FCC Test Report

Report No.:	RF190702C02A
FCC ID:	SWX-AF60
Test Model:	AF60
Received Date:	Sep. 11, 2019
Test Date:	Sep. 18 to Nov. 16, 2019
Issued Date:	Nov. 29, 2019
Applicant:	Ubiquiti Inc.
Address:	685 Third Avenue, New York, New York 10017 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF190702C02A	Original release.	Nov. 29, 2019

1 Certificate of Conformity

Product:	airFiber 60
Brand:	UBIQUITI
Test Model:	AF60
Sample Status:	ENGINEERING SAMPLE
Applicant:	Ubiquiti Inc.
Test Date:	Sep. 18 to Nov. 16, 2019
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.255) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Nov. 29, 2019

Phoenix Huang / Specialist

Approved by : _____ , **Date:** Nov. 29, 2019

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.255)			
FCC Clause	Test Item	Result	Remarks
15.255(e)	6dB Bandwidth	-	Reference only.
15.255 (c) & (e)	Output Power	Pass	Meet the requirement of limit.
15.255(d)	Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -4.0dB at 62.00MHz.

Note:
Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.0 dB
	30MHz ~ 1GHz	5.1 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.2 dB
	40GHz ~ 200GHz	5.4 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	airFiber 60
Brand	UBIQUITI
Test Model	AF60
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	24Vdc from PoE adapter
Modulation Type	π/2-BPSK, π/2-QPSK, π/2-16QAM
Modulation Technology	OFDM
Transfer Rate	Up to 2310 Mbps (for Bandwidth: 1GHz) Up to 4620 Mbps (for Bandwidth: 2GHz)
Operating Frequency	57 ~ 71 GHz
Output Power (EIRP)	**Bandwidth 1GHz:** 58.32 GHz: 55.60 dBm 62.64 GHz: 55.63 dBm 65.88 GHz: 55.61 dBm **Bandwidth 2GHz:** 65.88 GHz: 55.42 dBm
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	PoE adapter x 1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RF190702C02-4 as the following:
   - ◆ Add one channel (Freq. 65.88 GHz) for bandwidth (2GHz).
   - ◆ Update SW, add new bandwidth (1GHz) and change frequency range.
   - ◆ Change simultaneously transmission condition mode to WiGig+WLAN (2.4GHz)+WLAN (5GHz)+BT-LE.
2. According to above condition, all test items need to be performed (except for AC Power Conducted Emission & Frequency Stability test items). And all data were verified to meet the requirements.
3. The antennas provided to the EUT, please refer to the following table:

With dish Antenna Gain (dBi)	Frequency Range (GHz)	Connector Type
38	57 ~ 71	none

4. Simultaneously transmission condition.

Condition	Technology			
1	WiGig	WLAN (2.4GHz)	WLAN (5GHz)	BT-LE

5. The EUT must be supplied with a PoE adapter as following table:

Brand	Model No.	Spec.
Ubiquiti Networks. Inc.	GP-A240-050G	Input: 100-240Vac, 50/60Hz, MAX 0.3A AC Input Power Cable: unshielded, 0.6m Output: 24Vdc, 0.5A

6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

8 channels are provided for EUT bandwidth 1GHz

Channel	Frequency (GHz)	Channel	Frequency (GHz)	Channel	Frequency (GHz)	Channel	Frequency (GHz)
1	58.32	3	60.48	5	62.64	7	64.80
2	59.40	4	61.56	6	63.72	8	65.88

5 channels are provided for EUT bandwidth 2GHz

Channel	Frequency (GHz)	Channel	Frequency (GHz)	Channel	Frequency (GHz)	Channel	Frequency (GHz)
1	58.32	2	60.48	3	62.64	4	64.80
5	65.88						

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	BW	OP	RE < 1G	RE ≥ 1G	
1	√	√	√	√	Bandwidth 1GHz
2	√	√	√	√	Bandwidth 2GHz

Where **BW:** 6dB Bandwidth **OP:** Output Power
RE < 1G: Radiated Emission below 1GHz **RE ≥ 1G:** Radiated Emission above 1GHz

6dB Bandwidth Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Bandwidth (GHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	1 to 8	1, 5, 8	OFDM	π/2-BPSK	192.5
2	1 to 5	5	OFDM	π/2-BPSK	385

Output Power Measurement:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Bandwidth (GHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	1 to 8	1, 5, 8	OFDM	π/2-BPSK	192.5
2	1 to 5	5	OFDM	π/2-BPSK	385

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Bandwidth (GHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	1 to 8	1, 5, 8	OFDM	π/2-BPSK	192.5
2	1 to 5	5	OFDM	π/2-BPSK	385

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Bandwidth (GHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
1	1 to 8	1, 5, 8	OFDM	π/2-BPSK	192.5
2	1 to 5	5	OFDM	π/2-BPSK	385

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
BW	25 deg. C, 60 %RH	120Vac, 60Hz	Weiwei Liao
OP	23 deg. C, 62 %RH	120Vac, 60Hz	Weiwei Liao
RE<1G	23 deg. C, 67 %RH, 23 deg. C, 68 %RH	120Vac, 60Hz	Andy Ho, Weiwei Liao
RE≥1G	24 deg. C, 69 %RH, 22 deg. C, 65 %RH, 23 deg. C, 62 %RH, 23 deg. C, 68 %RH, 25 deg. C, 67 %RH	120Vac, 60Hz	Andy Ho, Weiwei Liao

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

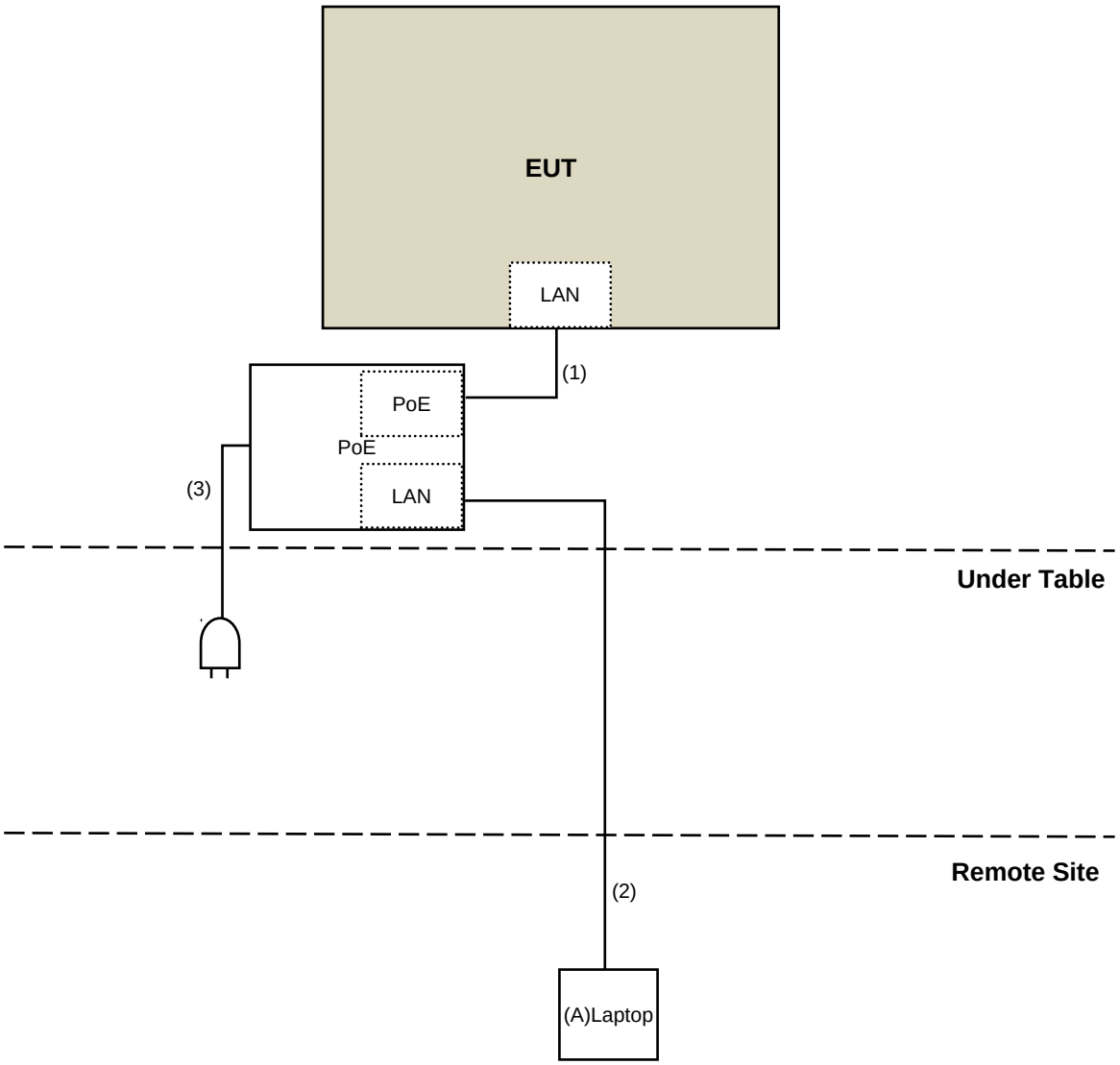
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	3	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	AC Cable	1	0.6	No	0	Supplied by client

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.255)
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission Measurement

4.1.1 Limits of Radiated Emission Measurement

Spurious Emission	
Frequency Range	Limitation
Radiated emissions below 40GHz	Part 15.209
Between 40GHz and 200GHz	90pW/cm^2 (at 3 meter)
Note: The levels of the spurious emissions shall not exceed the level of the fundamental emission	

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.

