FCC 47 CFR PART 15.255

TEST REPORT

For

Personal Computer

Model No.: ThinkCentre M90a Pro Gen6

Machine Type: 13AM******* , 13AN*******, 13AQ*******, 13AR*******, 13AS******* (Where * can be 0-9, a-z, A-Z, hyphen or blank for marketing purpose)

Trade Name: Lenovo

Issued to

Lenovo (Beijing) Limited
201-H2-6, Floor 2, Building 2, No.6 Shangdi West Road,
Haidian District, Beijing 100085, China

Issued by

Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City, Taiwan.
Issued Date: March 3, 2025

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	January 13, 2025	Initial Issue	ALL	Peggy Tsai
01	January 23, 2025	See the following Note Rev. (01)	P.48, 49	Peggy Tsai
02	March 3, 2025	See the following Note Rev. (02)	P. 15-20, 23, 25, 26	Peggy Tsai

Note:
Rev. (01)
1. Modify data in section 7.5.
Rev. (02)
1. Modify test data in section 7.1 and 7.2.

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION

Applicant:	Lenovo (Beijing) Limited 201-H2-6, Floor 2, Building 2, No.6 Shangdi West Road, Haidian District, Beijing 100085, China
Manufacturer:	Lenovo (Beijing) Ltd 201-H2-6, Floor 2, Building 2, No.6 Shangdi West Road, Haidian District, Beijing 100085, China
Equipment Under Test:	Personal Computer
Trade Name:	Lenovo
Model No.:	ThinkCentre M90a Pro Gen6
Machine Type:	13AM******* , 13AN*******, 13AQ*******, 13AR*******, 13AS******* (Where * can be 0-9, a-z, A-Z, hyphen or blank for marketing purpose)
Date of Test:	December 2, 2024 ~ March 3, 2025

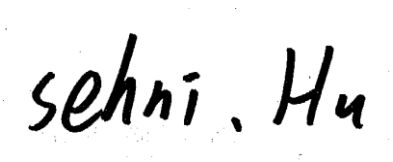
APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15.255	Compliance
Statements of Conformity	
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.	

We hereby certify that:

All test results conform to above mentioned standards.
The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.255.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:



Sehni Hu
Supervisor

2. EUT DESCRIPTION

Product	Personal Computer
Trade	Lenovo
Model No.	ThinkCentre M90a Pro Gen6
Model Discrepancy	N/A
Machine Type	13AM******* , 13AN*******, 13AQ*******, 13AR*******, 13AS******* (Where * can be 0-9, a-z, A-Z, hyphen or blank for marketing purpose)
Received Date	December 4, 2024
Power Supply	Power from AC 120V.
Frequency Band	Mode1: 60.5 ~ 61.5GHz Mode2: 58 ~ 62GHz
Modulation	FMCW ramping throughout the frequency range
Number of Channel	1
Antenna Designation	Built-in Antenna / Gain: 5 dBi
Temperature Range	0°C to +55 °C
HW Version	1.0
SW Version	1.0
Module Name / Trade Name / Regulatory Model	<table><tr><th>Name of Equipment</th><th>Trade Name</th><th>Regulatory Model</th></tr><tr><td>Lenovo HPD card gen2</td><td>Lenovo</td><td>KQ676 NS-F043</td></tr></table>
Sweep Characteristics	Mode1: AI privacy guard Sweep Bandwidth:1000MHz Sweep Time:32us Mode2: Zero touch log in/ou Sweep Bandwidth:4000MHz Sweep Time:128us
Declaration conditions	Operating environment: Indoor use Operating frequency band: 57-64GHz product type: FDS

Remark:

1. The sample selected for test was production product and was provided by manufacturer.
2. Disclaimer: Antenna and sweep characteristics information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. Disclaimer: Variant information between/among machine type is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.

3. TEST SUMMARY

Report Section	FCC Standard Section	Test Item	Result
7.1	15.255(c)(2)(iii) 15.255(c)(2)(iv)	Duty cycle	Pass
7.2	15.255(c)(2)(iii)	Output Power	Pass
7.3	15.255(e)	6dB Bandwidth	Reference only
7.3	-	Occupied Bandwidth	Pass
7.4	15.255(d) 15.205 15.209	Spurious Emissions	Pass
7.5	15.255(f)	Frequency Stability	Pass
7.6	15.207	AC Power Conducted Emission	Pass

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013, FCC CFR 47 Part 15.255, Part 15.207, Part 15.209 and Part 15.215 , FCC KDB 364244 D01 Meas 15.255 Radars v01.

4.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

4.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

4.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in ANSI C63.10: 2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 1.5 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in ANSI C63.10: 2013.

4.4 DESCRIPTION OF TEST MODES

The EUT (model: ThinkCentre M90a Pro Gen6) had been tested under operating condition.
Software used to control the EUT for staying in continuous transmitting mode was programmed. The worst case data rate is determined as the data rate with highest output power.

AC Power Line Conduction Emission	
Test Condition	**AC Power line conduction emission for line and neutral**
Power supply Mode	**Mode 1: EUT(AI privacy guard) power by AC 120V Mode 2: EUT(Zero touch log in/ou) power by AC 120V**
Worst Mode	**☒ Mode 1 ☒ Mode 2 ☐ Mode 3 ☐ Mode 4**

Radiated Emission Measurement Above 1G	
Test Condition	**Radiated Emission Above 1G**
Power supply Mode	**Mode 1: EUT(AI privacy guard) power by AC 120V Mode 2: EUT(Zero touch log in/ou) power by AC 120V**
Worst Mode	**☒ Mode 1 ☒ Mode 2 ☐ Mode 3 ☐ Mode 4**
Worst Position	**☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)**

Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Power supply Mode	**Mode 1: EUT(AI privacy guard) power by AC 120V Mode 2: EUT(Zero touch log in/ou) power by AC 120V**
Worst Mode	**☒ Mode 1 ☒ Mode 2 ☐ Mode 3 ☐ Mode 4**

Radiated Emission Measurement Co-Location	
Test Condition	**Radiated Emission Above 1G**
Power supply Mode	**Mode 1: EUT(AI privacy guard+ Zero touch log in/ou) power by AC120V**
Worst Mode	**☒ Mode 1 ☒ Mode 2 ☐ Mode 3 ☐ Mode 4**
Worst Position	**☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)**

Remark:
1. The worst mode was record in this test report.
2. AC power line conducted emission were performed the EUT transmit at the highest output power channel as worse case.
3. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z-Plane) were recorded in this report.
4. The device supports two modes, and the two modes are fully tested separately.

4.5 FAR FIELD CONDITION FOR FREQUENCY ABOVE 40GH

The equipment under test was transmitting while connected to its integral antenna and is placed on a turn table. The measurement antenna is in the far field of the EUT per formula 2D2/λ where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT.

In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

Model	Frequency Range (GH)	Largest Dimension of the Horn Antenna (mm)	Minimum Test Distance Rm (m)
RCHO19R	40~60	31	0.38
RCHO15R	50~75	25	0.26
RCHO12R	60~90	21	0.26
RCHO08R	90~140	15	0.21
RCHO05R	140~220	10	0.15
FH-PP-325	220~325	8	0.14

5. INSTRUMENT CALIBRATION

5.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Conducted Emissions Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Cal Due**
Cable	Woken	WC12	CC001	2024-06-26	2025-06-25
Horn Antenna / Spectrum Analyzer Mixer	VDI	SAX WR15	SAX994	2024-06-14	2025-06-13
Horn	CMI	WR15	WR15-03	2023-11-29	2026-11-28
PXA Signal Analyzer	Keysight	N9030B	MY62291089	2024-10-04	2025-10-03
Constant Temperature Humidity Chamber	TERCHY	MHG-150LF	930619	2024-10-15	2025-10-14
Software	N/A				

AC Mains Conduction					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Cal Due**
EMI Test Receiver	R&S	ESCI	100064	2024-06-14	2025-06-13
LISN	TESEQ	LN2-16N	22012	2024-02-29	2025-02-27
Cable	Woken	SFL402	185A	2024-07-08	2025-07-07
Software	e3 V6-110812				

Remark:
1. Each piece of equipment is scheduled for calibration once a year.
2. N.C.R. = No Calibration Request.

3M 966 Chamber Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Cal Date**	**Cal Due**
Pre-Amplifier	MITEQ	AMF-6F-18004000-37-8P	985646	2024-08-13	2025-08-12
Active Loop Antenna	SCHWARZBECK	FMZB 1513-60	1513-60-028	2023-12-13	2024-12-12
				2024-12-11	2025-12-10
Preamplifier	EMEC	EM330	060609	2024-02-21	2025-02-20
Thermo-Hygro Meter	WISEWIND	1206	D07	2024-11-26	2025-11-25
Signal Analyzer	Agilent	N9010A	MY52220817	2024-03-15	2025-03-14
Digital Storage Oscilloscope	KEYSIGHT	DSOX3104T	MY61500156	2024-03-26	2025-03-25
Probe	KEYSIGHT	N2843A	005	2024-03-25	2025-03-24
Preamplifier	HP	8449B	3008A00965	2023-12-22	2024-12-21
				2024-12-18	2025-12-17
Cable	EMCI	EMC101G	221213+221011+221012	2024-10-11	2025-10-10
Signal Generator	Agilent	E8257C	US42340383	2024-06-15	2025-06-14
STANDARD GAIN HORN ANTENNA	CMI	RCHO05R	RCHO05R	2024-06-22	2025-06-21
STANDARD GAIN HORN ANTENNA	CMI	RCHO08R	RCHO08R	2024-06-16	2025-06-15
STANDARD GAIN HORN ANTENNA	CMI	RCHO12R	RCHO12R	2024-06-16	2025-06-15
STANDARD GAIN HORN ANTENNA	CMI	RCHO19R	RCHO19R	2024-06-15	2025-06-14
Horn Antenna	CMI	WR-15	WR-15-03	2023-11-29	2026-11-28
SA EXTENSION MODULE	VDI	SAX WR8.0	SAX982	2024-06-14	2025-06-13
SA EXTENSION MODULE	VDI	SAX WR12	SAX983	2024-06-14	2025-06-13
SA EXTENSION MODULE	VDI	SAX WR19	SAX993	2024-06-14	2025-06-13
SA EXTENSION MODULE	VDI	SAX WR5.1	SAX995	2024-06-16	2025-06-15
SA EXTENSION MODULE	VDI	SAX WR15	SAX994	2024-06-14	2025-06-13
Bi-Log Antenna	Sunol Sciences	JB3	A030105	2024-07-12	2025-07-11
Horn Antenna	ETC	MCTD 1209	DRH13M02003	2023-12-28	2024-12-27
				2024-12-20	2025-12-19
Horn Antenna	SCHWARZBECK	BBHA9170	1047	2024-12-06	2025-12-05
Pre-Amplifier	EMCI	EMC184045SE	980860	2024-12-02	2025-12-01
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Software	e3 V9-210616c				

Remark:
1. Each piece of equipment is scheduled for calibration once a year. (Except mmwave antenna)
2. N.C.R. = No Calibration Request.

5.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	± 2.21 dB
Channel Bandwidth	± 2.79 dB
Radiated Emission_9kHz-30MHz	± 3.492 dB
Radiated Emission_30MHz-200MHz	± 3.683 dB
Radiated Emission_200MHz-1GHz	± 3.966 dB
Radiated Emission_1GHz-6GHz	± 5.063 dB
Radiated Emission_6GHz-18GHz	± 5.122 dB
Radiated Emission_18GHz-26GHz	± 3.032 dB
Radiated Emission_26GHz-40GHz	± 3.271 dB
Radiated Emission_40GHz-60GHz	±2.294 dB
Radiated Emission_60GHz-90GHz	±2.209 dB
Radiated Emission_90GHz-140GHz	±2.208 dB
Radiated Emission_140GHz-220GHz	±2.217 dB
Radiated Emission_220GHz-325GHz	±2.306 dB

Remark:
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

5.4 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at
No.11, Wugong 6th Rd., Wugu Dist., New Taipei City, Taiwan.
CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Ben Yang	-
Radiation	Tony Chao、Ray Li	-
RF Conducted	Tony Chao	-

Remark: The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC pubic Access Link (PAL) database, FCC Registration No. :444940, the FCC Designation No.:TW1309

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

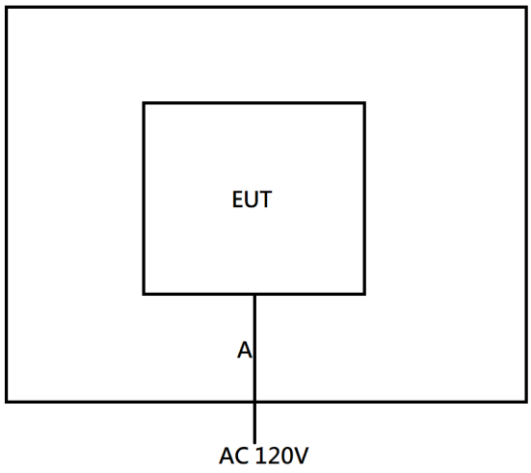
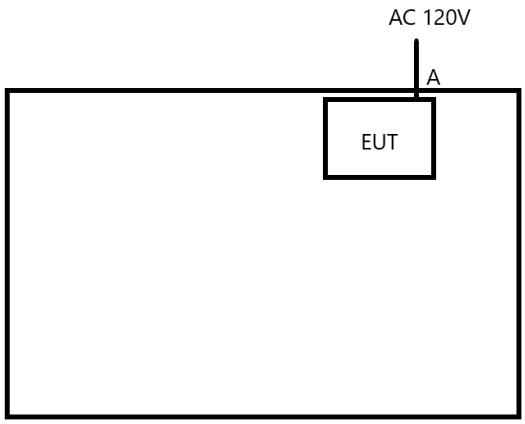
See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

EUT Accessories Equipment						
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**	**IC**
	N/A					

Support Equipment (RSE & Conduction)					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
A	Power Cable	ASAPTechnology	N/A	A062059	N/A

6.3 SETUP CONFIGURATION OF EUT

RSE	Conduction
	

6.4 TEST PROGRAM

This EUT uses "Lenovo Commercial Vantage" software and setup command to set the frequency, and power to allow the sample to continuously transmit.
For power setting: the default value

7. TEST REQUIREMENTS

7.1 DUTY CYCLE

LIMIT

Applies to 15.255(C)(2)(iii)

The peak EIRP shall not exceed 14 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 25.5 milliseconds within any contiguous interval of 33 milliseconds.

