Testing Laboratory
3787

RADIO TEST REPORT

FCC ID	:	HED-MLTGCNLR
Equipment	:	60GHz Long Haul terminal
Brand Name	:	Edgecore
Model Name	:	MLTG-CN LR
Applicant	:	Accton Technology Corp No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
Manufacturer(1)	:	Accton Technology Corp No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
Manufacturer(2)	:	Accton Technology Corporation Zhunan Factory 1F & 4F & 5F , No. 1, Keyi St., Zhunan Township, Miaoli County 350, Taiwan
Standard	:	47 CFR FCC Part 15.255

The product was received on Oct. 22, 2021, and testing was started from Nov. 02, 2021 and completed on Feb. 07, 2022. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

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

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

Table of Contents

History of this test report

Report No.	Version	Description	Issued Date
FR1O2206	01	Initial issue of report	Feb. 14, 2022

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.207	AC Power Conducted Emissions	PASS	-
3.2	15.255(e)	Occupied Bandwidth	PASS	-
3.3	15.255(c)	EIRP Power	PASS	-
3.4	15.255(c)	Peak Conducted Power	PASS	-
3.5	15.255(d)	Transmitter Spurious Emissions	PASS	-
3.6	15.255(f)	Frequency Stability	PASS	-
3.7	15.255(a),(h)	Operation Restriction and Group Installation	PASS	-

Declaration of Conformity:
1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results. 2. The measurement uncertainty please refer to report "Measurement Uncertainty".
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Penny Kao

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information	
Frequency Range	57-71 GHz
Modulation	OFDM
The Channel Plan(s)	Channel 1: 58.32 GHz Channel 2: 60.48 GHz Channel 3: 62.64 GHz Channel 4: 64.80 GHz

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Accton	123400001485A	Dish	IPEX	40

Note: The above information was declared by manufacturer.

1.1.3 Operating Conditions

Operating Conditions					
☒ -40 °C to +60 °C					
☐ 0 °C to +40 °C					
☐ Other:					
EUT Power Type	From PoE or DC Power (48V)				
Test Software Version	QRCT Ver4.0.00158.0				
Supply Voltage	☐ AC	State AC voltage		V	
Supply Voltage	☒ DC	State DC voltage	48	V	

1.1.4 Equipment Use Condition

Equipment Use Condition
☐ Fixed field disturbance sensors at 61-61.5GHz
☐ Except fixed field disturbance sensors at 61-61.5GHz
☒ Except fixed field disturbance sensors

1.1.5 User Condition

Intended Operation
☐ Indoor
☐ Outdoor (except outdoor fixed Point to Point)
☒ Outdoor fixed Point to Point

Note: The above information was declared by manufacturer.

1.1.6 Duty Cycle

TX-on(ms)	TX-on+TX-off(ms)	Duty Cycle(%)	Duty Cycle factor(dB)
100	100	100	0

1.2 Applicable Standards

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

- 47 CFR FCC Part 15.255
- ANSI C63.10-2013 Section 9. “Procedures for testing millimeter-wave systems”

The following reference test guidance is not within the scope of accreditation of TAF.

- FCC KDB 414788 D01 v01r01

1.3 Testing Location

Testing Location Information	
Test Lab.：Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo’ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.

Test Condition	Test Site No.	Test Engineer	Test Environment (°C / %)	Test Date
RF Conducted	TH03-CB	Eddie Wang	23.9~25.1 / 58~64	Nov. 02, 2021~ Nov. 03, 2021
Radiated (Below 1GHz)	03CH05-CB	Stim Sung	20~20.6 / 61~64	Nov. 03, 2021~ Jan. 26, 2022
Radiated (For 1~40GHz)	03CH06-CB	Stim Sung	20.1~20.9 / 62~64	Nov. 03, 2021~ Jan. 26, 2022
AC Conduction	CO01-CB	Peter Wu	22~23 / 60~62	Feb. 07, 2022

2 Test Configuration of Equipment under Test

2.1 Parameters of Test Software Setting

Parameters of Test Software Setting	
Test Frequencies (GHz)	**Software Setting**
58.32	Default
62.64	Default
64.80	Default

2.2 Conformance Tests and Related Test Frequencies

Test Item	Test Frequencies (GHz)
AC Power Conducted Emissions Test Voltage: 120V / 60Hz	Random Frequency
Occupied Bandwidth	58.32, 62.64, 64.80
EIRP Power	58.32, 62.64, 64.80
Peak Conducted Power	58.32, 62.64, 64.80
Transmitter Spurious Emissions (below 1 GHz)	58.32, 62.64, 64.80
Transmitter Spurious Emissions (1 GHz-40 GHz)	58.32, 62.64, 64.80
Transmitter Spurious Emissions (above 40 GHz)	58.32, 62.64, 64.80
Frequency Stability	62.64

Note : The EUT can only be used in Y axis position.

For AC Power Conducted Emissions:

Mode 1: EUT: 60GHz + PoE

Mode 2: EUT: 60GHz + DC power

For operating mode 1 is the worst case and it was record in this test report.

2.3 EUT Operation during Test

During the test, “QRCT Ver4.0.00158.0” under WIN 10 was executed the test program to control the EUT continuously transmit RF signal.

2.4 Accessories

Accessories
DC connector plug*1 Cable glands*3

2.5 Support Equipment

For AC Conduction test:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	PoE	SHENZHEN GOSPELL	G0720-480-050	N/A
B	Transceivers	Amphenol	56S57JJ03	N/A
C	2.5G LAN PC	DELL	T3400	N/A
D	60G Radio Client	Edgecore	MLTG-CN	N/A
E	60G Radio Client NB	DELL	E6430	N/A

For Radiated and RF Conducted and test:

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
A	Notebook	DELL	E4300	N/A
B	PoE	SHENZHEN GOSPELL	G0720-480-050	N/A

2.6 Far Field Boundary Calculations

The far-field boundary is given as:

far field = (2 * L^2) /**λ**

where:

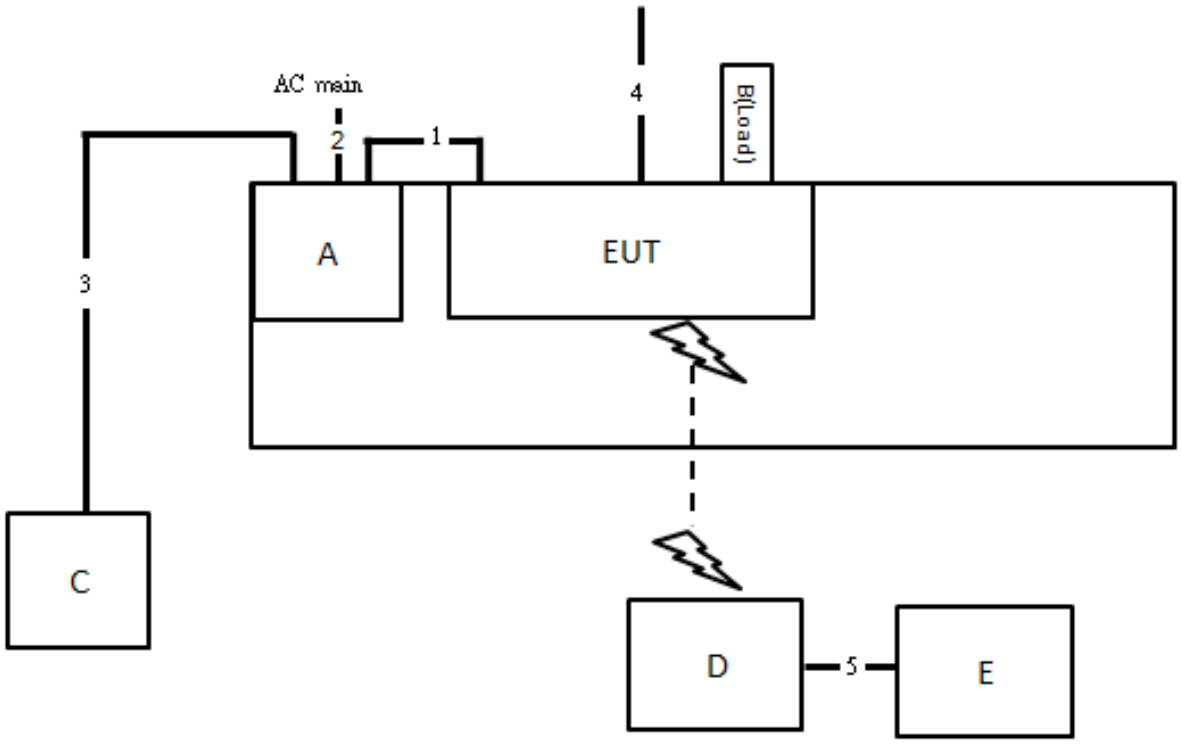
L = Largest Antenna Dimension, including the reflector, in meters

λ= wavelength in meters

Far Field (m)				
Frequency (GHz)	**L (m)**	**Lambda (m)**	**d(Far Field) (m)**	**d(Far Field) (cm)**
58.32	0.31	0.0051440	37.364	3736.37
62.64	0.31	0.0047893	40.131	4013.14
64.80	0.31	0.0046296	41.515	4151.52

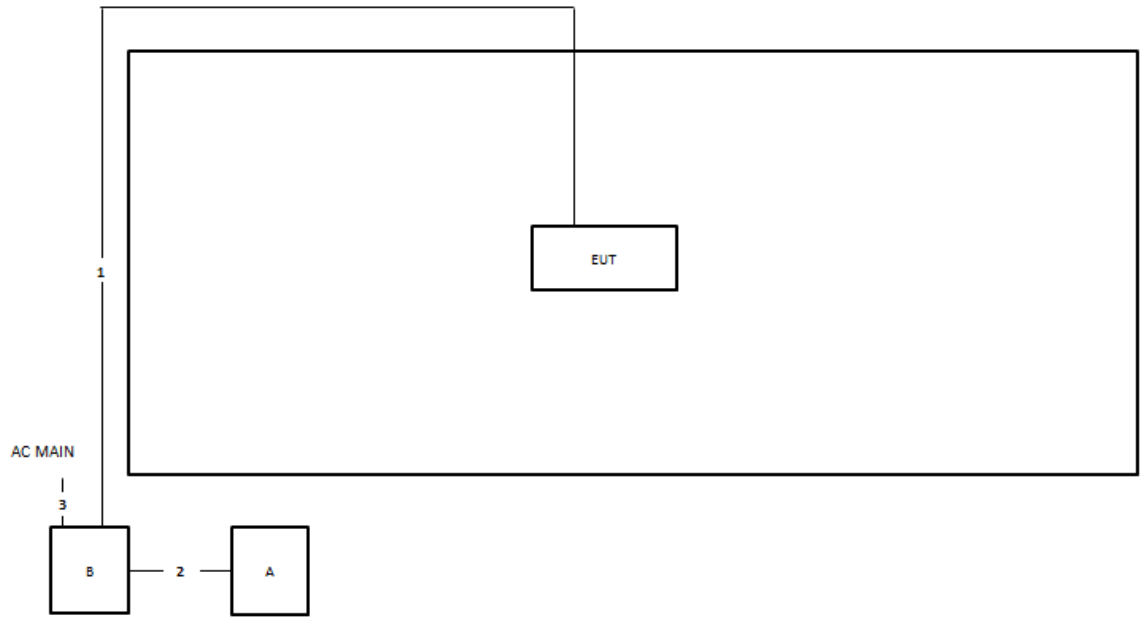
2.7 Test Setup Diagram

Test Setup Diagram - AC Power Conducted Emissions



Item	Connection	Shielded	Length
1	RJ-45 cable	No	1m
2	Power cable	No	0.9m
3	RJ-45 cable	No	10m
4	Ground cable	No	1.8m
5	RJ-45 cable	No	3m

Test Setup Diagram - Transmitter Spurious Emissions



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	0.9m

3 Transmitter Test Result

3.1 AC Power Conducted Emissions

3.1.1 Limit of AC Power Conducted Emissions

AC Power Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

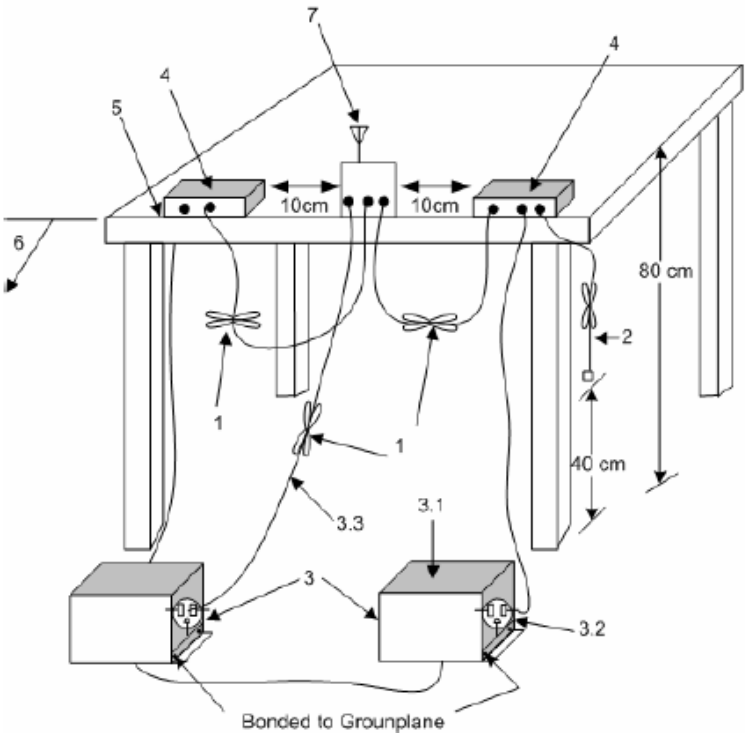
Refer a measuring instruments list in this test report.

