

RF Test Report

Applicant : Framery Oy
Product Name : Core Unit
Trade Name : Framery
Model Number : 9010673
Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2020
Received Date : Jun. 18, 2025
Test Period : Jul. 21, 2025 ~ Aug. 04, 2025
Issued Date : Apr. 15, 2026

Issued by

Eurofins E&E Wireless Taiwan Co., Ltd.
No. 140-1, Changan Street, Bade District,
Taoyuan City, Taiwan (R.O.C.)
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330
Frequency Range: 9 kHz to 325 GHz
Bade test site :
Test Firm Registration Number: 226252
Test Firm Designation Number: TW0010
Wugu test site :
Test Firm Registration Number: 191812
Test Firm Designation Number: TW0034

Note:

1. The test results are valid only for samples provided by customers and under the test conditions described in this report.
2. This report shall not be reproduced except in full, without the written approval of Eurofins E&E Wireless Taiwan Co., Ltd.
3. The relevant information is provided by customers in this test report. According to the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error in the information which affects the validity of the test results, the laboratory does not take the responsibility.

Revision History

Rev.	Issued Date	Description	Revised by
00	Apr. 15, 2026	Initial Issue	Snow Wang

Verification of Compliance

Applicant : Framery Oy

Product Name : Core Unit

Trade Name : Framery

Model Number : 9010673

FCC ID : 2AX4J9010673

Applicable Standard : FCC 47 CFR PART 15 SUBPART C
ANSI C63.10:2020

Test Result : Complied

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Eurofins E&E Wireless Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Eurofins E&E Wireless Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Approved By : _____

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1 General Information

1.1. Summary of Test Result

FCC Standard	Item	Result	Remark
15.207	AC Power Conducted Emission	PASS	-----
15.205, 15.209	Transmitter Radiated Emissions (Below 40 GHz)	PASS	-----
15.255(d)	Transmitter Radiated Emissions (Above 40 GHz)	PASS	-----
15.255(c)(1)(i)	EIRP (Peak & Avg)	PASS	-----
15.255(e)	Peak Conducted Output Power	PASS	-----
2.1049	99% Occupied Bandwidth	Reference only	-----
15.215 (c)	20 dB Emission Bandwidth	PASS	-----
15.255(f)	Frequency Stability	PASS	-----
15.203	Antenna Requirement	PASS	-----

Standard	Description
CFR47, Part 15, Subpart C	Intentional Radiators
ANSI C63.10: 2020	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 364244 D01 Meas 15.255 Radars v01r01	FIELD DISTURBANCE SENSORS AND RADAR DEVICES CERTIFYING UNDER THE PROVISIONS OF §15.255
CFR47, Part 15, Subpart C	Intentional Radiators

Decision Rule

- ☒ Uncertainty is not included.
- ☐ Uncertainty is included.

1.2. Testing Location

Lab Name: Eurofins E&E Wireless Taiwan Co., Ltd.
Site Address: ☒ No. 140-1, Changan Street, Bade District, Taoyuan City, Taiwan (R.O.C.)
Site Address: ☐ No. 2, Wuquan 5th Rd. Wugu Dist., New Taipei City, Taiwan (R.O.C.)

1.3. Measurement Uncertainty

Test Item	Frequency	Uncertainty				
		BD		WG		
Conducted Emission	150 kHz ~ 30 MHz	2.7 dB		2.6 dB		
Test Item	Frequency	Uncertainty				
		96601-BD	96603-BD	96602-WG	96603-WG	96604-WG
Radiated Emission	9 kHz ~ 30 MHz	1.8 dB	1.8 dB	1.9 dB	1.9 dB	1.9 dB
	30 MHz ~ 1000 MHz	4.7 dB	4.7 dB	4.7 dB	4.7 dB	4.5 dB
	1000 MHz ~ 18000 MHz	4.7 dB	4.8 dB	4.6 dB	4.7 dB	5.1 dB
	18000 MHz ~ 26500 MHz	4.0 dB	4.1 dB	3.9 dB	4.1 dB	4.3 dB
	26500 MHz ~ 40000 MHz	4.2 dB	4.2 dB	4.2 dB	4.2 dB	4.6 dB
	40000 MHz ~ 325000 MHz	3.0 dB	3.0 dB	3.0 dB	3.0 dB	2.9 dB

1.4. Test Site Environment

Items	Required (IEC 60068-1)	Interval(*)
Temperature (°C)	15-35	20-30
Humidity (%RH)	25-75	45-75

(*)The measurement ambient temperature is within this range.

2 EUT Description

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity(except Max. RF Output Power, Max. EIRP).

Applicant	Framery Oy Patamaenkatu 7, Tampere 33900, Finland		
Product Name	Core Unit		
Trade Name	Framery		
Model Number	9010673		
FCC ID	2AX4J9010673		
Frequency Range	60 - 64 GHz		
Modulation Type	FMCW		
Number of Channel	1 CH		
Operate Temp. Range	-15 ~ +35 °C		
EUT Power Rating	24 Vdc		
Max. EIRP	Peak	4.85 dBm	
Max. RF Output Power	Peak Conducted	-0.35 dBm	

Note. Only radiated measurements are used to show compliance with FCC/IC limits for fundamental and spurious emissions.

Testing Sample No.	
Test Item	Sample Number
Radiated Emissions	C256245_A003
Conducted	C256245_A003

3 Test Methodology

3.1. Mode of Operation

Decision of Test Eurofins has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Pre-Test Mode	Final-Test Mode
SRD_60-64 GHz	V

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

Power settings configuration:

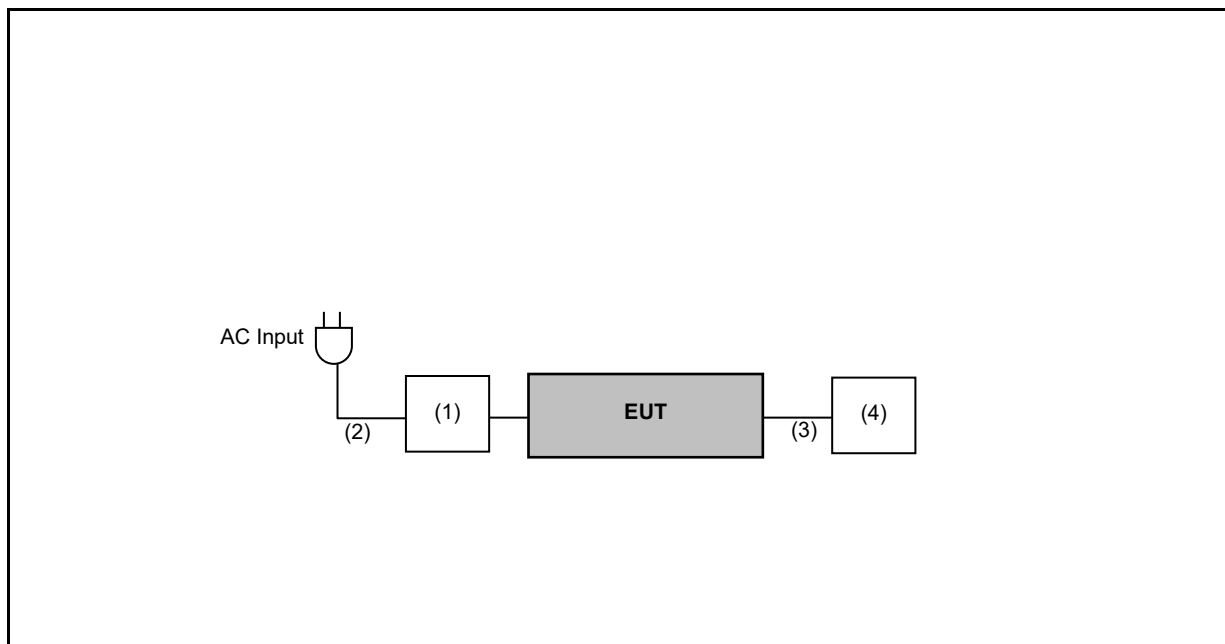
Test Mode	Frequency (GHz)	RF Power setting in Test Software	Test Software Version
SRD_60-64 GHz	60.984	31	Engineering Mode

3.2. EUT Test Step

1	Setup the EUT shown on "Configuration of Test System Details".
2	Turn on the power of EUT.

3.3. Configuration of Test System Details

Radiated Emission



	Product	Manufacturer	Model Number	Serial Number	Note
(1)	Power Unit	Framery	9004252	---	---
(2)	Power cable (2pin to 2pin)	Mekoprint	9007337	---	---
(3)	HDMI Cable	Mekoprint	9007337	---	---
(4)	Touch Screen	Framery	9007015	---	---

3.4. Test Instruments

For Conducted Emission
Test Period: Aug. 04, 2025
Testing Engineer: Jayson Hsieh

Test Site		Conduction01-BD				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
☒	Test Receiver	R&S	ESCI	100367	May 26, 2025	1 year
☐	Test Receiver	R&S	ESCI	100722	Oct. 26, 2023	1 year
☐	Test Receiver	R&S	ESCI	101000	Nov. 23, 2023	1 year
☒	LISN	R&S	ENV216	101040	Feb. 26, 2025	1 year
☐	LISN	R&S	ENV216	101140	Jan. 15, 2024	1 year
☒	RF Cable	Woken	00100D1380194M	TE-02-03	Jun. 10, 2025	1 year
☒	Software	EZ EMC	1.1.4.3	N/A	N.C.R.	---

☒ means with testing used ;

☐ means without testing used

Note: N.C.R. = No Calibration Request.

For Conducted
Test Period: Jul. 31, 2025 ~ Aug. 01, 2025
Testing Engineer: John Chen, Peter Shui

Test Site		RF01-BD				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
☒	Spectrum Analyzer (3 Hz~50 GHz)	Agilent	N9030A	MY53120541	Mar. 07, 2025	1 year
☒	Temperature & Humidity Chamber	TAICHY	MHU-225LA	980729	Mar. 26, 2025	1 year
☒	True RMS Multimeter	FLIKE	87V	15530240	Jun. 16, 2023	1 year
☒	Power Supply	KEITHLEY	2303	4045290	Jan. 03, 2025	1 year
☒	Millimeter-Wave Signal Analyzer Frequency Extension Module (50-75GHz)	VDI	N9029AV15 (SAX 410)	US54250165	Aug. 23, 2023	2 years
☒	Std Gain Horn Antenna Std Gain (50-75GHz)	VDI	N9029AH15 (WR15)	WR15-01	Aug. 22, 2023	2 years

Note: N.C.R. = No Calibration Request.

