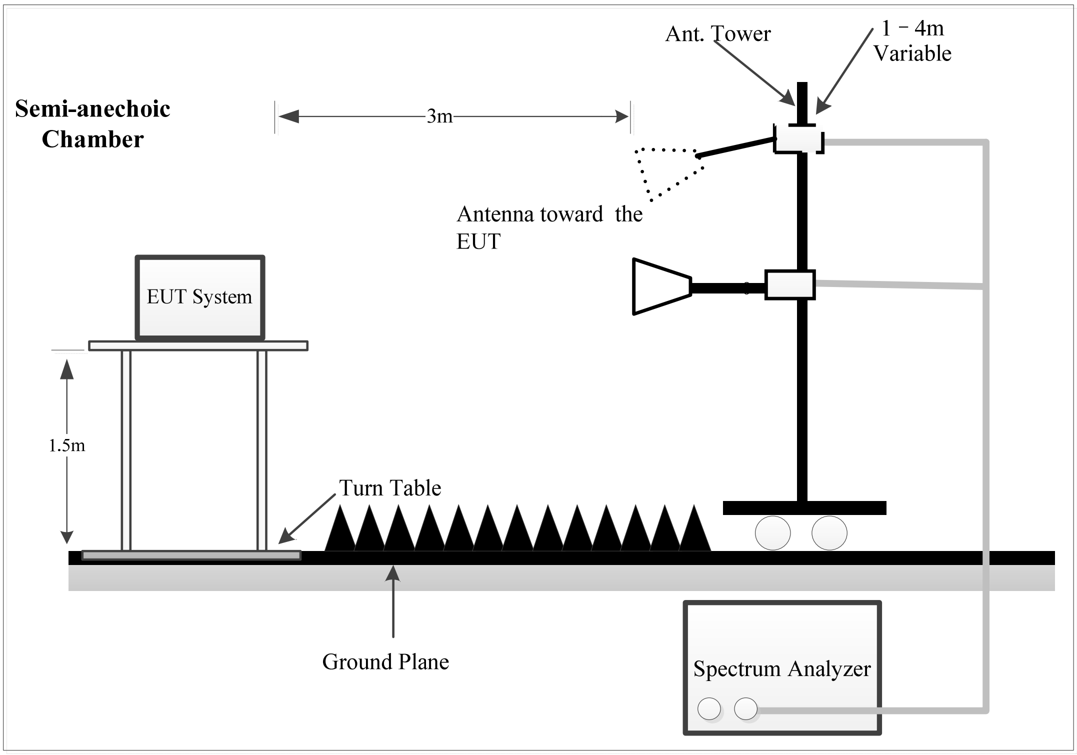
9kHz~30MHz:



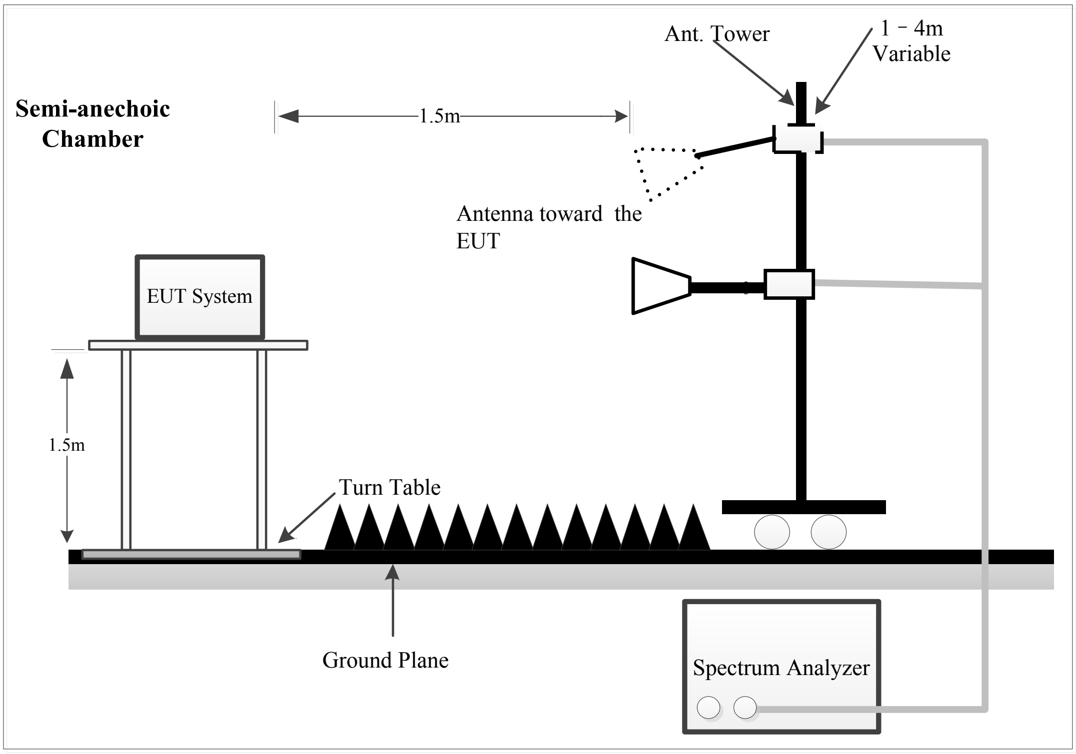
30MHz-1GHz:



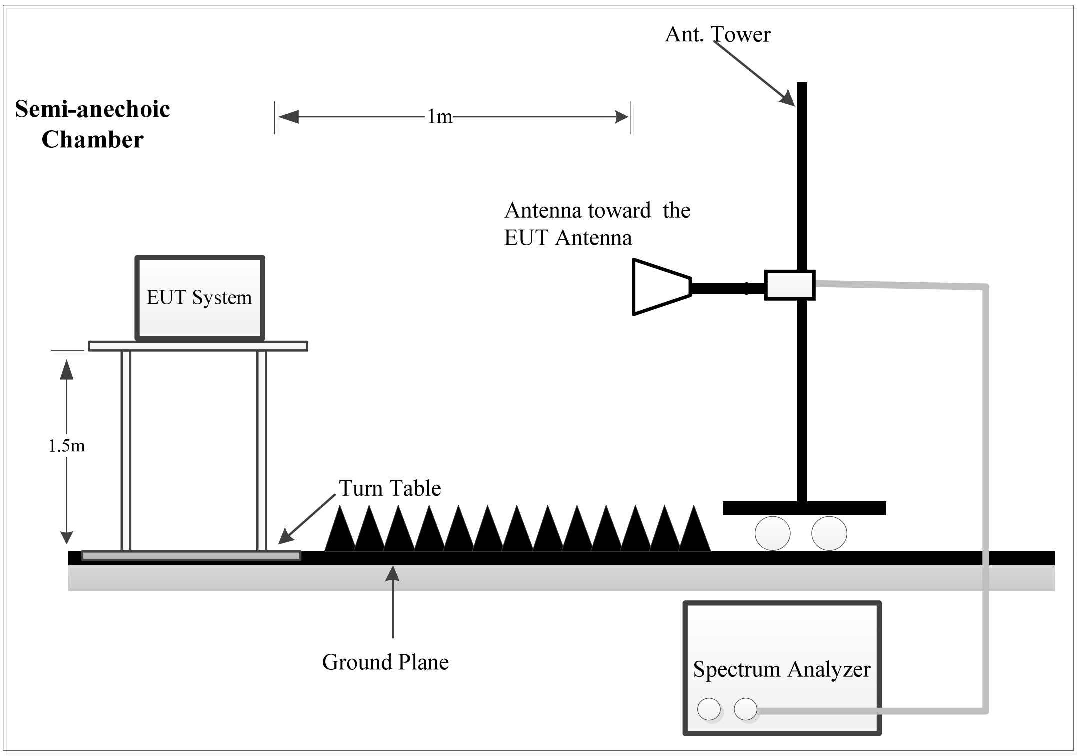
1GHz-26.5 GHz:



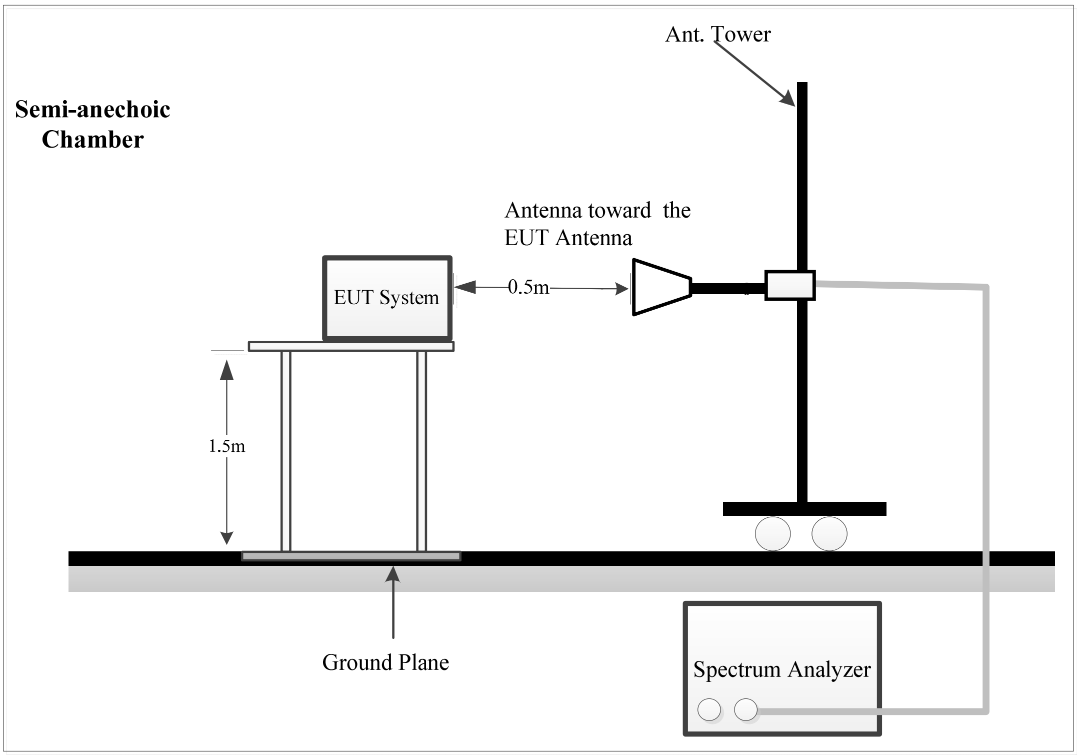
26.5-40GHz:



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 15.245,RSS-210 and RSS-Gen 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	0.54
M08RH	90-140	19.7	0.36

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

Result = Reading + Factor

For Radiated 26.5-40GHz test:
Factor = Antenna Factor + Cable Loss- Distance extrapolation Factor

Result = Reading + Factor

For Radiated 40-100GHz test:

Result = Reading + Factor- Distance extrapolation Factor

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

Margin = Limit – Result

For the spurious emission below 30MHz, the limit was convert from dBμA/m to dBμV/m by adding 51.5 dB.

4.2.6 Test Result

Serial Number:	2YAT-2, 2YAT-3	Test Date:	Below 1GHz: 2025/3/4 Above 1GHz: 2025/3/17-2025/3/21
Test Site:	Chamber10m, Chamber B	Test Mode:	Transmitting
Tester:	Zoo Zou, Colin Yang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.1~25.3	Relative Humidity: (%)	48~62	ATM Pressure: (kPa)	100.3~101.8

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-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	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).*

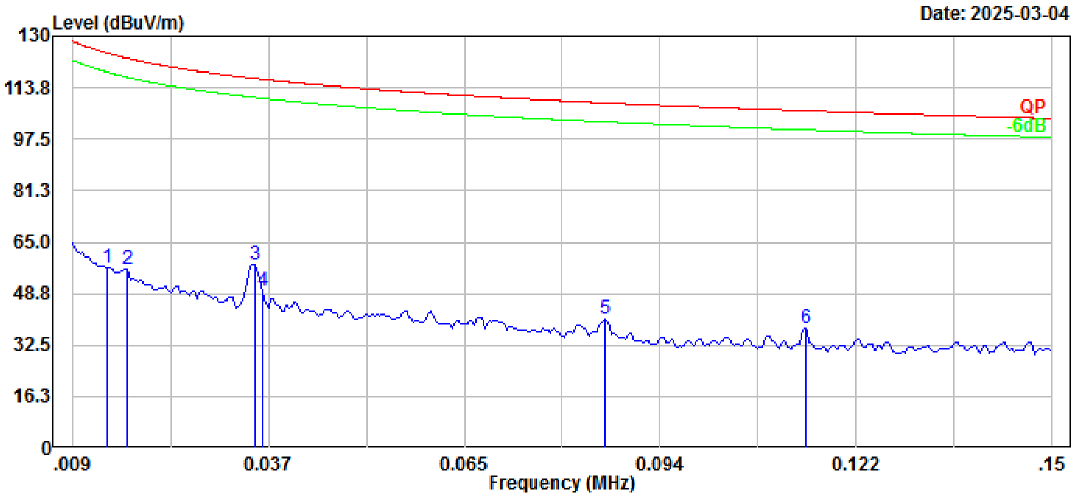
Test Data:

Please refer to the below table and plots.
After pre-scan in the X, Y and Z axes of orientation, the worst case is refer to 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.: 2502Q43833E-RF
Polarization: Parallel
Test Mode: Transmitting
Note:
RBW:300Hz VBW:1kHz

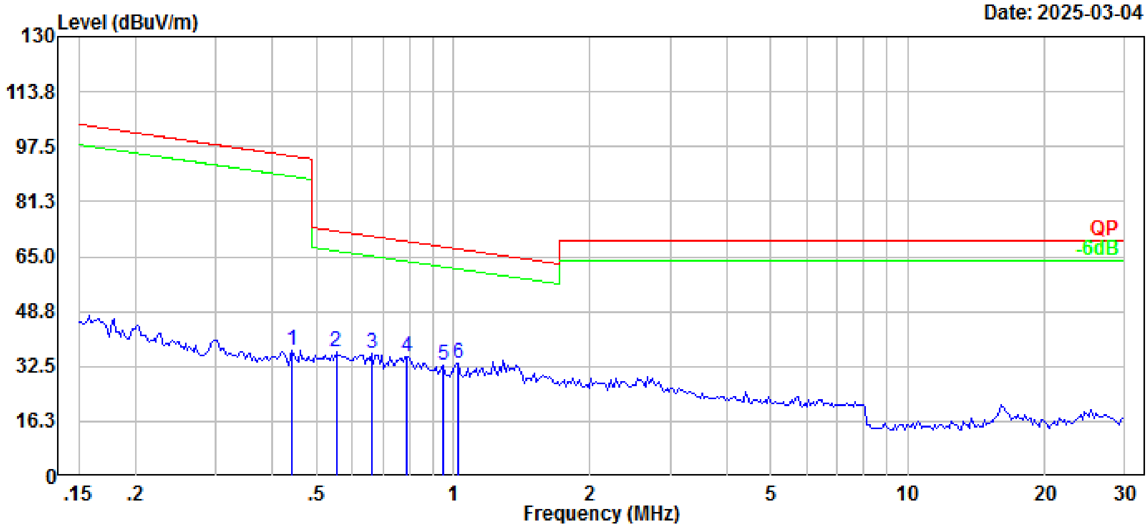
Serial No.: 2YAT-3
Tester: Zoo Zou



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.014	5.31	51.71	57.02	124.63	67.61	Peak
2	0.017	5.70	50.91	56.61	123.05	66.44	Peak
3	0.035	11.31	46.62	57.93	116.67	58.74	Peak
4	0.036	3.04	46.42	49.46	116.39	66.93	Peak
5	0.086	2.58	37.90	40.48	108.94	68.46	Peak
6	0.114	3.11	34.61	37.72	106.43	68.71	Peak

Project No.: 2502Q43833E-RF
Polarization: Parallel
Test Mode: Transmitting
Note:
RBW:10kHz VBW:30kHz