3.1.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clause 6.2.

3.1.4 Test Setup

AC Power Conducted Emissions



1—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.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.5 Measurement Results Calculation

The measured Level is calculated using:

a. Corrected Reading: LISN Factor (LISN) + Attenuator (AT/AUX) + Cable Loss (CL) + Read Level (Raw) = Level

b. Margin = -Limit + Level

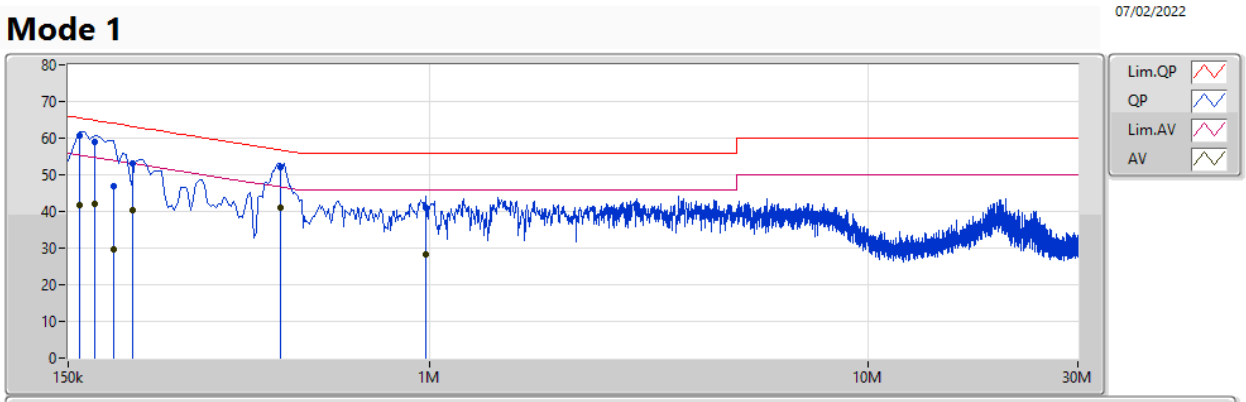
3.1.6 Test Result of AC Power Conducted Emissions

Test Conditions	see ANSI C63.10, clause 5.11
Test Setup	see ANSI C63.10, clause 6.2.3

NOTE 1: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes. If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.12 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing.

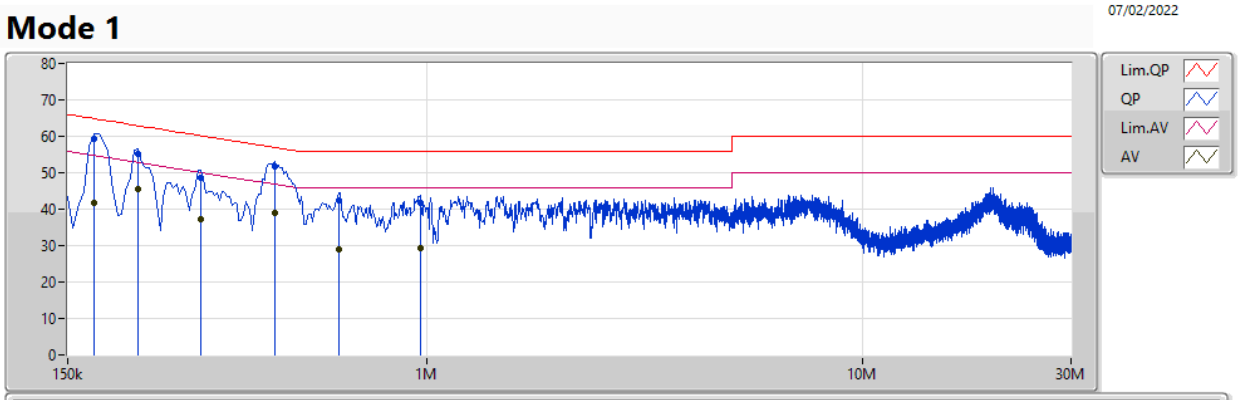
NOTE 2: “>20dB” means the tables in this clause should only list values of spurious emissions that exceed the level of 20 dB below the applicable limit, see ANSI C63.4, clause 10.1.8.1.

Phase	Line	Configuration	Normal Link



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	159k	60.65	65.52	-4.87	9.89	Line	"Worst"	50.76	0.04	0.04	9.81
AV	159k	41.83	55.52	-13.69	9.89	Line	-	31.94	0.04	0.04	9.81
QP	172.5k	59.11	64.83	-5.72	9.89	Line	-	49.22	0.04	0.04	9.81
AV	172.5k	42.07	54.83	-12.76	9.89	Line	-	32.18	0.04	0.04	9.81
QP	190.5k	46.77	64.01	-17.24	9.89	Line	-	36.88	0.04	0.04	9.81
AV	190.5k	29.62	54.01	-24.39	9.89	Line	-	19.73	0.04	0.04	9.81
QP	210.351k	52.99	63.19	-10.20	9.89	Line	-	43.10	0.04	0.04	9.81
AV	210.351k	40.49	53.19	-12.70	9.89	Line	-	30.60	0.04	0.04	9.81
QP	456k	52.00	56.76	-4.76	9.90	Line	-	42.10	0.04	0.04	9.82
AV	456k	41.17	46.76	-5.59	9.90	Line	-	31.27	0.04	0.04	9.82
QP	978k	41.12	56.00	-14.88	9.93	Line	-	31.19	0.06	0.04	9.83
AV	978k	28.30	46.00	-17.70	9.93	Line	-	18.37	0.06	0.04	9.83

Phase	Neutral	Configuration	Normal Link



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	172.5k	59.39	64.83	-5.44	9.88	Neutral	"Worst"	49.51	0.03	0.04	9.81
AV	172.5k	41.82	54.83	-13.01	9.88	Neutral	-	31.94	0.03	0.04	9.81
QP	217.5k	55.18	62.92	-7.74	9.88	Neutral	-	45.30	0.03	0.04	9.81
AV	217.5k	45.43	52.92	-7.49	9.88	Neutral	-	35.55	0.03	0.04	9.81
QP	303k	48.62	60.17	-11.55	9.89	Neutral	-	38.73	0.03	0.04	9.82
AV	303k	37.27	50.17	-12.90	9.89	Neutral	-	27.38	0.03	0.04	9.82
QP	447k	51.69	56.94	-5.25	9.89	Neutral	-	41.80	0.03	0.04	9.82
AV	447k	38.99	46.94	-7.95	9.89	Neutral	-	29.10	0.03	0.04	9.82
QP	627k	42.30	56.00	-13.70	9.90	Neutral	-	32.40	0.04	0.04	9.82
AV	627k	28.95	46.00	-17.05	9.90	Neutral	-	19.05	0.04	0.04	9.82
QP	964.5k	41.64	56.00	-14.36	9.92	Neutral	-	31.72	0.05	0.04	9.83
AV	964.5k	29.37	46.00	-16.63	9.92	Neutral	-	19.45	0.05	0.04	9.83

3.2 Occupied Bandwidth

3.2.1 Limit of Occupied Bandwidth

6dBc Bandwidth (see Note 1)	None
99% Occupied Bandwidth (see Note 2)	None

NOTE 1: The 6dBc bandwidth is the frequency bandwidth of the signal power at the -6 dBc points when measured with a 100 kHz resolution bandwidth. These measurements shall also be performed at normal test conditions.

NOTE 2: The 99% occupied bandwidth is the frequency bandwidth of the signal power at the 99% channel power of occupied bandwidth when resolution bandwidth should be approximately 1 % to 5 % of the occupied bandwidth (OBW). These measurements shall also be performed at normal test conditions.

3.2.2 Measuring Instruments

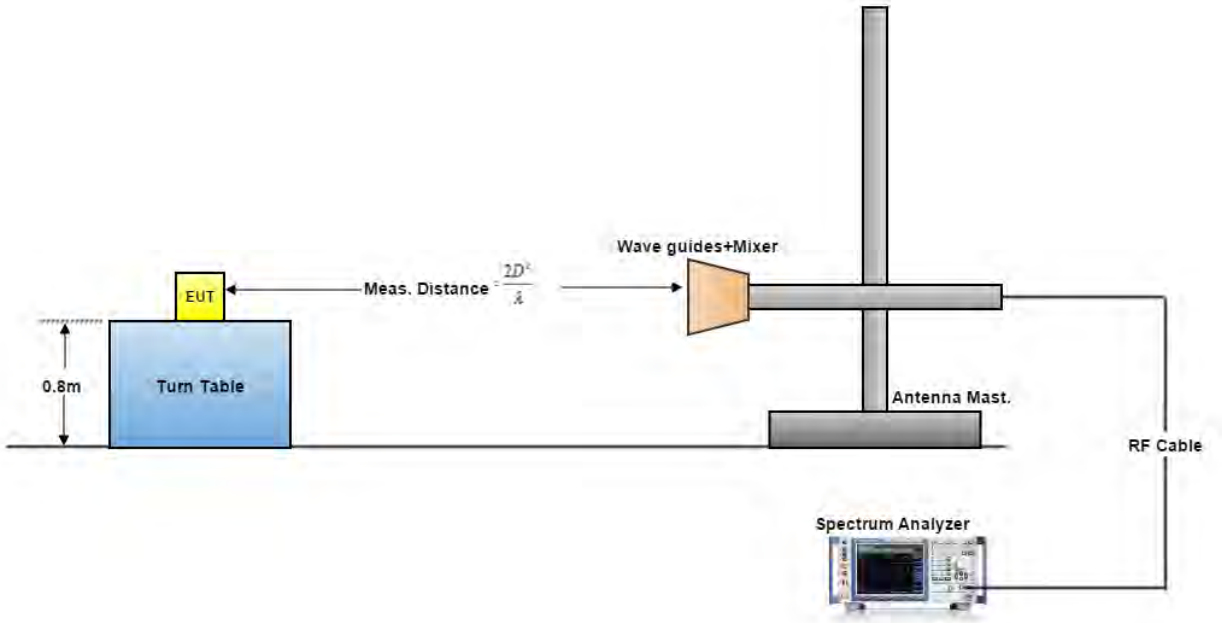
Refer a measuring instruments list in this test report.

3.2.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013, clauses 6.9.2.

3.2.4 Test Setup

Occupied Channel Bandwidth



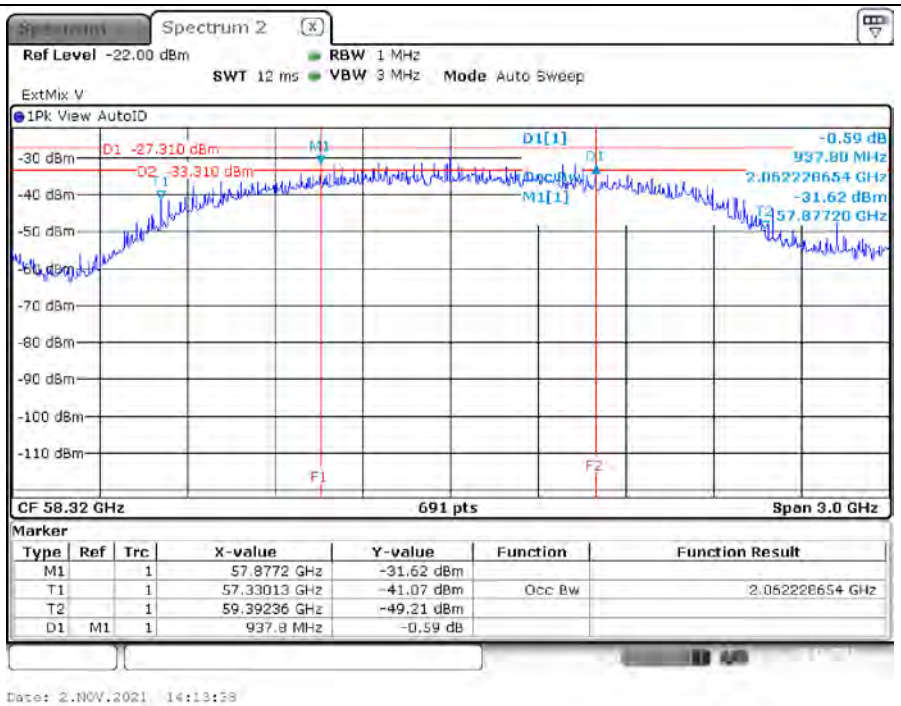
3.2.5 Test Result of Occupied Bandwidth

Test Conditions	see ANSI C63.10, clause 5.11
Test Setup	see ANSI C63.10, clause 6.9.2
NOTE: If equipment having different transmit operating modes (see test report clause 1.1.2), the measurements are uninfluenced by different transmit operating modes, may not need to be repeated for all the operating modes. Similar, if the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worse case combination to be used for the conformance testing. Refer as ANSI C63.10, clause 15, observe and record with plotted graphs or photographs the worst-case (i.e., widest) occupied bandwidth produced by these different modulation sources.	