4.1.2 Test Instruments

For Below 40GHz: (Bandwidth 1GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-3-1	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-2	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-3	Mar. 18, 2019	Mar. 17, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-1200	160922	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-2000	180601	June 10, 2019	June 09, 2020
RF Cable	EMC104-SM-SM-6000	180602	June 10, 2019	June 09, 2020
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC102-KM-KM-1200	160925	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Sep. 24, 2019

For Above 40GHz: (Bandwidth 1GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	July 24, 2019	July 23, 2020
*Harmonic Mixer (33~55GHz) OML	M22HWD	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Horn Antenna (33~55GHz) OML	M22RH	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Harmonic Mixer (50~75GHz) OML	M15RH	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Horn Antenna (50~75GHz) OML	M15HWD	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Harmonic Mixer (75~110GHz) OML	M10HWD	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Horn Antenna (75~110GHz) OML	M10RH	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Harmonic Mixer (110~170GHz) OML	M06RH	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Horn Antenna(110~170GHz) OML	M06HWD	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Harmonic Mixer (140~220GHz) OML	M05HWD	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Horn Antenna (140~220GHz) OML	M05RH	110215-1	Oct. 17, 2017	Oct. 16, 2019
*Diplexer EMCI	DPL26	DPL26_01	Oct. 17, 2017	Oct. 16, 2019
*Diplexer EMCI	DPL26	DPL26_02	Oct. 17, 2017	Oct. 16, 2019
*Precision 30dB Attenuator Keysight	11708A	MY55260015	Oct. 17, 2017	Oct. 16, 2019
*Zero-Bias Detector (50~75GHz) Vdi	WR15ZBD	WR15R5 1-30	Oct. 17, 2017	Oct. 16, 2019
4CH Infiniivision Oscilloscope Keysight	DSOX6004A	MY55190202	July 12, 2019	July 11, 2020
*WR15CH Conical Horn Keysight	WR15CH	WR15CH-01	Oct. 17, 2017	Oct. 16, 2019
*WR10CH Conical Horn Keysight	WR10CH	WR10CH-01	Oct. 17, 2017	Oct. 16, 2019
*Millimeter-Wave Signal Generator Frequency Extension Module (50~75 GHz) Keysight	E8257DV15	US54250106	Oct. 17, 2017	Oct. 16, 2019
*Millimeter-Wave Signal Generator Frequency Extension Module (75~110 GHz) Keysight	E8257DV10	US53250009	Oct. 17, 2017	Oct. 16, 2019
PSG analog signal generator Keysight	E8257D	MY53401987	June 21, 2019	June 20, 2020
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
*Preselected Millimeter Mixer (50~75GHz) Agilent	11974V	MY30012030	Oct. 17, 2017	Oct. 16, 2019
*Millimeter wave Pre_Amplifier (57~66GHz) Space Labs	SL629-29-5W	1F29	Oct. 17, 2017	Oct. 16, 2019
*SWV-1 waveguide (50~75GHz) Space Labs	WV-1 waveguide	SWV-1_01	Oct. 17, 2017	Oct. 16, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 6
4 Tested Date: Sep. 18, 2019

For Below 40GHz: (Bandwidth 2GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 30, 2019	Apr. 29, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-3-1	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-2	Mar. 18, 2019	Mar. 17, 2020
RF Cable	8D	966-3-3	Mar. 18, 2019	Mar. 17, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-1200	160922	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC104-SM-SM-2000	180601	June 10, 2019	June 09, 2020
RF Cable	EMC104-SM-SM-6000	180602	June 10, 2019	June 09, 2020
Spectrum Analyzer Keysight	N9030A	MY54490679	July 17, 2019	July 16, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC102-KM-KM-1200	160925	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Oct. 16, 2019

For Above 40GHz: (Bandwidth 2GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Keysight	N9030A	MY55330160	Jan. 28, 2019	Jan. 27, 2020
*Horn Antenna (33~55GHz) OML	M22RH	110215-1	Oct. 17, 2017	Oct. 16, 2020
*Horn Antenna (50~75GHz) OML	M15HWD	110215-1	Oct. 17, 2017	Oct. 16, 2020
*Horn Antenna (75~110GHz) OML	M10RH	110215-1	Oct. 17, 2017	Oct. 16, 2020
*Horn Antenna(110~170GHz) OML	M06HWD	110215-1	Oct. 17, 2017	Oct. 16, 2020
*Horn Antenna (140~220GHz) OML	M05RH	110215-1	Oct. 17, 2017	Oct. 16, 2020
N9029AV15-DC9 - 50-75 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR15	SAX 381	CoC	CoC
N9029AV10-DC9 - 75-110 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR10	SAX 378	CoC	CoC
N9029AV06-DC9 - 110-170 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR6.5	SAX 377	CoC	CoC
N9029AV05-DC9 - 140-220 GHz VDI Standard Downconverter with 9VDC supply Keysight	SA Extension WR5.1	SAX 375	CoC	CoC
*Millimeter-Wave Signal Generator Frequency Extension Module (50~75 GHz) Keysight	E8257DV15	SGX 050	CoC	CoC
*Millimeter-Wave Signal Generator Frequency Extension Module (75~110 GHz) Keysight	E8257DV10	SGX 069	CoC	CoC
*Millimeter-Wave Signal Generator Frequency Extension Module (110~170 GHz) Keysight	E8257DV06-DC9	SGX 223	CoC	CoC
PSG analog signal generator Keysight	E8257D	MY53401987	June 21, 2019	June 20, 2020
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 36 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Certificate of Conformance (CoC) which is issued by manufacturer states that the product meets the specification.
4. The test was performed in 966 Chamber No. 3
5. Tested Date: Nov. 16, 2019

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission 30MHz to 40GHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters (30MHz-18GHz) / 1 meters (18GHz-40GHz) away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 40GHz

a. Connect the test antenna covering the appropriate frequency range to a spectrum analyzer via an external mixer to the spectrum analyzer.

b. Set spectrum analyzer RBW = 1 MHz, VBW = 3 MHz, average detector.

c. Calculate the distance to the far field boundary and determine the maximum measurement distance.

d. Perform an exploratory search for emissions and determine the approximate direction at which each observed emission emanates from the EUT.

e. Exploratory measurements be made at a closer distance than the validated maximum measurement distance.

f. Perform a final measurement; begin with the test antenna at the approximate position where the maximum level occurred during the exploratory scan.

g. Slowly scan the test antenna around this position, slowly vary the test antenna polarization by rotating through at least 0° to 180°, and slowly vary the orientation of the test antenna to find the final position, polarization, and orientation at which the maximum level of the emission is observed.

h. Record the measured reading with the test antenna fixed at this maximized position, polarization, and orientation. Record the measurement distance.

i. Calculate the maximum field strength of the emission at the measurement distance and the adjusted/corrected power at the output of the test antenna.

j. Calculate the EIRP from the measured field strength and then convert to the linear.

k. Calculate the power density at the distance specified by the limit from the field strength at the distance specified by the limit.

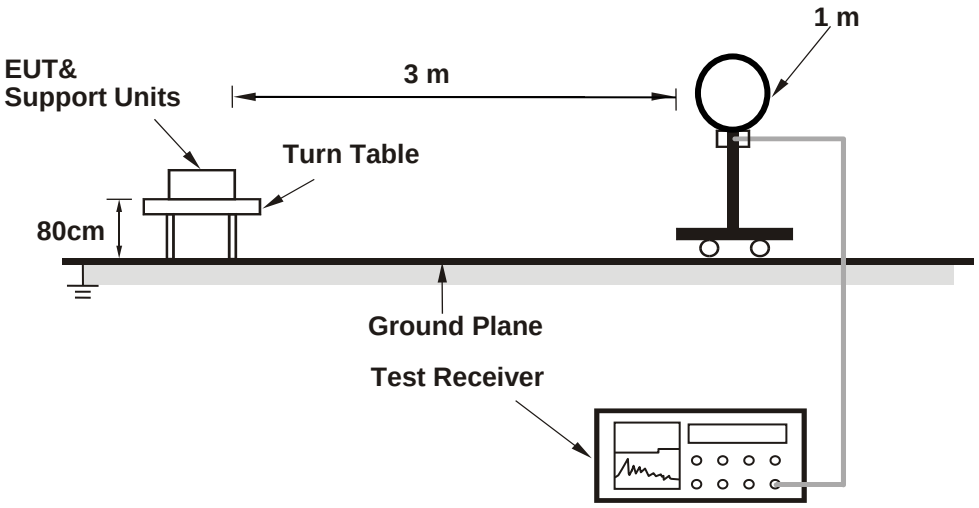
l. Repeat the preceding sequence for every emission observed in the frequency band under investigation.

4.1.4 Deviation from Test Standard

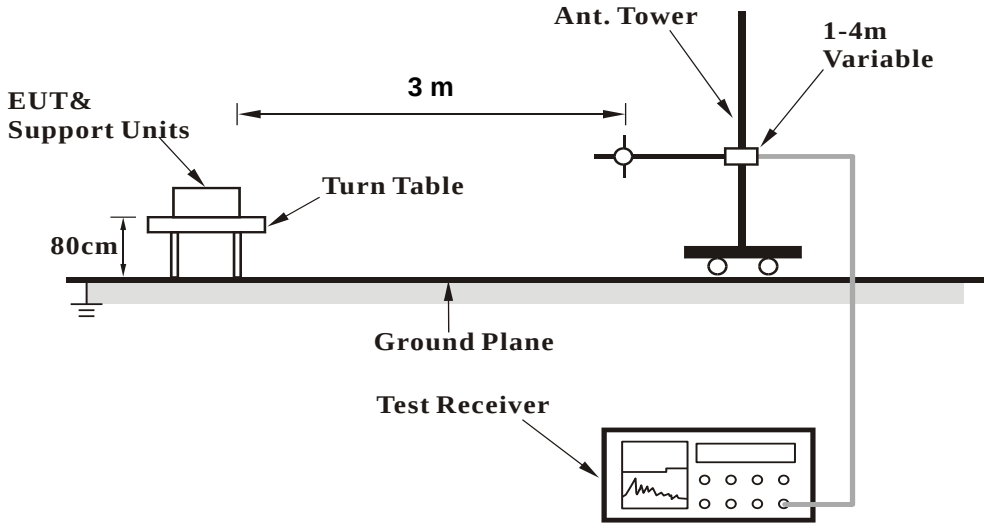
No deviation.