Serial No.: 2YAT-3
Tester: Zoo Zou

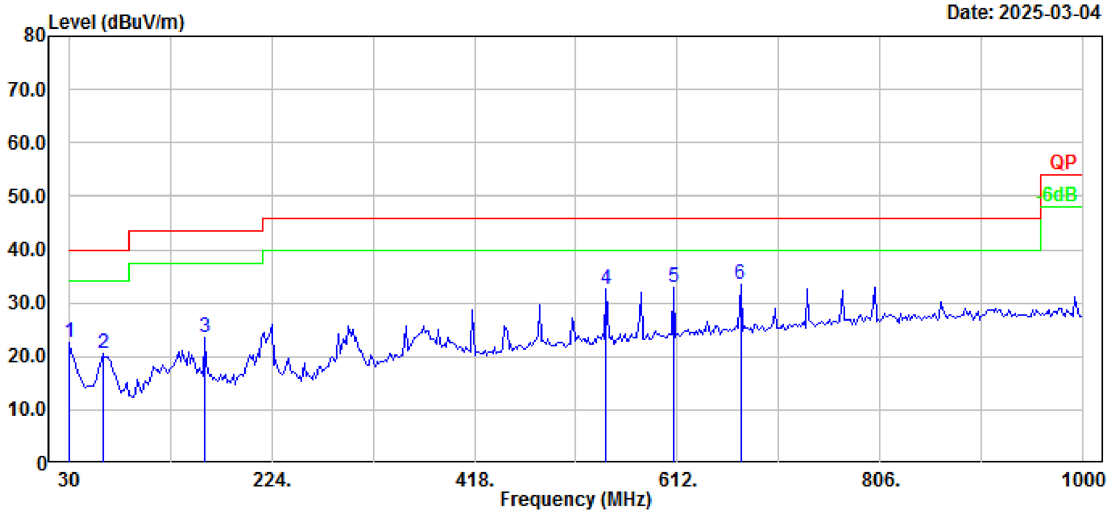


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	0.442	13.69	23.68	37.37	94.69	57.32	Peak
2	0.552	13.64	22.97	36.61	72.74	36.13	Peak
3	0.661	14.41	21.85	36.26	71.14	34.88	Peak
4	0.792	14.79	20.63	35.42	69.54	34.12	Peak
5	0.948	15.49	17.60	33.09	67.95	34.86	Peak
6	1.021	16.66	16.47	33.13	67.29	34.16	Peak

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

Project No.: 2502Q43833E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note:
RBW:100kHz VBW:300kHz

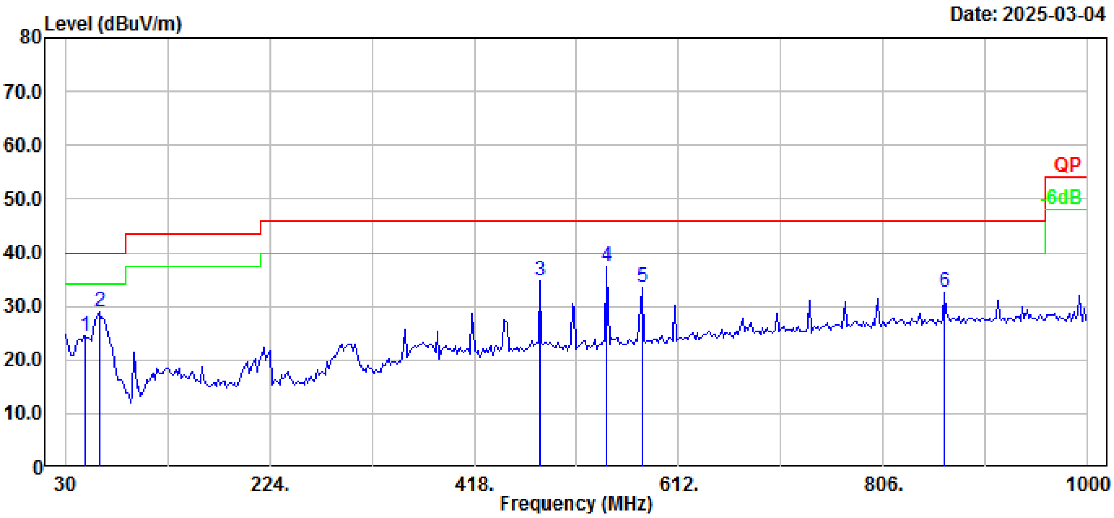
Serial No.: 2YAT-3
Tester: Zoo Zou



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.00	26.55	-3.80	22.75	40.00	17.25	Peak
2	62.98	36.99	-16.56	20.43	40.00	19.57	Peak
3	159.98	34.71	-11.15	23.56	43.50	19.94	Peak
4	544.10	36.02	-3.53	32.49	46.00	13.51	Peak
5	608.12	35.77	-2.75	33.02	46.00	12.98	Peak
6	672.14	35.09	-1.61	33.48	46.00	12.52	Peak

Project No.: 2502Q43833E-RF
Polarization: Vertical
Test Mode: Transmitting
Note:
RBW:100kHz VBW:300kHz

Serial No.: 2YAT-3
Tester: Zoo Zou



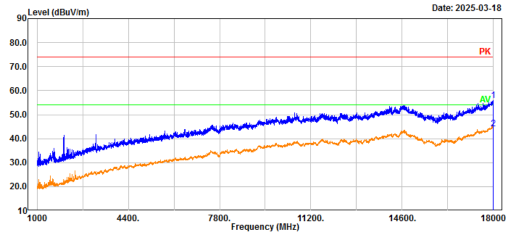
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	49.40	40.64	-16.14	24.50	40.00	15.50	Peak
2	62.98	45.48	-16.56	28.92	40.00	11.08	Peak
3	480.08	39.33	-4.71	34.62	46.00	11.38	Peak
4	544.10	40.86	-3.53	37.33	46.00	8.67	Peak
5	577.08	36.70	-3.16	33.54	46.00	12.46	Peak
6	864.20	31.52	1.03	32.55	46.00	13.45	Peak

3) 1-40GHz:

Low channel Horizontal	Low channel Vertical

Low channel Horizontal

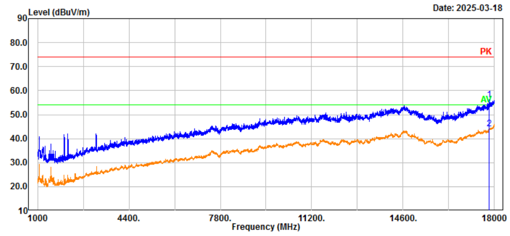
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	17993.20	47.68	8.09	55.77	74.00	18.23	Peak
2	17993.20	36.13	8.09	44.22	54.00	9.78	Average

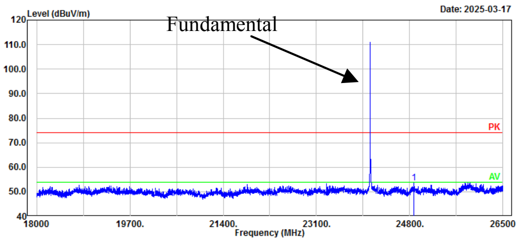
Low channel Vertical

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



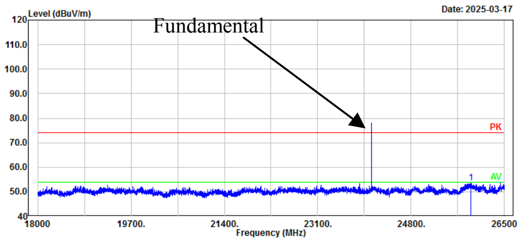
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	17813.00	49.41	6.80	56.21	74.00	17.79	Peak
2	17813.00	37.29	6.80	44.09	54.00	9.91	Average

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	24879.90	44.14	9.47	53.61	74.00	20.39	Peak

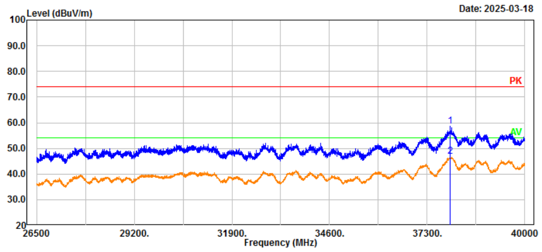
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	25888.00	42.92	10.64	53.56	74.00	20.44	Peak

Low channel Horizontal

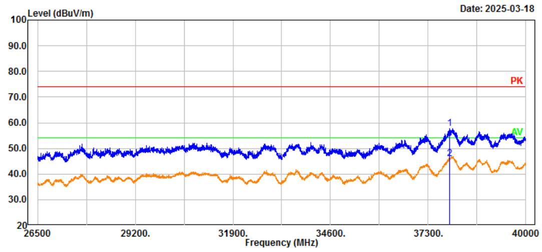
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	37939.90	47.01	11.65	58.66	74.00	15.34	Peak
2	37939.90	35.11	11.65	46.76	54.00	7.24	Average

