



FCC RADIO TEST REPORT

FCC ID : 2A564141V40
Equipment : PRM2141X-V-EGS
Brand Name : Peraso
Model Name : PRM2141X-V-EGS
Applicant : Peraso Inc
2309 Bering Dr. San Jose, CA 95131
Manufacturer : Peraso Inc
2309 Bering Dr. San Jose, CA 95131
Standard : FCC 47 CFR Part 15.255

The product was received on Oct. 19, 2022 and testing was performed from Oct. 19, 2022 to Oct. 26, 2022. We, Sporton International (USA) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures ANSI C63.10-2013 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval from Sporton International (USA) Inc., the test report shall not be reproduced except in full.

Approved by: Lance Tang

Sporton International (USA) Inc.

1175 Montague Expressway, Milpitas, CA 95035



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 Feature of Equipment Under Test.....	5
1.2 Product Specification of Equipment Under Test	5
1.3 Modification of EUT	5
1.4 Testing Location	6
1.5 Applied Standards	6
2 Test Configuration of Equipment Under Test	7
2.1 Test Mode.....	7
2.2 Connection Diagram of Test System	8
2.3 Far Field Condition for Frequency above 18GHz.....	8
3 Radiated Test Items	9
3.1 Measuring Instruments.....	9
3.2 Test Setup	9
3.3 Test Result of Radiated Test.....	10
3.4 Emission Bandwidth	11
3.5 EIRP Power Measurement.....	22
3.6 Peak Conducted Output Power.....	28
3.7 Transmit Spurious Emission.....	29
3.8 Frequency Stability.....	44
4 AC conducted Emission Measurement	46
4.1 Limit of AC Conducted Emission.....	46
4.2 Measuring Instruments.....	46
4.3 Test Procedures	46
4.4 Test Setup	47
4.5 Test Result of AC Conducted Emission	48
5 List of Measuring Equipment.....	54
6 Uncertainty of Evaluation	57
Appendix A. Setup Photographs	



History of this test report

Report No.	Version	Description	Issue Date
FR220826011	01	Initial issue of report	Nov. 08, 2022
FR220826011	02	1. Revise Far Field Condition for Frequency above 18GHz 2. Revise some content of descriptions in section 3.5.3, 3.5.4, 3.6.4, 3.7.4 and 3.8.4	Nov. 15, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Limit	Result (PASS/FAIL)	Remark
3.4	§15.215(c) §15.255(e)	Emission Bandwidth	20dB bandwidth Within 57 ~ 71GHz	Pass	-
3.5	§15.255(c)(1)	Peak EIRP & Average EIRP	Peak EIRP < 43dBm Average EIRP < 40dBm	Pass	-
3.6	§15.255(e)	Peak Conducted power	Conducted power < 500mW	Pass	-
3.7	§15.255(d)	Transmitter Spurious Emissions	§15.255(d)	Pass	-
3.8	§15.255(f)	Frequency Stability for Temperature & Voltage	Within 57 ~ 71GHz	Pass	-
4	§15.207	AC Power Conducted Emission	§15.207	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. Please refer to the section "Uncertainty of Evaluation" for measurement uncertainty.

Comments and Explanations:

The product specifications of the EUT presented in the report are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Feature of Equipment Under Test

General Information	
Equipment	PRM2141X-V-EGS
Model Name	PRM2141X-V-EGS
FCC ID	2A564141V40
EUT supports Radios application	802.11ad 60GHz WiFi

1.2 Product Specification of Equipment Under Test

Product Specification is subject to this standard	
Frequency Range	58.32 ~ 69.12 GHz
Antenna Type	embedded antennas in the PCB
Antenna Gain	16.2 dBi
Type of Modulation	pi/2-BPSK, pi/2-QPSK

Remark: The EUT's information above is declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.3 Modification of EUT

No modifications made to the EUT during the testing.



1.4 Testing Location

Test Site	Sporton International (USA) Inc.
Test Site Location	1175 Montague Expressway, Milpitas, CA 95035 TEL : 408 9043300
Test Site No.	Sporton Site No. 05CH01-CA, 03CH01-CA, CO01-CA, TH01-CA

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: US1250

1.5 Applied Standards

- ♦ FCC 47 CFR Part 2, 15.255
- ♦ ANSI C63.10-2013

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested to present compliance with the FCC Part 15, Subpart B requirements in a separate test report.



2 Test Configuration of Equipment Under Test

2.1 Test Mode

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X: flat, Y: portrait, Z: landscape), and adjusting the measurement antenna orientation, following C63.10 exploratory test procedures and only the worst case emissions were reported in this report.

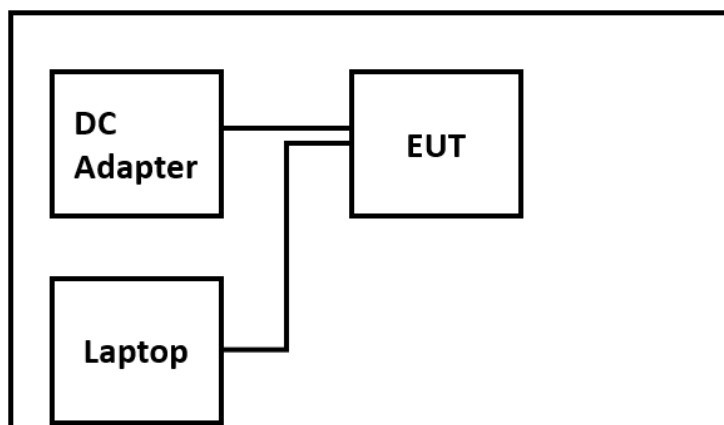
For EIRP, 99%OBW, 6dB BW, 20dB BW and transmitter spurious emissions

Test Configuration	
Mode 1	58.32GHz
Mode 2	62.64GHz
Mode 3	69.12GHz

For Frequency Stability

Test Configuration	
Mode 1	58.32GHz
Mode 2	69.12GHz

2.2 Connection Diagram of Test System



2.3 Far Field Condition for Frequency above 18GHz

Horn Antenna	Frequency (GHz)	Antenna Dimension A (mm)	Wavelength (λ) (m)	Far field R (m) $\geq 2A^2 / \lambda$	Measurement Distance (D) (m)
BBHA 9170	18	60	0.0167	0.43	1
	40	60	0.0075	0.96	
QWH-UPRR00	40	47.8	0.0075	0.61	1
	57	47.8	0.0053	0.87	
QWH-VPRR00	57	37.8	0.0053	0.54	1
	75	37.8	0.0040	0.71	
QWH-WPRR00	75	26.2	0.0040	0.34	1
	110	26.2	0.0027	0.50	
QWH-DPRR00	110	17.5	0.0027	0.22	0.5
	140	17.5	0.0021	0.29	
QWH-GPRR00	140	14	0.0021	0.18	0.5
	200	14	0.0015	0.26	

λ (meter) = 300 / f (MHz)

Note: The measurement distance may be far than the measurement distance above.

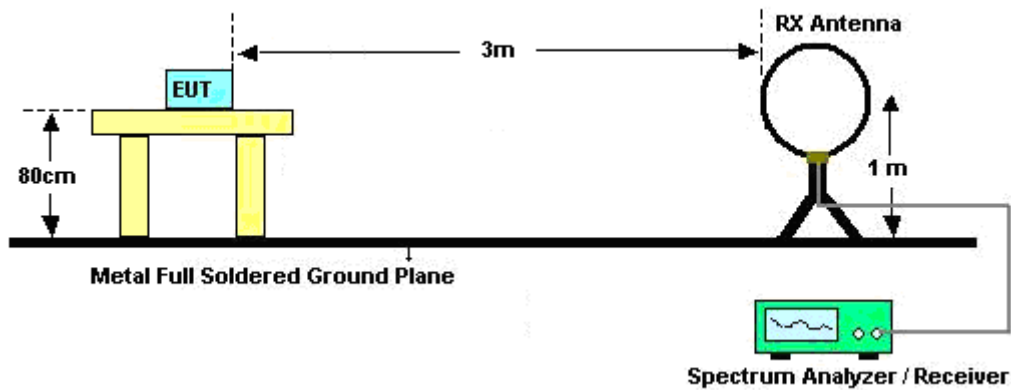
3 Radiated Test Items

3.1 Measuring Instruments

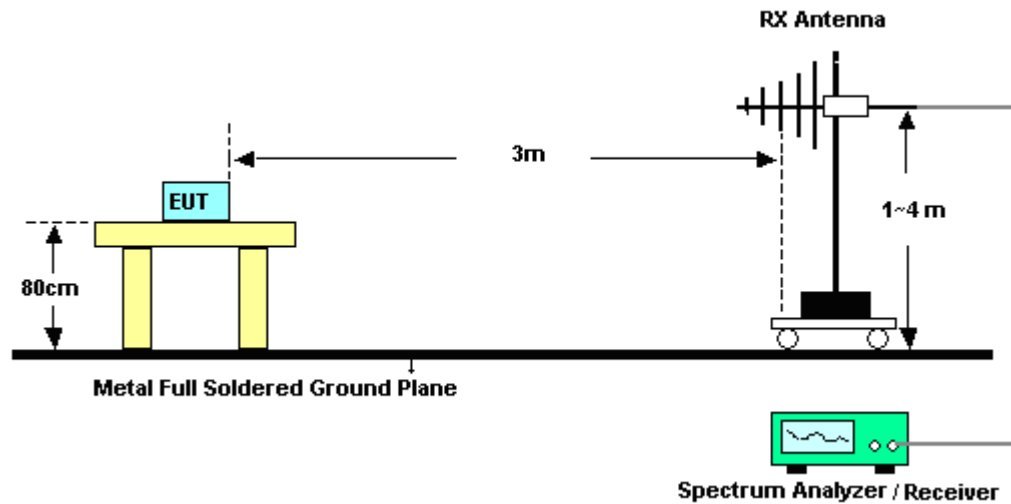
See list of measuring instruments of this test report.

3.2 Test Setup

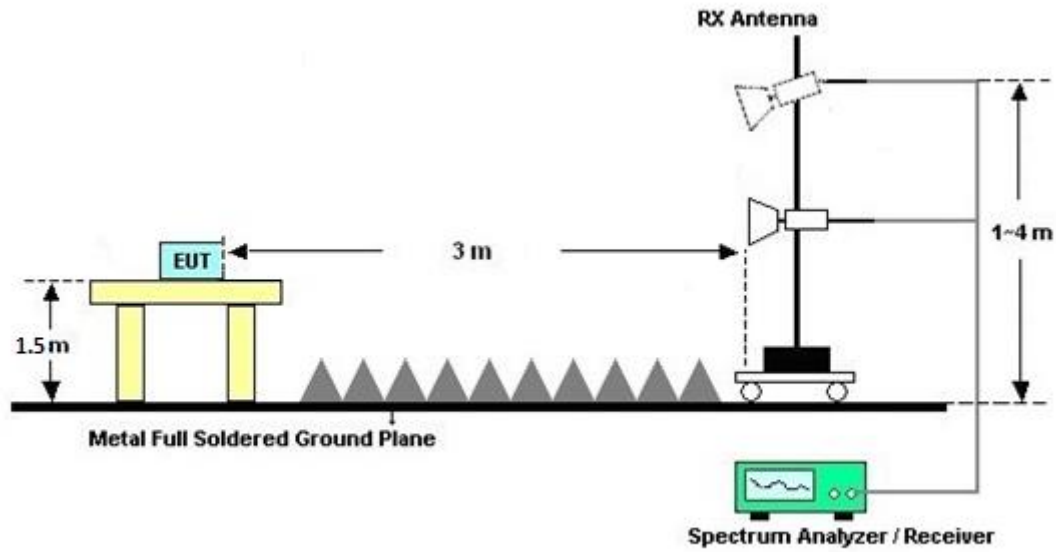
For radiated emissions from 9kHz to 30MHz



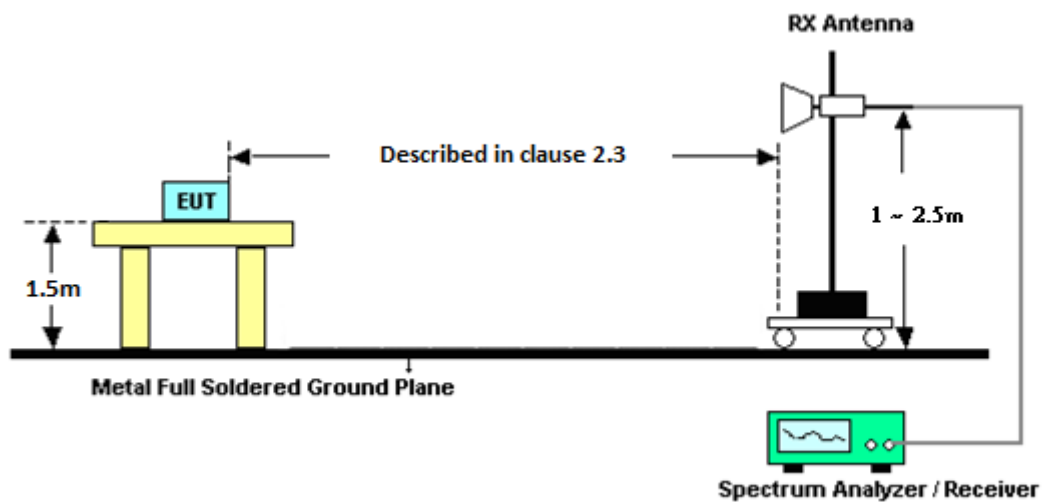
For radiated emissions from 30MHz to 1GHz



For radiated emissions 1GHz to 18GHz



For radiated emissions above 18GHz



3.3 Test Result of Radiated Test

Please refer to Clause 3.6.



3.4 Emission Bandwidth

3.4.1 Description of Emission Bandwidth Measurement

99% Occupied Bandwidth and 6dB Bandwidth are for reporting only.

Limit for 20 dB Bandwidth: Per Part15.215(C), the device shall operate in the 57 - 71 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.

3.4.2 Measuring Instruments

Please refer to list of measuring equipment.

3.4.3 Test Procedures

The testing follows ANSI C63.10-2013 Section 9.3.



3.4.4 Test Results

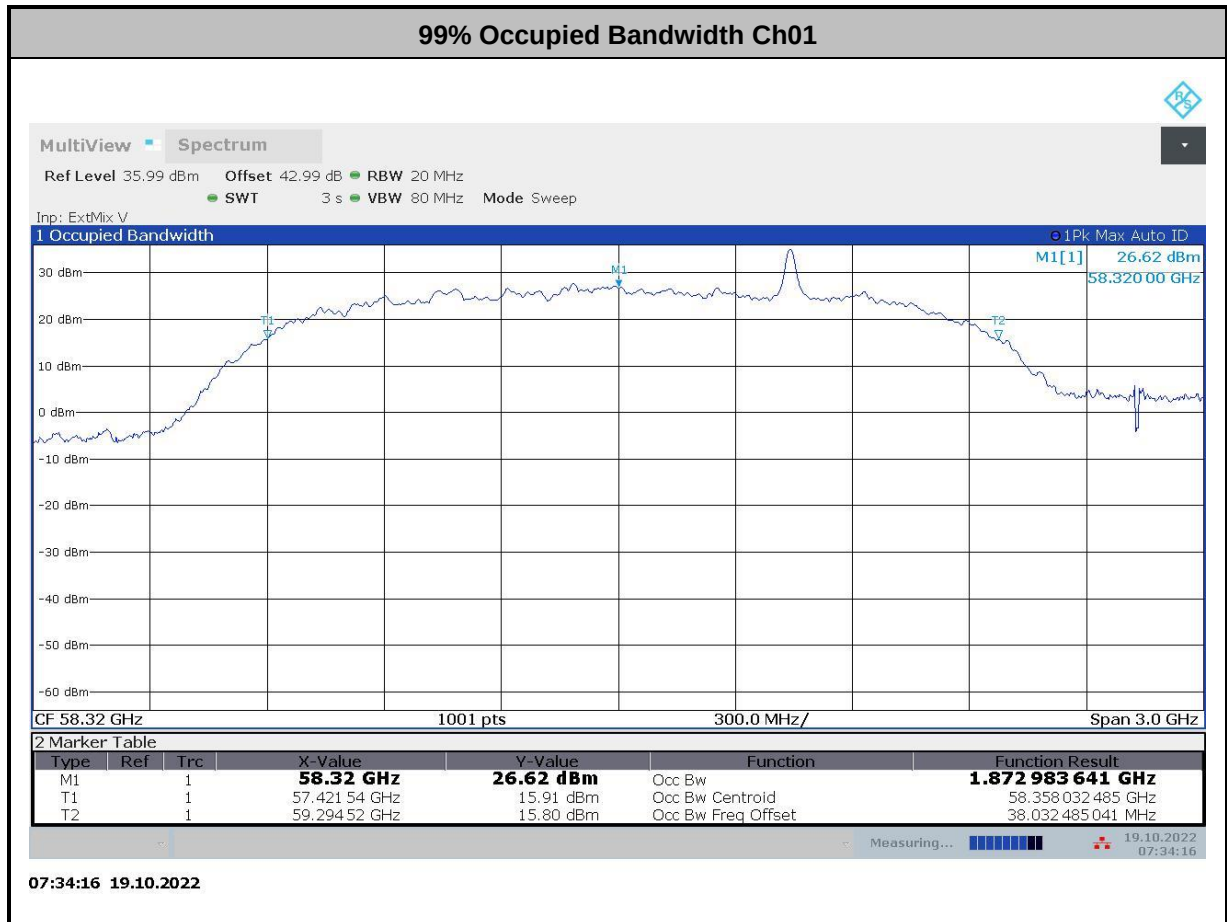
Temperature	21°C	Relative Humidity	49%
Test Engineer	David Hung		