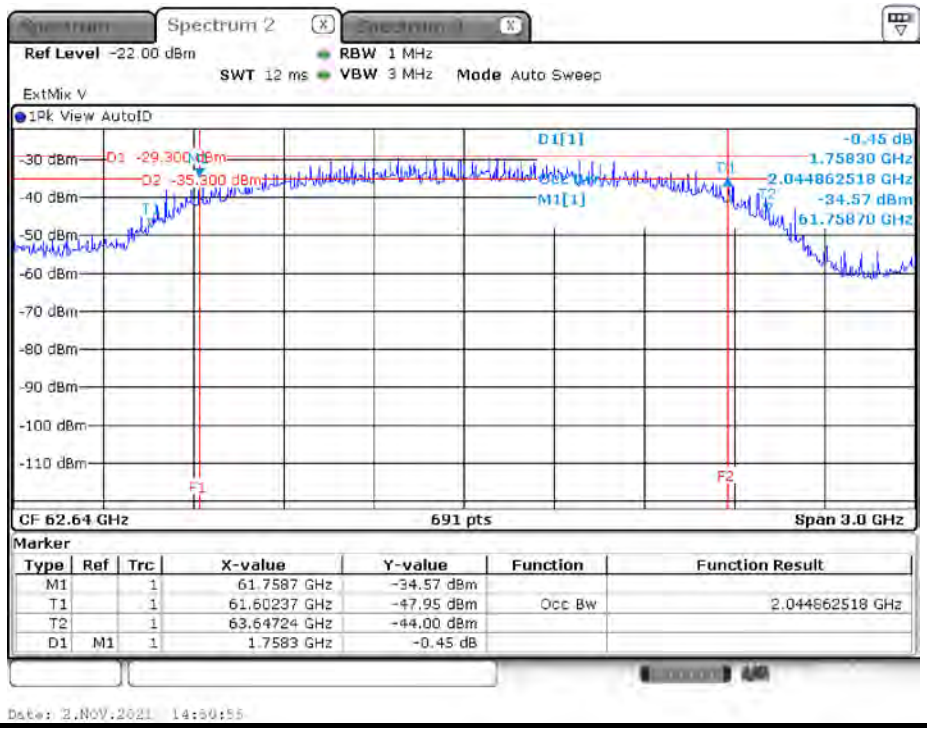
Test Results			
Test Freq. (GHz)	**6 dBc Bandwidth (MHz)**	**99% Occupied Bandwidth (MHz)**	**Limit (MHz)**
58.32	937.80	2062.22	N/A
62.64	1758.30	2044.86	N/A
64.80	1528.20	2044.86	N/A

3.2.5.1 Bandwidth Plots

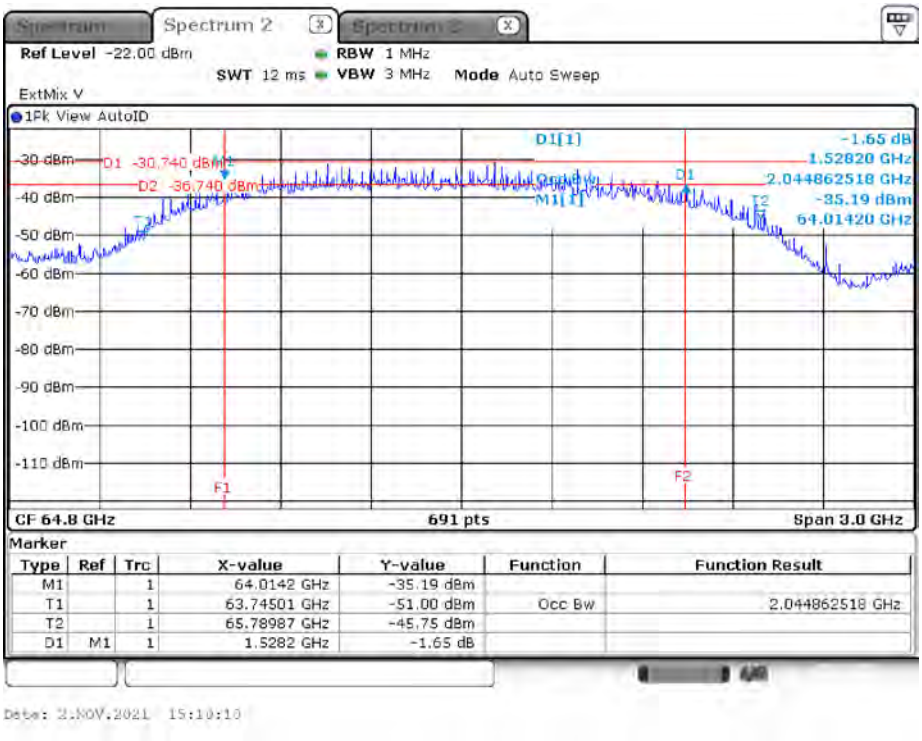
Test Frequency: 58.32 GHz
6 dBc Bandwidth and occupied Bandwidth



Test Frequency: 62.64 GHz
6 dBc Bandwidth and Occupied Bandwidth



Test Frequency: 64.80 GHz
6 dBc Bandwidth and Occupied Bandwidth



3.3 EIRP Power

3.3.1 Limit of EIRP Power

EIRP Power Limit		
Use Condition	**EIRP Average Power**	**EIRP Peak Power**
Fixed field disturbance sensors at within the frequency band 61-61.5GHz	40 dBm	43 dBm
Fixed field disturbance sensors at outside of the band 61-61.5GHz	10 dBm	13 dBm
Except fixed field disturbance sensors at 61-61.5GHz	N/A	10 dBm
Except outdoor fixed Point to Point	40 dBm	43 dBm
Outdoor fixed Point to Point	82 dBm	85 dBm
Note: 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.		

NOTE: For the applicable limit, see 15.255 (c)

3.3.2 Measuring Instruments

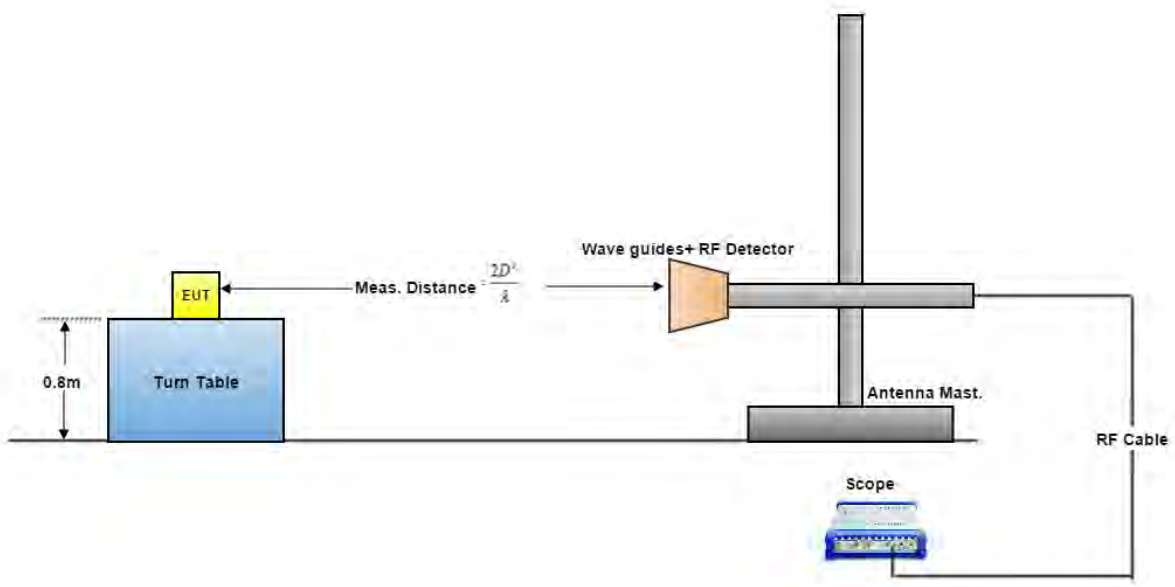
Refer a measuring instruments list in this test report.

3.3.3 Test Procedures

Method of measurement: Refer as ANSI C63.10-2013 clause 9.3 & 9.5.

3.3.4 Test Setup

EIPR Power



3.3.5 Test Result of EIRP Power

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.11

NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worst case combination to be used for the conformance testing.

3.3.5.1 Test Result of EIRP Power

Test Distance		45 m									
Test Results											
Test Freq. (GHz)	Rx Gain (dBi)	DSO (mV)		Power Measured (dBm)		E_{Meas} (dBuV/m)		EIRP (dBm)		EIRP Limit (dBm) (note 1)	
		Peak	AV	Peak	AV	Peak	AV	Peak	AV	Peak	AV
58.32	23.6	8.71	6.37	-21.79	-22.47	127.18	126.50	55.45	54.77	63	60
62.64	23.6	10.24	9.58	-21.31	-21.69	128.28	127.90	56.55	56.17	63	60
64.80	23.6	8.24	5.96	-22.86	-23.13	127.03	126.76	55.29	55.02	63	60

The measured power level is converted to EIRP using the Friis equation:

For radiated emissions, calculate the field strength (E) in dBμV/meter.

E = 126.8 – 20log(λ) + P - G

where:

E : is the field strength of the emission at the measurement distance, in dBμV/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.

EIRP = E-meas +20log(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 dBμV/m

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

NOTE 1: For the applicable limit, see 15.255 (c)

NOTE 2: The comparison method which replaces EUT with a signal generator is used to find the correct conversion factor between “DSO(mV)” & “Power Measured(dBm)”.

3.4 Peak Conducted Power

3.4.1 Limit of Peak Conducted Power

Peak Conducted Power Limit			
Use Condition	**6dBc Bandwidth**	**Occupied Bandwidth**	**Peak Conducted Power (note 1)**
Fixed field disturbance sensors at within the frequency band 61-61.5GHz	> 100MHz	≤500MHz	500mW
	≤ 100MHz		500mW x (BW/100) (see note 2)
Fixed field disturbance sensors at outside of the band 61-61.5GHz and within 57 -71 GHz	> 100MHz	N/A	500mW
	≤ 100MHz		500mW x (BW/100) (see note 2)
Except fixed field disturbance sensors at 61-61.5GHz	N/A	> 500MHz	-10 dBm
Except outdoor fixed Point to Point,	> 100MHz	N/A	500mW
Outdoor fixed Point to Point	≤ 100MHz	N/A	500mW x (BW/100) (see note 2)
NOTE 1: For the applicable limit, see FCC 15.255(c) NOTE 2: BW= 6dB bandwidth (measured at RBW 100kHz)			

3.4.2 Measuring Instruments

Refer a measuring instruments list in this test report.

3.4.3 Test Procedures

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

3.4.4 Test Result of Peak Conducted Power

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.11
NOTE: If the equipment supports different modulations and/or data rates, the measurements described in ANSI C63.10, clause 5.11 may not need to be repeated for all these modulations and data rates. Simple comparison of engineering test across all operating modes, modulations and data rates may need to be performed to define the worst case combination to be used for the conformance testing.	

3.4.4.1 Peak Conducted Power

Test Results						
Test Freq. (GHz)	**EIRP (dBm)**	**Max. Ant. Gain (dBi)**	**Peak Power (dBm)** (note1)	**Peak Power (mW)**	**6dBc BW (MHz)** (note2)	**Peak Power Limit (mW)** (note3)
58.32	55.45	40	15.45	35.060	937.80	500.00
62.64	56.55	40	16.55	45.174	1758.30	500.00
64.80	55.29	40	15.29	33.832	1528.20	500.00

NOTE 1: Because EUT used for the integral antenna without temporary RF connector provided. Therefore peak conducted power is equal to EIRP power subtract the antenna gain.