Low channel Vertical

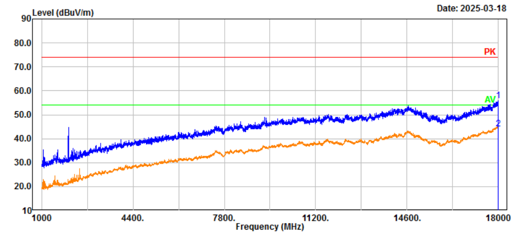
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	37888.60	46.45	11.39	57.84	74.00	16.16	Peak
2	37888.60	34.46	11.39	45.85	54.00	8.15	Average

Middle channel Horizontal

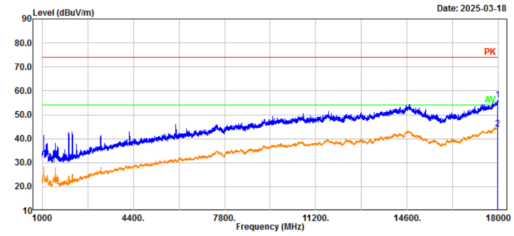
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	17986.40	47.98	8.04	56.02	74.00	17.98	Peak
2	17986.40	36.11	8.04	44.15	54.00	9.85	Average

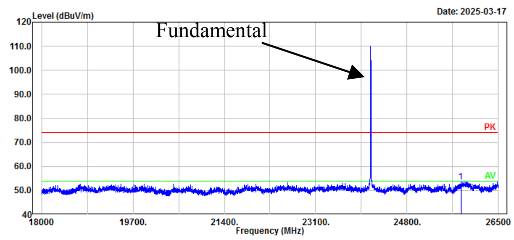
Middle channel Vertical

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



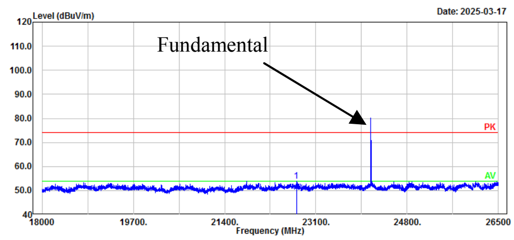
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	17969.40	48.29	7.91	56.20	74.00	17.80	Peak
2	17969.40	36.26	7.91	44.17	54.00	9.83	Average

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	25799.60	43.23	10.49	53.72	74.00	20.28	Peak

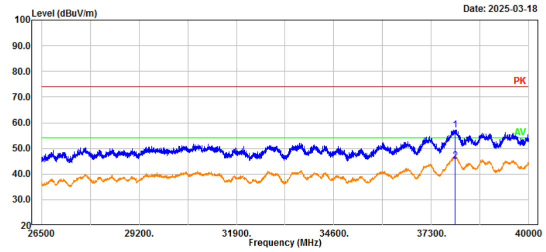
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	22736.20	45.60	8.24	53.84	74.00	20.16	Peak

Middle channel Horizontal

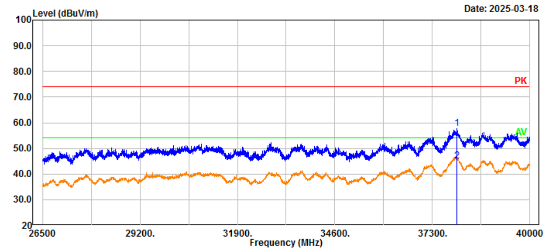
Project No.: 2502Q43833E-RF
Polarization: Horizontal
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz
Serial No.: 2YAT-2
Tester: Colin Yang



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	37961.50	45.48	11.74	57.22	74.00	16.78	Peak
2	37961.50	33.46	11.74	45.20	54.00	8.80	Average

Middle channel Vertical

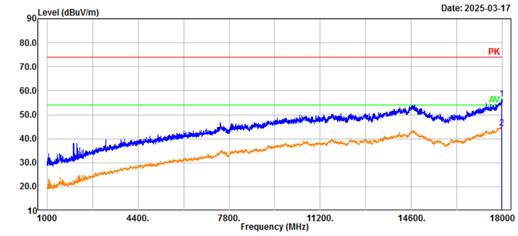
Project No.: 2502Q43833E-RF
Polarization: Vertical
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz
Serial No.: 2YAT-2
Tester: Colin Yang



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	37972.30	45.88	11.80	57.68	74.00	16.32	Peak
2	37972.30	33.39	11.80	45.19	54.00	8.81	Average

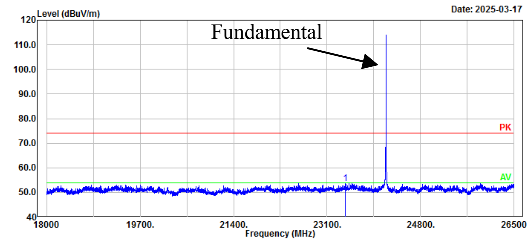
High channel Horizontal

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.16995GHz
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	17969.40	48.72	7.91	56.63	74.00	17.37	Peak
2	17969.40	36.38	7.91	44.29	54.00	9.71	Average

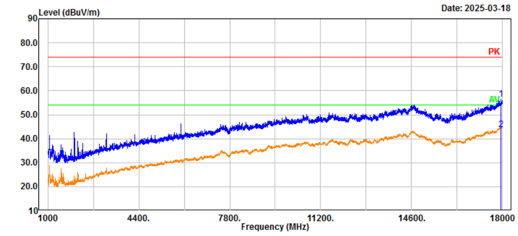
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.16995GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	23433.20	45.02	8.71	53.73	74.00	20.27	Peak

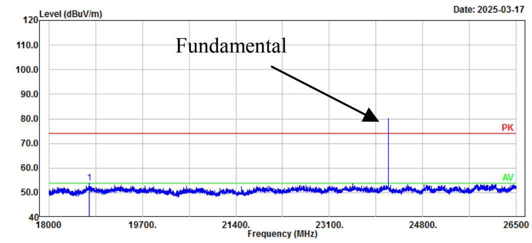
High channel Vertical

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.16995GHz
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	17925.20	48.90	7.61	56.51	74.00	17.49	Peak
2	17925.20	36.16	7.61	43.77	54.00	10.23	Average

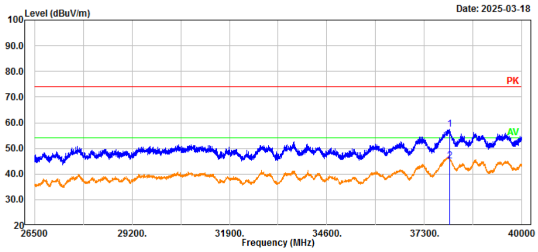
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.16995GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	18739.50	47.44	6.36	53.80	74.00	20.20	Peak

High channel Horizontal

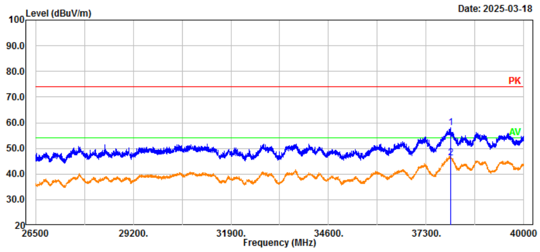
```
 Project No.: 2502Q43833E-RF                    Serial No.: 2YAT-2
Polarization: Horizontal                            Tester: Colin Yang
   Test Mode: Transmitting
        Note: Radar high channel 24.16995GHz
              Peak:RBW:1MHz,VBW:3MHz  Ave:RBW:1MHz,VBW:5kHz
```



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	37988.50	45.48	11.88	57.36	74.00	16.64	Peak
2	37988.50	33.23	11.88	45.11	54.00	8.89	Average

High channel Vertical

```
 Project No.: 2502Q43833E-RF                    Serial No.: 2YAT-2
Polarization: Vertical                              Tester: Colin Yang
   Test Mode: Transmitting
        Note: Radar high channel 24.16995GHz
              Peak:RBW:1MHz,VBW:3MHz  Ave:RBW:1MHz,VBW:5kHz
```

