

TEST REPORT

Application No.: SZCR2507002952AU
Applicant: BYD Auto Industry Company Limited
Address of Applicant: No. 3001 3007, Hengping Road, Pingshan New District, Shenzhen, Guangdong, China
Manufacturer: BYD Auto Industry Company Limited
Address of Manufacturer: No. 3001 3007, Hengping Road, Pingshan New District, Shenzhen, Guangdong, China
Factor: Hefei BYD Auto Company Limited
Address of Factor: Factory 15, No. 99, BYD Avenue, Xiatang Town, Changfeng County, Hefei City, Anhui Province
Equipment Under Test (EUT):
EUT Name: Projection sensing control module
Model No.: PL1k-L, PL1k-R ♣
♣ Please refer to section 1 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark: BYD
Standard(s): Item 8 of Article 2-1
Test Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407
Date of Receipt: 2025-07-08
Date of Test: 2025-07-08 to 2025-08-07
Date of Issue: 2025-08-11

Test Result:**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu
EMC Laboratory Manager



Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2025-08-11		Original

Authorized for issue by:			
		Leo Li	
		Leo Li/Project Engineer	
		Eric Fu	
		Eric Fu/Reviewer	



1 Test Summary

Test	Test Requirement	Limit/Severity	Result
Antenna Requirement	Item 8 of Article 2-1	Antenna Gain: 35dBi or less	PASS
Assigned Frequency		77.0GHz-81.0GHz	PASS
Tolerance of Frequency			
Occupied bandwidth		4GHz	PASS
Antenna Power		0.01W or less When OBW is 2GHz or less, :5uW/MHz or less(Average)	PASS
Unwanted Emission Strength, Outband area		100uW/MHz or less	PASS
Unwanted Emission Strength, Spurious area		50uW/MHz or less	PASS
Secondary Radiated Emission Strength		100uW/MHz or less: (Outband area) (Peak) 50uW/MHz or less: (Spurious area) (Peak)	PASS
RF accessibility		/	PASS

Declaration of EUT Family Grouping:

Model No.: PL1k-L, PL1k-R

Only the model PL1k-L was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used, internal wiring and functions were identical for all the above models, with only difference on their outer shell design structure to accommodate different installation positions.

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3 General Information

3.1 Details of E.U.T.

Power supply:	DC 9-16V
Test voltage:	DC 12V
Operation Frequency:	77GHz to 81GHz
Modulation Type:	FMCW
Period ON:	41 us
Period OFF:	7 us
Antenna Type:	Microstrip dressing array antenna
Antenna Gain:	8.8dBi(Provided by the manufacturer)

Remark: The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

3.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
DC power supply	ZHAOXIN	PS-3005D	REF. No.SEA27B01

3.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	RF Radiated power	3.26dB (9KHz ~ 30MHz)
		4.5dB (Below 1GHz)
		4.8dB (Above 1GHz)
2	Radiated Spuriousemission test	3.26dB (9KHz ~ 30MHz)
		4.5dB (Below 1GHz)
		4.8dB(Above 1GHz)
3	Supply voltages	± 1.5%

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3.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053

Fax: +86 755 2671 0594

No tests were sub-contracted.

3.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI (Member No. 1937)**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1336**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

3.6 Deviation from Standards

None

3.7 Abnormalities from Standard Conditions

None



4 Equipment List

Test Equipment List								
Test Equipment	Manufacturer	Model No.	Serial No.	Inventory No.	Cal. date	Cal Due Date	Calibration body	Classification
DC Power Supply	Chroma	62012P-80-60	6201 2PD0 1784	SEM011-11	2024-08-14	2025-08-13	GRGTES T	(c)
Multimeter	FLUKE	Fluke 73III	2790 0002	SEM022-01	2025-02-26	2026-02-25	CEPREI	(c)
Barometer	Changchun Meteorological Industry Factory	DYM3	0026	SEM002-01	2025-03-03	2026-03-02	CEPREI	(c)
MXE EMI receiver (3Hz-3.6GHz)	Keysight	N9038A	KEY SIGH T	SEM004-16	2024-08-14	2025-08-13	GRGTES T	(c)
EXA Signal Analyzer (10Hz-44GHz)	Keysight	N9010A	MY5 3420 154	SEM004-20	2024-08-14	2025-08-13	LISAI	(c)
BiConiLog Antenna	Schwarzbeck	VULB9163	9163-450	SEM003-05	2023-09-16	2025-09-15	STIEE	(c)



Horn Antenna(800MHz-18GHz)	R&S	HF907	102319	SEM003-06	2024-08-03	2026-08-02	GRGTES T	(c)
Broad-Band Horn Antenna(15GHz-40GHz)	SCHWARZB ECK	BBHA 9170	9170-374	SEM003-15	2024-08-16	2025-08-15	LISAI	(c)
Horn Antenna(40GHz-60GHz)	REBES	SAZ-2410-19-S1	06299-01	SEM020-02	N/A	N/A	N/A	(b)
Horn Antenna(50GHz-75GHz)	REBES	SAZ-2410-15-S1	01731-01	SEM020-03	N/A	N/A	N/A	(b)
Horn Antenna(75GHz-110GHz)	REBES	SAZ-2410-10-S1	01773-09	SEM020-04	N/A	N/A	N/A	(b)
Horn Antenna(110GHz-170GHz)	REBES	SAZ-2410-06-S1	01776-05	SEM020-05	N/A	N/A	N/A	(b)
Horn Antenna(140GHz-220GHz)	REBES	SAZ-2410-05-S1	01759-04	SEM020-06	N/A	N/A	N/A	(b)
Amplifier(30MHz~1GHz)	Shanghai Steed Automation Instrument Co.,Ltd	YX2898093 5	N/A	SEM005-26	2024-08-16	2025-08-15	CEPREI	(c)
Pre-amplifier (0.5GHz-26.5GHz)	Agilent	83017A	N/A	SEM005-25	2024-09-14	2025-09-13	CEPREI	(c)
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	2506.250 7	SEM005-08	2025-03-21	2026-03-20	CEPREI	(c)

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Coaxial Cable	HUBER+ SUHNER	N/A	N/A	SEM025-01	2025-07-04	2026-07-03	SGS	(b)
Extended waveguide(40- 60GHz)	REBES	SWG- 19025-FB	06303- 01	SEM020-08	N/A	N/A	N/A	(b)
Extended waveguide(50- 75GHz)	REBES	SWG- 19025-FB	01525- 09	SEM020-09	N/A	N/A	N/A	(b)
Extended waveguide(75- 110GHz)	REBES	SWG- 19025-FB	01509- 01	SEM020-10	N/A	N/A	N/A	(b)
Extended waveguide(110- 170GHz)	REBES	SWG- 19025-FB	06302- 01	SEM020-11	N/A	N/A	N/A	(b)
Extended waveguide(140- 220GHz)	REBES	SWG- 19025-FB	06304- 01	SEM020-12	N/A	N/A	N/A	(b)
Harmonic mixer(40-60GHz)	REBES	STH-19SF- S1	06937- 01	SEM020-14	N/A	N/A	N/A	(c)
Waveguide Harmonic Mixer(50-75GHz)	KEYSIGHT	M1970V	MY5139 0966	SEM020-15	N/A	N/A	N/A	(c)
Waveguide Harmonic Mixer(75- 110GHz)	KEYSIGHT	M1970W	MY5143 0883	SEM020-16	N/A	N/A	N/A	(c)
Harmonic mixer(110- 170GHz)	REBES	STH-06SF- S1	06110- 01	SEM020-17	N/A	N/A	N/A	(c)
Waveguide Harmonic	REBES	HM 140-220	200009	SEM020-18	N/A	N/A	N/A	(c)

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Mixer(140-220GHz)								
Waveguide Harmonic Mixer(50-75GHz) cable	Silverline	SLU18-SMSM-01.00M	99612	SEM020-20	N/A	N/A	N/A	(b)
Waveguide Harmonic Mixer(75-110GHz) cable	Silverline	SLU18-SMSM-01.00M	94202	SEM020-21	N/A	N/A	N/A	(b)
PXA Signal Analyzer(2Hz-50GHz)	Keysight	N9030B	MY60 07132 5	SEM04-30	2024-09-04	2025-09-03	GRGT EST	(c)
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A	N/A	N/A	(b)
Programmable Temperature&Humidity Chamber	Votsch Industrietechnik GmbH	VT 4002	58566 11100 0030	SEM002-15	2025-02-26	2026-02-25	CEPR EI	(c)
Vibration Tester	Dongling	ES-10-240	D1203 065	D1203065	2024-10-09	2025-10-08	CEPR EI	(c)
Power Sensor	Rohde & Schwarz	NRP-Z91	10302 7	SEM009-09	2025-03-05	2026-03-04	CEPR EI	(c)
Signal Generator	Rohde & Schwarz	SMB100A	11012 2	SEM006-11	2025-03-05	2026-03-04	CEPR EI	(c)

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).



(c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).

(d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

From JRL Article 24-2, paragraph 4, Item 2



5 Test Results

5.1 Radio Technical Requirements Specification

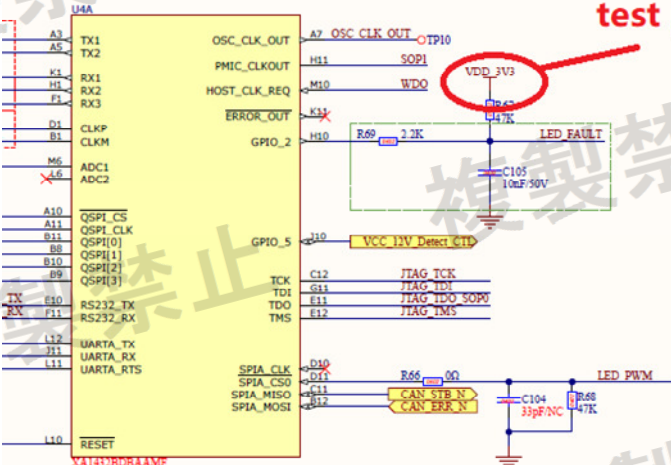
Table 1: Radio Technical Requirements Specification for 76-77GHzband specific low-power system (Ordinance for Regulating Radio Equipment 49-14-15)

Items		Technical standard
Assigned frequency (Frequency range)		79.0GHz (77.0GHz-81.0GHz)
Tolerance of frequency		77GHz-81GHz
Tolerance of occupied bandwidth		4GHz
Unwanted Emission Strength, Outband area		100uW/MHz or less
Unwanted Emission Strength, Spurious area		50uW/MHz or less
Antenna power		0.01W or less When OBW is 2GHz or less, :5uW/MHz or less(Average) Tolerance:+50%,-70%
Secondary Radiated Emission Strength		100uW/MHz or less: (Outband area) (Peak) 50uW/MHz or less: (Spurious area) (Peak)
Antenna Gain		35dBi or less
Radio waves exposed		Incident power density: 2mW/cm ² or less In the case of having a function to emit multiple radio waves at the same time: The total radiation ratio is 1 or less *Requirement is not applied to the equipment of the following. ·Body;"Average power:2mW or less(*Note.1)", or "Equipment that the separation distance between the human body and the transmission antenna (except head and both hand) is used in at least 20cm." (*Note.1):In the case of having a function to emit multiple radio waves at the same time: The total radiation ratio to threshold is 1 or less
Reference Test Condition for Frequency Stabilization	Voltage fluctuation	A transmitter shall be so constructed that the oscillation frequency will be as free from influence by changes in its power supply voltage or load as possible in order to maintain its frequency within the tolerance
	Environment	The oscillation circuit of a transmitter shall be based on an oscillation method that is as resistant to influence by changes in the ambient temperature or humidity as possible in order to maintain its oscillation frequency within the tolerance.
	Vibration	The transmitter of a mobile station (including a mobile amateur radio station) shall be able to maintain its frequency within the tolerance against any vibration or shock that can practically occur.

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5.2 E.U.T. test conditions

Environment:	Temperature Range:	-40.0 -85.0 °C												
	Humidity:	53.6 % RH												
	Atmospheric Pressure:	100.0 -102.0 kPa												
	Nomal Operating Environment:	Temperature: 22.7 °C Humidity: 52.9 % RH Atmospheric Pressure: 101.1 kPa												
Power supply:	Test Voltage: rated voltage and ±10% of the rated voltage. The product is supplied by DC 12V. The fluctuation of input voltage to the circuit of RF unit of test equipment is under ±1%, when input voltage to the test equipment is fluctuated by ±10%. So, all measurement has been conducted by only rated voltage DC 12V.													
														
<table><tr><th>Test Mode Classify</th><th>Power Supply</th><th>Measured Value</th></tr><tr><td>TM 1</td><td>DC 12V</td><td>DC 3.3V</td></tr><tr><td>TM 2</td><td>DC 9V</td><td>DC 3.3V</td></tr><tr><td>TM 3</td><td>DC 16V</td><td>DC 3.3V</td></tr></table>			Test Mode Classify	Power Supply	Measured Value	TM 1	DC 12V	DC 3.3V	TM 2	DC 9V	DC 3.3V	TM 3	DC 16V	DC 3.3V
Test Mode Classify	Power Supply	Measured Value												
TM 1	DC 12V	DC 3.3V												
TM 2	DC 9V	DC 3.3V												
TM 3	DC 16V	DC 3.3V												

5.3 Antenna Requirement

Standard requirement

Applicable for equipment with an antenna terminal, including testing terminals) If an antenna connector is available, all relevant tests will be carried out conducted. If not, tests will be carried out in an anechoic room or with a suitable test-fixture.

EUT Antenna

The antenna is Integrated Patch Antenna and no consideration of replacement.



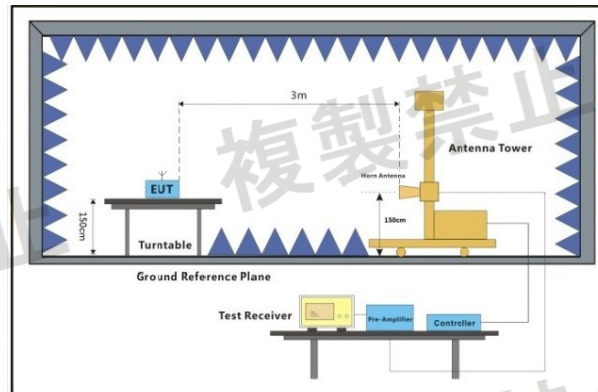
5.4 Assigned Frequency and Tolerance of Frequency

Test Requirement: Item 8 of Article 2-1

Text Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407

Test Status: Test the EUT in transmitting mode with modulation.

Test Configuration:



Test Procedure:

1) Test Conditions:

Spectrum Analyzer is used for measurement.

