中认信通
CHINA CERTIFICATION ICT CO., LTD (DONGGUAN)

ACCREDITED
TESTING LABORATORY
CERTIFICATE # 6356.01

TEST REPORT

Applicant: **NEWEST ONE TECH Co., Ltd.**

Address: A-607, 908, 910 DAEWOO TECHNO PARK, 261 DOYAK-RO, WONMI-GU, BUCHEON, South Korea

Product Name: **Radar Object Detection Sensor**

FCC ID: **2AT7URM-02C0830**

Standard(s): **47 CFR Part 15, Subpart C (15.249)**
ANSI C63.10-2013

The above device has been tested and found compliant with the requirement of the relative standards by China Certification ICT Co., Ltd (Dongguan)

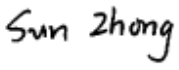
Report Number: **CR230637429-00A**

Date Of Issue: **2024/3/13**

Reviewed By: **Calvin Chen**

Title: RF Engineer

Approved By: **Sun Zhong**



Title: Manager

Test Laboratory: **China Certification ICT Co., Ltd (Dongguan)**
No. 113, Pingkang Road, Dalang Town, Dongguan, Guangdong, China
Tel: +86-769-82016888

Test Facility

The Test site used by China Certification ICT Co., Ltd (Dongguan) to collect test data is located on the No. 113, Pingkang Road, Dalang 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. : 442868, the FCC Designation No. : CN1314.

Declarations

China Certification ICT Co., Ltd (Dongguan) is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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CONTENTS

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	CR230637429-00A	Original Report	2024/3/13

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test (EUT)

EUT Name:	Radar Object Detection Sensor
EUT Model:	RM-02C(0830)
Multiple Model:	RM-02XX, RODS-MC(0830), RODS-XXXX, N-RODS-30MT(C), RVS-123-30M, RODS-MC-DF(0830), RODS-MC-DR(0830), D-RODS-MC(30), HR-300
Frequency Band:	24050-24250 MHz
Operation Frequency Range:	24065-24235 MHz
Modulation Type:	FMCW
Rated Input Voltage:	DC 12~32V, Typical Voltage DC 12V
Serial Number:	27KJ-4
EUT Received Date:	2023/6/30
EUT Received Status:	Good
Note: The Multiple models are electrically identical with the test model expect the model name. Please refer to the declaration letter for more detail, which was provided by manufacturer.	

Operation Frequency Detail:

Sweep Start Frequency (MHz)	**Sweep Stop Frequency (MHz)**
24065	24235
Per section 15.31(m), the below frequencies were performed the test as below:	
Test Frequency	**Frequency (MHz)**
Lowest	24065
Middle	24152
Highest	24235

Antenna Information Detail▲:

Antenna Type	**input impedance (Ohm)**	**Antenna Gain /Frequency Range**	**§15.203 Requirement**
Metal Patch Antenna	50	14.9 dBi/24.05~24.25GHz	**Compliance**
The Method of §15.203 Compliance: ☒Antenna must be permanently attached to the unit. ☐Antenna must use a unique type of connector to attach to the EUT. ☐Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.			

Accessory Information:

No Accessory.

1.2 Description of Test Configuration

1.2.1 EUT Operation Condition

EUT Operation Mode:	The system was configured for testing in Engineering Mode, which was provided by the manufacturer. Test Mode: Detection Mode 1: 4 x 20 meter (Detection zone 5) Detection Mode 2: 6 x 25 meter (Detection zone 5) Detection Mode 3: 8 x 30 meter (Detection zone 5) The device can support three detection modes, each detection mode shares the same transmit bandwidth, frequency and power level, tests are performed on all modes and only the worst-case emissions reported.
Equipment Modifications:	No
EUT Exercise Software:	No
The software was provided by manufacturer▲. The maximum power was configured default setting.	

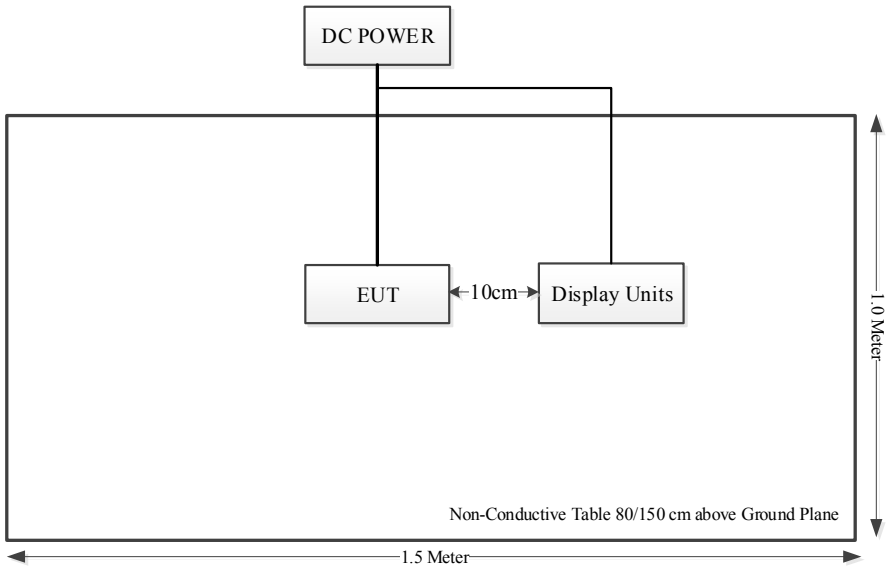
1.2.2 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D0912386
NEWEST	Display Unit	/	/

1.2.3 Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
Extension Cable	no	no	1.5	EUT	Display Unit
CAN Cable	no	no	3.0	EUT	DC Power Supply

1.2.4 Block Diagram of Test Setup



1.3 FAR Field Boundary Calculations

The far-field boundary is given in ANSI C63.10-2013:

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

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-140GHz 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	0.57
861V/385	50-75	43.7	0.64
M12RH	60-90	30.02	0.36
M08RH	90-140	19.7	0.23

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

1.4 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	9k~30MHz: 4.12dB, 30M~200MHz: 4.15 dB, 200M~1GHz: 5.61 dB,1G~6GHz: 5.14 dB, 6G~18GHz: 5.93 dB, 18G~26.5G:5.47 dB,26.5G~40G:5.63 dB, 40~60G: 4.83dB, 60G~90G: 4.94dB, 90G-140G: 5.46dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	2.8 dB (150 kHz to 30 MHz)

2. SUMMARY OF TEST RESULTS

Standard(s)/Rule(s)	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.207(a)	Conduction Emissions	Not Applicable
15.205, §15.209, §15.249	Radiated Emissions	Compliant
§15.215 (c)	20 dB Bandwidth	Compliant
§1.1307	RF Exposure Evaluation	Compliant

Note:
Not Applicable: Since the EUT is for vehicle use, not applicable for this test item.

3. REQUIREMENTS AND TEST PROCEDURES

3.1 AC Line Conducted Emissions

3.1.1 Applicable Standard

FCC§15.207(a).

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

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

*Decreases with the logarithm of the frequency.

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

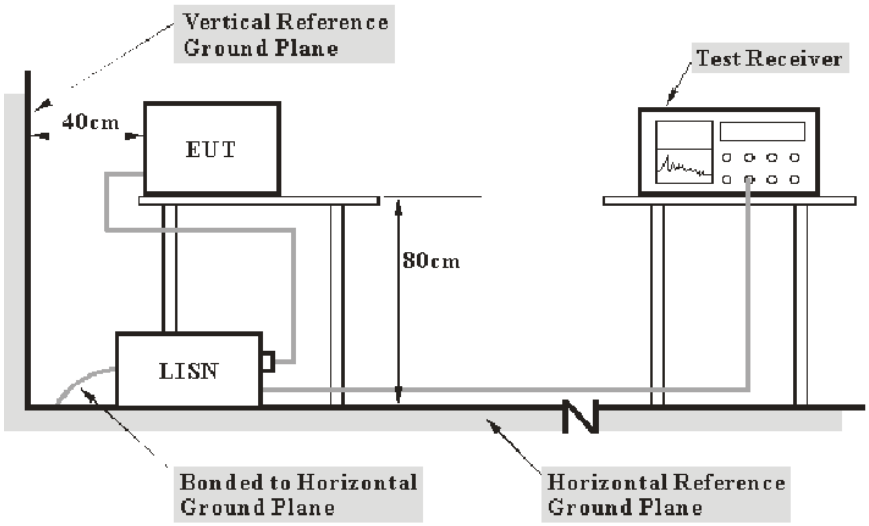
(1) For carrier current system containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

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

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

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

3.1.2 EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

The spacing between the peripherals was 10 cm.