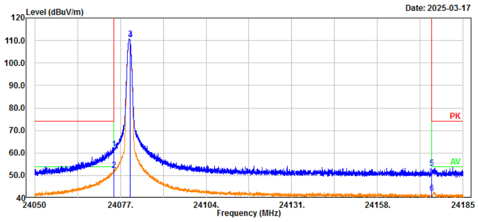


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	37966.90	46.24	11.78	58.02	74.00	15.98	Peak
2	37966.90	34.44	11.78	46.22	54.00	7.78	Average

Fundamental strength and Bandedge:

Low channel Horizontal

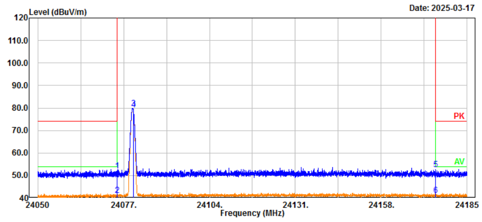
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	24075.00	52.87	8.80	61.67	74.00	12.33	Peak
2	24075.00	43.63	8.80	52.43	54.00	1.57	Average
3	24080.00	101.92	8.81	110.73	147.96	37.23	Peak
4	24080.00	101.46	8.81	110.27	127.96	17.69	Average
5	24175.00	44.38	8.86	53.24	74.00	20.76	Peak
6	24175.00	33.32	8.86	42.18	54.00	11.82	Average

Low channel Vertical

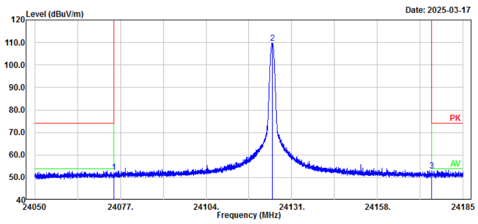
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar low channel 24.07995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	24075.00	43.38	8.80	52.18	74.00	21.82	Peak
2	24075.00	32.45	8.80	41.25	54.00	12.75	Average
3	24080.00	71.12	8.81	79.93	147.96	68.03	Peak
4	24080.00	70.36	8.81	79.17	127.96	48.79	Average
5	24175.00	43.91	8.86	52.77	74.00	21.23	Peak
6	24175.00	32.47	8.86	41.33	54.00	12.67	Average

Middle channel Horizontal

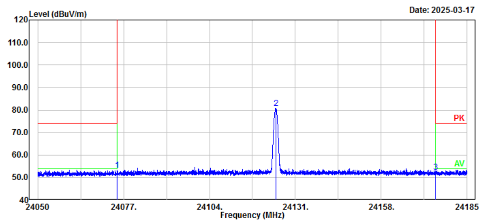
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	24075.00	43.63	8.80	52.43	74.00	21.57	Peak
2	24125.00	100.87	8.84	109.71	147.96	38.25	Peak
3	24175.00	44.02	8.86	52.88	74.00	21.12	Peak

Middle channel Vertical

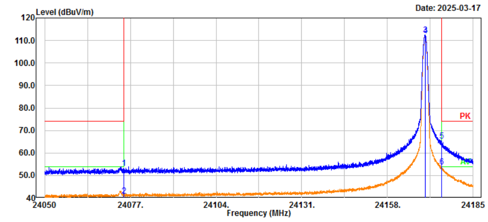
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar middle channel 24.125GHz
Peak:RBW:1MHz,VBW:3MHz



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Measurement
1	24075.00	44.48	8.80	53.28	74.00	20.72	Peak
2	24125.00	71.95	8.84	80.79	147.96	67.17	Peak
3	24175.00	43.62	8.86	52.48	74.00	21.52	Peak

High channel Horizontal

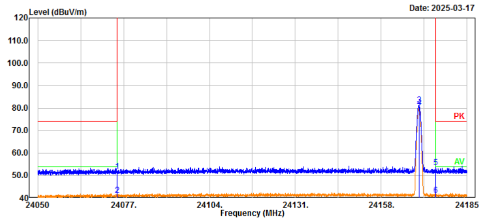
Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Horizontal Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.16995GHz
Peak:RBW:1MHz,VBW:3MHz Ave:RBW:1MHz,VBW:5kHz



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement
1	24075.00	44.60	8.80	53.40	74.00	20.60	Peak
2	24075.00	32.20	8.80	41.00	54.00	13.00	Average
3	24170.00	103.59	8.86	112.45	147.96	35.51	Peak
4	24170.00	103.23	8.86	112.09	127.96	15.87	Average
5	24175.00	56.53	8.86	65.39	74.00	8.61	Peak
6	24175.00	45.13	8.86	53.99	54.00	0.01	Average

High channel Vertical

Project No.: 2502Q43833E-RF Serial No.: 2YAT-2
Polarization: Vertical Tester: Colin Yang
Test Mode: Transmitting
Note: Radar high channel 24.16995GHz
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	24075.00	43.11	8.80	51.91	74.00	22.09	Peak
2	24075.00	32.26	8.80	41.06	54.00	12.94	Average
3	24170.00	72.39	8.86	81.25	147.96	66.71	Peak
4	24170.00	71.33	8.86	80.19	127.96	47.77	Average
5	24175.00	44.78	8.86	53.64	74.00	20.36	Peak
6	24175.00	32.40	8.86	41.26	54.00	12.74	Average

40-100GHz:

Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
channel 24.07995 GHz							
48.160	45.26	PK	H	40.06	75.78	107.96	32.18
48.160	33.19	AV	H	40.06	63.71	87.96	24.25
48.160	45.48	PK	V	40.06	76.00	107.96	31.96
48.160	33.39	AV	V	40.06	63.91	87.96	24.05
72.240	42.15	PK	H	43.82	76.43	107.96	31.53
72.240	30.44	AV	H	43.82	64.72	87.96	23.24
72.240	42.49	PK	V	43.82	76.77	107.96	31.19
72.240	30.51	AV	V	43.82	64.79	87.96	23.17
channel 24.125 GHz							
48.250	45.87	PK	H	40.08	76.41	107.96	31.55
48.250	33.39	AV	H	40.08	63.93	87.96	24.03
48.250	45.61	PK	V	40.08	76.15	107.96	31.81
48.250	33.42	AV	V	40.08	63.96	87.96	24.00
72.375	42.78	PK	H	43.84	77.08	107.96	30.88
72.375	30.63	AV	H	43.84	64.93	87.96	23.03
72.375	42.91	PK	V	43.84	77.21	107.96	30.75
72.375	30.57	AV	V	43.84	64.87	87.96	23.09
channel 24.16995 GHz							
48.340	45.39	PK	H	40.09	75.94	107.96	32.02
48.340	33.19	AV	H	40.09	63.74	87.96	24.22
48.340	45.64	PK	V	40.09	76.19	107.96	31.77
48.340	33.51	AV	V	40.09	64.06	87.96	23.90
72.510	42.82	PK	H	43.86	77.14	107.96	30.82
72.510	30.50	AV	H	43.86	64.82	87.96	23.14
72.510	42.79	PK	V	43.86	77.11	107.96	30.85
72.510	30.43	AV	V	43.86	64.75	87.96	23.21

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 and 99% Occupied 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.

RSS-Gen Clause 6.7

The occupied bandwidth or the "99% emission bandwidth" is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.
In some cases, the "x dB bandwidth" is required, which is defined as the frequency range between two points, one at the lowest frequency below and one at the highest frequency above the carrier frequency, at which the maximum power level of the transmitted emission is attenuated x dB below the maximum in-band power level of the modulated signal, where the two points are on the outskirts of the in-band emission.
The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:
The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