NOTE 2: For the 6dBc bandwidth, see test report clause 3.2.5.

NOTE 3: For the applicable limit, see FCC 15.255(c)

NOTE 4: For radiated emission measurements, calculate conducted transmitter output power P(cond)(dBm)

P(cond) = EIRP - G(dBi)

where:

G(dBi) is gain of EUT antenna.

3.5 Transmitter Spurious Emissions

3.5.1 Limit of Transmitter Spurious Emissions

Frequency Range	Limit
Radiated emissions below 40 GHz	15.209
Radiated emissions above 40 GHz – 200GHz	90 pW/cm^2 @ 3 m (Equivalent EIRP 102 μW, -9.91dBm)
NOTE 1: For the applicable limit, see 15.255(d) NOTE 2: Spurious emissions shall not exceed the level of the fundamental emission.	

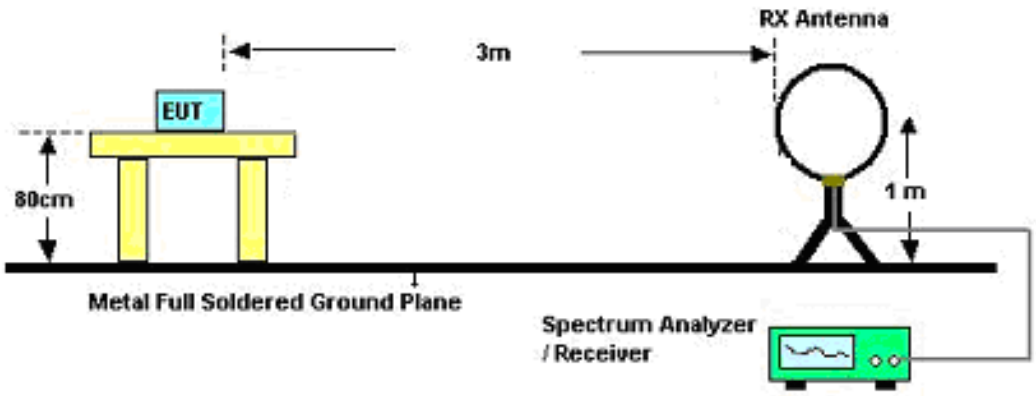
3.5.2 Test Procedures

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

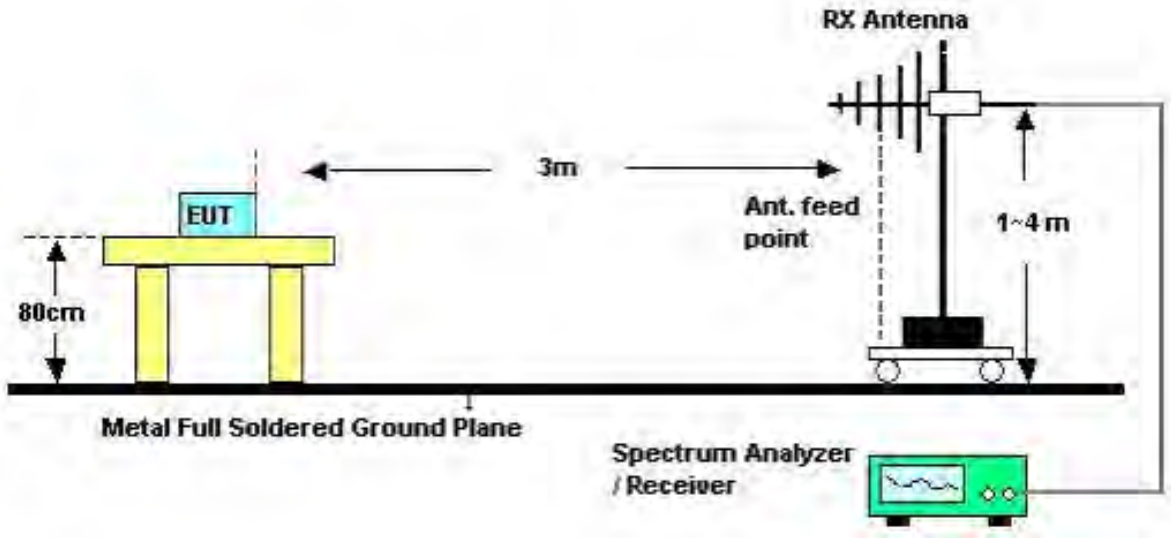
3.5.3 Test Setup

Transmitter Spurious Emissions

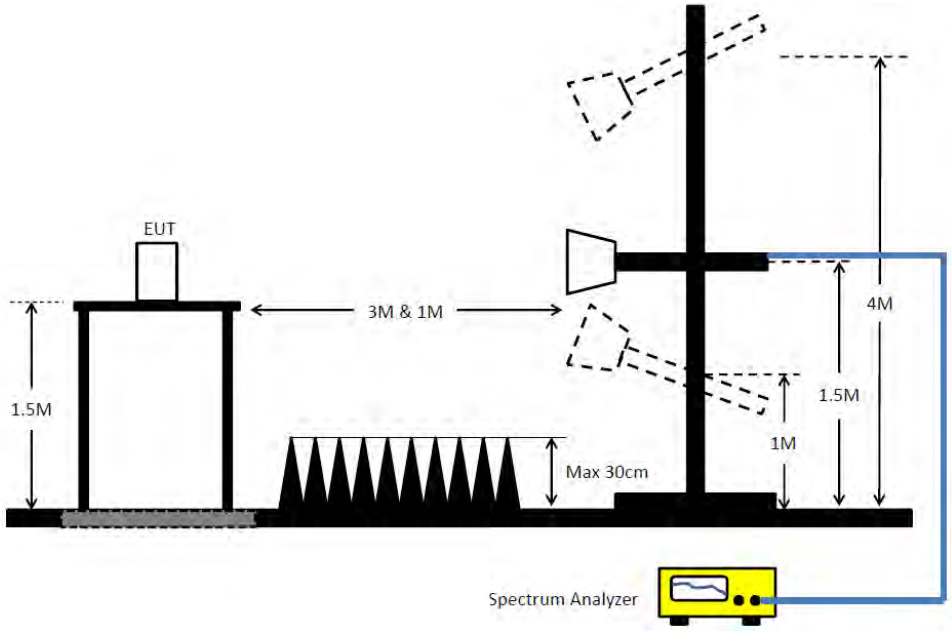
9kHz ~30MHz



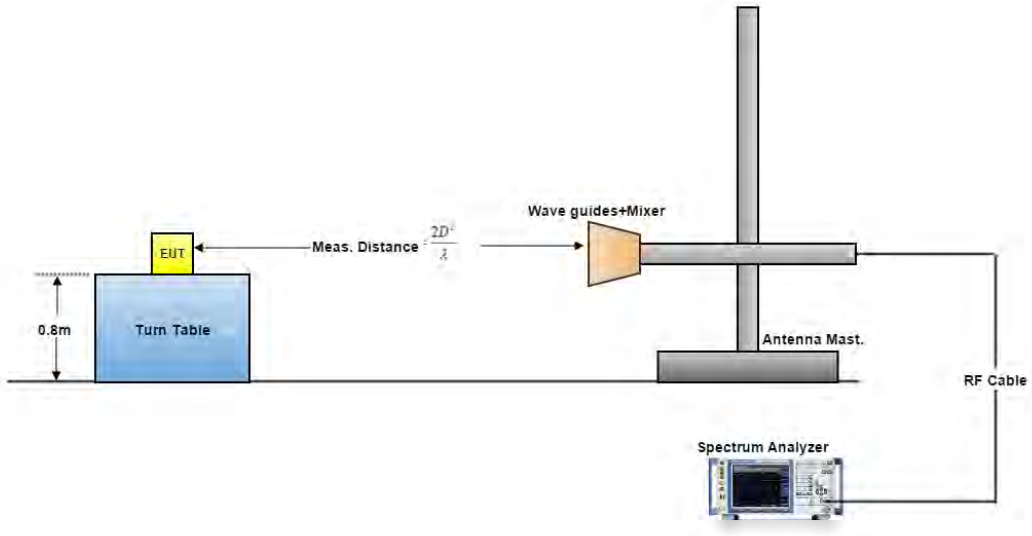
30MHz~1GHz



1GHz~40GHz



Above 40GHz



A measuring distance of at 3 m shall be used for measurements at frequencies up to 15 GHz. For frequencies above 15 GHz, any suitable measuring distance may be used. The measurement distance is chosen up to far field distance, depending on the test system noise floor for detecting spurious emission signals. Then above 15 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade from spec. distance (3 m) to measurement distance. Distance extrapolation factor = 20 log (spec. distance [3 m] / measurement distance [N m]) (dB) .The measurements described in ANSI C63.10, clause 7.8.6. If the emission cannot be detected at 1 m, reduce the RBW to increase system sensitivity. Note the value. If the emission still cannot be detected, move the horn closer to the EUT, noting the distance at which a measurement is made.

3.5.4 Measurement Results Calculation

The measured Level is calculated using:

For below 40GHz

Corrected Reading: Antenna factor (AF) + Cable loss (CL) + Read level (Raw) - Preamp factor (PA)(if applicable) = Level.

For above 40GHz

EIRP = Meas. Level - RX Antenna Gain + 20*log(4*Pi(3.14159)*D/(300/(Frequency*1000)))

3.5.5 Test Result of Transmitter Spurious Emissions

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.12 、9.13
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.5.5.1 Test Result of Transmitter Spurious Emissions (Below 30MHz)

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to KDB414788 Radiated Test Site, and the result came out very similar.

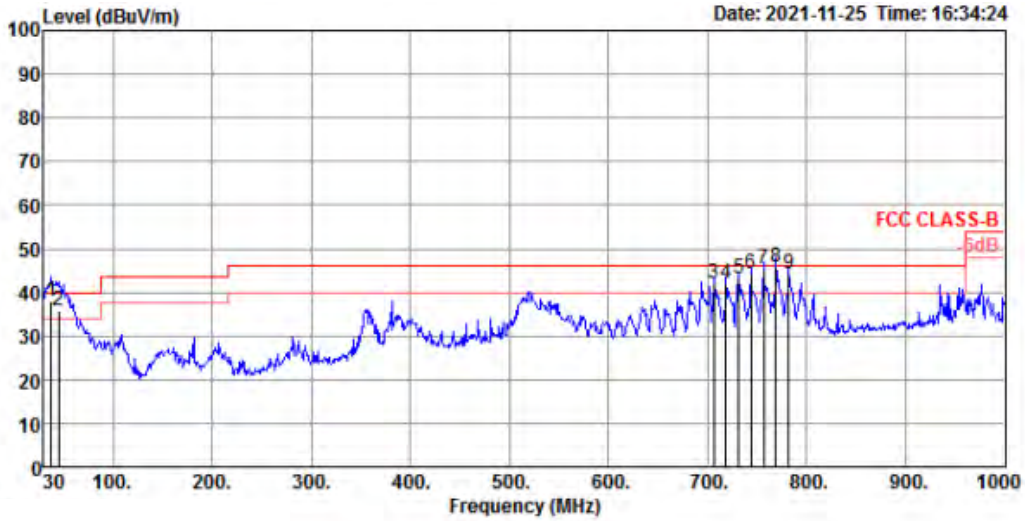
All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

The radiated emissions were investigated from 9 kHz or the lowest frequency generated within the device, up to the 10 harmonic or 40 GHz, whichever is appropriate.