4.1.5 Test Setup

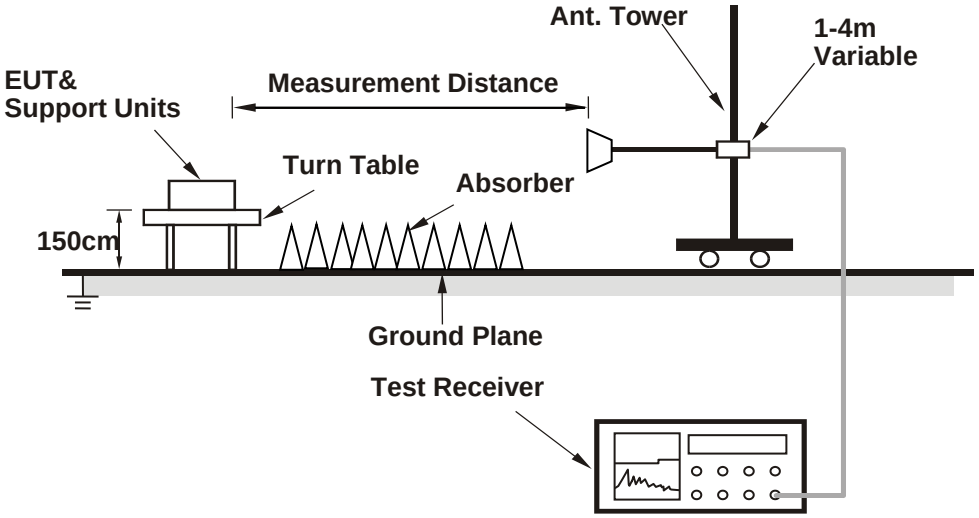
For Radiated emission below 30MHz



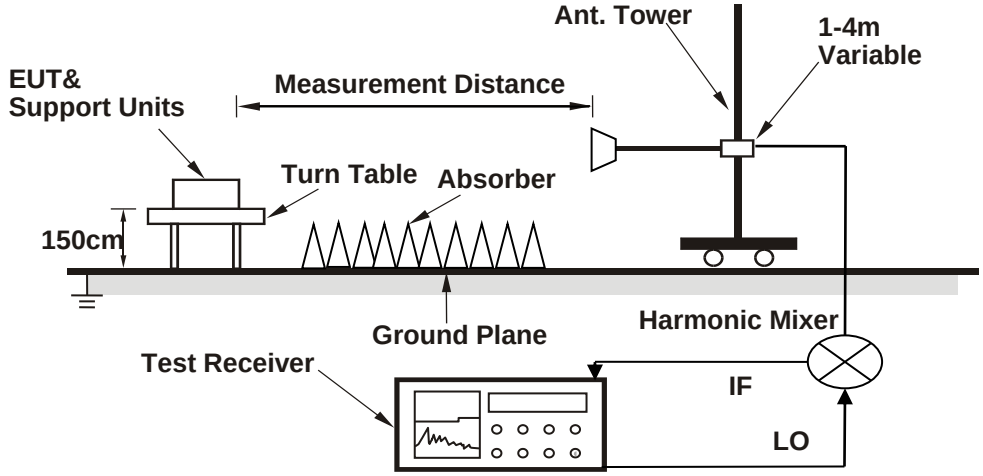
For Radiated emission 30MHz to 1GHz



For Radiated emission 1GHz to 40GHz



For Radiated emission above 40 GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software has been activated to set the EUT under transmission condition continuously on specific status.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

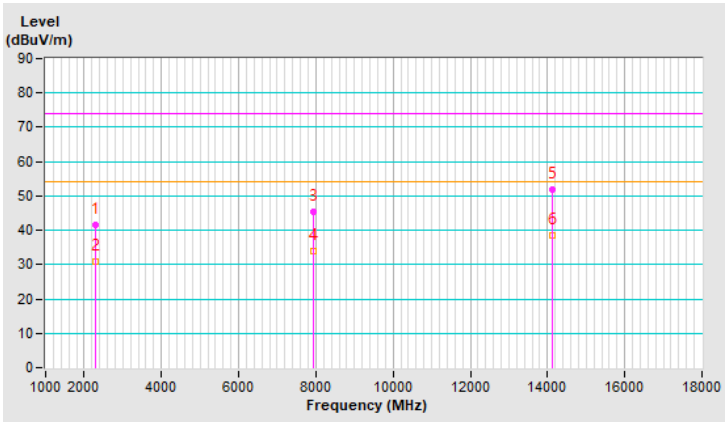
For 1~18 GHz

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2294.94	41.7 PK	74.0	-32.3	2.23 H	135	43.5	-1.8
2	2294.94	30.8 AV	54.0	-23.2	2.23 H	135	32.6	-1.8
3	7929.38	45.4 PK	74.0	-28.6	1.66 H	220	36.5	8.9
4	7929.38	33.9 AV	54.0	-20.1	1.66 H	220	25.0	8.9
5	14120.60	52.0 PK	74.0	-22.0	1.49 H	357	36.4	15.6
6	14120.60	38.5 AV	54.0	-15.5	1.49 H	357	22.9	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

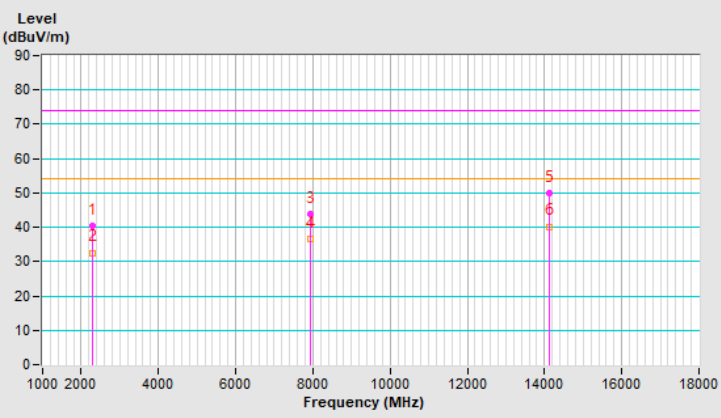


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2295.35	40.5 PK	74.0	-33.5	2.15 V	149	42.3	-1.8
2	2295.35	32.6 AV	54.0	-21.4	2.15 V	149	34.4	-1.8
3	7930.07	44.0 PK	74.0	-30.0	1.66 V	193	35.1	8.9
4	7930.07	36.6 AV	54.0	-17.4	1.66 V	193	27.7	8.9
5	14121.22	49.9 PK	74.0	-24.1	1.47 V	324	34.3	15.6
6	14121.22	40.2 AV	54.0	-13.8	1.47 V	324	24.6	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

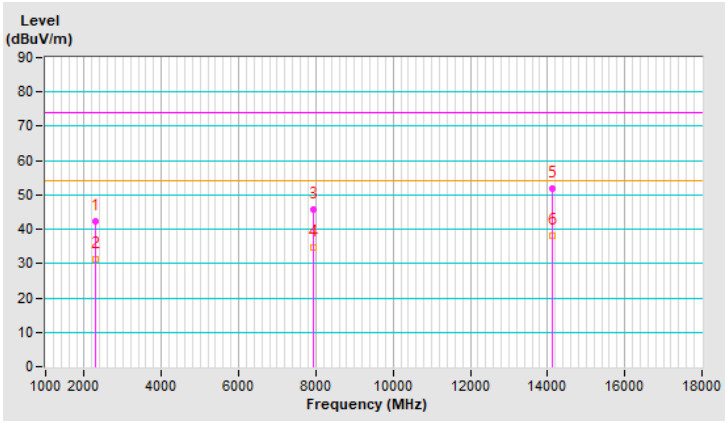


CHANNEL	TX Channel 5	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2294.73	42.2 PK	74.0	-31.8	2.13 H	118	44.0	-1.8
2	2294.73	31.4 AV	54.0	-22.6	2.13 H	118	33.2	-1.8
3	7929.41	45.9 PK	74.0	-28.1	1.62 H	214	37.0	8.9
4	7929.41	34.8 AV	54.0	-19.2	1.62 H	214	25.9	8.9
5	14120.08	51.9 PK	74.0	-22.1	1.48 H	356	36.3	15.6
6	14120.08	38.0 AV	54.0	-16.0	1.48 H	356	22.4	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

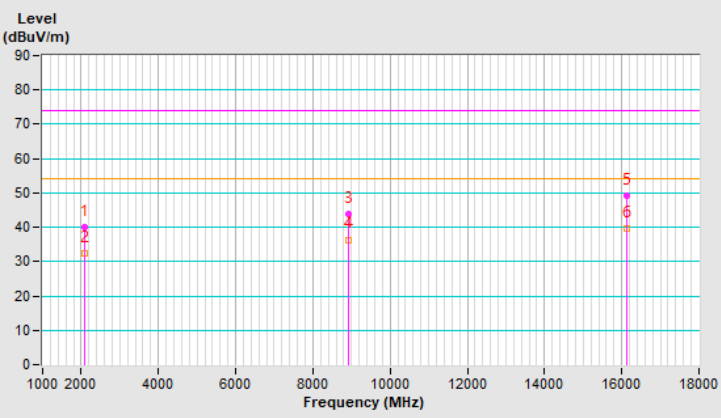


CHANNEL	TX Channel 5	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2095.05	39.9 PK	74.0	-34.1	2.20 V	150	42.7	-2.8
2	2095.05	32.3 AV	54.0	-21.7	2.20 V	150	35.1	-2.8
3	8929.97	43.8 PK	74.0	-30.2	1.71 V	186	33.8	10.0
4	8929.97	36.4 AV	54.0	-17.6	1.71 V	186	26.4	10.0
5	16120.75	49.3 PK	74.0	-24.7	1.47 V	340	36.2	13.1
6	16120.75	39.8 AV	54.0	-14.2	1.47 V	340	26.7	13.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