Applies to 15.255(C)(2)(iv)

A field disturbance sensor may operate in any of the modes in the above sub-sections so long as the device operates in only one mode at any time and does so for at least 33 milliseconds before switching to another mode.

TEST PROCEDURES

1. Applies to Measurement of the fundamental emission using spectrum analyzer.
2.Set the maximum power setting and enable the EUT to FMCW mode.
3. The EUT is placed on a turntable with 1.5 meter respectively above ground.
4. The EUT is set 1 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Use 50-75 GHz receiver antenna, pre-amp and digital storage oscilloscope (DSO) or SA.
6. The EUT is arranged to its worst case and then tune the antenna tower and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. Digital storage oscilloscope (DSO) and SA adjust the length of time appropriately and confirm burst period, chirp width and chirp numbers.

TEST RESULTS

Compliance

Test Data

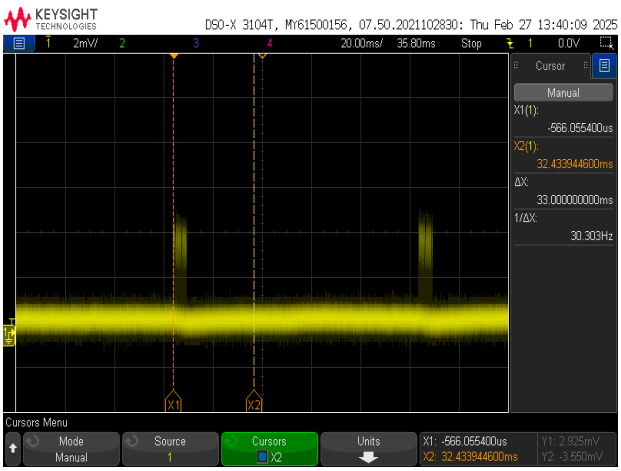
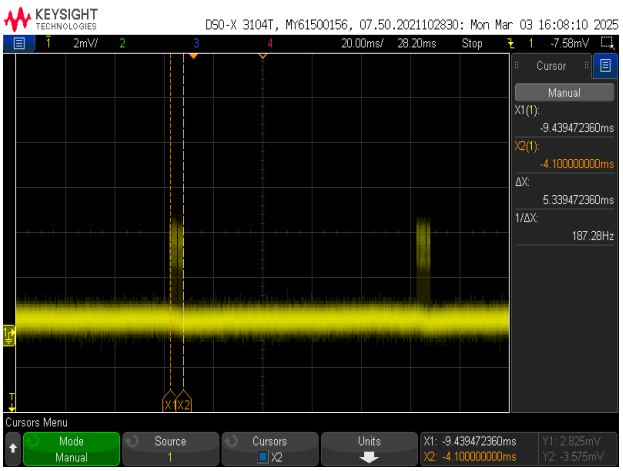
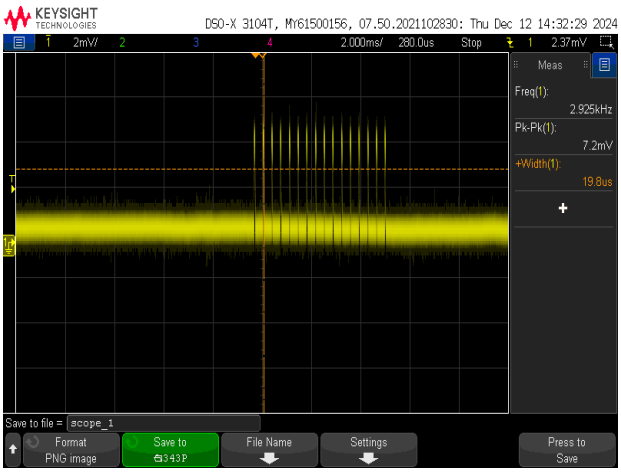
Temperature:	24.3 ~ 24.8℃	**Test date:**	December 2, 2024 ~ March 3, 2025
Humidity:	56 ~ 59% RH	**Tested by:**	Tony Chao

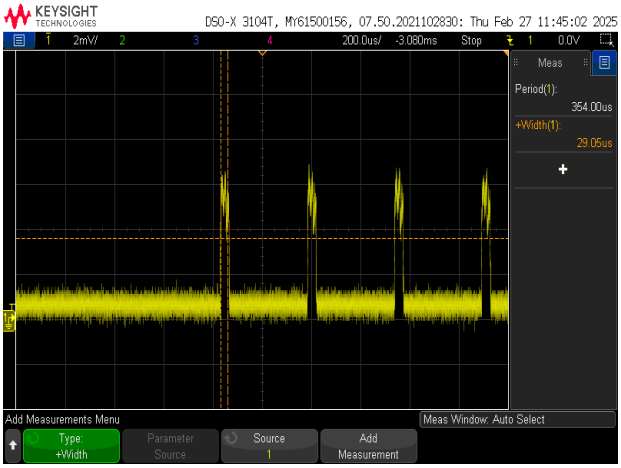
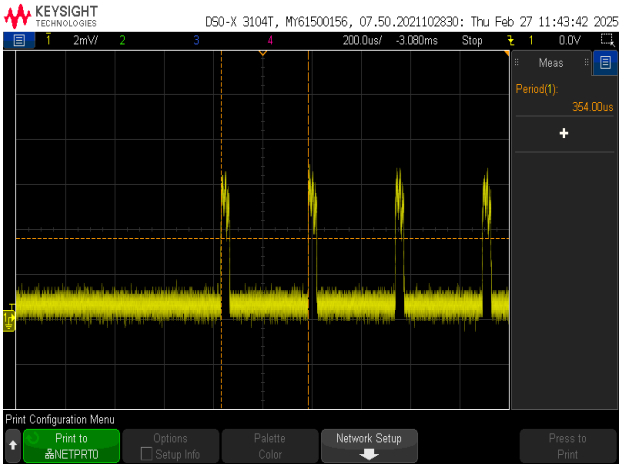
Mode 1

Observation Time 33ms

Mode1: 60.5~ 61.5GHz					
Chirp Width (ms)	**Chirp Number**	**Transmitter on (ms)**	**Sum of continuous transmitter off-times (ms)**	**Limit (ms)**	**Result**
0.02905	16	0.4648	32.5352	>25.50	Pass

Note:
Transmitter on = Chirp numbers (16) x Chirp Width (29.05μs)
Sum of continuous transmitter off-times= Observation Time 33ms- Transmitter on

On-time of chirp sequence (frame on time)/33ms	On-time of chirp sequ ence (frame on time)
	
Chirp Numbers: 16	
	

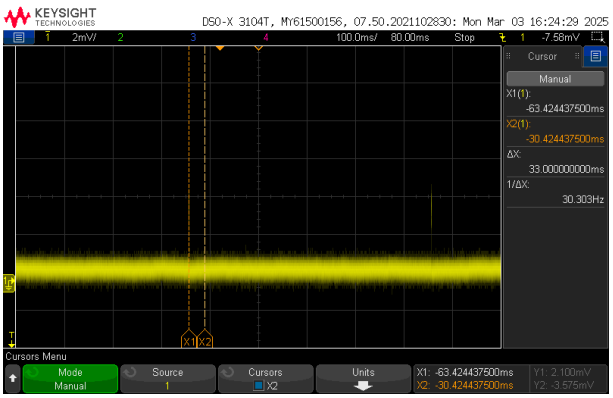
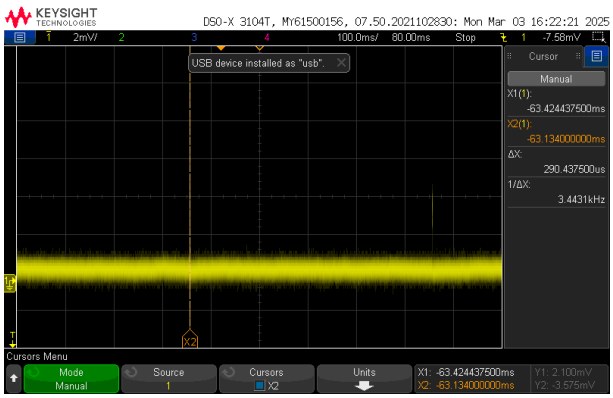
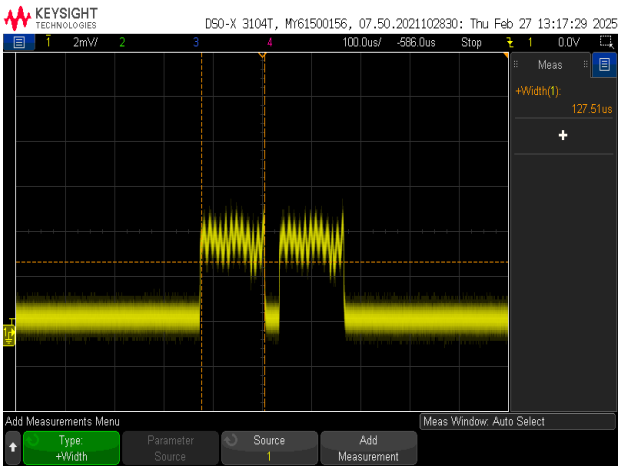
On-times of chirp	Off-time of chirp = Repetition time of chirps within burst -on-times of chip 354us-29.05us=324.95us <2ms
	

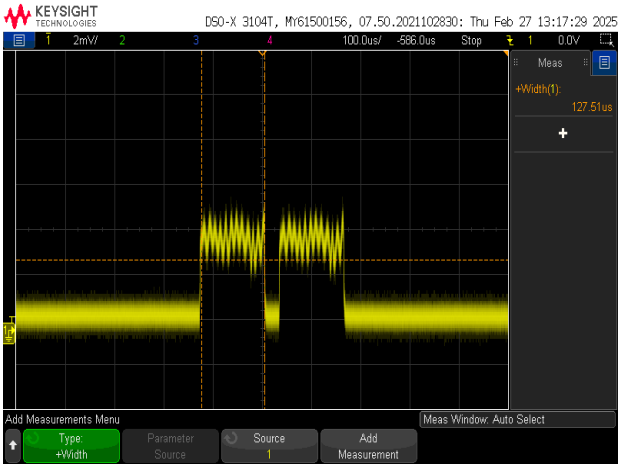
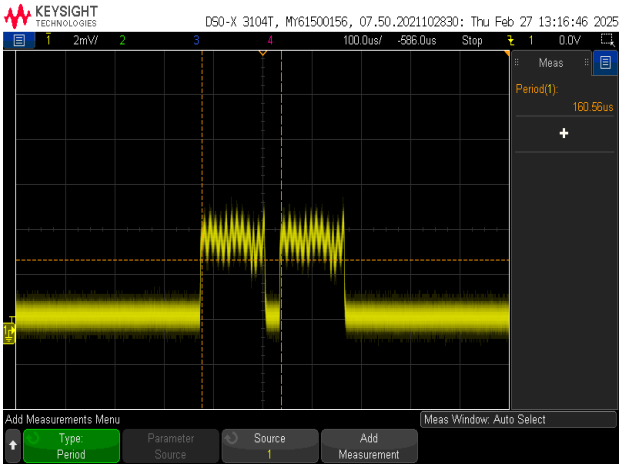
Mode 2

Observation Time 33ms

Mode2: 58~ 62GHz					
Chirp Width (ms)	**Chirp Number**	**Transmitter on (ms)**	**Sum of continuous transmitter off-times (ms)**	**Limit (ms)**	**Result**
0.12751	2	0.25502	32.74498	>25.50	Pass

Note:
Transmitter on = Chirp numbers (2) x Chirp Width (127.51μs)
Sum of continuous transmitter off-times= Observation Time 33ms- Transmitter on

On-time of chirp sequence (frame on time)/33ms	On-time of chirp sequ ence (frame on time)
	
Chirp Numbers: 2	
	

On-times of chirp	Off-time of chirp = Repetition time of chirps within burst -on-times of chip 160.56us-127.51us=33.05us <2ms
	

Co-Location

Switch Mode


Note:
Pay attention to the monitoring time and confirm that the switching time of each mode is greater than 33ms.

7.2 OUTPUT POWER & EIRP

LIMIT

Applies to 15.255(C)(2)(iii),
The peak EIRP shall not exceed 14 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 25.5 milliseconds within any contiguous interval of 33 milliseconds.

TEST PROCEDURE

1. Applies to Measurement of the fundamental emission using spectrum analyzer.
2.Set the maximum power setting and enable the EUT to FMCW mode.
3. The EUT is placed on a turntable with 1.5 meter respectively above ground.
4. The EUT is set 1 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Use 50-75 GHz receiver antenna, mixer and spectrum analyzer.
6. The EUT is arranged to its worst case and then tune the antenna tower(antenna polarization adjustment) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. The spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and Video bandwidth (VBW) is set 3MHz.
8. Use mark Peak function to check result.
9. Measure and record the results in the test report.