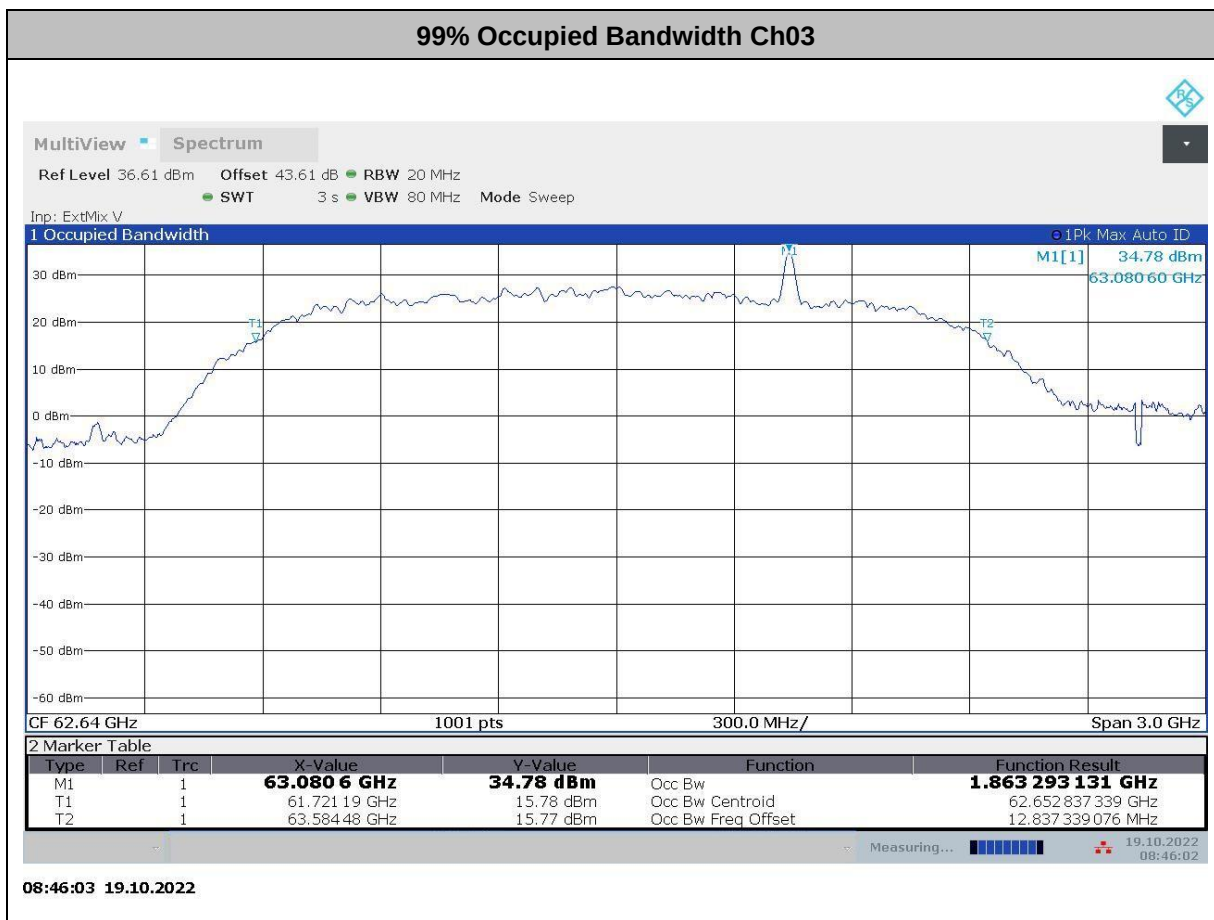
Channel 01 58.32GHz			
99% Occupied Bandwidth (GHz)		Limit (GHz)	
1.873		Report Only	
6dB Bandwidth (GHz)		Limit (GHz)	
0.98970		Report Only	
20dB Bandwidth Measurement			
Bandwidth (GHz)	Low Frequency (GHz)	High Frequency (GHz)	Result
1.9175	57.4040	59.3215	Pass

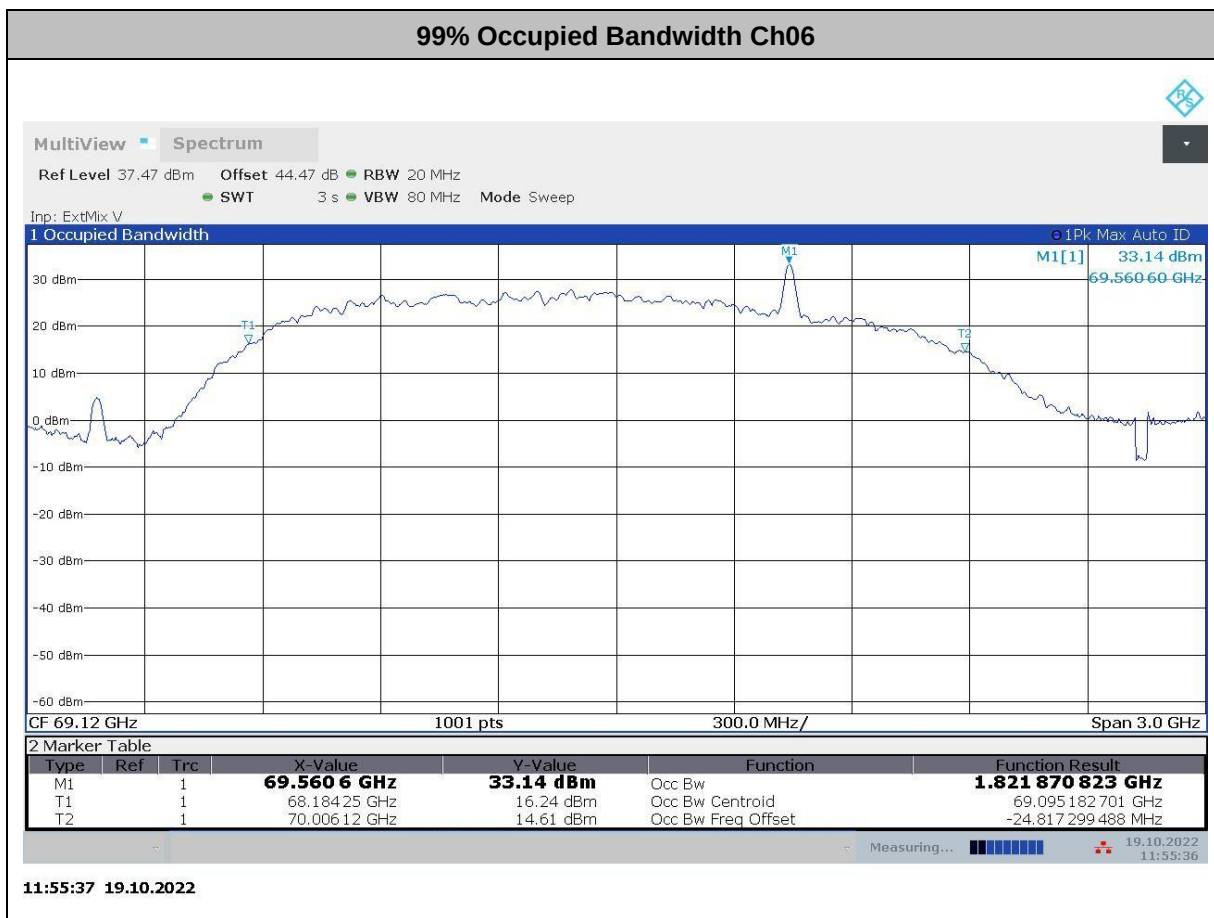
Channel 03 62.64GHz			
99% Occupied Bandwidth (GHz)		Limit (GHz)	
1.863		Report Only	
6dB Bandwidth (GHz)		Limit (GHz)	
0.68070		Report Only	
20dB Bandwidth Measurement			
Bandwidth (GHz)	Low Frequency (GHz)	High Frequency (GHz)	Result
1.910	61.6940	63.604	Pass

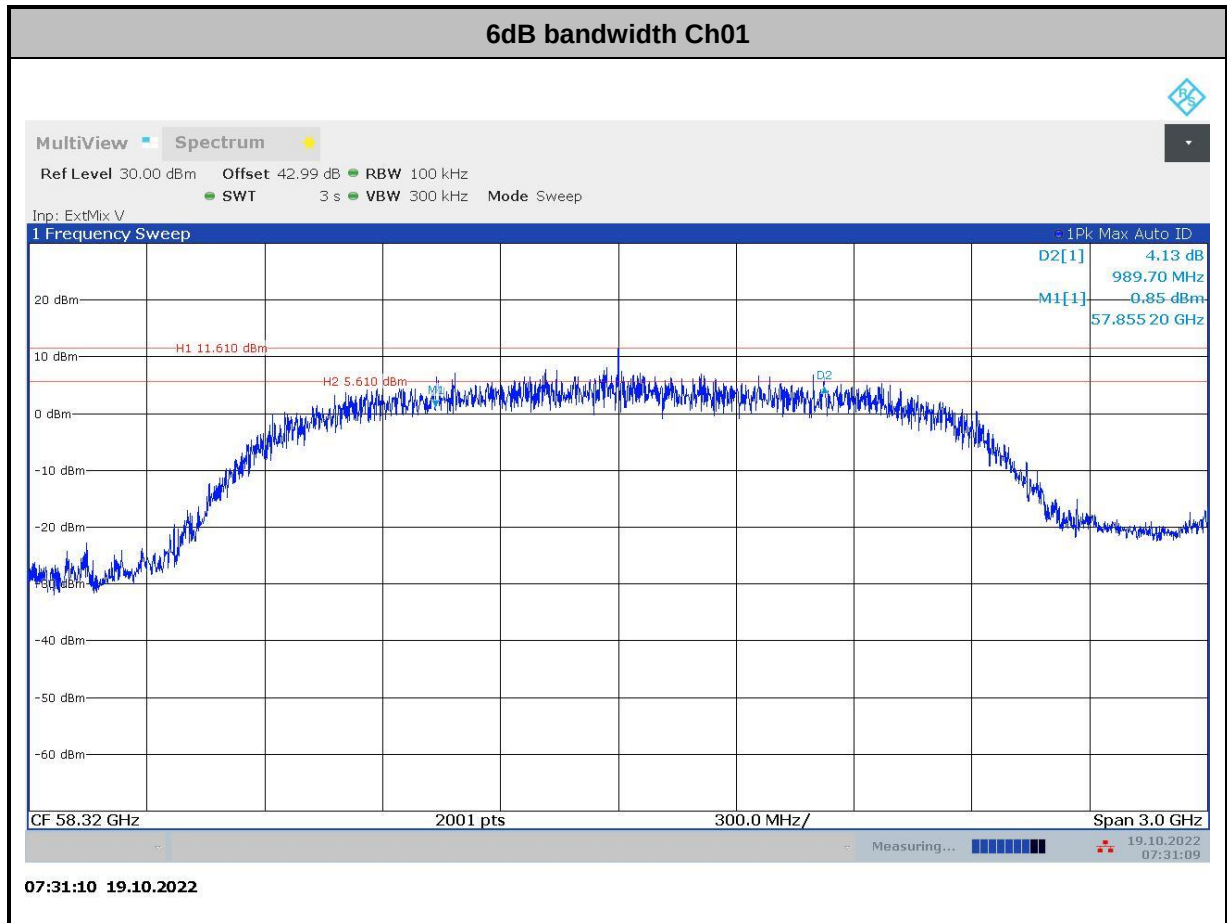
Channel 06 69.12GHz			
99% Occupied Bandwidth (GHz)		Limit (GHz)	
1.822		Report Only	
6dB Bandwidth (GHz)		Limit (GHz)	
1.30130		Report Only	
20dB Bandwidth Measurement			
Bandwidth (GHz)	Low Frequency (GHz)	High Frequency (GHz)	Result
1.907	68.1365	70.0435	Pass