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

3.1.3 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

3.1.4 Test Procedure

During the conducted emission test, the EUT was connected to the outlet of the first LISN.

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.

3.1.5 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

3.2 Radiated Emissions

3.2.1 Applicable Standard

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

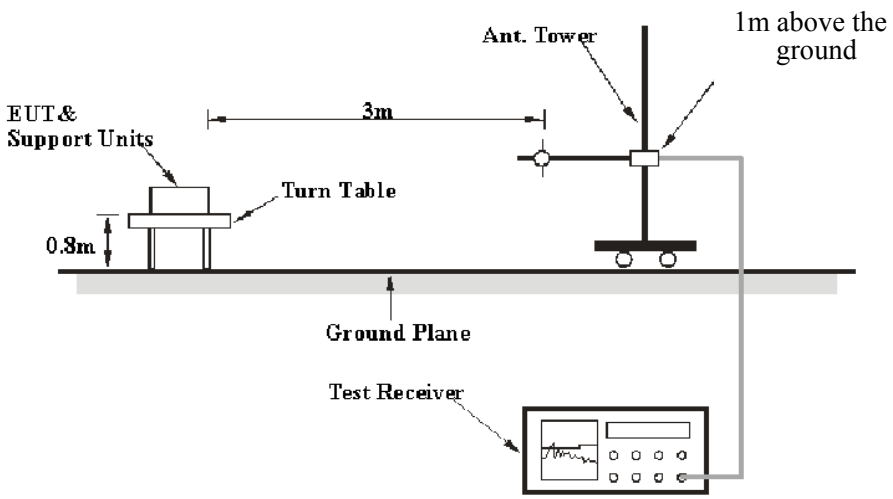
Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

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

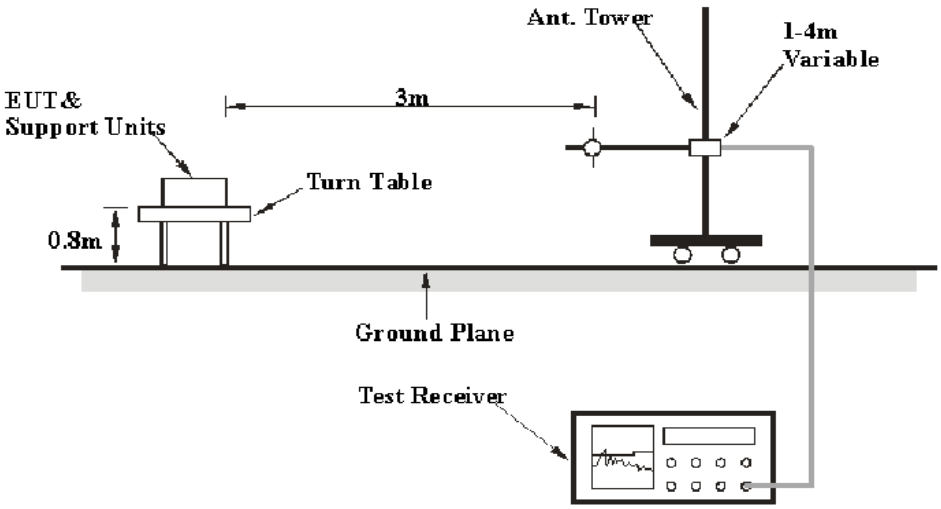
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

3.2.2 EUT Setup

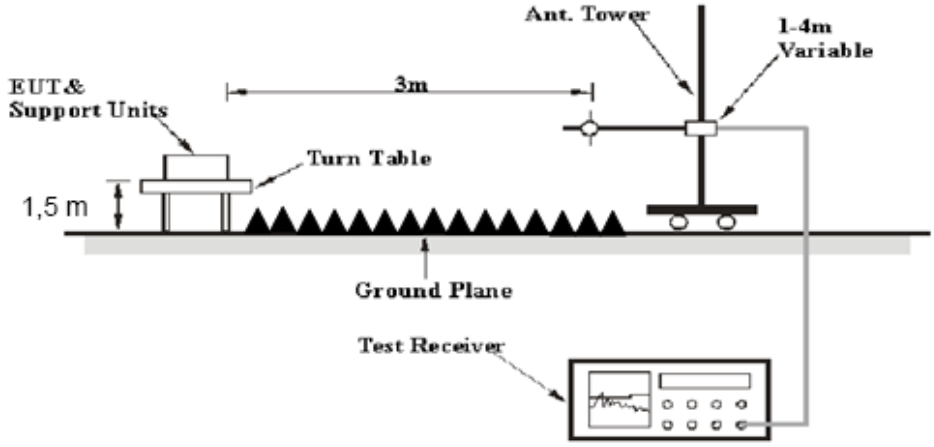
9 kHz-30MHz:



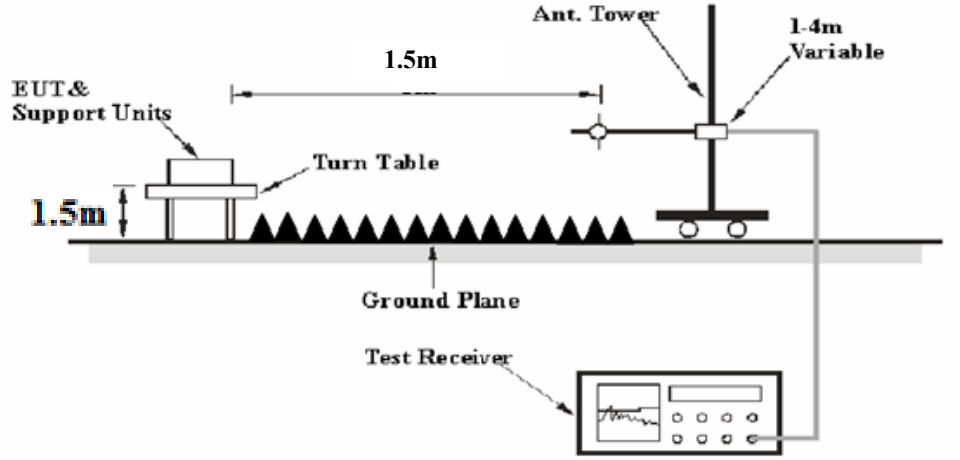
30MHz - 1GHz:



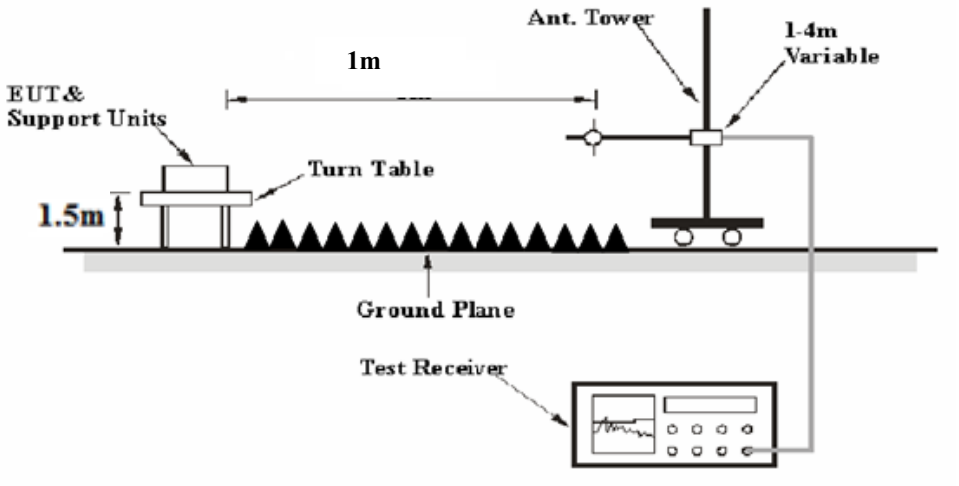
1GHz - 26.5 GHz:



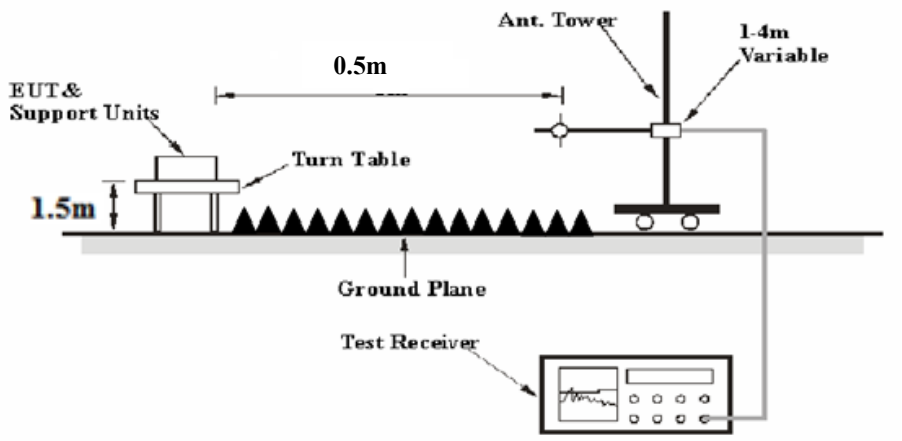
26.5GHz - 40 GHz:



40GHz - 90 GHz:



90GHz - 100 GHz:



The radiated emissions were performed in the 3 meters distance, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.249 limits.

3.2.3 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 100 GHz.

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

Frequency Range	RBW	Video B/W	IF B/W	Measurement
9 kHz – 150 kHz	/	/	200 Hz	QP/AV
	300 Hz	1 kHz	/	PK
150 kHz – 30 MHz	/	/	9 kHz	QP/AV
	10 kHz	30 kHz	/	PK
30 MHz – 1000 MHz	/	/	120 kHz	QP
	100 kHz	300 kHz	/	PK
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	AV

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.

3.2.4 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.

According to C63.10, the 26.5- 100GHz test result shall be extrapolated to the specified distance using an extrapolation factor of 20dB/decade from 3m to 1.5m, 1m or 0.5m

For 26.5-40GHz
Distance extrapolation factor =20 log (specific distance [3m]/test distance [1.5m]) dB=6.02dB

For 40-90GHz
Distance extrapolation factor =20 log (specific distance [3m]/test distance [1m]) dB=9.54dB

For 90-100GHz
Distance extrapolation factor =20 log (specific distance [3m]/test distance [0.5m]) dB=15.56dB

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.

3.2.5 Corrected Amplitude & Margin Calculation

The basic equation is as follows:

For 30MHz-26.5GHz:
Result = Reading + Factor

For 26.5GHz-100GHz
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

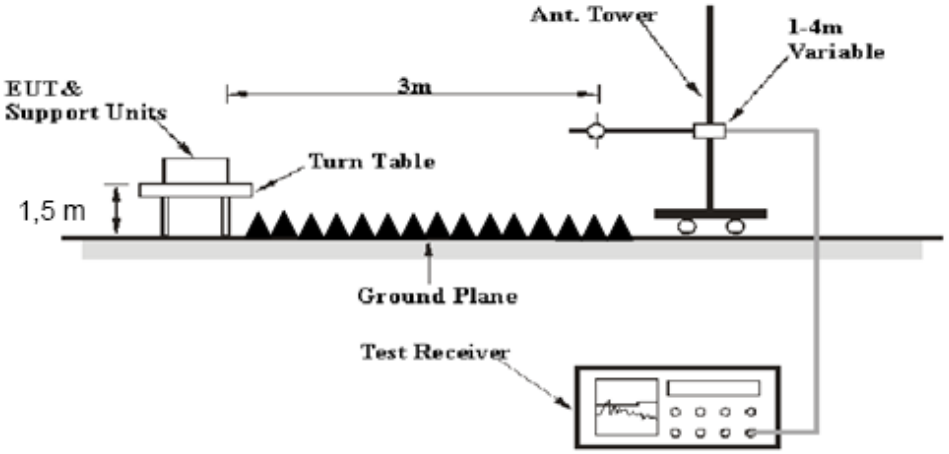
3.3 20 dB Emission Bandwidth:

3.3.1 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.

3.3.2 EUT Setup



3.3.3Test Procedure

1. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.

2. Repeat above procedures until all frequencies measured were complete.

3.4 Antenna Requirement

3.4.1 Applicable Standard

FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

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

3.4.2 Judgment

Please refer to the Antenna Information detail in Section 1.

4. Test DATA AND RESULTS

4.1 Radiation Spurious Emissions

Serial Number:	27KJ-4	Test Date:	2024/2/22~2024/3/2
Test Site:	966-2,966-1	Test Mode:	Transmitting
Tester:	Vic Du, Jeff Luo, coco Tian	Test Result:	Pass

Environmental Conditions:

Temperature: (℃)	23.1~25.9	Relative Humidity: (%)	44~60	ATM Pressure: (kPa)	100.9~101.8

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB6	A082520-5	2023/12/1	2026/11/30
BACL	Loop Antenna	1313-1A	3110611	2023/12/4	2026/12/3
Daruikang	Coaxial Cable	BNC-JJ-RG58	C-0300-01	2024/1/11	2025/1/10
Daruikang	Coaxial Cable	BNC-JJ-RG58	C-0500-01	2024/1/11	2025/1/10
R&S	EMI Test Receiver	ESR3	102724	2023/3/31	2024/3/30
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0470-02	2023/7/16	2024/7/15
TIMES MICROWAVE	Coaxial Cable	LMR-600-UltraFlex	C-0780-01	2023/7/16	2024/7/15
Sonoma	Amplifier	310N	186165	2023/7/16	2024/7/15
Audix	Test Software	E3	201021 (V9)	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	9912-5985	2023/12/6	2026/12/5
R&S	Spectrum Analyzer	FSV40	101591	2023/3/31	2024/3/30
MICRO-COAX	Coaxial Cable	UFA210A-1-1200-70U300	217423-008	2024/1/15	2025/1/14
MICRO-COAX	Coaxial Cable	UFA210A-1-2362-300300	235780-001	2024/1/15	2025/1/14
A.H	Preamplifier	PAM-0118P	628	2024/1/15	2025/1/14
Audix	Test Software	E3	191218 (V9)	N/A	N/A
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2024/2/4	2027/2/3
Quinstar	Preamplifier	QLW-18405536-JO	15964001005	2024/1/15	2025/1/14
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2024/1/15	2025/1/14
PASTERNACK	Horn Antenna	PE9850/2F-20	072001	2024/2/4	2027/2/3
OML	Harmonic Mixer	WR19/M19HWD	U60314-1	2023/2/16	2026/2/15
OML	Horn Antenna	M19RH	11648-03	2023/2/27	2026/2/26
OML	Harmonic Mixer	WR12/M12HWD	E60119-1	2023/2/16	2026/2/15
OML	Horn Antenna	M12RH	E60119-2	2023/2/27	2026/2/26
OML	Harmonic Mixer	WR08/M08HWD	F60315-1	2023/2/16	2026/2/15
OML	Horn Antenna	M08RH	F60315-2	2023/2/27	2026/2/26

** Statement of Traceability: China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Note:
The device can support three detection modes, each detection mode shares the same transmit bandwidth, frequency and power level, tests are performed on all modes and only the worst-case emissions reported.