TEST RESULTS

Compliance

Test Data

Temperature:	24.3 ~ 24.8℃	**Test date:**	December 2, 2024 ~ March 3, 2025
Humidity:	56 ~ 59% RH	**Tested by:**	Tony Chao

Far Field Condition for EUT

Frequency Range (GHz)	Largest Dimension of the Horn Antenna (mm)	Minimum Test Distance Rm (m)
61.50	9.00	0.03

Mode 1

Frequency (GHz)	SA Reading (dBm)	Antenna Gain	Mixer	Cable	Distance (m)	Level (dBm)	FMCW desensitization factor	EIRP (dBm)	Limit (dBm)	Margin (dB)	Remark	Result
61.11	-58.85	21.60	12.65	1.42	1	1.78	-11.41	13.19	14.00	-0.81	Peak	Pass

Note:

1. Level=Reading - antenna Gain + mixer loss + cable
   EIRP=Level - desensitization factor
2. Follow Annex L of the C63.10-2020 standard.
   FMCW desensitization factor =20 * Log(α)

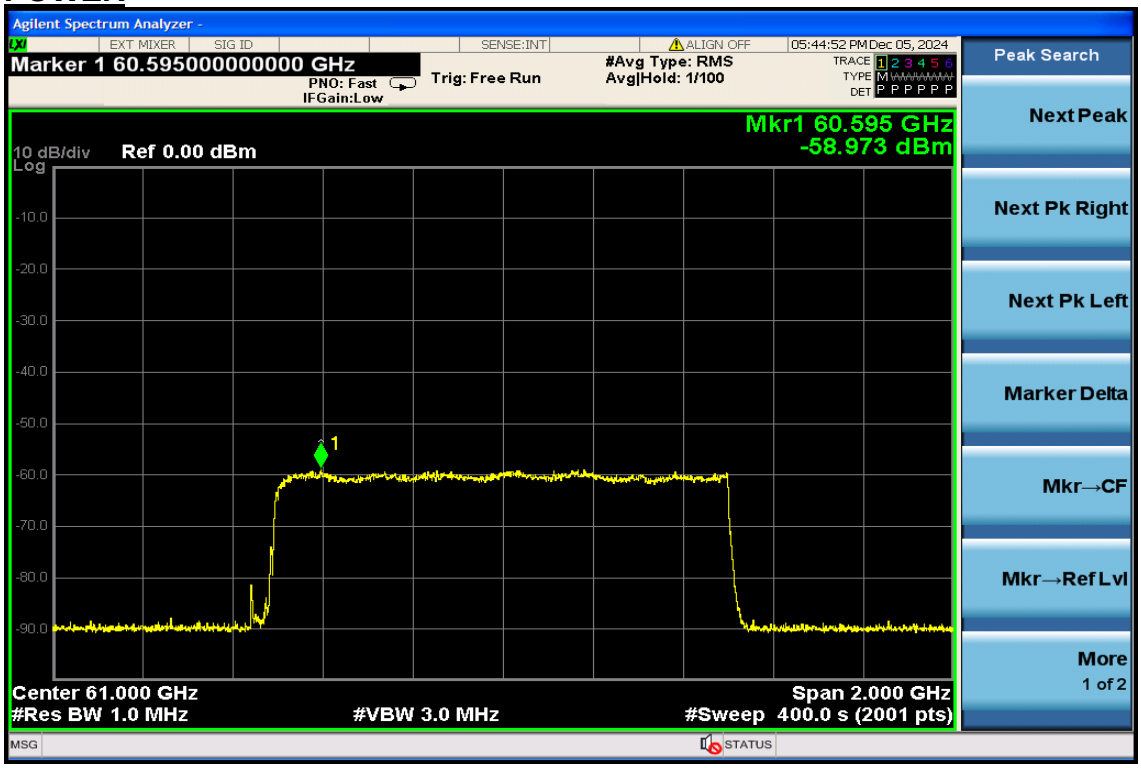
$$\alpha = \frac{1}{\left(1+\left[\left(\frac{2\times\ln(2)}{\pi}\right)^2\times\left(\frac{BW_{Chirp}}{T_{Chirp}\times RBW^2}\right)^2\right]\right)^{0.25}}$$

   BW_{chirp}: follow report sec 2
   T_{Chirp}: Follow manufacturer's declaration 32us
   RBW:1MHz
3. $EIRP = 21.98-20\log(\lambda)+20\log(d_{Meas})+P-G$

where

EIRP	is the equivalent isotropic radiated power, in dBm
λ	is the wavelength of the emission under investigation【300/*f*(MHz)】, in m
d_{Meas}	is the measurement distance, in m
P	is the power measured at the output of the measurement antenna, in dBm
G	is the gain of the measurement antenna, in dBi

POWER



Far Field Condition for EUT

Frequency Range (GHz)	Largest Dimension of the Horn Antenna (mm)	Minimum Test Distance Rm (m)
62.00	9.00	0.03

Mode 2

Frequency (GHz)	SA Reading (dBm)	Antenna Gain	Mixer	Cable	Distance (m)	Level (dBm)	FMCW desensitization factor	EIRP (dBm)	Limit (dBm)	Margin (dB)	Remark	Result
58.01	-60.166	21.10	11.38	1.39	1	-0.79	-11.41	10.62	14.00	-3.38	Peak	Pass

Note:

1. Level=Reading - antenna Gain + mixer loss + cable
   EIRP=Level - desensitization factor
2. Follow Annex L of the C63.10-2020 standard.
   FMCW desensitization factor =20 * Log(α)

$$\alpha = \frac{1}{\left(1+\left[\left(\frac{2\times\ln(2)}{\pi}\right)^2\times\left(\frac{BW_{Chirp}}{T_{Chirp}\times RBW^2}\right)^2\right]\right)^{0.25}}$$

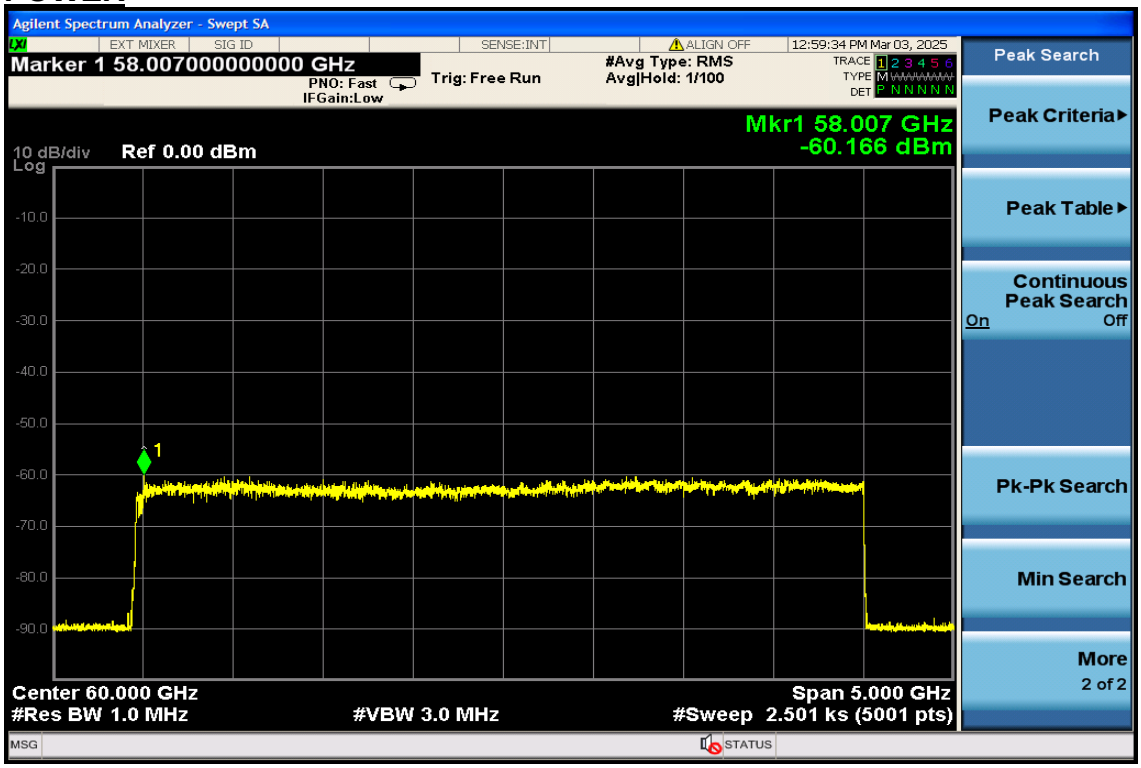
BW_{chirp}: follow report sec 2
T_{Chirp}: Follow manufacturer's declaration 128us
RBW:1MHz

3. $EIRP = 21.98-20\log(\lambda)+20\log(d_{Meas})+P-G$

where

$EIRP$	is the equivalent isotropic radiated power, in dBm
λ	is the wavelength of the emission under investigation【300/f(MHz)】, in m
d_{Meas}	is the measurement distance, in m
P	is the power measured at the output of the measurement antenna, in dBm
G	is the gain of the measurement antenna, in dBi

POWER



7.3 EMISSION BANDWIDTH

LIMIT

99% Occupied Bandwidth and 6dB Bandwidth are for reporting only.
Limit for 20 dB Bandwidth: Per Part 15.255(e), the device shall operate in the 57 – 64 GHz band.
The emission bandwidth (EBW) is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least the specified amount below the maximum level of the modulated carrier.

TEST PROCEDURE

1. Applies to Measurement of the fundamental emission using spectrum analyzer.
2. Set the maximum power setting and enable the EUT to FMCW mode.
3. The EUT is placed on a turntable with 1.5 meter respectively above ground.
4. The EUT is set 1 meters away from the receiving antenna, which is mounted on the top of a variable height antenna tower.
5. Use 50-75 GHz receiver antenna, mixer and spectrum analyzer.
6. The EUT is arranged to its worst case and then tune the antenna tower(antenna polarization adjustment) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
7. For 20dB and 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and Video bandwidth (VBW) is set 3MHz.
8. For 6dB Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 100kHz and Video bandwidth (VBW) is set 300kHz
9. Measure and record the results in the test report.

TEST RESULTS

Compliance.

Temperature:	24.3 ~ 24.8℃	**Test date:**	December 2, 2024 ~ February 27, 2025
Humidity:	56 ~ 59% RH	**Tested by:**	Tony Chao

Mode 1

20dB Occupied Bandwidth				
Freq(GHz)		**Limit Range (GHz)**	**OBW (MHz)**	**Test Result**
FL	60.48160515	**FL ≧ 57GHz**	**1030.409221**	**PASS**
FH	61.51201437	**FH ≦ 64GHz**		

20dBc

6dB Occupied Bandwidth			
Freq(GHz)		**Limit Range (GHz)**	**OBW (MHz)**
FL	60.47286431	**FL ≧ 57GHz**	**1026.955**
FH	61.49981926	**FH ≦ 64GHz**	

6dBc

Mode 2

20dB Occupied Bandwidth				
Freq(GHz)		**Limit Range (GHz)**	**OBW (MHz)**	**Test Result**
FL	57.95498795	**FL ≧ 57GHz**	**4053.409793**	**PASS**
FH	62.00839774	**FH ≦ 64GHz**		

20dBc

6dB Occupied Bandwidth			
Freq(GHz)		**Limit Range (GHz)**	**OBW (MHz)**
FL	58.00366169	**FL ≧ 57GHz**	**3999.91455**
FH	62.00357624	**FH ≦ 64GHz**	

6dBc

7.4 SPURIOUS EMISSIONS

7.4.1 Radiated Emissions

LIMIT

1. According to FCC PART 15.255(d), Radiated emissions below 40 GHz shall not exceed the field strength as shown in the following emissions table.

Frequency (MHz)	Field Strength (μV/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

2. Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm2 at a distance of 3 meters.
3. The levels of the spurious emissions shall not exceed the level of the fundamental emission.

