



RF MEASUREMENT REPORT

FCC ID: 2BLND-FR552
Applicant: Indigo Technologies, Inc.
Product: Millimeter wave radar
Model No.: FR552
FCC Classification: Part 95 Vehicular Radar Systems (VRD)
FCC Rule Part(s): FCC Part 95, Subpart M
Received Date: 2024-10-12
Test Date: 2024-10-17 ~ 2024-12-12

Reviewed By:

Yuri Li

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2020. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2409RSU036-U1	V01	Initial Report	2025-01-15	Invalid
2409RSU036-U1	V02	Update Antenna Information	2025-02-28	Invalid
2409RSU036-U1	V03	Update Radio Specification	2025-03-05	Valid

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1.1. Applicant

1.2. Manufacturer

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory			
	Laboratory Location (Suzhou - Wuzhong)			
	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China			
	Laboratory Location (Suzhou - SIP)			
	4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China			
	Laboratory Location (Suzhou - Wujiang)			
Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People's Republic of China				
☐	Laboratory Accreditations			
	A2LA: 3628.01		CNAS: L10551	
	FCC: CN1166		ISED: CN0001	
	VCCI:	☐ R-20025	☐ G-20034	☐ C-20020
		☐ T-20020		
		☐ R-20141	☐ G-20134	☐ C-20103
☐	Test Site – MRT Shenzhen Laboratory			
	Laboratory Location (Shenzhen)			
	1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China			
	Laboratory Accreditations			
	A2LA: 3628.02		CNAS: L10551	
	FCC: CN1284		ISED: CN0105	
☐	Test Site – MRT Taiwan Laboratory			
	Laboratory Location (Taiwan)			
	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)			
	Laboratory Accreditations			
	TAF: 3261			
	FCC: 291082, TW3261		ISED: TW3261	

1.4. Product Information

Product Name	Millimeter wave radar
Model No.	FR552
EUT Identification No.	20241128Sample#03
RF Specification	76 ~ 77GHz Radar
Product Voltage	9 ~ 16V DC (normal 12V)
Working Temperature Rang	-40 ~ 85°C
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification under Test

Working Frequency Range	76 ~ 77GHz
Radar Type	Non-pulsed Radar (FMCW)
Modulation Type	Sawtooth wave
FMCW Sweep Bandwidth	Long Range: 200MHz Short Range: 600MHz
FMCW Sweep Rate	Long Range: 9.765625MHz/μs Short Range: 29.296875MHz/μs
FMCW Sweep Time	Long Range: 28.48μs Short Range: 24.48μs
Antenna Type	Planar Antenna
Antenna Gain	Long Range: 18dBi Short Range: 13dBi

2. Test Configuration

2.1. Test Mode

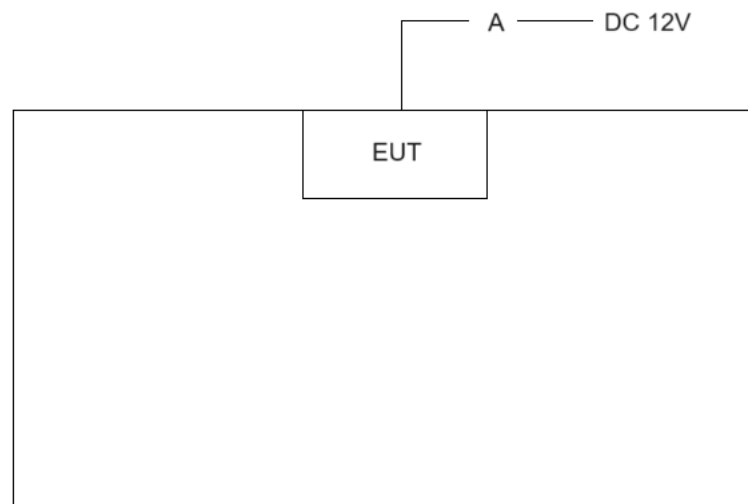
Mode 1: Collocated Tx/ Rx mode by DC 12V

Note: The test sample was provided by the manufacturer, which was configured into Collocated Tx/ Rx mode after power on.

2.2. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2020 was used to reference the appropriate EUT setup for radiated emissions testing.

Connection Diagram



Cable Type		Cable Description	Length
A	DC Cable	Non shielded	2.0m

2.3. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 95, Subpart M
- KDB 653005 D01v01r02
- ANSI C63.10-2020
- ANSI C63.26-2015

2.4. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20% ~ 75%RH

3. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2024-12-17	SIP-AC3
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2025-05-08	SIP-AC3
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06599	1 year	2025-09-08	SIP-AC3
Preamplifier	EMCI	EMC184045SE	MRTSUE06602	1 year	2025-10-08	SIP-AC3
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2025-07-07	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2025-10-16	SIP-AC3
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2025-01-11	SIP-AC3
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06646	1 year	2025-07-29	SIP-AC3
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2024-12-21	SIP-AC3
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2025-01-27	SIP-AC3
Waveguide Harmonic Mixer	Keysight	M1970V	MRTSUE06271	3 years	2025-09-22	SIP-TR2
Waveguide Harmonic Mixer	Keysight	M1970W	MRTSUE06272	3 years	2025-09-29	SIP-TR1/SIP-TR2
mmWave Antenna	MI-WWAVE	261U-25/383	MRTSUE06273	N/A	N/A	SIP-TR2
mmWave Antenna	MI-WWAVE	261G/387	MRTSUE06274	N/A	N/A	SIP-TR2
mmWave Antenna	MI-WWAVE	261F/387	MRTSUE06275	N/A	N/A	SIP-TR2
mmWave Antenna	VDI	WR3/4	MRTSUE06277	N/A	N/A	SIP-TR2
mmWave Extension Module	Keysight	N9029AV03	MRTSUE06366	N/A	N/A	SIP-TR2
mmWave Extension Module	Keysight	N9029AV05	MRTSUE06367	N/A	N/A	SIP-TR2
mmWave Extension Module	Keysight	N9029AV06	MRTSUE06368	N/A	N/A	SIP-TR2
mmWave Antenna	A-INFO	LB-15-25-A	MRTSUE06409	N/A	N/A	SIP-TR2
mmWave Antenna	A-INFO	LB-10-25-A	MRTSUE06410	N/A	N/A	SIP-TR1/SIP-TR2
Thermohygrometer	testo	608-H1	MRTSUE11109	1 year	2025-03-05	SIP-TR2
Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2025-06-21	SIP-TR1/SIP-TR2
Temperature Chamber	BAOYT	BYG-408CS	MRTSUE06847	1 year	2025-02-03	SIP-TR1
Thermohygrometer	testo	608-H1	MRTSUE11022	1 year	2025-10-16	SIP-TR1

Note: Standard gain horns need not be periodically calibrated. Antenna appearance and connector were checked and no damage.