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

1) Radiation Spurious Emissions for 9kHz~30MHz

Detection Mode 1 *was the worst case.*

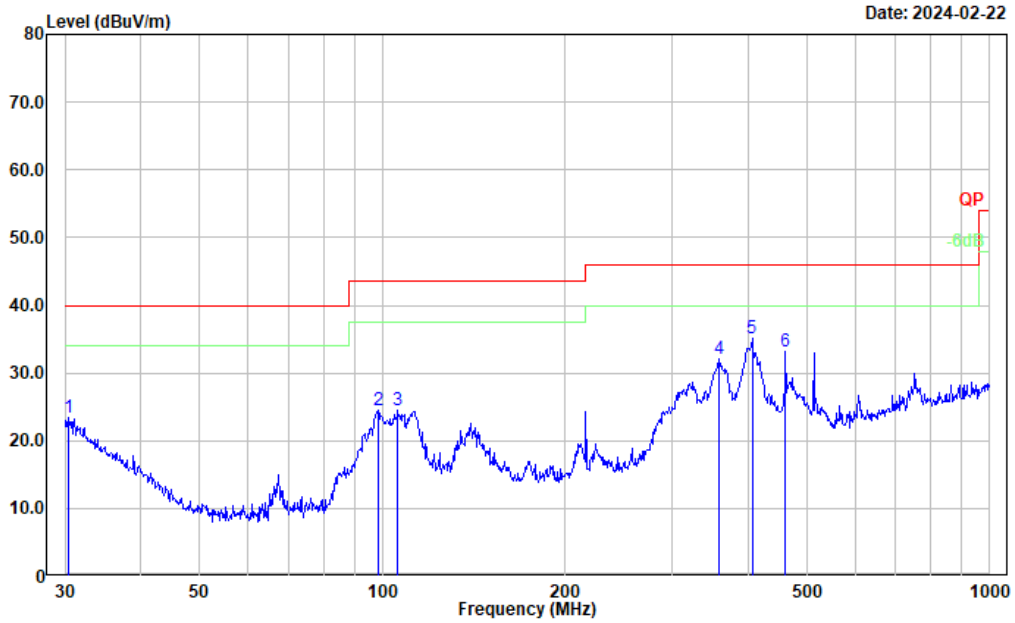
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

2) Radiation Spurious Emissions for 30MHz-1GHz

Detection Mode 1 *was the worst case. Please refer to the below test plots.*

Detection Mode 1 – Horizontal

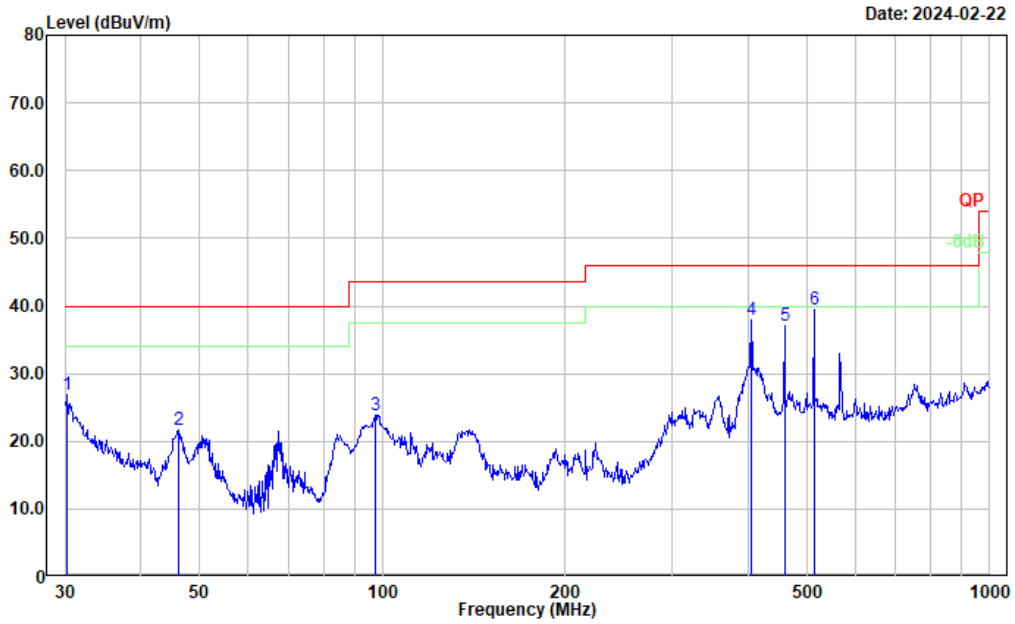
Project No.: CR230637429
Tester: Vic Du
Polarization: horizontal
Note: Transmitting(4.0 x 20 meter)



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.424	27.55	-4.12	23.43	40.00	16.57	Peak
2	98.487	39.45	-14.94	24.51	43.50	18.99	Peak
3	106.013	37.46	-12.96	24.50	43.50	19.00	Peak
4	359.186	41.46	-9.35	32.11	46.00	13.89	Peak
5	406.088	43.05	-8.04	35.01	46.00	10.99	Peak
6	460.727	39.70	-6.63	33.07	46.00	12.93	Peak

Detection Mode 1 – Vertical

Project No.: CR230637429
Tester: Vic Du
Polarization: vertical
Note: Transmitting(4.0 x 20 meter)



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	30.317	30.90	-4.06	26.84	40.00	13.16	Peak
2	46.178	37.15	-15.42	21.73	40.00	18.27	Peak
3	97.115	39.21	-15.27	23.94	43.50	19.56	Peak
4	404.667	46.09	-8.06	38.03	46.00	7.97	Peak
5	459.114	43.74	-6.69	37.05	46.00	8.95	Peak
6	513.633	45.04	-5.69	39.35	46.00	6.65	Peak

3) Radiation Spurious Emissions for 1GHz-40GHz

Detection Mode 2 was the worst case.

Frequency (MHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low channel				24065	MHz		
24065.000	91.25	PK	H	4.80	96.05	127.96	31.91
24065.000	77.93	AV	H	4.80	82.73	107.96	25.23
24065.000	107.84	PK	V	4.80	112.64	127.96	15.32
24065.000	96.78	AV	V	4.80	101.58	107.96	6.38
23994.270	51.72	PK	H	4.55	56.27	74.00	17.73
23994.270	39.97	AV	H	4.55	44.52	54.00	9.48
23934.270	51.23	PK	V	4.71	55.94	74.00	18.06
23934.270	38.57	AV	V	4.71	43.28	54.00	10.72
1244.80	63.67	PK	V	-15.95	47.72	74.00	26.28
1244.80	50.53	AV	V	-15.95	34.58	54.00	19.42
25146.80	51.18	PK	V	5.65	56.83	74.00	17.17
25146.80	37.70	AV	V	5.65	43.35	54.00	10.65
39387.10	52.59	PK	V	7.65	60.24	74.00	13.76
39387.10	39.97	AV	V	7.65	47.62	54.00	6.38
Middle channel				24152	MHz		
24152.000	87.89	PK	H	5.14	93.03	127.96	34.93
24152.000	79.74	AV	H	5.14	84.88	107.96	23.08
24152.000	104.86	PK	V	5.14	110.00	127.96	17.96
24152.000	97.08	AV	V	5.14	102.22	107.96	5.74
1232.40	46.23	PK	V	-16.15	30.08	74.00	43.92
1232.40	33.41	AV	V	-16.15	17.26	54.00	36.74
23297.00	51.95	PK	V	4.34	56.29	74.00	17.71
23297.00	39.04	AV	V	4.34	43.38	54.00	10.62
39318.50	52.54	PK	V	7.94	60.48	74.00	13.52
39318.50	39.46	AV	V	7.94	47.40	54.00	6.60
High channel				24235	MHz		
24235.000	85.86	PK	H	5.28	91.14	127.96	36.82
24235.000	77.82	AV	H	5.28	83.10	107.96	24.86
24235.000	103.92	PK	V	5.28	109.20	127.96	18.76
24235.000	95.82	AV	V	5.28	101.10	107.96	6.86
24302.850	51.81	PK	H	5.12	56.93	74.00	17.07
24302.850	39.38	AV	H	5.12	44.50	54.00	9.50
24261.380	51.81	PK	V	5.23	57.04	74.00	16.96
24261.380	40.09	AV	V	5.23	45.32	54.00	8.68
1225.75	46.02	PK	V	-16.24	29.78	74.00	44.22
1225.75	33.08	AV	V	-16.24	16.84	54.00	37.16
23245.47	51.70	PK	V	4.56	56.26	74.00	17.74
23245.47	38.87	AV	V	4.56	43.43	54.00	10.57
39312.55	52.41	PK	V	7.97	60.38	74.00	13.62
39312.55	39.14	AV	V	7.97	47.11	54.00	6.89