Notes:

Calculate correction:
Power density (mW/m2)X 4π(r)2=P(mW)
P(mW)-20log(d)+104.77=dBuV/m
90 pW/cm^2 = 85.31 dBuV/m @ 3m
P: Power
r: measurement distance(m)

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

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

where

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

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

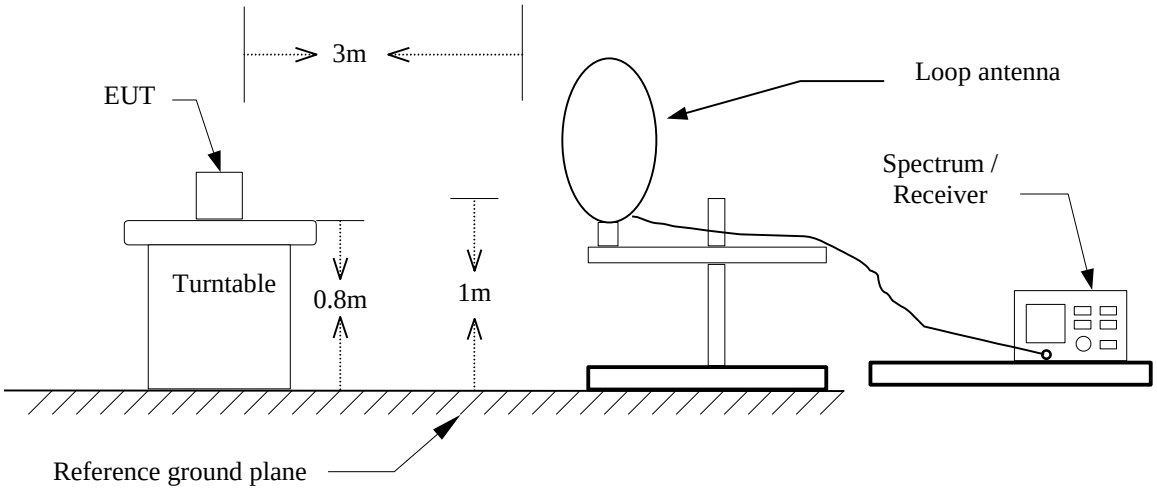
where

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

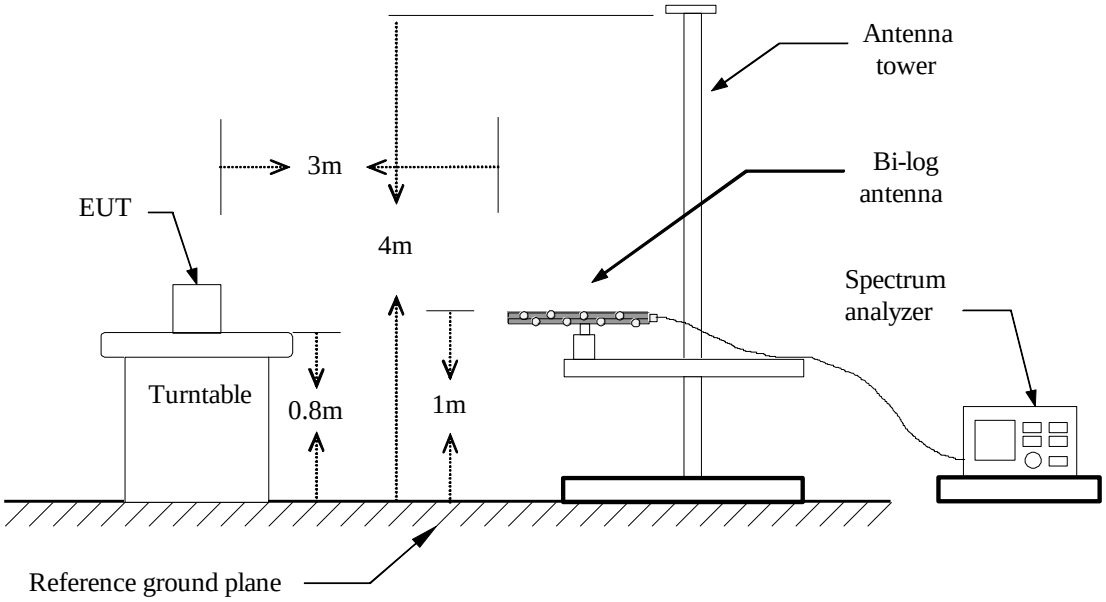
The Specified distance is 3m.

Test Configuration

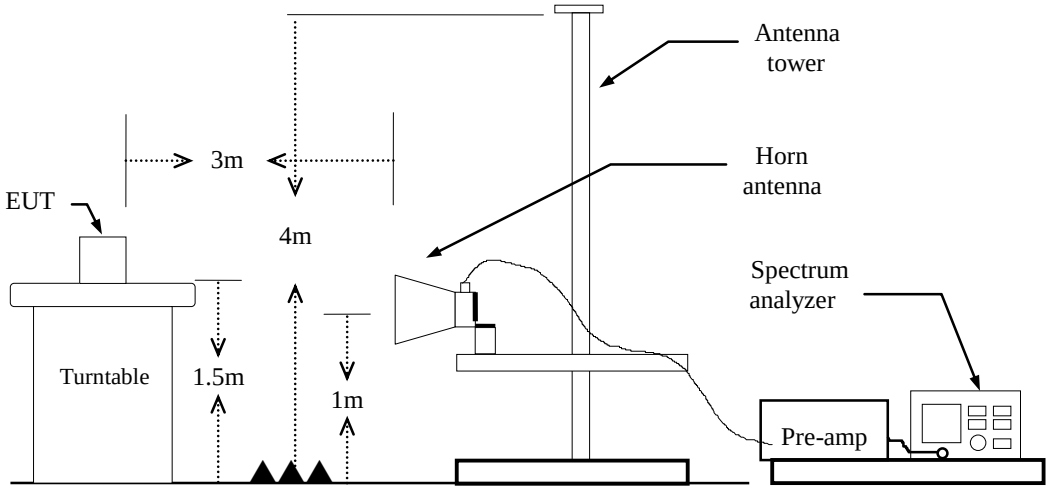
9kHz ~ 30MHz



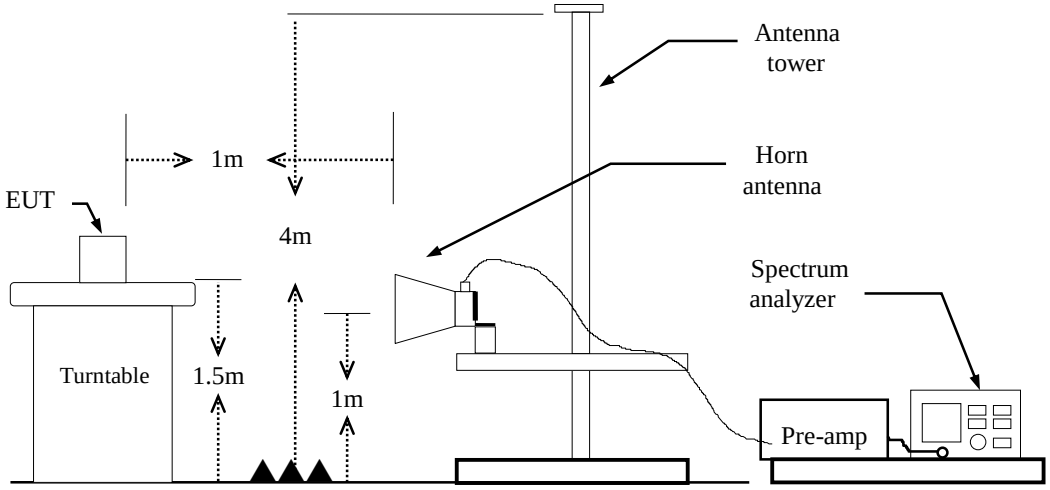
30MHz ~ 1 GHz



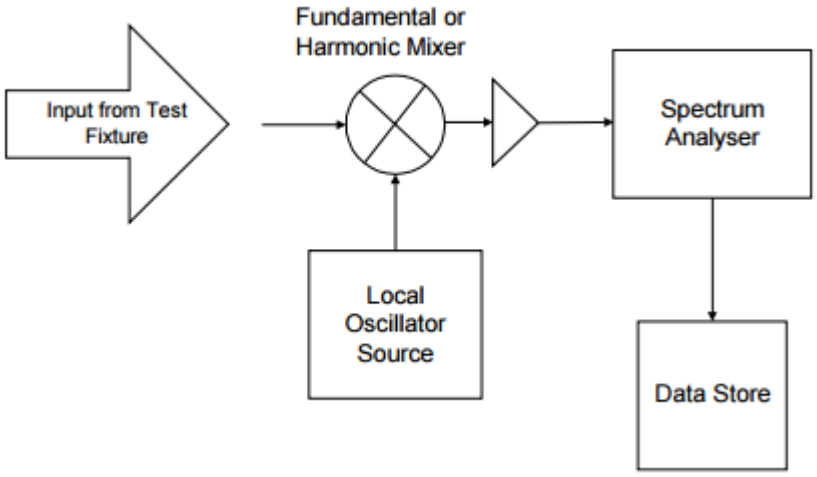
Above 1 GHz ~ 18GHz



18GHz ~ 40GHz



Above 40 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The system was investigated from 9kHz to 200 GHz.

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

Frequency Range	RBW	Video B/W
9kHz-150kHz	300 Hz	1 kHz
150 kHz-30MHz	10 kHz	30 kHz
30MHz-1000MHz	100 kHz	300 kHz
1-40GHz	1 MHz	3 MHz
Above 40GHz	1 MHz	3 MHz

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.

7. Repeat above procedures until the measurements for all frequencies are complete.
8. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
9. Radiated emission below 30MHz is measured in a 9m*6m*6m semi-ane choic chamber, the measurements correspond to those obtained at an open-field test site. There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

Below 1 GHz

Mode 1

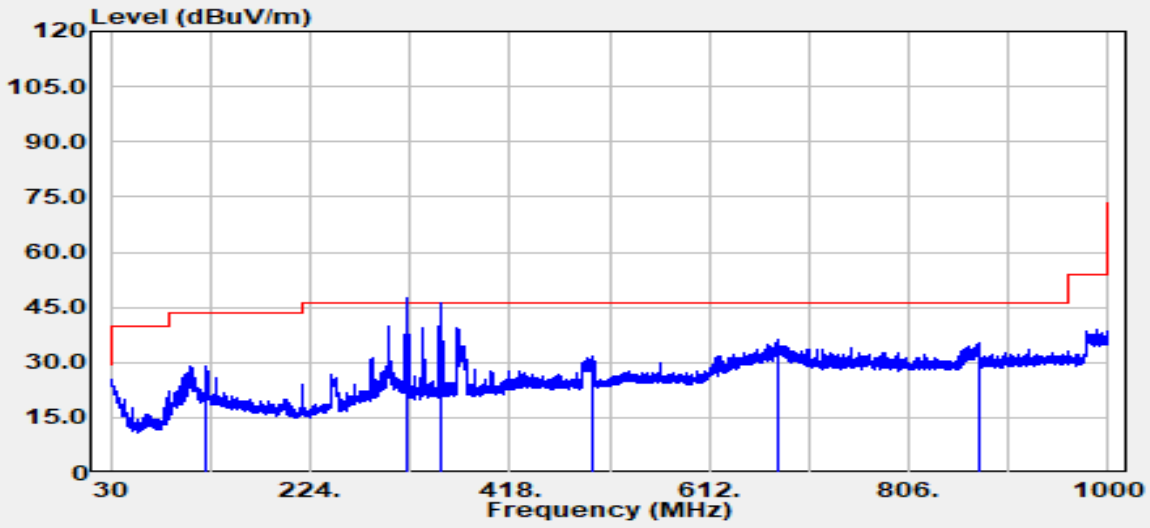
Test Mode:	TX	**Antenna Pol.:**	Vertical / Horizontal
Temperature:	24.6℃	**Test Date:**	December 2, 2024
Humidity:	57% RH	**Tested by:**	Tony Chao

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	Ant. Pol. (H/V)
123.00	Peak	38.69	-9.71	28.98	43.50	-14.52	V
317.24	QP	48.16	-8.96	39.20	46.00	-6.80	V
350.46	QP	43.52	-8.26	35.26	46.00	-10.74	V
498.51	Peak	36.02	-4.39	31.63	46.00	-14.37	V
678.81	Peak	37.59	-1.57	36.02	46.00	-9.98	V
874.02	Peak	33.94	1.50	35.44	46.00	-10.56	V
122.51	Peak	35.89	-9.66	26.22	43.50	-17.28	H
267.04	Peak	41.35	-9.88	31.48	46.00	-14.52	H
350.59	QP	45.49	-8.25	37.24	46.00	-8.76	H
527.00	Peak	38.86	-4.05	34.82	46.00	-11.18	H
707.55	Peak	38.11	-0.88	37.22	46.00	-8.78	H
874.63	Peak	36.64	1.50	38.14	46.00	-7.86	H

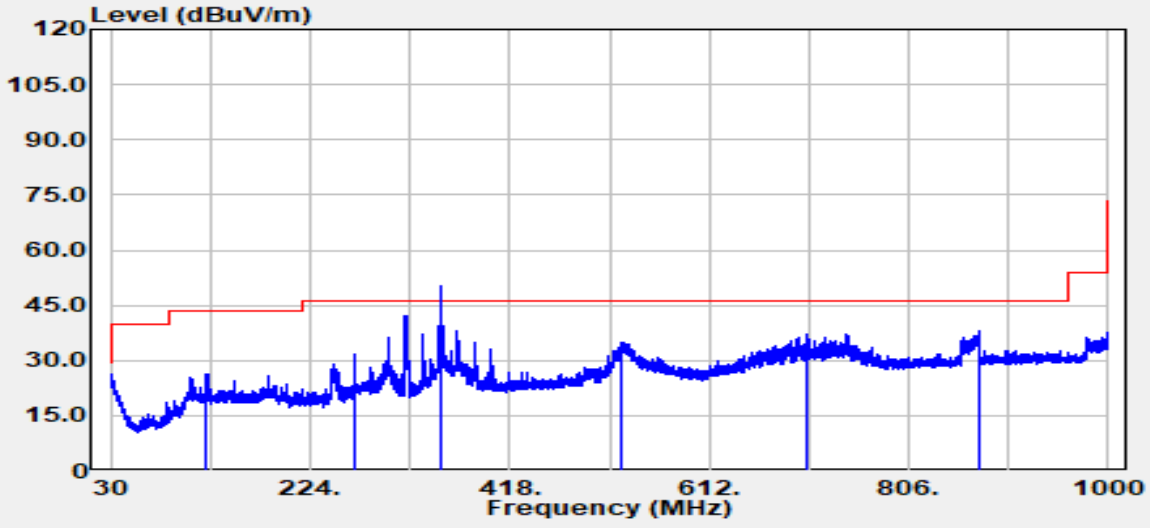
Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).
6. Factor=antenna factor-amp gain+ cable loss