For Radiated Emissions

Test Period: Jul. 21, 2025 ~ Jul. 25, 2025

Testing Engineer: Bruce Chen

Test Site		96603-BD				
Radiation test sites		Semi Anechoic Room				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
☐	Spectrum Analyzer (10 Hz~44 GHz)	Keysight	N9010A	MY52221312	Jan. 04, 2024	1 year
☒	Spectrum Analyzer (3 Hz~50 GHz)	Agilent	N9030A	MY53120541	Mar. 07, 2025	1 year
☐	Spectrum Analyzer (2 Hz~50 GHz)	Keysight	N9030B	MY57143537	Apr. 18, 2023	1 year
☒	Spectrum Analyzer (10 Hz~44 GHz)	Keysight	N9020B	MY60112363	Jan. 13, 2025	1 year
☒	Amplifier (100 kHz~1.3 GHz)	Agilent	8447D	2944A11119	Jan. 14, 2025	1 year
☐	Amplifier (100 kHz~1.3 GHz)	Agilent	8447D	2944A10961	Jul. 10, 2023	1 year
☐	Broadband Amplifier (100 kHz~1 GHz)	Titan	T0910E000143 30A1F	001	Jul. 31, 2024	1 year
☐	Amplifier (1 GHz~26.5 GHz)	Agilent	8449B	3008A02237	Oct. 30, 2024	1 year
☐	Pre Amplifier (1~26.5 GHz)	Agilent	8449B	3008A02455	Jul. 10, 2024	1 year
☒	Broadband Amplifier (1 GHz~26.5 GHz)	Titan	T0912E012630 25A1F	002	Jul. 31, 2024	1 year
☒	Preamplifier (26.5 GHz~40 GHz)	EMCI	EMC2654045	980028	Sep. 02, 2024	1 year
☐	Loop Antenna (9 kHz~30 MHz)	COM-POWER CORPORATION	AL-130	121014	Mar. 27, 2025	1 year
☐	Active Loop Antenna (9 kHz~30 MHz)	Schwarzbeck Mess-Elektronik	FMZB 1513-60	1513-60-031	Feb. 23, 2024	1 year
☐	Trilog Broadband Antenna (30 kHz~1 GHz)	Schwarzbeck Mess-Elektronik	VULB9168	01146	Jun. 26, 2025	1 year
☒	Trilog Broadband Antenna (30 kHz~1 GHz)	Schwarzbeck Mess-Elektronik	VULB9168	416	Jun. 19, 2025	1 year
☒	Broadband Horn Antenna (1 GHz~18 GHz)	Schwarzbeck Mess-Elektronik	9120D	02207	Aug. 30, 2024	1 year
☐	Broadband Horn Antenna (1 GHz~18 GHz)	Schwarzbeck Mess-Elektronik	9120D	9120D-550	Jul. 22, 2024	1 year
☒	Broadband Horn Antenna (18 GHz~40 GHz)	Schwarzbeck Mess-Elektronik	9170	9170-320	Jul. 22, 2024	1 year
☐	Horn Antenna (18 GHz~40 GHz)	ETS	3116	00086467	Dec. 05, 2024	1 year

☒ means with testing used ;

☐ means without testing used

Note: N.C.R. = No Calibration Request.

For Radiated Emissions

Test Period: Jul. 21, 2025 ~ Jul. 25, 2025

Testing Engineer: Bruce Chen

Test Site		96603-BD				
Radiation test sites		Semi Anechoic Room				
Use	Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Cal. Period
☒	Coaxial Cable	Titan	T0710AT327A 10A100	J11006	Aug. 08, 2024	1 year
☒	Coaxial Cable	Titan	T0710AT327A 10A900	J11003	Aug. 08, 2024	1 year
☒	Coaxial Cable	Titan	EMCCFD400- NM-NM-13000	210302	Aug. 08, 2024	1 year
☒	Millimeter-Wave Signal Analyzer Frequency Extension Module (50- 75GHz)	VDI	N9029AV15 (SAX 410)	US54250165	Aug. 23, 2023	2 years
☒	Millimeter-Wave Signal Analyzer Frequency Extension Module (60- 90GHz)	VDI	N9029AV12 (SAX 409)	US54250171	Aug. 23, 2023	2 years
☒	Millimeter-Wave Signal Analyzer Frequency Extension Module (90- 140GHz)	VDI	N9029AV08 (SAX 406)	US53250013	Aug. 24, 2023	2 years
☒	Millimeter-Wave Signal Analyzer Frequency Extension Module (140-220GHz)	VDI	N9029AV05 (SAX 407)	US53250020	Aug. 28, 2023	2 years
☒	Millimeter-Wave Signal Analyzer Frequency Extension Module (220-330GHz)	VDI	N9029AV03 (SAX 408)	US53250022	Aug. 28, 2023	2 years
☒	Horn Antenna (33-50GHz)	QuinStar	QWH-QPRR00	1231900027	Aug. 21, 2023	2 years
☒	Std Gain Horn Antenna Std Gain (50-75GHz)	VDI	N9029AH15 (WR15)	WR15-01	Aug. 22, 2023	2 years
☒	Std Gain Horn Antenna Std Gain (60-90GHz)	VDI	N9029AH12 (WR12)	WR12-01	Aug. 22, 2023	2 years
☒	Std Gain Horn Antenna Std Gain (90-140GHz)	VDI	N9029AH08 (WR8.0)	WR08-01	Aug. 22, 2023	2 years
☒	Std Gain Horn Antenna Std Gain (140- 220GHz)	VDI	N9029AH05 (WR5.0)	WR05-01	Aug. 28, 2023	2 years
☒	Std Gain Horn Antenna Std Gain (220- 330GHz)	VDI	N9029AH03 (WR3.4)	WR3.4-01	Aug. 28, 2023	2 years
☒	Power Supply	KEITHLEY	2303	4045290	Jan. 03, 2025	1 year
☐	Software	EZ EMC	1.1.4.4	N/A	N.C.R.	---
☒	Software	R_RAN	1.4	N/A	N.C.R.	---

☒ means with testing used ;

☐ means without testing used

Note: N.C.R. = No Calibration Request.

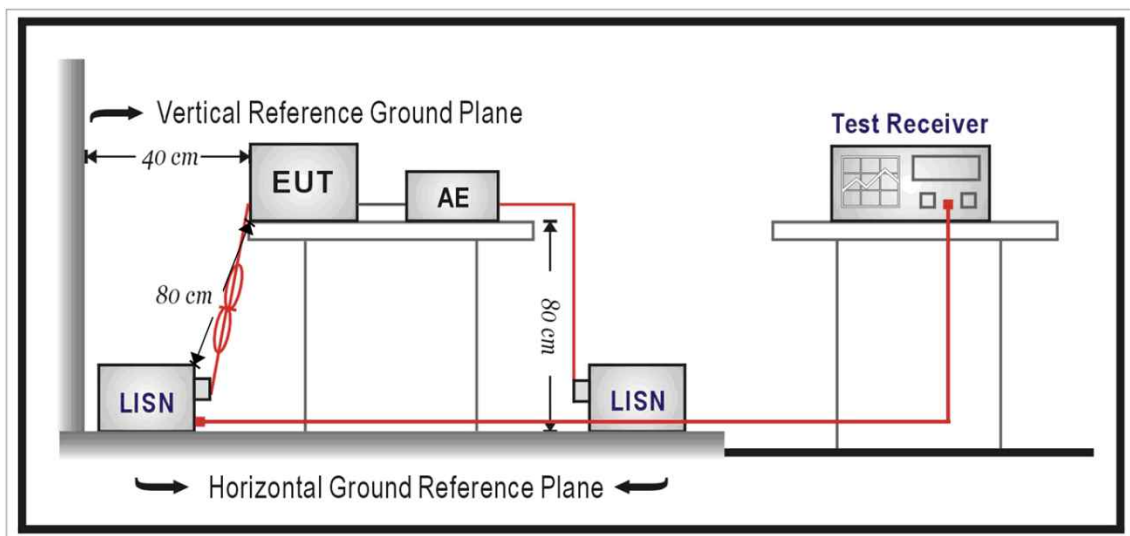
4 Measurement Procedure

4.1. AC Power Line Conducted Emission Measurement

■ Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

■ Test Setup



■ Test Procedure

The EUT and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a $50\ \Omega // 50\ \mu\text{H}$ coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a $50\ \Omega // 50\ \mu\text{H}$ coupling impedance with 50 ohm termination.

Tabletop device shall be placed on a non-conducting platform, of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The wall of screened room shall be located 40 cm to the rear of the EUT. Other surfaces of tabletop or floor standing EUT shall be at least 80 cm from any other ground conducting surface including one or more LISNs. For floor-standing device shall be placed under the EUT with a 12 mm insulating material.

Conducted emissions were investigated over the frequency range from 0.15 MHz to 30 MHz using a resolution bandwidth of 9 kHz. The equipment under test (EUT) shall be meet the limits in section 4.1, as applicable, including the average limit and the quasi-peak limit when using respectively, an average detector and quasi-peak detector measured in accordance with the methods described of related standard. When all of peak value were complied with quasi-peak and average limit from 150 kHz to 30 MHz then quasi-peak and average measurement was unnecessary.

The AMN shall be placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for AMNs mounted on top of the ground reference plane. This distance is between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8 m from the AMN. If the mains power cable is longer than 1 m then the cable shall be folded back and forth at the centre of the lead to form a bundle no longer than 0.4 m. All of interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long. All of EUT and AE shall be separate place more than 0.1 m. All 50 Ω ports of the LISN shall be resistively terminated into 50 Ω loads when not connected to the measuring instrument.

If the reading of the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the higher reading shall be recorded with the exception of any brief isolated high reading which shall be ignored.

4.2. Radiated Emission Measurement

■ Limit

- (1) The power density of any emissions outside the 57–71 GHz band shall consist solely of spurious emissions.
- (2) Radiated emissions below 40 GHz shall not exceed the general limits in § 15.209
- (3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm² at a distance of 3 meters.
- (4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

Limits of Radiated Emission Measurement (FCC 15.20):

Frequency (MHz)	Field Strength (μV/m at meter)	Measurement Distance (meter)
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

- Note: (1) The tighter limit applies at the band edges.
(2) Emission level (dBuV/m)=20 log Emission level (uV/m).

