FCC Test Report

Report No.:	RF190731E05
FCC ID:	PY319200454
Test Model:	MR60
Series Model:	MS60
Received Date:	Aug. 01, 2019
Test Date:	Aug. 16 to 29, 2019
Issued Date:	Sep. 03, 2019
Applicant:	NETGEAR, Inc.
Address:	350 East Plumeria Drive San Jose, CA 95134
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 R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF190731E05	Original release.	Sep. 03, 2019

1 Certificate of Conformity

Product:	Mesh WiFi 6 Router, Mesh WiFi 6 Satellite
Brand:	NETGEAR
Test Model:	MR60
Series Model:	MS60
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	Aug. 16 to 29, 2019
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) 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:** Sep. 03, 2019

Wendy Wu / Specialist

Approved by : _____ , **Date:** Sep. 03, 2019

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.37dB at 0.15000MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.50MHz.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is i-pex(MHF) not a standard connector.

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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.8 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.9 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	4.9 dB
	18GHz ~ 40GHz	5.2 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Mesh WiFi 6 Router, Mesh WiFi 6 Satellite
Brand	NETGEAR
Test Model	MR60
Series Model	MS60
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in VHT20/40 mode 1024QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps 802.11ax: up to 1201Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462 GHz **5GHz:** 5.18~ 5.24 GHz, 5.745 ~ 5.825 GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	**Non-Beamforming Mode:** **2.412 ~ 2.462 GHz:** 801.045 mW **5.18 ~ 5.24 GHz:** 674.577 mW **5.745 ~ 5.825 GHz:** 886.057 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 592.844 mW **5.18 ~ 5.24 GHz:** 529.192 mW **5.745 ~ 5.825 GHz:** 886.057 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable x 1 (Unshielded, 1.8m)

Note:

1. The EUT has below product names and model names which are identical to each other in all aspects except for the followings:

Product Name	Model Name	Description
Mesh WiFi 6 Router	MR60	Function: Master More for WAN port and single GPHY
Mesh WiFi 6 Satellite	MS60	Function: Client
Note: From the above models, model: MR60 was selected as representative model for the test and its data was recorded in this report.		

2. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WLAN 5GHz
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

3. The EUT must be supplied one power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	2ABB018F 1 NJ	332-10927-01	Input: 100-120Vac, 0.6A, 50/60Hz Output: 12V, 1.5A DC Output cable: Unshielded, 1.8m
2	NETGEAR	AD2076F10	332-10993-01	Input: 100-120Vac, 0.56A, 50/60Hz Output: 12V, 1.5A DC Output cable: Unshielded, 1.8m
Note: 1. From the above adapters, the AC Power Conducted Emissions worse case was found in **Adapter 2**. Therefore only the test data of the mode was recorded in this report. 2. From the above adapters, the Radiated Emissions worse case was found in **Adapter 1**. Therefore only the test data of the mode was recorded in this report.				

4. The antennas provided to the EUT, please refer to the following table:

Antenna No.	Transmitter Circuit	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain 0	1.38	2.4~2.4835	Dipole	i-pex(MHF)	65
2	Chain 1	1.03	2.4~2.4835	Dipole	i-pex(MHF)	105
3	Chain 0	1.73	5.15~5.25	Dipole	i-pex(MHF)	105
		2.04	5.725~5.85			
4	Chain 1	1.71	5.15~5.25	Dipole	i-pex(MHF)	65
		1.89	5.725~5.85			

5. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and Non-Beamforming mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

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

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20), VHT20 and 802.11ax (HE20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	7	2442
2	2417	8	2447
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437		

7 channels are provided for 802.11n (HT40), VHT40 and 802.11ax (HE40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	7	2442
4	2427	8	2447
5	2432	9	2452
6	2437		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

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.

Non-Beamforming Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

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.

Non-Beamforming Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	6	DSSS	DBPSK	1Mb/s

Power Line Conducted Emission 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.

Non-Beamforming Mode					
Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11b	1 to 11	6	DSSS	DBPSK	1Mb/s

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ 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.