Polarity : Vertical



Polarity : Horizontal



Mode 2

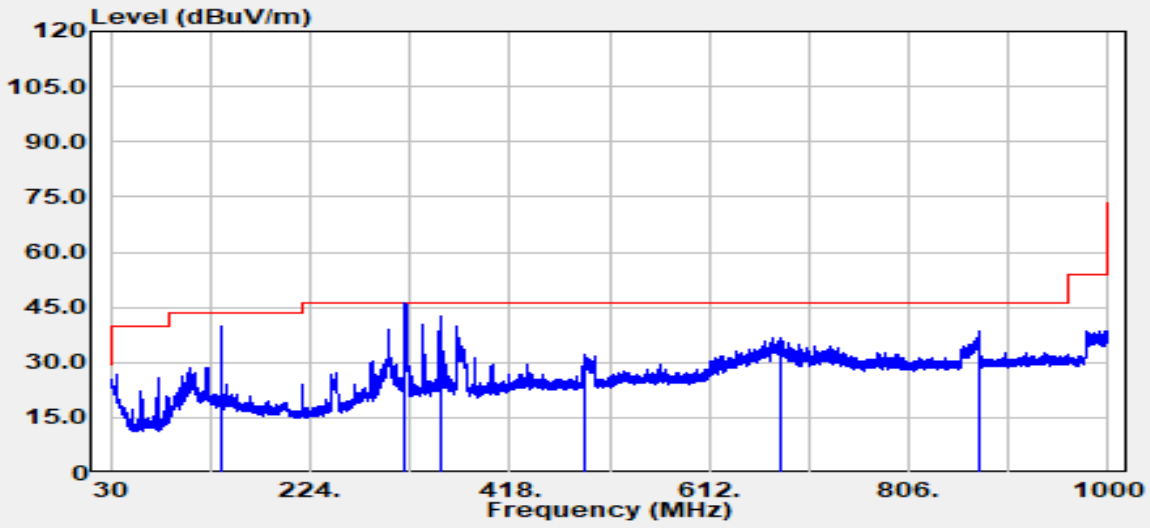
Test Mode:	TX	**Antenna Pol.:**	Vertical / Horizontal
Temperature:	24.6℃	**Test Date:**	December 2, 2024
Humidity:	57% RH	**Tested by:**	Tony Chao

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	Ant. Pol. (H/V)
137.19	Peak	50.21	-10.35	39.85	43.50	-3.65	V
316.76	QP	47.96	-8.95	39.01	46.00	-6.99	V
351.07	Peak	50.68	-8.23	42.45	46.00	-3.55	V
490.63	Peak	36.43	-4.49	31.94	46.00	-14.06	V
680.75	Peak	38.31	-1.51	36.80	46.00	-9.20	V
874.63	Peak	37.08	1.50	38.58	46.00	-7.42	V
122.88	Peak	37.96	-9.70	28.27	43.50	-15.23	H
317.36	Peak	53.85	-8.96	44.89	46.00	-1.11	H
351.07	QP	45.78	-8.23	37.55	46.00	-8.45	H
528.58	Peak	40.33	-3.96	36.36	46.00	-9.64	H
716.03	Peak	37.58	-0.82	36.76	46.00	-9.24	H
874.02	Peak	39.84	1.50	41.34	46.00	-4.66	H

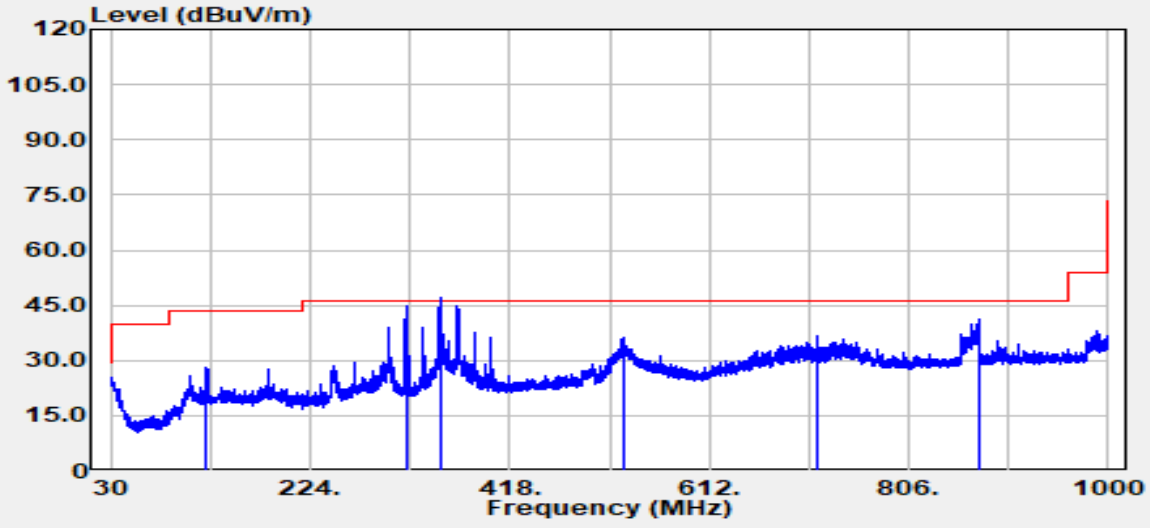
Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).
6. Factor=antenna factor-amp gain+ cable loss

Polarity : Vertical



Polarity : Horizontal



Co-Location

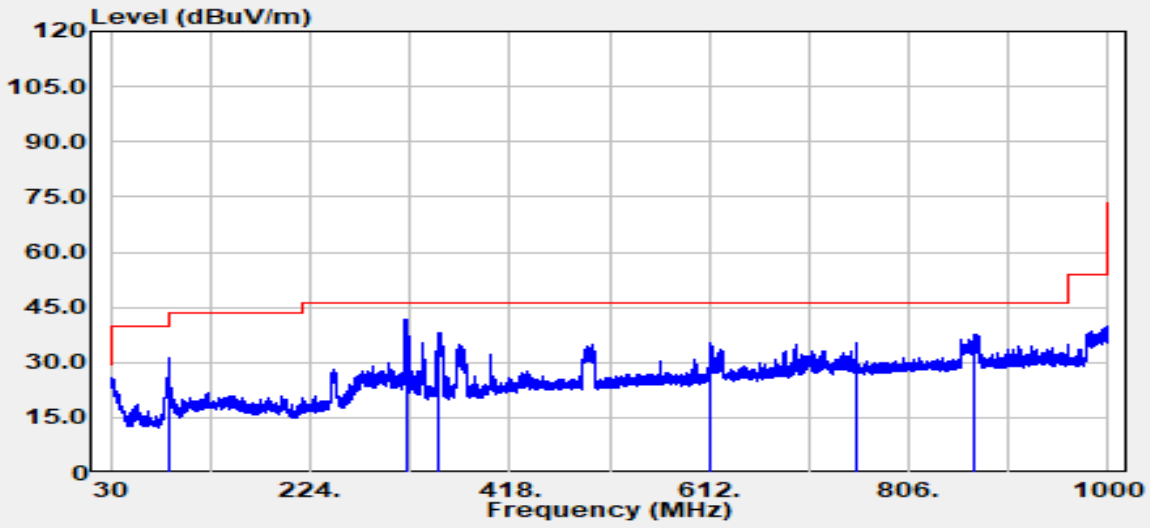
Test Mode:	TX	**Antenna Pol.:**	Vertical / Horizontal
Temperature:	24.7℃	**Test Date:**	December 31, 2024
Humidity:	58% RH	**Tested by:**	Ray Li

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	Ant. Pol. (H/V)
87.70	Peak	47.60	-16.39	31.20	40.00	-8.80	V
317.00	Peak	50.56	-8.96	41.61	46.00	-4.39	V
349.80	Peak	46.24	-8.29	37.95	46.00	-8.05	V
612.50	Peak	37.74	-2.59	35.16	46.00	-10.84	V
754.10	Peak	35.59	-0.25	35.34	46.00	-10.66	V
869.40	Peak	35.99	1.49	37.48	46.00	-8.52	V
199.90	Peak	40.81	-10.25	30.56	43.50	-12.94	H
316.60	Peak	47.22	-8.95	38.27	46.00	-7.73	H
349.90	Peak	46.16	-8.28	37.88	46.00	-8.12	H
399.40	Peak	44.80	-6.73	38.08	46.00	-7.92	H
711.70	Peak	41.00	-0.83	40.17	46.00	-5.83	H
874.50	Peak	37.88	1.50	39.38	46.00	-6.62	H

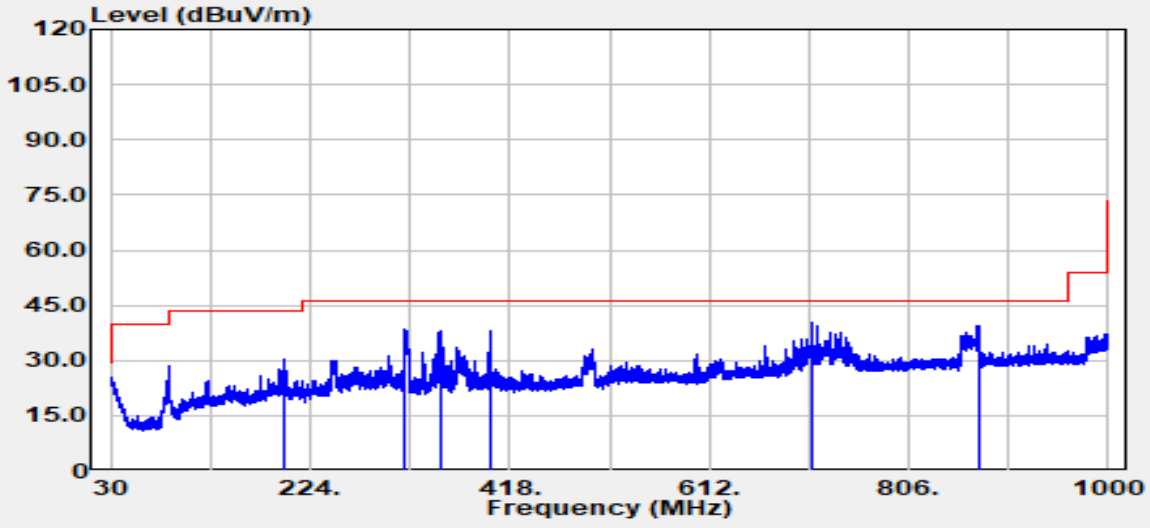
Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with “ N/A ” remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).
6. Factor=antenna factor-amp gain+ cable loss

Polarity : Vertical



Polarity : Horizontal



1 GHz ~ 40 GHz

Mode 1

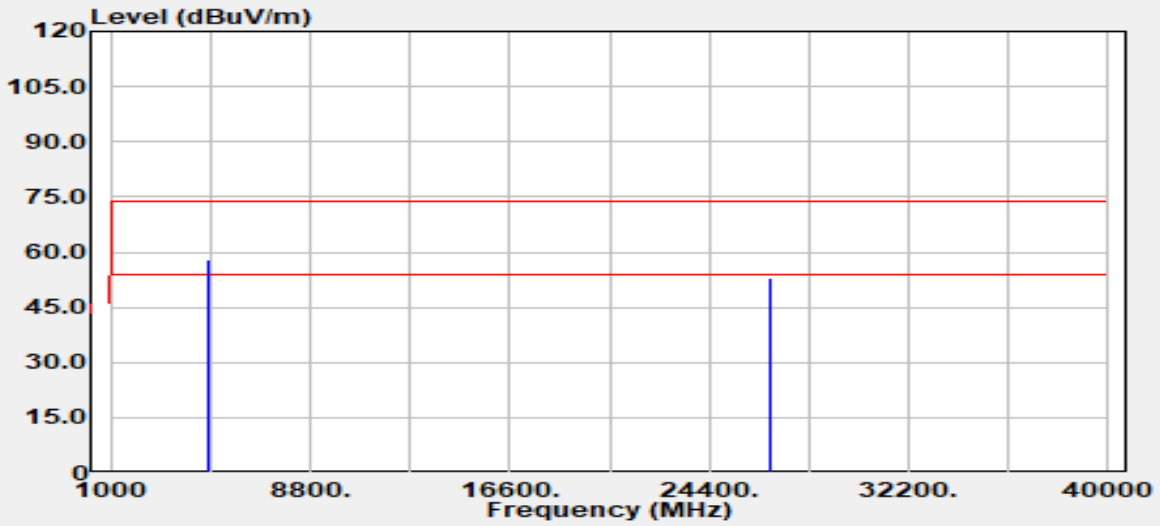
Test Mode:	TX	**Antenna Pol.:**	Vertical / Horizontal
Temperature:	24.6℃	**Test Date:**	December 2, 2024
Humidity:	57% RH	**Tested by:**	Tony Chao

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	Ant. Pol. (H/V)
4783.00	Peak	56.24	1.85	58.09	74.00	-15.91	V
4783.00	Average	45.05	1.85	46.90	54.00	-7.10	V
26815.00	Peak	49.99	3.16	53.15	74.00	-20.85	V
N/A							
4788.00	Peak	58.08	1.83	59.91	74.00	-14.09	H
4788.00	Average	47.83	1.83	49.66	54.00	-4.34	H
26761.00	Peak	49.96	2.94	52.90	74.00	-21.10	H
N/A							

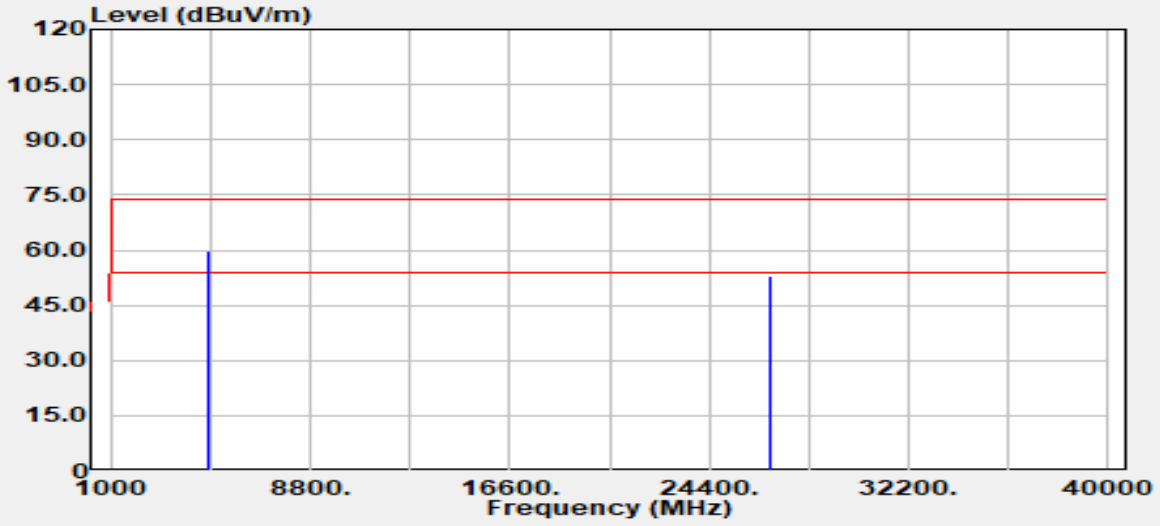
Remark:

1. Actual FS (dBuV/m) = Factor + Spectrum Reading Level
2. Margin (dB) = Actual FS – Limit
3. measurement distance: 3m@1-18G、measurement distance: 1m@18-40G
4. Factor:
Antenna factor+Cable loss -amp gain @1-18GHz
Antenna factor+Cable loss -amp gain + distance factor [20LOG(1/3)= -9.54]@18-40GHz
5. The measurement result is PK, but it also meets the RMS limit value.