Software	Version	Function
e3	230711	EMI Test Software
Controller_MF 7802BS	1.02	RE Antenna & Turntable
MotorContor	V 2	mmw

4. Decision Rules and Measurement Uncertainty

4.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.

(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

4.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

Radiated Emission Measurement

Measurement Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$):

Coaxial: 9kHz~30MHz: 2.59dB

Coplanar: 9kHz~30MHz: 2.60dB

Horizontal: 30MHz~200MHz: 3.85dB

200MHz~1GHz: 4.36dB

1GHz~40GHz: 4.98dB

40GHz~50GHz: 3.96dB

50GHz~75GHz: 4.01dB

75GHz~110GHz: 3.99dB

110GHz~140GHz: 4.11dB

140GHz~220GHz: 4.20dB

220GHz~231GHz: 4.29dB

Vertical: 30MHz~200MHz: 4.06dB

200MHz~1GHz: 5.28dB

1GHz~40GHz: 4.91dB

40GHz~50GHz: 3.86dB

50GHz~75GHz: 3.89dB

75GHz~110GHz: 3.87Db

110GHz~140GHz: 4.13dB

140GHz~220GHz: 4.24dB

220GHz~231GHz: 4.28dB

5. Test Result

5.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
95.3367	EIRP	Radiated	Pass
2.1049	Occupied bandwidth		Pass
95.3379(a)	Unwanted Emissions		Pass
95.3379(b)	Frequency stability		Pass

Note: The radiation measurements are performed in X, Y, Z axis positioning. Only the worst-case data are shown in the report.

5.2. Equivalent Isotropically Radiated Power (EIRP)

5.2.1. Test Limit

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

- (a) The maximum power (EIRP) within the 76-81 GHz band shall not exceed 50 dBm based on measurements employing a power averaging detector with a 1 MHz Resolution Bandwidth (RBW).
- (b) The maximum peak power (EIRP) within the 76-81 GHz band shall not exceed 55 dBm based on measurements employing a peak detector with a 1 MHz RBW.

5.2.2. Test Procedure

ANSI C63.26 Section 4.6.2

KDB 653005 D01v01r02 Section 4.b) & 4.c)

Note: Far-field boundary calculation as below.

According to ANSI C63.10-2020, Clause 9.1.4, the far-field boundary for mm-wave antennas is $2D^2/\lambda$. For fundamental or out-of-band emissions the far-field boundary distance of the EUT antenna or measurement antenna, whichever is largest, shall be used.

- D is the largest dimension of the antenna aperture in meters.
- λ is the wavelength in m

Far-field boundary calculation			
Frequency Range (GHz)	λ (m)	D (m)	$R_{(\text{Far Field})}$ (m)
76 ~ 81	0.0037	0.026	0.365

The measurement is performed at a minimum distance of $0.75\text{m} > R_{(\text{Far Field})}$

5.2.3. Test Setting

For the maximum power (EIRP)

1. Span = approximately 2 × the OBW, centered on the carrier frequency
2. Set the RBW = 1MHz
3. Set the VBW ≥ 3 × RBW
4. Detector function = Average
5. Sweep time ≥ (span / RBW) × (transmission symbol period).
6. Trace mode = Average
7. Allow the trace to stabilize
8. Use the integrated band/channel power analyzer function to determine the average power.

For the maximum peak power (EIRP)

1. Span = approximately 2 × the OBW, centered on the carrier frequency
2. Set the RBW = 1MHz
3. Set the VBW ≥ 3 × RBW
4. Detector function = Peak
5. Sweep time ≥ (span / RBW) × (transmission symbol period).
6. Trace mode = max hold
7. Allow the trace to stabilize
8. Use the peak search function to mark the max value of the emission.
9. For FMCW emissions, the Desensitization for peak detection needs to be considered. The desensitization when the above signal passes through a Gaussian RBW filter is calculated by following