Non-Beamforming Mode					
Mode	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1Mb/s
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6Mb/s
VHT20 (Output power only)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40 (Output power only)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)					
Mode	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
VHT20	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
VHT40	3 to 9	3, 6, 9	OFDM	BPSK	MCS0
802.11ax (HE20)	1 to 11	1, 6, 11	OFDMA	BPSK	MCS0
802.11ax (HE40)	3 to 9	3, 6, 9	OFDMA	BPSK	MCS0

Test Condition:

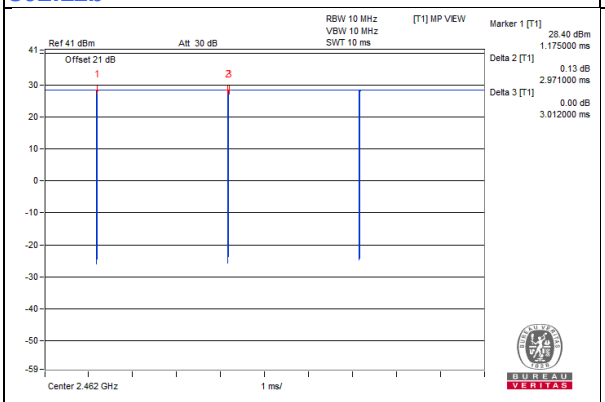
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Tank Wu
RE<1G	23deg. C, 70%RH	120Vac, 60Hz	Andy Ho
PLC	23deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

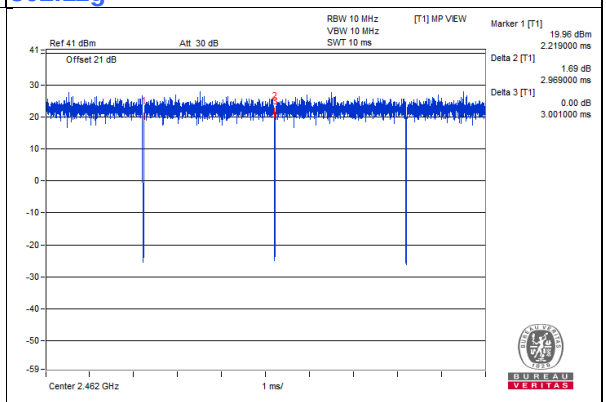
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11b: Duty cycle = 2.971 ms/3.012 ms = 0.986
802.11g: Duty cycle = 2.969 ms/3.001 ms = 0.989
VHT20: Duty cycle = 2.968 ms/3.006 ms = 0.987
VHT40: Duty cycle = 2.968 ms/3.006 ms = 0.987
802.11ax (HE20): Duty cycle = 2.271 ms/2.311 ms = 0.983
802.11ax (HE40): Duty cycle = 2.355 ms/2.396 ms = 0.983