2) EUT Conditions:

FMCW Tx

3) Spectrum Analyzer conditions:

Frequency: Test Frequency

Span: OBW×2

RBW: 1MHz

VBW: 3MHz

Sweep Time: Auto

Detector mode: Positive Peak

Sweep mode: Max Hold

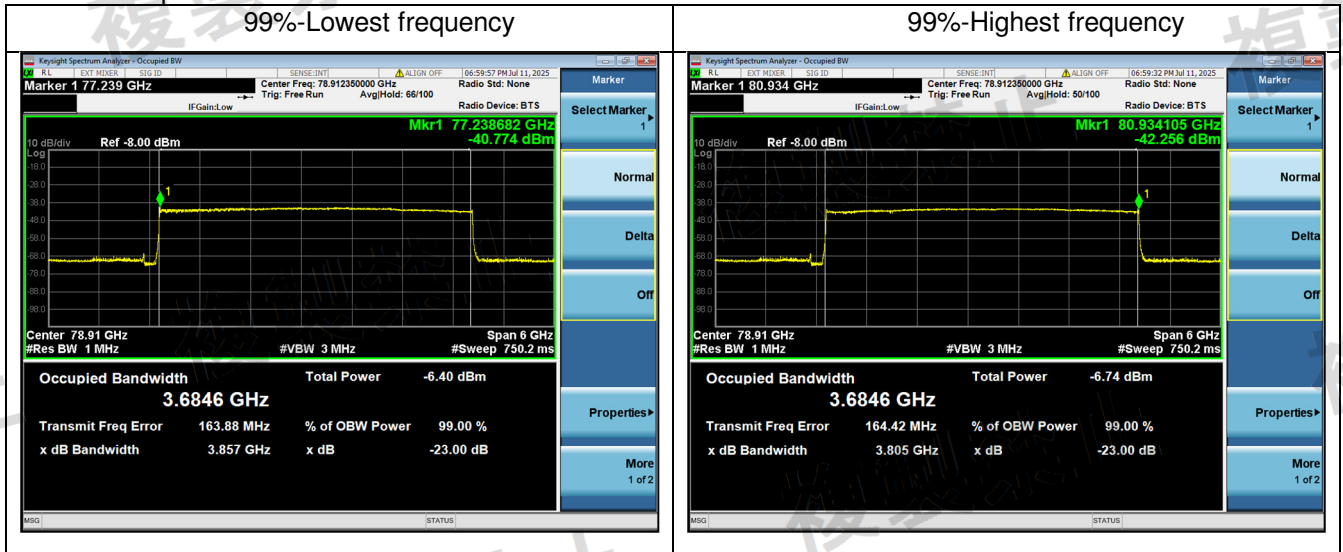
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Test Data:

Test Frequency (GHz)	Test Frequency(GHz)	Limit	Frequency Deviation	Result
78.91	77.238682-80.934105	77-81GHz	0.31% to -0.08%	Pass

Test plots as below:



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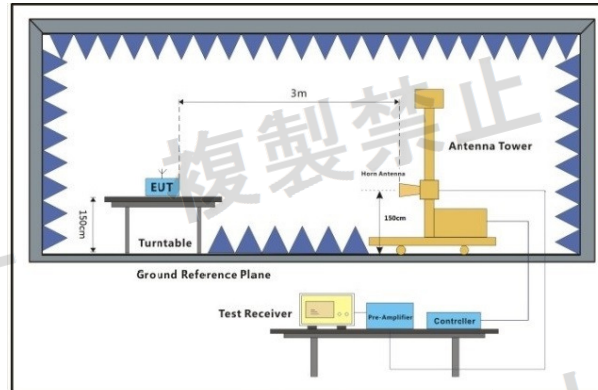
5.5 Condition for Frequency Stabilization

Test Requirement: Item 8 of Article 2-1

Text Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407

Test Status: Test the EUT in transmitting mode with modulation.

Test Configuration:



Test Procedure:

Test Conditions:

Spectrum Analyzer is used for measurement.,EUT setup at different condition

EUT Conditions:

FMCW Tx

Spectrum Analyzer conditions:

Frequency: Test Frequency

Span: OBW×2

RBW: 1MHz

VBW: 3MHz

Sweep Time: Auto

Detector mode: Positive Peak

Sweep mode: Max Hold

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Reference Test

Temperature Test Data:

Test Frequency (GHz)	Temperature (°C)	Humidity (%)	Lowest frequency (GHz)	Highest frequency (GHz)	Limit	Result
78.91	0	53.6	77.238682	80.934105	77.0-81.0GHz	Pass
	-10	53.6	77.237181	80.934105		Pass
	-20	53.6	77.237181	80.934105		Pass
	40	53.6	77.237181	80.934105		Pass
	50	53.6	77.237181	80.934105		Pass
	60	53.6	77.237181	80.937106		Pass

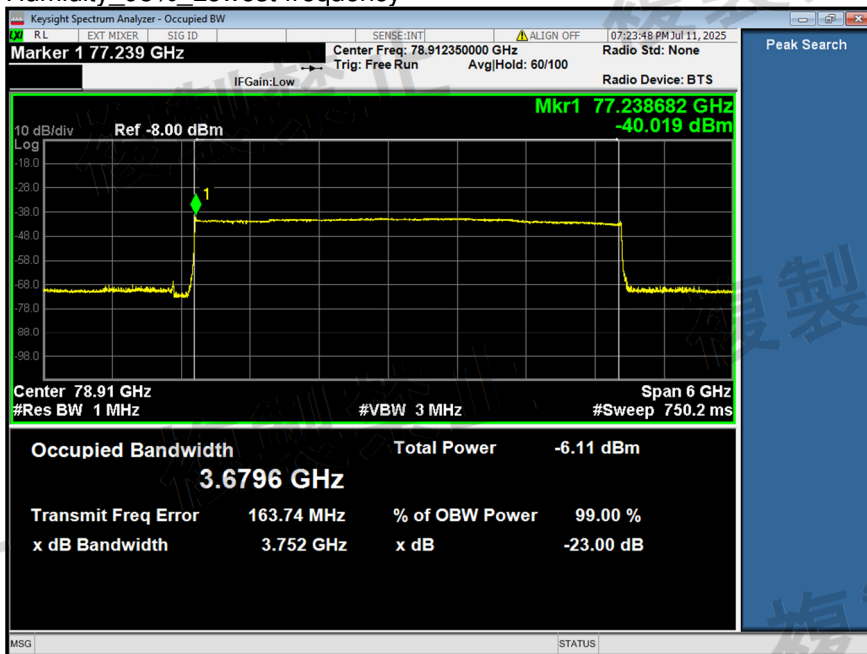
Humidity Test Data:

Test Frequency (GHz)	Humidity (%)	Temperature (°C)	Lowest frequency (GHz)	Highest frequency (GHz)	Limit	Result
78.91	95	35	77.238682	80.935606	77.0-81.0GHz	Pass

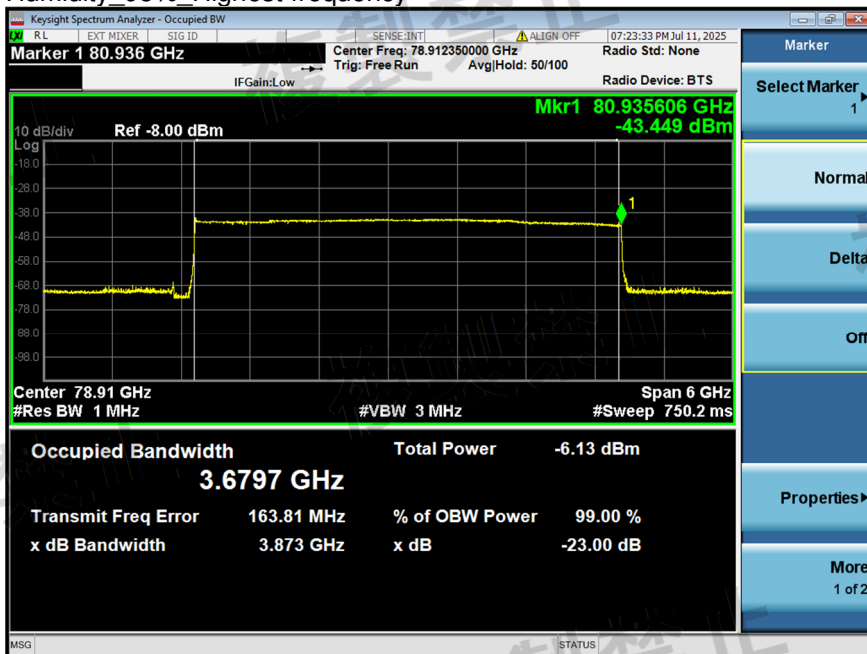


Test plots as below:

Humidity 95% Lowest frequency



Humidity 95% Highest frequency



Vibration Test Data:

Test Frequency (GHz)	Amplitude of vibration	Vibration direction	Vibrations Number	Lowest frequency (GHz)	Highest frequency (GHz)	Limit	Result
78.91	3	Up and down	500	77.238682	80.934105	77.0-81.0GHz	Pass
	3	Left and right	500	77.237181	80.934105		Pass
	3	Front and rear	500	77.237181	80.934105		Pass
	1	Up and down	500	77.237181	80.934105		Pass
	1	Left and right	500	77.237181	80.934105		Pass
	1	Front and rear	500	77.237181	80.934105		Pass
	1	Up and down	1800	77.237181	80.934105		Pass
	1	Left and right	1800	77.237181	80.937106		Pass
	1	Front and rear	1800	77.237181	80.934105		Pass

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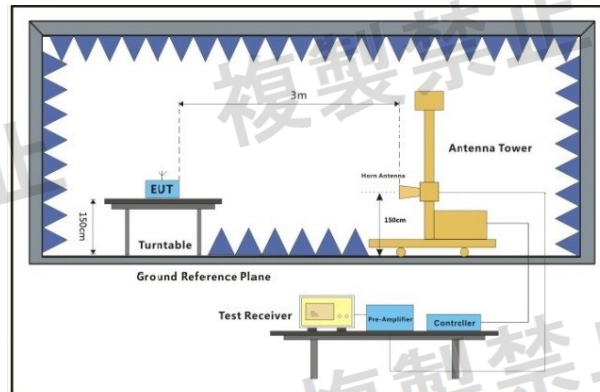
5.6 Occupied Bandwidth (99%)

Test Requirement: Item 8 of Article 2-1

Text Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1) Test Conditions:

Spectrum Analyzer Occupied BW is used for measurement.

2) EUT conditions:

FMCW Tx

3) Spectrum Analyzer conditions:

Frequency: Test Frequency

Span: OBW×2

RBW: 1MHz

VBW: 3MHz

Sweep Time: Auto

Detector mode: Positive Peak

Sweep mode: Max Hold

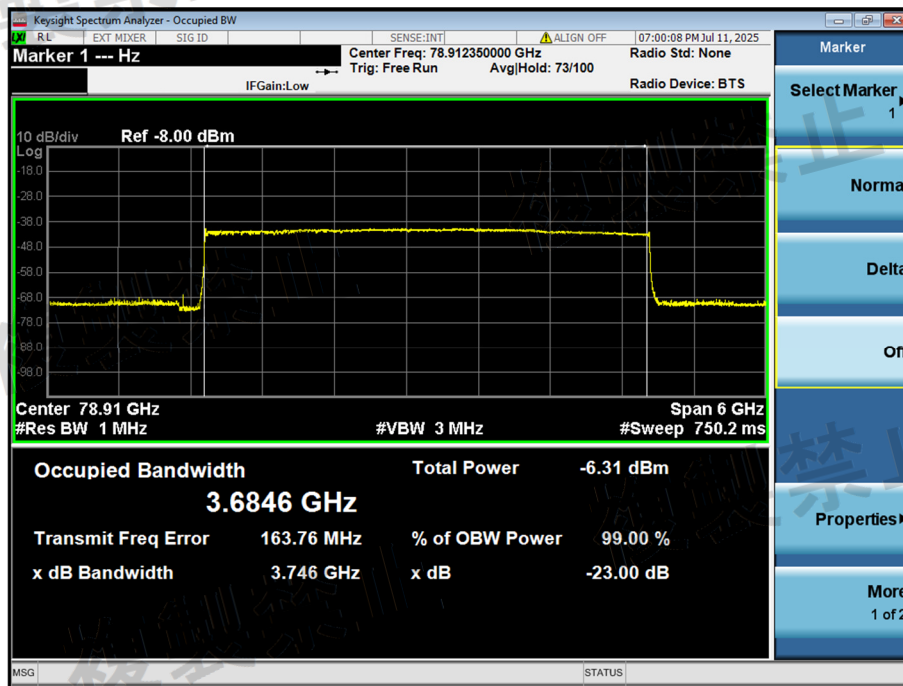
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Test Data:

Test Frequency (GHz)	OBW(GHz)	Limit	Result
78.91	3.6846	4GHz	Pass

Test plots as below:



5.7 Antenna Power

Test Requirement: Item 8 of Article 2-1

0.01W or less
When OBW is 2GHz or less,
:5uW/MHz or less(Average)

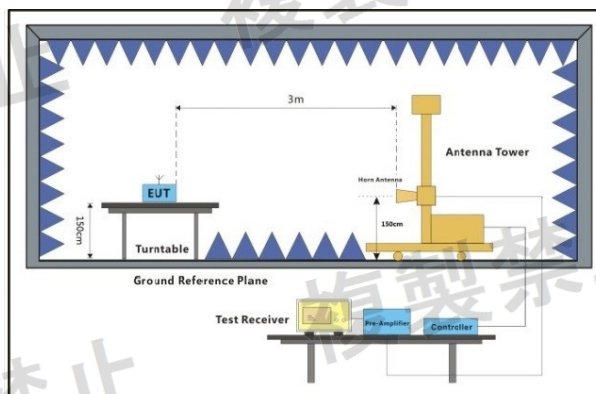
Text Method: MIC notification.No.88 of 2004,Annex 22-14

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Status:

Following channel(s) was (were) selected for the final test as listed below.

Test Configuration:



Test Procedure:

1) Test Conditions:

Spectrum Analyzer is used for measurement.

2) EUT conditions:

FMCW Tx

3) Spectrum Analyzer conditions:

Searching the frequency the frequency that gives maximum antenna power

Frequency: Test Frequency

Measure the Peak power of the transmitter.



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SGS-CSTC Standards Technical Services Co., Ltd
Shenzhen Branch Testing Center EEC Laboratory.