Result = Reading + Factor- Distance extrapolation Factor
For 1-26.5GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [3m]) dB= 0 dB
For 26.5-40GHz:
Distance extrapolation Factor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB

4) Radiation Spurious Emissions for 40GHz-100GHz

Detection Mode 2 was the worst case.

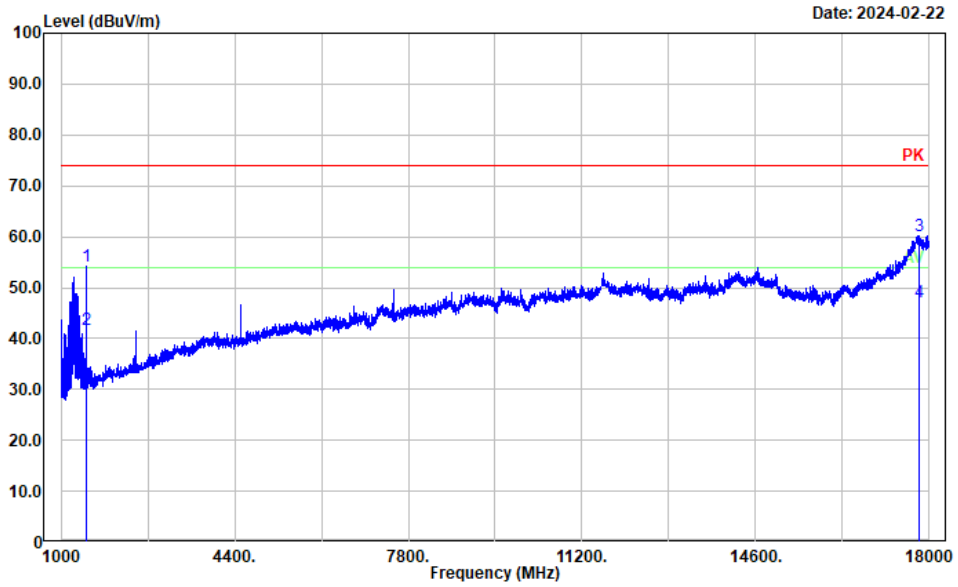
Frequency (GHz)	Receiver		Polar (H/V)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector					
Low channel				24.065	GHz		
48.130	43.17	PK	H	40.06	73.69	87.96	14.27
48.130	30.66	AV	H	40.06	61.18	67.96	6.78
48.130	40.69	PK	V	40.06	71.21	87.96	16.75
48.130	28.44	AV	V	40.06	58.96	67.96	9.00
72.195	41.92	PK	H	43.81	76.19	87.96	11.77
72.195	30.12	AV	H	43.81	64.39	67.96	3.57
72.195	41.36	PK	V	43.81	75.63	87.96	12.33
72.195	30.52	AV	V	43.81	64.79	67.96	3.17
96.260	40.12	PK	H	45.88	70.44	87.96	17.52
96.260	28.63	AV	H	45.88	58.95	67.96	9.01
96.260	40.36	PK	V	45.88	70.68	87.96	17.28
96.260	28.55	AV	V	45.88	58.87	67.96	9.09
Middle channel				24.152	GHz		
48.304	44.85	PK	H	40.09	75.40	87.96	12.56
48.304	32.52	AV	H	40.09	63.07	67.96	4.89
48.304	45.63	PK	V	40.09	76.18	87.96	11.78
48.304	33.65	AV	V	40.09	64.20	67.96	3.76
72.456	41.33	PK	H	43.85	75.64	87.96	12.32
72.456	29.39	AV	H	43.85	63.70	67.96	4.26
72.456	42.19	PK	V	43.85	76.50	87.96	11.46
72.456	30.58	AV	V	43.85	64.89	67.96	3.07
96.608	39.63	PK	H	45.92	69.99	87.96	17.97
96.608	27.88	AV	H	45.92	58.24	67.96	9.72
96.608	40.39	PK	V	45.92	70.75	87.96	17.21
96.608	28.64	AV	V	45.92	59.00	67.96	8.96
High channel				24.235	GHz		
48.470	45.93	PK	H	40.11	76.50	87.96	11.46
48.470	34.20	AV	H	40.11	64.77	67.96	3.19
48.470	45.89	PK	V	40.11	76.46	87.96	11.50
48.470	33.67	AV	V	40.11	64.24	67.96	3.72
72.705	41.06	PK	H	43.89	75.41	87.96	12.55
72.705	28.92	AV	H	43.89	63.27	67.96	4.69
72.705	41.62	PK	V	43.89	75.97	87.96	11.99
72.705	29.87	AV	V	43.89	64.22	67.96	3.74
96.940	40.21	PK	H	45.96	70.61	87.96	17.35
96.940	28.67	AV	H	45.96	59.07	67.96	8.89
96.940	40.56	PK	V	45.96	70.96	87.96	17.00
96.940	28.60	AV	V	45.96	59.00	67.96	8.96

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

Worst Radiated Emissions Margin Test plots (Detection Mode 2 lowest channel was the worst)

1GHz-18GHz-Horizontal

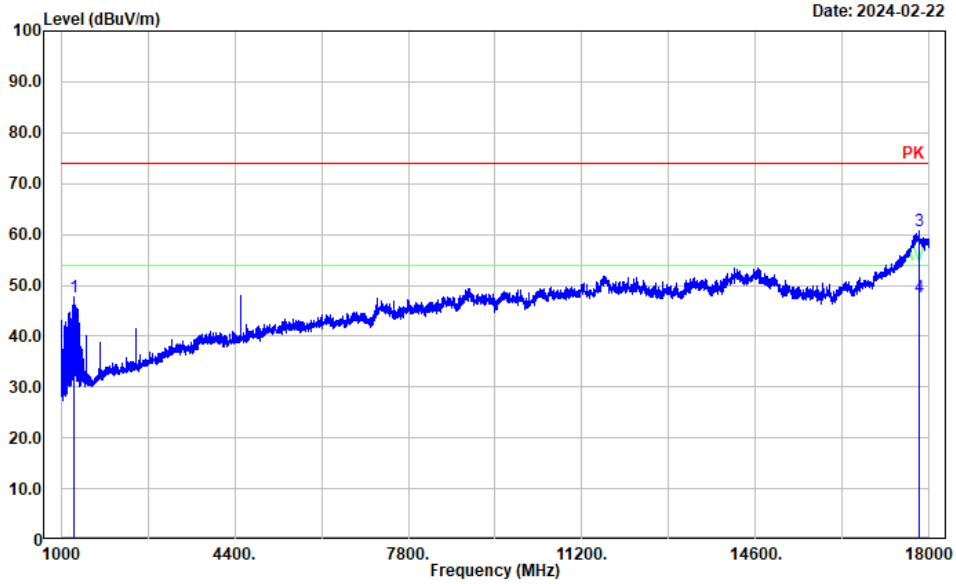
```
Project No.: CR230637429-RF
     Tester: coco Tian
Polarization: horizontal
       Note:
```