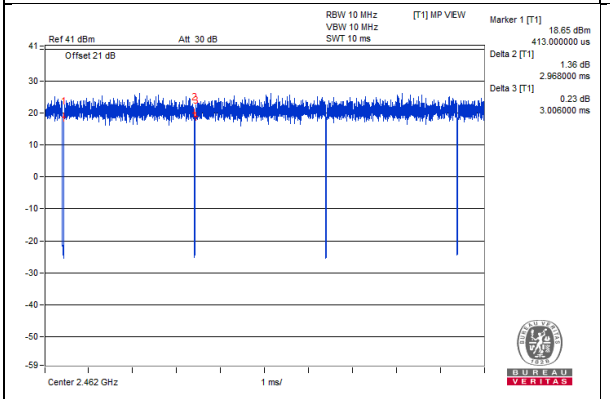
802.11b



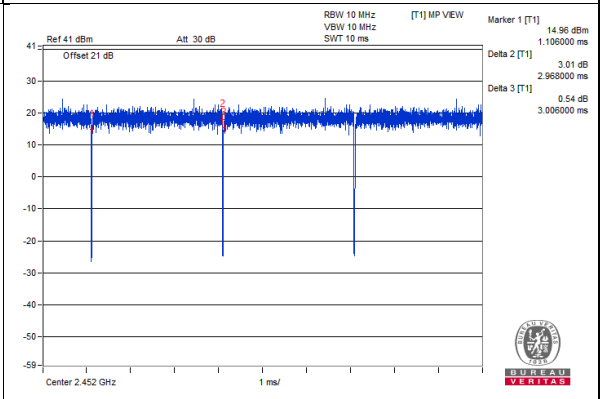
802.11g



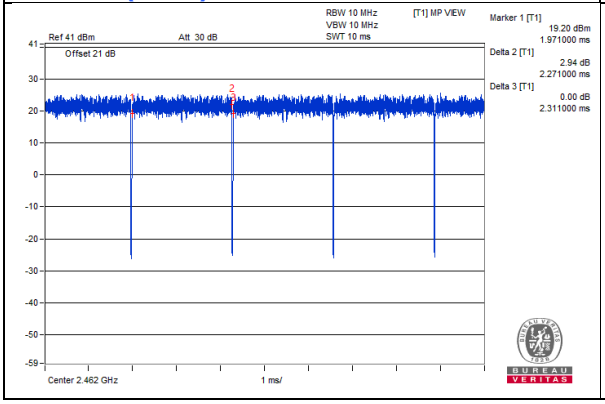
VHT20



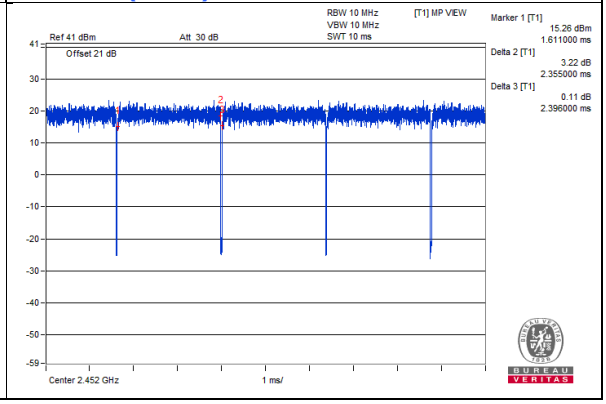
VHT40



802.11ax (HE20)



802.11ax (HE40)



3.4 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.