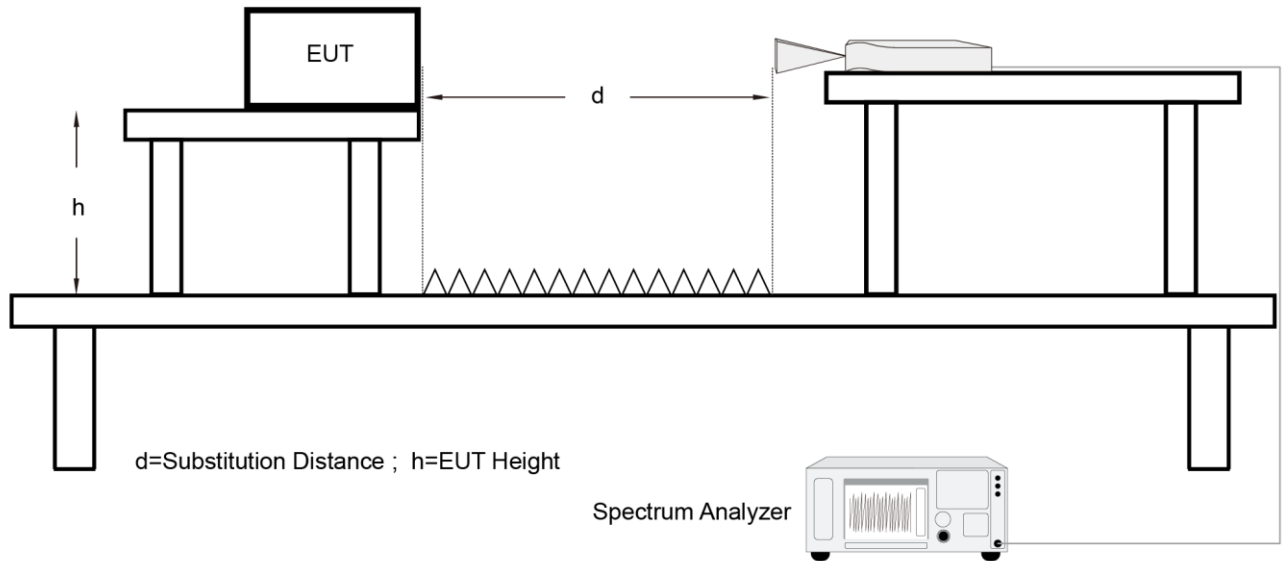
Equation

$$\text{Desensitization Factor} = -10 \cdot \log(\alpha)$$
$$\alpha = \{[1 + (2 \cdot \ln(2) / \pi)^2 \cdot [BW_{\text{Chirp}} / (T_{\text{Chirp}} \cdot B^2)]^2]\}^{0.5}$$

Where

- | | |
|---------------------|--|
| α | is the reduction in amplitude |
| BW_{Chirp} | is the FMCW Chirp Bandwidth, in MHz |
| T_{Chirp} | is the FMCW Chirp Time, in μs |
| B | is the 3 dB IF Bandwidth = RBW, in MHz |

5.2.4. Test Setup



5.2.5. Test Result

Refer to Appendix A.1.

5.3. Occupied bandwidth

5.3.1. Test Limit

The occupied bandwidth of the radar device shall be shown to be fully contained within the designated 76-81 GHz frequency band.

5.3.2. Test Procedure

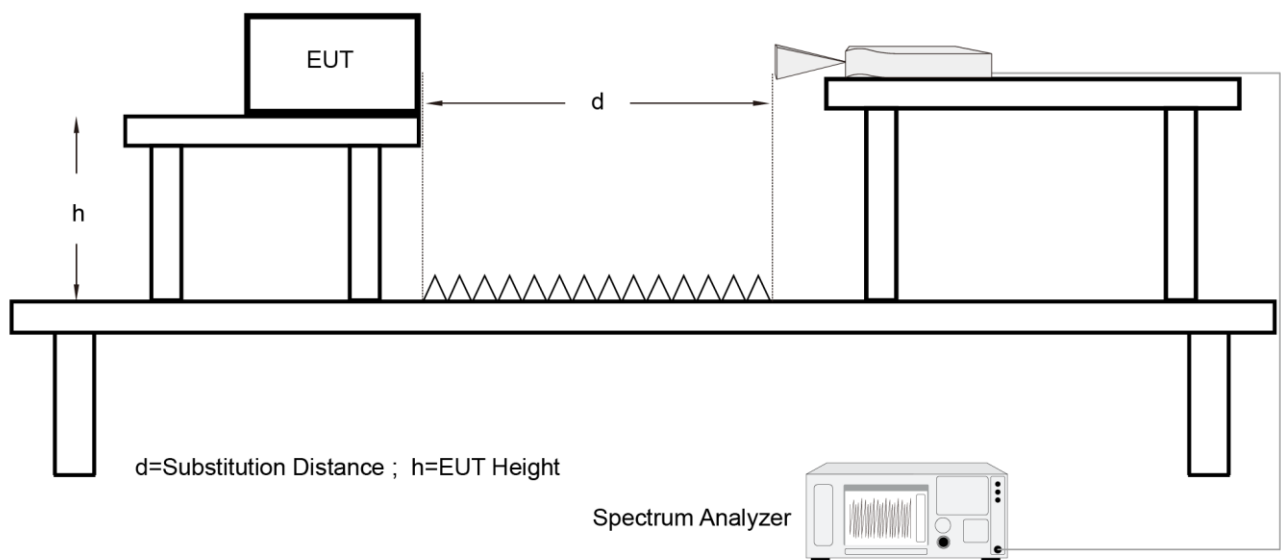
ANSI C63.26 Section 5.4.4

KDB 653005 D01v01r02 Section 4.d)

5.3.3. Test Setting

1. Span = $1.5 \times \text{OBW}$, centered on the carrier frequency
2. RBW = 1% to 5% of the anticipated OBW
3. Set the VBW $\geq 3 \times \text{RBW}$
4. Detector function = Peak
5. Trace mode = max hold.
6. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

5.3.4. Test Setup



5.3.5. Test Result

Refer to Appendix A.2.

5.4. Unwanted Emissions

5.4.1. Test Limit

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

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

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

(i) The tighter limit applies at the band edges.

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

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

- (2) The power density of radiated emissions outside the 76-81 GHz band above 40.0 GHz shall not exceed the following, based on measurements employing an average detector with a 1 MHz RBW:
- (i) For radiated emissions between 40 GHz and 200 GHz: 600 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.
- (ii) For radiated emissions above 200 GHz: 1000 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.
- (3) For field disturbance sensors and radar systems operating in the 76-81 GHz band, the spectrum shall be investigated up to 231.0 GHz.

5.4.2. Test Procedure

ANSI C63.10 Section 4.1.5.2.2 & 4.1.5.2.8

ANSI C63.26 Section 4.6.3

KDB 653005 D01v01r02 Section 4.e)

Note: Far-field boundary calculation as below.

According to ANSI C63.10-2020, Clause 9.1.4, the far-field boundary for mm-wave antennas is $2D^2/\lambda$. For spurious and harmonic emissions the far-field boundary distance shall be based on the measurement antenna.

- D is the largest dimension of the antenna aperture in meters.
- λ is the wavelength in m

Far-field boundary calculation			
Frequency Range (GHz)	λ (m)	D (m)	$R_{(\text{Far Field})}$ (m)
40.00 ~ 50.00	0.006	0.046	0.705
50.00 ~ 75.00	0.004	0.036	0.648
75.00 ~ 110.00	0.0027	0.026	0.501
110.00 ~ 140.00	0.0021	0.020	0.381
140.00 ~ 220.00	0.0014	0.014	0.280
220.00 ~ 231.00	0.0013	0.0055	0.047

For 40.00 ~ 231.00GHz, Our measurement is performed at a minimum distance of 0.75m > $R_{(\text{Far Field})}$.