Polarity : Vertical



Polarity : Horizontal



Mode 2

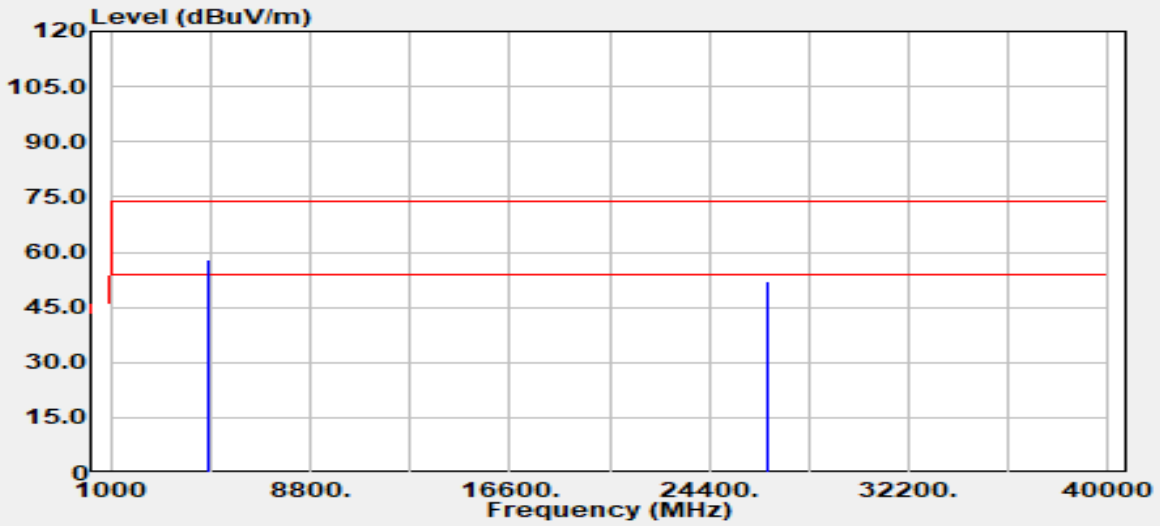
Test Mode:	TX	**Antenna Pol.:**	Vertical / Horizontal
Temperature:	24.6℃	**Test Date:**	December 2, 2024
Humidity:	57% RH	**Tested by:**	Tony Chao

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	Ant. Pol. (H/V)
4789.00	Peak	56.25	1.83	58.07	74.00	-15.93	V
4789.00	Average	44.64	1.83	46.46	54.00	-7.54	V
26719.00	Peak	49.82	2.47	52.29	74.00	-21.71	V
N/A							
4782.00	Peak	58.08	1.86	59.93	74.00	-14.07	H
4782.00	Average	46.54	1.86	48.40	54.00	-5.60	H
26732.00	Peak	49.64	2.60	52.24	74.00	-21.76	H
N/A							

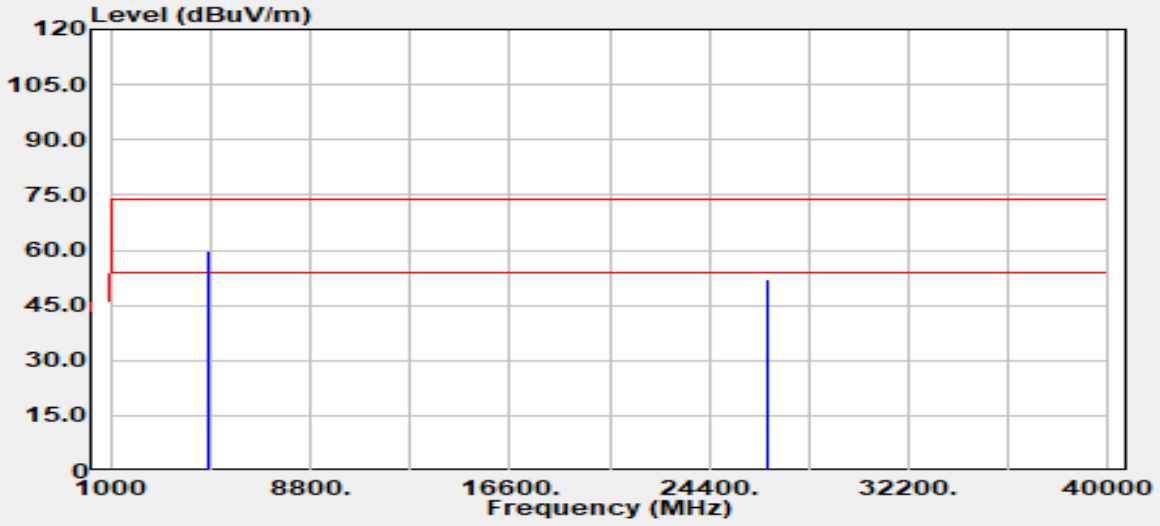
Remark:

1. Actual FS (dBuV/m) = Factor + Spectrum Reading Level
2. Margin (dB) = Actual FS – Limit
3. measurement distance: 3m@1-18G、measurement distance: 1m@18-40G
4. Factor:
Antenna factor+Cable loss -amp gain @1-18GHz
Antenna factor+Cable loss -amp gain + distance factor [20LOG(1/3)= -9.54]@18-40GHz
5. The measurement result is PK, but it also meets the RMS limit value.

Polarity : Vertical



Polarity : Horizontal



Co-Location

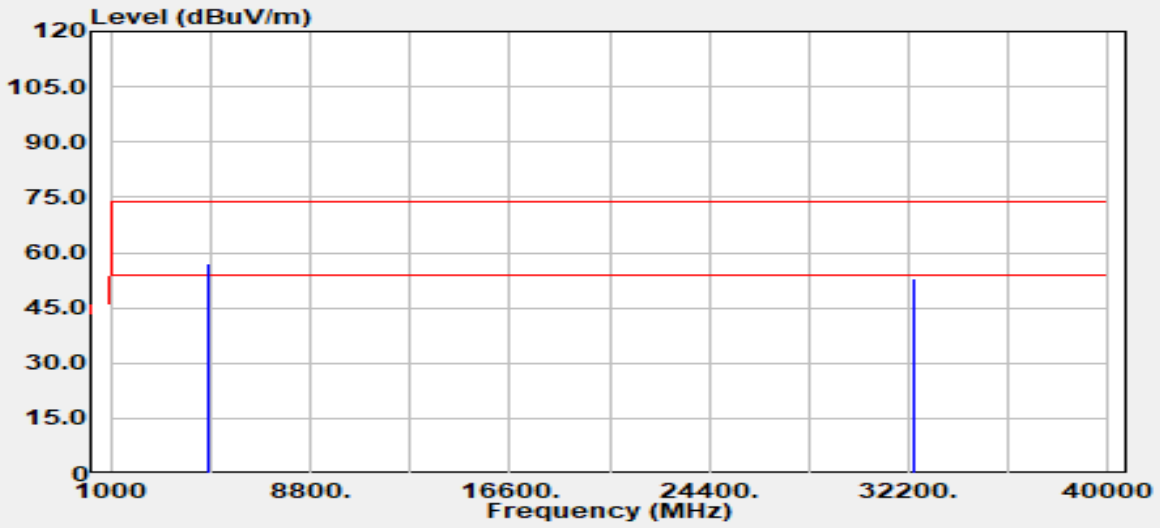
Test Mode:	TX	**Antenna Pol.:**	Vertical / Horizontal
Temperature:	24.7℃	**Test Date:**	December 31, 2024
Humidity:	58% RH	**Tested by:**	Ray Li

Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit @3m dBµV/m	Margin dB	Ant. Pol. (H/V)
4796.00	Peak	55.24	1.80	57.04	74.00	-16.96	V
4796.00	Average	44.11	1.80	45.91	54.00	-8.09	V
32412.59	Peak	48.23	4.66	52.89	74.00	-21.11	V
N/A							
4792.00	Peak	58.29	1.80	60.09	74.00	-13.91	H
4792.00	Average	47.36	1.80	49.17	54.00	-4.83	H
32193.88	Peak	48.99	3.51	52.49	74.00	-21.51	H
N/A							

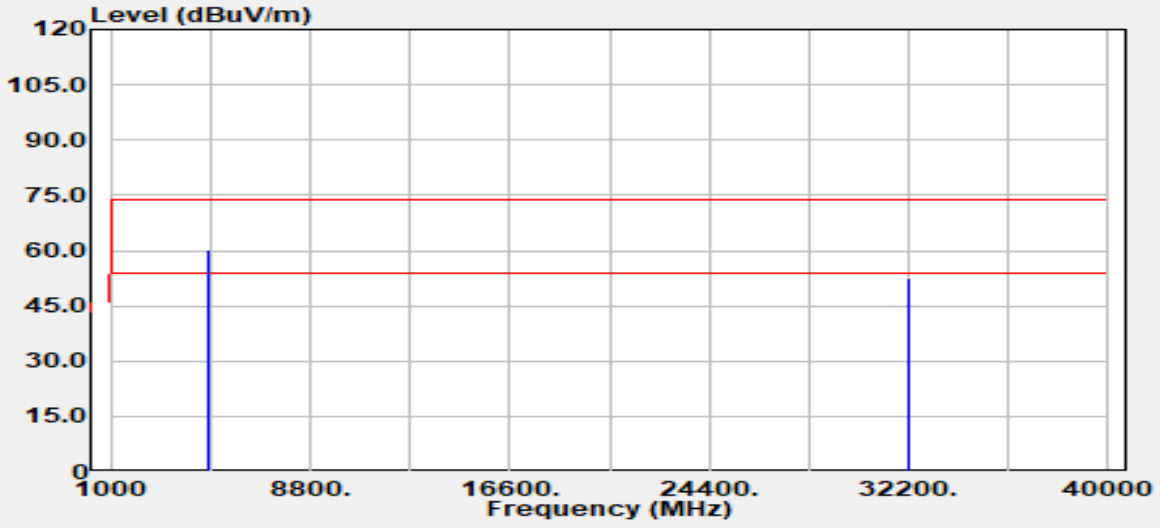
Remark:

1. Actual FS (dBuV/m) = Factor + Spectrum Reading Level
2. Margin (dB) = Actual FS – Limit
3. measurement distance: 3m@1-18G、measurement distance: 1m@18-40G
4. Factor:
Antenna factor+Cable loss -amp gain @1-18GHz
Antenna factor+Cable loss -amp gain + distance factor [20LOG(1/3)= -9.54]@18-40GHz
5. The measurement result is PK, but it also meets the RMS limit value.