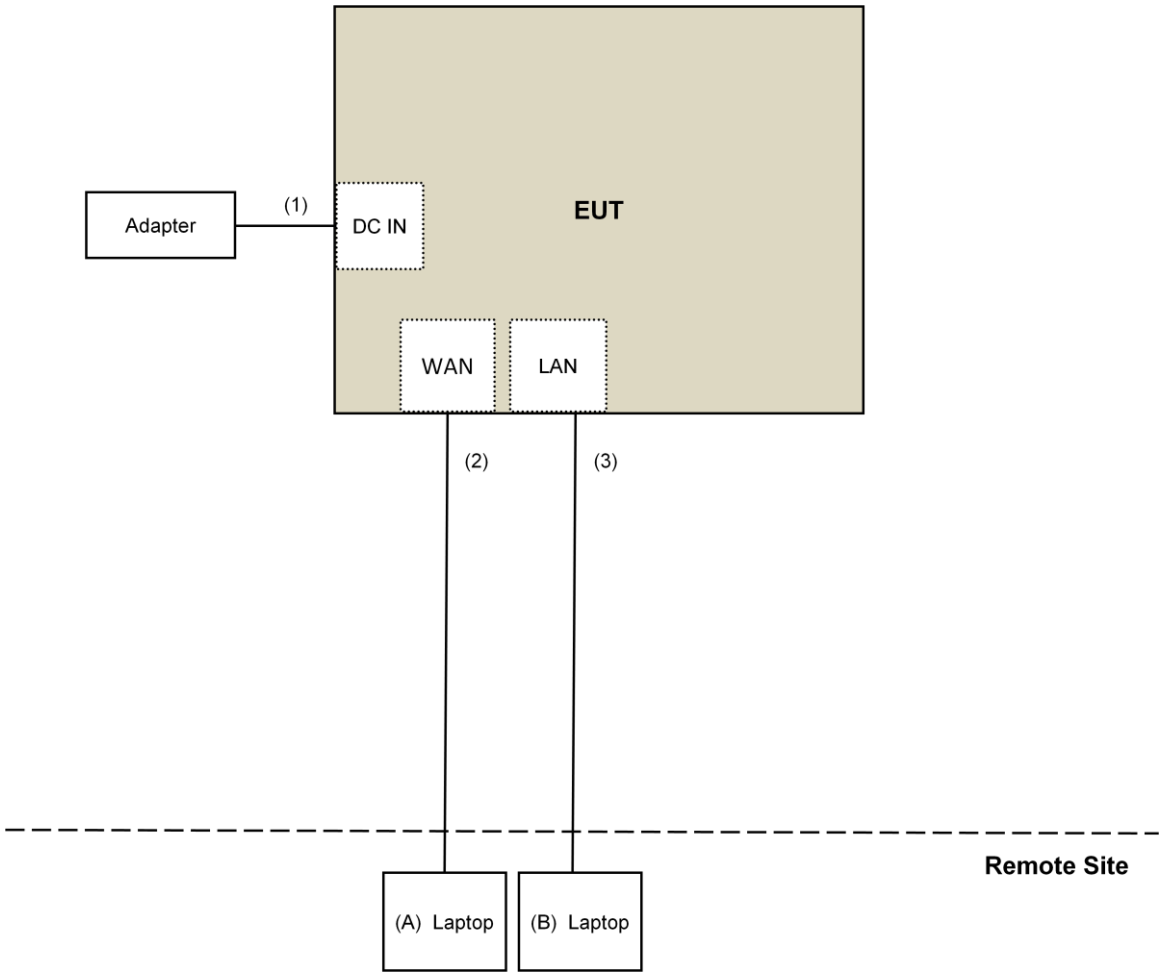
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab

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.	DC Cable	1	1.8	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 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 (15.247)
KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01
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 and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power:

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. 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.

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 03, 2019	July 02, 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-01	Oct. 30, 2018	Oct. 29, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-4-1	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-2	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-3	Mar. 19, 2019	Mar. 18, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980385	Aug. 15, 2019	Aug. 14, 2020
RF Cable	EMC104-SM-SM-1200	160923	Jan. 28, 2019	Jan. 27, 2020
RF Cable	104 RF cable	131215	Jan. 10, 2019	Jan. 09, 2020
RF Cable	EMC104-SM-SM-6000	180418	May 03, 2019	May 02, 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
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 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. 4.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Aug. 16 to 17, 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 above 30MHz

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 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:

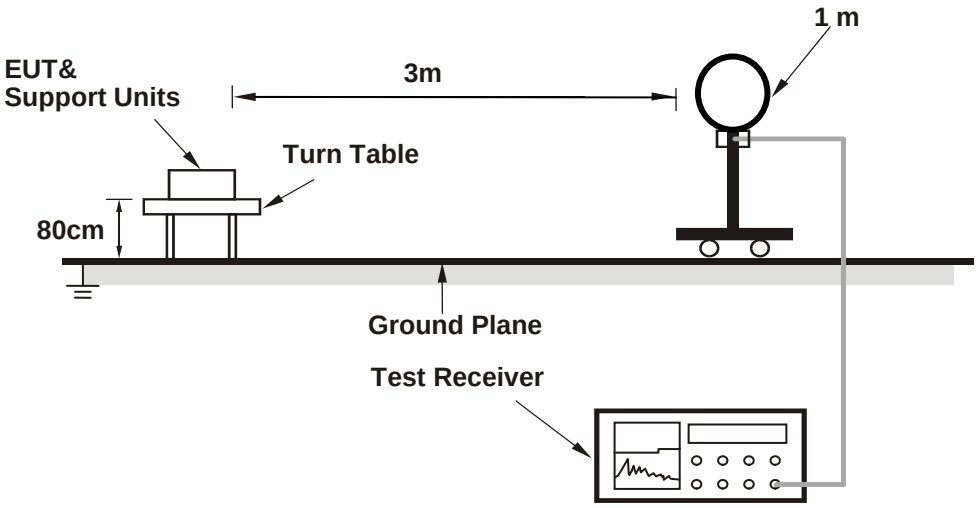
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