Member of the SGS Group (SGS SA)

Test Data:



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Voltage (V)	Frequency (GHz)	Antenna Power (dBm)	Antenna Power (mW)	EIRP (dBm)	Read Level (dBm)	Air Loss (dB)	Cable Loss (dB)	Antenna Gain (dBi)	Power Limit (mW)	Power Tolerance %	Regulation %	Result
9	78.91	2.192	1.6565	10.992	-36.078	44.37	2.7	8.8	10	-17.18	+50~-70	PASS
12	78.91	2.156	1.6429	10.956	-36.114	44.37	2.7	8.8	10	-17.86	+50~-70	PASS
16	78.91	2.031	1.5962	10.831	-36.239	44.37	2.7	8.8	10	-20.19	+50~-70	PASS

1 EIRP (dBm) = Read Level (dBm) + Air Loss (dB) + Cable Loss (dB)

Antenna Power (dBm) = EIRP (dBm) - EUT Antenna Gain (dBi), EUT Antenna Gain = 8.8dBi

2 Air Loss (dB) = 32.44 + 20×Log(f) + 20×Log(d)

3 Normal antenna power: 2mW

Where,

f is carrier frequency (in MHz)

d is distance between transmitter and receiver (in Km)



5.8 Unwanted Emission Strength

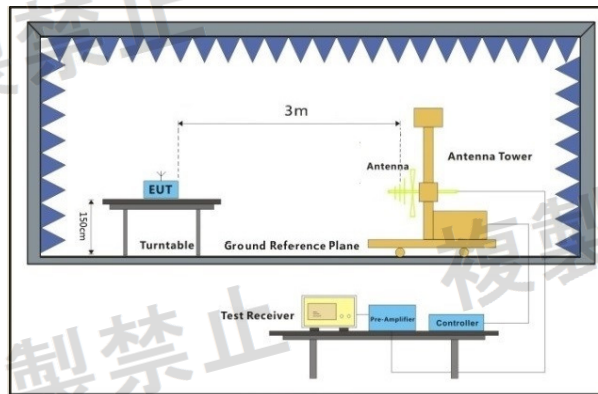
Item 8 of Article 2-1

Test Requirement: Unwanted Emission Strength, Outband area: 100uW/MHz or less
Unwanted Emission Strength, Spurious area: 50uW/MHz or less

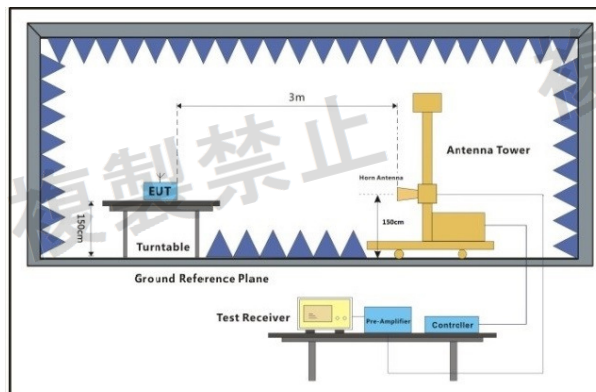
Text Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Following channel(s) was (were) selected for the final test as listed below.

Test Configuration: **For radiated emissions from 30MHz to 1GHz**



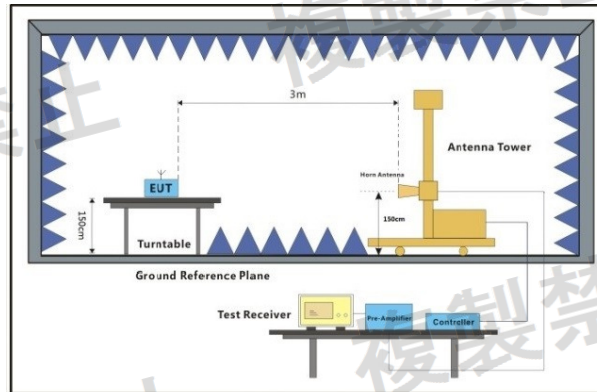
For radiated emissions from 1GHz to 18GHz



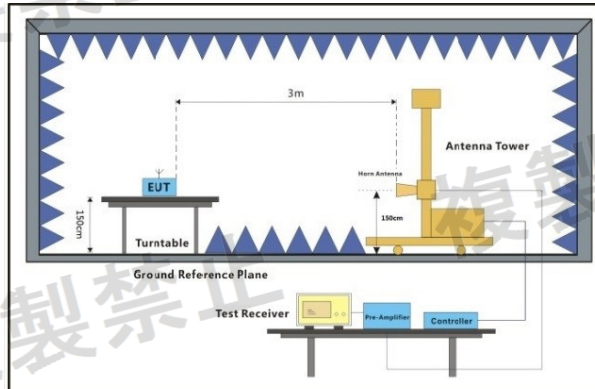
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For radiated emissions from 18GHz to 40GHz



For radiated emissions from 40GHz to 140GHz



Test Procedure:

- 1) Test Conditions:
Spectrum Analyzer is used for measurement.
- 2) EUT conditions:
FMCW Tx
- 3) Spectrum Analyzer conditions:
Measurement range is as follows.
except 77GHz-81GHz

Outband area:

100 μ W/MHz (72.5-77GHz, 81-85.5GHz)

Spurious area: 50 μ W/MHz (30MHz-72.5GHz, 85.5-110GHz)

Test setup for Step 1:

Frequency: 30MHz-1GHz , 1GHz-140GHz

RBW 100 kHz (30MHz-1GHz) , 1 MHz (over 1GHz)

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VBW 100 kHz (30MHz–1GHz) , 3 MHz (over 1GHz)

Sweep Time Auto

Detector mode Positive peak

Indication mode Max hold

Test setup for Step 2:

Frequency: Spurious Frequency

Span 0Hz

RBW 1 MHz

VBW 3 MHz

Detector mode: Positive Peak

Indication mode Max hold

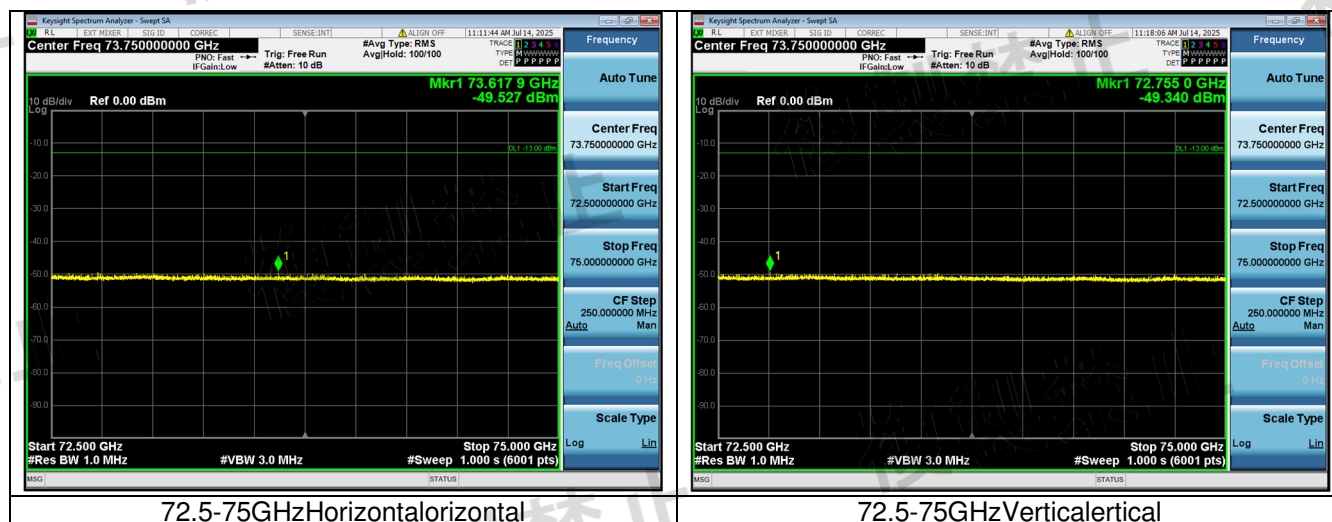


Test Data:

Out of band emission

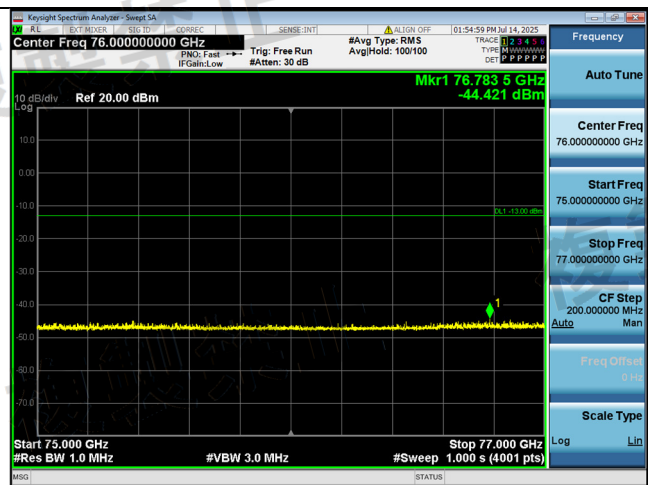
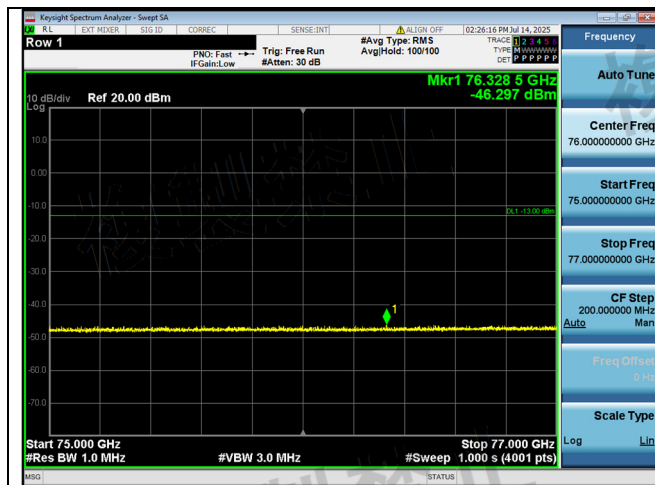
Frequency range (GHz)	Freq (GHz)	Level (dBm/MHz)	Limit (100uW/MHz) dBm/MHz	Over Limit (dB)	Result
72.5-75	73.6179	-49.527	-10	-39.527	Pass
72.5-75	72.7550	-49.340	-10	-39.340	Pass
75-77	76.3825	-46.297	-10	-36.297	Pass
75-77	76.7835	-44.210	-10	-34.210	Pass
81-85.5	81.4830	-41.708	-10	-34.393	Pass
81-85.5	81.0445	-42.195	-10	-34.421	Pass

Note: The measurement just show the test results, expressed in dBm units, which has the same meaning as uW/MHz.

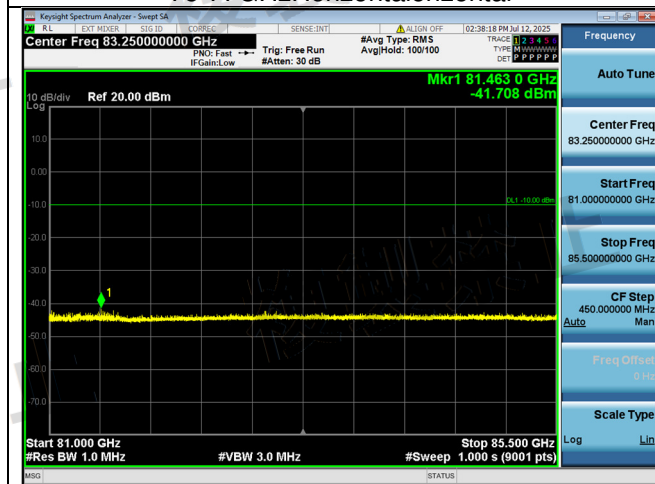


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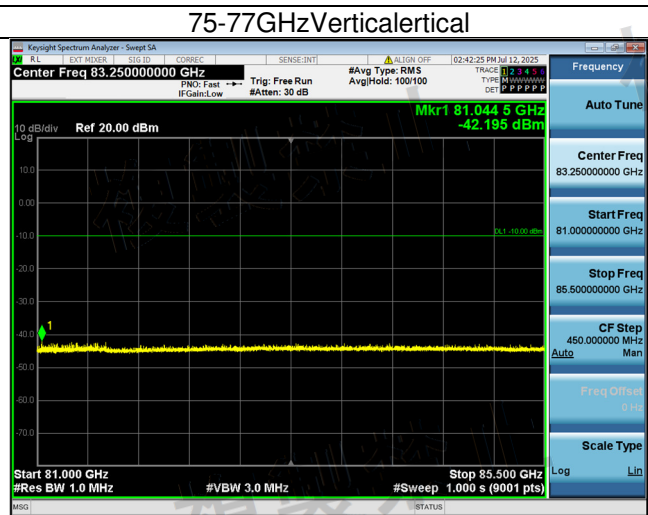
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75-77GHzHorizontal



81-85.5GHz- Horizontal



81-85.5GHz- Vertical

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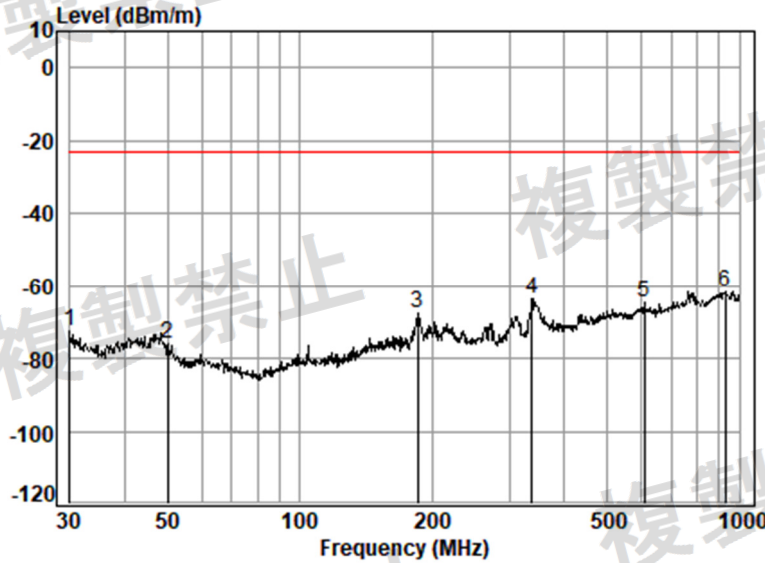
5.9 Spurious Emission

Frequency range (GHz)	Level (dBm/MHz)	Limit (50uW/MHz) dBm/MHz	Result
0.03-1	-51.19	-13	Pass
1-18	-37.15	-13	Pass
18-40	-25.89	-13	Pass
40-60	-44.812	-13	Pass
60-72.5	-36.605	-13	Pass
85.5-110	-43.222	-13	Pass
110-140	-53.172	-13	Pass

Note: The measurement just show the test results, expressed in dBm units, which has the same meaning as uW/MHz.