5.4.3. Test Setting

Measurement of harmonic and spurious emissions above 40 GHz

1. Connect the test antenna covering the appropriate frequency range to a spectrum analyzer via an external mixer.
2. Set spectrum analyzer RBW = 1MHz, VBW = 3MHz, average detector.
3. Maximize all observed emissions. Note the maximum power indicated on the spectrum analyzer. Adjust this reading, if necessary, by the conversion loss of the external mixer used at the frequency under investigation and the external mixer IF cable loss.
4. Calculate the maximum field strength of the emission at the measurement distance.
5. Calculate the power density at the distance specified by the limit from the field strength at the distance specified by the limit.
6. Repeat the preceding sequence for every emission observed in the frequency band under investigation.

Measurement of harmonic and spurious emissions below 40 GHz

Quasi-Peak Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3 x RBW
4. Detector = Peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table 1 – RBW

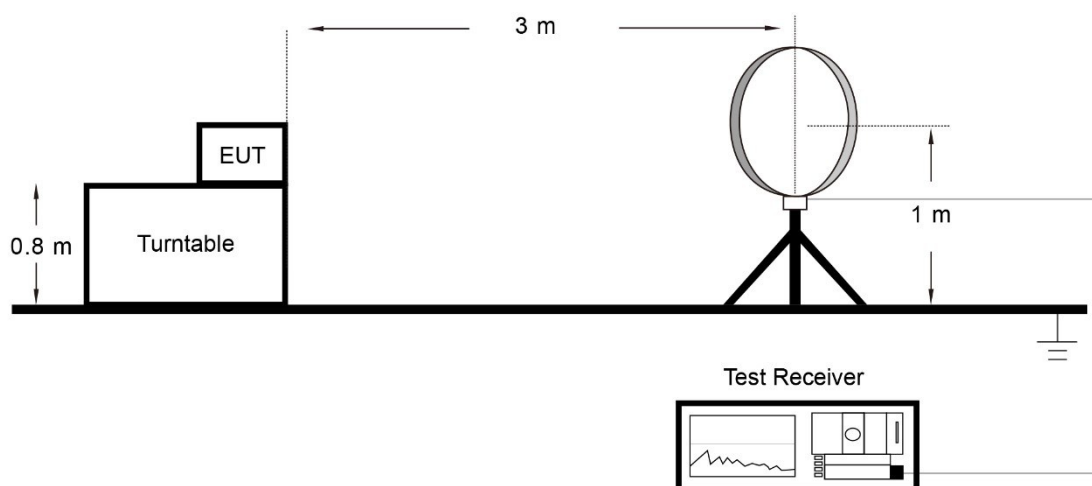
Frequency	RBW
9 ~ 90 kHz	1 MHz
90 ~ 110 kHz	200 Hz
110 ~ 490 kHz	1 MHz
0.49 ~ 30 MHz	9 kHz
30 ~ 1000 MHz	120 kHz
> 1000 MHz	1 MHz

Average Field Strength Measurements

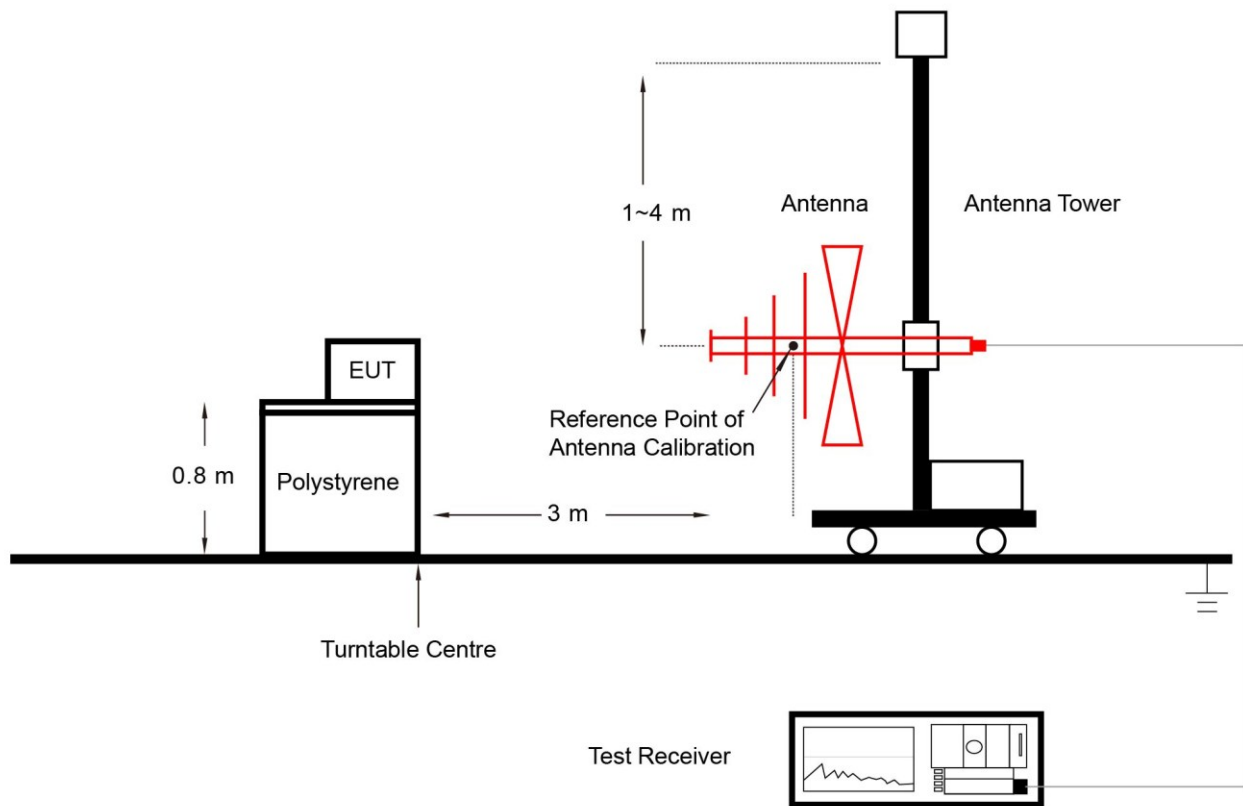
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3 x RBW
4. Detector = Average
5. Sweep time = auto couple
6. Trace mode = Average