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	1503.200	69.61	-15.47	54.14	74.00	19.86	Peak
2	1503.200	57.12	-15.47	41.65	54.00	12.35	Average
3	17799.400	44.08	16.20	60.28	74.00	13.72	Peak
4	17799.400	31.01	16.20	47.21	54.00	6.79	Average

1GHz-18GHz-Vertical

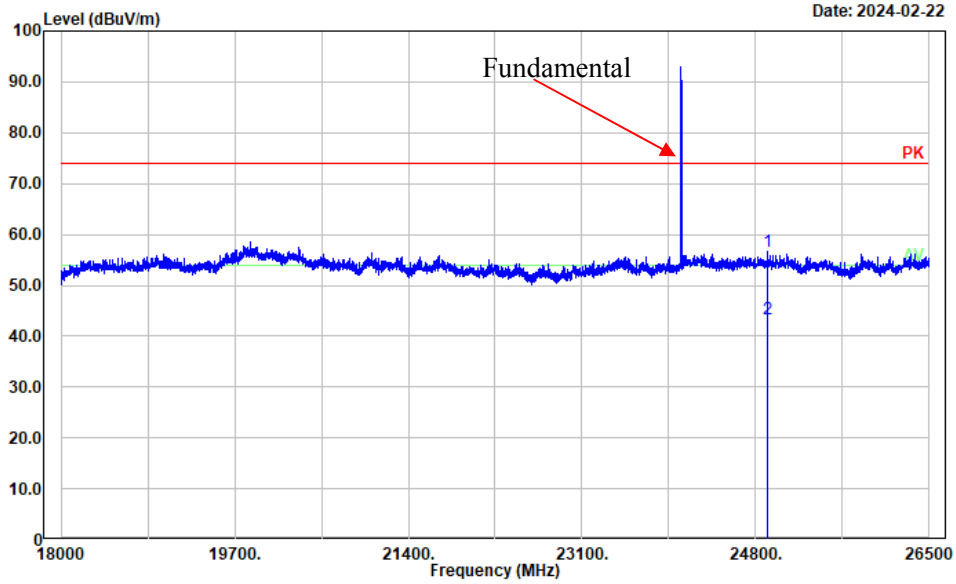
Project No.: CR230637429-RF
Tester: coco Tian
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	1244.800	63.67	-15.95	47.72	74.00	26.28	Peak
2	1244.800	50.53	-15.95	34.58	54.00	19.42	Average
3	17796.000	44.52	16.18	60.70	74.00	13.30	Peak
4	17796.000	31.47	16.18	47.65	54.00	6.35	Average

18GHz-26.5GHz_Horizontal

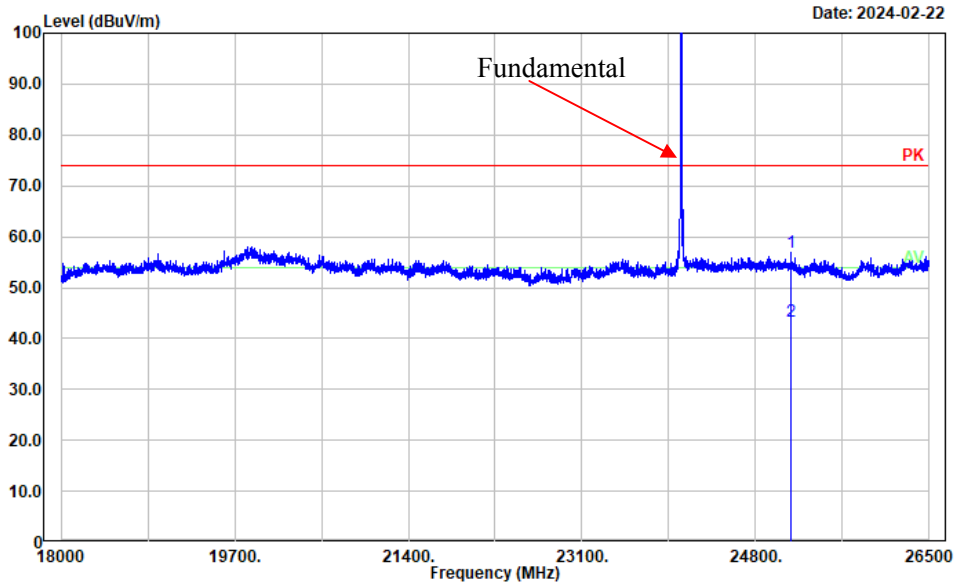
Project No.: CR230637429-RF
Tester: coco Tian
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	24912.200	51.18	5.44	56.62	74.00	17.38	Peak
2	24912.200	37.81	5.44	43.25	54.00	10.75	Average

18GHz-26.5GHz_ Vertical

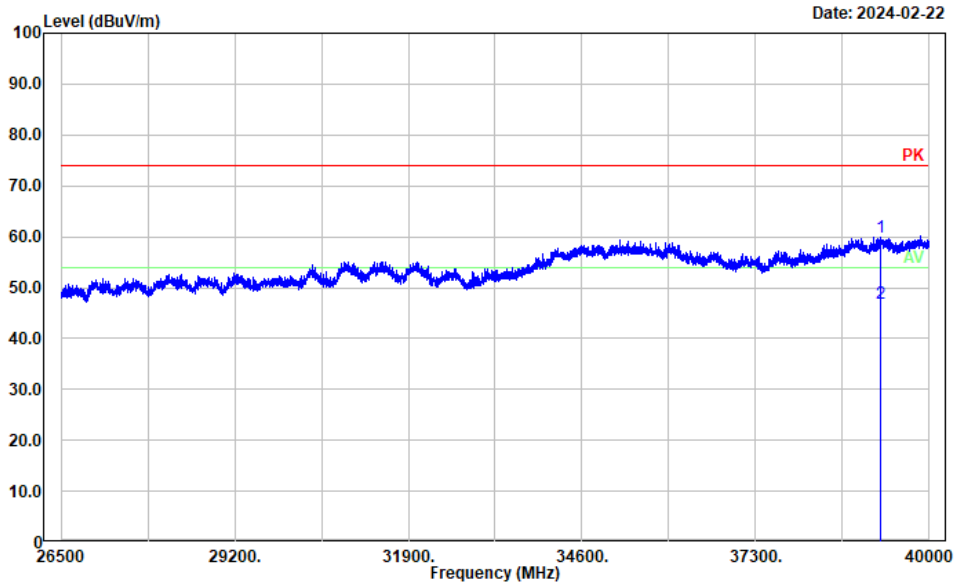
Project No.: CR230637429-RF
Tester: coco Tian
Polarization: vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	25146.800	51.18	5.65	56.83	74.00	17.17	Peak
2	25146.800	37.70	5.65	43.35	54.00	10.65	Average