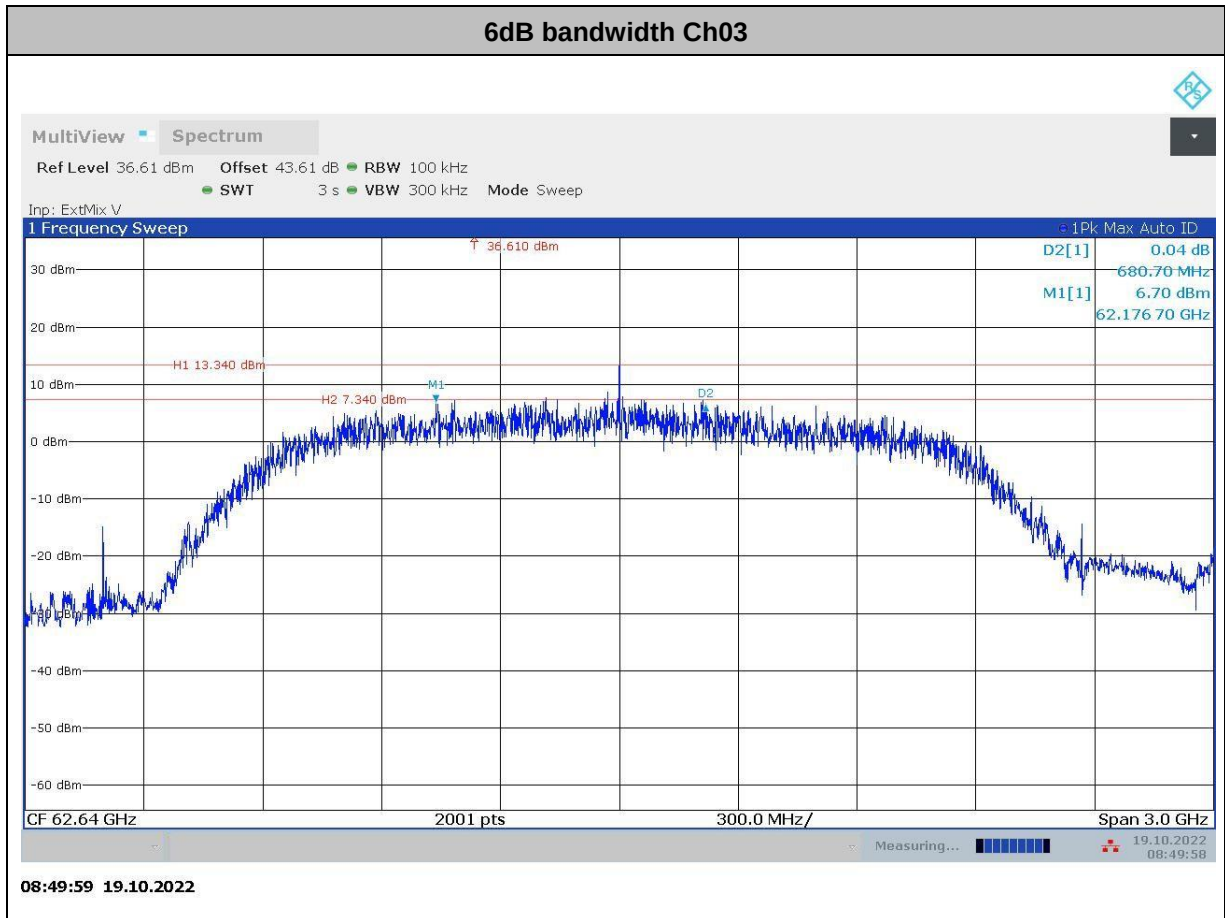
3.4.5 Test Plots

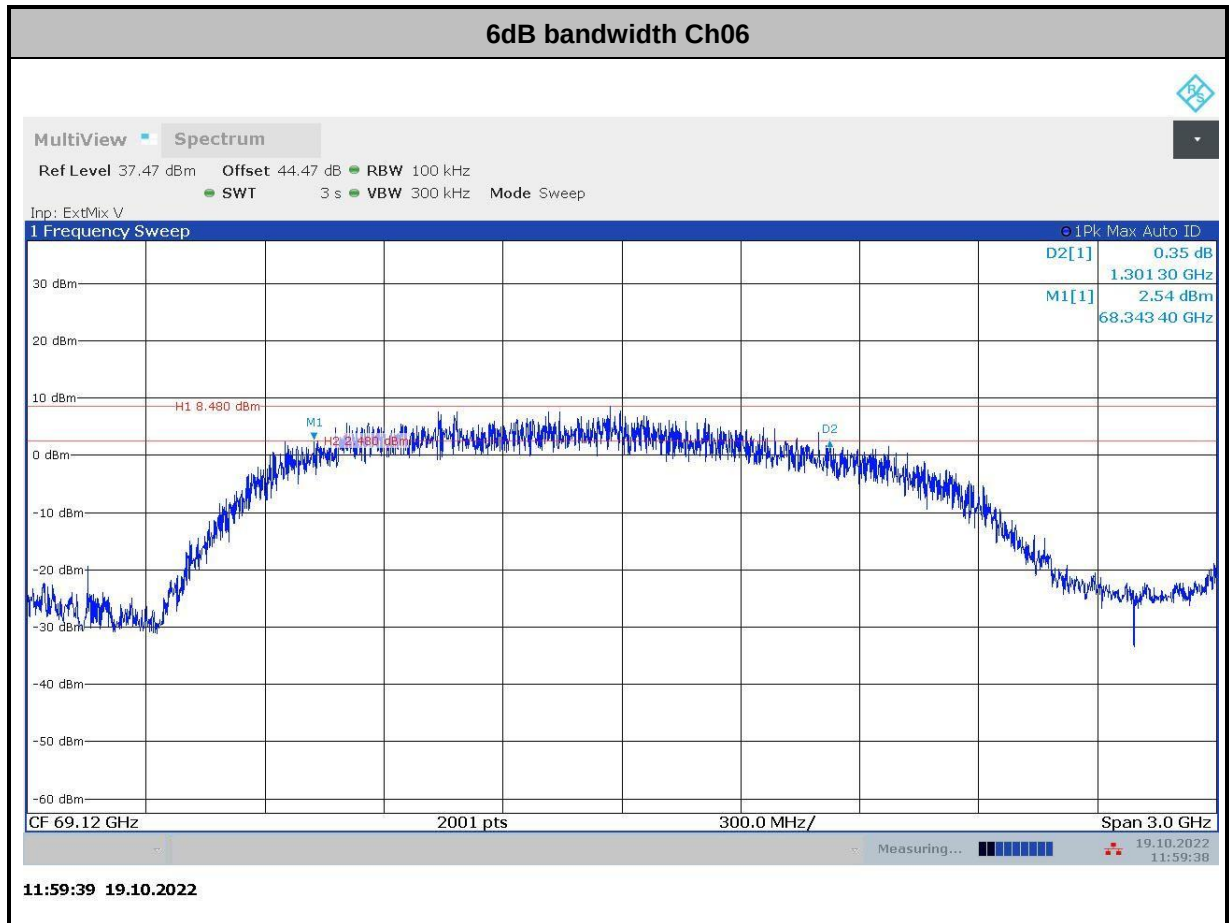


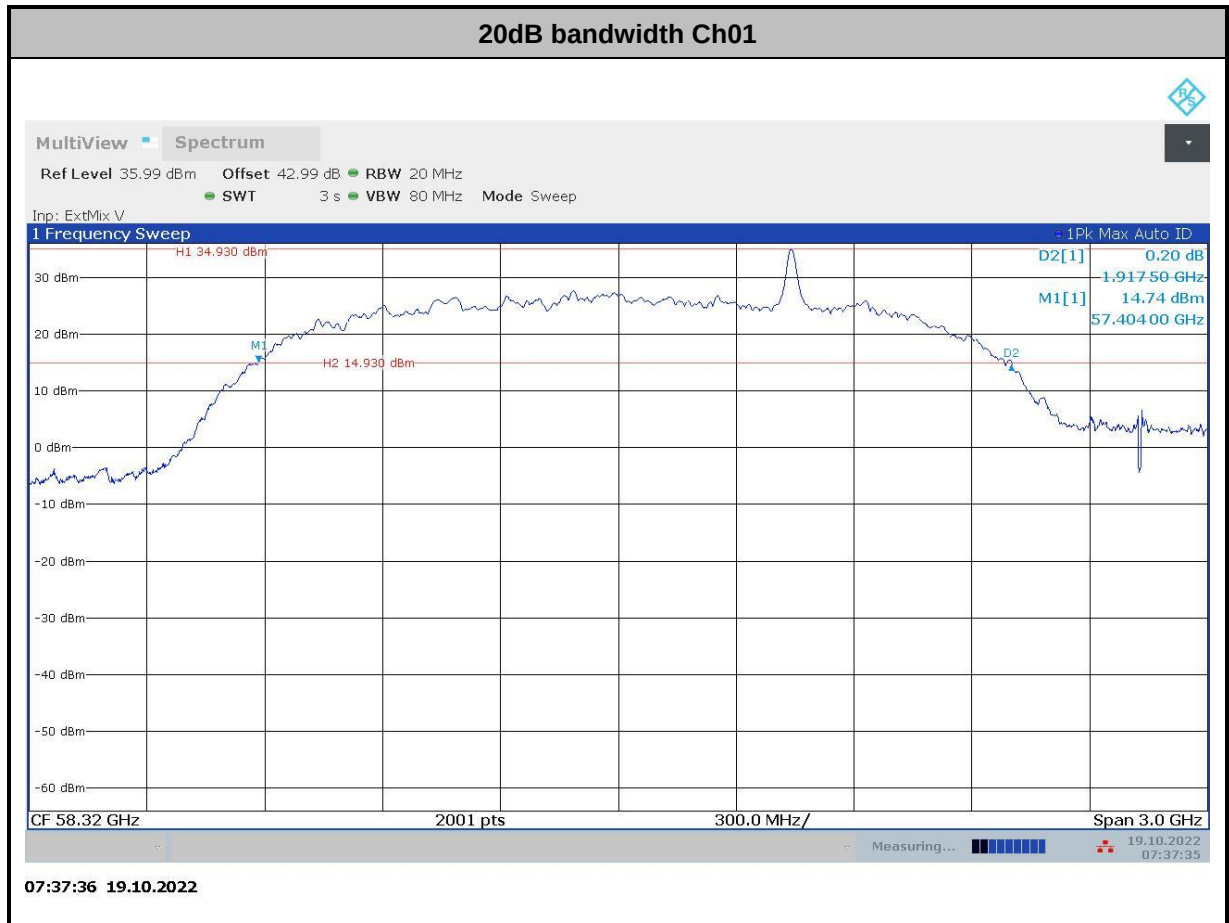


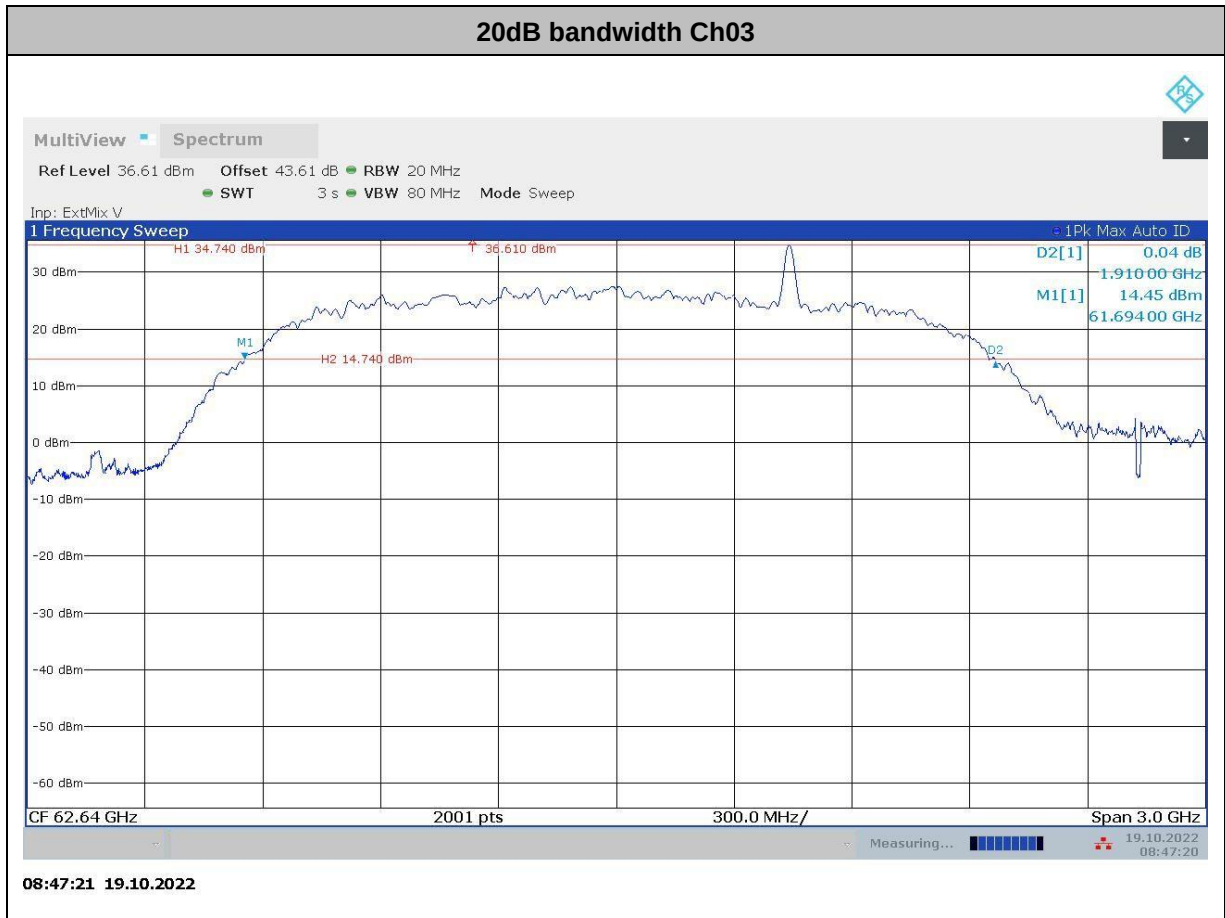


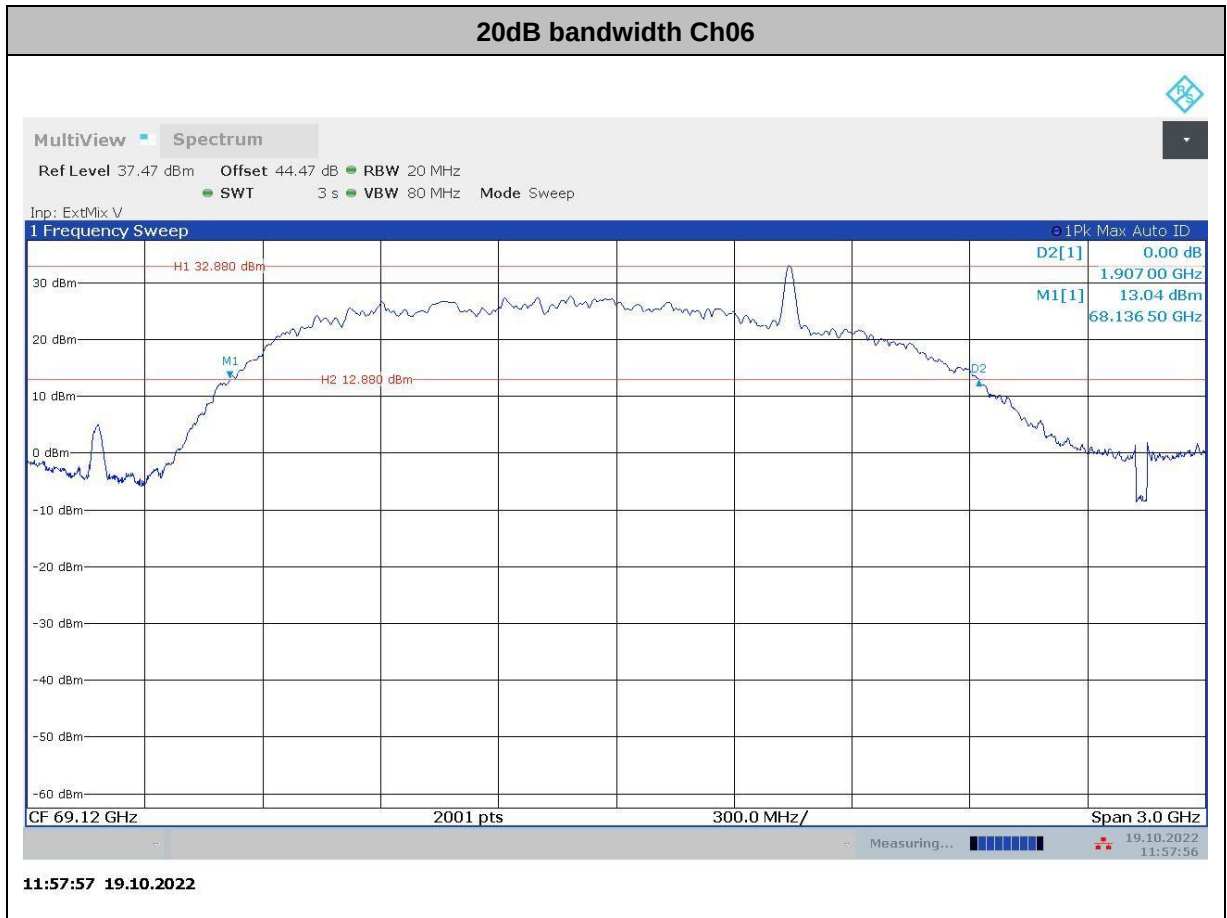














3.5 EIRP Power Measurement

3.5.1 Test Limit

Regulation	Product Type	Peak EIRP Power (dBm)	Average EIRP Power (dBm)
FCC 15.255 (c) (1)	Other than fixed field disturbance sensors Other than fixed point-to-point transmitters	43	40

3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013 clause 9.4, 9.5 and 9.11

3.5.4 Test Results

Temperature		21℃		Relative Humidity		49%		
Test Engineer		David Hung						
Peak EIRP Power Measurement Ch01								
Frequency (GHz)	Measure Dist. (m)	Measure Ant Gain (dBi)	DSO (mV)	Power measured (dBm)	Emeas (dBuV/m)	EIRP (dBm)	EIRP Limit (dBm) Peak	Result
58.32	0.7	22.5	25.296	-3.98	146.094	38.30	43	PASS
Average EIRP Power Measurement Ch01								
Frequency (GHz)	Measure Dist. (m)	Measure Ant Gain (dBi)	DSO (mV)	Power measured (dBm)	Emeas (dBuV/m)	EIRP (dBm)	EIRP Limit (dBm) Average	Result
58.32	0.7	22.5	14.007	-6.90	143.174	35.38	40	PASS

Peak EIRP Power Measurement Ch03								
Frequency (GHz)	Measure Dist. (m)	Measure Ant Gain (dBi)	DSO (mV)	Power measured (dBm)	Emeas (dBuV/m)	EIRP (dBm)	EIRP Limit (dBm) Peak	Result
62.64	0.7	22.5	24.506	-4.26	146.435	38.64	43	PASS
Average EIRP Power Measurement Ch03								
Frequency (GHz)	Measure Dist. (m)	Measure Ant Gain (dBi)	DSO (mV)	Power measured (dBm)	Emeas (dBuV/m)	EIRP (dBm)	EIRP Limit (dBm) Average	Result
62.64	0.7	22.5	14.736	-6.60	144.095	36.30	40	PASS

Peak EIRP Power Measurement Ch06								
Frequency (GHz)	Measure Dist. (m)	Measure Ant Gain (dBi)	DSO (mV)	Power measured (dBm)	Emeas (dBuV/m)	EIRP (dBm)	EIRP Limit (dBm) Peak	Result
69.12	0.7	22.5	11.858	-6.33	145.220	37.42	43	PASS
Average EIRP Power Measurement Ch06								
Frequency (GHz)	Measure Dist. (m)	Measure Ant Gain (dBi)	DSO (mV)	Power measured (dBm)	Emeas (dBuV/m)	EIRP (dBm)	EIRP Limit (dBm) Average	Result
69.12	0.7	22.5	5.567	-9.15	142.400	34.60	40	PASS

For radiated emissions, calculate the field strength (E) in dB μ V/m.

$$E = 126.8 - 20 \cdot \log(\lambda) + P - G$$

where:

E : is the field strength of the emission at the measurement distance, in dB μ V/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 For radiated emissions, calculate the EIRP (dBm).

If the measurement was performed in the far field, calculate the EIRP.

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

where:

EIRP : is the equivalent isotopically radiated power, in dBm

E-meas. : is the field strength of the emission at the measurement distance, in dB μ V/m

d-meas. : is the measurement distance, in m

NOTE: The procedure of ANSI C63.10-2013 9.11(e) was used. EUT was replaced with mm-wave signal source and variable attenuator was tuned so that the DSO indicates the same reading which represent for EUT's peak and average power.