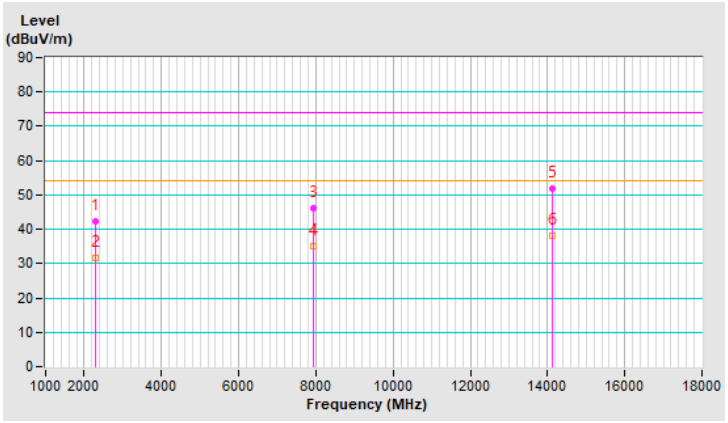


CHANNEL	TX Channel 8	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2294.89	42.3 PK	74.0	-31.7	2.19 H	124	44.1	-1.8
2	2294.89	31.6 AV	54.0	-22.4	2.19 H	124	33.4	-1.8
3	7928.90	46.2 PK	74.0	-27.8	1.66 H	202	37.3	8.9
4	7928.90	35.1 AV	54.0	-18.9	1.66 H	202	26.2	8.9
5	14120.24	52.0 PK	74.0	-22.0	1.48 H	360	36.4	15.6
6	14120.24	38.2 AV	54.0	-15.8	1.48 H	360	22.6	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

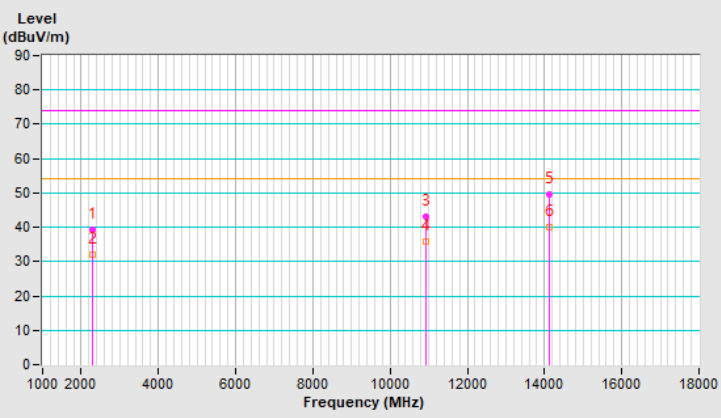


CHANNEL	TX Channel 8	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2295.06	39.3 PK	74.0	-34.7	2.16 V	135	41.1	-1.8
2	2295.06	31.9 AV	54.0	-22.1	2.16 V	135	33.7	-1.8
3	10929.71	43.1 PK	74.0	-30.9	1.73 V	196	29.9	13.2
4	10929.71	35.9 AV	54.0	-18.1	1.73 V	196	22.7	13.2
5	14120.85	49.5 PK	74.0	-24.5	1.42 V	343	33.9	15.6
6	14120.85	40.1 AV	54.0	-13.9	1.42 V	343	24.5	15.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



For 18~40 GHz

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

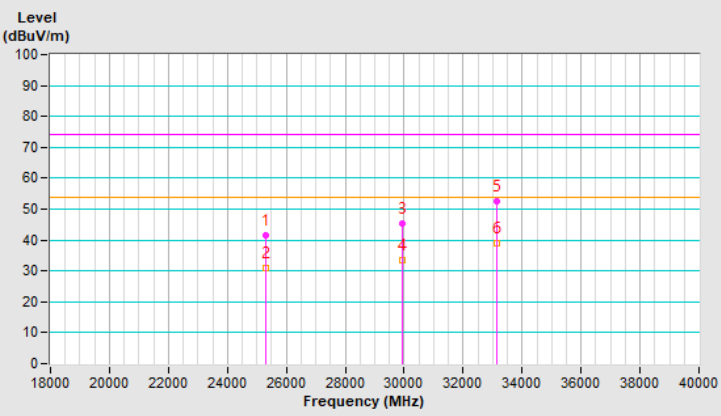
ANTENNA POLARITY: HORIZONTAL								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	25294.94	41.7 PK	74.0	-32.3	2.28 H	131	57.9	-16.2
2	25294.94	30.9 AV	54.0	-23.1	2.28 H	131	47.1	-16.2
3	29929.38	45.3 PK	74.0	-28.7	1.72 H	228	62.4	-17.1
4	29929.38	33.6 AV	54.0	-20.4	1.72 H	228	50.7	-17.1
5	33120.60	52.5 PK	74.0	-21.5	1.47 H	353	70.6	-18.1
6	33120.60	38.9 AV	54.0	-15.1	1.47 H	353	57.0	-18.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

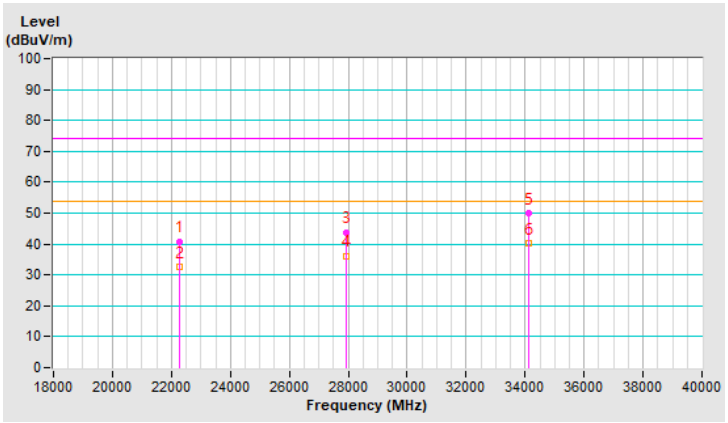
ANTENNA POLARITY: VERTICAL								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	22295.09	40.7 PK	74.0	-33.3	2.10 V	151	59.0	-18.3
2	22295.09	32.5 AV	54.0	-21.5	2.10 V	151	50.8	-18.3
3	27929.90	43.7 PK	74.0	-30.3	1.68 V	184	61.1	-17.4
4	27929.90	36.2 AV	54.0	-17.8	1.68 V	184	53.6	-17.4
5	34120.89	49.8 PK	74.0	-24.2	1.42 V	312	67.4	-17.6
6	34120.89	40.1 AV	54.0	-13.9	1.42 V	312	57.7	-17.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



CHANNEL	TX Channel 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

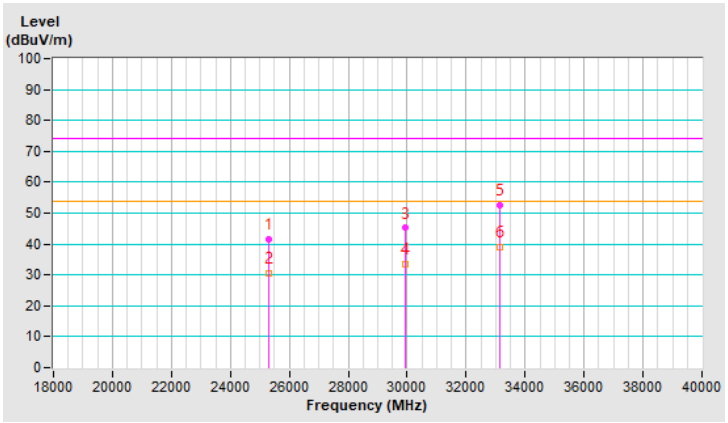
ANTENNA POLARITY: HORIZONTAL								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	25294.79	41.6 PK	74.0	-32.4	2.22 H	126	57.8	-16.2
2	25294.79	30.7 AV	54.0	-23.3	2.22 H	126	46.9	-16.2
3	29928.94	45.2 PK	74.0	-28.8	1.70 H	225	62.3	-17.1
4	29928.94	33.5 AV	54.0	-20.5	1.70 H	225	50.6	-17.1
5	33120.20	52.7 PK	74.0	-21.3	1.52 H	343	70.8	-18.1
6	33120.20	39.1 AV	54.0	-14.9	1.52 H	343	57.2	-18.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



CHANNEL	TX Channel 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

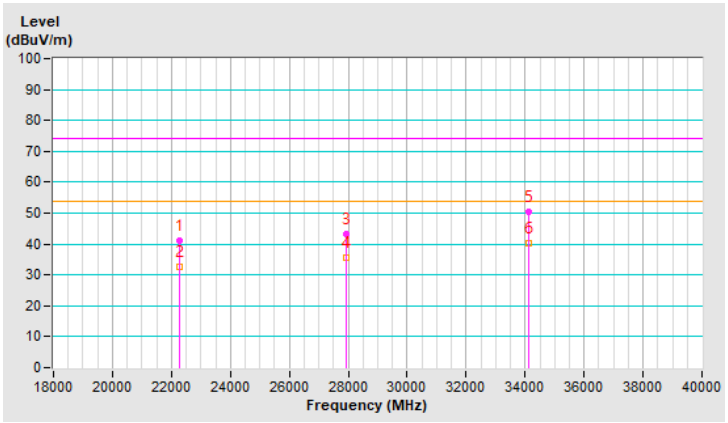
ANTENNA POLARITY: VERTICAL								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	22295.00	41.1 PK	74.0	-32.9	2.06 V	146	59.4	-18.3
2	22295.00	32.7 AV	54.0	-21.3	2.06 V	146	51.0	-18.3
3	27929.62	43.2 PK	74.0	-30.8	1.73 V	189	60.6	-17.4
4	27929.62	35.7 AV	54.0	-18.3	1.73 V	189	53.1	-17.4
5	34120.72	50.4 PK	74.0	-23.6	1.38 V	312	68.0	-17.6
6	34120.72	40.4 AV	54.0	-13.6	1.38 V	312	58.0	-17.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