3.5.5.2 Test Result of Transmitter Spurious Emissions

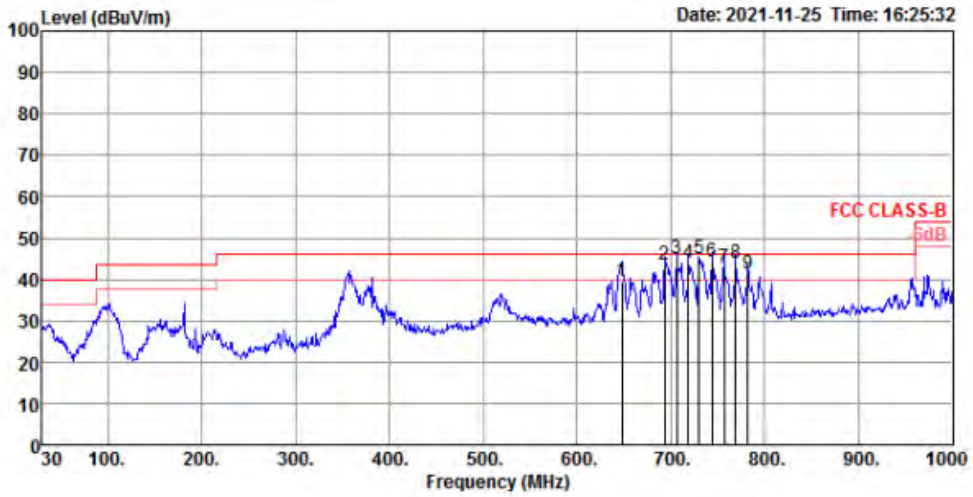
Test Range	30 MHz – 1 GHz	Test Distance	3 m
Test Freq. (GHz)	58.32		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37.76	37.99	40.00	-2.01	48.80	0.90	19.92	31.63	100	69	QP	VERTICAL
2	44.55	35.95	40.00	-4.05	50.30	0.99	16.37	31.71	100	344	QP	VERTICAL
3	706.09	42.01	46.00	-3.99	45.91	4.21	24.55	32.66	100	357	QP	VERTICAL
4	718.70	42.09	46.00	-3.91	45.80	4.24	24.72	32.67	100	341	QP	VERTICAL
5	731.31	43.27	46.00	-2.73	46.71	4.26	24.99	32.69	100	349	QP	VERTICAL
6	743.92	44.36	46.00	-1.64	47.60	4.29	25.17	32.70	100	5	QP	VERTICAL
7	756.53	45.38	46.00	-0.62	48.50	4.32	25.27	32.71	100	0	QP	VERTICAL
8	769.14	45.93	46.00	-0.07	48.90	4.38	25.35	32.70	100	3	QP	VERTICAL
9	781.75	44.37	46.00	-1.63	47.21	4.43	25.43	32.70	100	0	QP	VERTICAL

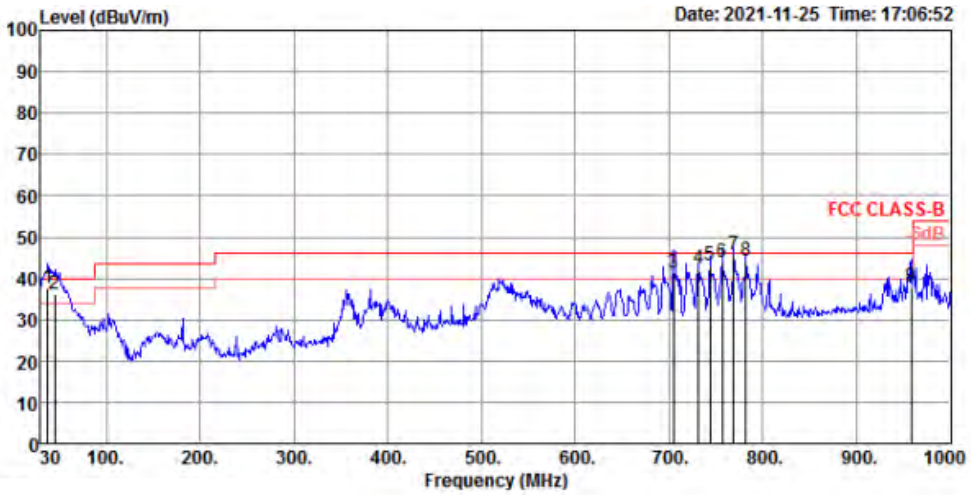
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	647.89	39.63	46.00	-6.37	43.60	3.99	24.58	32.54	125	326	QP	HORIZONTAL
2	693.48	43.57	46.00	-2.43	47.50	4.18	24.53	32.64	100	241	QP	HORIZONTAL
3	706.09	44.89	46.00	-1.11	48.79	4.21	24.55	32.66	100	254	QP	HORIZONTAL
4	718.70	43.84	46.00	-2.16	47.55	4.24	24.72	32.67	200	249	QP	HORIZONTAL
5	730.34	45.12	46.00	-0.88	48.60	4.26	24.95	32.69	125	228	QP	HORIZONTAL
6	743.92	44.26	46.00	-1.74	47.50	4.29	25.17	32.70	125	208	QP	HORIZONTAL
7	756.53	42.91	46.00	-3.09	46.03	4.32	25.27	32.71	200	329	QP	HORIZONTAL
8	769.14	43.83	46.00	-2.17	46.80	4.38	25.35	32.70	200	329	QP	HORIZONTAL
9	781.75	41.37	46.00	-4.63	44.21	4.43	25.43	32.70	100	91	QP	HORIZONTAL

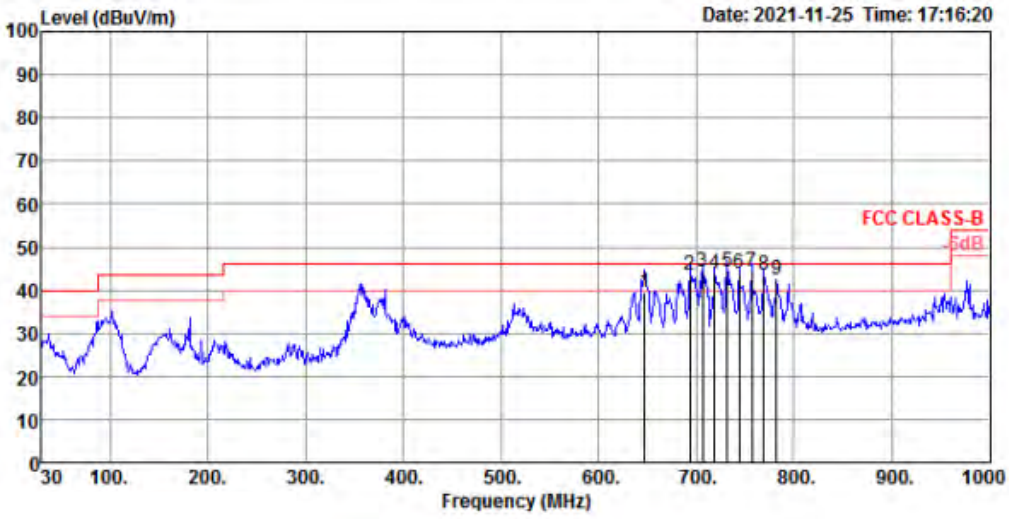
Test Range	30 MHz – 1 GHz	Test Distance	3 m
Test Freq. (GHz)	62.64		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37.76	37.69	40.00	-2.31	48.50	0.90	19.92	31.63	100	6	QP	VERTICAL
2	44.55	36.15	40.00	-3.85	50.50	0.99	16.37	31.71	100	293	QP	VERTICAL
3	705.12	41.48	46.00	-4.52	45.40	4.21	24.53	32.66	100	243	QP	VERTICAL
4	731.31	42.47	46.00	-3.53	45.91	4.26	24.99	32.69	100	335	QP	VERTICAL
5	743.92	43.16	46.00	-2.84	46.40	4.29	25.17	32.70	100	0	QP	VERTICAL
6	756.53	43.78	46.00	-2.22	46.90	4.32	25.27	32.71	100	0	QP	VERTICAL
7	769.14	45.88	46.00	-0.12	48.85	4.38	25.35	32.70	100	356	QP	VERTICAL
8	781.75	44.17	46.00	-1.83	47.01	4.43	25.43	32.70	100	9	QP	VERTICAL
9	958.29	37.85	46.00	-8.15	38.80	5.04	26.58	32.57	200	360	QP	VERTICAL

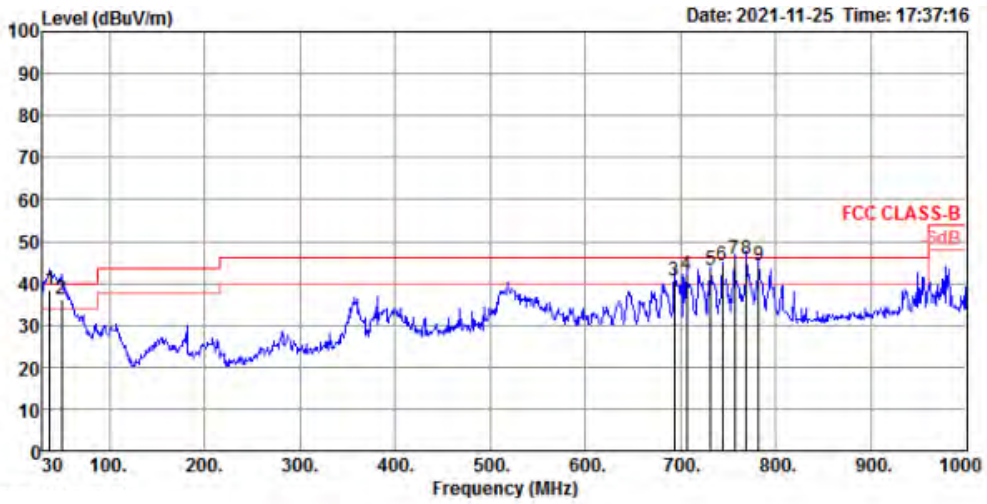
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	646.92	39.63	46.00	-6.37	43.60	3.99	24.58	32.54	125	340	QP	HORIZONTAL
2	693.48	43.67	46.00	-2.33	47.60	4.18	24.53	32.64	125	242	QP	HORIZONTAL
3	706.09	44.31	46.00	-1.69	48.21	4.21	24.55	32.66	100	250	QP	HORIZONTAL
4	718.70	43.89	46.00	-2.11	47.60	4.24	24.72	32.67	200	257	QP	HORIZONTAL
5	731.31	44.17	46.00	-1.83	47.61	4.26	24.99	32.69	125	335	QP	HORIZONTAL
6	743.92	43.76	46.00	-2.24	47.00	4.29	25.17	32.70	200	315	QP	HORIZONTAL
7	756.53	44.38	46.00	-1.62	47.50	4.32	25.27	32.71	200	333	QP	HORIZONTAL
8	769.14	43.73	46.00	-2.27	46.70	4.38	25.35	32.70	200	336	QP	HORIZONTAL
9	781.75	42.61	46.00	-3.39	45.45	4.43	25.43	32.70	100	84	Peak	HORIZONTAL

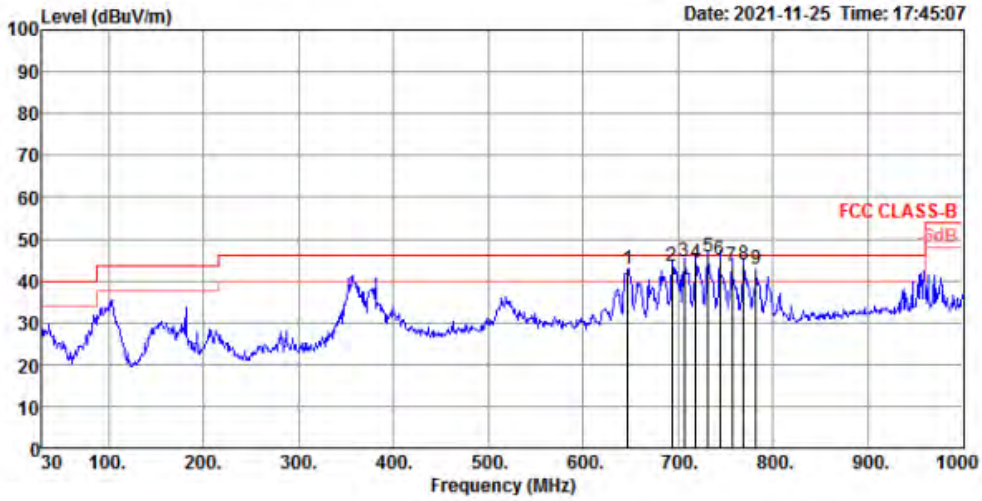
Test Range	30 MHz – 1 GHz	Test Distance	3 m
Test Freq. (GHz)	64.80		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	37.76	38.39	40.00	-1.61	49.20	0.90	19.92	31.63	100	3	QP	VERTICAL
2	49.40	36.01	40.00	-3.99	52.59	1.00	14.17	31.75	125	360	QP	VERTICAL
3	693.48	40.67	46.00	-5.33	44.60	4.18	24.53	32.64	100	4	QP	VERTICAL
4	706.09	42.01	46.00	-3.99	45.91	4.21	24.55	32.66	100	3	QP	VERTICAL
5	731.31	43.27	46.00	-2.73	46.71	4.26	24.99	32.69	125	308	QP	VERTICAL
6	743.92	44.36	46.00	-1.64	47.60	4.29	25.17	32.70	100	0	QP	VERTICAL
7	756.53	45.58	46.00	-0.42	48.70	4.32	25.27	32.71	100	358	QP	VERTICAL
8	769.14	45.90	46.00	-0.10	48.87	4.38	25.35	32.70	100	353	QP	VERTICAL
9	781.75	44.37	46.00	-1.63	47.21	4.43	25.43	32.70	100	0	QP	VERTICAL