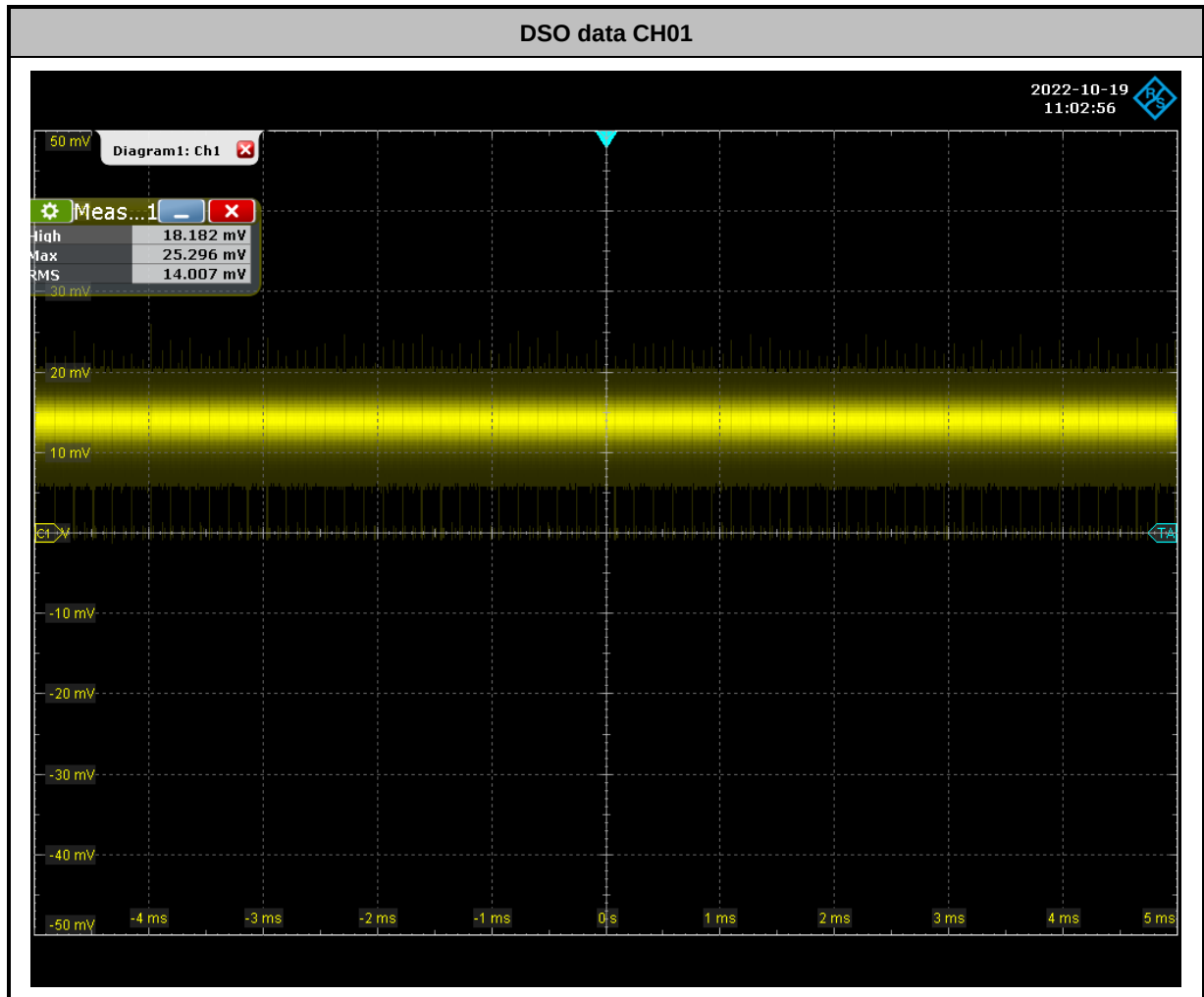
Calculation example:

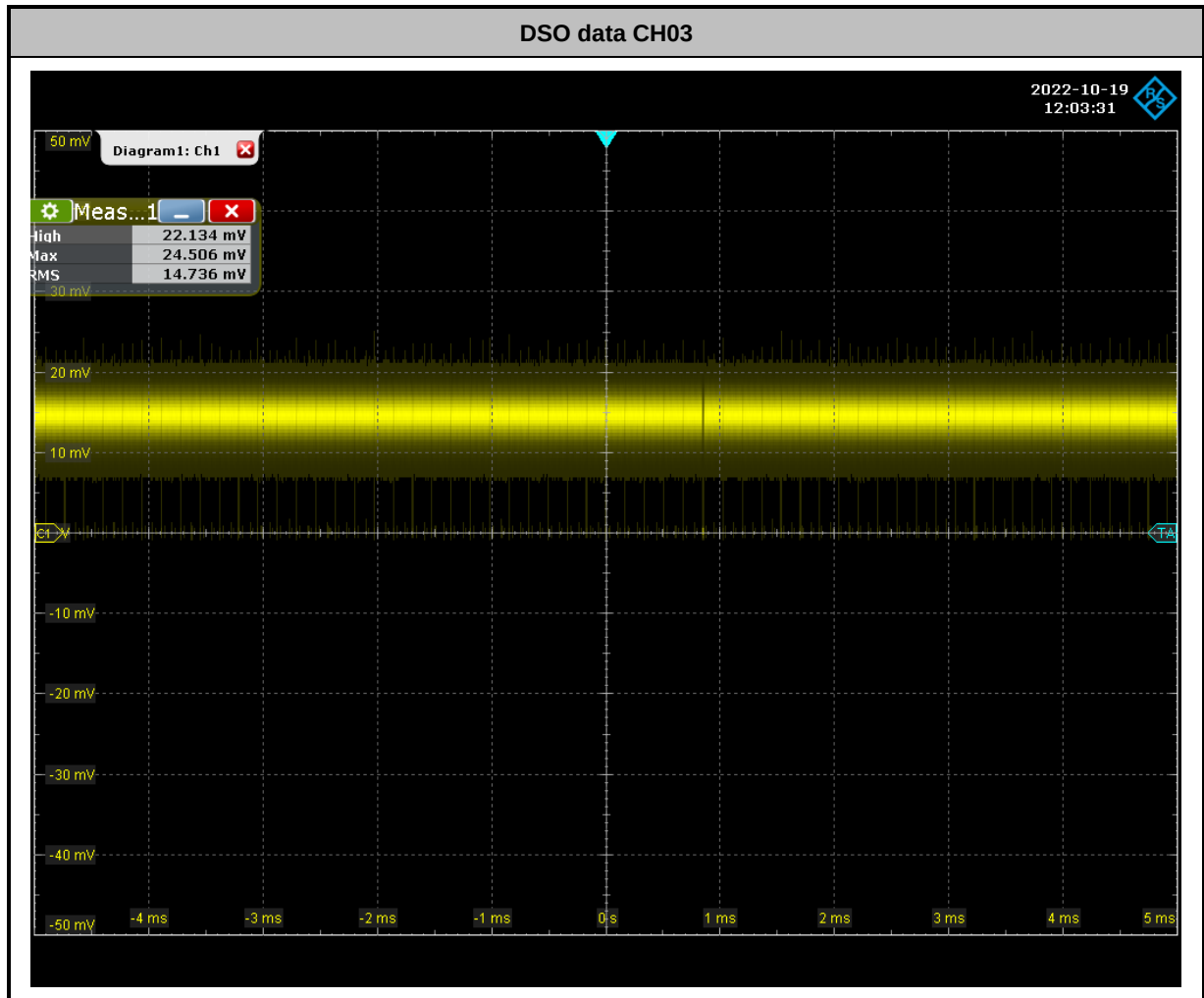
$$\text{E(dBuV/m)} = 126.8 - 20 \cdot \log(\lambda) + P - G, \text{ where } f=60\text{GHz}, P= -10\text{dBm}, G= 24\text{dBi}, \text{ then } E = 138.8 \text{ (dBuV/m)}$$

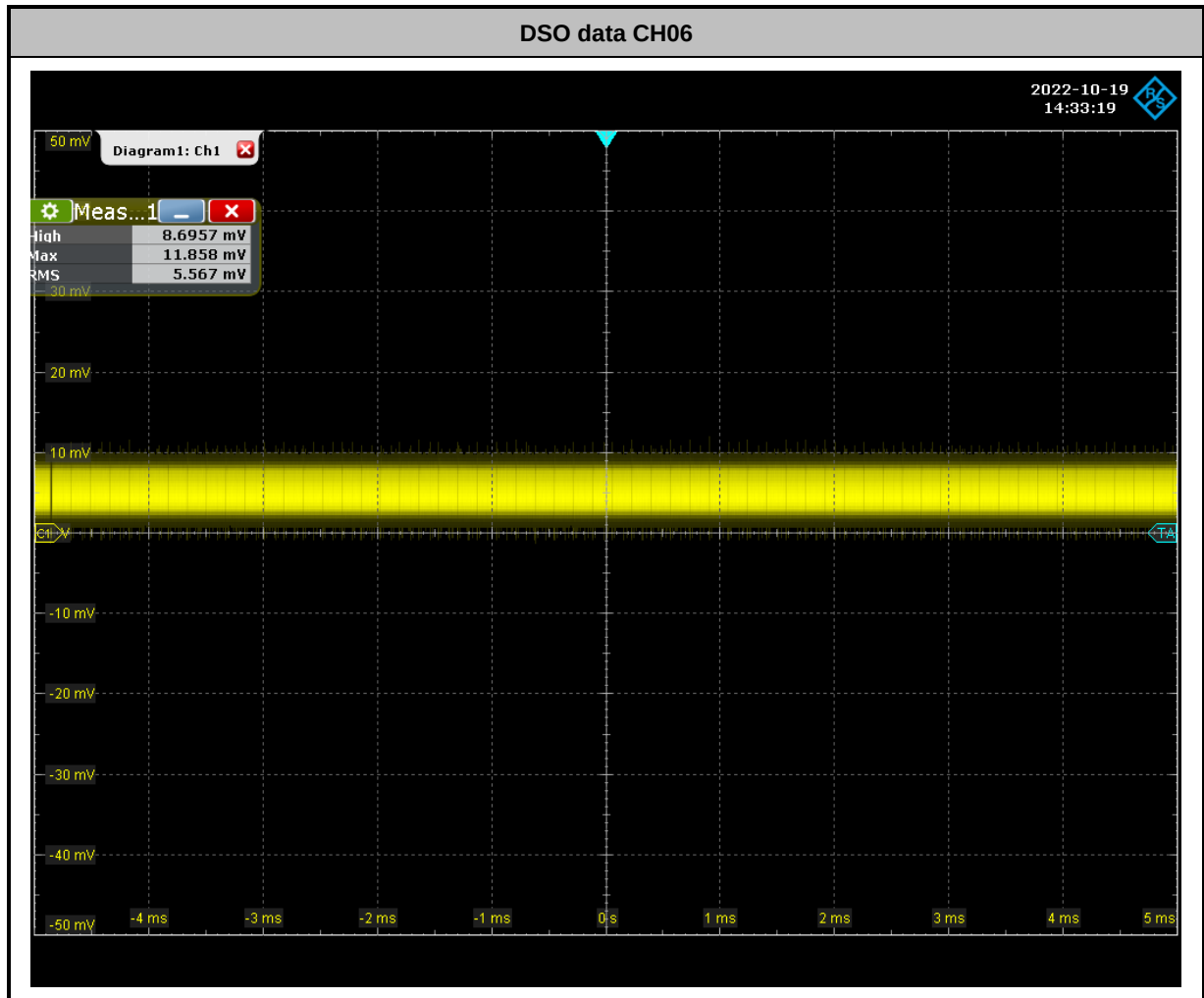
$$\text{EIRP (dBm)} = \text{E(dBuV/m)} + 20 \cdot \log(d) - 104.7 = 138.8 \text{ (dBuV/m)} + 20 \cdot \log(d=1) - 104.7 = 31.4\text{dBm}$$



3.5.5 Test Plots







3.6 Peak Conducted Output Power

3.6.1 Limit

The peak transmitter conducted output power shall not exceed 500 mW.

Transmitters with an emission bandwidth of less than 100 MHz must limit their peak transmitter conducted output power to the product of 500 mW times their emission bandwidth divided by 100 MHz. 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 kHz resolution bandwidth spectrum analyzer.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013 clause 9.5 and 9.11

3.6.4 Test Results

Peak Conducted Power Measurement							
Channel	Frequency (GHz)	6dB BW (MHz)	Peak EIRP (dBm)	Antenna gain(dBi)	Conducted power (dBm)	Limit (dBm)	Result
Ch01	58.32	989.70	38.30	16.2	22.10	26.99	PASS
Ch03	62.64	680.70	38.64	16.2	22.44	26.99	PASS
Ch06	69.12	1301.30	37.42	16.2	21.22	26.99	PASS

3.7 Transmit Spurious Emission

3.7.1 Limit of Radiated Spurious Emission

Frequency Range	Limit
Below 40GHz	Follow 15.209
Above 40GHz	90 pW/cm ² @ 3m (equivalent EIRP 102uW, -10dBm)
Note1: For the applicable limit, see FCC 15.255 (d)	
Note2: Spurious emissions shall not exceed the level of fundamental emission.	

3.7.2 Measuring Instruments

See list of measuring equipment of this test report.

3.7.3 Test Procedures

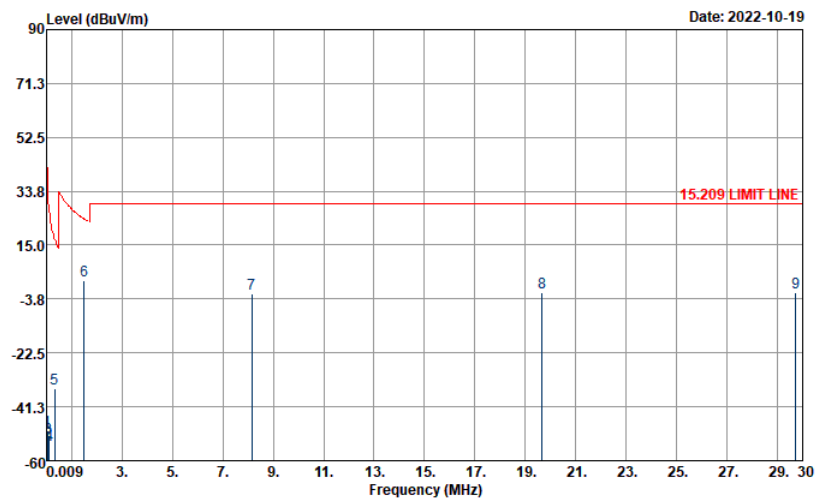
Method of measurement: Refer as ANSI C63.10-2013, clause 9.12 and 9.13.



3.7.4 Test Result

<Below 30MHz>

Temperature	24.8℃	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	3m
Test Range	9KHz to 30MHz	Test Polarization	Horizontal
Test Configuration	Mode 1: Ch01 58.32GHz		

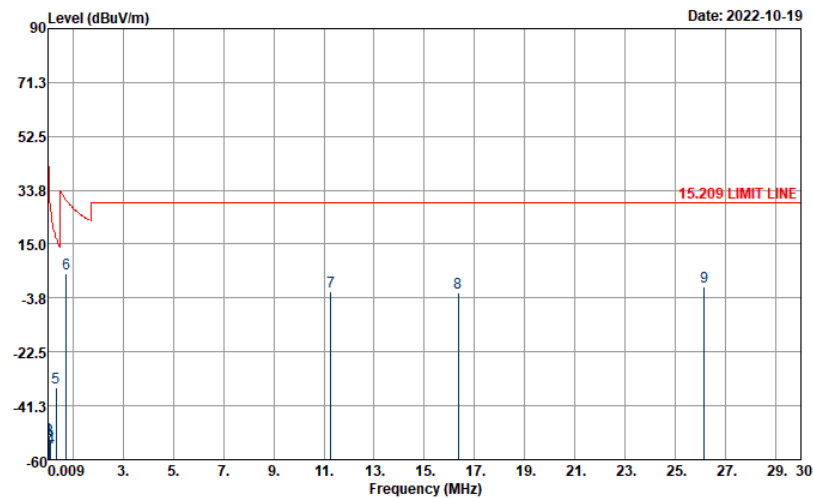


Site : 03CH01-CA
Condition : 15.209 LIMIT LINE 3m LOOP_100840_ON220705 HORIZONTAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read Level	Over Limit	Limit Line	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	0.04	-49.55	-0.49	-86.13	36.58	-49.06	---	---	Peak
2	0.07	-53.16	-3.54	-83.72	30.56	-49.62	---	---	Peak
3	0.10	-51.99	-2.31	-79.51	27.52	-49.68	---	---	Peak
4	0.13	-54.47	-4.66	-79.97	25.50	-49.81	---	---	Peak
5	0.32	-34.94	14.91	-52.46	17.52	-49.85	---	---	Peak
6	1.50	2.60	12.18	-21.50	24.10	-9.58	---	---	Peak
7	8.16	-1.77	7.70	-31.27	29.50	-9.47	---	---	Peak
8	19.66	-1.32	8.05	-30.82	29.50	-9.37	---	---	Peak
9	29.72	-1.59	7.61	-31.09	29.50	-9.20	---	---	Peak



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	3m
Test Range	9KHz to 30MHz	Test Polarization	Vertical
Test Configuration	Mode 1: Ch01 58.32GHz		