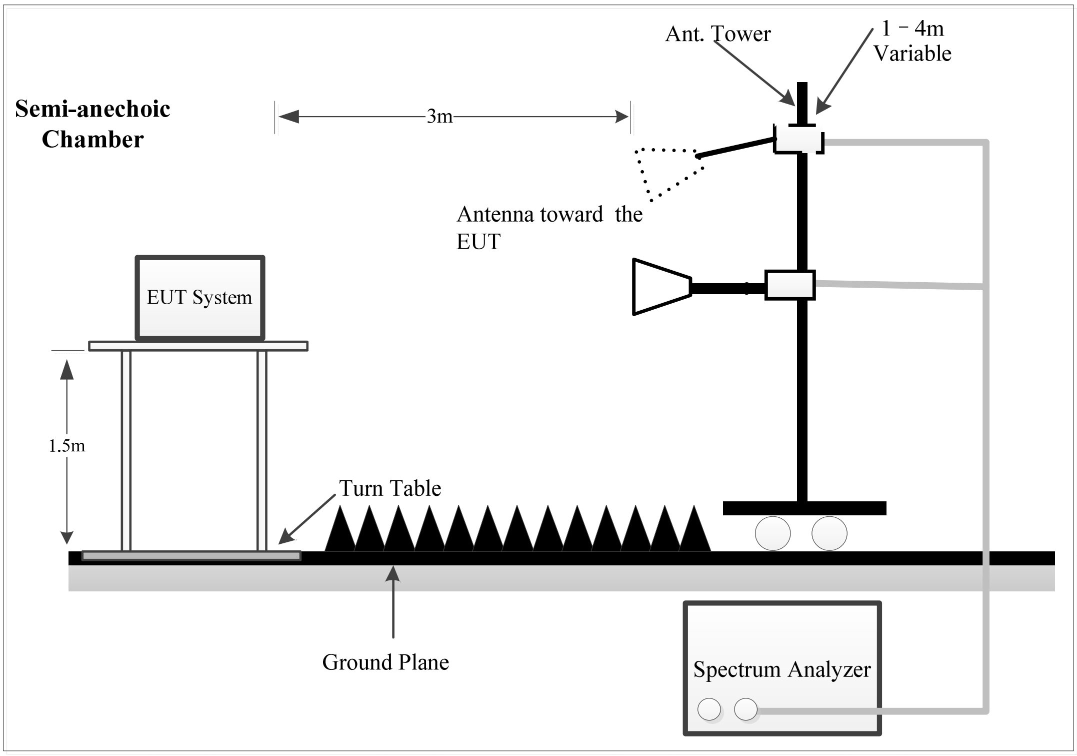
The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

For the 99% emission bandwidth, the trace data points are recovered and directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached, and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded. The difference between the two recorded frequencies is the occupied bandwidth (or the 99% emission bandwidth).

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.

According to ANSI C63.10-2020 Section 6.9.3

The occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. The following procedure shall be used for measuring 99% power bandwidth:
a) The instrument center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.
b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW, unless otherwise specified by the applicable requirement.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope shall be more than [10 log (OBW/RBW)] below the reference level. Specific guidance is given in 4.1.5.2.

d) Step a) through step c) might require iteration to adjust within the specified range.
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99% power bandwidth function of the instrument (if available) and report the measured bandwidth.

g) If the instrument does not have a 99% power bandwidth function, then the trace data points are recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% power bandwidth is the difference between these two frequencies.
h) The occupied bandwidth shall be reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

4.3.4 Test Result

Serial Number:	2YAT-2	Test Date:	2025/3/21
Test Site:	Chamber B	Test Mode:	Transmitting
Tester:	Colin Yang	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.1	Relative Humidity: (%)	48	ATM Pressure: (kPa)	101.8

Test Equipment List and Details:

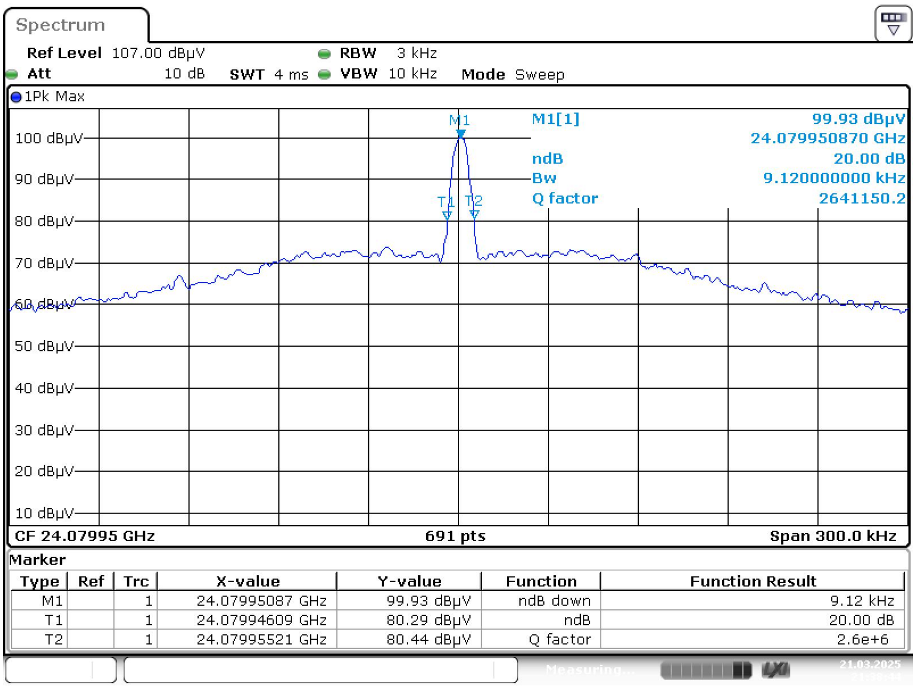
Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2023/2/22	2026/2/21
AH	Preamplifier	PAM-1840VH	191	2024/9/5	2025/9/4
Xinhang Macrowave	Coaxial Cable	XH360A-2.92/J-2.92/J-6M-A	20231208001 #0001	2024/12/9	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 Channel	20 dB Bandwidth (kHz)	99% Occupied Bandwidth (kHz)	Result
Low Channel	9.120	129.812	Pass
Middle Channel	8.680	114.182	Pass
High Channel	9.120	124.602	Pass
Note: the 20 dB bandwidth of the emission and 99% Occupied Bandwidth is contained within the operation frequency band. Please refer to the below plots.			