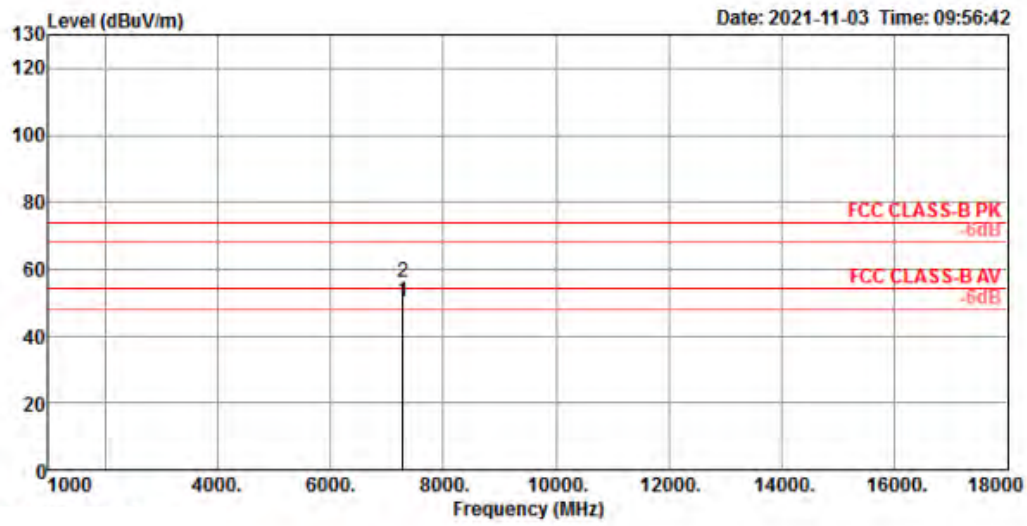
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	646.92	42.99	46.00	-3.01	46.96	3.99	24.58	32.54	125	320	Peak	HORIZONTAL
2	693.48	43.67	46.00	-2.33	47.60	4.18	24.53	32.64	200	256	QP	HORIZONTAL
3	706.09	44.51	46.00	-1.49	48.41	4.21	24.55	32.66	125	254	QP	HORIZONTAL
4	718.70	44.29	46.00	-1.71	48.00	4.24	24.72	32.67	100	244	QP	HORIZONTAL
5	731.31	45.77	46.00	-0.23	49.21	4.26	24.99	32.69	125	320	QP	HORIZONTAL
6	743.92	44.96	46.00	-1.04	48.20	4.29	25.17	32.70	200	314	QP	HORIZONTAL
7	756.53	43.63	46.00	-2.37	46.75	4.32	25.27	32.71	200	309	QP	HORIZONTAL
8	769.14	43.98	46.00	-2.02	46.95	4.38	25.35	32.70	200	322	QP	HORIZONTAL
9	781.75	42.98	46.00	-3.02	45.82	4.43	25.43	32.70	100	114	Peak	HORIZONTAL

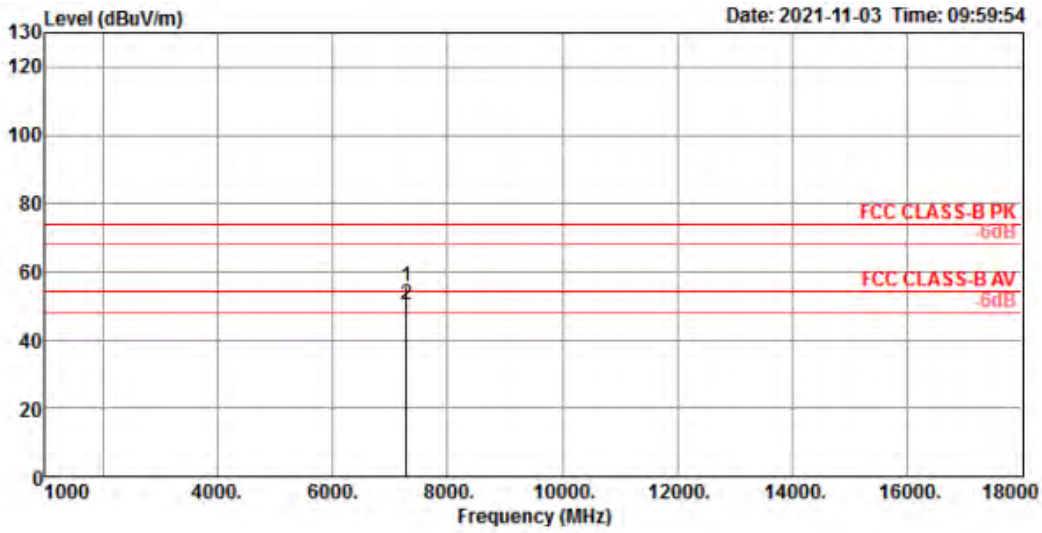
Test Range	1 GHz – 18 GHz	Test Distance	3 m
Test Freq. (GHz)	58.32		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	7289.83	50.45	54.00	-3.55	40.63	6.90	36.37	33.45	198	14	Average	VERTICAL
2	7289.87	56.03	74.00	-17.97	46.21	6.90	36.37	33.45	198	14	Peak	VERTICAL

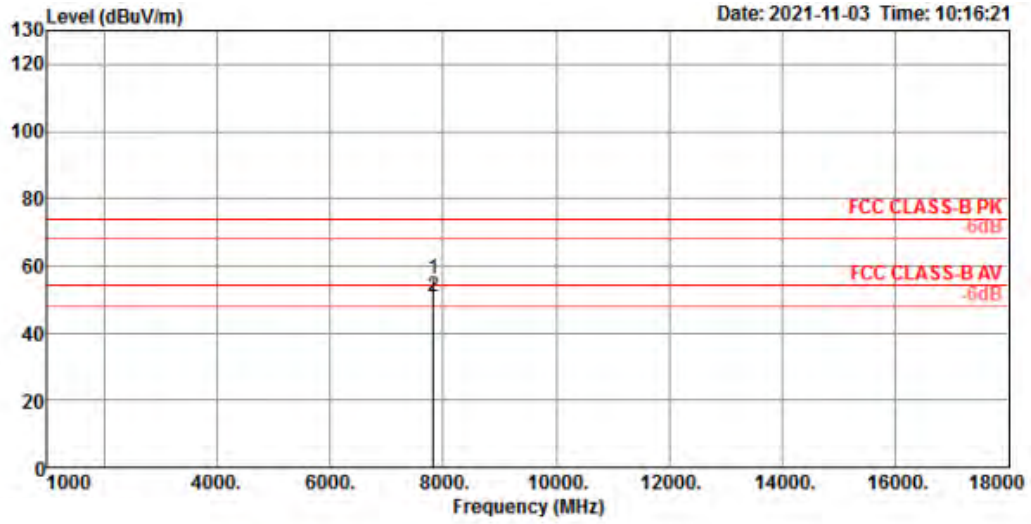
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	7289.75	55.52	74.00	-18.48	45.70	6.90	36.37	33.45	143	14	Peak	HORIZONTAL
2	7289.79	50.54	54.00	-3.46	40.72	6.90	36.37	33.45	143	14	Average	HORIZONTAL

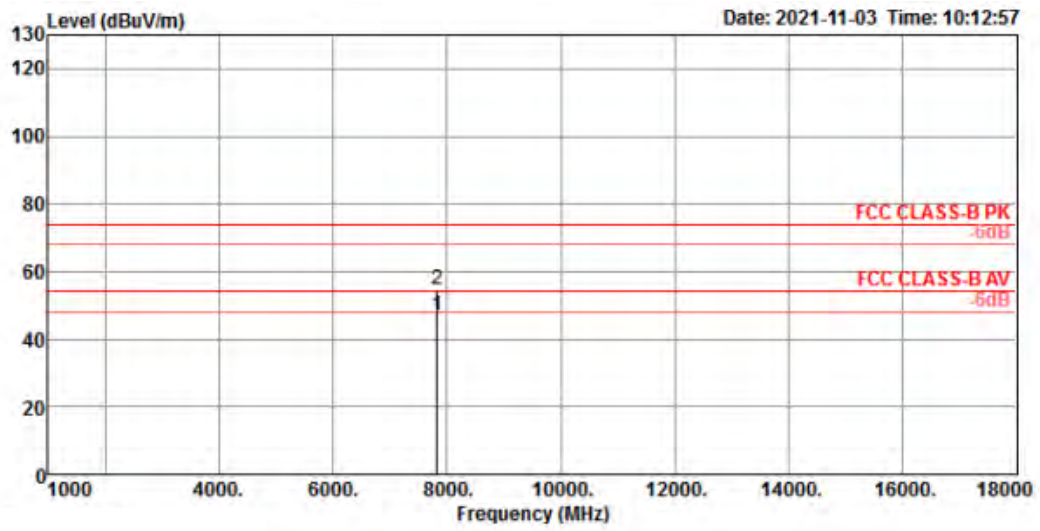
Test Range	1 GHz – 18 GHz	Test Distance	3 m
Test Freq. (GHz)	62.64		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	7829.63	55.94	74.00	-18.06	46.25	7.24	36.30	33.85	147	345	Peak	VERTICAL
2	7829.82	50.74	54.00	-3.26	41.05	7.24	36.30	33.85	147	345	Average	VERTICAL

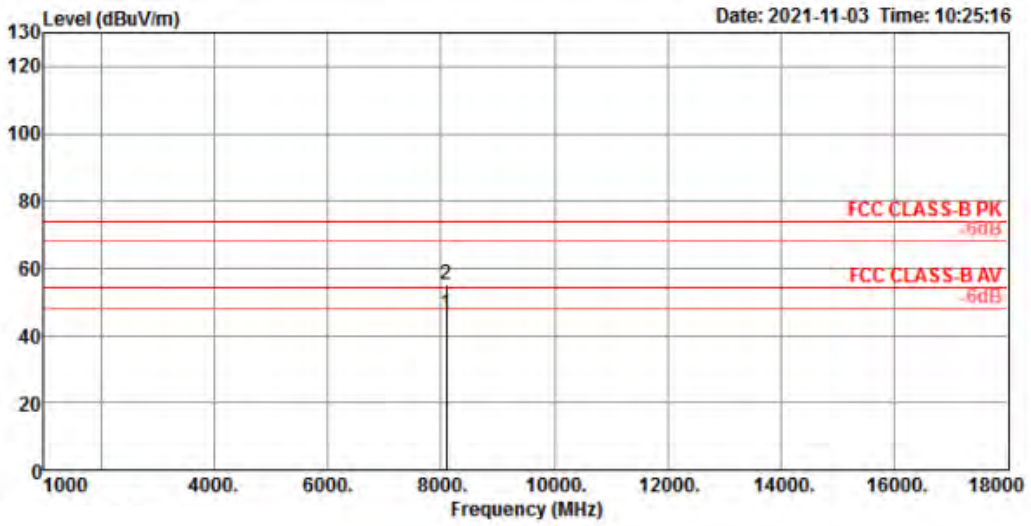
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	7829.74	47.08	54.00	-6.92	37.39	7.24	36.30	33.85	154	353	Average	HORIZONTAL
2	7829.76	54.65	74.00	-19.35	44.96	7.24	36.30	33.85	154	353	Peak	HORIZONTAL

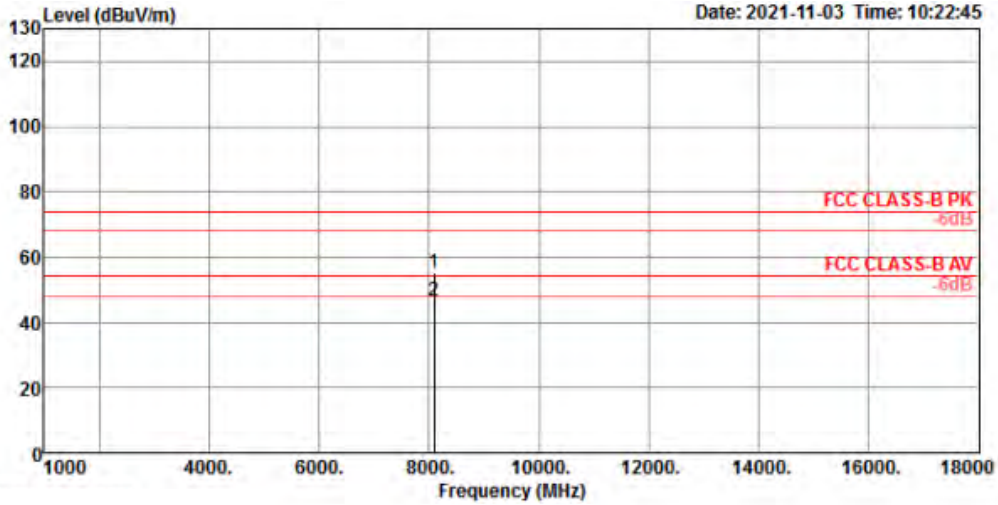
Test Range	1 GHz – 18 GHz	Test Distance	3 m
Test Freq. (GHz)	64.80		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	8099.78	46.46	54.00	-7.54	35.81	7.56	37.10	34.01	217	355	Average	VERTICAL
2	8099.81	55.14	74.00	-18.86	44.49	7.56	37.10	34.01	217	355	Peak	VERTICAL