5.4.4. Test Setup

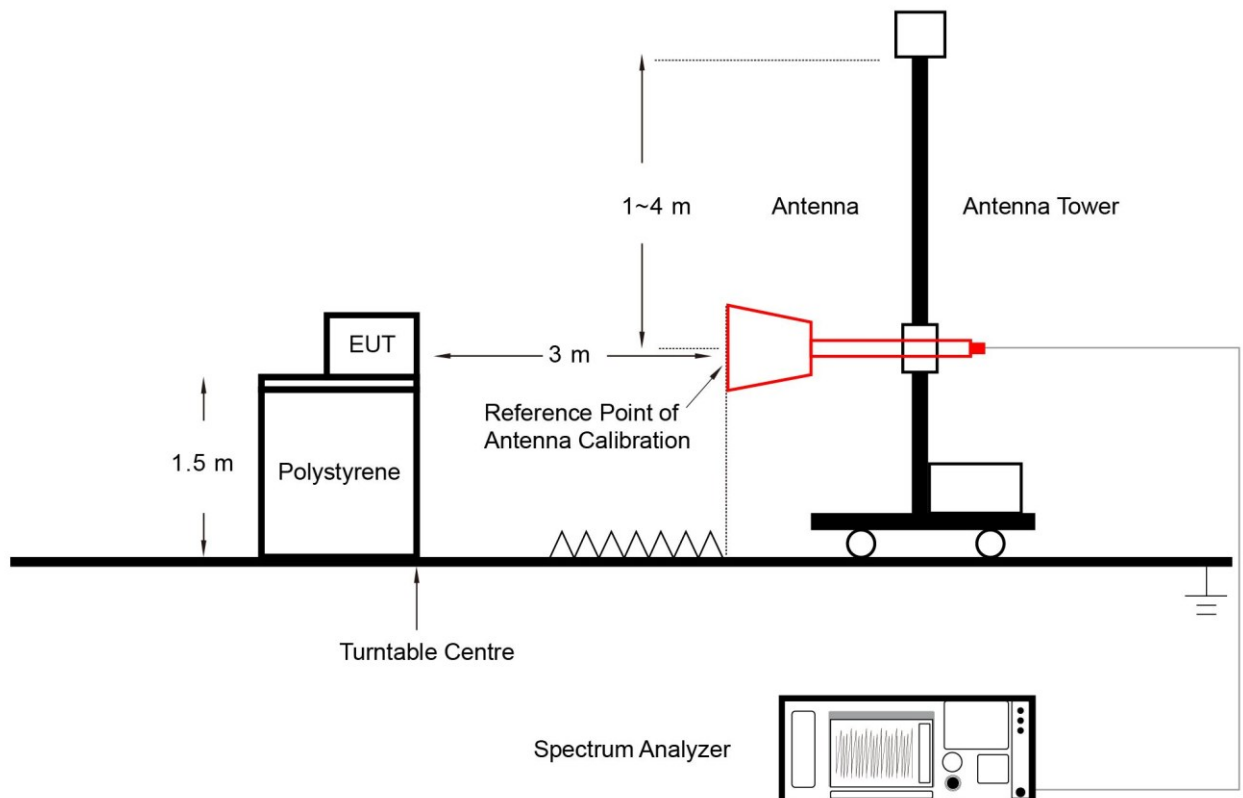
Below 30MHz Test Setup:



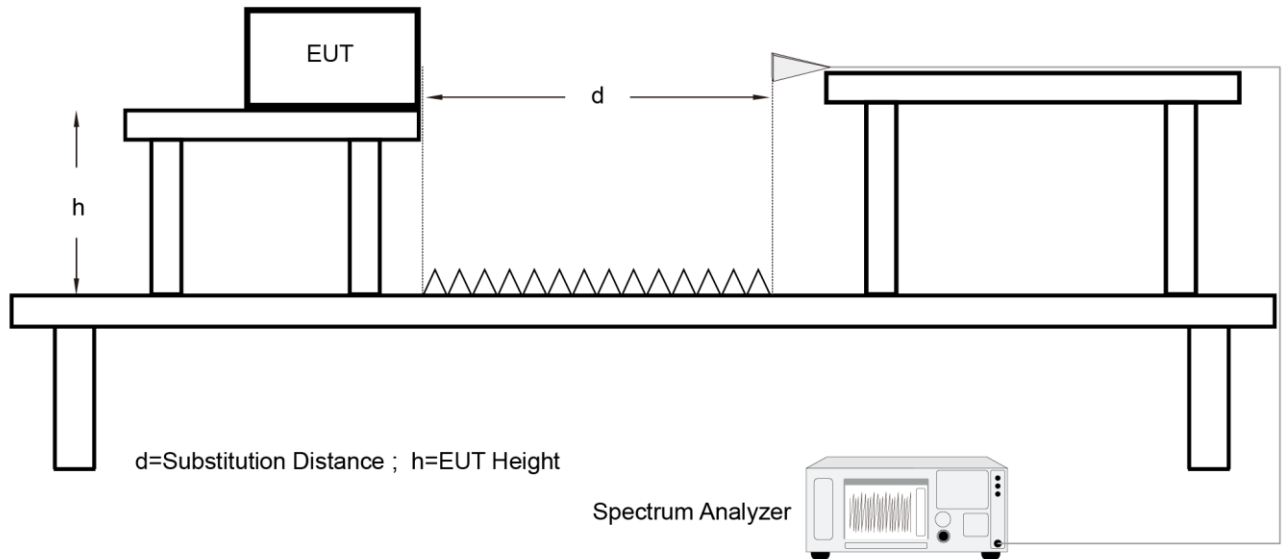
Below 1GHz Test Setup:



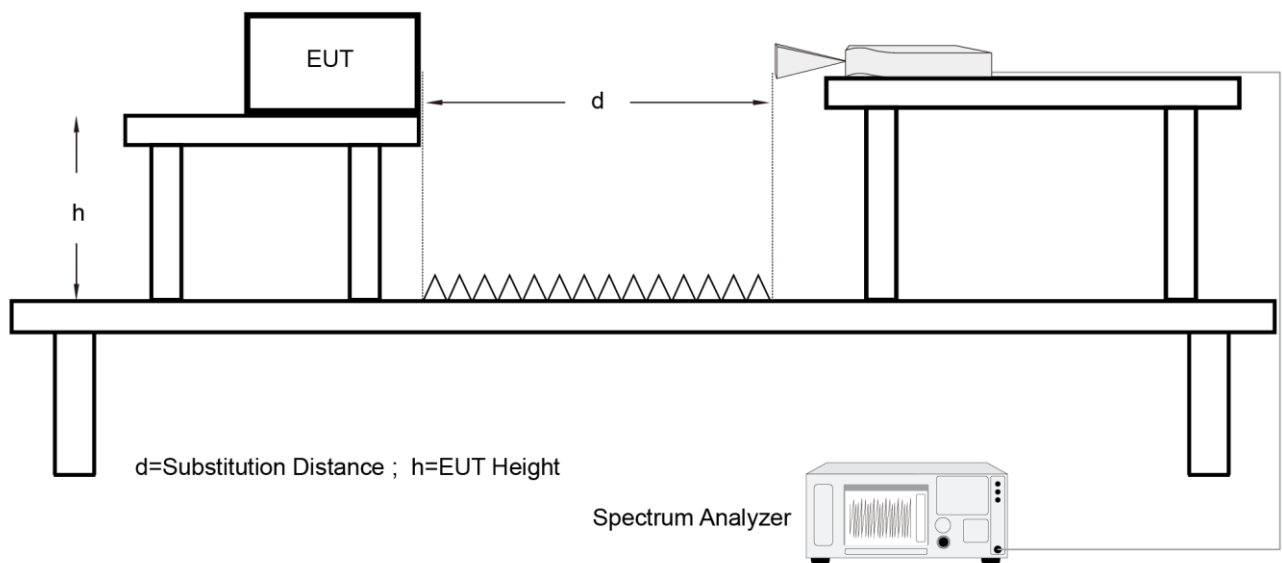
1GHz ~ 40GHz Test Setup:



40GHz ~ 50GHz Test Setup:



Above 50GHz Test Setup:



5.4.5. Test Results

Refer to Appendix A.3.

5.5. Frequency Stability

5.5.1. Test Limit

Fundamental emissions must be contained within the frequency bands 76 - 81GHz during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

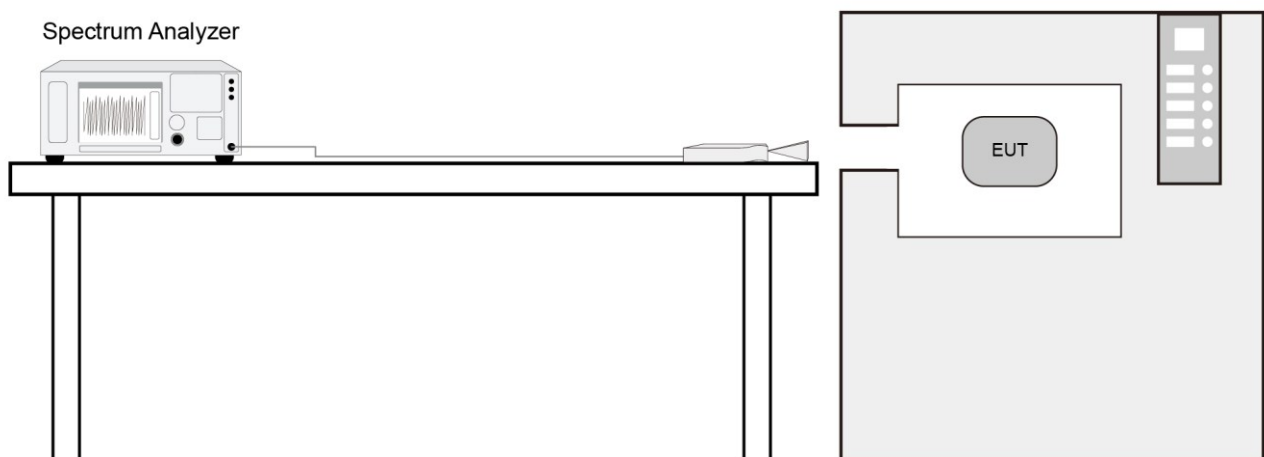
5.5.2. Test Procedure

ANSI C63.26 Section 5.4.4 & 5.6.3

5.5.3. Test Setting

1. Arrange EUT and test equipment according Section 5.5.4.
2. With the EUT at ambient temperature (20 °C) and voltage source set to the EUT nominal operating voltage
3. Use the 99% power bandwidth function of the instrument, record the Low and high frequencies (f_L and f_H) of the fundamental frequency emission.
4. Vary EUT power supply between 85% and 115% of nominal Voltage, record the f_L and f_H .
5. Set the power supply to 100% nominal setting, and raise EUT operating temperature to 50 °C.
6. Record the f_L and f_H of the fundamental frequency emission.
7. Repeat step 6 at each 10°C increment down to -20 °C.

5.5.4. Test Setup



5.5.5. Test Result

Refer to Appendix A.4.

Appendix A – Test Result

A.1 Equivalent Isotropically Radiated Power (EIRP) Test Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2024-12-04		

FMCW Desensitization Factor						
Frequency Band (GHz)	BW _{Chirp} (MHz)	T _{Chirp} (μs)	B (MHz)	Normalized Sweep Rate	α	Desensitization Factor (dB)
76 ~ 77	800	52.96	1.00	15.11	0.15	8.29

Notes:

1. Normalized Sweep Rate = $BW_{Chirp} / (T_{Chirp} * B^2)$
2. Desensitization Factor = $-10 * \log(\alpha)$
3. $\alpha = \{ [1 + (2 * \ln(2) / \pi)^2 * [BW_{Chirp} / (T_{Chirp} * B^2)]^2 \}^{0.5}$
4. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.