Polarity : Vertical



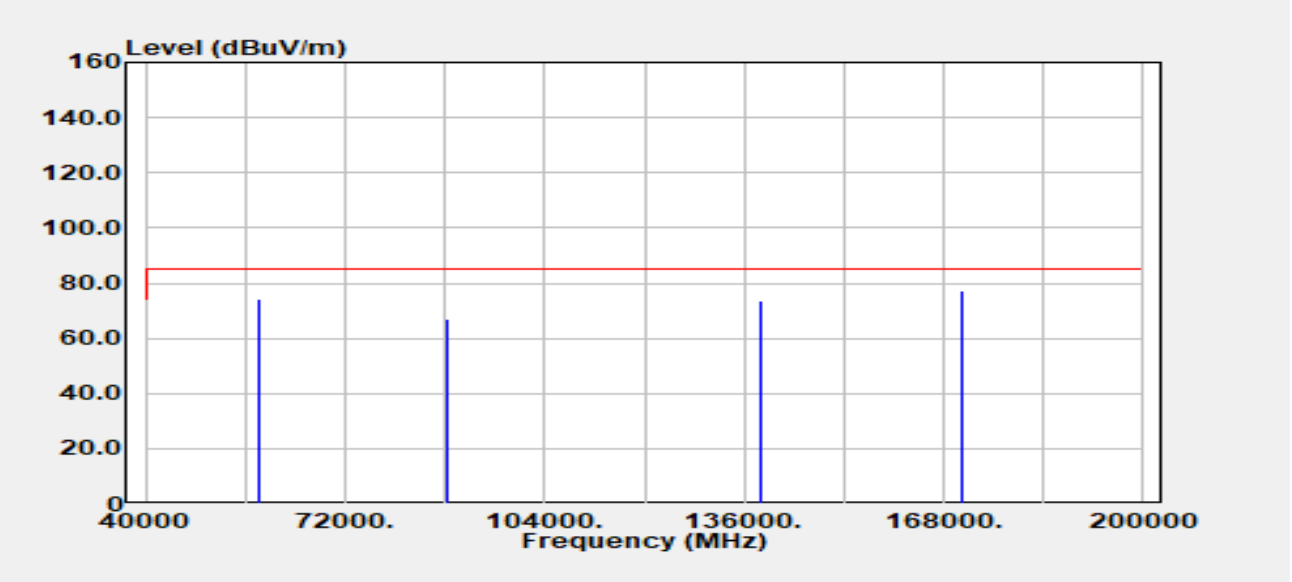
Polarity : Horizontal



40GHz~200GHz

Mode 1

Test Mode:	TX	**Antenna Pol.:**	Vertical
Temperature:	24.6℃	**Tested by:**	December 6, 2024
Humidity:	57% RH	**Test Date:**	Ray Li



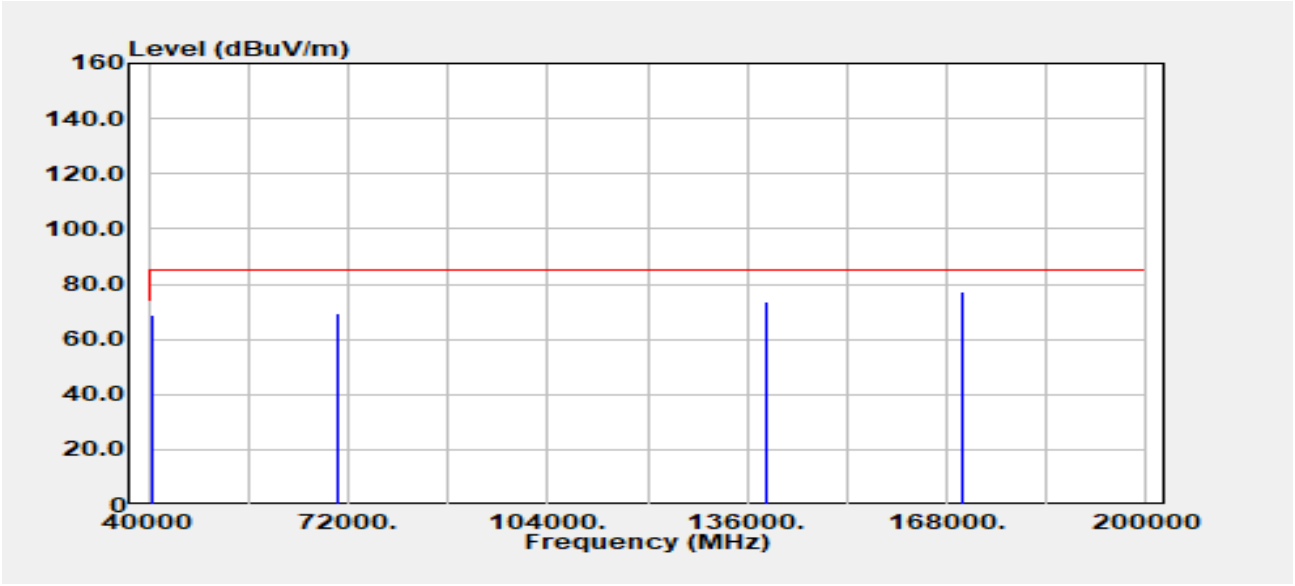
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit dBµV/m	Margin dB
58380.00	Peak	24.30	49.72	74.02	85.31	-11.29
88320.00	Peak	15.48	51.53	67.00	85.31	-18.30
138800.00	Peak	15.32	58.08	73.40	85.31	-11.91
171098.00	Peak	15.31	62.02	77.32	85.31	-7.99

Note:

1. Actual FS (dBuV/m) = Factor + Spectrum Reading Level
2. Margin (dB) = Actual FS – Limit
3. Factor = antenna factor+cable loss+mixer loss+ distance factor [20LOG(1/3)= -9.54]
4. Measurement distance: above 40G@1m
5. After pre-scanning, the worst mode (Pol: V) is recorded in the report.

Mode 2

Test Mode:	TX	**Antenna Pol.:**	Vertical
Temperature:	24.6℃	**Tested by:**	December 6, 2024
Humidity:	57% RH	**Test Date:**	Ray Li



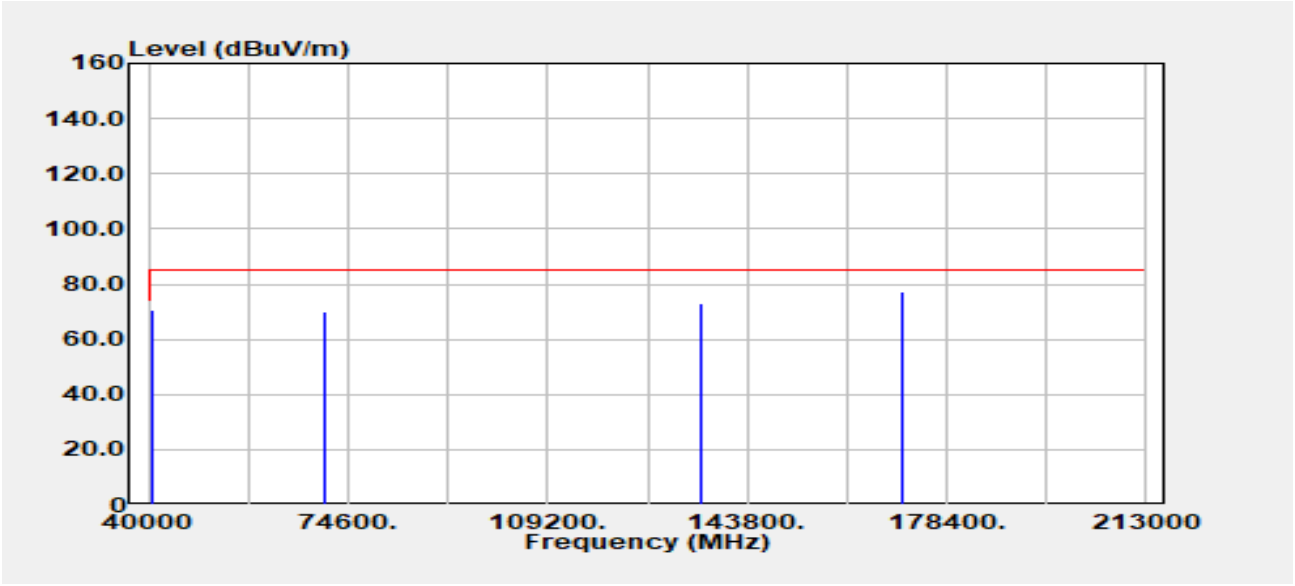
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit dBµV/m	Margin dB
40720.00	Peak	18.29	50.27	68.56	85.31	-16.74
70500.00	Peak	18.45	50.79	69.24	85.31	-16.07
139150.00	Peak	15.38	58.11	73.49	85.31	-11.81
170660.00	Peak	15.63	61.84	77.47	85.31	-7.83

Note:

1. Actual FS (dBuV/m) = Factor + Spectrum Reading Level
2. Margin (dB) = Actual FS – Limit
3. Factor = antenna factor+cable loss+mixer loss+ distance factor [20LOG(1/3)= -9.54]
4. Measurement distance: above 40G@1m
5. After pre-scanning, the worst mode (Pol: V) is recorded in the report.

Co-Location

Test Mode:	TX	**Antenna Pol.:**	Vertical
Temperature:	24.6℃	**Test Date:**	December 31, 2024
Humidity:	57% RH	**Tested by:**	Ray Li



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBµV	Factor dB	Actual FS dBµV/m	Limit dBµV/m	Margin dB
40800.00	Peak	20.29	50.45	70.74	85.31	-14.57
70380.00	Peak	19.30	50.88	70.18	85.31	-15.12
135900.00	Peak	15.58	57.61	73.18	85.31	-12.12
170660.00	Peak	15.73	61.84	77.57	85.31	-7.74

Note:

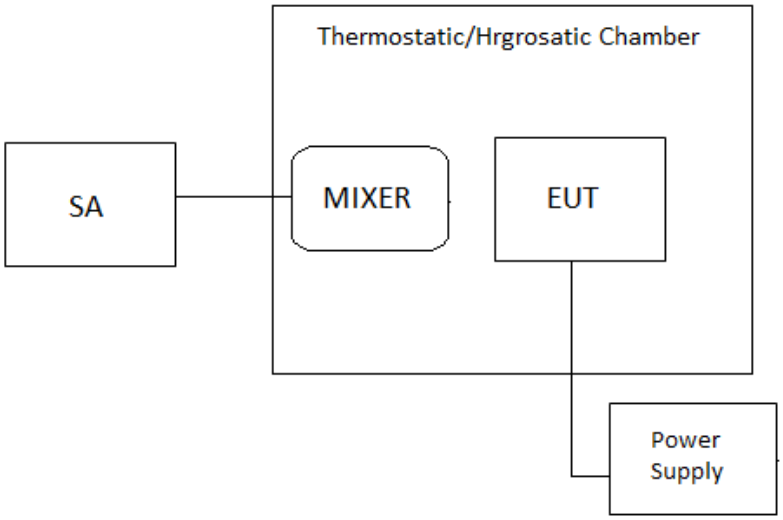
1. Actual FS (dBuV/m) = Factor + Spectrum Reading Level
2. Margin (dB) = Actual FS – Limit
3. Factor = antenna factor+cable loss+mixer loss+ distance factor [20LOG(1/3)= -9.54]
4. Measurement distance: above 40G@1m
5. After pre-scanning, the worst mode (Pol: V) is recorded in the report.

7.5 FREQUENCY STABILITY

LIMIT

According to FCC 15.255(f), Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range −20 to + 50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

Test Configuration



TEST PROCEDURE

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to –20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

TEST RESULTS

Compliance

Test Data

Temperature:	24.3 ~ 24.8℃	**Test date:**	December 2, 2024 ~ February 27, 2025
Humidity:	56 ~ 59% RH	**Tested by:**	Tony Chao

Mode 1

Temperature(°C)	Voltage(Vac)	FL(GHz)	FH(GHz)	Limit Range(GHz)	Test Result
55	120	60.503027384	61.495842451	57~64	PASS
50	120	60.504368642	61.495971322		PASS
40	120	60.502966631	61.495620380		PASS
30	120	60.502229894	61.495718669		PASS
20	120	60.502307620	61.497165225		PASS
10	120	60.502631813	61.498187856		PASS
0	120	60.504963477	61.497736212		PASS
-10	120	60.506357843	61.497879457		PASS
-20	120	60.505609851	61.497705300		PASS
Temperature(°C)	**Voltage(Vac)**	**FL(GHz)**	**FH(GHz)**	**Limit Range(GHz)**	**Test Result**
20	138	60.505073538	61.496804460	57~64	PASS
20	120	60.505660885	61.497002971		PASS
20	102	60.504915216	61.496963629		PASS

Note: The extreme voltage and extreme temperature is specified by the manufacturer

Mode 2

Temperature(°C)	Voltage(Vac)	FL(GHz)	FH(GHz)	Limit Range(GHz)	Test Result
55	120	58.004011971	61.976980782	57~64	PASS
50	120	58.011610800	61.979949066		PASS
40	120	58.015428454	61.981673837		PASS
30	120	58.009608232	61.980831003		PASS
20	120	58.005989469	61.991463915		PASS
10	120	58.007874264	61.990469281		PASS
0	120	58.020348507	61.991705705		PASS
-10	120	58.008812436	61.991843146		PASS
-20	120	58.012639945	61.984805184		PASS
Temperature(°C)	**Voltage(Vac)**	**FL(GHz)**	**FH(GHz)**	**Limit Range(GHz)**	**Test Result**
20	138	58.004559011	61.989806905	57~64	PASS
20	120	58.006142748	61.990928065		PASS
20	102	58.005701223	61.989889737		PASS

Note: The extreme voltage and extreme temperature is specified by the manufacturer

7.6 AC POWER LINE CONDUCTED EMISSION

7.6.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

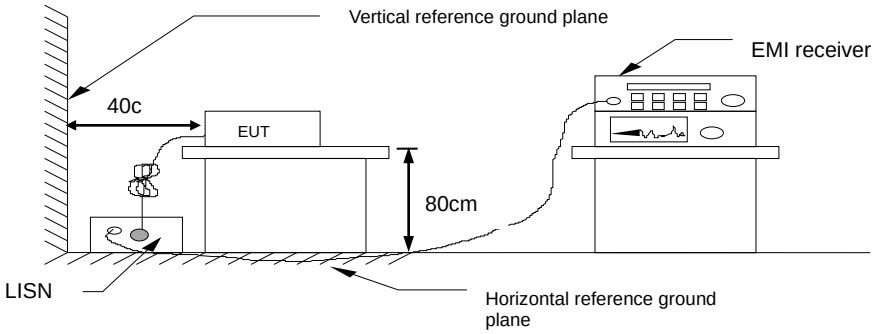
* Decreases with the logarithm of the frequency.