26.5GHz-40GHz_Horizontal

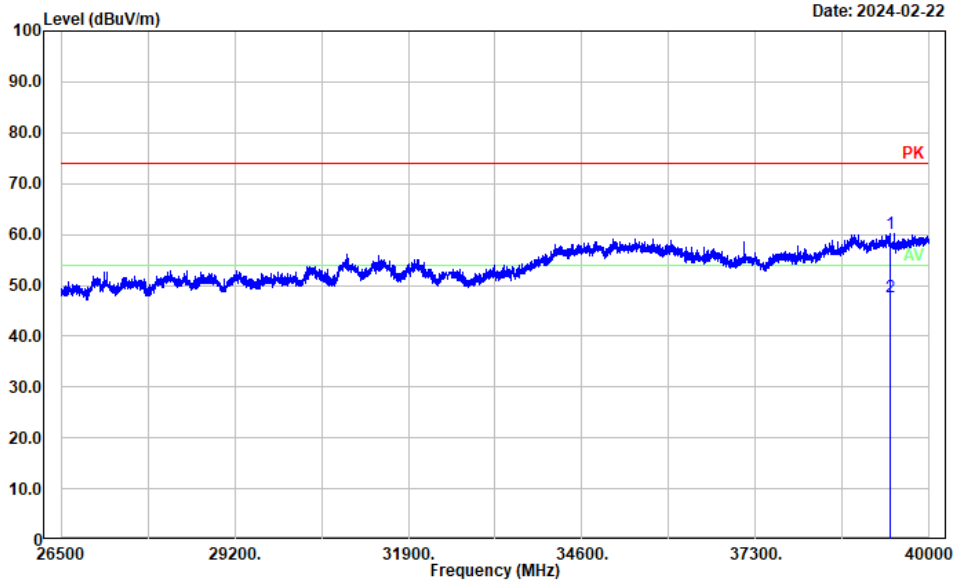
Project No.: CR230637429-RF
Tester: coco Tian
Polarization: horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	39233.200	51.62	8.31	59.93	74.00	14.07	Peak
2	39233.200	38.58	8.31	46.89	54.00	7.11	Average

26.5GHz-40GHz_Vertical

Project No.: CR230637429-RF
Tester: coco Tian
Polarization: vertical
Note:

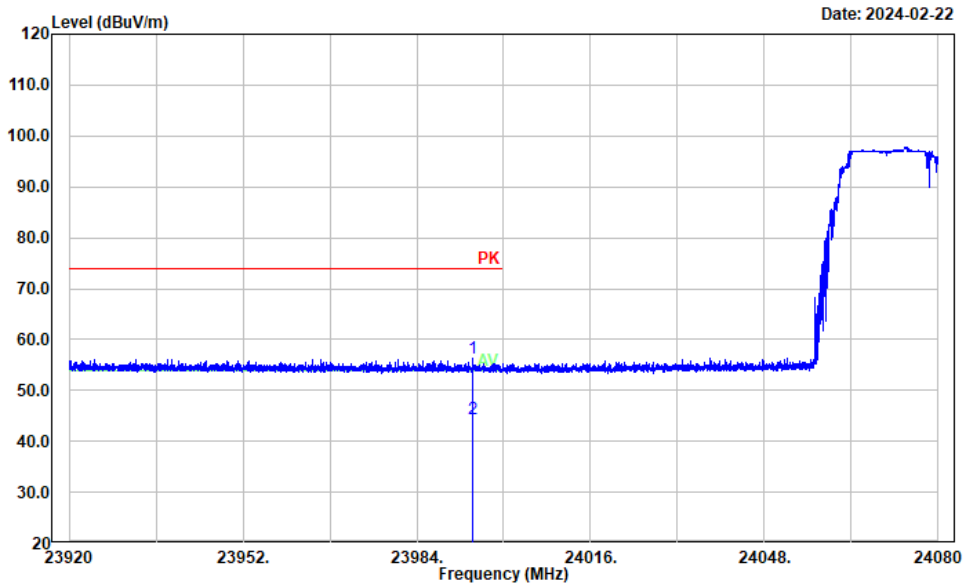


No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	39387.100	52.59	7.65	60.24	74.00	13.76	Peak
2	39387.100	39.97	7.65	47.62	54.00	6.38	Average

Radiated Band Edge Test Plots:

Lowest Channel_ Horizontal

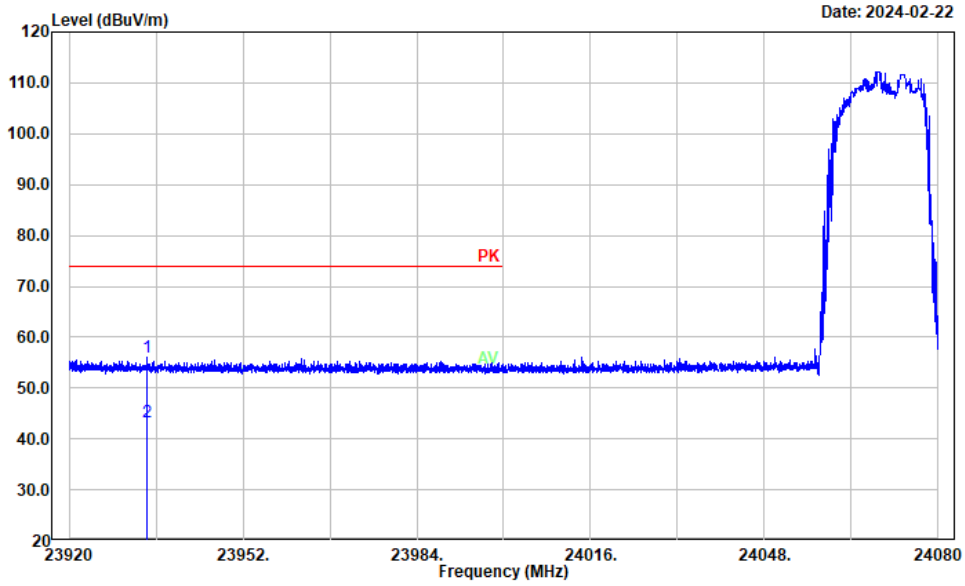
Project No.: CR230637429-RF
Tester: Coco Tian
Polarization: Horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23994.270	51.72	4.55	56.27	74.00	17.73	Peak
2	23994.270	39.97	4.55	44.52	54.00	9.48	Average

Lowest Channel_ Vertical

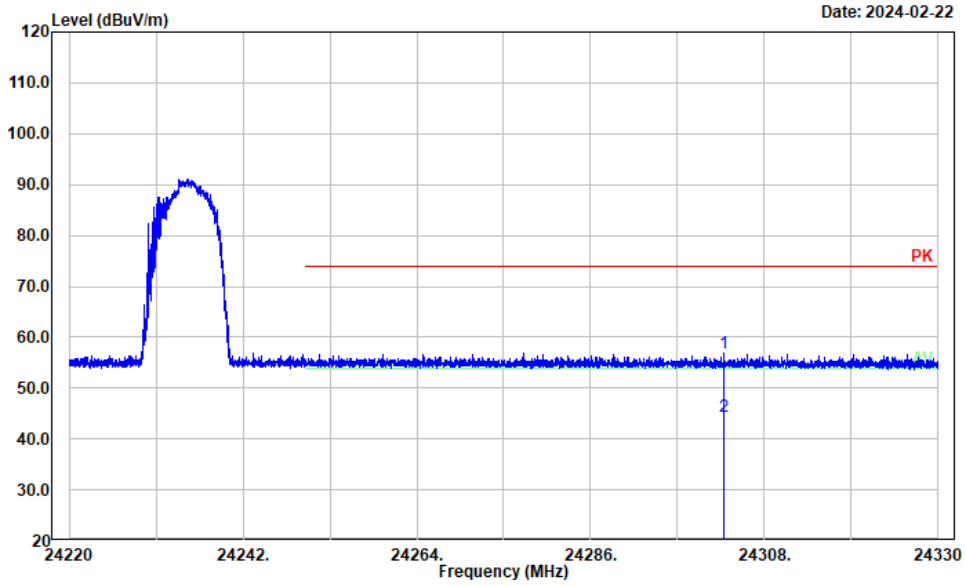
Project No.: CR230637429-RF
Tester: Coco Tian
Polarization: Vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	23934.270	51.23	4.71	55.94	74.00	18.06	Peak
2	23934.270	38.57	4.71	43.28	54.00	10.72	Average