Test Result
30MHz--1GHz
Horizontal



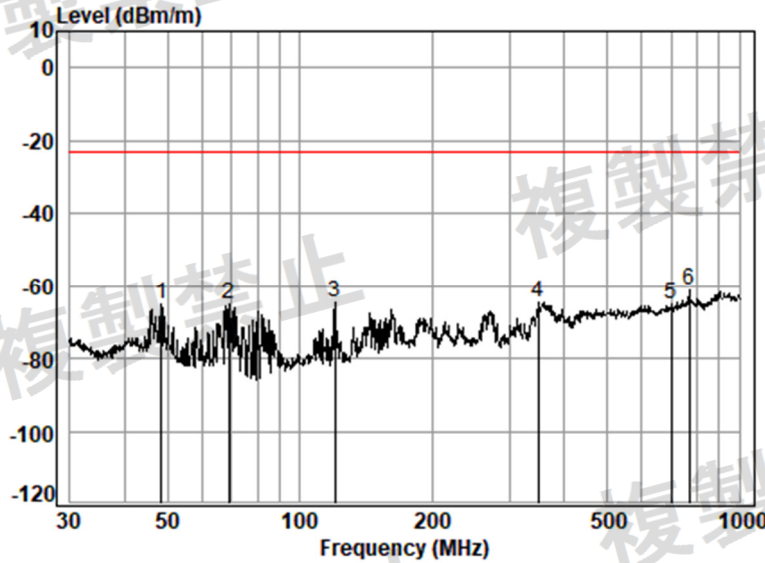
Test Site: 3M-chamber HORIZONTAL
Job No.: 02952AU
Test mode: TX RSE

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	30.00	-72.67	-23.00	-49.67
2	50.06	-76.12	-23.00	-53.12
3	185.79	-67.83	-23.00	-44.83
4	337.22	-63.52	-23.00	-40.52
5	607.79	-64.62	-23.00	-41.62
6	929.01	-61.78	-23.00	-38.78

Remark: RBW=100 kHz; VBW=100 kHz ; Detector mode: Positive Peak



Vertical



Test Site: 3M-chamber
Job No.: 02952AU
Test mode: TX RSE

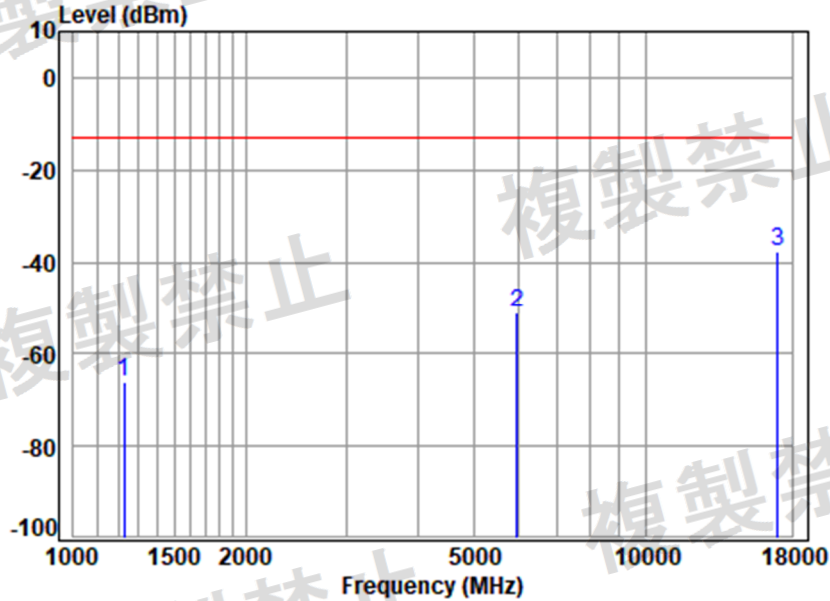
Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	48.50	-64.94	-23.00	-41.94
2	68.87	-65.14	-23.00	-42.14
3	120.28	-64.54	-23.00	-41.54
4	349.25	-64.85	-23.00	-41.85
5	699.30	-65.27	-23.00	-42.27
6	768.75	-61.19	-23.00	-38.19

Remark: RBW=100 kHz; VBW=100 kHz ; Detector mode: Positive Peak



1-18GHz

Horizontal



Condition: 3m HORIZONTAL

Job No: 02952AU

Test mode: RSE TX

Note:

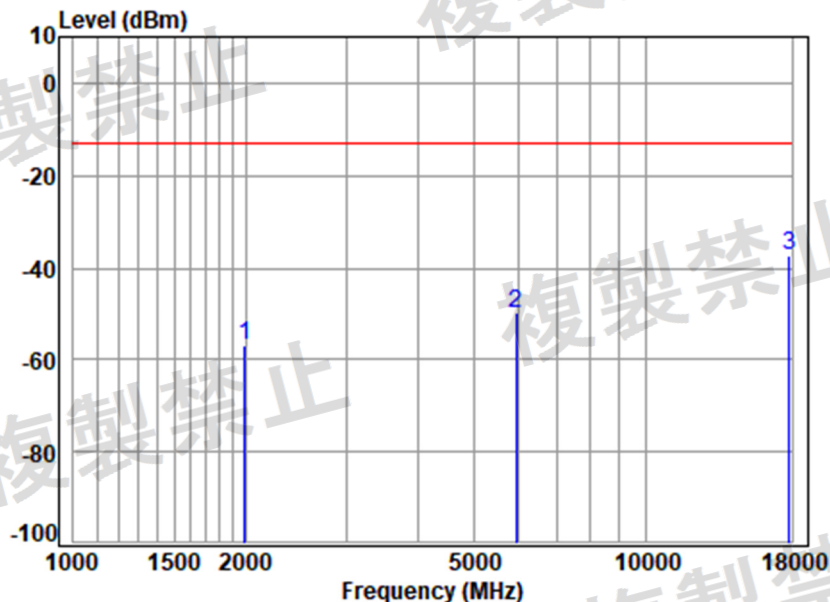
Note:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	1227.79	-66.01	-13.00	-53.01
2	5967.03	-51.02	-13.00	-38.02
3	17038.15	-37.67	-13.00	-24.67

Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak



Vertical



Condition: 3m VERTICAL

Job No: 02952AU

Test mode: RSE TX

Note:

Note:

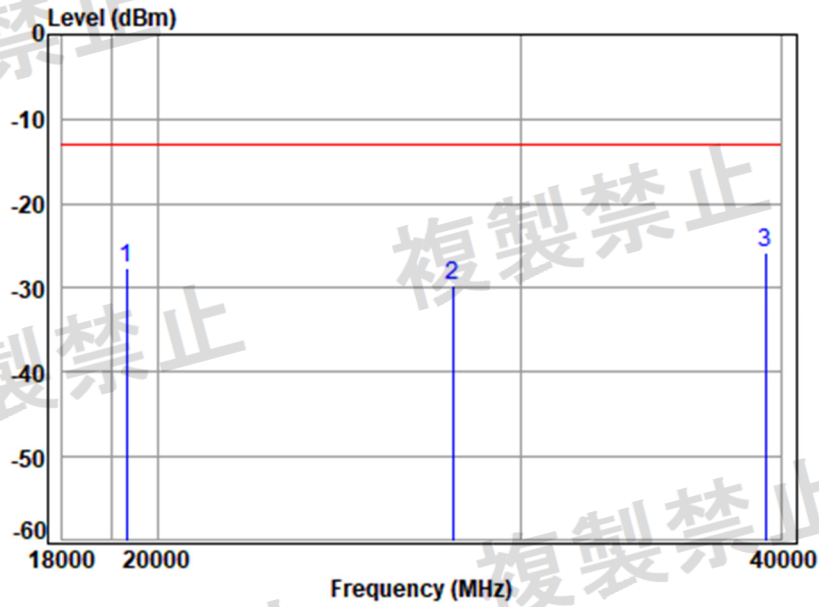
Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	1995.31	-56.97	-13.00	-43.97
2	5932.64	-50.00	-13.00	-37.00
3	17793.09	-37.15	-13.00	-24.15

Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak



18-40GHz

Horizontal



Condition: 3m HORIZONTAL

Job No: 02952AU

Test mode: RSE TX

Note:

Note:

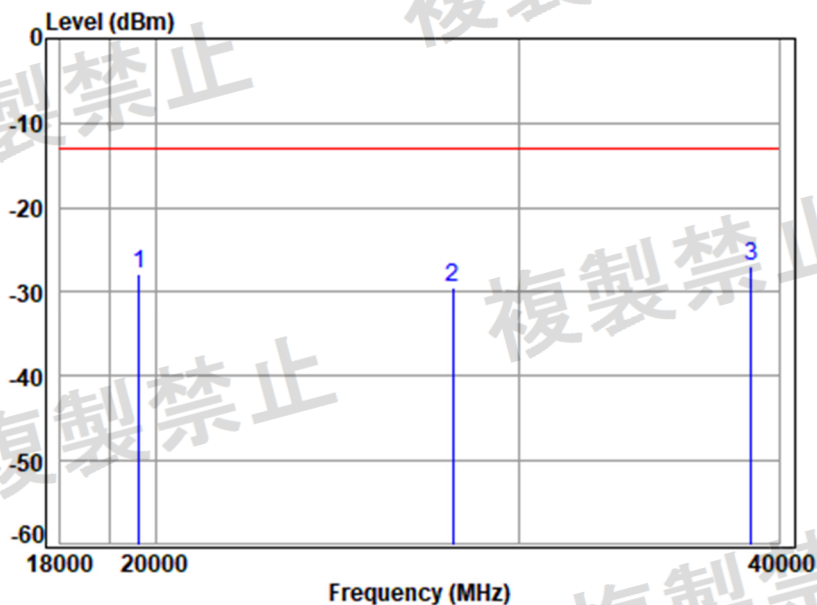
Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	19341.20	-27.70	-13.00	-14.70
2	27770.14	-29.56	-13.00	-16.56
3	39334.85	-25.89	-13.00	-12.89

Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak

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Vertical



Condition: 3m VERTICAL

Job No: 02952AU

Test mode: RSE TX

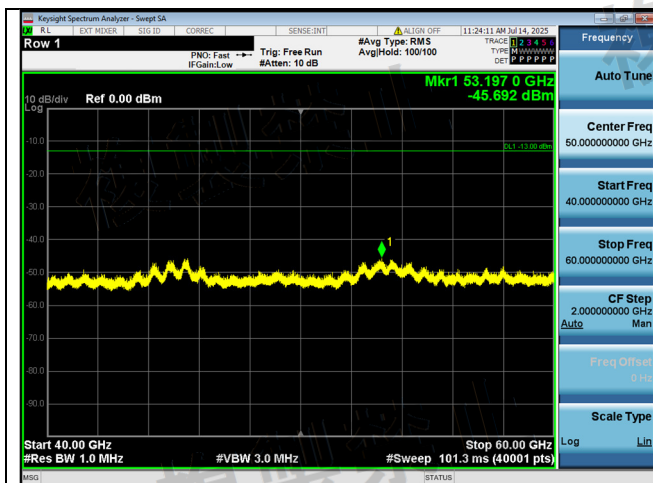
Note:

Note:

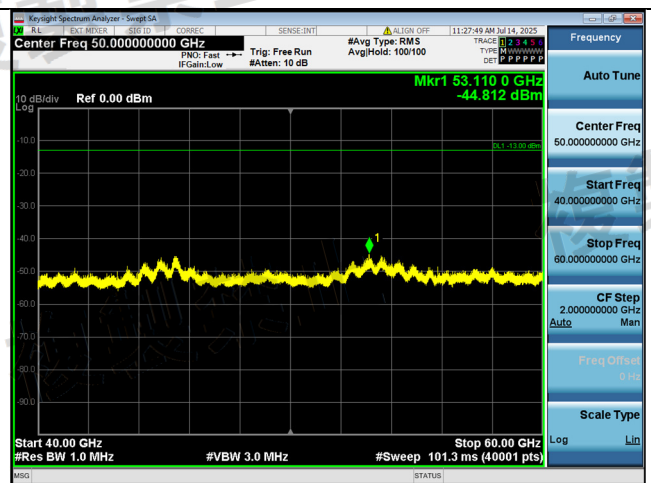
Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	19652.56	-27.92	-13.00	-14.92
2	27836.75	-29.42	-13.00	-16.42
3	38804.50	-27.01	-13.00	-14.01

Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak

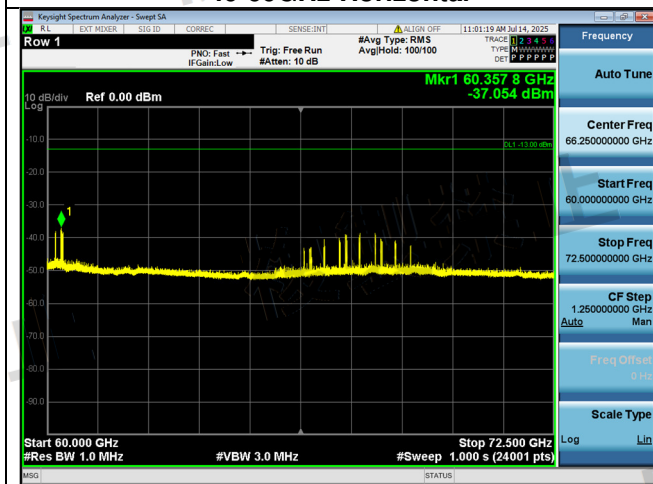




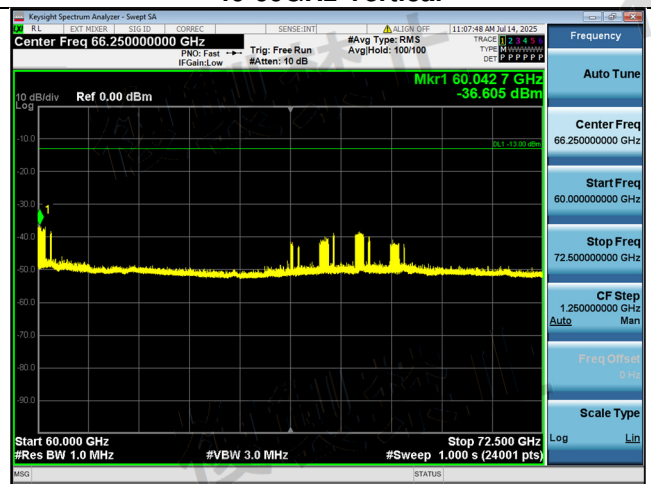
40-60GHz-Horizontal



40-60GHz-Vertical

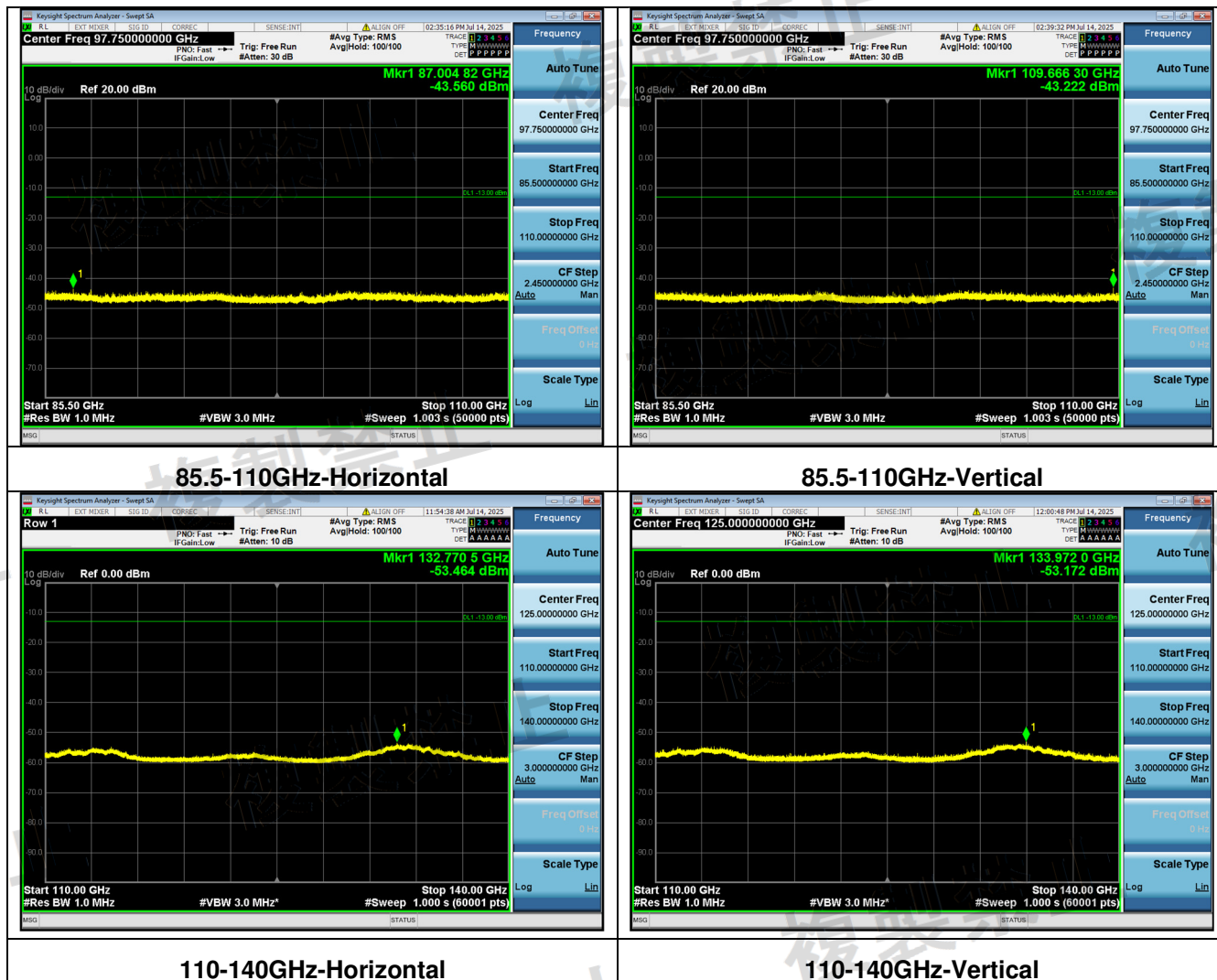


60-72.5GHz-Horizontal



60-72.5GHz-Vertical



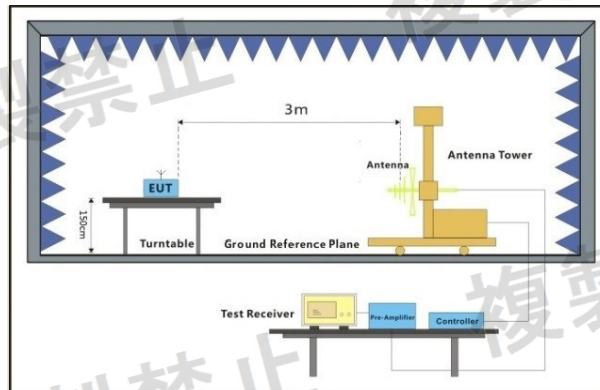


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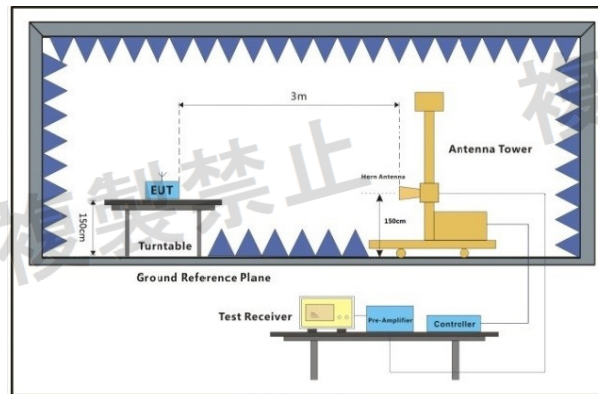
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5.10 Secondary Radiated Emission Strength

- Item 8 of Article 2-1
- Test Requirement: 100uW/MHz or less: (Outband area) (Peak)
50uW/MHz or less: (Spurious area) (Peak)
- Text Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407
- Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). Following channel(s) was (were) selected for the final test as listed below.
- Test Configuration: **For radiated emissions from 30MHz to 1GHz**



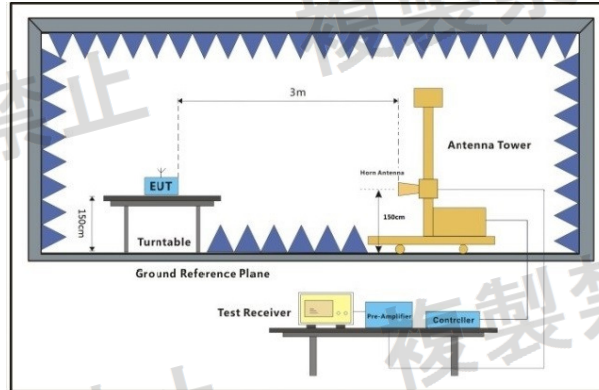
For radiated emissions from 1GHz to 18GHz



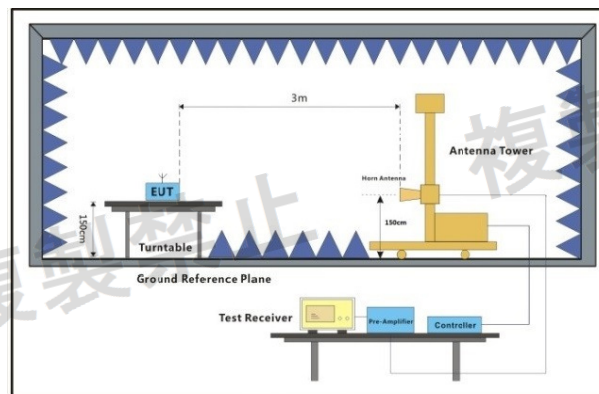
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For radiated emissions from 18GHz to 40GHz



For radiated emissions from 40GHz to 140GHz



Test Procedure:

1) Test Conditions:

Spectrum Analyzer is used for measurement.

2) EUT conditions:

FMCW Rx

3) Spectrum Analyzer conditions:

Measurement range is as follows.
except 77GHz-81GHz

Outband area:

100 μ W/MHz (72.5-77GHz, 81-85.5GHz)

Spurious area: 50 μ W/MHz (30MHz-72.5GHz, 85.5-110GHz)

Test setup for Step 1:

Frequency: 30MHz – 1GHz , 1GHz –140GHz

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RBW 100 kHz (30MHz – 1GHz) , 1 MHz (over 1GHz)

VBW 100 kHz (30MHz – 1GHz) , 3 MHz (over 1GHz)

Sweep Time Auto

detector mode Positive peak

Indication mode Max hold

Test setup for Step 2:

Frequency: Spurious Frequency

Span 0Hz

RBW 1 MHz

VBW 3 MHz

Detector mode: Positive Peak

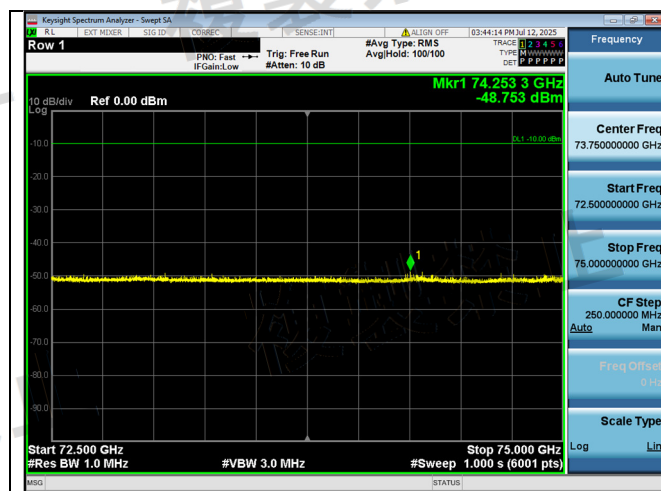
Indication mode Max hold



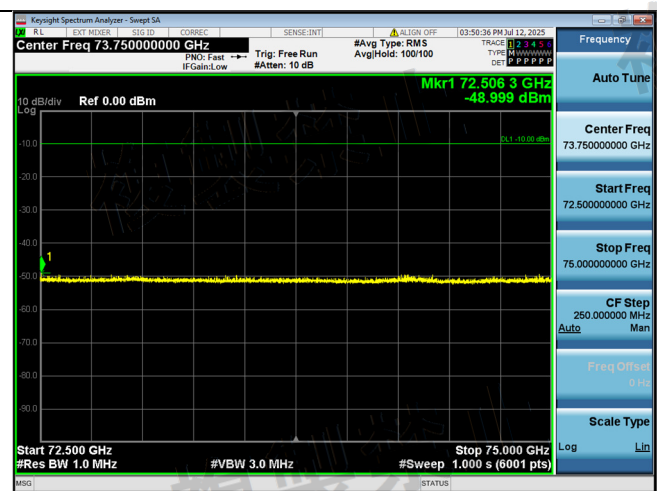
Test Data:

Out of band emission

Frequency range (GHz)	Freq (GHz)	Level (dBm/MHz)	Limit (100uW/MHz) dBm/MHz	Over Limit (dB)	Result
72.5-75	74.2533	-48.753	-10	-38.753	Pass
72.5-75	72.5063	-48.999	-10	-38.999	Pass
75-77	76.8445	-43.547	-10	-33.547	Pass
75-77	76.16267	-43.722	-10	-33.722	Pass
81-85.5	81.4745	-41.941	-10	-31.941	Pass
81-85.5	81.2660	-41.902	-10	-31.902	Pass



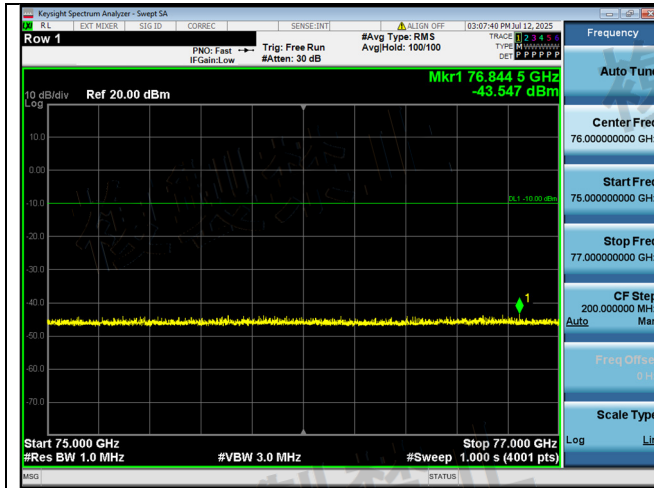
72.5-75GHz Horizontal



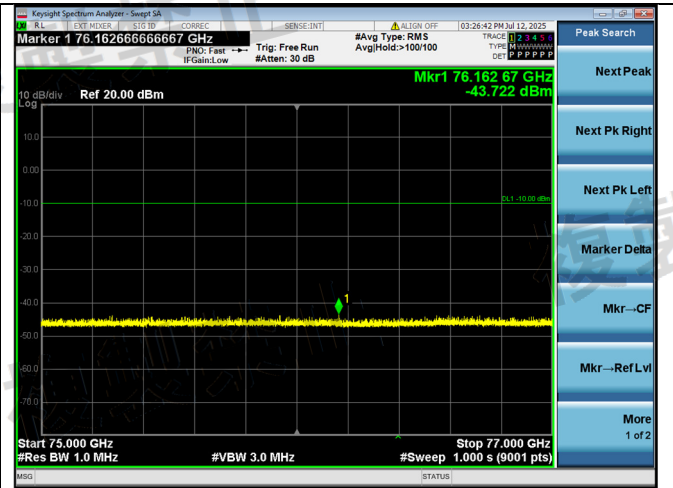
72.5-75GHz Vertical

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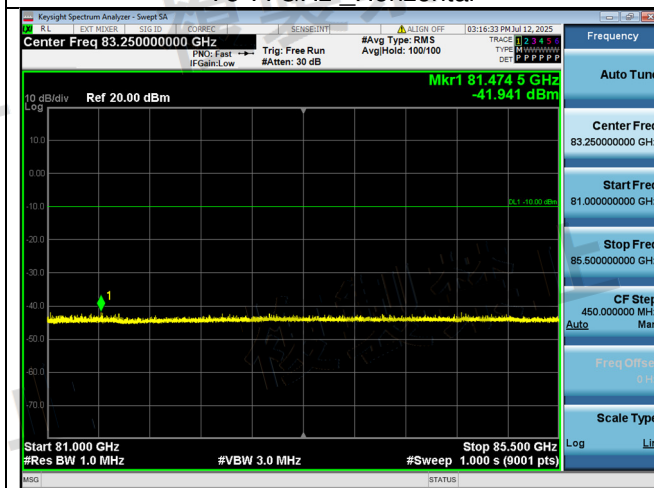
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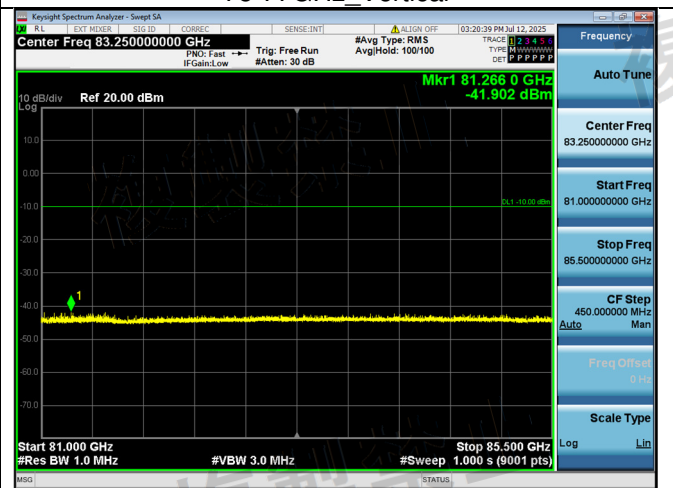
75-77GHz_Horizontal



75-77GHz_Vertical



81-85.5GHz- Horizontal



81-85.5GHz- Vertical



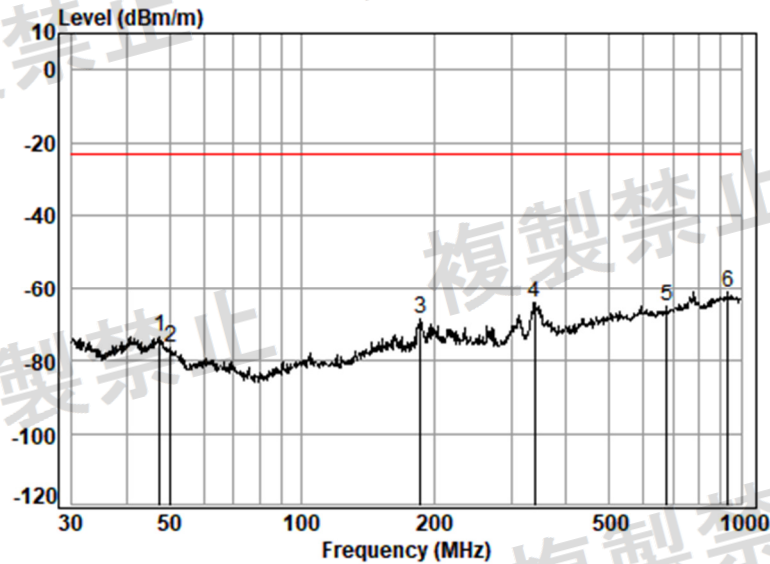
5.11 Spurious Emission

Frequency range (GHz)	Level (dBm/MHz)	Limit (50uW/MHz) dBm/MHz	Result
0.03-1	-51.19	-13	Pass
1-18	-37.18	-13	Pass
18-40	-28.34	-13	Pass
40-60	-42.538	-13	Pass
60-72.5	-36.673	-13	Pass
85.5-110	-50.038	-13	Pass
110-140	-43.552	-13	Pass