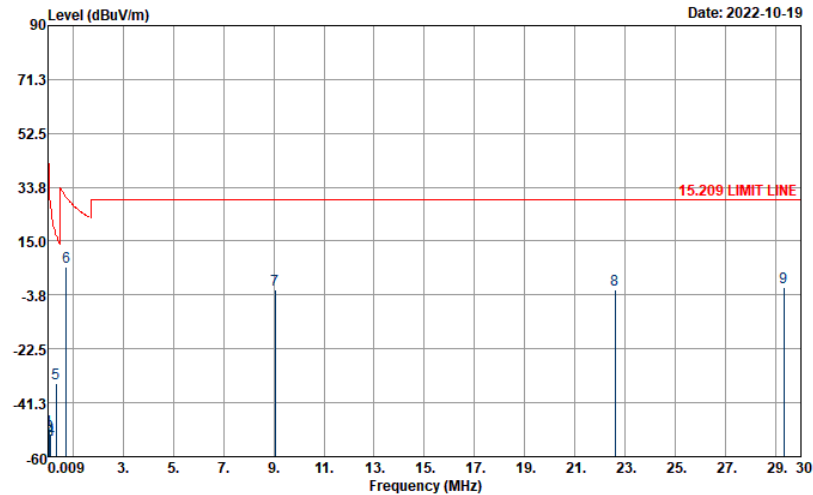


Site : 03CH01-CA
Condition : 15.209 LIMIT LINE 3m LOOP_100840_ON220705 VERTICAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read Level	Over Limit	Limit Line	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	0.04	-52.42	-3.36	-89.00	36.58	-49.06	---	---	Peak
2	0.07	-54.96	-5.35	-85.81	30.85	-49.61	---	---	Peak
3	0.10	-52.98	-3.30	-80.49	27.51	-49.68	---	---	Peak
4	0.11	-55.93	-6.17	-82.52	26.59	-49.76	---	---	Peak
5	0.32	-34.91	14.94	-52.30	17.39	-49.85	---	---	Peak
6	0.73	4.95	14.69	-25.38	30.33	-9.74	---	---	Peak
7	11.27	-1.54	7.92	-31.04	29.50	-9.46	---	---	Peak
8	16.34	-2.07	7.36	-31.57	29.50	-9.43	---	---	Peak
9	26.16	0.05	9.26	-29.45	29.50	-9.21	---	---	Peak



Temperature	24.8℃	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	3m
Test Range	9KHz to 30MHz	Test Polarization	Horizontal
Test Configuration	Mode 2: Ch03 62.64GHz		

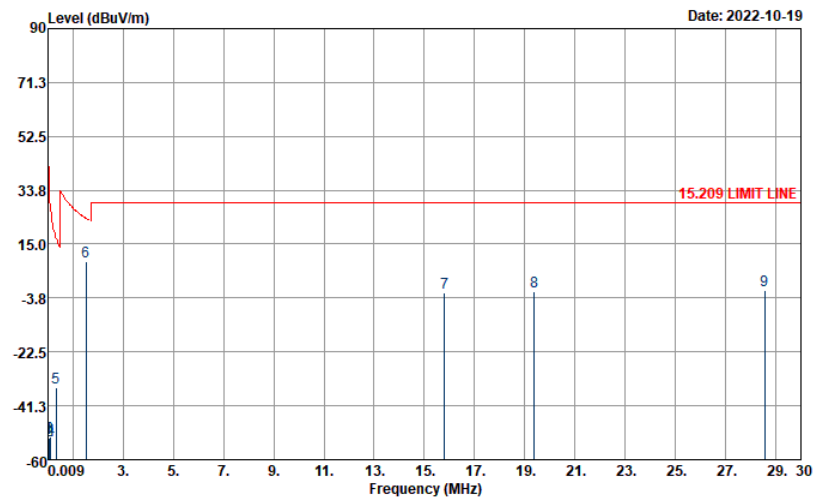


Site : 03CH01-CA
Condition : 15.209 LIMIT LINE 3m LOOP_100840_ON220705 HORIZONTAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read Level	Over Limit	Limit Line	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	0.05	-50.97	-1.49	-84.51	33.54	-49.48	---	---	Peak
2	0.07	-54.30	-4.68	-84.87	30.57	-49.62	---	---	Peak
3	0.10	-52.60	-2.94	-80.22	27.62	-49.66	---	---	Peak
4	0.12	-53.54	-3.73	-79.35	25.81	-49.81	---	---	Peak
5	0.32	-34.59	15.26	-52.09	17.50	-49.85	---	---	Peak
6	0.73	5.85	15.59	-24.48	30.33	-9.74	---	---	Peak
7	9.06	-2.05	7.41	-31.55	29.50	-9.46	---	---	Peak
8	22.60	-1.77	7.54	-31.27	29.50	-9.31	---	---	Peak
9	29.33	-1.19	8.00	-30.69	29.50	-9.19	---	---	Peak



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	3m
Test Range	9KHz to 30MHz	Test Polarization	Vertical
Test Configuration	Mode 2: Ch03 62.64GHz		

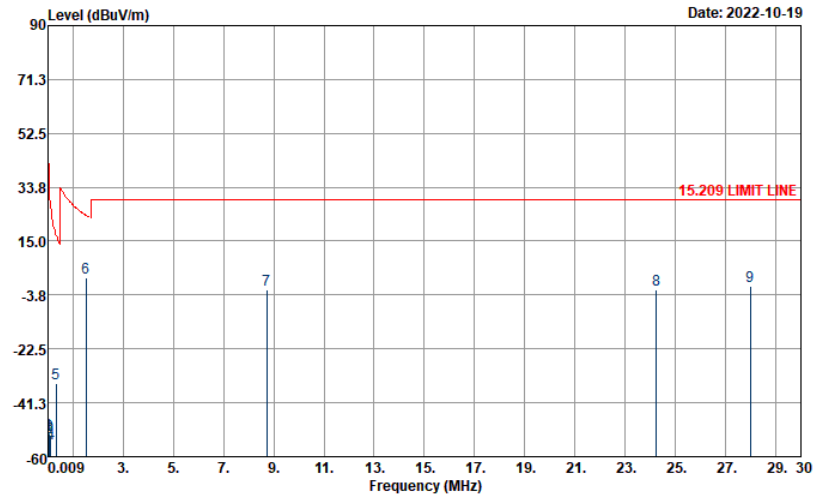


Site : 03CH01-CA
Condition : 15.209 LIMIT LINE 3m LOOP_100840_ON220705 VERTICAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read Level	Over Limit	Limit Line	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	0.03	-52.33	-3.36	-89.37	37.04	-48.97	---	---	Peak
2	0.07	-53.20	-3.58	-83.77	30.57	-49.62	---	---	Peak
3	0.10	-51.92	-2.26	-79.54	27.62	-49.66	---	---	Peak
4	0.12	-53.09	-3.28	-78.91	25.82	-49.81	---	---	Peak
5	0.33	-35.04	14.82	-52.17	17.13	-49.86	---	---	Peak
6	1.51	8.98	18.55	-15.04	24.02	-9.57	---	---	Peak
7	15.81	-1.76	7.68	-31.26	29.50	-9.44	---	---	Peak
8	19.38	-1.56	7.83	-31.06	29.50	-9.39	---	---	Peak
9	28.56	-0.97	8.19	-30.47	29.50	-9.16	---	---	Peak



Temperature	24.8℃	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	3m
Test Range	9KHz to 30MHz	Test Polarization	Horizontal
Test Configuration	Mode 3: Ch06 69.12GHz		

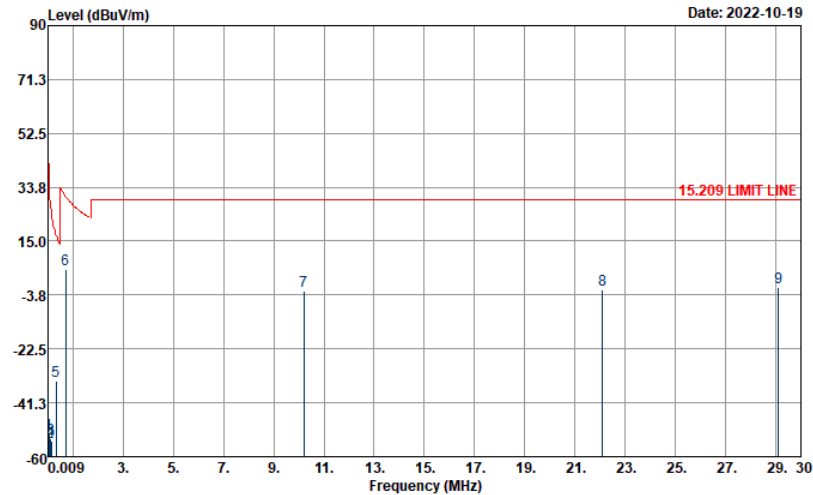


Site : 03CH01-CA
Condition : 15.209 LIMIT LINE 3m LOOP_100840_ON220705 HORIZONTAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read Level	Over Limit	Limit Line	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	0.05	-51.85	-2.37	-85.06	33.21	-49.48	---	---	Peak
2	0.07	-53.17	-3.55	-83.73	30.56	-49.62	---	---	Peak
3	0.10	-52.45	-2.77	-79.94	27.49	-49.68	---	---	Peak
4	0.12	-55.46	-5.65	-81.23	25.77	-49.81	---	---	Peak
5	0.32	-34.63	15.22	-52.10	17.47	-49.85	---	---	Peak
6	1.53	2.15	11.72	-21.78	23.93	-9.57	---	---	Peak
7	8.73	-1.93	7.54	-31.43	29.50	-9.47	---	---	Peak
8	24.25	-1.73	7.53	-31.23	29.50	-9.26	---	---	Peak
9	27.99	-0.72	8.44	-30.22	29.50	-9.16	---	---	Peak



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	3m
Test Range	9KHz to 30MHz	Test Polarization	Vertical
Test Configuration	Mode 3: Ch06 69.12GHz		



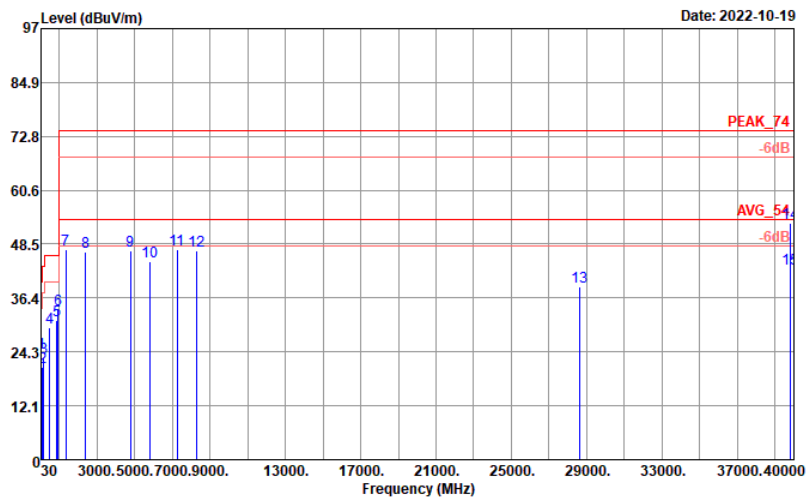
Site : 03CH01-CA
Condition : 15.209 LIMIT LINE 3m LOOP_100840_ON220705 VERTICAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read Level	Over Limit	Limit Line	Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	0.04	-51.91	-2.85	-88.49	36.58	-49.06	---	---	Peak
2	0.07	-54.96	-5.34	-85.52	30.56	-49.62	---	---	Peak
3	0.10	-53.63	-3.92	-80.83	27.20	-49.71	---	---	Peak
4	0.15	-54.64	-4.94	-78.75	24.11	-49.70	---	---	Peak
5	0.32	-33.82	16.03	-51.30	17.48	-49.85	---	---	Peak
6	0.72	5.17	14.91	-25.25	30.42	-9.74	---	---	Peak
7	10.21	-2.27	7.19	-31.77	29.50	-9.46	---	---	Peak
8	22.10	-1.89	7.44	-31.39	29.50	-9.33	---	---	Peak
9	29.11	-1.21	7.97	-30.71	29.50	-9.18	---	---	Peak



<30MHz to 40GHz>

Temperature	24.8℃	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	30MHz ~ 18GHz: 3m 18GHz ~ 40GHz: 1m
Test Range	30MHz to 40GHz	Test Polarization	Horizontal
Test Configuration	Mode 1: Ch01 58.32GHz		

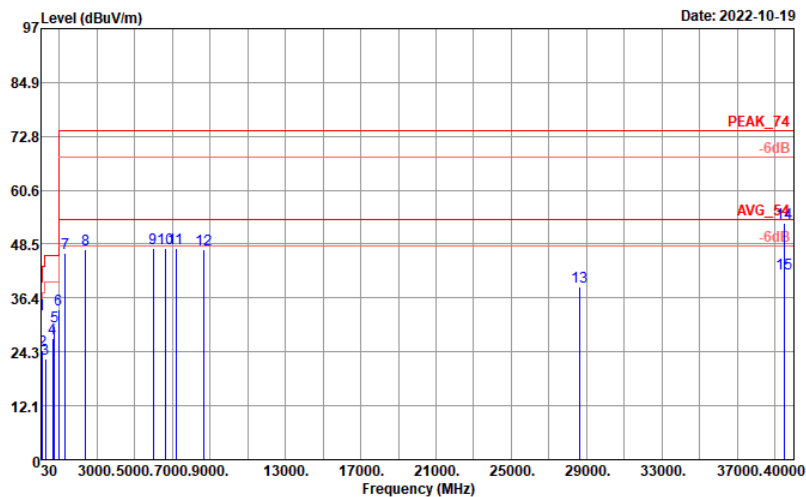


Site : 03CH01-CA
Condition : PEAK_74 1m SHF_HORN_842_220816 HORIZONTAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read	Over	Limit	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg
1	47.46	24.13	39.74	-15.87	40.00	-15.61	---	Peak
2	113.42	20.90	34.49	-22.60	43.50	-13.59	---	Peak
3	170.65	22.88	37.61	-20.62	43.50	-14.73	---	Peak
4	501.42	29.65	35.09	-16.35	46.00	-5.44	---	Peak
5	856.44	31.40	29.91	-14.60	46.00	1.49	---	Peak
6	949.56	33.73	29.48	-12.27	46.00	4.25	---	Peak
7	1340.00	47.29	82.76	-26.71	74.00	-35.47	---	Peak
8	2394.00	46.64	79.15	-27.36	74.00	-32.51	---	Peak
9	4791.00	47.14	71.17	-26.86	74.00	-24.03	---	Peak
10	5811.00	44.50	63.82	-29.50	74.00	-19.32	---	Peak
11	7273.00	47.26	62.91	-26.74	74.00	-15.65	---	Peak
12	8276.00	47.07	63.75	-26.93	74.00	-16.68	---	Peak
13	28656.00	38.86	34.54	-35.14	74.00	4.32	---	Peak
14	39824.00	53.14	37.43	-20.86	74.00	15.71	---	Peak
15	39824.00	42.84	27.13	-11.16	54.00	15.71	---	Average



Temperature	24.8℃	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	30MHz ~ 18GHz: 3m 18GHz ~ 40GHz: 1m
Test Range	30MHz to 40GHz	Test Polarization	Vertical
Test Configuration	Mode 1: Ch01 58.32GHz		

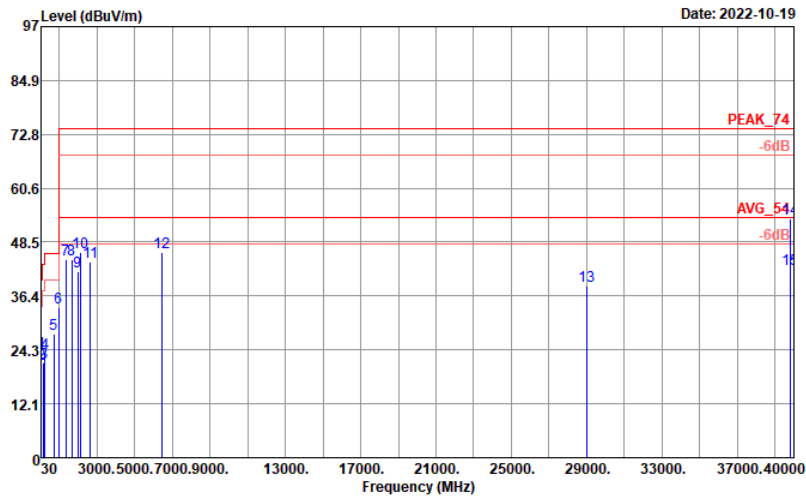


Site : 03CH01-CA
Condition : PEAK_74 1m SHF_HORN_842_220816 VERTICAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read	Over	Limit		A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	46.49	32.75	64.05	-7.25	40.00	-31.30	---	---	Peak
2	105.66	24.48	55.23	-19.02	43.50	-30.75	---	---	Peak
3	264.74	22.59	52.49	-23.41	46.00	-29.90	---	---	Peak
4	646.92	27.25	56.11	-18.75	46.00	-28.86	---	---	Peak
5	750.71	30.10	58.46	-15.90	46.00	-28.36	---	---	Peak
6	954.41	33.77	60.26	-12.23	46.00	-26.49	---	---	Peak
7	1323.00	46.53	82.06	-27.47	74.00	-35.53	---	---	Peak
8	2394.00	47.15	79.46	-26.85	74.00	-32.31	---	---	Peak
9	5981.00	47.64	67.34	-26.36	74.00	-19.70	---	---	Peak
10	6661.00	47.51	63.48	-26.49	74.00	-15.97	---	---	Peak
11	7205.00	47.66	62.58	-26.34	74.00	-14.92	---	---	Peak
12	8684.00	47.39	62.71	-26.61	74.00	-15.32	---	---	Peak
13	28633.80	38.77	34.42	-35.23	74.00	4.35	---	---	Peak
14	39483.00	53.30	38.45	-20.70	74.00	14.85	---	---	Peak
15	39483.00	41.92	27.07	-12.08	54.00	14.85	---	---	Average