Radiated emissions above 40 GHz:

Frequency Range (GHz)	Limit (pW/cm ²) @ 3 m	Equivalent to EIRP limit (dBm)
40-200	90	-9.92

Note: (1) $PD = EIRP_{Linear} / (4 * \pi * d^2)$

Where:

PD is the power density at the distance specified by the limit, in W/m²

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

d is the distance at which the power density limit is specified, in m

Within the 57–71 GHz band, emission levels shall not exceed the following equivalent isotropically radiated power (EIRP):

Standard		Limit
☐	Part 15.255(b)(3)	Field disturbance sensors/radar devices deployed on unmanned aircraft may operate within the frequency band 60-64 GHz, provided that the transmitter not exceed 20 dBm peak EIRP. The sum of continuous transmitter off-times of at least two milliseconds shall equal at least 16.5 milliseconds within any contiguous interval of 33 milliseconds. Operation shall be limited to a maximum of 121.92 meters (400 feet) above ground level.
☐	Part 15.255(c)(1)(i),	The average power of any emission shall not exceed 40 dBm and the peak power of any emission shall not exceed 43 dBm.
☐	Part 15.255(c)(1)(ii)(A)	For fixed point-to-point transmitters located outdoors, the average power of any emission shall not exceed 82 dBm, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51 dBi. The peak power of any emission shall not exceed 85 dBm, and shall be reduced by 2 dB for every dB that the antenna gain is less than 51 dBi. The provisions in this <u>paragraph (c)</u> for reducing transmit power based on antenna gain shall not require that the power levels be reduced below the limits specified in <u>paragraph (c)(1)(i)</u> of this section.
☐	Part 15.255(c)(2)	Field disturbance sensors/radars shall not exceed –10 dBm peak conducted output power and 10 dBm peak EIRP except that field disturbance sensors/radars that limit their operation to all or part of the specified frequency band may operate without being subject to a transmitter conducted output power limit if they operate in compliance with paragraph (b)(3) of this section or with one or more of the provisions below:
☐	Part 15.255(c)(2)(i)	the peak EIRP level shall not exceed 20 dBm for indoor operation or 30 dBm for outdoor operation;
☐	Part 15.255(c)(2)(ii)	the peak EIRP shall not exceed 3 dBm except that the peak EIRP shall not exceed 20 dBm if the sum of continuous transmitter off-times of at least two milliseconds equals at least 16.5 milliseconds within any contiguous interval of 33 milliseconds;
☒	Part 15.255(c)(2)(iii)(A)	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, except as specific in <u>paragraph (c)(2)(iii)(B)</u> of this section;
☐	Part 15.255(c)(2)(iii)(B)	The peak EIRP shall not exceed 20 dBm, and the sum of continuous transmitter off-times of at least two milliseconds shall equal at least 16.5 milliseconds within any contiguous interval of 33 milliseconds when operated outdoors:
☐	Part 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.
☐	Part 15.255(c)(2)(v)	For field disturbance sensors/radars that occupy 500 MHz bandwidth or less that are contained wholly within the frequency band 61.0–61.5 GHz, the average power of any emission, measured during the transmit interval, shall not exceed 40 dBm, and the peak power of any emission shall not exceed 43 dBm. In addition, the average power of any emission outside of the 61.0–61.5 GHz band, measured during the transmit interval, but still within the 57–71 GHz band, shall not exceed 10 dBm, and the peak power of any emission shall not exceed 13 dBm.
☐	Part 15.255(c)(3),	For pulsed field disturbance sensors/radars operating in the 57-64 GHz band that have a maximum pulse duration of 6 ns, the average EIRP shall not exceed 13 dBm and the transmit duty cycle shall not exceed 10% during any 0.3 μ s time window. In addition, the average integrated EIRP within the frequency band 61.5-64.0 GHz shall not exceed 5 dBm in any 0.3 μ s time window. Peak emissions shall not exceed 20 dB above the maximum permitted average emission limit applicable to the equipment under test. The radar bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna.

Peak transmitter conducted output power:

Except as specified in paragraph (e)(2) of this section, the peak transmitter conducted output power of devices other than field disturbance sensors/radars shall not exceed 500 mW. Depending on the gain of the antenna, it may be necessary to operate the intentional radiator using a lower peak transmitter output power in order to comply with the EIRP limits specified in paragraph (c) of this section.

Devices other than field disturbance sensors/radars with an emission bandwidth of less than 100 megahertz must limit their peak transmitter conducted output power to the product of 500 mW times their emission bandwidth divided by 100 megahertz. For the purposes of this paragraph, emission bandwidth is defined as the instantaneous frequency range occupied by a steady state radiated signal with modulation, outside which the radiated power spectral density never exceeds 6 dB below the maximum radiated power spectral density in the band, as measured with a 100 kilohertz resolution bandwidth spectrum analyzer. The center frequency must be stationary during the measurement interval, even if not stationary during normal operation (e.g., for frequency hopping devices).

Calculate the conducted output power (in watts) from the EIRP (in watts) using Equation:

$$P_{\text{cond}} = \text{EIRP}_{\text{Linear}} / G_{\text{EUT}}$$

Where:

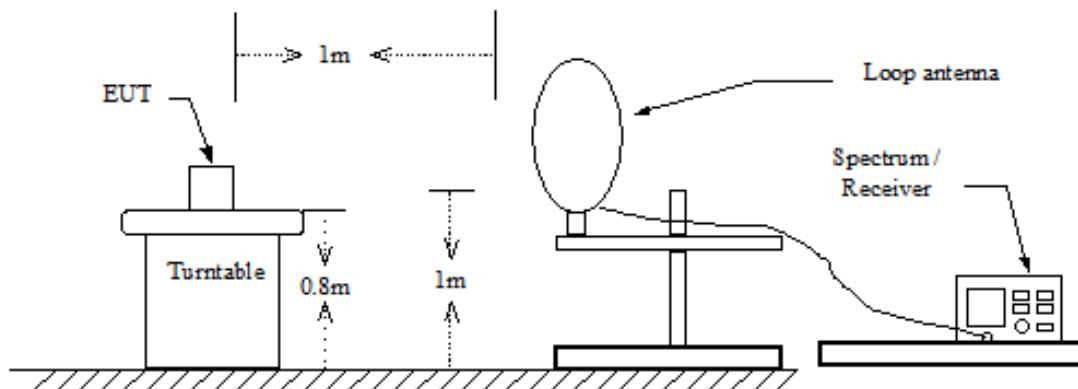
P_{cond} is the conducted output power, in W

$\text{EIRP}_{\text{Linear}}$ is the equivalent isotropically radiated power, in W

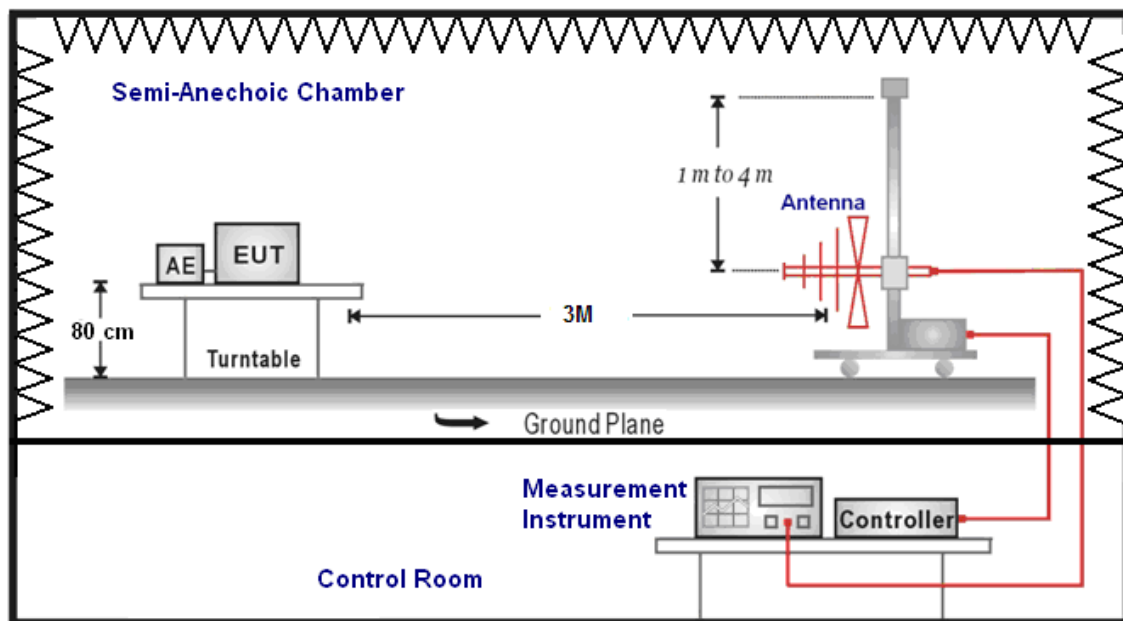
G_{EUT} is numeric gain of the EUT radiating element (antenna)

■ Setup

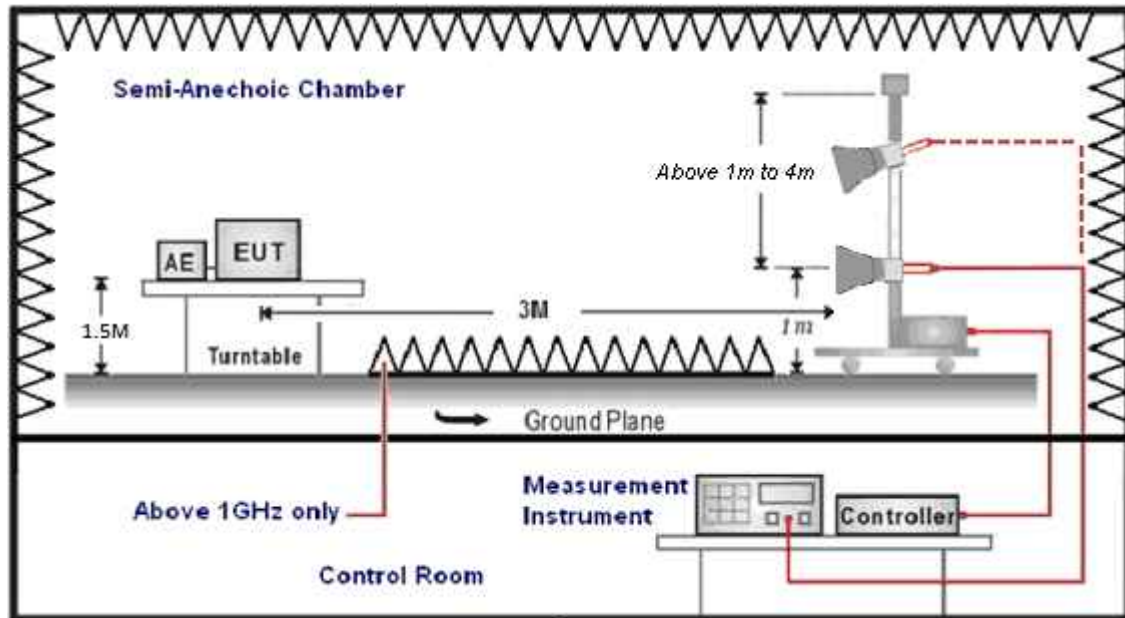
Below 30 MHz



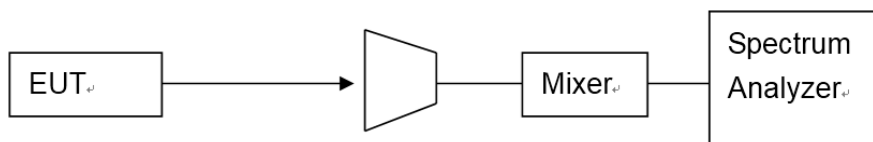
30 MHz ~ 1 GHz



Above 1 GHz



Above 50 GHz



■ Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The EUT was set to transmit continuously & Measurements range from 9 kHz to 10th harmonic is investigated.