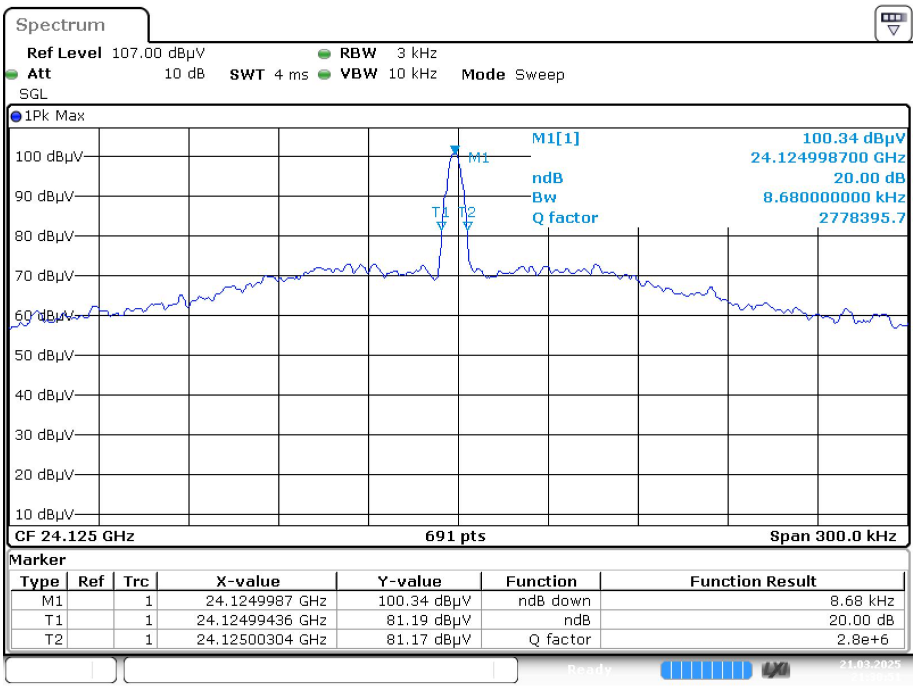
20 dB Bandwidth- Low Channel



ProjectNo.:2502Q43833E-RF Tester:Colin Yang

Date: 21.MAR.2025 21:38:45

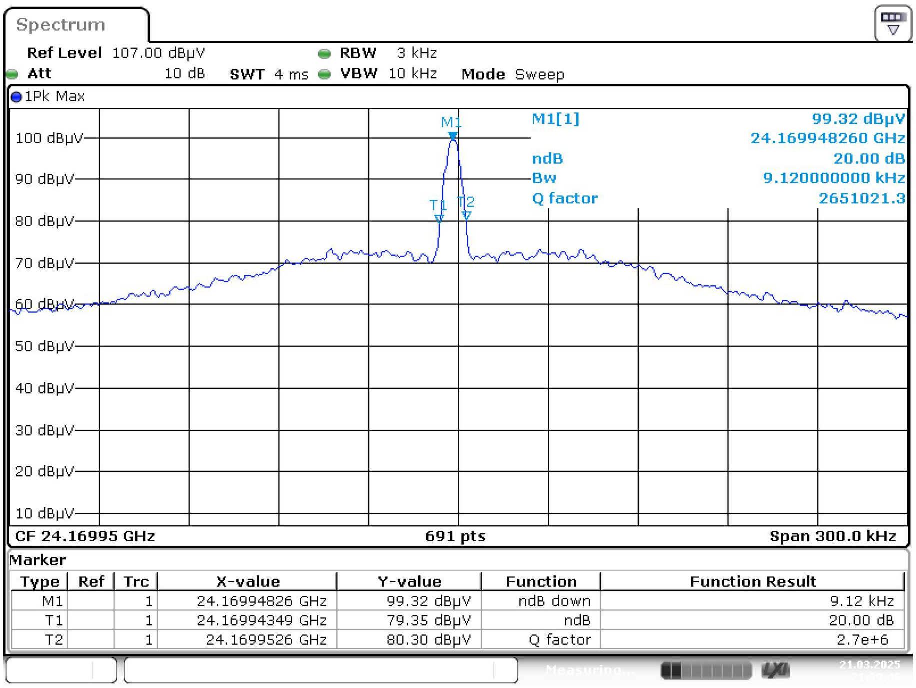
20 dB Bandwidth- Middle Channel



ProjectNo.:2502Q43833E-RF Tester:Colin Yang

Date: 21.MAR.2025 21:30:51

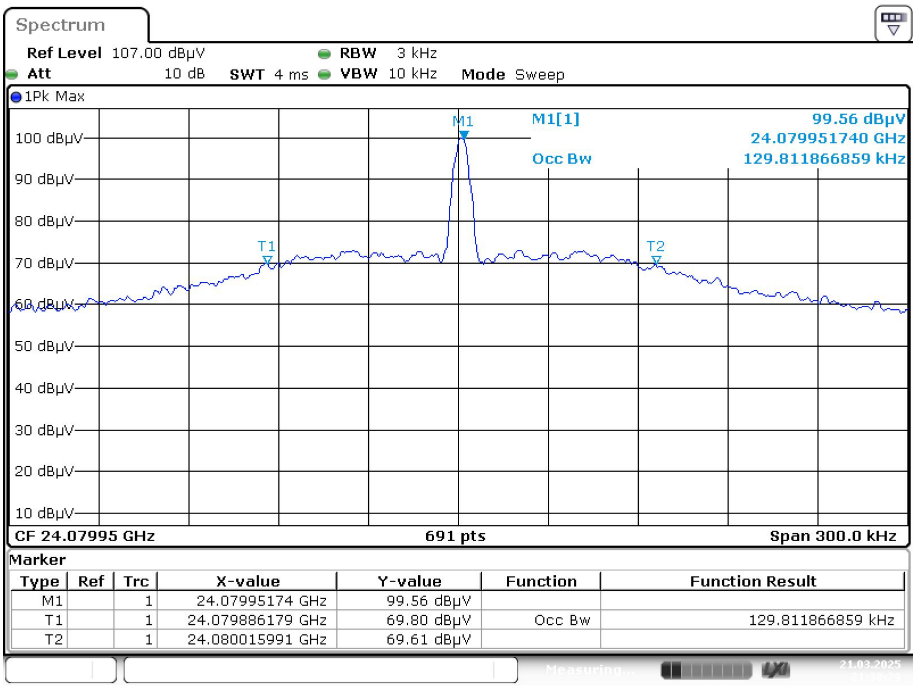
20 dB Bandwidth- High Channel



ProjectNo.:2502Q43833E-RF Tester:Colin Yang

Date: 21.MAR.2025 21:39:46

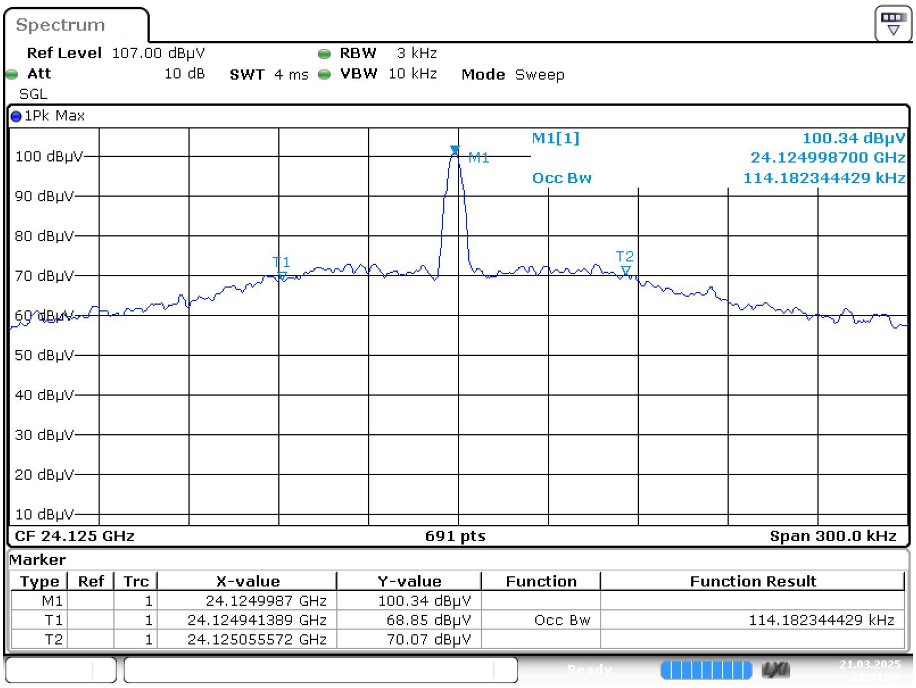
99% Occupied Bandwidth- Low Channel



ProjectNo.:2502Q43833E-RF Tester:Colin Yang

Date: 21.MAR.2025 21:38:29

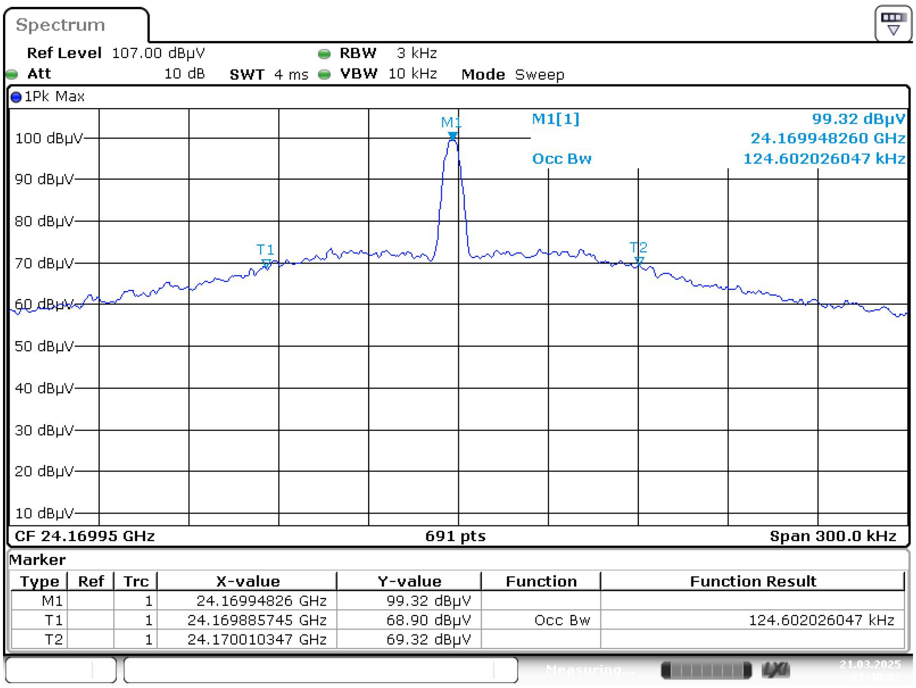
99% Occupied Bandwidth- Middle Channel



ProjectNo.:2502Q43833E-RF Tester:Colin Yang

Date: 21.MAR.2025 21:31:06

99% Occupied Bandwidth- High Channel



ProjectNo.:2502Q43833E-RF Tester:Colin Yang

Date: 21.MAR.2025 21:40:03

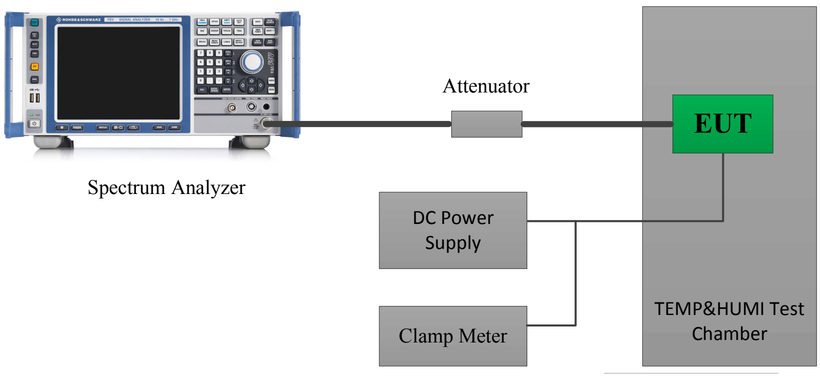
4.4 Frequency Stability

4.4.1 Applicable Standard

RSS-210, Annex F, F.2

(e)The carrier frequency stability shall be sufficient to ensure that the 40 dB bandwidth stays within the operating frequency band when tested at the temperature and supply voltage variations specified for the frequency stability measurement in RSS-Gen.

4.4.2 EUT Setup



4.4.3 Test Procedure

According to ANSI C63.10-2020 Section 6.8

Frequency stability with respect to ambient temperature

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.

NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more that 10 °C, and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.

Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15 °C to +25 °C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.

NOTE—An instrument that has an adequate level of accuracy as specified by the procuring or regulatory agency is the recommended measuring instrument.

b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

c) Measure the frequency at each of the frequencies specified in 5.6.

Repeat the above procedure at 85% and 115% of the nominal supply voltage as described in 5.13.

4.4.4 Test Result

Serial Number:	2YAT-2	Test Date:	2025/3/21
Test Site:	RF	Test Mode:	Transmitting
Tester:	Colin Yang	Test Result:	Pass

Environmental Conditions:

Temperature: (℃)	22.1	Relative Humidity: (%)	48	ATM Pressure: (kPa)	101.8

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101944	2024/9/6	2025/9/5
Eastsheep	Coaxial Attenuator	2W-SMA-JK-6G-10dB	F-08-EM509	2024/6/7	2025/6/6
Unknown	Coaxial Cable	C-SJSJ-50	C-0060-02	2024/6/1	2025/5/31
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30173	2024/9/6	2025/9/5
All-sun	Clamp Meter	EM305A	8348897	2024/8/16	2025/8/15
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:

Temperature (℃)	Voltage (V_{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
		Result (MHz)	Limit (MHz)	Result (MHz)	Limit (MHz)
-20	3.8	24079.816	24075.000	24170.053	24175.000
-10		24079.818	24075.000	24170.051	24175.000
0		24079.825	24075.000	24170.061	24175.000
10		24079.828	24075.000	24170.055	24175.000
20		24079.821	24075.000	24170.058	24175.000
30		24079.823	24075.000	24170.056	24175.000
40		24079.816	24075.000	24170.052	24175.000
50		24079.812	24075.000	24170.055	24175.000
20	3	24079.822	24075.000	24170.054	24175.000
20	4.45	24079.826	24075.000	24170.059	24175.000

Note: the voltage range was declared by manufacturer▲.

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.

RSS-Gen Clause 6.8

The applicant for equipment certification shall provide a list of all antenna types that may be used with the transmitter, where applicable (i.e. for transmitters with detachable antenna), indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna. The test report shall demonstrate the compliance of the transmitter with the limit for maximum equivalent isotropically radiated power (e.i.r.p.) specified in the applicable RSS, when the transmitter is equipped with any antenna type, selected from this list.

For expediting the testing, measurements may be performed using only the antenna with highest gain of each combination of transmitter and antenna type, with the transmitter output power set at the maximum level. However, the transmitter shall comply with the applicable requirements under all operational conditions and when in combination with any type of antenna from the list provided in the test report (and in the notice to be included in the user manual, provided below).