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	30MHz ~ 18GHz: 3m 18GHz ~ 40GHz: 1m
Test Range	30MHz to 40GHz	Test Polarization	Horizontal
Test Configuration	Mode 2: Ch03 62.64GHz		

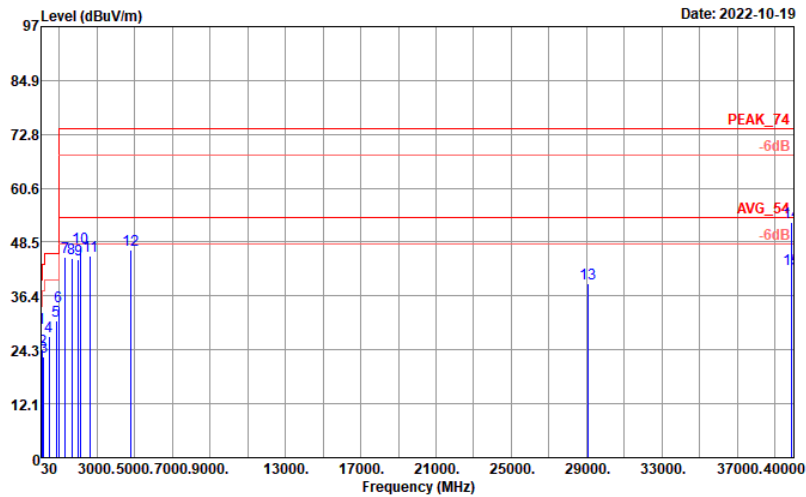


Site : 03CH01-CA
Condition : PEAK_74 1m SHF_HORN_842_220816 HORIZONTAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read	Over	Limit	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg
1	30.00	23.76	30.46	-16.24	40.00	-6.70	---	Peak
2	54.25	21.11	39.87	-18.89	40.00	-18.76	---	Peak
3	168.71	21.36	35.94	-22.14	43.50	-14.58	---	Peak
4	250.19	23.39	34.83	-22.61	46.00	-11.44	---	Peak
5	720.64	27.74	29.13	-18.26	46.00	-1.39	---	Peak
6	955.38	33.69	29.27	-12.31	46.00	4.42	---	Peak
7	1340.00	44.58	80.05	-29.42	74.00	-35.47	---	Peak
8	1663.00	44.67	81.16	-29.33	74.00	-36.49	---	Peak
9	1986.00	41.89	76.22	-32.11	74.00	-34.33	---	Peak
10	2156.00	46.26	79.56	-27.74	74.00	-33.30	---	Peak
11	2649.00	44.15	75.90	-29.85	74.00	-31.75	---	Peak
12	6474.00	46.13	64.24	-27.87	74.00	-18.11	---	Peak
13	28977.90	38.54	34.11	-35.46	74.00	4.43	---	Peak
14	39813.00	53.90	38.15	-20.10	74.00	15.75	---	Peak
15	39813.00	42.34	26.59	-11.66	54.00	15.75	---	Average



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	30MHz ~ 18GHz: 3m 18GHz ~ 40GHz: 1m
Test Range	30MHz to 40GHz	Test Polarization	Vertical
Test Configuration	Mode 2: Ch03 62.64GHz		

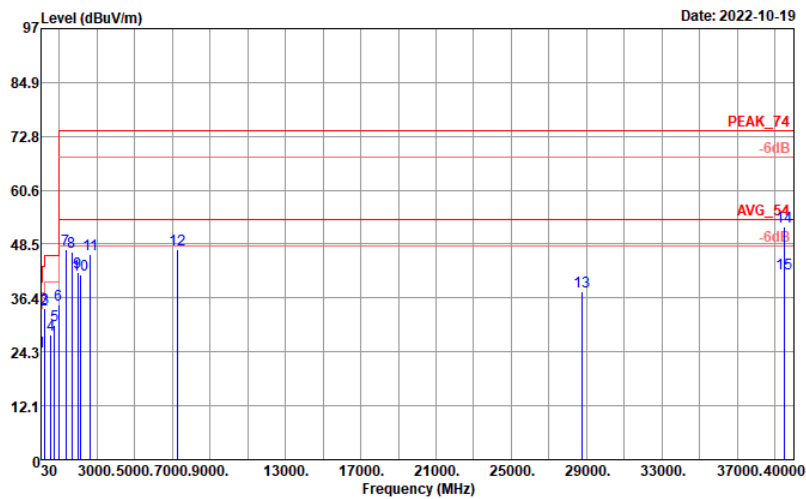


Site : 03CH01-CA
Condition : PEAK_74 1m SHF_HORN_842_220816 VERTICAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read	Over	Limit		A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	46.49	29.17	44.31	-10.83	40.00	-15.14	---	---	Peak
2	105.66	24.31	38.49	-19.19	43.50	-14.18	---	---	Peak
3	163.86	22.69	36.89	-20.81	43.50	-14.20	---	---	Peak
4	450.98	27.23	33.64	-18.77	46.00	-6.41	---	---	Peak
5	824.43	30.92	30.76	-15.08	46.00	0.16	---	---	Peak
6	954.41	33.94	29.54	-12.06	46.00	4.40	---	---	Peak
7	1323.00	45.26	80.79	-28.74	74.00	-35.53	---	---	Peak
8	1663.00	44.87	81.16	-29.13	74.00	-36.29	---	---	Peak
9	2003.00	44.51	78.45	-29.49	74.00	-33.94	---	---	Peak
10	2156.00	47.23	80.57	-26.77	74.00	-33.34	---	---	Peak
11	2666.00	45.32	76.73	-28.68	74.00	-31.41	---	---	Peak
12	4774.00	46.64	70.74	-27.36	74.00	-24.10	---	---	Peak
13	29055.60	39.16	34.62	-34.84	74.00	4.54	---	---	Peak
14	39868.00	52.96	37.50	-21.04	74.00	15.46	---	---	Peak
15	39868.00	42.34	26.88	-11.66	54.00	15.46	---	---	Average



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	30MHz ~ 18GHz: 3m 18GHz ~ 40GHz: 1m
Test Range	30MHz to 40GHz	Test Polarization	Horizontal
Test Configuration	Mode 3: Ch06 69.12GHz		

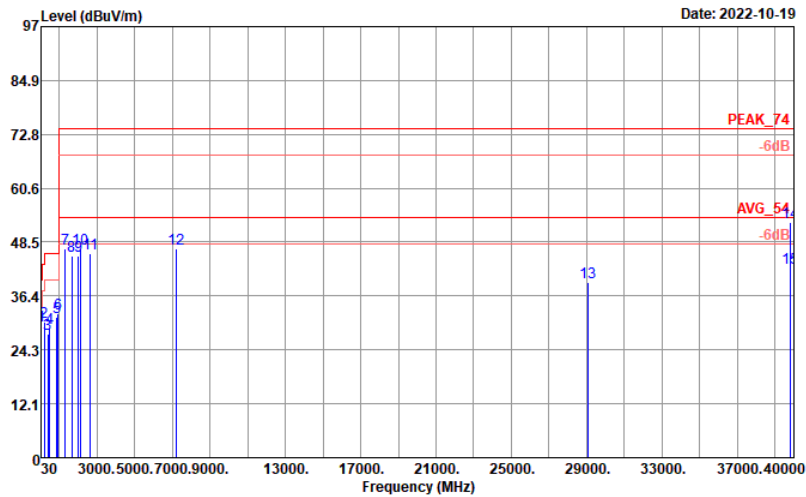


Site : 03CH01-CA
Condition : PEAK_74 1m SHF_HORN_842_220816 HORIZONTAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read	Over	Limit	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg
1	50.37	24.31	41.44	-15.69	40.00	-17.13	---	Peak
2	211.39	33.80	48.92	-9.70	43.50	-15.12	---	Peak
3	224.00	33.92	48.39	-12.08	46.00	-14.47	---	Peak
4	547.01	27.97	32.14	-18.03	46.00	-4.17	---	Peak
5	746.83	30.24	30.58	-15.76	46.00	-0.34	---	Peak
6	955.38	34.74	30.32	-11.26	46.00	4.42	---	Peak
7	1340.00	47.33	82.80	-26.67	74.00	-35.47	---	Peak
8	1663.00	46.77	83.26	-27.23	74.00	-36.49	---	Peak
9	1986.00	42.22	76.55	-31.78	74.00	-34.33	---	Peak
10	2156.00	41.61	74.91	-32.39	74.00	-33.30	---	Peak
11	2649.00	46.29	78.04	-27.71	74.00	-31.75	---	Peak
12	7256.00	47.23	62.59	-26.77	74.00	-15.36	---	Peak
13	28722.60	37.74	33.42	-36.26	74.00	4.32	---	Peak
14	39494.00	52.45	37.53	-21.55	74.00	14.92	---	Peak
15	39494.00	41.90	26.98	-12.10	54.00	14.92	---	Average



Temperature	24.8°C	Relative Humidity	43%
Test Engineer	Leo Liu	Test Distance	30MHz ~ 18GHz: 3m 18GHz ~ 40GHz: 1m
Test Range	30MHz to 40GHz	Test Polarization	Vertical
Test Configuration	Mode 3: Ch06 69.12GHz		



Site : 03CH01-CA
Condition : PEAK_74 1m SHF_HORN_842_220816 VERTICAL
Project : 220826011
Power : 120Vac/60Hz
Plane : Z

	Freq	Level	Read	Over	Limit		A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV	dB	dBuV/m	dB/m	cm	deg	
1	50.37	29.77	46.90	-10.23	40.00	-17.13	---	---	Peak
2	220.12	30.63	45.42	-15.37	46.00	-14.79	---	---	Peak
3	381.14	27.80	36.22	-18.20	46.00	-8.42	---	---	Peak
4	502.39	29.07	34.50	-16.93	46.00	-5.43	---	---	Peak
5	883.60	31.53	29.90	-14.47	46.00	1.63	---	---	Peak
6	936.95	32.56	28.97	-13.44	46.00	3.59	---	---	Peak
7	1323.00	46.90	82.43	-27.10	74.00	-35.53	---	---	Peak
8	1663.00	45.45	81.74	-28.55	74.00	-36.29	---	---	Peak
9	2003.00	45.50	79.44	-28.50	74.00	-33.94	---	---	Peak
10	2156.00	47.04	80.38	-26.96	74.00	-33.34	---	---	Peak
11	2666.00	45.87	77.28	-28.13	74.00	-31.41	---	---	Peak
12	7239.00	46.91	62.13	-27.09	74.00	-15.22	---	---	Peak
13	29088.90	39.47	34.95	-34.53	74.00	4.52	---	---	Peak
14	39791.00	52.86	37.16	-21.14	74.00	15.70	---	---	Peak
15	39791.00	42.82	27.12	-11.18	54.00	15.70	---	---	Average



<40GHz to 200GHz>

Temperature	21°C	Relative Humidity	49%
Test Engineer	David Hung	Test Range	40GHz to 200GHz

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
Ch01 58.32GHz	22.5	0.5	192.1875	-72.64
EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Limit (pW/cm ²)	Test Result
-21.77	3	5.882	90	PASS

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
Ch03 62.64GHz	22.5	0.5	192.2325	-72.79
EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Limit (pW/cm ²)	Test Result
-21.92	3	5.683	90	PASS

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
Ch06 69.12GHz	22.5	0.5	192.1225	-72.7
EIRP (dBm)	Specification Distance (m)	Power Density (pW/cm ²)	Limit (pW/cm ²)	Test Result
-21.83	3	5.802	90	PASS

Note: IF cable loss = 0.93 dB

For above 40GHz emission:

$EIRP = P_{rx} - G_{rx} + \text{Free space loss} = P_{rx} - G_{rx} + 20 \cdot \log(4 \pi d / \lambda) + \text{IF cable loss}$

Where

P_{rx} = Read Level

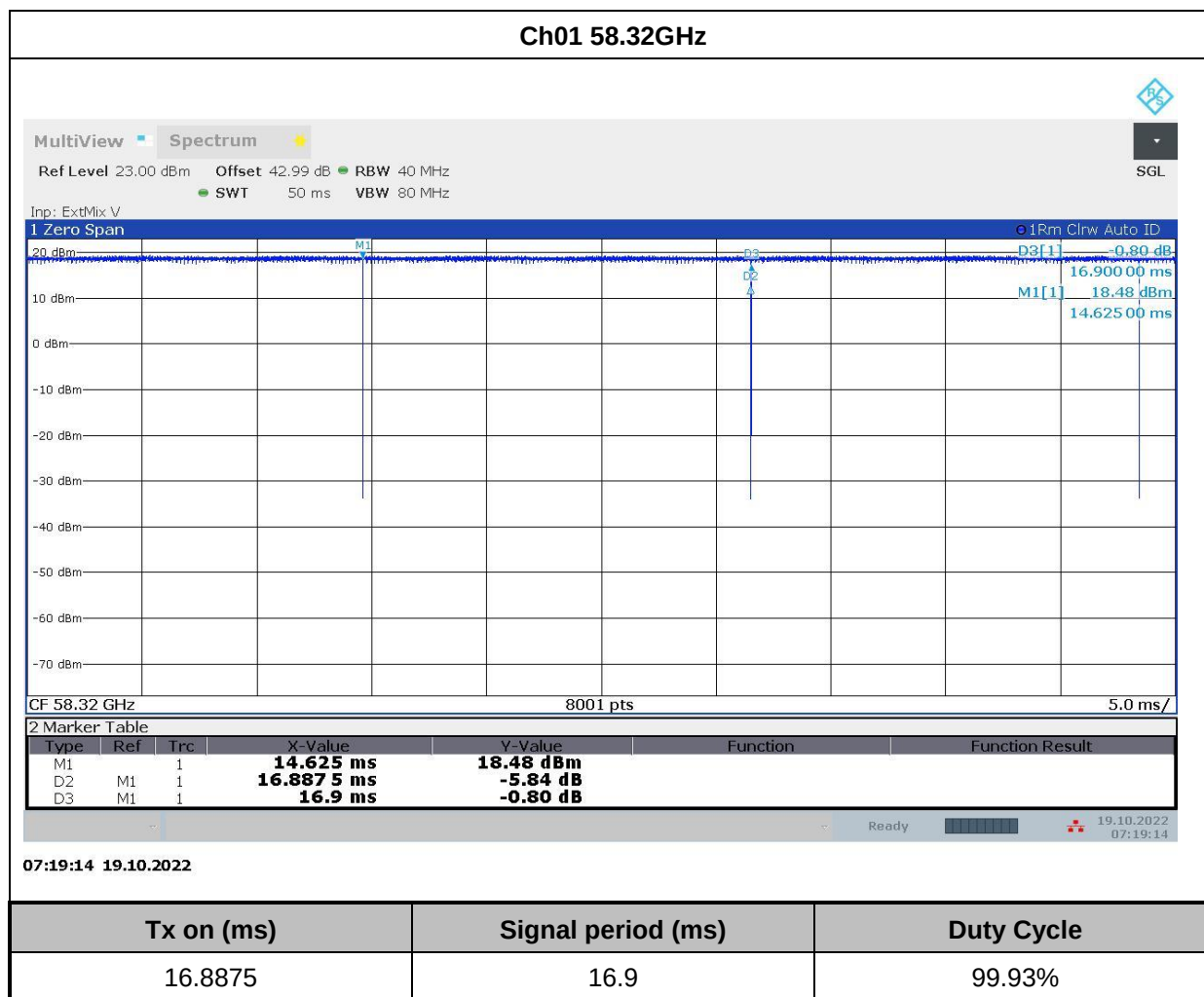
G_{rx} = Rx Antenna Gain

$\text{Power Density (W/m}^2\text{)} = 10^{[(EIRP-30)/10]} / 4 \pi d$

$\text{Power Density (pW/cm}^2\text{)} = \text{Power Density (W/m}^2\text{)} \cdot 10^{(-8)}$



3.7.5 Test Result for Duty cycle



3.8 Frequency Stability

3.8.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency range, 57GHz – 71GHz.

3.8.2 Measuring Instruments

See list of measuring equipment of this test report.