For measurements below 30 MHz the resolution bandwidth is set to 10 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements. The video bandwidth is 3 times of the resolution bandwidth.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 3 MHz for peak (detector for peak) measurements and average (detector for peak) measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Biconilog/Horn Antenna were used in frequency 30 MHz to 18 GHz at a distance of 3 meter. Loop/Horn Antenna was used in frequency 9 kHz to 30 MHz and 18 to 40 GHz at a distance of 1 meter. The antenna at an angle toward the source of the emission. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20 dB/decade).

For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts pre meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field is intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

$$(1) \text{ Amplitude (dBuV/m) = FI (dBuV) + AF (dBuV) + CL (dBuV) - Gain (dB)}$$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

$$(2) \text{ Actual Amplitude (dBuV/m) = Amplitude (dBuV) - Dis(dB)}$$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30 dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

$$\text{Above 40GHz: } E = 126.8 - 20\log(\lambda) + P - G$$

E is the field strength of the emission at the measurement distance, in dBuV/m

P is the power measured at the output of the test antenna, in dBm

λ is the wavelength of the emission under investigation [300/fMHz], in m

G is the gain of the test antenna, in dBi

Note: The measured power P includes all applicable instrument correction factors up to the connection to the test antenna.

Measurement distance conversion calculation formula:

$$E_{\text{Space Limit}} = E_{\text{Meas}} + 20\log(D_{\text{Meas}} / D_{\text{Space Limit}})$$

$E_{\text{Space Limit}}$ is the field strength of the emission at the distance specified by the limit, in dBuV/m

E_{Meas} is the field strength of the emission at the distance specified by the limit, in dBuV/m

D_{Meas} is the measurement distance, in m

$D_{\text{Space Limit}}$ is the distance specified by the limit, in m

Field strength to EIRP calculation formula:

$$\text{EIRP} = E + 20\log(d) - 104.7$$

EIRP is the equivalent isotropically radiated power, in dBm

E is the field strength of the emission at the measurement distance, in dBuV/m

d is the measurement distance, in m

Far Field Distance Evaluation:

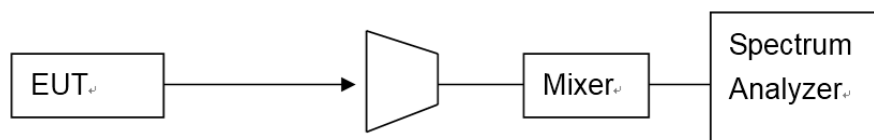
Rx Antenna	Frequency (GHz)	Wavelength λ (m)	Measurement Antenna D (m)	Far field R_m (m) $\geq 2 \cdot D^2 / \lambda$	Measurement Distance d_1 (m)	Distance specified by the limit d_2 (m)	Distance Factor = $20 \cdot \log (d_1/d_2)$ (dB)
9170	18	0.0167	0.06	0.43	1	3	-9.54
	40	0.0075	0.06	0.96	1	3	-9.54
QWH-QPRR00	40	0.0075	0.0389	0.40	1	3	-9.54
	50	0.0060	0.0389	0.50	1	3	-9.54
N9029AH15	50	0.0060	0.0241	0.19	1	3	-9.54
	75	0.0040	0.0241	0.29	1	3	-9.54
N9029AH12	60	0.0050	0.0199	0.16	1	3	-9.54
	90	0.0033	0.0199	0.24	1	3	-9.54
N9029AH08	90	0.0033	0.0136	0.11	1	3	-9.54
	140	0.0021	0.0136	0.17	1	3	-9.54
N9029AH05	140	0.0021	0.0084	0.07	1	3	-9.54
	220	0.0014	0.0084	0.10	1	3	-9.54
N9029AH03	220	0.0014	0.0056	0.05	1	3	-9.54
	325	0.0009	0.0056	0.07	1	3	-9.54

4.3. 99% Occupied Bandwidth Measurement

■ Limit

NA

■ Test Setup



■ Test Procedure

99 % Occupied Bandwidth:

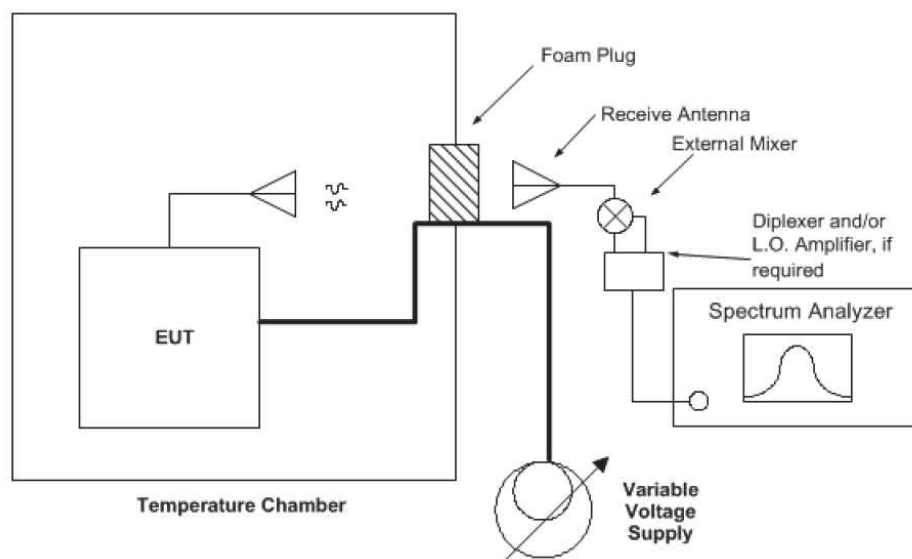
The testing follows ANSI C63.10-2020 Section 9.4.

4.4. Frequency Stability Measurement

■ Limit

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 Setup



■ Test Procedure

The testing follows ANSI C63.10-2020 Section 9.5.

4.5. Antenna Measurement

■ Limit

FCC Part 15.203:

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

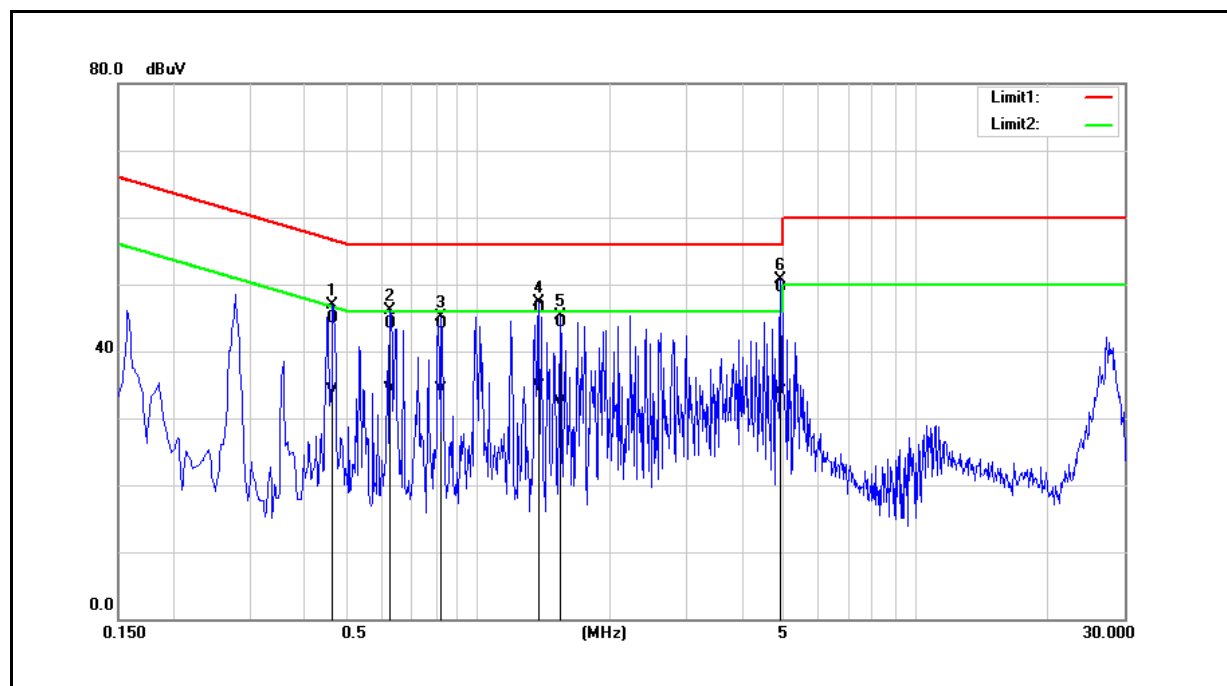
■ Antenna Connector Construction

See section 2 – antenna information.

5 Test Results

5.1. Conducted Emission

Standard:	FCC Part 15.255	Line:	L1
Test item:	Conducted Emission	Power:	AC 120 V/60 Hz
Mode:	SRD_60-64 GHz		
Description:			

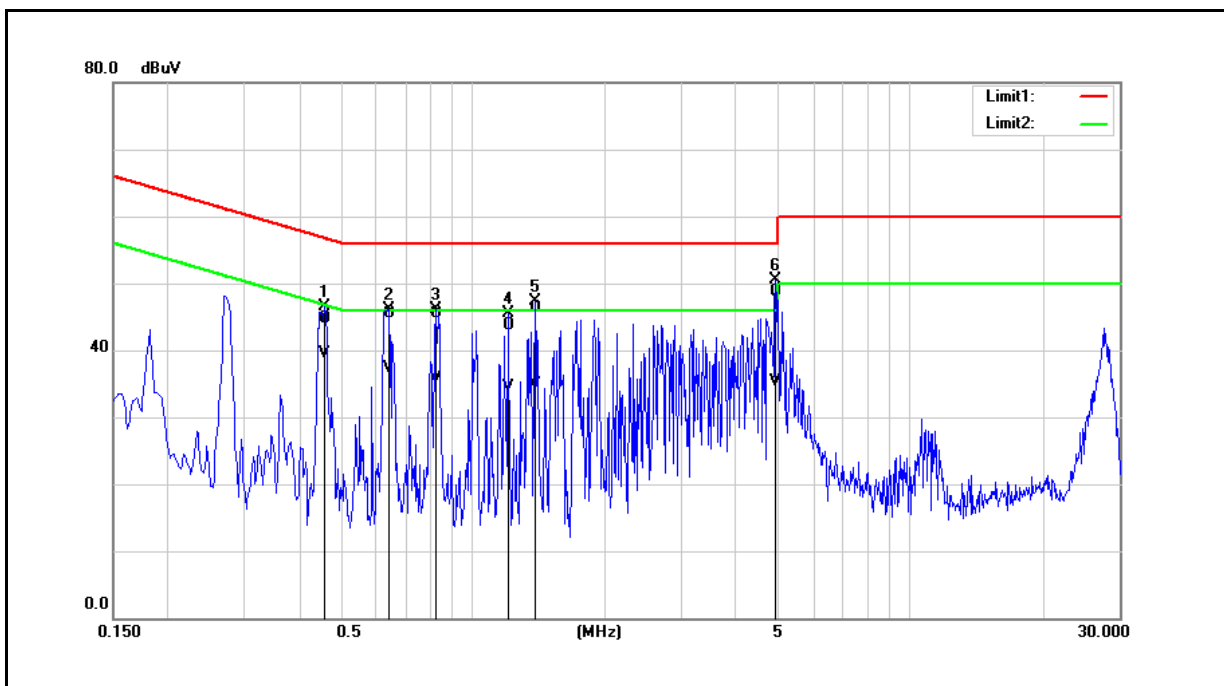


No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.4660	35.36	24.48	9.57	44.93	34.05	56.58	46.58	-11.65	-12.53	Pass
2	0.6300	34.43	24.82	9.58	44.01	34.40	56.00	46.00	-11.99	-11.60	Pass
3	0.8260	34.54	24.74	9.60	44.14	34.34	56.00	46.00	-11.86	-11.66	Pass
4	1.3740	36.83	25.18	9.61	46.44	34.79	56.00	46.00	-9.56	-11.21	Pass
5	1.5420	34.61	22.71	9.61	44.22	32.32	56.00	46.00	-11.78	-13.68	Pass
6	4.9020	39.84	24.31	9.68	49.52	33.99	56.00	46.00	-6.48	-12.01	Pass