CHANNEL	TX Channel 8	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

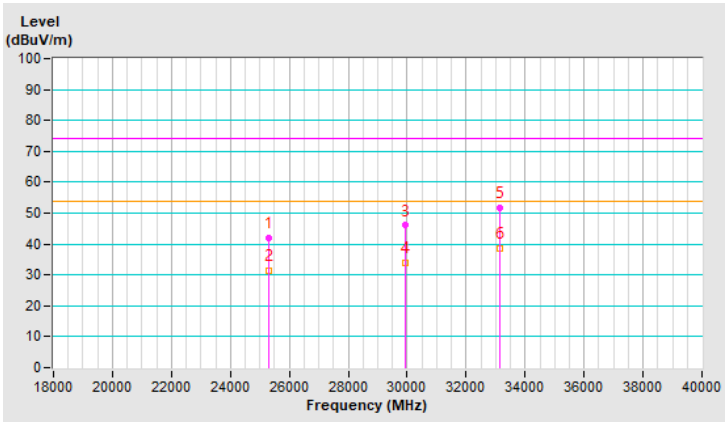
ANTENNA POLARITY: HORIZONTAL								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	25294.34	42.1 PK	74.0	-31.9	2.28 H	147	58.3	-16.2
2	25294.34	31.3 AV	54.0	-22.7	2.28 H	147	47.5	-16.2
3	29929.22	46.0 PK	74.0	-28.0	1.77 H	228	63.1	-17.1
4	29929.22	34.1 AV	54.0	-19.9	1.77 H	228	51.2	-17.1
5	33120.16	51.9 PK	74.0	-22.1	1.51 H	360	70.0	-18.1
6	33120.16	38.6 AV	54.0	-15.4	1.51 H	360	56.7	-18.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



CHANNEL	TX Channel 8	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

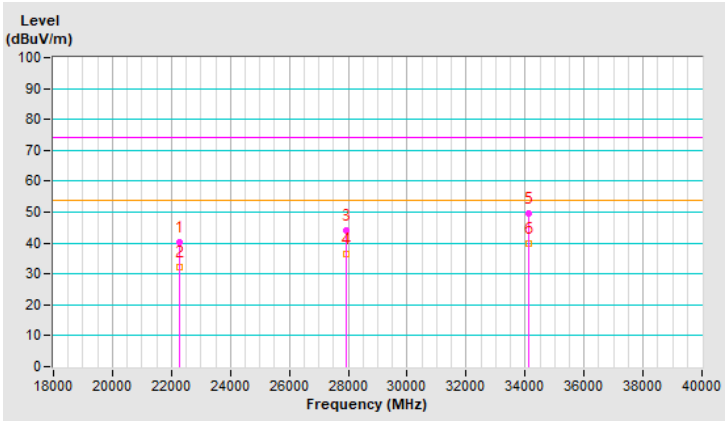
ANTENNA POLARITY: VERTICAL								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	22294.94	40.3 PK	74.0	-33.7	2.06 V	157	58.6	-18.3
2	22294.94	32.2 AV	54.0	-21.8	2.06 V	157	50.5	-18.3
3	27929.77	44.0 PK	74.0	-30.0	1.63 V	183	61.4	-17.4
4	27929.77	36.4 AV	54.0	-17.6	1.63 V	183	53.8	-17.4
5	34120.82	49.6 PK	74.0	-24.4	1.36 V	315	67.2	-17.6
6	34120.82	39.8 AV	54.0	-14.2	1.36 V	315	57.4	-17.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



For above 40 GHz

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Average (AV)
FREQUENCY RANGE	40GHz ~ 200GHz		

ANTENNA POLARITY: HORIZONTAL						
NO.	**Frequency (GHz)**	**EIRP Level (dBm)**	**Reading Value (dBm)**	**Receiver Antenna Gain (dBi)**	**Power Density (pW/cm^2)**	**Power Density Limit (pW/cm^2)**
1	116.64	-17.2	-67.8	23.2	16.728	90
2	200	-20.8	-75.9	23.3	7.393	90
ANTENNA POLARITY: VERTICAL						
NO.	**Frequency (GHz)**	**EIRP Level (dBm)**	**Reading Value (dBm)**	**Receiver Antenna Gain (dBi)**	**Power Density (pW/cm^2)**	**Power Density Limit (pW/cm^2)**
1	116.64	-16.8	-67.4	23.2	18.511	90
2	200	-17.9	-73.1	23.3	14.315	90

Note:

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

EIRP = Raw Value - Receiver Antenna Gain + 20*log(4*3.1416*D/λ)

where:

D is the measurement distance

λ is the wavelength

*Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

R far field = (2 * L^2) /λ

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
58.32	0.03	0.00514	0.35

CHANNEL	TX Channel 5	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	40GHz ~ 200GHz		

ANTENNA POLARITY: HORIZONTAL						
NO.	Frequency (GHz)	EIRP Level (dBm)	Reading Value (dBm)	Receiver Antenna Gain (dBi)	Power Density (pW/cm^2)	Power Density Limit (pW/cm^2)
1	125.28	-16.8	-67.9	23.3	18.429	90
2	200	-21.0	-76.1	23.3	7.06	90
ANTENNA POLARITY: VERTICAL						
NO.	Frequency (GHz)	EIRP Level (dBm)	Reading Value (dBm)	Receiver Antenna Gain (dBi)	Power Density (pW/cm^2)	Power Density Limit (pW/cm^2)
1	125.28	-16.7	-67.8	23.3	18.815	90
2	200	-18.3	-73.5	23.3	13.116	90

Note:

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

EIRP = Raw Value - Receiver Antenna Gain + 20*log(4*3.1416*D/λ)

where:

D is the measurement distance

λ is the wavelength

*Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

R far field = (2 * L^2) /λ

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
62.64	0.03	0.00479	0.376

CHANNEL	TX Channel 8	DETECTOR FUNCTION	Average (AV)
FREQUENCY RANGE	40GHz ~ 200GHz		

ANTENNA POLARITY: HORIZONTAL						
NO.	Frequency (GHz)	EIRP Level (dBm)	Reading Value (dBm)	Receiver Antenna Gain (dBi)	Power Density (pW/cm^2)	Power Density Limit (pW/cm^2)
1	131.76	-16.7	-68.1	23.4	19.024	90
2	200	-20.9	-76.0	23.3	7.224	90
ANTENNA POLARITY: VERTICAL						
NO.	Frequency (GHz)	EIRP Level (dBm)	Reading Value (dBm)	Receiver Antenna Gain (dBi)	Power Density (pW/cm^2)	Power Density Limit (pW/cm^2)
1	131.76	-15.9	-67.4	23.4	22.506	90
2	200	-18.3	-73.5	23.3	12.966	90

Note:

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

EIRP = Raw Value - Receiver Antenna Gain + 20*log(4*3.1416*D/λ)

where:

D is the measurement distance

λ is the wavelength

*Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

R far field = (2 * L^2) /λ

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
65.88	0.03	0.00455	0.396

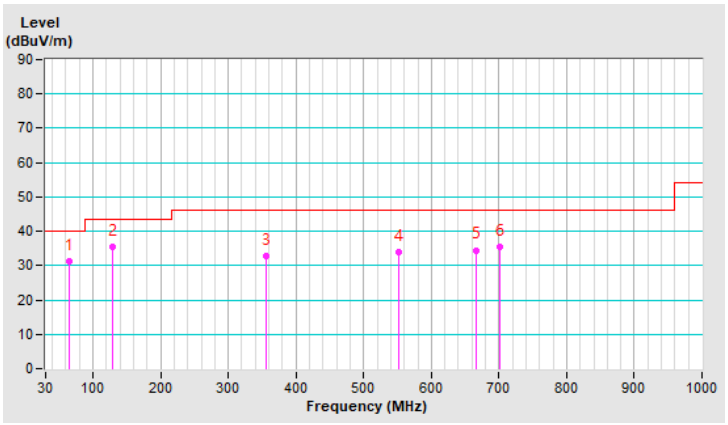
For below 1GHz

CHANNEL	TX Channel 1	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	64.18	31.4 QP	40.0	-8.6	2.28 H	117	40.8	-9.4
2	129.21	35.5 QP	43.5	-8.0	1.74 H	238	44.9	-9.4
3	356.04	32.9 QP	46.0	-13.1	1.49 H	340	38.0	-5.1
4	552.05	33.9 QP	46.0	-12.1	2.30 H	147	34.6	-0.7
5	665.98	34.5 QP	46.0	-11.5	1.77 H	233	32.7	1.8
6	701.58	35.4 QP	46.0	-10.6	1.51 H	360	33.0	2.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

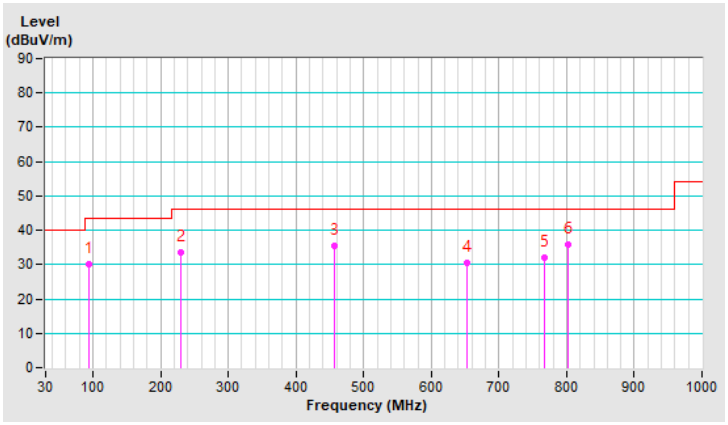


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	94.87	30.2 QP	43.5	-13.3	2.10 V	151	43.1	-12.9
2	229.73	33.7 QP	46.0	-12.3	1.68 V	184	43.1	-9.4
3	456.47	35.6 QP	46.0	-10.4	1.42 V	312	38.3	-2.7
4	652.75	30.5 QP	46.0	-15.5	2.07 V	152	28.8	1.7
5	766.28	31.9 QP	46.0	-14.1	1.71 V	195	27.9	4.0
6	802.21	35.7 QP	46.0	-10.3	1.43 V	309	31.6	4.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