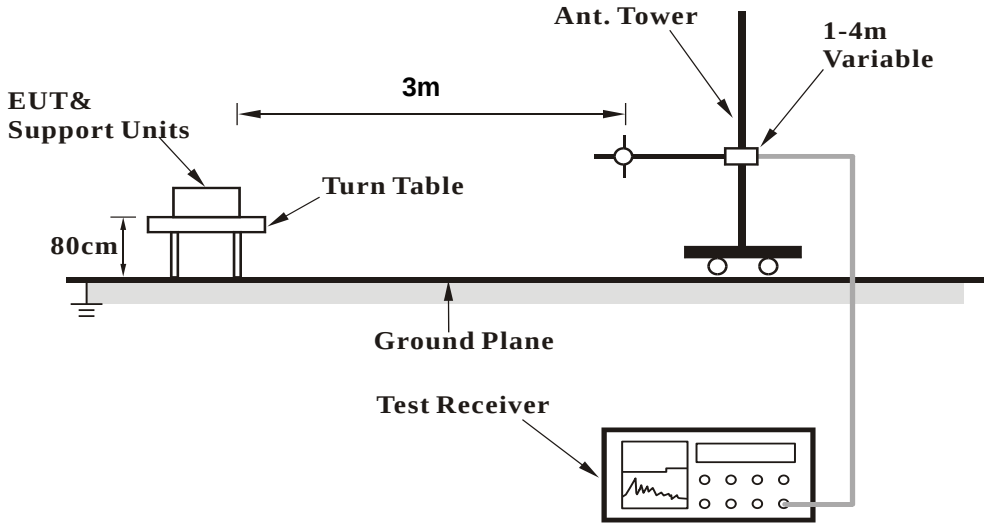
No deviation.

4.1.5 Test Setup

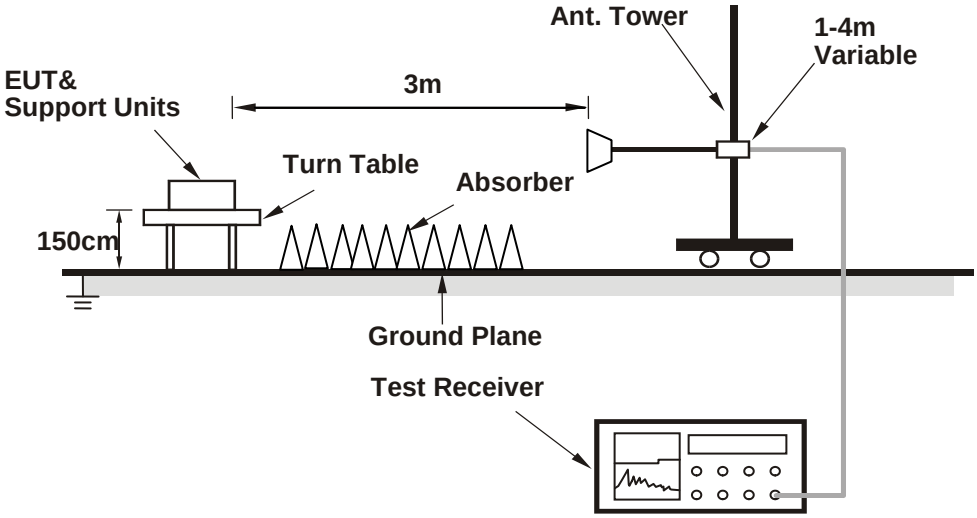
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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 (Mtool 3.1.0.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	60.9 PK	74.0	-13.1	1.29 H	62	62.5	-1.6
2	2390.00	48.8 AV	54.0	-5.2	1.29 H	62	50.4	-1.6
3	*2412.00	115.5 PK			1.29 H	62	117.2	-1.7
4	*2412.00	111.9 AV			1.29 H	62	113.6	-1.7
5	4824.00	43.6 PK	74.0	-30.4	2.18 H	356	41.3	2.3
6	4824.00	39.6 AV	54.0	-14.4	2.18 H	356	37.3	2.3
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	2390.00	64.7 PK	74.0	-9.3	1.50 V	143	66.3	-1.6
2	2390.00	53.7 AV	54.0	-0.3	1.50 V	143	55.3	-1.6
3	*2412.00	121.6 PK			1.50 V	143	123.3	-1.7
4	*2412.00	117.8 AV			1.50 V	143	119.5	-1.7
5	4824.00	49.4 PK	74.0	-24.6	2.74 V	196	47.1	2.3
6	4824.00	47.2 AV	54.0	-6.8	2.74 V	196	44.9	2.3