Note: 1. Result (dBuV) = Correction factor (dB) + Reading(dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

Standard:	FCC Part 15.255	Line:	N
Test item:	Conducted Emission	Power:	AC 120 V/60 Hz
Mode:	SRD_60-64 GHz		
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.4580	35.04	29.92	9.61	44.65	39.53	56.73	46.73	-12.08	-7.20	Pass
2	0.6420	35.84	27.76	9.61	45.45	37.37	56.00	46.00	-10.55	-8.63	Pass
3	0.8220	35.82	26.11	9.63	45.45	35.74	56.00	46.00	-10.55	-10.26	Pass
4	1.2020	34.03	24.88	9.63	43.66	34.51	56.00	46.00	-12.34	-11.49	Pass
5	1.3860	36.61	25.25	9.63	46.24	34.88	56.00	46.00	-9.76	-11.12	Pass
6	4.9180	39.08	25.68	9.69	48.77	35.37	56.00	46.00	-7.23	-10.63	Pass

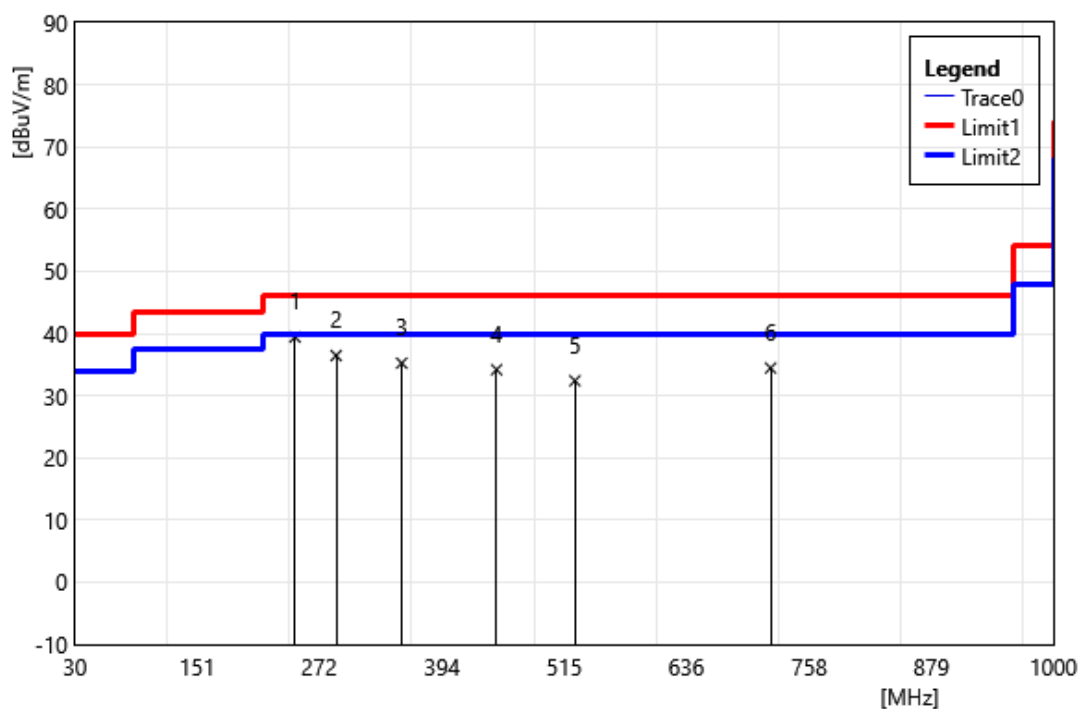
Note: 1. Result (dBuV) = Correction factor (dB) + Reading (dBuV).

2. Correction factor (dB) = Cable loss (dB) + L.I.S.N. factor (dB).

5.2. Radiated Emission Test Results

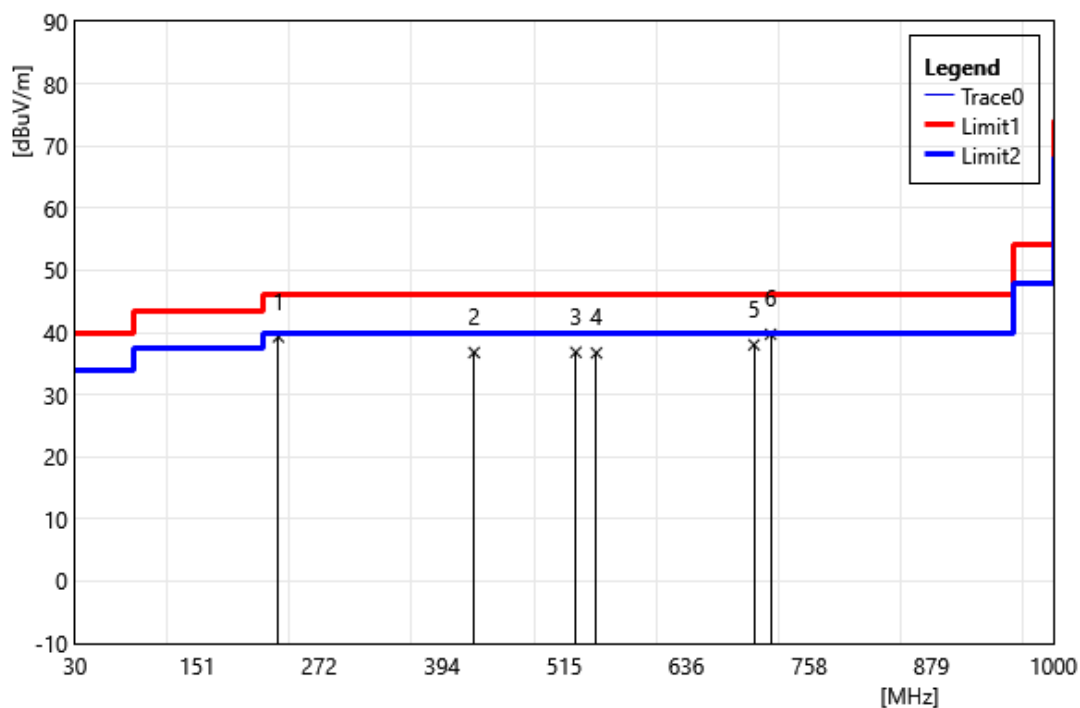
Radiated Emissions (below 1 GHz)

Test Site:	966C Chamber	Standard:	Part 15C
Test Mode:	SRD_60-64 GHz		
Polarization:	Vertical		
Remark:			



ID	Frequency MHz	Reading dBuV	Correct Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
1	248.25	46.32	-6.89	39.43	46.00	-6.57	QP
2	288.99	41.73	-5.27	36.46	46.00	-9.54	QP
3	353.98	39.62	-4.39	35.24	46.00	-10.77	QP
4	448.07	36.36	-2.18	34.19	46.00	-11.82	QP
5	525.67	33.34	-0.93	32.41	46.00	-13.59	QP
6	719.67	31.43	3.03	34.46	46.00	-11.54	QP

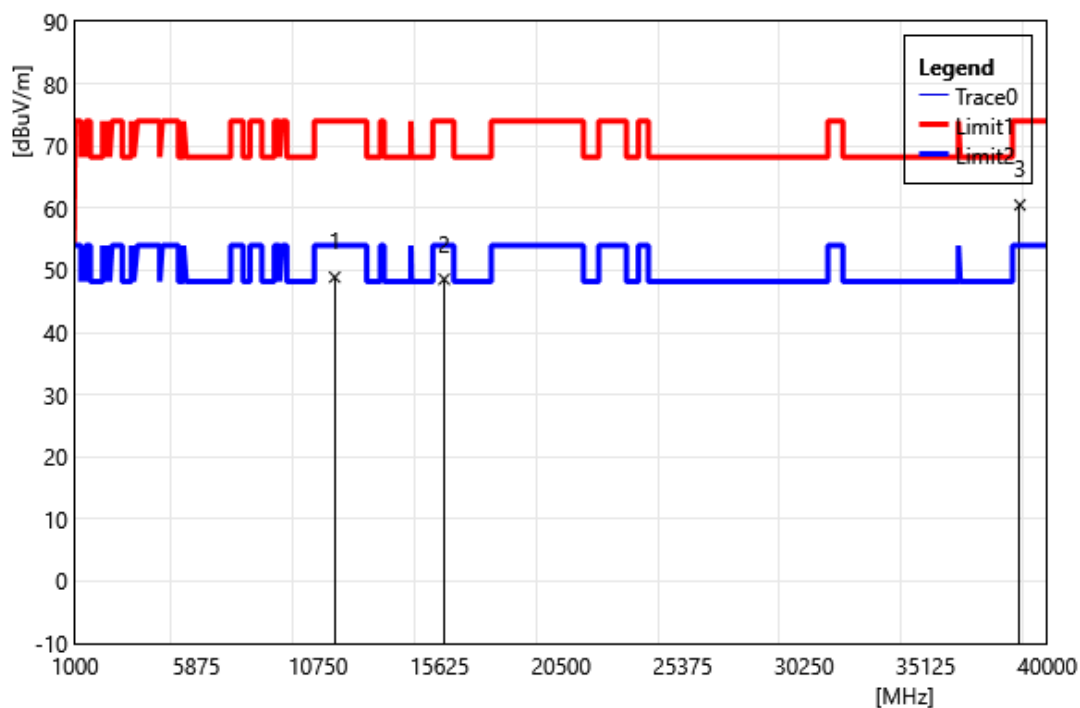
Test Site:	966C Chamber	Standard:	Part 15C
Test Mode:	SRD_60-64 GHz		
Polarization:	Horizontal		
Remark:			