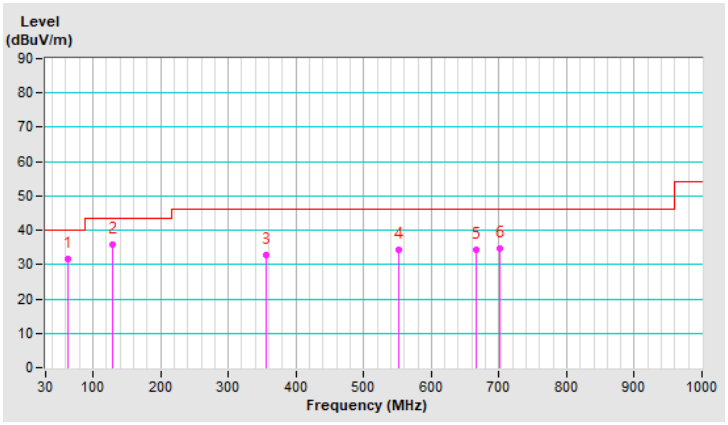


CHANNEL	TX Channel 5	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	63.73	31.7 QP	40.0	-8.3	2.26 H	109	40.9	-9.2
2	129.19	35.7 QP	43.5	-7.8	1.73 H	237	45.1	-9.4
3	355.91	32.7 QP	46.0	-13.3	1.55 H	352	37.8	-5.1
4	551.67	34.4 QP	46.0	-11.6	2.28 H	146	35.1	-0.7
5	665.45	34.4 QP	46.0	-11.6	1.77 H	223	32.6	1.8
6	701.38	34.8 QP	46.0	-11.2	1.48 H	360	32.4	2.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

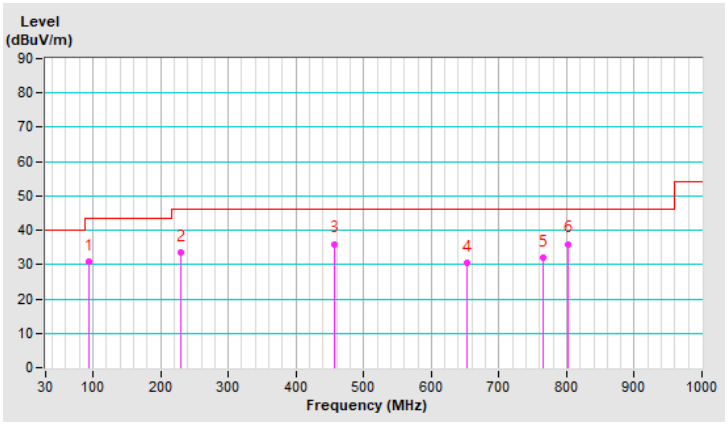


CHANNEL	TX Channel 5	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	94.79	30.8 QP	43.5	-12.7	2.04 V	142	43.7	-12.9
2	229.66	33.6 QP	46.0	-12.4	1.67 V	181	43.0	-9.4
3	455.98	36.0 QP	46.0	-10.0	1.47 V	312	38.7	-2.7
4	652.68	30.4 QP	46.0	-15.6	2.11 V	163	28.7	1.7
5	766.01	31.9 QP	46.0	-14.1	1.69 V	209	27.9	4.0
6	801.82	36.0 QP	46.0	-10.0	1.49 V	311	31.9	4.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

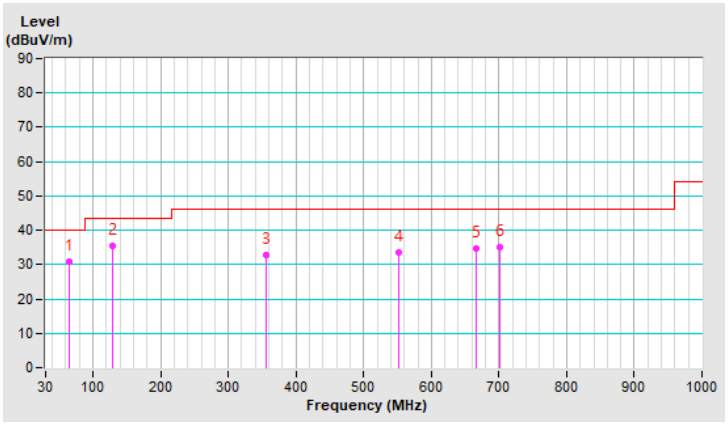


CHANNEL	TX Channel 8	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	64.09	30.8 QP	40.0	-9.2	2.22 H	114	40.2	-9.4
2	129.03	35.4 QP	43.5	-8.1	1.75 H	230	44.9	-9.5
3	355.53	32.8 QP	46.0	-13.2	1.49 H	349	37.9	-5.1
4	551.57	33.5 QP	46.0	-12.5	2.24 H	159	34.2	-0.7
5	665.87	34.6 QP	46.0	-11.4	1.80 H	237	32.8	1.8
6	701.30	35.0 QP	46.0	-11.0	1.49 H	360	32.6	2.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

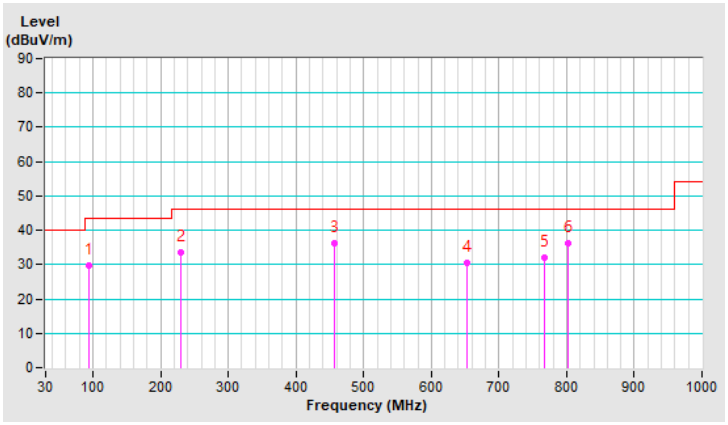


CHANNEL	TX Channel 8	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	94.43	29.8 QP	43.5	-13.7	2.10 V	163	42.7	-12.9
2	229.32	33.6 QP	46.0	-12.4	1.70 V	176	43.0	-9.4
3	456.01	36.1 QP	46.0	-9.9	1.39 V	310	38.8	-2.7
4	652.32	30.6 QP	46.0	-15.4	2.01 V	155	28.9	1.7
5	766.24	31.9 QP	46.0	-14.1	1.76 V	188	27.9	4.0
6	802.08	36.1 QP	46.0	-9.9	1.40 V	302	32.0	4.1

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.1.8 Test Results (Mode 2)

Above 1GHz Data:

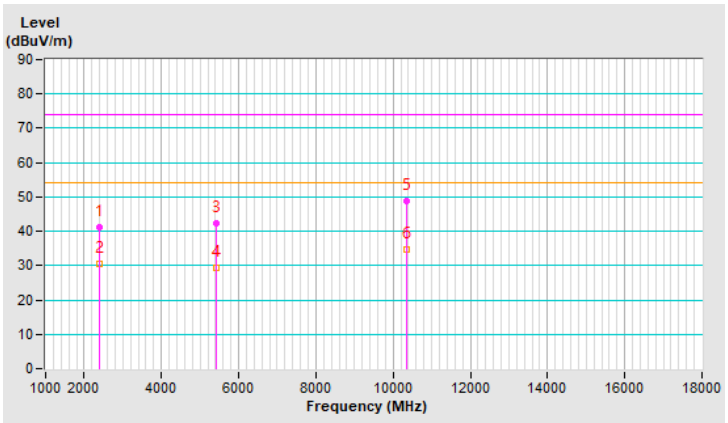
For 1~18 GHz

CHANNEL	TX Channel 5	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2390.97	41.0 PK	74.0	-33.0	1.39 H	10	43.0	-2.0
2	2390.97	30.5 AV	54.0	-23.5	1.39 H	10	32.5	-2.0
3	5417.43	42.2 PK	74.0	-31.8	1.90 H	332	39.0	3.2
4	5417.43	29.5 AV	54.0	-24.5	1.90 H	332	26.3	3.2
5	10357.69	48.9 PK	74.0	-25.1	1.40 H	216	36.7	12.2
6	10357.69	34.8 AV	54.0	-19.2	1.40 H	216	22.6	12.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.

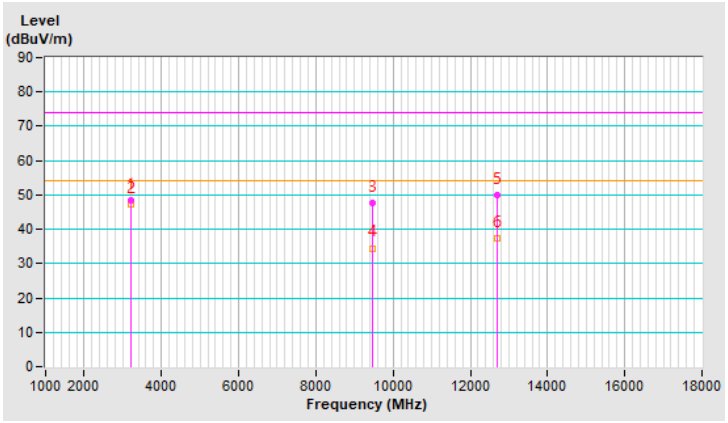


CHANNEL	TX Channel 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 18GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3212.60	48.3 PK	74.0	-25.7	1.20 V	341	49.0	-0.7
2	3212.60	47.1 AV	54.0	-6.9	1.20 V	341	47.8	-0.7
3	9471.88	47.6 PK	74.0	-26.4	1.40 V	83	36.8	10.8
4	9471.88	34.5 AV	54.0	-19.5	1.40 V	83	23.7	10.8
5	12695.25	50.1 PK	74.0	-23.9	1.30 V	360	37.3	12.8
6	12695.25	37.2 AV	54.0	-16.8	1.30 V	360	24.4	12.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.