3.8.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013 clause 9.14

3.8.4 Test Result

Test Engineer	Liliana Gonzalez, David Hung			
Test Conditions	Ch01 58.32GHz			Limit
Test Temperature (°C)	Voltage (Volt)	Frequency F _L (GHz)	Frequency F _H (GHz)	Within Band
50	5	57.3155	59.3365	pass
40	5	57.3425	59.3545	
30	5	57.3710	59.2465	
20	5	57.3710	59.2645	
10	5	57.4819	59.2480	
0	5	57.4729	59.2465	
-10	5	57.4804	59.1491	
-20	5	57.4744	59.2870	
20	4.25	57.4774	59.2570	
20	5.75	57.5194	59.2600	



Test Engineer	Liliana Gonzalez, David Hung			
Test Conditions	Ch06 69.12GHz			Limit
Test Temperature (°C)	Voltage (Volt)	Frequency F _L (GHz)	Frequency F _H (GHz)	Within Band
50	5	68.1110	69.9656	pass
40	5	68.1005	70.0570	
30	5	68.1485	70.0210	
20	5	68.1170	70.0151	
10	5	68.1515	70.0585	
0	5	68.1530	70.1290	
-10	5	68.1335	70.1440	
-20	5	68.2249	70.1365	
20	4.25	68.1695	70.0240	
20	5.75	68.1650	70.0555	

4 AC conducted Emission Measurement

4.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

*Decreases with the logarithm of the frequency.

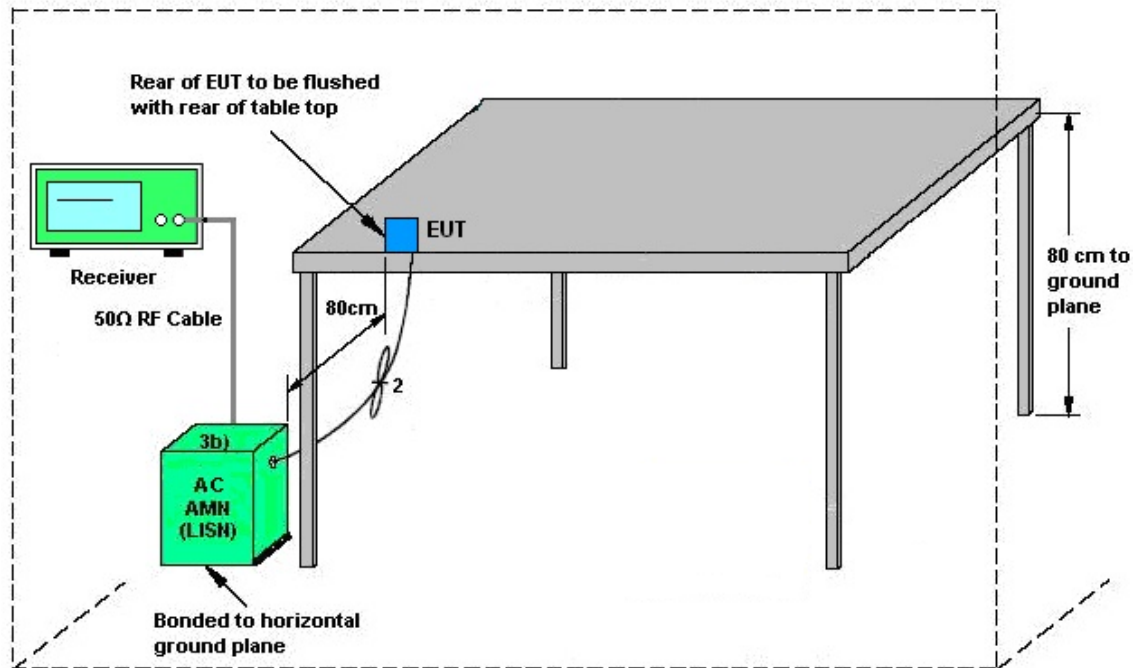
4.2 Measuring Instruments

See list of measuring equipment of this test report.

4.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

4.4 Test Setup

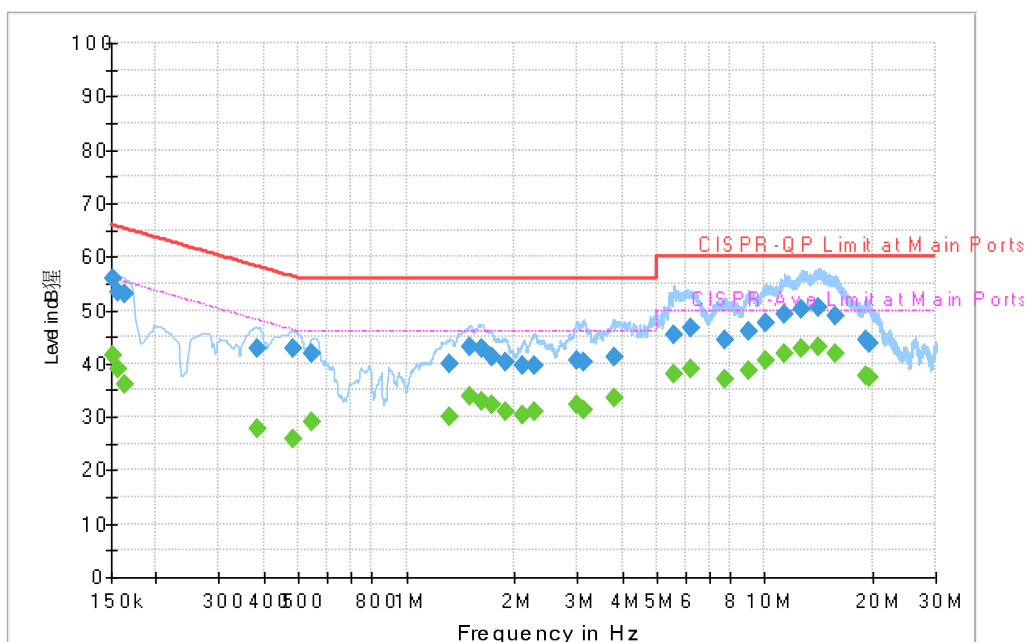


AMN = Artificial mains network (LISN)
 AE = Associated equipment
 EUT = Equipment under test
 ISN = Impedance stabilization network

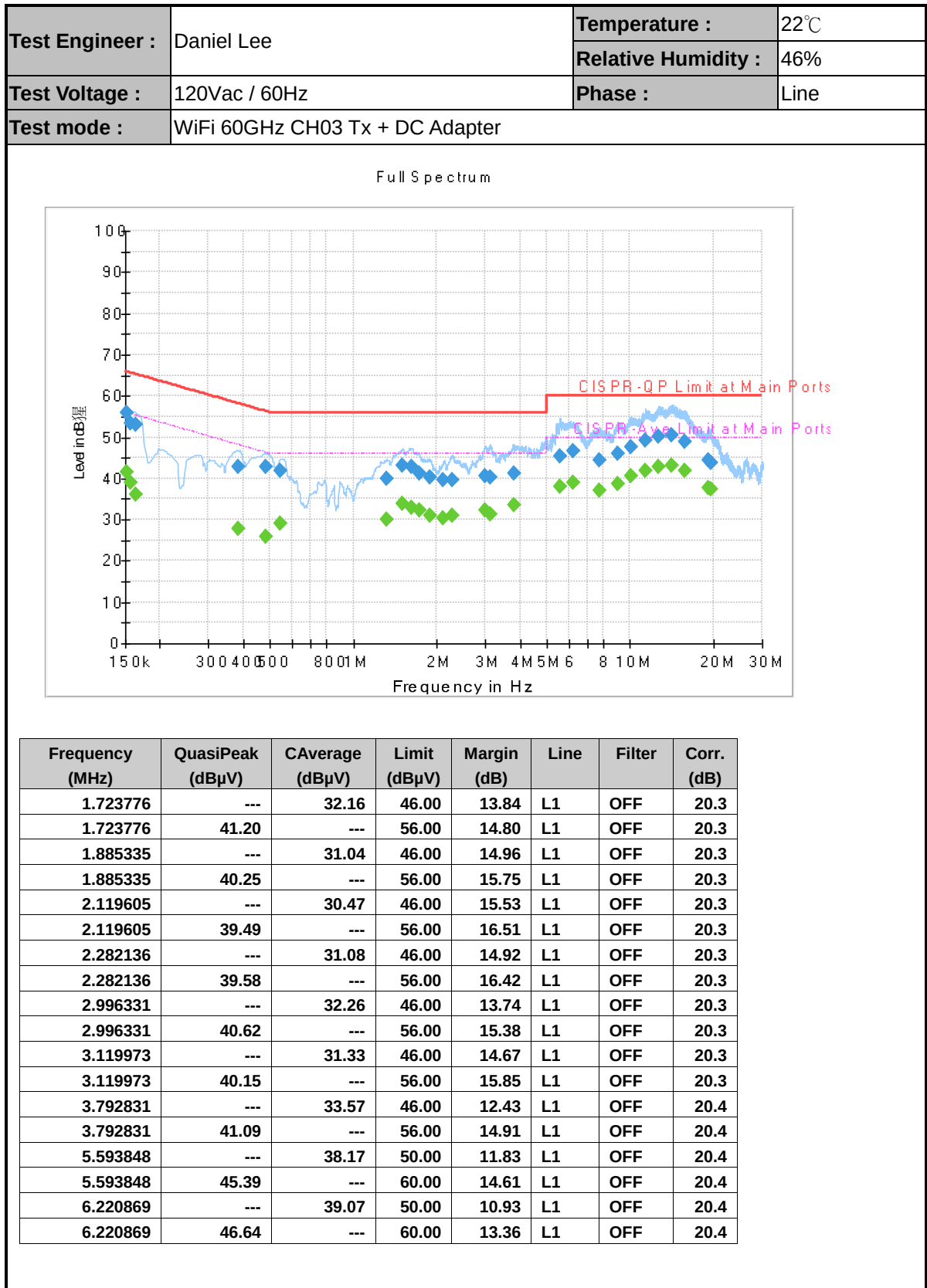
4.5 Test Result of AC Conducted Emission

Test Engineer :	Daniel Lee	Temperature :	22°C
		Relative Humidity :	46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Test mode :	WiFi 60GHz CH03 Tx + DC Adapter		

Full Spectrum



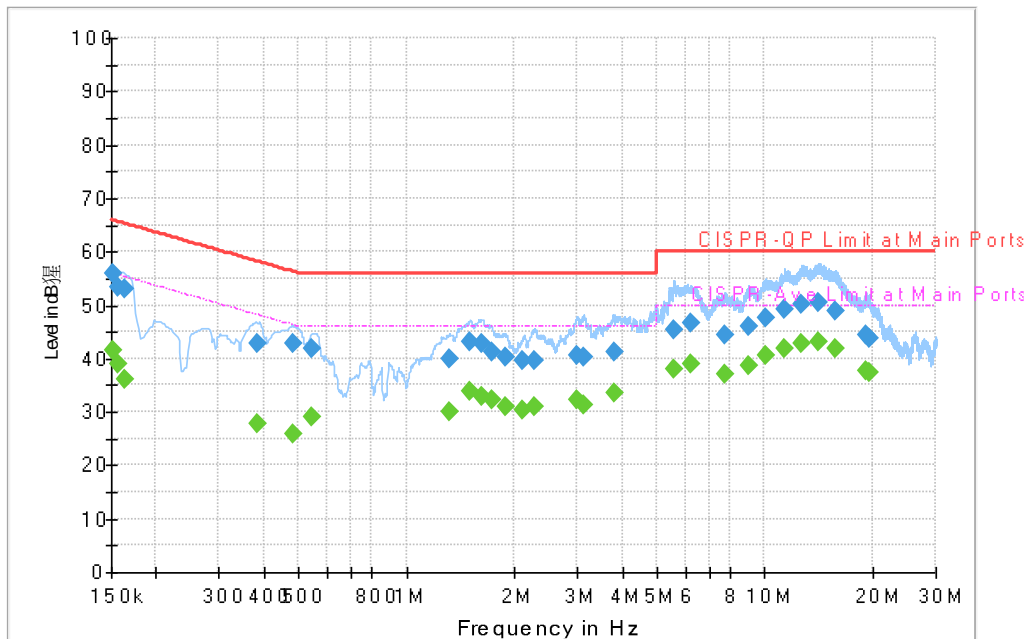
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150824	---	41.69	55.96	14.26	L1	OFF	20.3
0.150824	55.92	---	65.96	10.03	L1	OFF	20.3
0.156921	---	39.00	55.63	16.63	L1	OFF	20.3
0.156921	53.47	---	65.63	12.16	L1	OFF	20.3
0.163878	---	35.99	55.27	19.28	L1	OFF	20.3
0.163878	53.03	---	65.27	12.24	L1	OFF	20.3
0.385017	---	27.90	48.17	20.27	L1	OFF	20.3
0.385017	42.89	---	58.17	15.28	L1	OFF	20.3
0.481470	---	26.02	46.31	20.29	L1	OFF	20.3
0.481470	42.86	---	56.31	13.45	L1	OFF	20.3
0.544587	---	28.92	46.00	17.08	L1	OFF	20.3
0.544587	41.81	---	56.00	14.19	L1	OFF	20.3
1.316571	---	30.09	46.00	15.91	L1	OFF	20.3
1.316571	39.85	---	56.00	16.15	L1	OFF	20.3
1.503942	---	33.89	46.00	12.11	L1	OFF	20.3
1.503942	43.12	---	56.00	12.88	L1	OFF	20.3
1.624506	---	33.01	46.00	12.99	L1	OFF	20.3
1.624506	42.80	---	56.00	13.20	L1	OFF	20.3





Test Engineer :	Daniel Lee	Temperature :	22°C
		Relative Humidity :	46%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Test mode :	WiFi 60GHz CH03 Tx + DC Adapter		

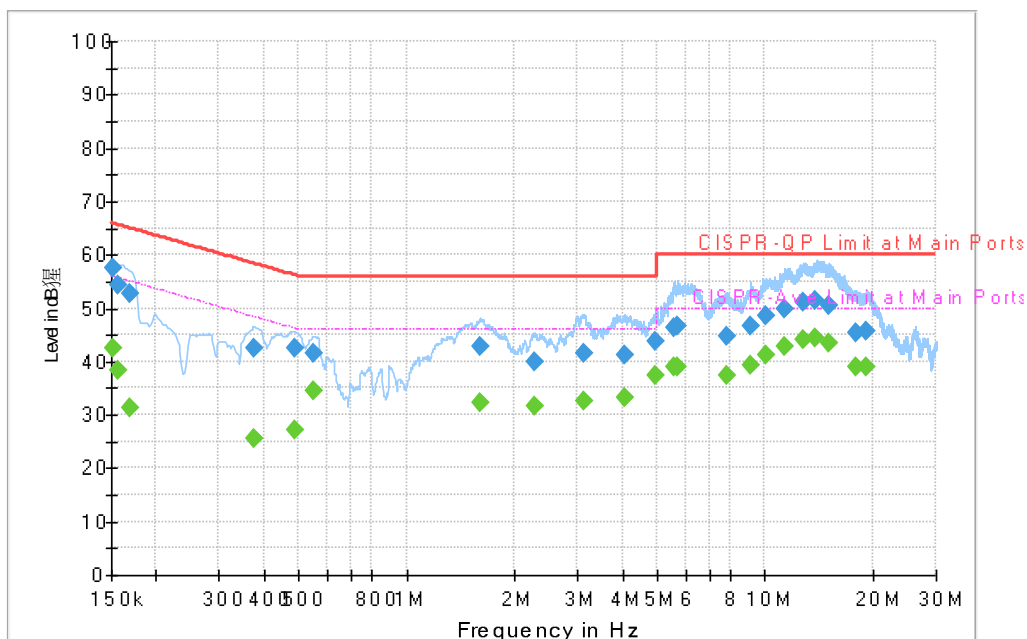
Full Spectrum



Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
7.738962	---	36.97	50.00	13.03	L1	OFF	20.4
7.738962	44.40	---	60.00	15.60	L1	OFF	20.4
9.062529	---	38.59	50.00	11.41	L1	OFF	20.4
9.062529	45.94	---	60.00	14.06	L1	OFF	20.4
10.093659	---	40.48	50.00	9.52	L1	OFF	20.4
10.093659	47.49	---	60.00	12.51	L1	OFF	20.4
11.387823	---	41.98	50.00	8.02	L1	OFF	20.5
11.387823	49.13	---	60.00	10.87	L1	OFF	20.5
12.723027	---	42.87	50.00	7.13	L1	OFF	20.5
12.723027	50.06	---	60.00	9.94	L1	OFF	20.5
14.083143	---	43.26	50.00	6.74	L1	OFF	20.5
14.083143	50.55	---	60.00	9.45	L1	OFF	20.5
15.758565	---	41.70	50.00	8.30	L1	OFF	20.5
15.758565	48.73	---	60.00	11.27	L1	OFF	20.5
19.254129	---	37.83	50.00	12.17	L1	OFF	20.5
19.254129	44.29	---	60.00	15.71	L1	OFF	20.5
19.560903	---	37.47	50.00	12.53	L1	OFF	20.5
19.560903	43.90	---	60.00	16.10	L1	OFF	20.5

Test Engineer :	Daniel Lee	Temperature :	22°C
		Relative Humidity :	46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Test mode :	WiFi 60GHz CH03 Tx + DC Adapter		