ID	Frequency MHz	Reading dBuV	Correct Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
1	231.76	46.68	-7.38	39.30	46.00	-6.70	QP
2	425.76	39.53	-2.75	36.78	46.00	-9.22	QP
3	526.64	37.73	-0.90	36.83	46.00	-9.17	QP
4	547.01	37.15	-0.43	36.72	46.00	-9.28	QP
5	703.18	35.34	2.67	38.01	46.00	-7.99	QP
6	719.67	36.68	3.03	39.72	46.00	-6.29	QP

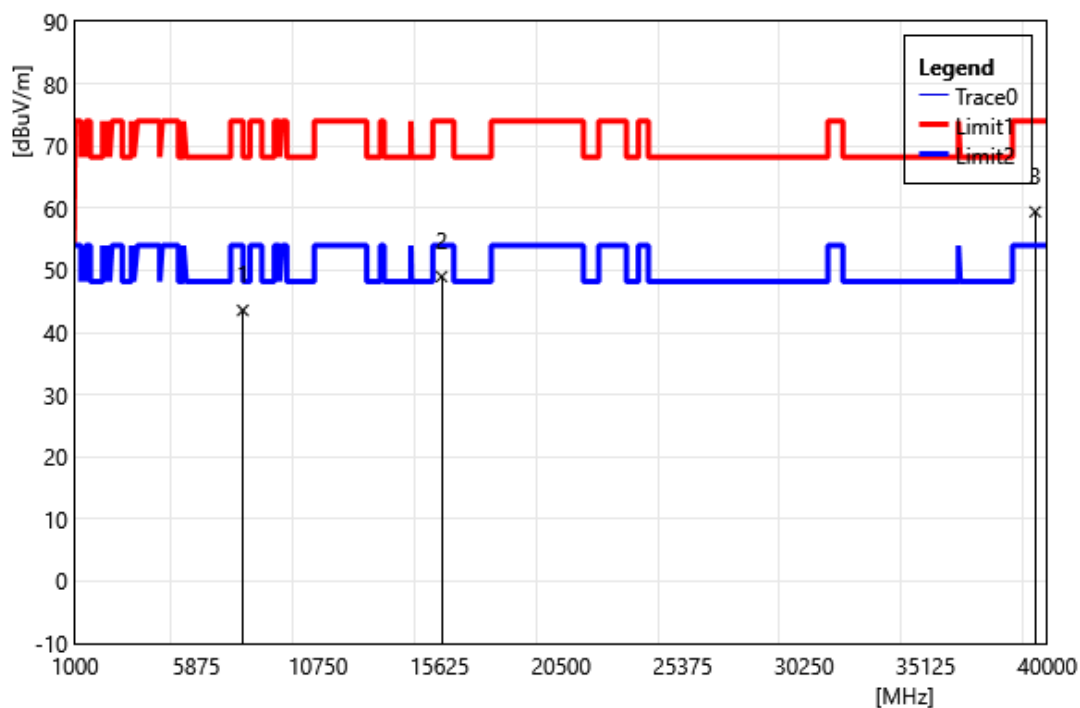
Radiated Emissions (Above 1 GHz)

Test Site:	966C Chamber	Standard:	Part 15C
Test Mode:	SRD_60-64 GHz		
Polarization:	Vertical		
Remark:			



ID	Frequency MHz	Reading dBuV	Correct Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
1	11421.00	36.59	12.32	48.91	74.00	-25.09	PEAK
2	15807.00	34.87	13.70	48.57	74.00	-25.43	PEAK
3	38900.00	37.15	23.37	60.52	74.00	-13.48	PEAK

Test Site:	966C Chamber	Standard:	Part 15C
Test Mode:	SRD_60-64 GHz		
Polarization:	Horizontal		
Remark:			

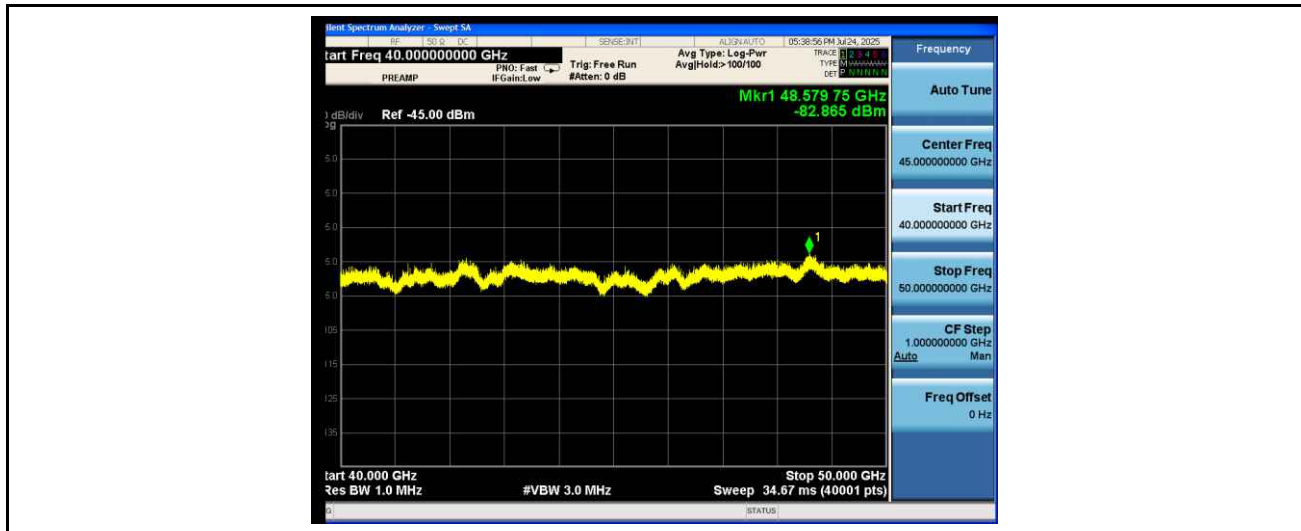


ID	Frequency MHz	Reading dBuV	Correct Factor dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Remark
1	7732.00	37.85	5.71	43.56	74.00	-30.44	PEAK
2	15705.00	35.16	13.84	49.00	74.00	-25.00	PEAK
3	39516.00	36.69	22.73	59.42	74.00	-14.58	PEAK

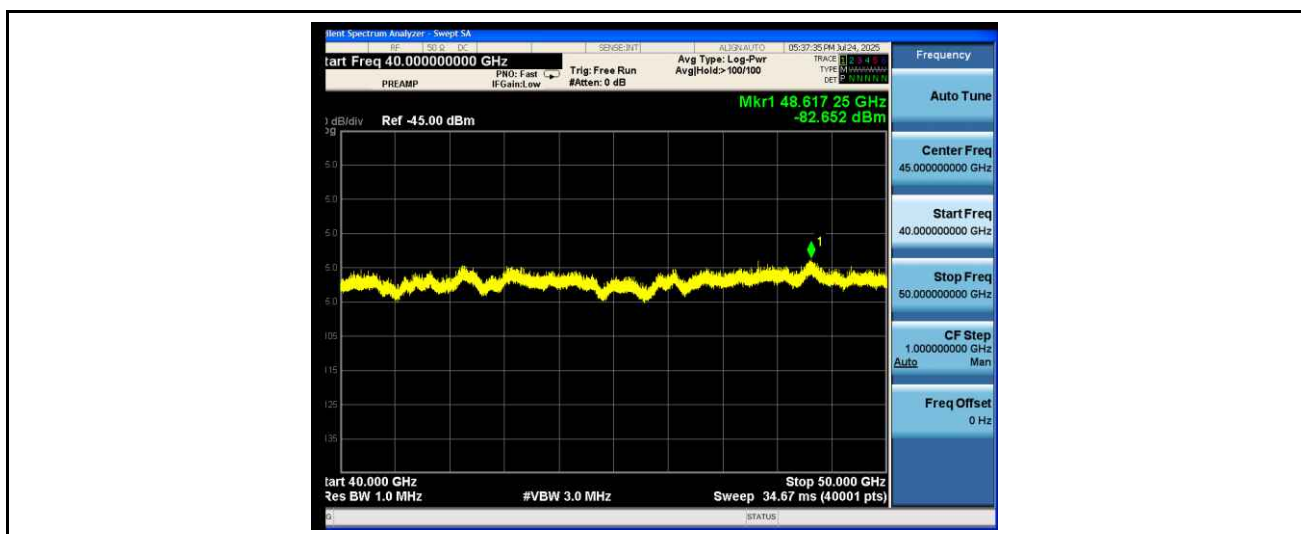
5.3. Power density Test Results

SRD_60-64 GHz								
Frequency (GHz)	Reading (dBm)	Distance Factor = $20 \cdot \log(1\text{m}/3\text{m})$ (dB)	Ant. Pol.	AF (dBm/m)	CL+ML (dB)	Result (dBm)	Power Density (pW/cm ²)	Limit ((pW/cm ²))
48.627	-82.865	-9.54	H	41.20	6.12	-45.09	0.0274	90
48.586	-82.652	-9.54	V	41.20	6.12	-44.87	0.0288	
74.583	-93.528	-9.54	H	44.90	13.70	-44.47	0.0316	
54.776	-93.865	-9.54	V	44.30	13.71	-45.40	0.0255	
77.948	-94.537	-9.54	H	46.20	13.68	-44.20	0.0336	
83.824	-94.288	-9.54	V	46.70	14.23	-42.90	0.0453	
113.567	-93.788	-9.54	H	49.80	12.56	-40.97	0.0707	
134.896	-93.265	-9.54	V	50.70	14.18	-37.93	0.1425	
145.914	-93.287	-9.54	H	53.20	15.30	-34.33	0.3263	
149.651	-93.74	-9.54	V	53.80	13.77	-35.71	0.2373	

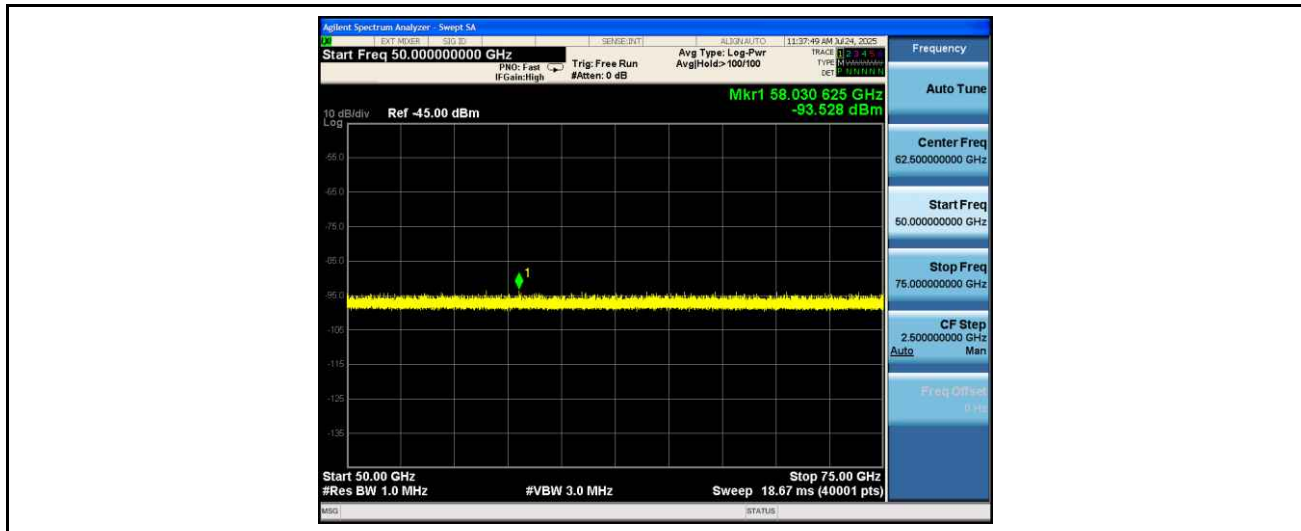
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Horizontal		
Test Mode:	SRD_60-64 GHz		
Remark:	40-50 G		