When measurements at the antenna port are used to determine the RF output power, the effective gain of the device’s antenna shall be stated, based on a measurement or on data from the antenna’s manufacturer. The test report shall state the RF power, output power setting and spurious emission measurements with each antenna type that is used with the transmitter being tested.
For licence-exempt equipment with detachable antennas, the user manual shall also contain the following notice in a conspicuous location:
This radio transmitter [enter the device’s ISED certification number] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

4.5.2 Judgment

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

EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the attachment 2502Q43833E-RF-EXP EUT EXTERNAL PHOTOGRAPHS and 2502Q43833E-RF-INP EUT INTERNAL PHOTOGRAPHS

EXHIBIT B - TEST SETUP PHOTOGRAPHS

Please refer to the attachment 2502Q43833E-RF-00B-TSP TEST SETUP PHOTOGRAPHS.

EXHIBIT C - RF EXPOSURE EVALUATION

Maximum Permissible Exposure (MPE)

Applicable Standard

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

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

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

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

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

Calculation formula:

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

Calculated Data:

Mode	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)			
BLE	2402-2480	2.3	1.70	3.5	2.24	20.00	0.001	1.0
24G Radar	24079.95-24169.95	14.7	29.51	2.55	1.80	20.00	0.011	1.0
For 24G Radar, Fundamental field strength is 112.45BμV/m @ 3m =17.25dBm(53.09mW) EIRP. EIRP(dBm)=Field Strength of Fundamental(dBuV/m)-95.2 (dB). Conducted power=17.25-14.7dBm=2.55dBm. Conducted power(dBm)= EIRP(dBm)-Antenna Gain(dBi).								

Note:
The Conducted output power including Tune-up Tolerance provided by manufacturer▲.

Simultaneous transmission:

BLE and 24G Radar can transmit simultaneously:

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

$S_{BLE} / S_{limit\text{-}BLE} + S_{24G\ Radar} / S_{limit\text{-}24G\ Radar}$

=0.001/1.0+0.011/1.0

=0.012

< 1.0

Result: Compliant. The devices meet FCC MPE at 20 cm distance.

Exemption Limits For Routine Evaluation-RF Exposure Evaluation

Applicable Standard

RSS-102, Issue 6, Clause 5.3.2:

According to RSS-102 issue 6 Table 7, RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Table 7: RF field strength and power density limits for devices used by the general public (uncontrolled environment)

Frequency range (MHz)	Electric field (V_{RMS}/m)	Magnetic field (A_{RMS}/m)	Power density (W/m²)	Reference period (minutes)
10-20	27.46	0.0728	2	6
20-48	$58.07 / f^{0.25}$	$0.1540 / f^{0.25}$	$8.944 / f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.

MPE Calculation

Predication of MPE limit at a given distance
S = PG/4πR² = power density (in appropriate units, e.g. mW/cm²);
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:

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

Calculated Data:

Mode	Frequency (MHz)	Antenna Gain	Conducted output power including Tune-up Tolerance▲	EIRP		Evaluation Distance (cm)	Power Density (W/m^2)	MPE Limit (W/m^2)
		(dBi)	(dBm)	(dBm)	(mW)			
Bluetooth	2402-2480	2.3	3.5	5.8	3.80	20.00	0.01	10
24G Radar	24079.95-24169.95	14.7	2.55	17.25	53.09	20.00	0.11	10
For 24G Radar, Fundamental field strength is 112.45BµV/m @ 3m =17.25dBm(53.09mW) EIRP. EIRP(dBm)=Field Strength of Fundamental(dBuV/m)-95.2 (dB). Conducted power=17.25-15dBm=2.55dBm. Conducted power(dBm)= EIRP(dBm)-Antenna Gain(dBi).								

Note:
The Conducted output power including Tune-up Tolerance provided by manufacturer▲.

For Simultaneous transmission:

BLE and 24G Radar can transmit simultaneously:

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

$S_{BLE}/S_{limit\text{-}BLE} + S_{24G\ Radar}/S_{limit\text{-}24G\ Radar}$

=0.01/10+0.11/10

=0.012

< 1.0

Result: Compliant. The device compliant Simultaneous transmission at 20cm distances.

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