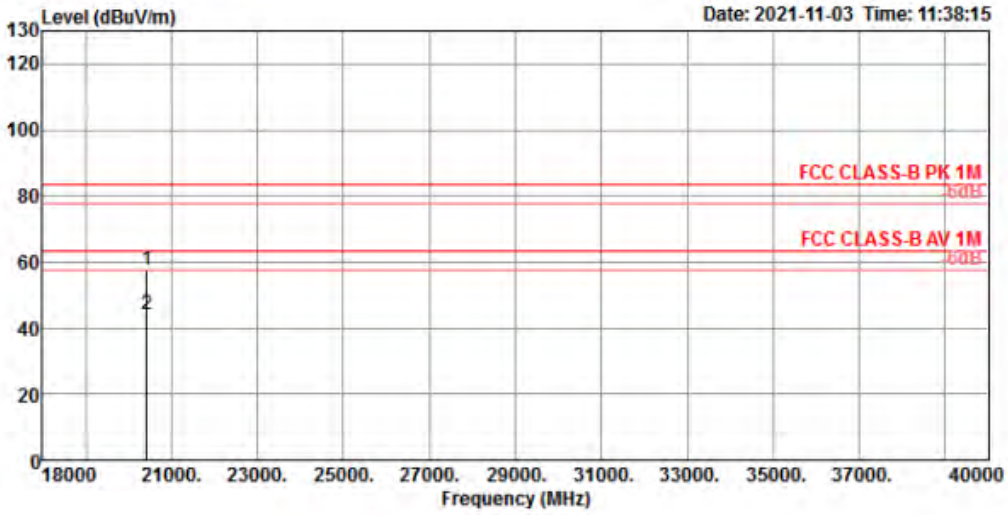
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	8099.73	55.33	74.00	-18.67	44.68	7.56	37.10	34.01	138	14	Peak	HORIZONTAL
2	8099.80	46.49	54.00	-7.51	35.84	7.56	37.10	34.01	138	14	Average	HORIZONTAL

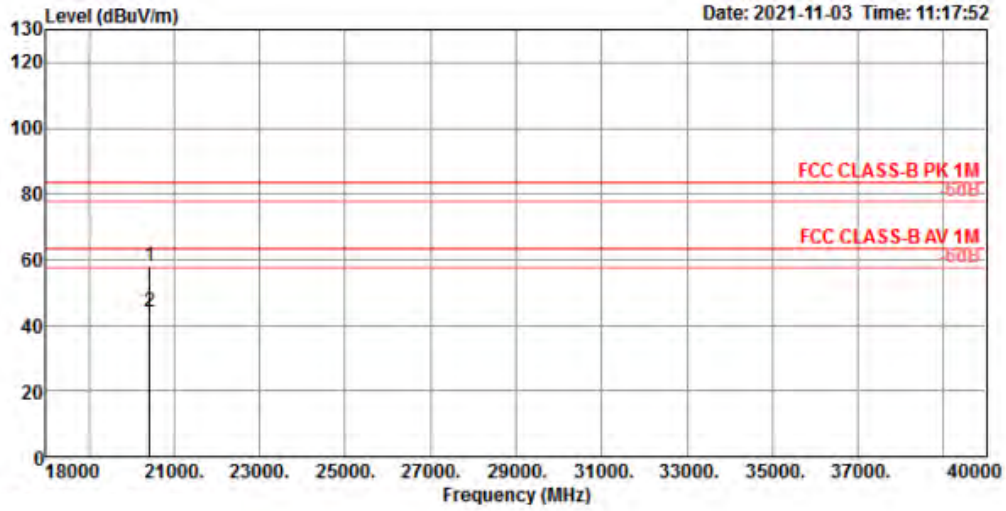
Test Range	18 GHz – 40 GHz	Test Distance	1 m
Test Freq. (GHz)	58.32		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	20419.44	57.62	83.54	-25.92	55.47	14.35	37.67	49.87	150	23	Peak	VERTICAL
2	20419.58	44.35	63.54	-19.19	42.20	14.35	37.67	49.87	150	23	Average	VERTICAL

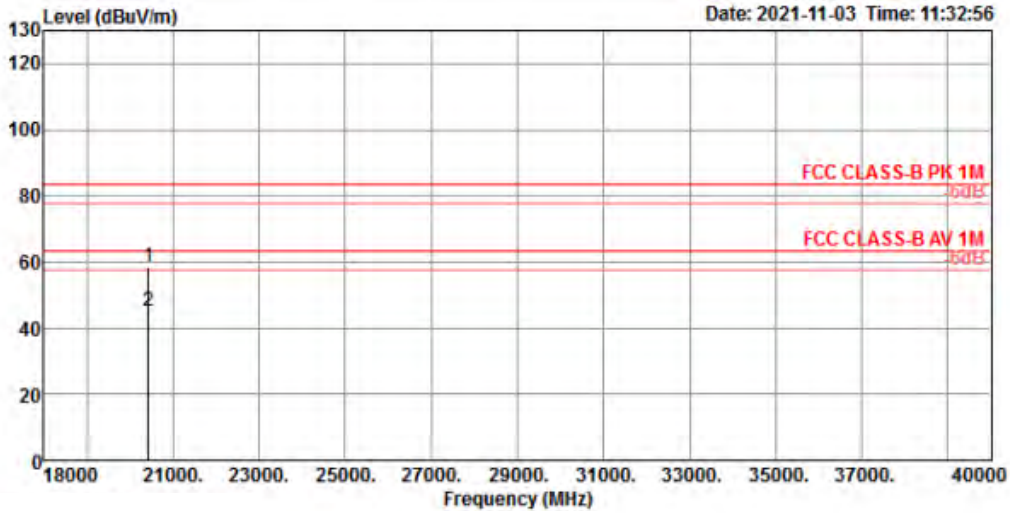
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	20418.74	58.05	83.54	-25.49	55.90	14.35	37.67	49.87	150	316	Peak	HORIZONTAL
2	20419.43	44.11	63.54	-19.43	41.96	14.35	37.67	49.87	150	316	Average	HORIZONTAL

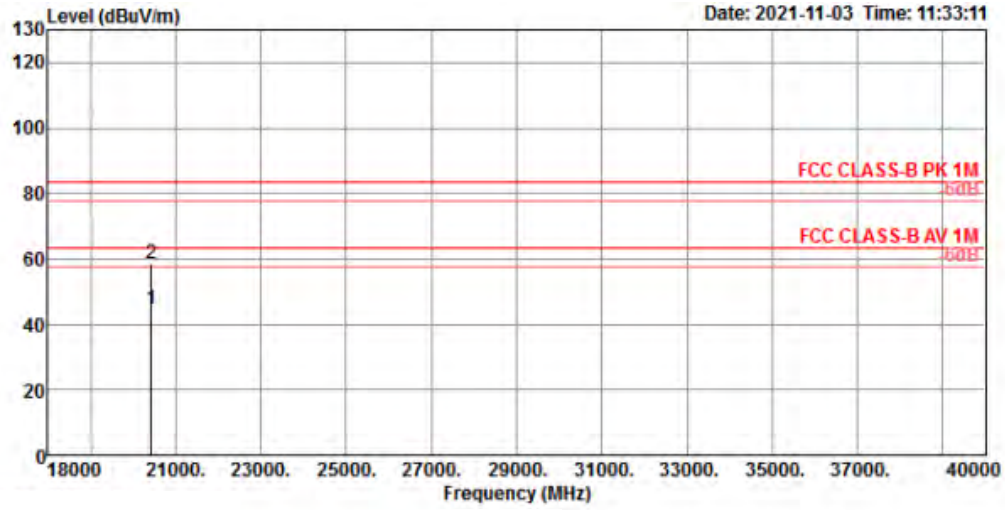
Test Range	18 GHz – 40 GHz	Test Distance	1 m
Test Freq. (GHz)	62.64		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	20421.12	58.46	83.54	-25.08	56.31	14.35	37.67	49.87	150	195	Peak	VERTICAL
2	20421.62	45.25	63.54	-18.29	43.10	14.35	37.67	49.87	150	195	Average	VERTICAL

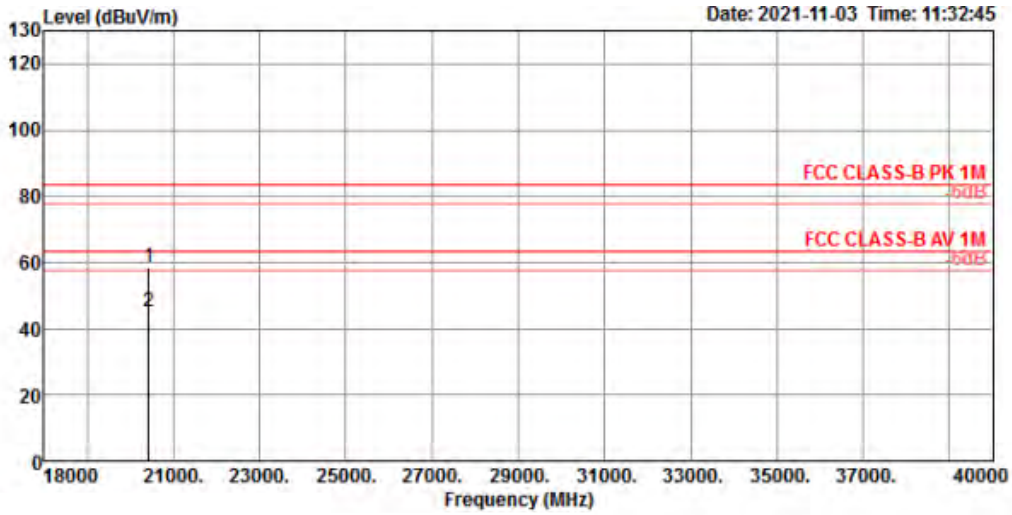
Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	20421.78	44.58	63.54	-18.96	42.43	14.35	37.67	49.87	150	64	Average	HORIZONTAL
2	20421.81	58.55	83.54	-24.99	56.40	14.35	37.67	49.87	150	64	Peak	HORIZONTAL

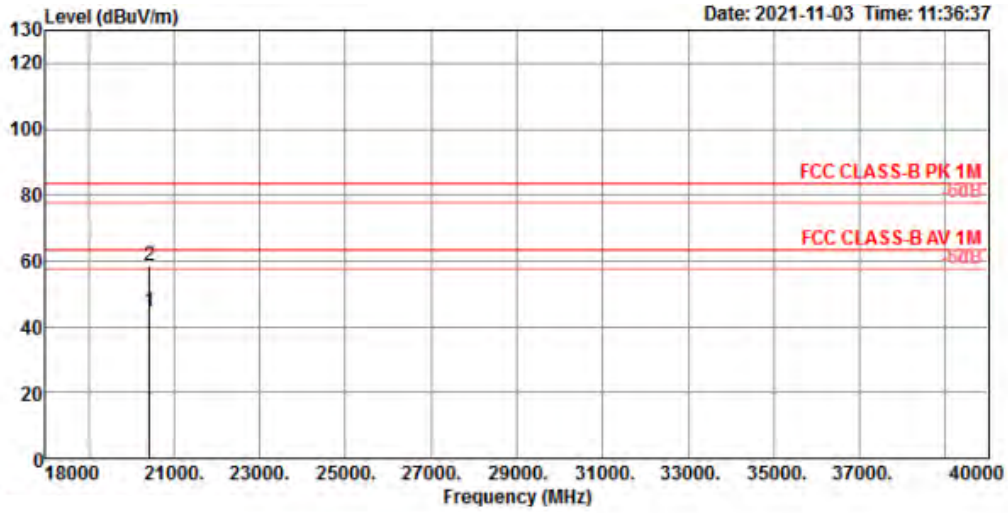
Test Range	18 GHz – 40 GHz	Test Distance	1 m
Test Freq. (GHz)	64.80		

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	20421.56	58.50	83.54	-25.04	56.35	14.35	37.67	49.87	150	132	Peak	VERTICAL
2	20421.65	45.16	63.54	-18.38	43.01	14.35	37.67	49.87	150	132	Average	VERTICAL

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	20420.50	44.50	63.54	-19.04	42.35	14.35	37.67	49.87	150	27	Average	HORIZONTAL
2	20420.94	58.71	83.54	-24.83	56.56	14.35	37.67	49.87	150	27	Peak	HORIZONTAL

Test Range	40GHz – 200GHz

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
58.32	23.6	45.00	56.56	-89.6
EIRP (dBm)	**Specification Distance (m)**	**Power Density (pW/cm^2)**	**Limit (pW/cm^2)**	**Test Result**
-12.64	3	48.0975	90.00	PASS

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
62.64	23.6	45.00	54.05	-87.54
EIRP (dBm)	**Specification Distance (m)**	**Power Density (pW/cm^2)**	**Limit (pW/cm^2)**	**Test Result**
-10.98	3	70.5818	90.00	PASS

Test Frequency (GHz)	Rx Antenna Gain (dBi)	Measurement Distance (m)	Read Worse Frequency (GHz)	Read Level (dBm)
64.80	23.6	45.00	56.70	-91.32
EIRP (dBm)	**Specification Distance (m)**	**Power Density (pW/cm^2)**	**Limit (pW/cm^2)**	**Test Result**
-14.34	3	32.5335	90.00	PASS

Note:
EIRP = Prx – Grx + Free Space Path Loss = Prx – Grx + 20Log(4πd/ λ)2
Which
Prx = Read Level.
Grx = Rx Antenna Gain.
A distance factor is offset and the formula is 20LOG(D1/D2)
Which
D1 = Specification Distance
D2 = Measurement Distance

3.6 Frequency Stability

3.6.1 Limit of Frequency Stability

Frequency Stability	Limit
Refer as 15.255(f) and ANSI C63.10-2013, clause 9.14	within the frequency bands
Note: These measurements shall also be performed at normal and extreme test conditions.	