Note: The measurement just show the test results, expressed in dBm units, which has the same meaning as uW/MHz



Test Result
30MHz-GHz:

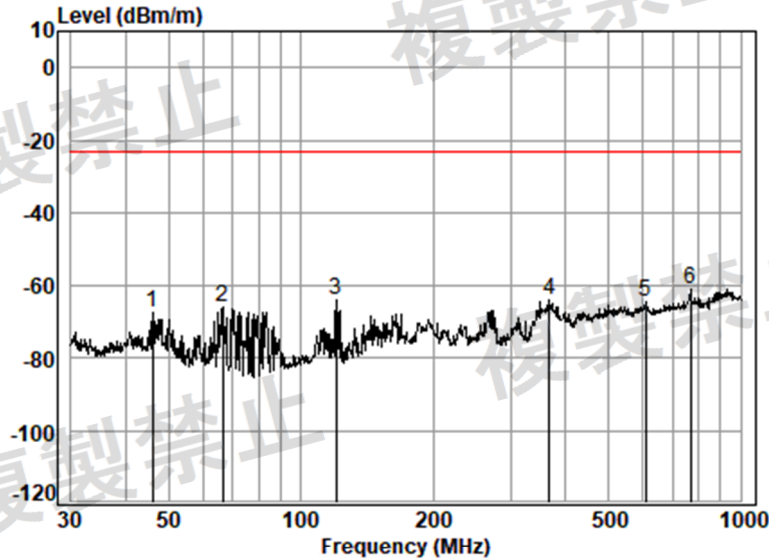


Test Site: 3M-chamber HORIZONTAL
Job No.: 02952AU
Test mode: RX RSE

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	47.49	-73.43	-23.00	-50.43
2	50.23	-76.34	-23.00	-53.34
3	186.44	-68.36	-23.00	-45.36
4	339.59	-64.00	-23.00	-41.00
5	677.58	-65.03	-23.00	-42.03
6	932.27	-61.19	-23.00	-38.19

Remark: RBW=100 kHz; VBW=100 kHz ; Detector mode: Positive Peak





Test Site: 3M-chamber VERTICAL
Job No.: 02952AU
Test mode: RX RSE

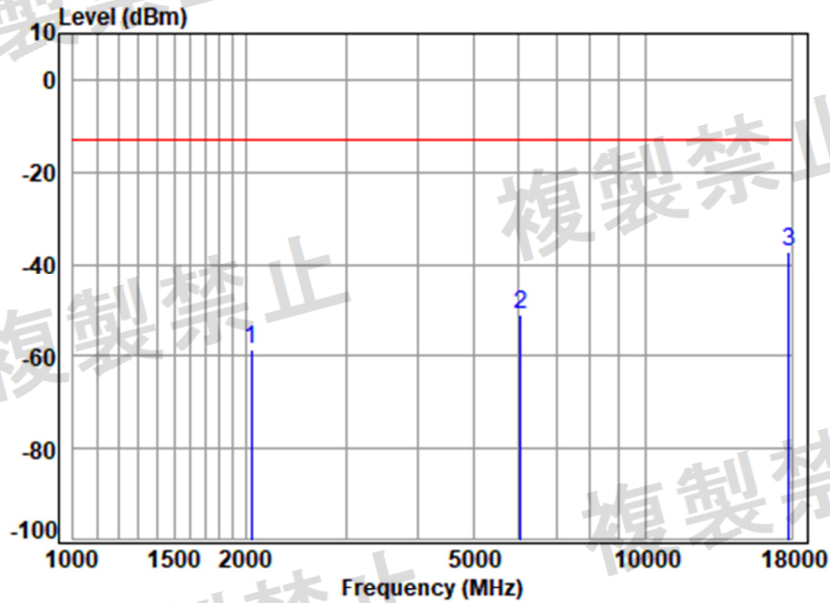
Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	46.02	-67.74	-23.00	-44.74
2	66.27	-66.09	-23.00	-43.09
3	120.28	-64.37	-23.00	-41.37
4	366.82	-64.39	-23.00	-41.39
5	607.79	-64.42	-23.00	-41.42
6	768.75	-61.28	-23.00	-38.28

Remark: RBW=100 kHz; VBW=100 kHz ; Detector mode: Positive Peak



1-18GHz

Horizontal



Condition: 3m HORIZONTAL

Job No: 02952AU

Test mode: RSE RX

Note:

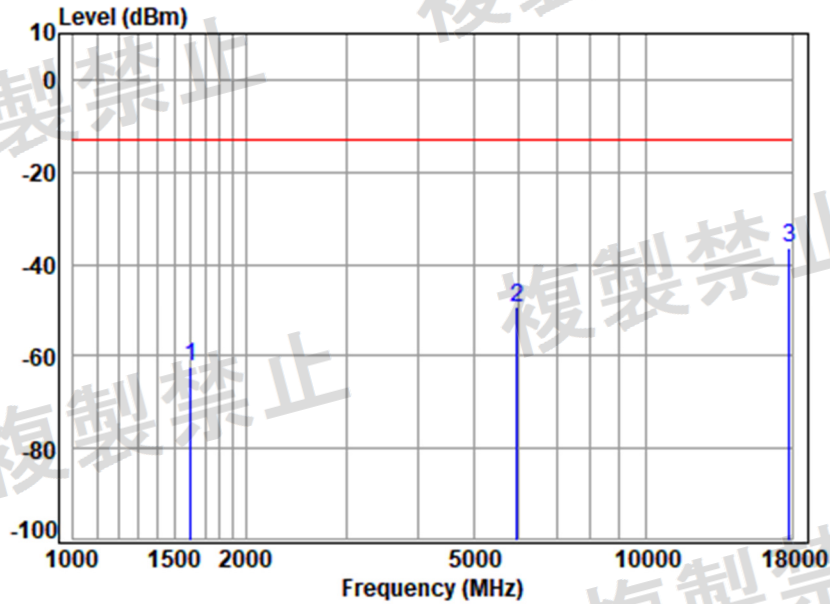
Note:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	2047.90	-58.48	-13.00	-45.48
2	6053.89	-50.90	-13.00	-37.90
3	17793.09	-37.18	-13.00	-24.18

Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak



Vertical



Condition: 3m VERTICAL

Job No: 02952AU

Test mode: RSE RX

Note:

Note:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	1601.80	-62.38	-13.00	-49.38
2	5967.03	-49.30	-13.00	-36.30
3	17844.59	-36.63	-13.00	-23.63

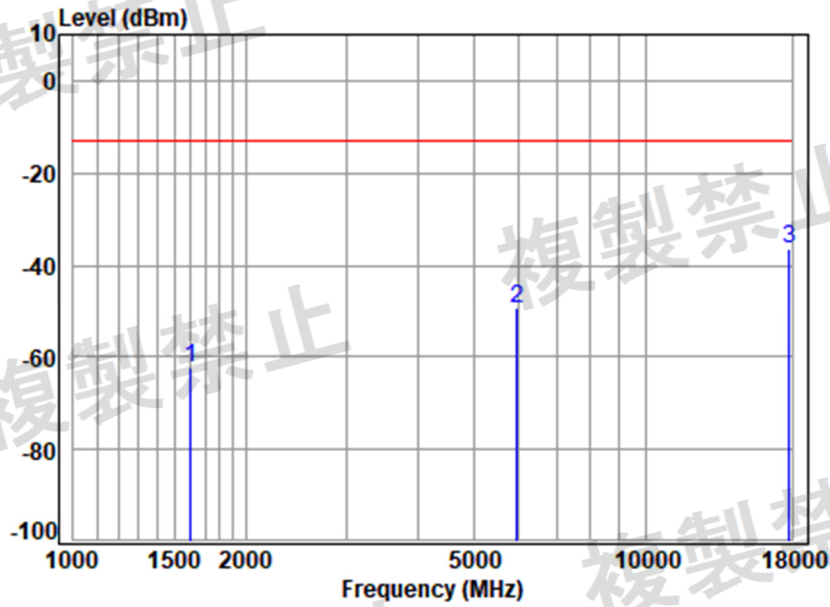
Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak

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18-40GHz

Horizontal



Condition: 3m VERTICAL

Job No: 02952AU

Test mode: RSE RX

Note:

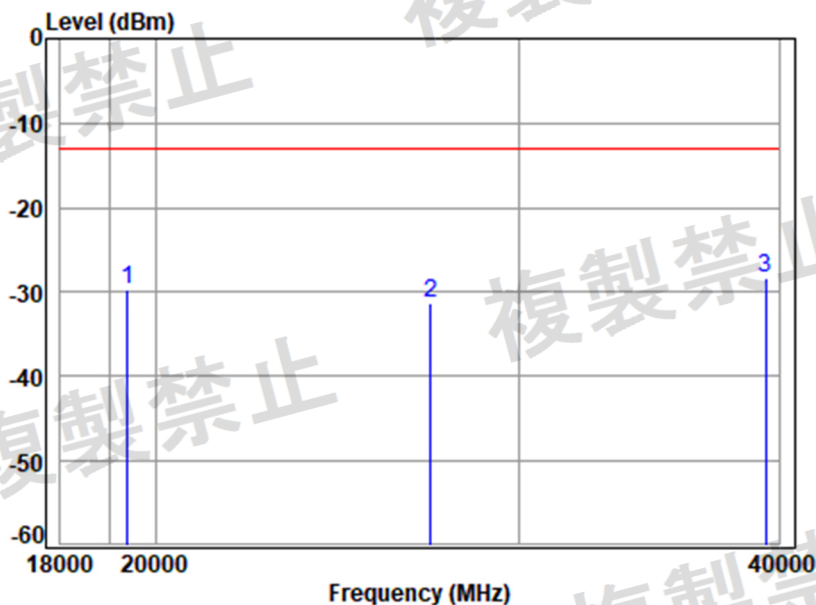
Note:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	1601.80	-62.38	-13.00	-49.38
2	5967.03	-49.30	-13.00	-36.30
3	17844.59	-36.63	-13.00	-23.63

Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak



Vertical



Condition: 3m VERTICAL

Job No: 02952AU

Test mode: RSE RX

Note:

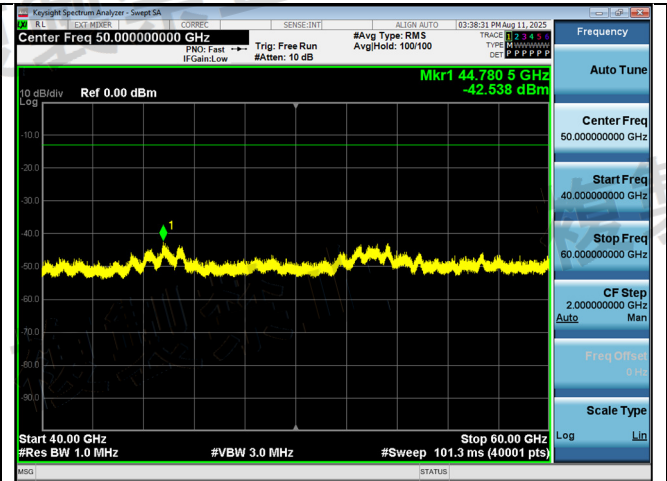
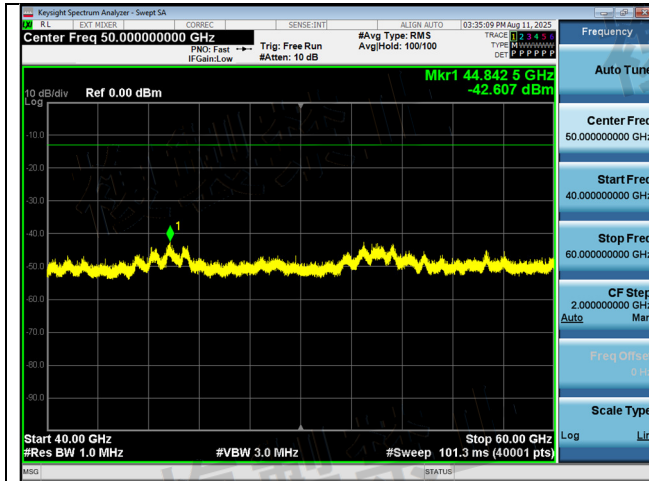
Note:

Marker	Freq. MHz	Level dBm	Limit dBm	Over Limit dB
1	19387.59	-29.56	-13.00	-16.56
2	27156.14	-31.20	-13.00	-18.20
3	39429.19	-28.34	-13.00	-15.34

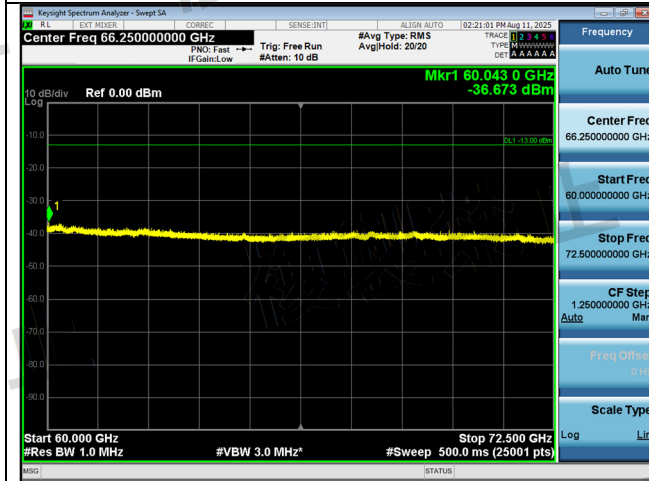
Remark: RBW=1MHz; VBW=3MHz; Detector mode: Positive Peak

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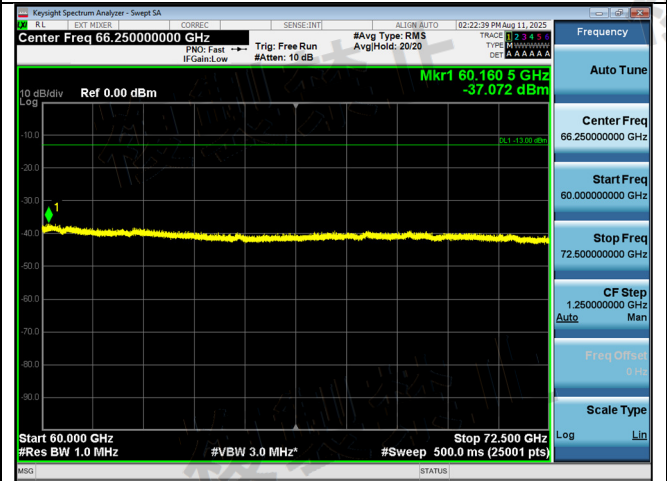
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40-60GHz-Horizontal