EIRP (dBm)		EIRP Limit (dBm)		Result
Peak	Average	Peak	Average	
12.51	-3.21	≤ 55	≤ 50	Pass

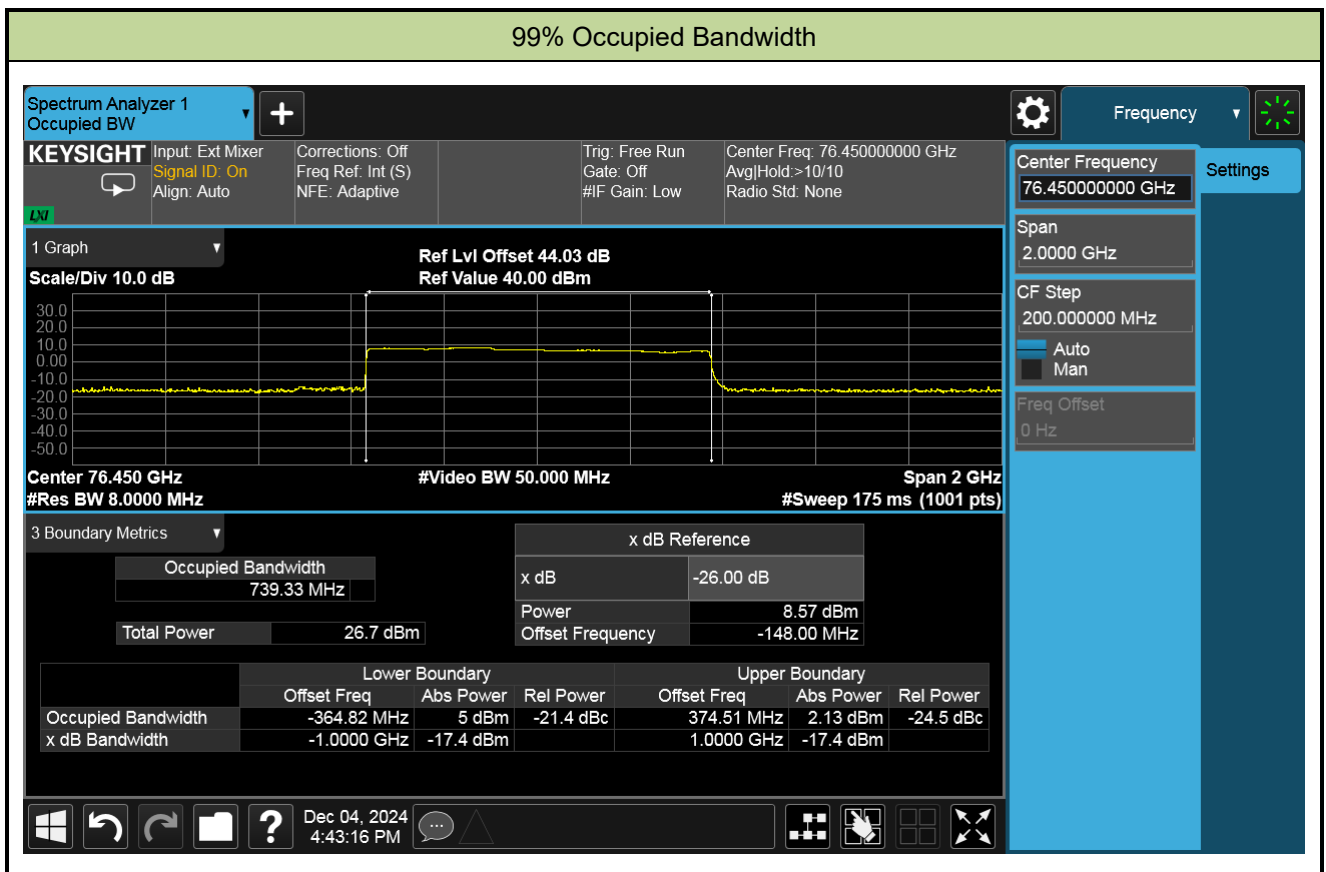
Note: Peak EIRP = Measure Peak EIRP + Desensitization Factor



A.2 Occupied bandwidth Test Result

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2024-12-04		

99% Bandwidth (MHz)	f _L (MHz)	f _L Limit (MHz)	f _H (MHz)	f _H Limit (MHz)	Result
739.33	76085.18	≥ 76000	76824.51	≤ 81000	Pass



Note: f_L (MHz) = Center Frequency (MHz) + Lower Boundary Offset Frequency (MHz)

f_H (MHz) = Center Frequency (MHz) + Upper Boundary Offset Frequency (MHz)

A.3 Unwanted Emissions Test Result

Test Site	SIP-AC3	Test Engineer	Mero Zhou
Test Date	2024-12-09	Test Frequency Range	Below 1GHz

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
61.2	3.2	17.8	21.0	40.0	-19.0	QP	Horizontal
107.3	9.0	14.9	23.9	43.5	-19.6	QP	Horizontal
178.5	5.3	16.9	22.2	43.5	-21.3	QP	Horizontal
241.7	12.5	16.6	29.1	46.0	-16.9	QP	Horizontal
247.3	8.3	16.8	25.1	46.0	-20.9	QP	Horizontal
934.2	-5.3	29.8	24.5	46.0	-21.5	QP	Horizontal
43.8	4.3	18.3	22.6	40.0	-17.4	QP	Vertical
56.0	9.0	18.4	27.4	40.0	-12.6	QP	Vertical
61.5	7.0	17.8	24.8	40.0	-15.2	QP	Vertical
67.0	5.6	16.8	22.4	40.0	-17.6	QP	Vertical
106.9	6.2	14.8	21.0	43.5	-22.5	QP	Vertical
241.7	10.5	16.6	27.1	46.0	-18.9	QP	Vertical

Notes:

- Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)
- The amplitude of radiated emissions (frequency range from 9KHz to 30MHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value. Therefore, the data is not presented in the report.
- Test Distance “d” = 3m, Test height “h” = 0.8m