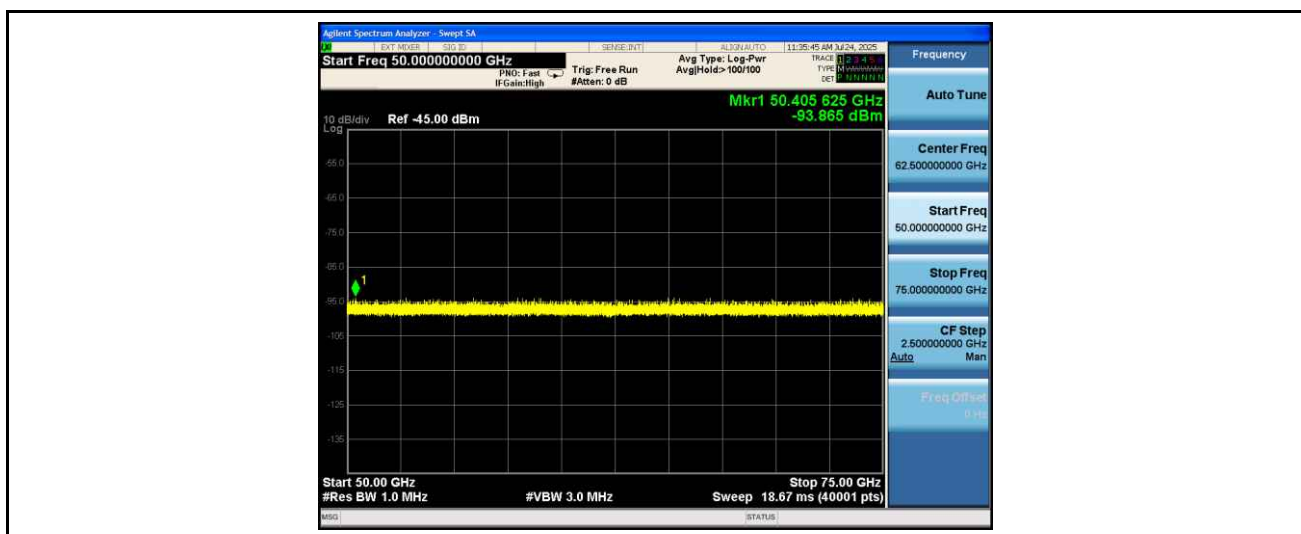
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Vertical		
Test Mode:	SRD_60-64 GHz		
Remark:	40-50 G		



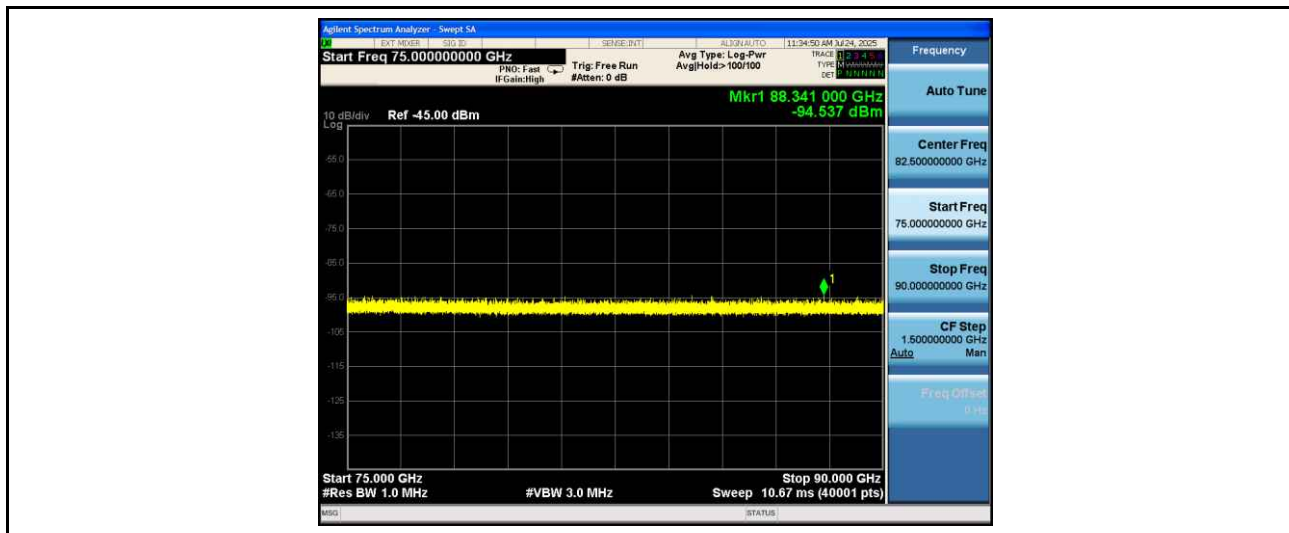
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Horizontal		
Test Mode:	SRD_60-64 GHz		
Remark:	50-75 G		



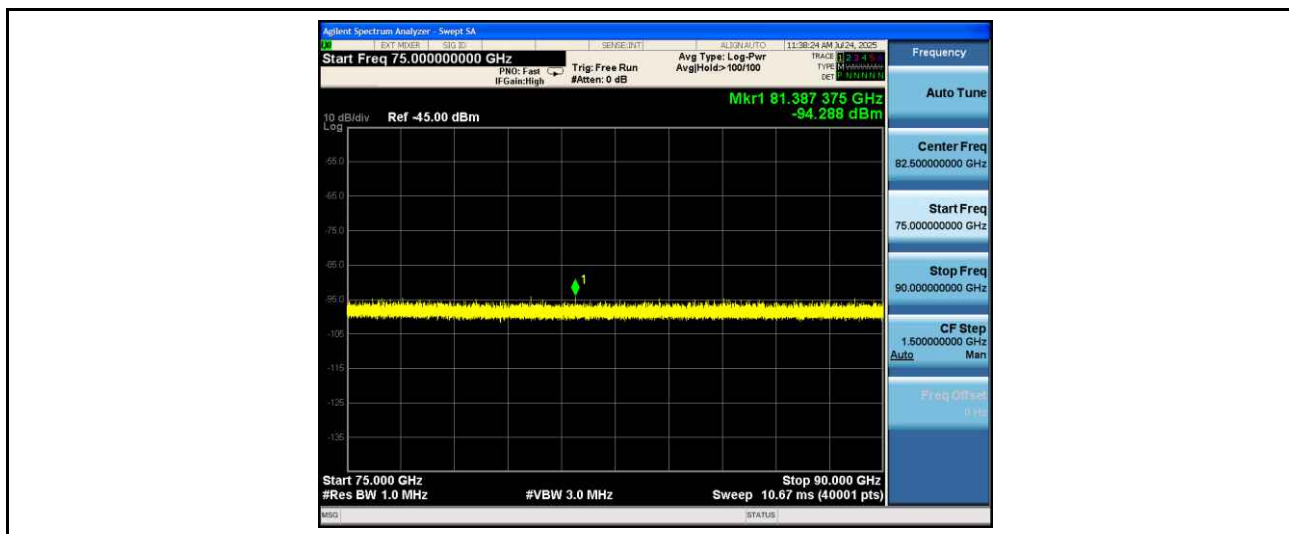
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Vertical		
Test Mode:	SRD_60-64 GHz		
Remark:	50-75 G		



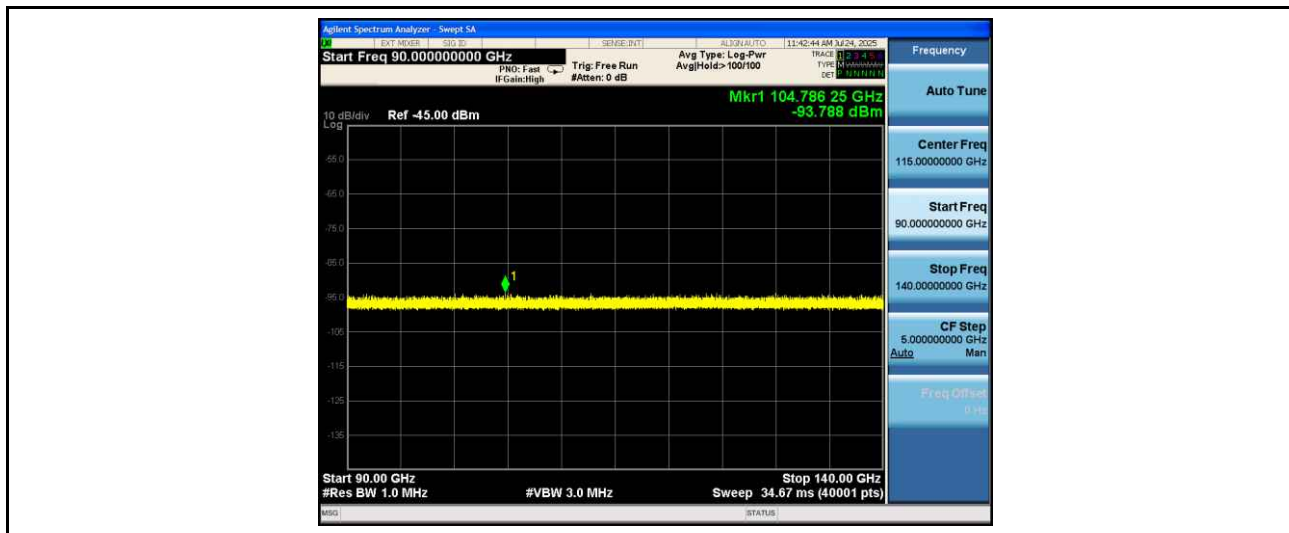
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Horizontal		
Test Mode:	SRD_60-64 GHz		
Remark:	75-90 G		