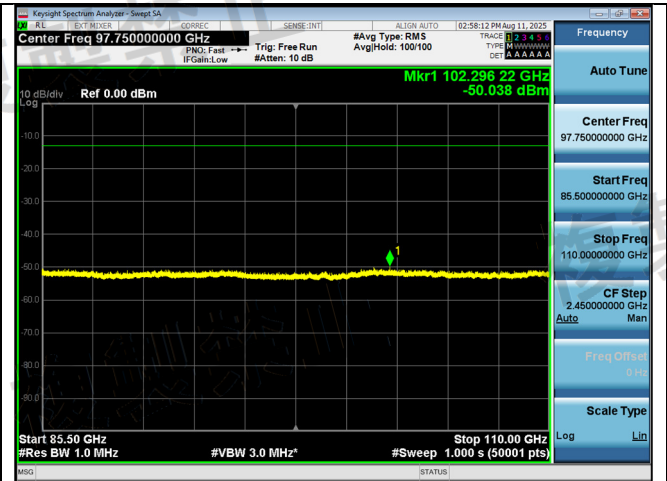
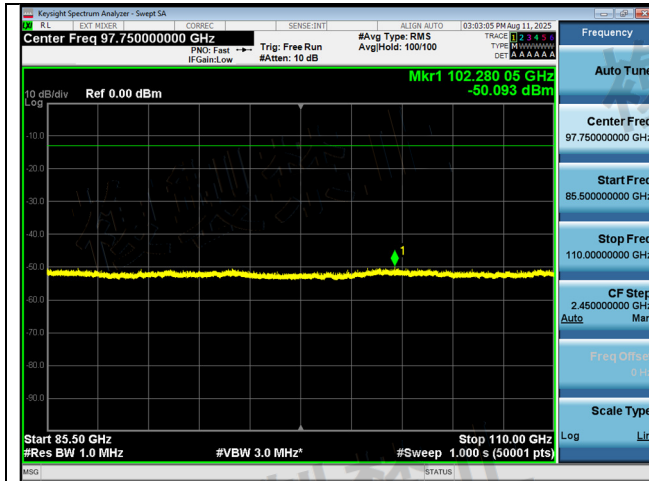
40-60GHz-Vertical



60-72.5GHz-Horizontal

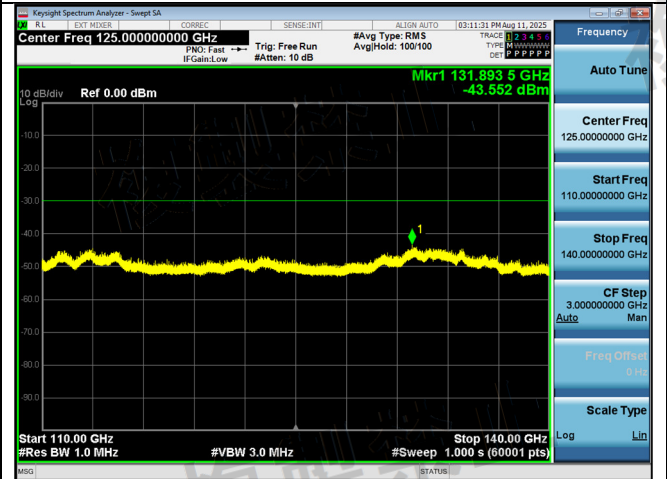
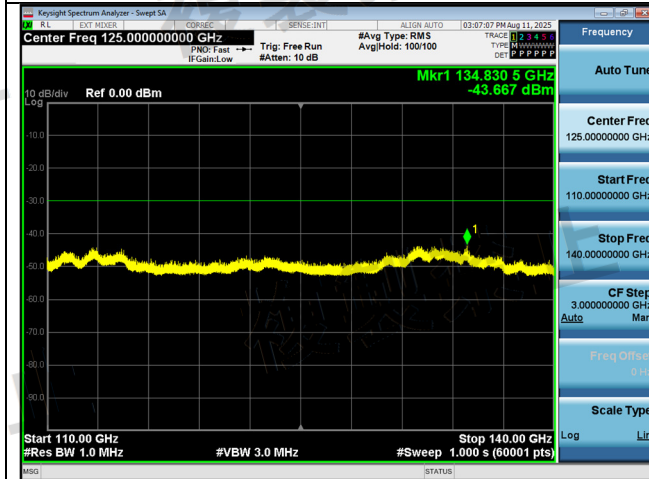
60-72.5GHz-Vertical





85.5-110GHz-Horizontal

85.5-110GHz-Vertical



110-140GHz-Horizontal

110-140GHz-Vertical



6 Radion waves exposed to the human

Test Requirement: Item 8 of Article 2-1

Text Method: MIC notification.No.88 of 2004, Annex 22-14
TELEC-T319,T407
2mW/cm² or less

6.1.1 Calculation Formula

$$P_d = (P_{out} * G) / 4\pi R^2$$

Where:

P_d = Power density in mW/cm²

P_{out} = Output power to antenna in mW

G = Antenna Gain in linear scale

π = 3.14

R = distance to the center of radiation of antenna (in meter) = 20cm

NOTE: P_d limit = 2mW/cm².

6.1.2 Test Results

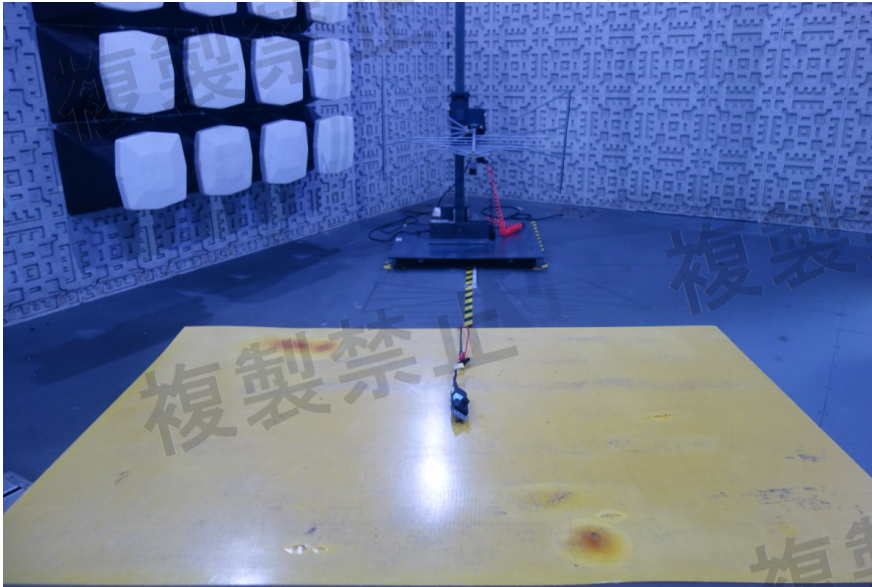
Max. Conducted Power P (mW)	Gain in Linear Scale G	Operation Distance R (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
1.656	7.586	0.5	0.00250	2	Pass

Which is below the max permitted sending level of 2mw/m².



7 Test Setup Photo

Radiated Spurious Emission



1GHz-18GHz



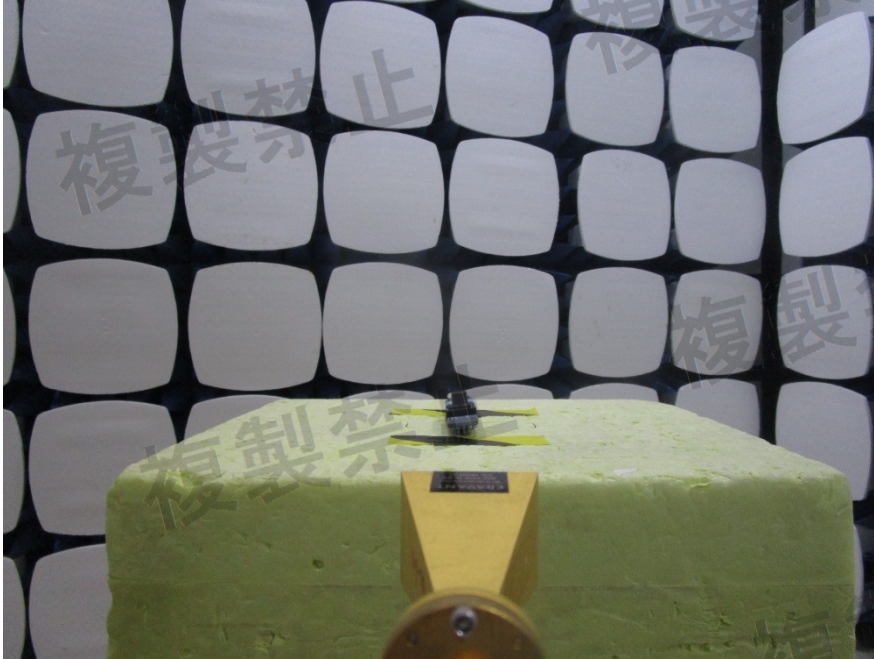
18GHz-40GHz



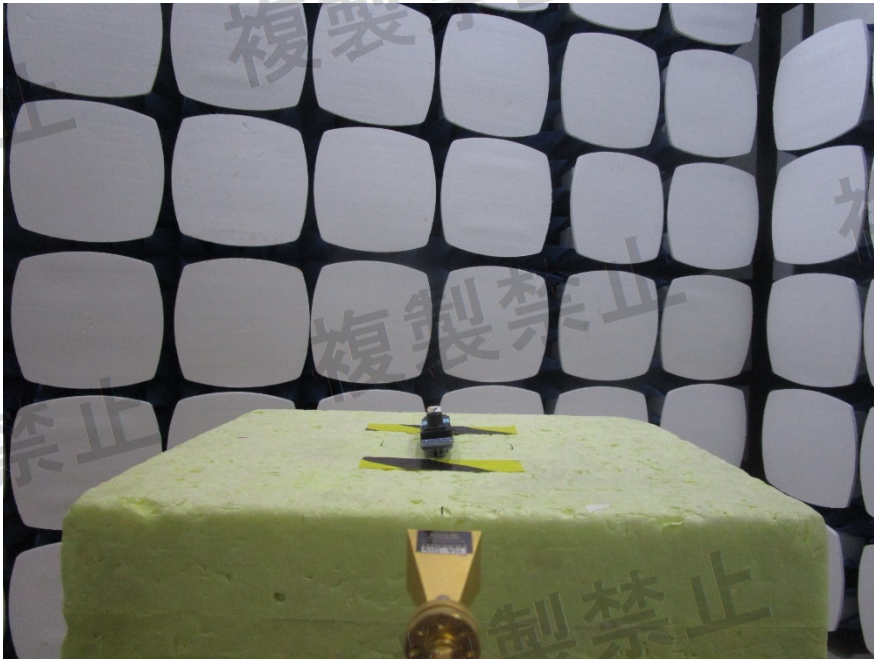
40GHz-60GHz



60GHz-75GHz



75GHz-110GHz



110GHz-140GHz



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch Testing & Calibration Laboratory

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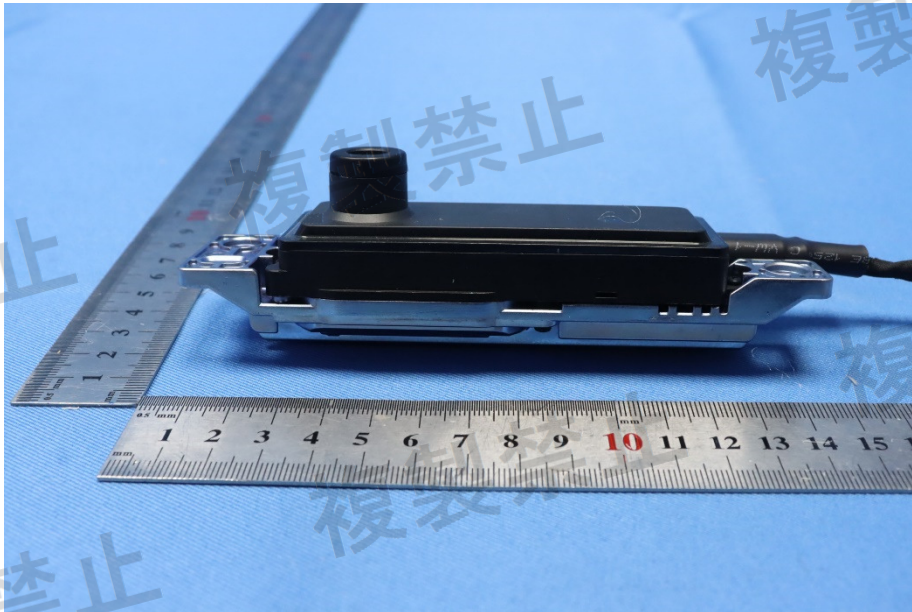
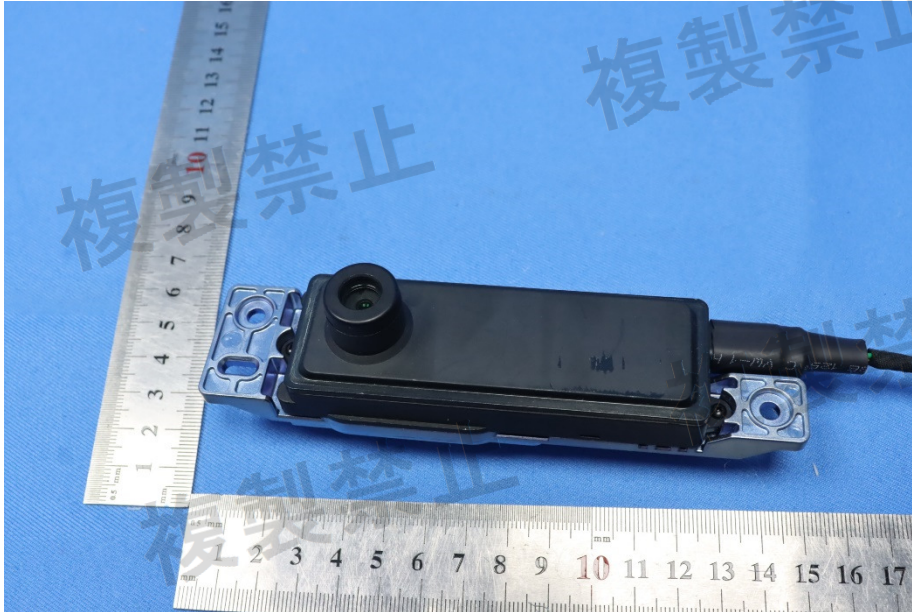
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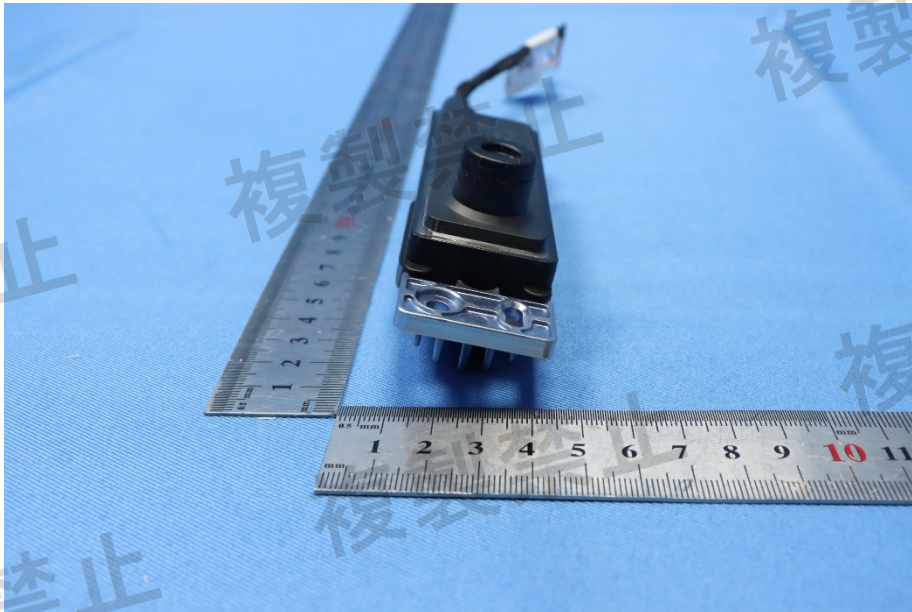
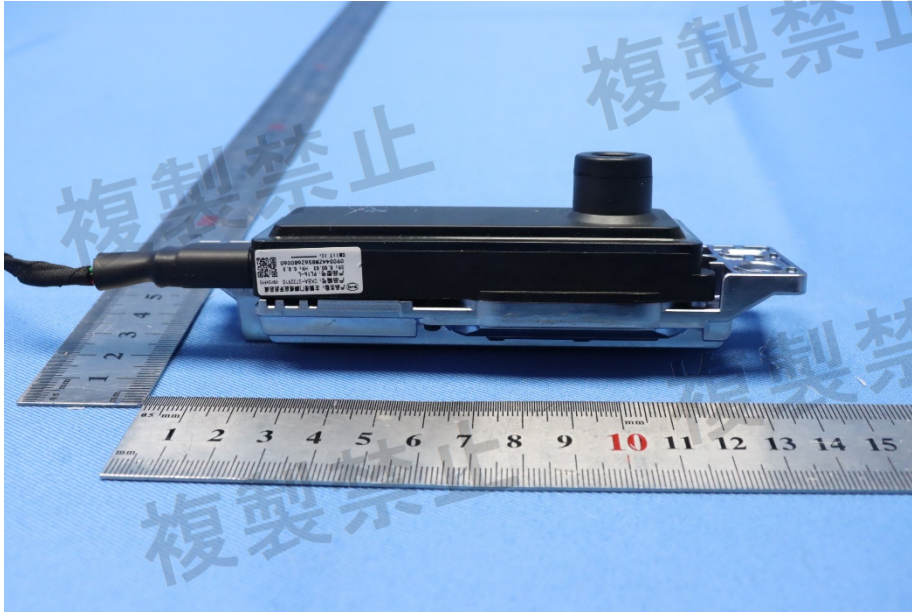
No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.ssgroup.com.cn
中国·广东·深圳市南山区科技园中区M-10栋1号厂房 邮编: 518057 t (86-755) 26012053 f (86-755) 26710594 sgs.china@sgs.com