7.6.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

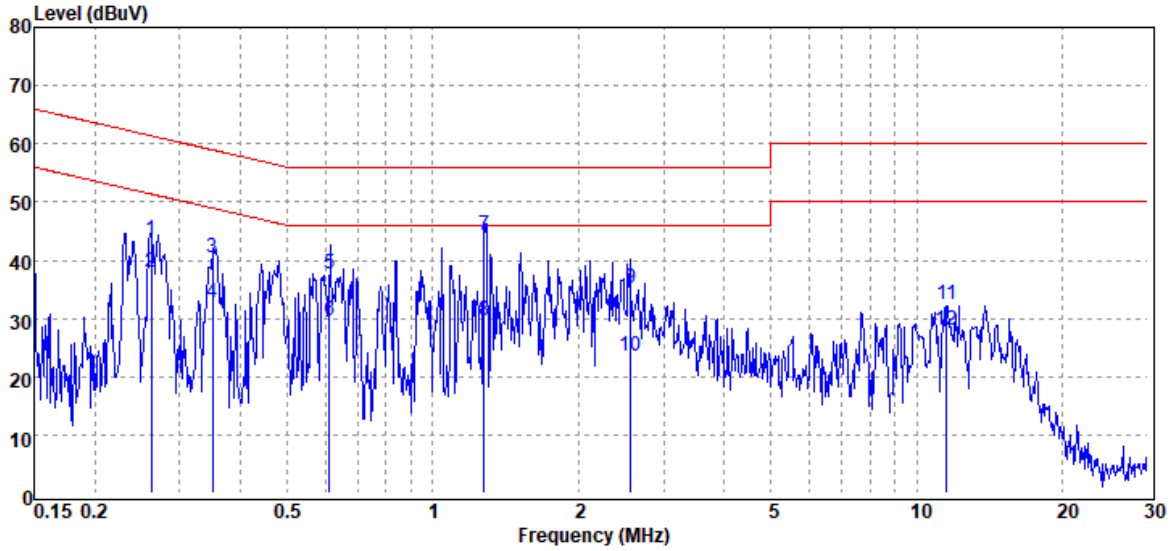
7.6.3 Test Setup



7.6.4 Test Result

Mode 1

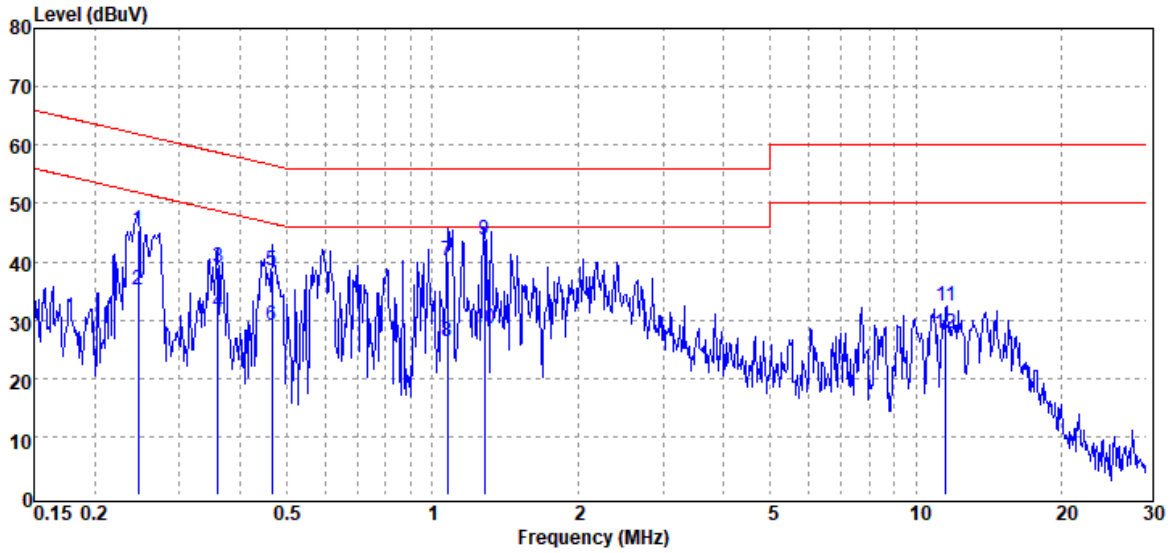
Project No	: TM-2411000343P	Test Date	: 2024-12-16
Operation Mode	: 60.5~61.5GHz	Temp./Humi.	: 23.4°C / 54%
Test Chamber	: Conduction	Engineer	: Ben Yang
Probe	: LINE	Test Voltage	: AC 120V/60Hz
Note	:		



Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.262	QP	43.01	0.39	43.40	61.37	-17.97
0.262	Average	37.61	0.39	38.00	51.37	-13.37
0.351	QP	40.09	0.38	40.47	58.94	-18.47
0.351	Average	32.31	0.38	32.69	48.94	-16.25
0.611	QP	37.19	0.38	37.57	56.00	-18.43
0.611	Average	29.32	0.38	29.70	46.00	-16.30
1.275	QP	44.17	0.16	44.33	56.00	-11.67
1.275	Average	29.55	0.16	29.71	46.00	-16.29
2.566	QP	34.92	0.20	35.12	56.00	-20.88
2.566	Average	23.41	0.20	23.61	46.00	-22.39
11.529	QP	32.06	0.38	32.44	60.00	-27.56
11.529	Average	27.47	0.38	27.85	50.00	-22.15

Note: 1. Actual FS= Spectrum Read Level + Factor
Note: 2. Margin= Actual FS - Limit

Project No	: TM-2411000343P	Test Date	: 2024-12-16
Operation Mode	: 60.5~61.5 GHz	Temp./Humi.	: 23.4°C / 54%
Test Chamber	: Conduction	Engineer	: Ben Yang
Probe	: NEUTRAL	Test Voltage	: AC 120V/60Hz
Note	:		

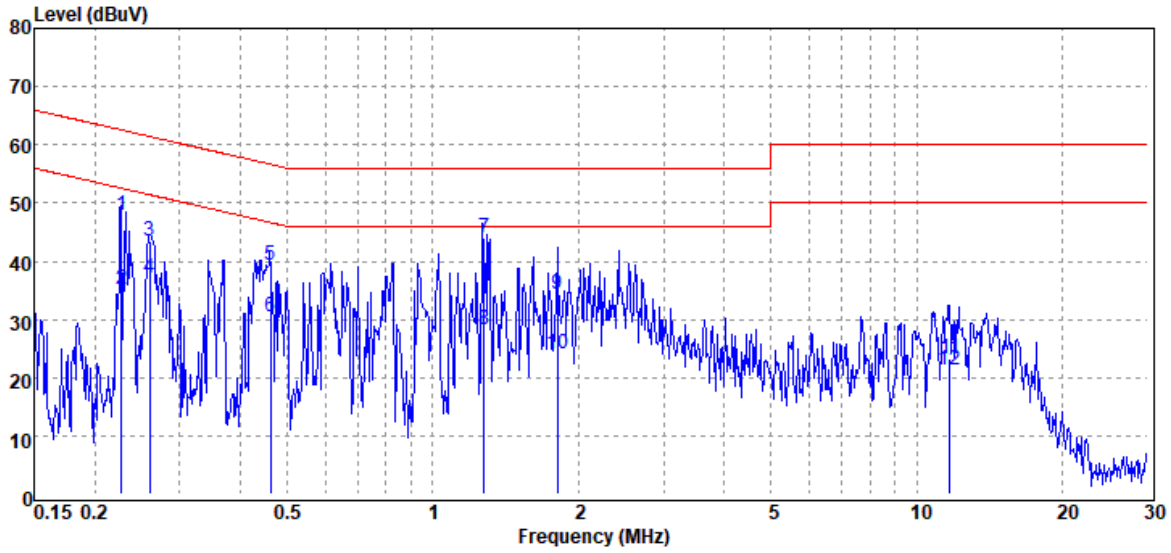


Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.247	QP	45.10	0.36	45.46	61.87	-16.41
0.247	Average	34.83	0.36	35.19	51.87	-16.68
0.360	QP	38.73	0.35	39.08	58.74	-19.66
0.360	Average	31.02	0.35	31.37	48.74	-17.37
0.465	QP	38.00	0.35	38.35	56.61	-18.26
0.465	Average	28.85	0.35	29.20	46.61	-17.41
1.075	QP	39.92	0.13	40.05	56.00	-15.95
1.075	Average	26.12	0.13	26.25	46.00	-19.75
1.281	QP	43.62	0.14	43.76	56.00	-12.24
1.281	Average	28.28	0.14	28.42	46.00	-17.58
11.532	QP	32.04	0.36	32.40	60.00	-27.60
11.532	Average	27.19	0.36	27.55	50.00	-22.45

Note: 1. Actual FS= Spectrum Read Level + Factor
Note: 2. Margin= Actual FS - Limit

Mode 2

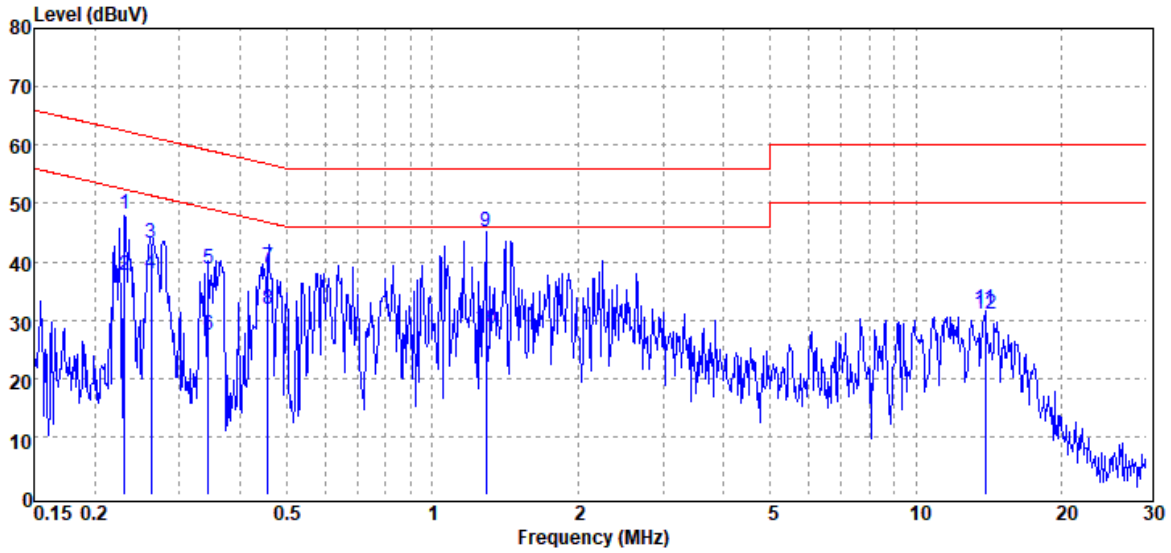
Project No	: TM-2411000343P	Test Date	: 2024-12-16
Operation Mode	: 58~62GHz	Temp./Humi.	: 23.4°C / 54%
Test Chamber	: Conduction	Engineer	: Ben Yang
Probe	: LINE	Test Voltage	: AC 120V/60Hz
Note	:		



Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.228	QP	47.63	0.39	48.02	62.54	-14.52
0.228	Average	34.66	0.39	35.05	52.54	-17.49
0.260	QP	43.03	0.39	43.42	61.43	-18.01
0.260	Average	36.60	0.39	36.99	51.43	-14.44
0.462	QP	38.82	0.38	39.20	56.65	-17.45
0.462	Average	30.16	0.38	30.54	46.65	-16.11
1.275	QP	43.89	0.16	44.05	56.00	-11.95
1.275	Average	28.19	0.16	28.35	46.00	-17.65
1.807	QP	34.02	0.18	34.20	56.00	-21.80
1.807	Average	24.02	0.18	24.20	46.00	-21.80
11.716	QP	22.77	0.38	23.15	60.00	-36.85
11.716	Average	20.81	0.38	21.19	50.00	-28.81

Note: 1. Actual FS= Spectrum Read Level + Factor
Note: 2. Margin= Actual FS - Limit

Project No	: TM-2411000343P	Test Date	: 2024-12-16
Operation Mode	: 58~62GHz	Temp./Humi.	: 23.4°C / 54%
Test Chamber	: Conduction	Engineer	: Ben Yang
Probe	: NEUTRAL	Test Voltage	: AC 120V/60Hz
Note	:		



Freq.	Detector Mode	Spectrum Read Level	Factor	Actual FS	Limit	Margin
MHz	PK/QP/AV	dBµV	dB	dBµV	dBµV	dB
0.231	QP	47.86	0.36	48.22	62.42	-14.20
0.231	Average	37.39	0.36	37.75	52.42	-14.67
0.262	QP	42.82	0.36	43.18	61.38	-18.20
0.262	Average	37.51	0.36	37.87	51.38	-13.51
0.344	QP	38.50	0.35	38.85	59.11	-20.26
0.344	Average	27.00	0.35	27.35	49.11	-21.76
0.457	QP	38.67	0.35	39.02	56.75	-17.73
0.457	Average	31.51	0.35	31.86	46.75	-14.89
1.291	QP	44.85	0.14	44.99	56.00	-11.01
1.291	Average	28.27	0.14	28.41	46.00	-17.59
13.909	QP	31.55	0.38	31.93	60.00	-28.07
13.909	Average	30.67	0.38	31.05	50.00	-18.95

Note: 1. Actual FS= Spectrum Read Level + Factor
Note: 2. Margin= Actual FS - Limit

- End of Test Report -