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2390.00	59.0 PK	74.0	-15.0	1.30 H	54	60.6	-1.6
2	2390.00	46.7 AV	54.0	-7.3	1.30 H	54	48.3	-1.6
3	*2437.00	117.5 PK			1.30 H	54	119.3	-1.8
4	*2437.00	114.4 AV			1.30 H	54	116.2	-1.8
5	2483.50	59.8 PK	74.0	-14.2	1.30 H	54	61.5	-1.7
6	2483.50	46.6 AV	54.0	-7.4	1.30 H	54	48.3	-1.7
7	4874.00	45.2 PK	74.0	-28.8	2.17 H	348	42.8	2.4
8	4874.00	41.1 AV	54.0	-12.9	2.17 H	348	38.7	2.4
9	7311.00	45.4 PK	74.0	-28.6	1.47 H	169	36.2	9.2
10	7311.00	33.2 AV	54.0	-20.8	1.47 H	169	24.0	9.2
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	2390.00	63.4 PK	74.0	-10.6	1.26 V	250	65.0	-1.6
2	2390.00	51.6 AV	54.0	-2.4	1.26 V	250	53.2	-1.6
3	*2437.00	123.6 PK			1.26 V	250	125.4	-1.8
4	*2437.00	120.3 AV			1.26 V	250	122.1	-1.8
5	2483.50	64.5 PK	74.0	-9.5	1.26 V	250	66.2	-1.7
6	2483.50	51.5 AV	54.0	-2.5	1.26 V	250	53.2	-1.7
7	4874.00	51.1 PK	74.0	-22.9	2.80 V	210	48.7	2.4
8	4874.00	49.2 AV	54.0	-4.8	2.80 V	210	46.8	2.4
9	7311.00	46.3 PK	74.0	-27.7	2.15 V	85	37.1	9.2
10	7311.00	34.5 AV	54.0	-19.5	2.15 V	85	25.3	9.2

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2462.00	115.7 PK			1.29 H	57	117.5	-1.8
2	*2462.00	112.3 AV			1.29 H	57	114.1	-1.8
3	2483.50	59.6 PK	74.0	-14.4	1.29 H	57	61.3	-1.7
4	2483.50	47.9 AV	54.0	-6.1	1.29 H	57	49.6	-1.7
5	4924.00	43.1 PK	74.0	-30.9	2.14 H	348	40.6	2.5
6	4924.00	39.2 AV	54.0	-14.8	2.14 H	348	36.7	2.5
7	7386.00	45.5 PK	74.0	-28.5	1.48 H	159	36.1	9.4
8	7386.00	33.0 AV	54.0	-21.0	1.48 H	159	23.6	9.4
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	*2462.00	121.8 PK			1.12 V	149	123.6	-1.8
2	*2462.00	118.2 AV			1.12 V	149	120.0	-1.8
3	2483.50	64.3 PK	74.0	-9.7	1.12 V	149	66.0	-1.7
4	2483.50	52.8 AV	54.0	-1.2	1.12 V	149	54.5	-1.7
5	4924.00	49.0 PK	74.0	-25.0	2.80 V	185	46.5	2.5
6	4924.00	46.7 AV	54.0	-7.3	2.80 V	185	44.2	2.5
7	7386.00	46.6 PK	74.0	-27.4	2.14 V	94	37.2	9.4
8	7386.00	34.7 AV	54.0	-19.3	2.14 V	94	25.3	9.4

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. " * ": Fundamental frequency.