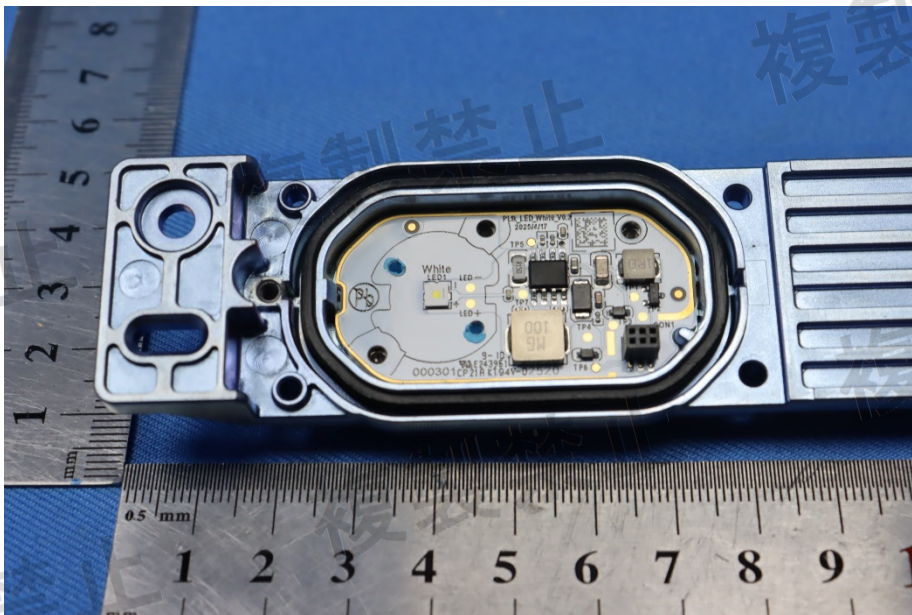
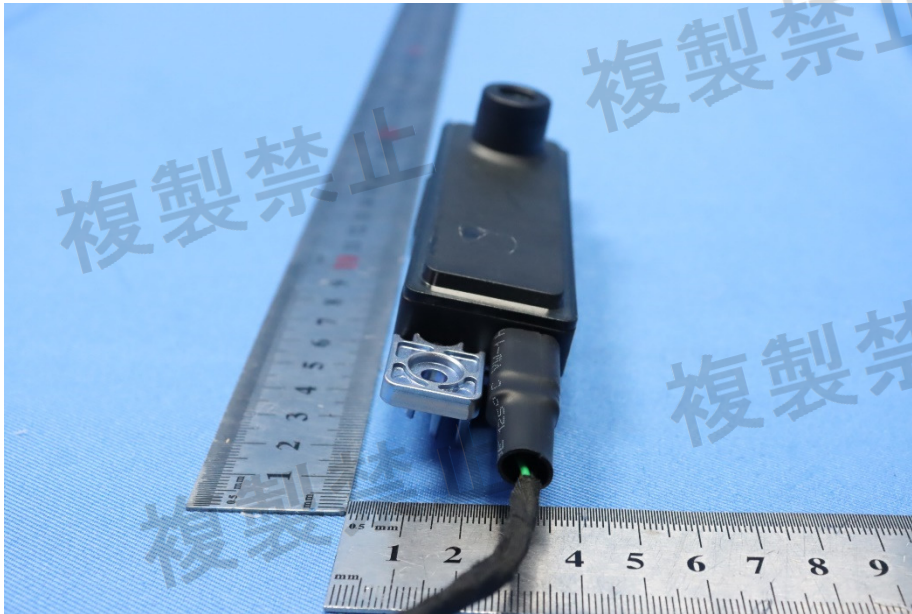
8 EUT Constructional Details (EUT Photos)





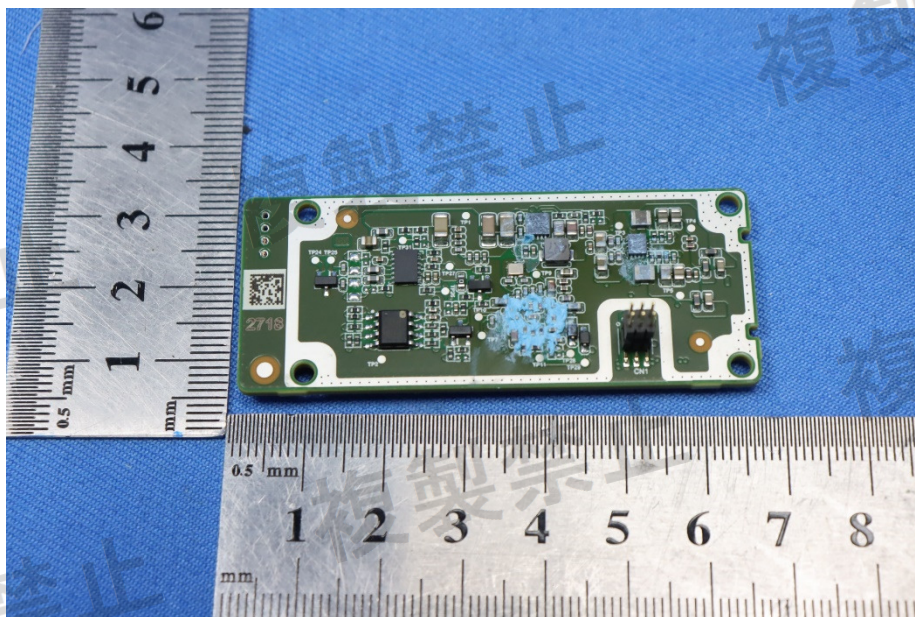
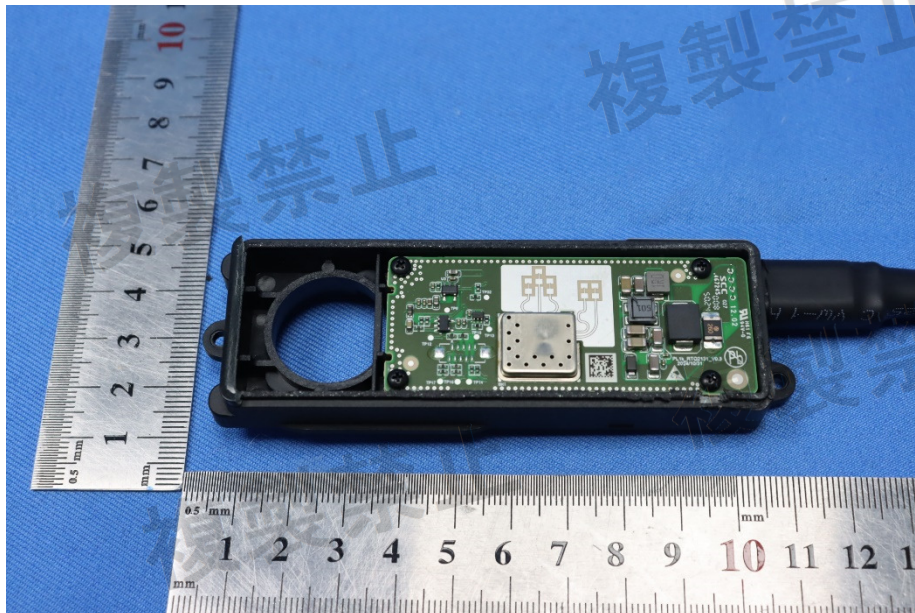


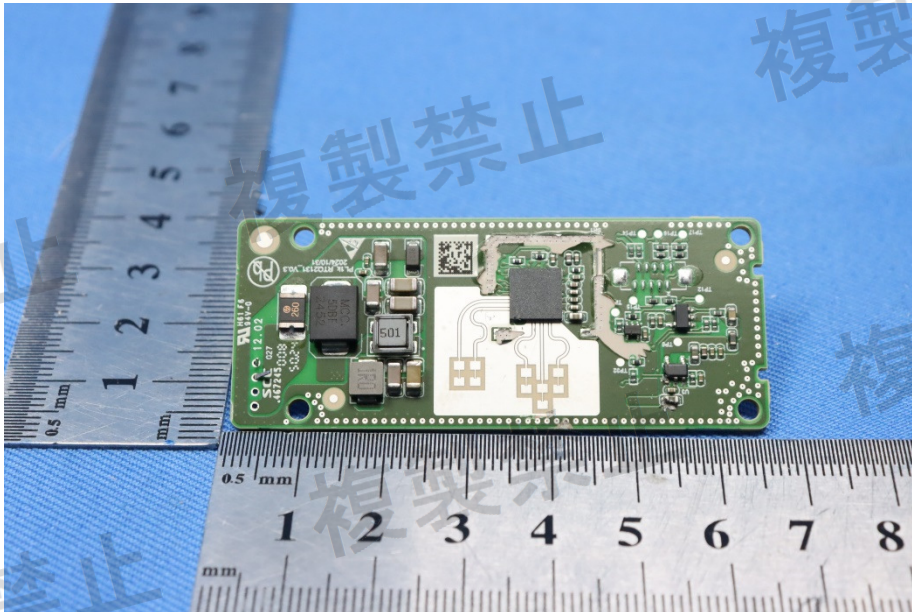
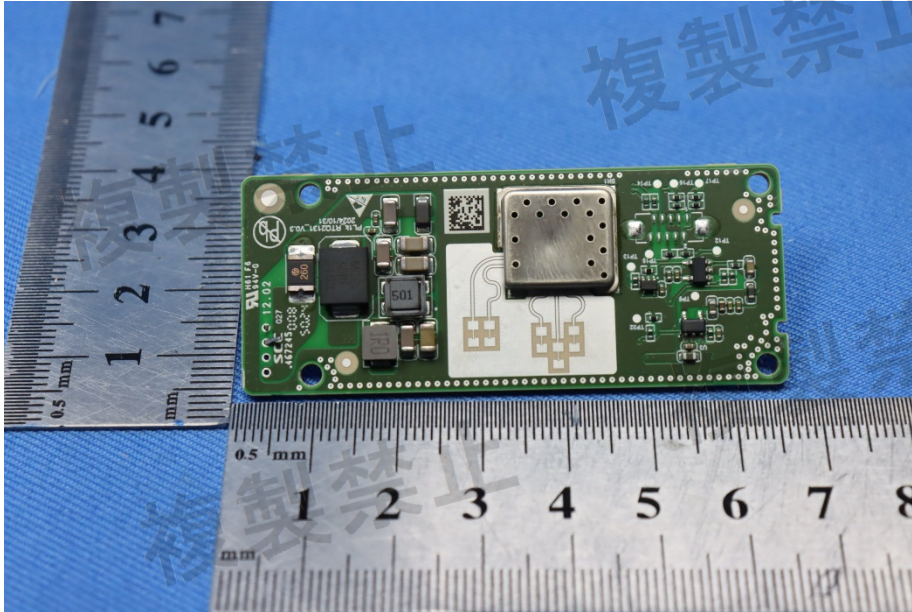


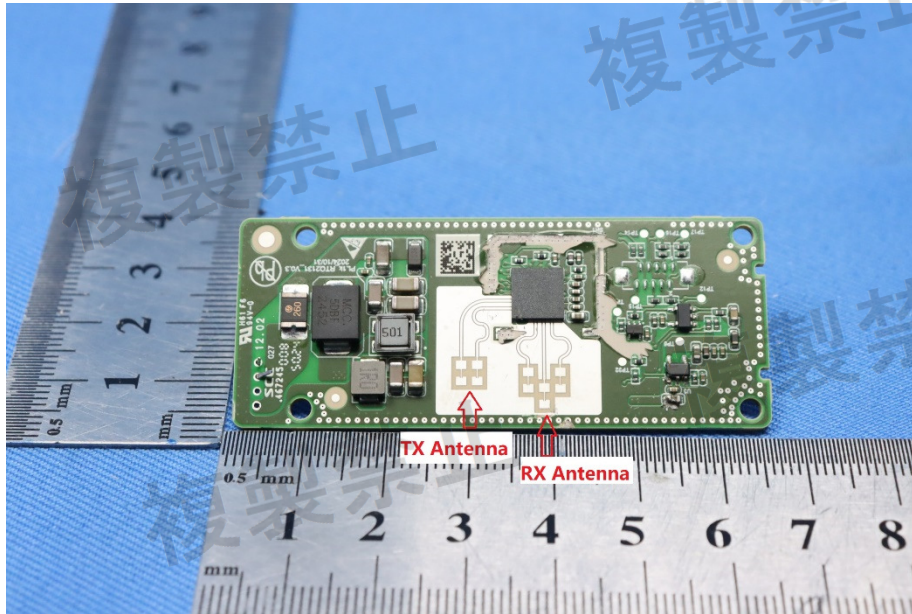


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-End of the Report-