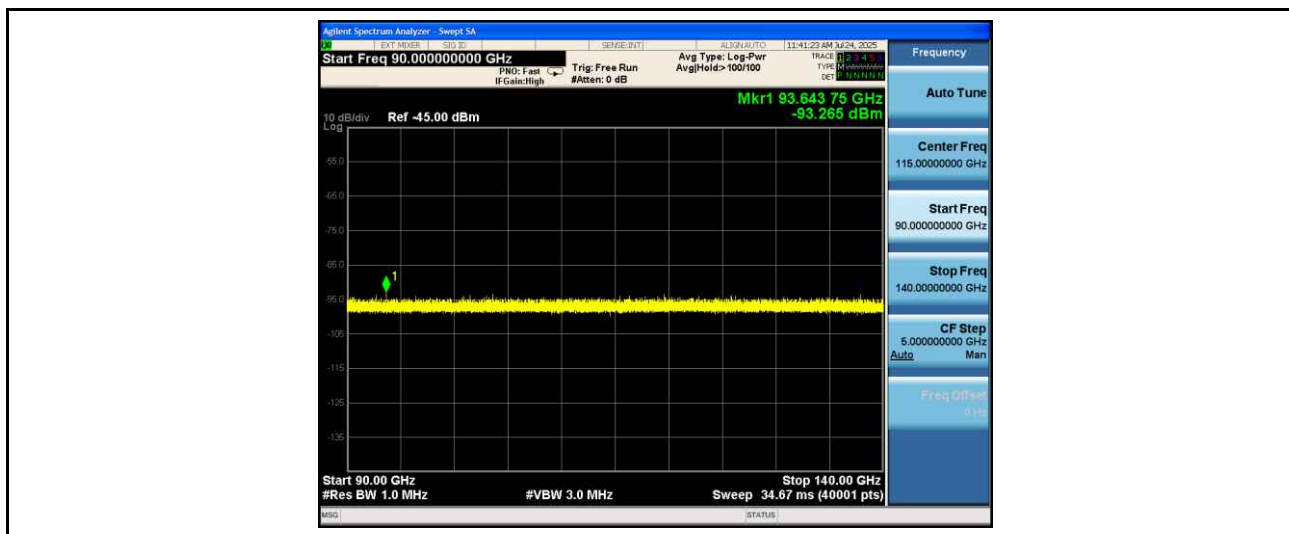
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Vertical		
Test Mode:	SRD_60-64 GHz		
Remark:	75-90 G		



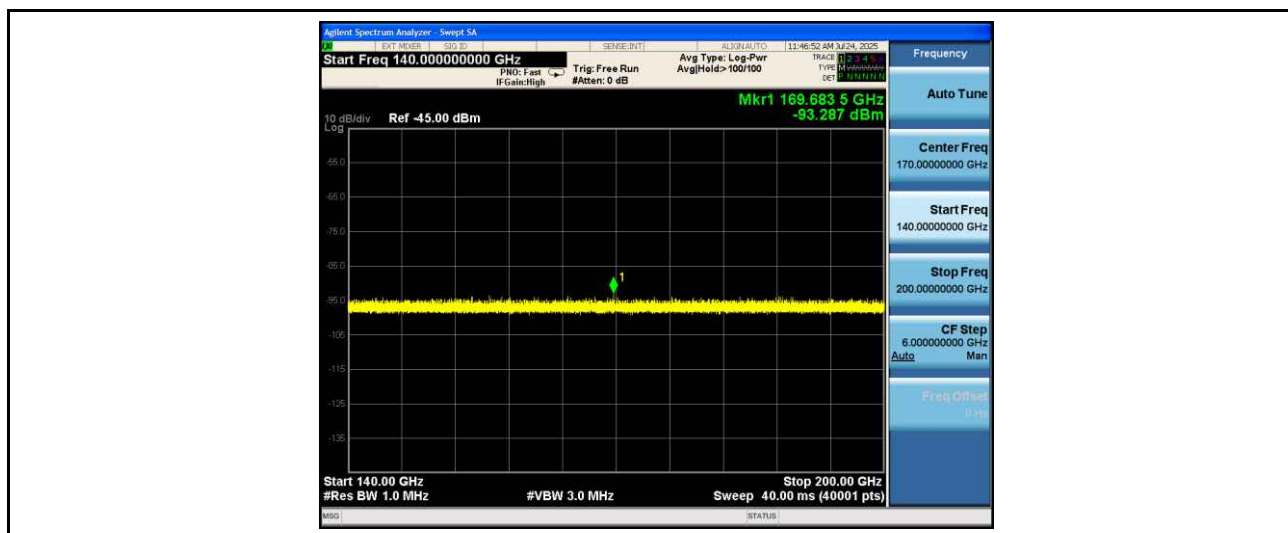
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Horizontal		
Test Mode:	SRD_60-64 GHz		
Remark:	90-140 G		



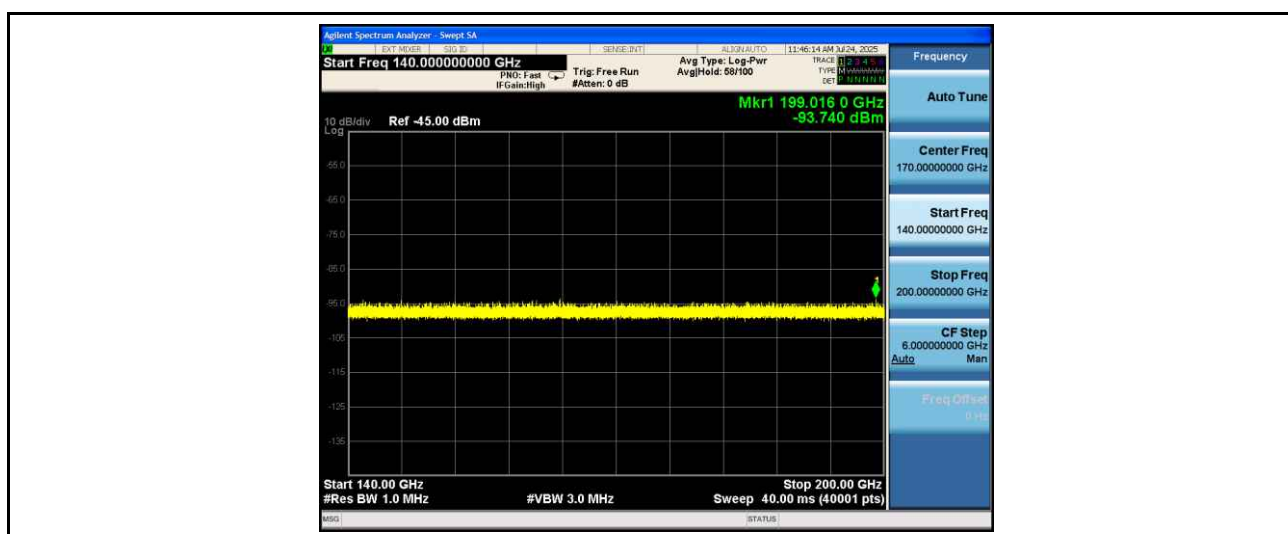
Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Vertical		
Test Mode:	SRD_60-64 GHz		
Remark:	90-140 G		



Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Horizontal		
Test Mode:	SRD_60-64 GHz		
Remark:	140-200 G		



Standard:	Part 15.255	Test Site:	966 Chamber
Polarization:	Vertical		
Test Mode:	SRD_60-64 GHz		
Remark:	140-200 G		



5.4. Output Power Test Results

For Peak Power (E.I.R.P)

Mode	Measurement Distance (m)	Frequency (GHz)	Readin (dBm)	Antenna Gain (dBi)	E (dBuV/m)	E.I.R.P (dBm)	Limit (dBm)	Result
SRD_60-64 GHz	1	60.984	-41.916114	21.5	109.55	4.85	14	PASS

Note: The EIRP was evaluated on vertical and horizontal polarization, the worst case is Vertical polarization.

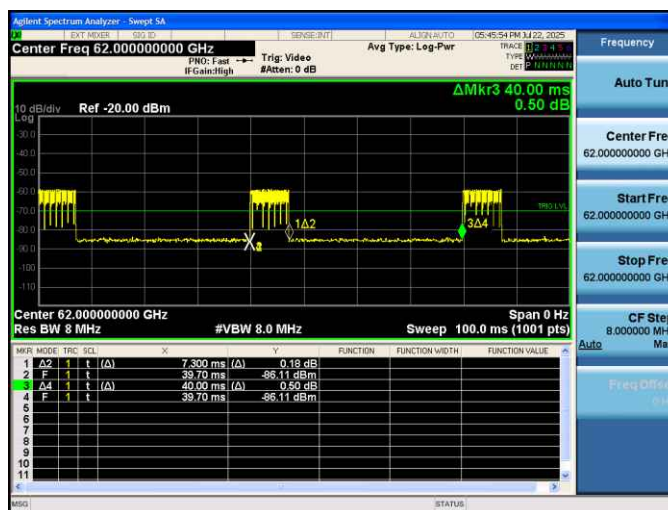
For Continuous Transmitter off-times

Mode	Frequency (GHz)	On time (ms)	Specify period (ms)	Off time (ms)	Limit (ms)	Result
SRD_60-64 GHz	60.984	7.3	33	25.70	25.50	PASS

For Duty cycle

Mode	Frequency (GHz)	On time (us)	On+off time (us)	Duty cycle (%)	Duty Factor (dB)
SRD_60-64 GHz	60.984	7.3	40000	0.02	37.39

Duty cycle



5.5. 20dB & 99 Occupied Bandwidth Test Results

Mode	Frequency (GHz)	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
SRD_60-64 GHz	60.984	3907	3837.3

20 dB Bandwidth / 99 Occupied Bandwidth



5.6. Frequency Stability Test Results

Test Mode	: SRD_60-64 GHz
Frequency	: 61.25 GHz
V _{Nom}	: 24 Vdc

Environment Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (GHz)				Result
		0 min	2 min	5 min	10 min	
-20	V _{Nom}	62.0318	62.0304	62.0301	62.0346	PASS
-10	V _{Nom}	62.0284	62.0288	62.0304	62.0302	PASS
0	V _{Nom}	62.0266	62.0272	62.0267	62.0275	PASS
10	V _{Nom}	62.0246	62.0231	62.0225	62.0228	PASS
20(Normal)	V _{Nom}	62.0222	62.0243	62.0258	62.0248	PASS
30	V _{Nom}	62.0231	62.0226	62.0238	62.0234	PASS
40	V _{Nom}	62.0244	62.0238	62.0235	62.0252	PASS
50	V _{Nom}	62.0276	62.0288	62.0292	62.0303	PASS

Environment Temperature (°C)	Power Supplied (Vdc)	Measured Frequency (GHz)				Result
		0 min	2 min	5 min	10 min	
20	V _{Low}	62.0228	62.0255	62.0236	62.0242	PASS
	V _{Nom}	62.0222	62.0243	62.0258	62.0248	PASS
	V _{High}	62.0252	62.0234	62.0223	62.0256	PASS

Note 1: V_{Low}=V_{Nom}-15 % ; V_{High}=V_{Nom}+15 %

---END---