3.6.2 Measuring Instruments

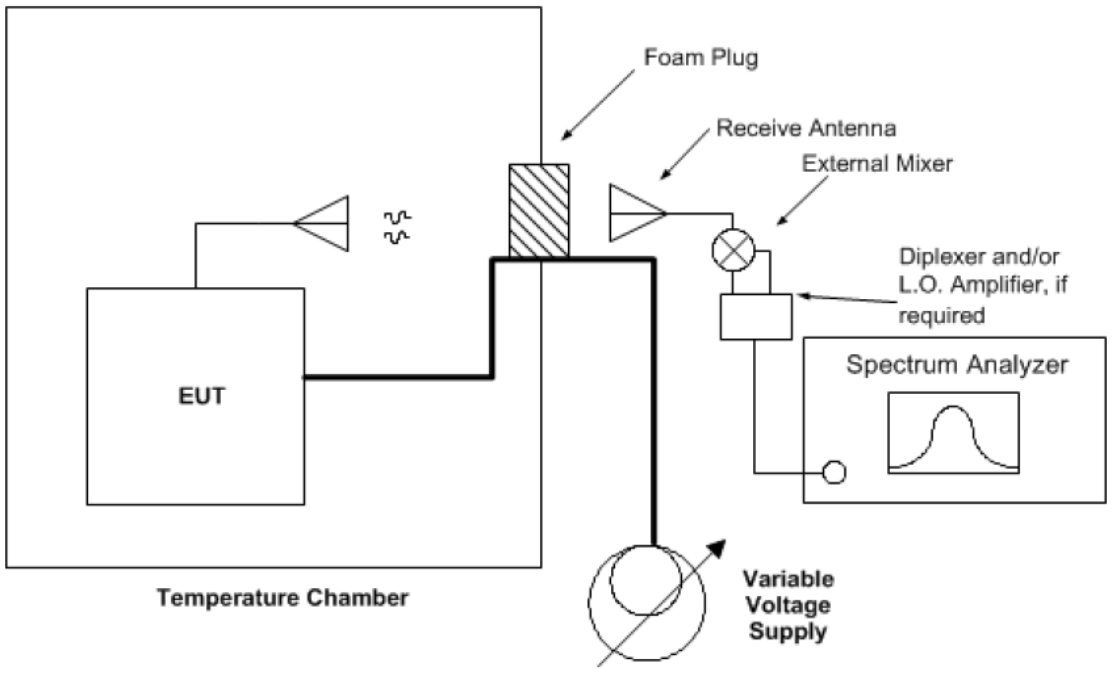
Refer a measuring instruments list in this test report.

3.6.3 Test Procedures

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

3.6.4 Test Setup

Frequency Stability



3.6.5 Test Result of Frequency Stability

Test Conditions	see ANSI C63.10, clause 5.11 & clause 9
Test Setup	see ANSI C63.10, clause 9.14
NOTE: If equipment having different channel plan and nominal channel bandwidth modes (see test report clause 1.1.1), the measurements are uninfluenced by different channel plan and nominal channel bandwidth modes, may not need to be repeated for all modes.	

3.6.5.1 Frequency Stability with Respect to Ambient Temperature

Frequency Stability with Respect to Ambient Temperature			
Test Results			
Test Temp.erature (°C)	**Measured Frequency (MHz)**	**Delta Frequency (kHz)**	**Limit (±kHz)**
-40	62638.957	-1.0	within band
-30	62638.954	-4.0	within band
-20	62638.813	-145.0	within band
-10	62638.942	-16.0	within band
0	62638.958	0.0	within band
10	62638.958	0.0	within band
20	62638.958	Reference	within band
30	62638.942	-16.0	within band
40	62638.954	-4.0	within band
50	62638.942	-16.0	within band
60	62638.942	-16.0	within band
NOTE: The manufacturer’s specified temperature range of -40 to 60°C.			

3.6.5.2 Frequency Stability When Varying Supply Voltage

Frequency Stability When Varying Supply Voltage			
Test Results			
Test Voltage: (Vdc)	Measured Frequency (MHz)	Delta Frequency (kHz)	Limit (±kHz)
93.5	62638.958	0	within band
110	62638.958	Reference	within band
126.5	62638.942	-16	within band

3.7 Operation Restriction and Group Installation

3.7.1 Limit of Operation Restriction and Group Installation

Item	Limit
Operation Restriction	Operation is not permitted for the following products: ♦ Equipment used on aircraft or satellites. (Refer as 15.255 (a)) ♦ Field disturbance sensors, including vehicle radar systems, unless the field disturbance sensors are employed for fixed operation. (Refer as 15.255 (a))
Group Installation	Operation is not permitted for the following products: ♦ External phase-locking (Refer as 15.255 (h))

3.7.2 Result of Operation Restriction

Manufacturer declares that EUT will not been used on aircraft or satellites. Then user manual will include a statement to caution EUT is not permitted for used on aircraft or satellites.

3.7.3 Result of Group Installation

The frequency, amplitude and phase of the transmit signal are set within the EUT. There are no external phase-locking inputs or any other means of combining two or more units together to realize a beam-forming array.

4 Test Equipment and Calibration Data

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.4GHz	Mar. 03, 2021	Mar. 02, 2022	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Dec. 22, 2021	Dec. 21, 2022	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Mar. 07, 2021	Mar. 06, 2022	Conduction (CO01-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F-N	00378	9kHz ~ 30MHz	Mar. 18, 2021	Mar. 17, 2022	Conduction (CO01-CB)
COND Cable	Woken	Cable	Low cable-CO01	9kHz ~ 30MHz	May 19, 2021	May 18, 2022	Conduction (CO01-CB)
Software	SPORTON	SENSE	V5.10	-	N.C.R.	N.C.R.	Conduction (CO01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Apr. 14, 2021	Apr. 13, 2022	Radiation (03CH05-CB)
3m Semi Anechoic Chamber NSA	TDK	SAC-3M	03CH05-CB	30 MHz ~ 1 GHz	Aug. 09, 2021	Aug. 08, 2022	Radiation (03CH05-CB)
Bilog Antenna with 6dB Attenuator	TESEQ & EMCI	CBL 6112D & N-6-06	35236 & AT-N0610	30MHz ~ 2GHz	Mar. 26, 2021	Mar. 25, 2022	Radiation (03CH05-CB)
Pre-Amplifier	EMCI	EMC330N	980331	20MHz ~ 3GHz	Apr. 27, 2021	Apr. 26, 2022	Radiation (03CH05-CB)
Signal Analyzer	R&S	FSV40	101903	9kHz ~ 40GHz	Mar. 22, 2021	Mar. 21, 2022	Radiation (03CH05-CB)
EMI Test Receiver	R&S	ESCS	826547/017	9kHz ~ 2.75GHz	Jun. 21, 2021	Jun. 20, 2022	Radiation (03CH05-CB)
RF Cable-low	Woken	RG402	Low Cable-04+23	30MHz~1GHz	Oct. 13, 2021	Oct. 12, 2022	Radiation (03CH05-CB)
Test Software	Audix	E3	6.120210m	-	N.C.R.	N.C.R.	Radiation (03CH05-CB)
3m Semi Anechoic Chamber VSWR	TDK	SAC-3M	03CH06-CB	1GHz ~18GHz 3m	Oct. 01, 2021	Sep. 30, 2022	Radiation (03CH06-CB)
Horn Antenna	SCHWARZBECK	BBHA9120D	BBHA 9120D-1292	1GHz~18GHz	Aug. 04, 2021	Aug. 03, 2022	Radiation (03CH06-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 05, 2021	Aug. 04, 2022	Radiation (03CH06-CB)
Pre-Amplifier	Agilent	83017A	MY53270064	0.5GHz ~ 26.5GHz	May 06, 2021	May 05, 2022	Radiation (03CH06-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jul. 13, 2021	Jul. 12, 2022	Radiation (03CH06-CB)
Signal Analyzer	R&S	FSV40	101903	9kHz ~ 40GHz	Mar. 22, 2021	Mar. 21, 2022	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05	1GHz~18GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-05+24	1GHz~18GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (03CH06-CB)

Instrument	Brand	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date	Remark
RF Cable-high	Woken	RG402	High Cable-40G#1	18GHz ~ 40 GHz	Jul. 15, 2021	Jul. 14, 2022	Radiation (03CH06-CB)
RF Cable-high	Woken	RG402	High Cable-40G#2	18GHz ~ 40 GHz	Jul. 15, 2021	Jul. 14, 2022	Radiation (03CH06-CB)
Test Software	Audix	E3	6.120210m	-	N.C.R.	N.C.R.	Radiation (03CH06-CB)
*Mixer	OML	M19HWA	U91113-1	40 ~ 60 GHz	Nov. 02, 2020	Nov. 01, 2022	Radiation (03CH06-CB)
*Mixer	OML	M15HWA	V91113-1	50 ~ 75 GHz	Nov. 13, 2020	Nov. 12, 2022	Radiation (03CH06-CB)
*Mixer	OML	M12HWA	E91113-1	60 ~ 90 GHz	Nov. 14, 2020	Nov. 13, 2022	Radiation (03CH06-CB)
*Mixer	OML	M08HWA	F91113-1	90 ~ 140 GHz	Nov. 02, 2020	Nov. 01, 2022	Radiation (03CH06-CB)
*Mixer	OML	M05HW/A	G91113-1	140 ~ 220 GHz	Nov. 02, 2020	Nov. 01, 2022	Radiation (03CH06-CB)
Standard Horn Antenna	Custom Microwave	M19RH	U91113-A	40 ~ 60 GHz	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Standard Horn Antenna	Custom Microwave	M15RH	V91113-A	50 ~ 75 GHz	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Standard Horn Antenna	Custom Microwave	M12RH	E91113-A	60 ~ 90 GHz	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Standard Horn Antenna	Custom Microwave	M08RH	F91113-A	90 ~ 140 GHz	N.C.R.	N.C.R.	Radiation (03CH06-CB)
Standard Horn Antenna	Custom Microwave	M05RH	G91113-A	140 ~ 220 GHz	N.C.R.	N.C.R.	Radiation (03CH06-CB)
*Detector	Millitech	DET-15-RPF W0	#A18185(074)	50 ~ 75 GHz	Apr. 02, 2020	Apr. 01, 2022	Radiation (03CH06-CB)
PC Oscilloscope	PICO TECH	6402C	CX372/002	N/A	Jul. 08, 2021	Jul. 07, 2022	Radiation (03CH06-CB)
Spectrum analyzer	R&S	FSV40	101028	9kHz~40GHz	Dec. 31, 2020	Dec. 30, 2021	Radiation (TH03-CB)
Temp. and Humidity Chamber	Gaint Force	GTH-408-40-CP-AR	MAA1410-011	-40~100 degree	Sep. 09, 2021	Sep. 08, 2022	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-11	1 GHz –18 GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-12	1 GHz –18 GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-13	1 GHz –18 GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-14	1 GHz –18 GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (TH03-CB)
RF Cable-high	Woken	RG402	High Cable-15	1 GHz –18 GHz	Oct. 04, 2021	Oct. 03, 2022	Radiation (TH03-CB)

Note: Calibration Interval of instruments listed above is one year.
"*" Calibration Interval of instruments listed above is two years.
N.C.R. means Non-Calibration required.

5 Measurement Uncertainty

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.0 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	5.5 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	4.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (40GHz ~ 60GHz)	4.2 dB	Confidence levels of 95%
Radiated Emission (60GHz ~ 90GHz)	5.1 dB	Confidence levels of 95%
Radiated Emission (90GHz ~ 200GHz)	4.2 dB	Confidence levels of 95%
Temperature	1.7°C	Confidence levels of 95%