Highest Channel_ Horizontal

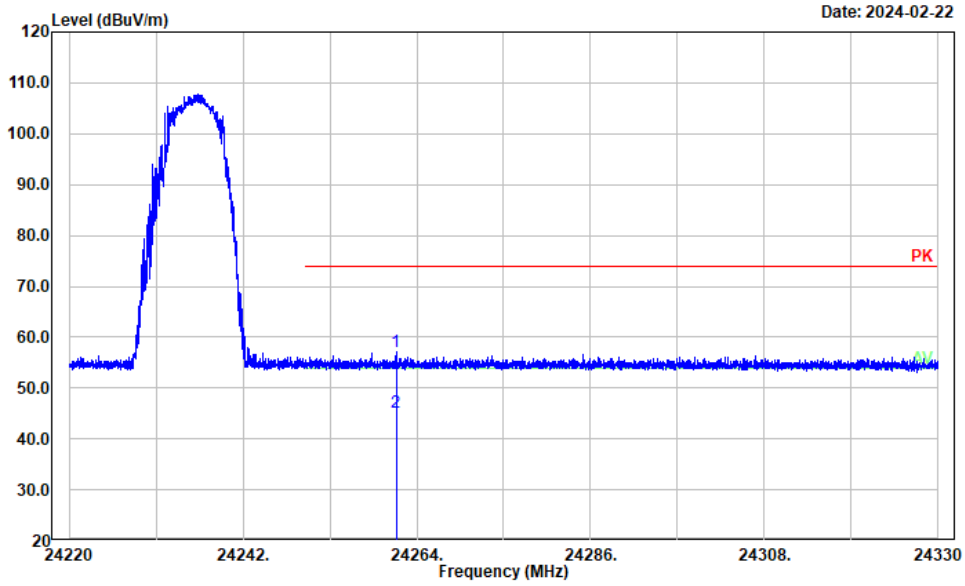
Project No.: CR230637429-RF
Tester: Coco Tian
Polarization: Horizontal
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	24302.850	51.81	5.12	56.93	74.00	17.07	Peak
2	24302.850	39.38	5.12	44.50	54.00	9.50	Average

Highest Channel_ Vertical

Project No.: CR230637429-RF
Tester: Coco Tian
Polarization: Vertical
Note:



No.	Frequency (MHz)	Reading (dBµV)	Factor (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
1	24261.380	51.81	5.23	57.04	74.00	16.96	Peak
2	24261.380	40.09	5.23	45.32	54.00	8.68	Average

4.2 20 dB Emission Bandwidth

Serial Number:	27KJ-4	Test Date:	2024/3/12
Test Site:	966-1	Test Mode:	Transmitting
Tester:	Coco Tian	Test Result:	Pass

Environmental Conditions:					
Temperature: (℃)	22.5	Relative Humidity: (%)	57	ATM Pressure: (kPa)	101.3

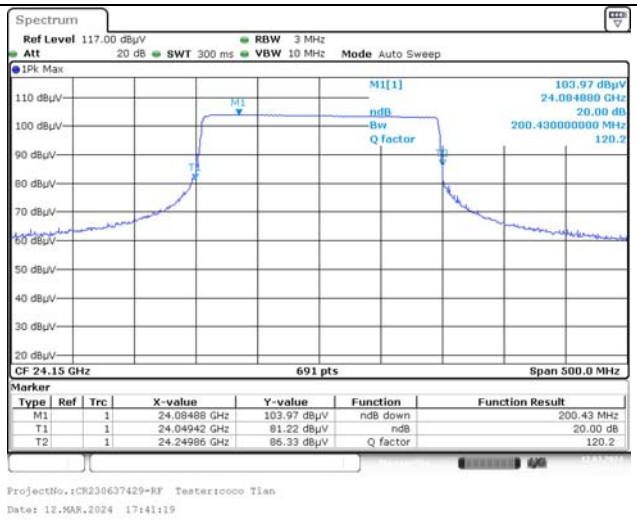
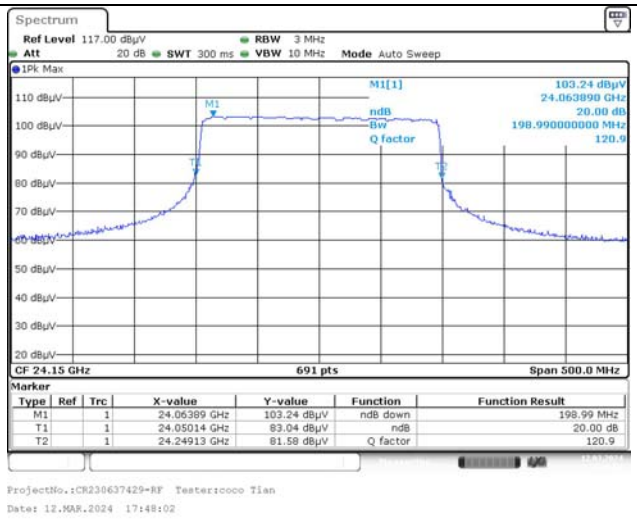
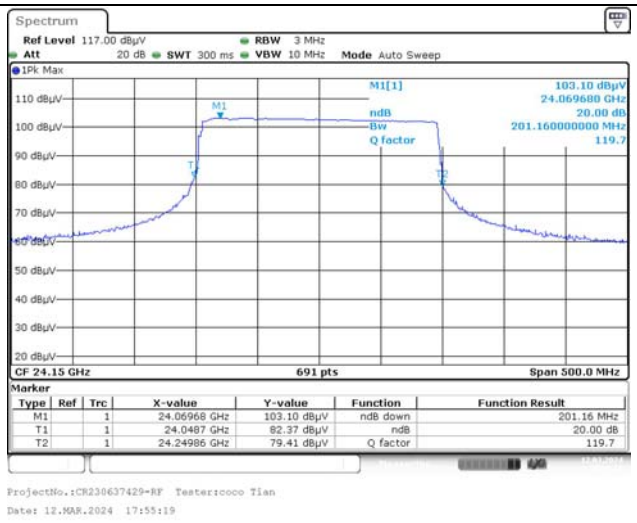
Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101591	2023/3/31	2024/3/30
PASTERNACK	Horn Antenna	PE9852/2F-20	112002	2024/2/4	2027/2/3
Quinstar	Preamplifier	QLW-18405536-JO	15964001005	2024/1/15	2025/1/14
MICRO-COAX	Coaxial Cable	UFB142A-1-2362-200200	235772-001	2024/1/15	2025/1/14

**** Statement of Traceability:*** *China Certification ICT Co., Ltd (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).*

Test Data:

Test Mode	20 dB Bandwidth (MHz)
Detection Mode 1_Sweep Mode	200.430
Detection Mode 2_Sweep Mode	198.990
Detection Mode 3_Sweep Mode	201.160

20dB Emission Bandwidth	
Detection Mode 1_Sweep Mode	
Detection Mode 2_Sweep Mode	
Detection Mode 3_Sweep Mode	

5. RF EXPOSURE EVALUATION

5.1 Applicable Standard

According to §1.1307(b)(3)(i)

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

5.2 Measurement Result

Frequency (GHz)	λ/2Π (mm)	Distance (mm)	Exemption ERP (mW)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum ERP (mW)	MPE-Based Exemption
24.065-24.235	1.99	200	768	17.44	15.29	33.81	Compliant

Note:
1. Chose the maximum power to do MPE analysis.
2. This device maximum E-Field level is 112.64 dBuV/m at 3m, so the EIRP power is 17.44 dBm.
3. Pout EIRP (dBm)=Field Strength of Fundamental(dBuV/m)-95.2
4. ERP [dBm]=EIRP[dBm]-2.15

Result: The device compliant the MPE-Based Exemption at 20cm distances.

6. EUT PHOTOGRAPHS

Please refer to the attachment CR230637429-EXP EUT EXTERNAL PHOTOGRAPHS and CR230637429-INP EUT INTERNAL PHOTOGRAPHS

7. TEST SETUP PHOTOGRAPHS

Please refer to the attachment CR230637429-00A-TSP TEST SETUP PHOTOGRAPHS.

===== END OF REPORT =====