For 18~40 GHz

CHANNEL	TX Channel 5	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

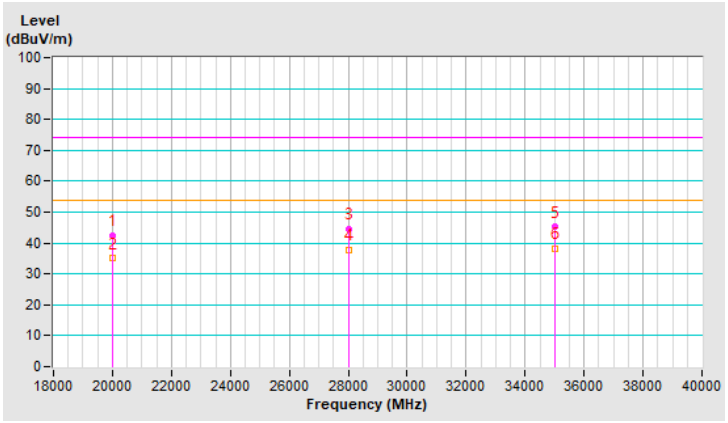
ANTENNA POLARITY: HORIZONTAL								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	20002.00	42.4 PK	74.0	-31.6	1.23 H	110	62.5	-20.1
2	20002.00	35.0 AV	54.0	-19.0	1.23 H	110	55.1	-20.1
3	28003.00	44.4 PK	74.0	-29.6	1.51 H	245	61.7	-17.3
4	28003.00	37.6 AV	54.0	-16.4	1.51 H	245	54.9	-17.3
5	35003.00	45.2 PK	74.0	-28.8	1.60 H	116	62.6	-17.4
6	35003.00	38.3 AV	54.0	-15.7	1.60 H	116	55.7	-17.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



CHANNEL	TX Channel 5	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	18GHz ~ 40GHz		

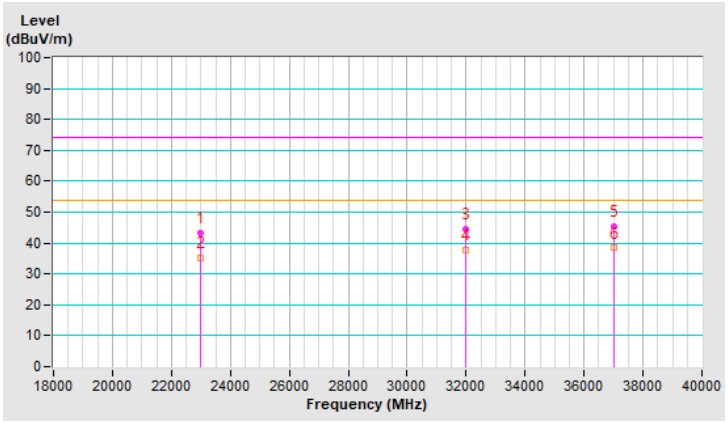
ANTENNA POLARITY: VERTICAL								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	23002.00	43.4 PK	74.0	-30.6	1.05 V	0	61.4	-18.0
2	23002.00	35.3 AV	54.0	-18.7	1.05 V	0	53.3	-18.0
3	32003.00	44.6 PK	74.0	-29.4	1.46 V	255	61.6	-17.0
4	32003.00	37.9 AV	54.0	-16.1	1.46 V	255	54.9	-17.0
5	37003.00	45.4 PK	74.0	-28.6	1.79 V	115	60.9	-15.5
6	37003.00	38.4 AV	54.0	-15.6	1.79 V	115	53.9	-15.5

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. Shorter measurement distances was used to improve the measurement system's noise floor. As standard description is based on the measurement in distance of 3 meters, the data obtained at 1-meter distance was extrapolate results to the 3-m distance:

   Test value at 3-meter distance (dBuV)
   = Test value at 1 meter distance (dBuV) -20log(3/1)(dB)
   = Test value at 1 meter distance (dBuV) -9.54(dB).

   *Measurements made at 1 meter distance. Test value converted to account for 3-meter measurement distance.



For above 40 GHz

CHANNEL	TX Channel 5	**DETECTOR FUNCTION**	Average (AV)
FREQUENCY RANGE	40GHz ~ 200GHz		

ANTENNA POLARITY: HORIZONTAL						
NO.	**Frequency (GHz)**	**EIRP Level (dBm)**	**Reading Value (dBm)**	**Receiver Antenna Gain (dBi)**	**Power Density (pW/cm^2)**	**Power Density Limit (pW/cm^2)**
1	131.76	-16.6	-68.0	23.4	19.345	90
2	200	-20.4	-75.6	23.3	8.064	90
ANTENNA POLARITY: VERTICAL						
NO.	**Frequency (GHz)**	**EIRP Level (dBm)**	**Reading Value (dBm)**	**Receiver Antenna Gain (dBi)**	**Power Density (pW/cm^2)**	**Power Density Limit (pW/cm^2)**
1	131.76	-15.9	-67.3	23.4	22.728	90
2	200	-17.5	-72.6	23.3	15.724	90

Note:

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

EIRP = Raw Value - Receiver Antenna Gain + 20*log(4*3.1416*D/λ)

where:

D is the measurement distance

λ is the wavelength

*Measurements made at 1 meter distance.

2. The far-field boundary is given in ANSI 63.10 as:

R far field = (2 * L^2) /λ

L is the Largest Antenna Dimension of measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
65.88	0.03	0.00455	0.396

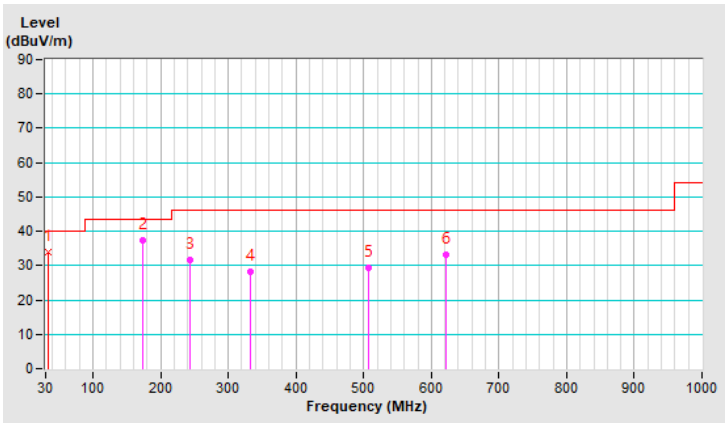
For below 1GHz

CHANNEL	TX Channel 5	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	34.78	34.0 QP	40.0	-6.0	1.30 H	47	43.5	-9.5
2	173.02	37.4 QP	43.5	-6.1	1.50 H	27	46.1	-8.7
3	244.30	31.8 QP	46.0	-14.2	1.20 H	340	40.3	-8.5
4	332.82	28.2 QP	46.0	-17.8	1.30 H	330	33.7	-5.5
5	507.45	29.2 QP	46.0	-16.8	2.80 H	318	30.3	-1.1
6	622.10	33.3 QP	46.0	-12.7	1.20 H	66	32.0	1.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

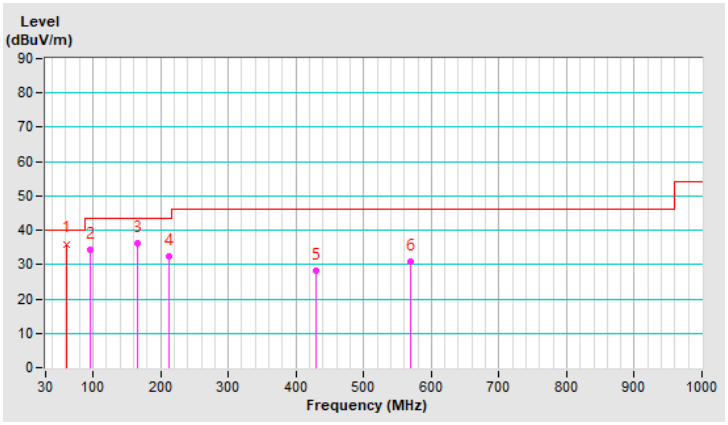


CHANNEL	TX Channel 5	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**62.00**	**36.0 QP**	**40.0**	**-4.0**	**1.30 V**	**235**	**45.0**	**-9.0**
2	95.78	34.3 QP	43.5	-9.2	1.30 V	106	46.9	-12.6
3	165.45	36.2 QP	43.5	-7.3	1.30 V	320	44.6	-8.4
4	212.43	32.3 QP	43.5	-11.2	1.20 V	303	42.3	-10.0
5	429.05	28.2 QP	46.0	-17.8	1.30 V	24	31.6	-3.4
6	568.92	30.8 QP	46.0	-15.2	1.70 V	66	31.0	-0.2

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

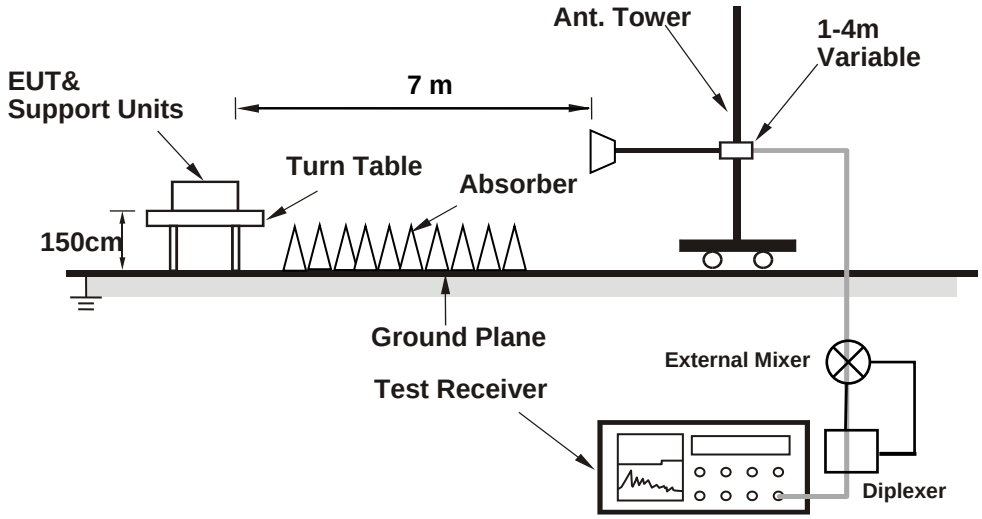


4.2 6dB Bandwidth Measurement

4.2.1 Limits of 6dB Bandwidth Measurement

None: For reporting purposes only.