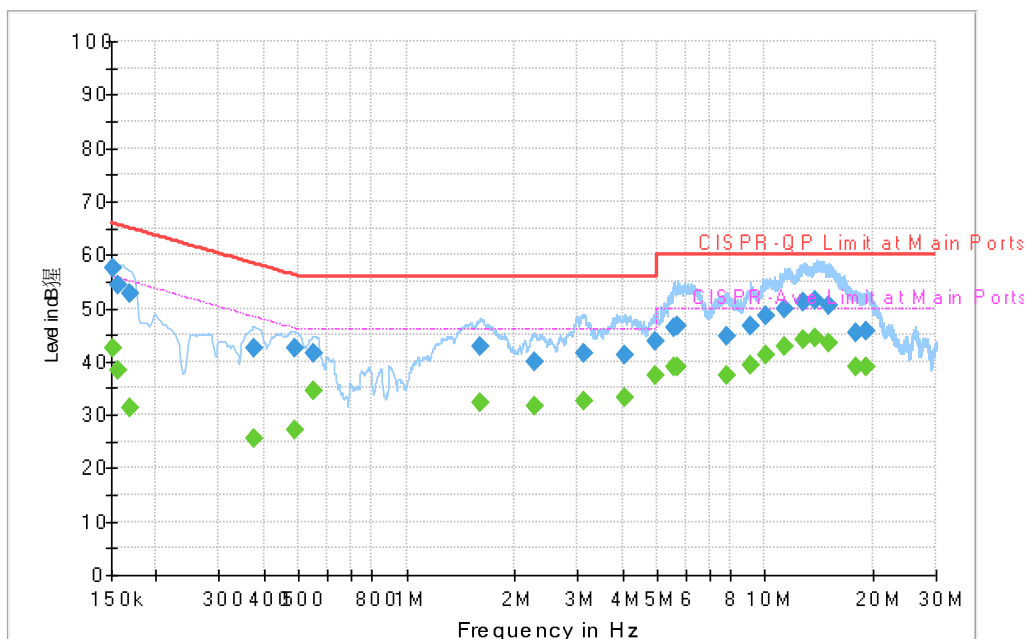
Full Spectrum



Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
0.151006	---	42.60	55.94	13.34	N	OFF	20.3
0.151006	57.61	---	65.94	8.33	N	OFF	20.3
0.156939	---	38.24	55.62	17.38	N	OFF	20.3
0.156939	54.42	---	65.62	11.20	N	OFF	20.3
0.169242	---	31.36	55.00	23.64	N	OFF	20.3
0.169242	52.87	---	65.00	12.13	N	OFF	20.3
0.376134	---	25.55	48.36	22.81	N	OFF	20.3
0.376134	42.37	---	58.36	15.99	N	OFF	20.3
0.487779	---	27.25	46.21	18.96	N	OFF	20.3
0.487779	42.47	---	56.21	13.74	N	OFF	20.3
0.551598	---	34.41	46.00	11.59	N	OFF	20.3
0.551598	41.62	---	56.00	14.38	N	OFF	20.3
1.597884	---	32.22	46.00	13.78	N	OFF	20.3
1.597884	42.66	---	56.00	13.34	N	OFF	20.3
2.278257	---	31.62	46.00	14.38	N	OFF	20.3
2.278257	40.08	---	56.00	15.92	N	OFF	20.3
3.111171	---	32.48	46.00	13.52	N	OFF	20.3
3.111171	41.60	---	56.00	14.40	N	OFF	20.3

Test Engineer :	Daniel Lee	Temperature :	22°C
		Relative Humidity :	46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Test mode :	WiFi 60GHz CH03 Tx + DC Adapter		

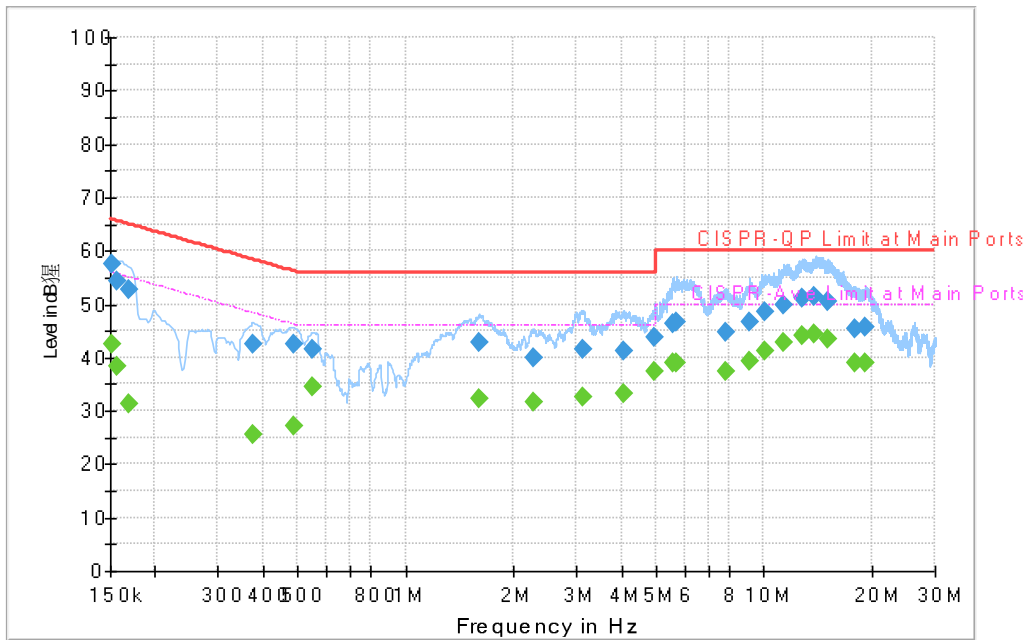
Full Spectrum



Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
4.061967	---	33.28	46.00	12.72	N	OFF	20.3
4.061967	41.28	---	56.00	14.72	N	OFF	20.3
4.937343	---	37.51	46.00	8.49	N	OFF	20.4
4.937343	43.63	---	56.00	12.37	N	OFF	20.4
5.592264	---	38.85	50.00	11.15	N	OFF	20.4
5.592264	46.33	---	60.00	13.67	N	OFF	20.4
5.699787	---	38.86	50.00	11.14	N	OFF	20.4
5.699787	46.60	---	60.00	13.40	N	OFF	20.4
7.788480	---	37.25	50.00	12.75	N	OFF	20.4
7.788480	44.58	---	60.00	15.42	N	OFF	20.4
9.106494	---	39.45	50.00	10.55	N	OFF	20.4
9.106494	46.57	---	60.00	13.43	N	OFF	20.4
10.104711	---	41.25	50.00	8.75	N	OFF	20.4
10.104711	48.43	---	60.00	11.57	N	OFF	20.4
11.401638	---	42.95	50.00	7.05	N	OFF	20.5
11.401638	49.94	---	60.00	10.06	N	OFF	20.5
12.790293	---	44.24	50.00	5.76	N	OFF	20.5
12.790293	51.18	---	60.00	8.82	N	OFF	20.5

Test Engineer :	Daniel Lee	Temperature :	22°C
		Relative Humidity :	46%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Test mode :	WiFi 60GHz CH03 Tx + DC Adapter		

Full Spectrum



Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Line	Filter	Corr. (dB)
13.885323	---	44.49	50.00	5.51	N	OFF	20.5
13.885323	51.52	---	60.00	8.48	N	OFF	20.5
15.017334	---	43.60	50.00	6.40	N	OFF	20.5
15.017334	50.53	---	60.00	9.47	N	OFF	20.5
17.908062	---	38.89	50.00	11.11	N	OFF	20.5
17.908062	45.51	---	60.00	14.49	N	OFF	20.5
19.081014	---	39.05	50.00	10.95	N	OFF	20.5
19.081014	45.54	---	60.00	14.46	N	OFF	20.5



5 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
LISN	TESEQ	NNB51	47407	N/A	May 10, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 09, 2023	Conduction (CO01-CA)
LISN	TESEQ	NNB51	47415	N/A	May 10, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 09, 2023	Conduction (CO01-CA)
EMI Test Receiver	R&S	ESR7	102177	9kHz~7GHz	May 31, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 30, 2023	Conduction (CO01-CA)
Pulse limiter with 10dB attenuation	R&S	VTSD 9561-F N	9561-F- N00412	N/A	Jul. 05, 2022	Oct. 19, 2022~ Oct. 26, 2022	Jul. 04, 2023	Conduction (CO01-CA)
Test Software	R&S	EMC32 V10.30.0	N/A	N/A	N/A	Oct. 19, 2022~ Oct. 26, 2022	N/A	Conduction (CO01-CA)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100840	9kHz~30MHz	Jul. 05, 2022	Oct. 19, 2022~ Oct. 26, 2022	Jul. 04, 2023	Radiation (03CH01-CA)
Bilog Antenna	TESEQ	6111D	50392	30MHz~1GHz	Jul. 11, 2022	Oct. 19, 2022~ Oct. 26, 2022	Jul. 10, 2023	Radiation (03CH01-CA)
Horn Antenna	SCHWARZBECK	BBHA 9120D	02115	1GHz~18GHz	Aug. 16, 2022	Oct. 19, 2022~ Oct. 26, 2022	Aug. 15, 2023	Radiation (03CH01-CA)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA9170	00842	18GHz~40GHz	Aug. 16, 2022	Oct. 19, 2022~ Oct. 26, 2022	Aug. 15, 2023	Radiation (03CH01-CA)
Preamplifier	SONOMA	310N	372241	9kHz~1GHz	May 09, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 08, 2023	Radiation (03CH01-CA)
Preamplifier	E-instrument	ERA-100M-18 G-56-01-A70	EC1900252	1GHz~18GHz	May 09, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 08, 2023	Radiation (03CH01-CA)
Preamplifier	EMEC	EMC18G40G	060725	18GHz~40GHz	May 10, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 09, 2023	Radiation (03CH01-CA)
EMI Test Receiver	R&S	ESU26	100049	20Hz~26.5GHz	Jun. 01, 2022	Oct. 19, 2022~ Oct. 26, 2022	May 31, 2023	Radiation (03CH01-CA)
Spectrum Analyzer	R&S	FSW43	104042	2Hz~43GHz	Nov. 18, 2021	Oct. 19, 2022~ Oct. 26, 2022	Nov. 17, 2022	Radiation (03CH01-CA)
RF Cable	HUBER+SUHNER	SUCOFLEX 102	8015932/2, 8015762/2, 6015772/2	N/A	Aug. 08, 2022	Oct. 19, 2022~ Oct. 26, 2022	Aug. 07, 2023	Radiation (03CH01-CA)
Hygrometer	TESTO	608-H1	45141354	N/A	Jul. 27, 2022	Oct. 19, 2022~ Oct. 26, 2022	Jul. 26, 2023	Radiation (03CH01-CA)
Controller	Chaintek	EM-1000	060881	Control Turn Table & Antenna Mast	N/A	Oct. 19, 2022~ Oct. 26, 2022	N/A	Radiation (03CH01-CA)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Oct. 19, 2022~ Oct. 26, 2022	N/A	Radiation (03CH01-CA)
Test Software	Audix E3	E6.2009-8-24d	PK-002093	N/A	N/A	Oct. 19, 2022~ Oct. 26, 2022	N/A	Radiation (03CH01-CA)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Controller	ChainTek	3000-1	N/A	Control Turn table & Ant Mast	N/A	Oct. 19, 2022 ~ Oct. 26, 2022	N/A	Radiation (05CH01-CA)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Oct. 19, 2022 ~ Oct. 26, 2022	N/A	Radiation (05CH01-CA)
Hygrometer	TESTO	608-H1	45141354	N/A	Jul. 27, 2022	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 26, 2023	Radiation (05CH01-CA)
Spectrum Analyzer	R&S	FSW43	104042	2Hz~43GHz	Nov. 18, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Nov. 17, 2022	Radiation (05CH01-CA)
Harmonic Mixer	Rohde & Schwarz	FS-Z60	101033	40GHz to 60GHz	Mar. 17, 2020	Oct. 19, 2022 ~ Oct. 26, 2022	Mar. 16, 2023	Radiation (05CH01-CA)
Harmonic Mixer	Rohde & Schwarz	FS-Z75	102042	50 GHz to 75 GHz	Apr. 23, 2020	Oct. 19, 2022 ~ Oct. 26, 2022	Apr. 22, 2023	Radiation (05CH01-CA)
Harmonic Mixer	Rohde & Schwarz	FS-Z110	102010	75GHz to 110GHz	Jun. 17, 2020	Oct. 19, 2022 ~ Oct. 26, 2022	Jun. 16, 2023	Radiation (05CH01-CA)
Harmonic Mixer	Rohde & Schwarz	FS-Z170	101004	110GHz to 170GHz	Sep. 17, 2020	Oct. 19, 2022 ~ Oct. 26, 2022	Sep. 16, 2023	Radiation (05CH01-CA)
Harmonic Mixer	Rohde & Schwarz	FS-Z220	101042	140GHz to 220GHz	Sep. 15, 2020	Oct. 19, 2022 ~ Oct. 26, 2022	Sep. 14, 2023	Radiation (05CH01-CA)
Antenna	Quinstar	QWH-UPRR00	QWH-UPRR00-01	40-60 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Antenna	Quinstar	QWH-VPRR00	1002000000	50-75 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Antenna	Quinstar	QWH-WPRR00	1410400004	75-110 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Antenna	Quinstar	QWH-DPRR00	1410500005	110-170 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Antenna	Quinstar	QWH-GPRR00	923900002	140-220 GHz	Jan. 20, 2022	Oct. 19, 2022 ~ Oct. 26, 2022	Jan. 19, 2025	Radiation (05CH01-CA)
Detector	Quinstars	QEA-FBFBVP	2672009	50 ~ 75 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Oscilloscope	Rohde & Schwarz	RTO2022	320003	N/A	Jun. 01, 2022	Oct. 19, 2022 ~ Oct. 26, 2022	May 31, 2023	Radiation (05CH01-CA)
Power Meter	Agilent	N1914A	MY59330013	N/A	Sep. 23, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Sep. 22, 2023	Radiation (05CH01-CA)
Power Sensor	Keysight	V8486A	MY59200006	50 ~ 75 GHz	Nov. 04, 2019	Oct. 19, 2022 ~ Oct. 26, 2022	Nov. 03, 2022	Radiation (05CH01-CA)
Signal Generator	Rohde & Schwarz	SMF100A	105544	9kHz ~ 44GHz	May 17, 2022	Oct. 19, 2022 ~ Oct. 26, 2022	May 16, 2023	Radiation (05CH01-CA)
Frequency Multiplier	Eravant	SFA-503753416-15KF-E1	03099-01	50 ~ 75 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Attenuator	SAGE	STA-30-15-M2	18953-01	50 ~ 75 GHz	Jul. 06, 2021	Oct. 19, 2022 ~ Oct. 26, 2022	Jul. 05, 2024	Radiation (05CH01-CA)
Temperature and Humidity chamber	ESPEC	SH-642	93012171	N/A	Sep. 06, 2022	Oct. 19, 2022 ~ Oct. 26, 2022	Sep. 05, 2023	Radiation (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101545	10Hz~40GHz	May 31, 2022	Oct. 19, 2022 ~ Oct. 26, 2022	May 30, 2023	Radiation (TH01-CA)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Hygrometer	Testo	608-H1	45141354	N/A	Jul. 27, 2022	Oct. 20, 2022	Jul. 26, 2023	Conducted (TH01-CA)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101545	10Hz-40GHz	May 31, 2022	Oct. 20, 2022	May 30, 2023	Conducted (TH01-CA)
Harmonic Mixer	Rohde & Schwarz	FS-Z75	102042	50-75GHz	Apr. 23, 2020	Oct. 20, 2022	Apr. 22, 2023	Conducted (TH01-CA)
mmW Attenuator	Eravant	STA-30-15-F2	02487-01	50-75GHz	Jul. 06, 2021	Oct. 20, 2022	Jul. 05, 2024	Conducted (TH01-CA)
Temperature & Humidity Chamber	ESPEC	SH-642	93012171	N/A	Sep. 06, 2022	Oct. 20, 2022	Sep. 05, 2023	Conducted (TH01-CA)
Power Supply	GW Instek	SPS-606	GES85198 2	N/A	May 11, 2022	Oct. 20, 2022	May 10, 2023	Conducted (TH01-CA)

6 Uncertainty of Evaluation

Test Item	Uncertainty
AC Power Conducted Emission Measurement (150 kHz ~ 30 MHz)	±2.0dB
Radiated Emission Measurement (9 kHz ~ 30 MHz)	±2.9dB
Radiated Emission Measurement (30 MHz ~ 1000 MHz)	±5.0dB
Radiated Emission Measurement (1 GHz ~ 18 GHz)	±6.2dB
Radiated Emission Measurement (18 GHz ~ 40 GHz)	±6.1dB
Radiated Emission Measurement (40 GHz ~ 60 GHz)	±5.1dB
Radiated Emission Measurement (60 GHz ~ 90 GHz)	±4.9dB
Radiated Emission Measurement (90 GHz ~ 325 GHz)	±7.5dB
Emission Bandwidth	±110 kHz
Frequency Stability	±100 kHz
Temperature	±2.1°C

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