Test Site	SIP-AC3	Test Engineer	Mero Zhou
Test Date	2024-11-29 ~ 2024-12-09	Test Frequency Range	1 ~ 40 GHz

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
11574.0	48.7	0.4	49.1	74.0	-24.9	Peak	Horizontal
15555.4	45.8	6.1	51.9	74.0	-22.1	Peak	Horizontal
15555.4	38.6	6.1	44.7	54.0	-9.3	Average	Horizontal
17733.1	46.0	8.2	54.2	74.0	-19.8	Peak	Horizontal
17733.1	38.6	8.2	46.8	54.0	-7.2	Average	Horizontal
11628.4	49.2	0.0	49.2	74.0	-24.8	Peak	Vertical
15640.4	46.1	6.0	52.1	74.0	-21.9	Peak	Vertical
15640.4	38.3	6.0	44.3	54.0	-9.7	Average	Vertical
17850.4	45.7	9.5	55.2	74.0	-18.8	Peak	Vertical
17850.4	37.6	9.5	47.1	54.0	-6.9	Average	Vertical
19025.2	63.3	-10.2	53.1	74.0	-20.9	Peak	Horizontal
19025.2	58.9	-10.2	48.7	54.0	-5.3	Average	Horizontal
37762.6	56.4	-1.9	54.5	74.0	-19.5	Peak	Horizontal
37762.6	40.8	-1.9	38.9	54.0	-15.1	Average	Horizontal
38981.4	55.0	1.5	56.5	74.0	-17.5	Peak	Horizontal
38981.4	41.4	1.5	42.9	54.0	-11.1	Average	Horizontal
19025.2	59.6	-10.2	49.4	74.0	-24.6	Peak	Vertical
19025.2	54.6	-10.2	44.4	54.0	-9.6	Average	Vertical
27358.8	59.0	-7.6	51.4	74.0	-22.6	Peak	Vertical
27358.8	44.6	-7.6	37.0	54.0	-17.0	Average	Vertical
39300.4	53.7	2.3	56.0	74.0	-18.0	Peak	Vertical
39300.4	41.1	2.3	43.4	54.0	-10.6	Average	Vertical

Notes:

- Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)
- Average measurement was not performed when the peak level lower than average limit
- Test Distance "d" = 3m, Test height "h" = 1.5m

Test Site	SIP-TR2	Test Engineer	Alisa Deng
Test Date	2024-10-17 ~ 2024-12-05	Test Frequency Range	40 ~ 231GHz

Frequency (GHz)	Reading Level @0.75m (dBμV)	Factor (dB/m)	Measure Level @0.75m (dBμV/m)	Measure Level @3m (dBμV/m)	Power Density (pW/cm ²)	Limit	Margin (dB)	Detector	Polarization
49.294	5.088	45.72	50.81	38.77	0.002	600	-599.998	Average	Horizontal
49.144	6.884	45.78	52.66	40.62	0.003	600	-599.997	Average	Vertical
60.452	23.090	41.51	64.60	52.56	0.048	600	-599.952	Average	Horizontal
61.216	23.168	41.18	64.35	52.31	0.045	600	-599.955	Average	Vertical
75.929	25.737	44.01	69.75	57.71	0.156	600	-599.844	Average	Horizontal
75.943	27.037	44.01	71.05	59.01	0.211	600	-599.789	Average	Vertical
83.081	26.708	44.20	70.91	58.87	0.204	600	-599.796	Average	Horizontal
83.456	26.209	44.25	70.46	58.42	0.184	600	-599.816	Average	Vertical
110.276	4.971	58.06	63.03	50.99	0.033	600	-599.967	Average	Horizontal
110.368	5.024	58.06	63.08	51.04	0.034	600	-599.966	Average	Vertical
141.386	5.363	61.25	66.61	54.57	0.076	600	-599.924	Average	Horizontal
141.287	5.281	61.25	66.53	54.49	0.075	600	-599.925	Average	Vertical
181.807	5.299	60.29	65.59	53.55	0.060	600	-599.940	Average	Horizontal
189.185	5.414	61.33	66.74	54.70	0.078	600	-599.922	Average	Vertical
228.989	5.409	60.05	65.46	53.42	0.058	1000	-999.942	Average	Horizontal
228.482	5.375	60.05	65.43	53.38	0.058	1000	-999.942	Average	Vertical

Notes:

- Measure Level @0.75m ((dBμV/m)) = Reading Level @0.75m ((dBμV)) + Factor (dB/m)
For below 110GHz: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)
For above 110GHz: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) + Mixer Conversion Loss (dB)
- Measure Level @3m (dBμV/m) = Measure Level @0.75m (dBμV/m) + 20 * log(0.75m / 3m)
- Power Density = $(10^8 / 377) * \{10^{[(\text{Measure Level @3m} - 120) / 20]}\}^2$
- Test Distance "d" = 0.75m, Test height "h" = 0.45m

A.4 Frequency Stability Test Result

Test Site	SIP-TR1	Test Engineer	Alisa Deng
Test Date	2024-12-12		

Voltage (%)	Power (VDC)	Temp (°C)	f _L (GHz)	f _H (GHz)	Limit (GHz)	Result
100	12.0	- 20	76.08728	76.82354	76 ~ 81	Pass
		- 10	76.08722	76.82607	76 ~ 81	Pass
		0	76.08623	76.82570	76 ~ 81	Pass
		+ 10	76.08619	76.82481	76 ~ 81	Pass
		+ 20	76.08598	76.82393	76 ~ 81	Pass
		+ 30	76.81376	76.82378	76 ~ 81	Pass
		+ 40	76.08599	76.82361	76 ~ 81	Pass
		+ 50	76.08635	76.82301	76 ~ 81	Pass
115	13.8	+ 20	76.08628	76.82444	76 ~ 81	Pass
85	10.2	+ 20	76.08715	76.82383	76 ~ 81	Pass



Appendix B - Test Setup Photograph.

Refer to “2409RSU036-UT” file.

Appendix C - EUT Photograph

Refer to "2409RSU036-UE" file.