4.2.2 Test Setup



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

The spectrum analyzer and external mixer are set up to measure the radiated output of the transmitter.

4.2.5 Deviation fromTest Standard

No deviation.

4.2.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.2.7 Test Result (Mode 1)

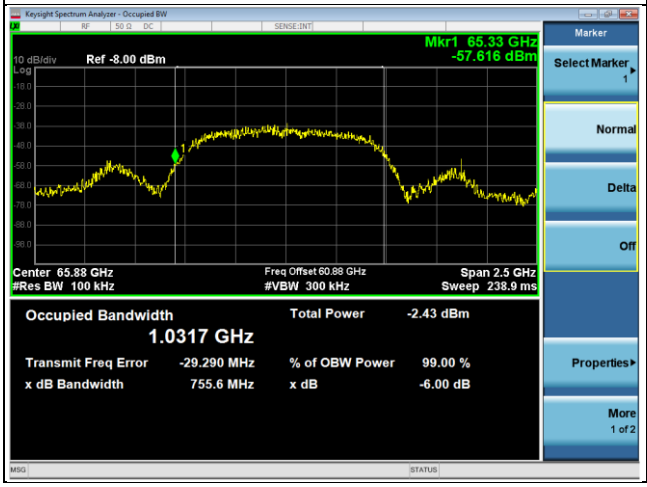
Channel	Frequency (GHz)	6dB Bandwidth (MHz)
1	58.32	838.1
5	62.64	837.6
8	65.88	755.6

Spectrum Plot of Worst Value

CH1

CH5

CH8



4.2.8 Test Result (Mode 2)

Channel	Frequency (GHz)	6dB Bandwidth (GHz)
5	65.88	1.992

Spectrum Plot of Worst Value	
CH5	
	

4.3 Output Power Measurement

4.3.1 Limits of Output Power Measurement

15.255 (c) & (e)

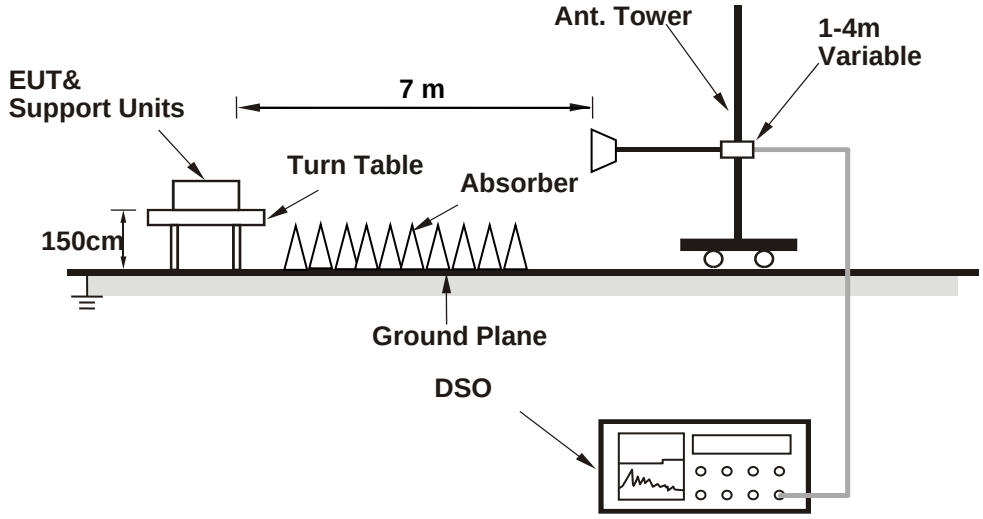
Output Power (EIRP)				
Applicaple	**Type**		**Peak Power**	**Average Power**
	Within the 57-71 GHz band (Other than fixed field disturbance sensors and short-range devices)	Other than fixed point to point transmitters located outdoors	43dBm	40dBm
V		Fixed point-to-point transmitters located outdoors	85dBm (*Note 1)	82dBm (*Note 2)
	Fixed field disturbance sensors (61-61.5GHz)	Occupy 500 MHz or less of bandwidth	43dBm (*Note 3)	40dBm (*Note 3)
	Fixed field disturbance sensors	Other than occupy 500 MHz or less of bandwidth and that are contained wholly within the frequency band 61.0-61.5 GHz	10dBm	-
	short-range devices for interactive motion sensing	-		

Note:
1. 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.
2. 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.
3. In addition, the average power of any emission outside of the 61.0-61.5 GHz band, measured during the transmit interval, but still within the 57-71 GHz band, shall not exceed 10 dBm,and the peak power of any emission shall not exceed 13 dBm.

Peak Output Power (Conducted Power)			
Applicaple	**Type**	**6dB Bandwidth**	**Maximum Conducted Power**
	Fixed field disturbance sensors (Exclude 61-61.5GHz)	-	≦ 0.1mW
V	Other	Other	500mW
		Less than 100MHz	500mW x (B/100)

Note:
1. B is 6dB Bandwidth (measured with a 100kHz resolution bandwidth)
2. Peak transmitter output power shall be measured with an RF detector that has a detection bandwidth that encompasses the 57-64 GHz band and the has a video bandwidth of at least 10 MHz, or using an equivalent measurement method.
3. For purposes of demonstrating complained with this paragraph (e), corrections to the transmitter output power may be made due to the antenna and circuit loss.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedures

a. Place the EUT in a continuous transmission mode.
b. For radiated emission measurements, attach a test receive antenna for the fundamental frequency band to the RF input of an RF detector or a downconverter with an RF detector at the output.
c. Connect the video output of the detector to the 50 ohm input of the DSO.
d. Place the test receive antenna in the main beam of the EUT at a distance which will provide a signal within the operating range of the RF detector.
e. Set the sampling rate of the DSO to the required value. Adjust the memory depth, the triggering and the sweep speed to obtain a display which is representative of the signal considering the type of modulation.
f. For radiated emission measurements, calculate the distance to the far field boundary of the fundamental emission using following equation

R far field = (2 * L^2) /λ

Where:

L is the Largest Antenna Dimension of either the EUT antenna or measurement antenna, including the reflector

λ is the wavelength

Frequency (GHz)	L (m)	Lambda (m)	R (Far Field) (m)
58.32	0.41	0.00514	65.409
62.64	0.41	0.00479	70.188
65.88	0.41	0.00455	73.89

Note: Follow ANSI C63.10, when far-field measurements are not practical, and the test laboratory intends to use a distance attenuation factor other than 20 dB/decade of distance.
*Measurements made at 7 meter distance.

g. Perform radiated emission measurements to keep maximize the received signal from the EUT in the far field.
h. Record the average and peak from the DSO and the measurement distance.
i. Disconnect the EUT fromthe RF input port of the instrumentation system.
j. Connect a mm-wave source to the RF input port of the instrumentation system via a waveguide variable attenuator. The mm-wave source is unmodulated.
k. Using substitution measurement.
l. Measure and note the power.
m. For conducted power measurements, calculate the conducted power using following equation

P_{cond} = EIRP-G_{dBi}

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

Same as Item 4.2.6.

4.3.7 Test Results (Mode 1)

For Peak Power

Channel	Frequency (GHz)	Transmitt Antenna (dBi)	S.G Output Value (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Pass /Fail
1	58.32	23.7	31.90	55.60	59	Pass
5	62.64	24	31.63	55.63	59	Pass
8	65.88	24	31.61	55.61	59	Pass

Channel	Frequency (GHz)	EIRP (dBm)	Max. Antenna Gain (dBi)	Conducted Output Power (dBm)	Conducted Output Power (mW)	Conducted Output Power limit (mW)	Pass /Fail
1	58.32	55.60	38.00	17.6	57.5	500	Pass
5	62.64	55.63	38.00	17.63	57.9	500	Pass
8	65.88	55.61	38.00	17.61	57.7	500	Pass

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

For Average Power

Channel	Frequency (GHz)	Transmitt Antenna (dBi)	S.G Output Value (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Pass /Fail
1	58.32	23.7	18.88	42.58	56	Pass
5	62.64	24	18.63	42.63	56	Pass
8	65.88	24	18.60	42.60	56	Pass

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

4.3.8 Test Results (Mode 2)

For Peak Power

Channel	Frequency (GHz)	Transmitt Antenna (dBi)	S.G Output Value (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Pass /Fail
5	65.88	24	31.42	55.42	59	Pass

Channel	Frequency (GHz)	EIRP (dBm)	Max. Antenna Gain (dBi)	Conducted Output Power (dBm)	Conducted Output Power (mW)	Conducted Output Power limit (mW)	Pass /Fail
5	65.88	55.42	38.00	17.42	55.2	500	Pass

Note:

3. The EIRP was evaluated on vertical and horizontal polarization, the worst case is Horizontal polarization.

For Average Power

Channel	Frequency (GHz)	Transmitt Antenna (dBi)	S.G Output Value (dBm)	EIRP (dBm)	EIRP Limit (dBm)	Pass /Fail
5	65.88	24	18.60	42.60	56	Pass

Note:

2. The EIRP was evaluated on vertical and horizontal polarization, the worst case is Horizontal polarization.

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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