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CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	58.2 PK	74.0	-15.8	1.55 H	247	59.8	-1.6
2	2390.00	42.8 AV	54.0	-11.2	1.55 H	247	44.4	-1.6
3	*2412.00	106.8 PK			1.55 H	247	108.5	-1.7
4	*2412.00	97.4 AV			1.55 H	247	99.1	-1.7
5	4824.00	36.8 PK	74.0	-37.2	1.35 H	207	34.5	2.3
6	4824.00	23.1 AV	54.0	-30.9	1.35 H	207	20.8	2.3
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	2390.00	73.7 PK	74.0	-0.3	1.15 V	250	75.3	-1.6
2	2390.00	50.8 AV	54.0	-3.2	1.15 V	250	52.4	-1.6
3	*2412.00	115.9 PK			1.15 V	250	117.6	-1.7
4	*2412.00	106.4 AV			1.15 V	250	108.1	-1.7
5	4824.00	41.9 PK	74.0	-32.1	1.03 V	35	39.6	2.3
6	4824.00	30.2 AV	54.0	-23.8	1.03 V	35	27.9	2.3

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2390.00	61.2 PK	74.0	-12.8	1.57 H	256	62.8	-1.6
2	2390.00	45.8 AV	54.0	-8.2	1.57 H	256	47.4	-1.6
3	*2437.00	113.2 PK			1.57 H	256	115.0	-1.8
4	*2437.00	103.8 AV			1.57 H	256	105.6	-1.8
5	2483.50	61.8 PK	74.0	-12.2	1.57 H	256	63.5	-1.7
6	2483.50	46.2 AV	54.0	-7.8	1.57 H	256	47.9	-1.7
7	4874.00	40.8 PK	74.0	-33.2	1.36 H	200	38.4	2.4
8	4874.00	29.2 AV	54.0	-24.8	1.36 H	200	26.8	2.4
9	7311.00	32.2 PK	74.0	-41.8	1.56 H	210	23.0	9.2
10	7311.00	21.3 AV	54.0	-32.7	1.56 H	210	12.1	9.2
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	2390.00	70.5 PK	74.0	-3.5	1.77 V	360	72.1	-1.6
2	2390.00	53.6 AV	54.0	-0.4	1.77 V	360	55.2	-1.6
3	*2437.00	122.3 PK			1.77 V	360	124.1	-1.8
4	*2437.00	112.8 AV			1.77 V	360	114.6	-1.8
5	2483.50	73.6 PK	74.0	-0.4	1.77 V	360	75.3	-1.7
6	**2483.50**	**53.9 AV**	**54.0**	**-0.1**	**1.77 V**	**360**	**55.6**	**-1.7**
7	4874.00	47.6 PK	74.0	-26.4	1.00 V	29	45.2	2.4
8	4874.00	35.9 AV	54.0	-18.1	1.00 V	29	33.5	2.4
9	7311.00	33.1 PK	74.0	-40.9	1.49 V	198	23.9	9.2
10	7311.00	21.7 AV	54.0	-32.3	1.49 V	198	12.5	9.2

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2462.00	106.7 PK			1.56 H	268	108.5	-1.8
2	*2462.00	97.7 AV			1.56 H	268	99.5	-1.8
3	2483.50	66.0 PK	74.0	-8.0	1.56 H	268	67.7	-1.7
4	2483.50	42.1 AV	54.0	-11.9	1.56 H	268	43.8	-1.7
5	4924.00	40.8 PK	74.0	-33.2	1.34 H	191	38.3	2.5
6	4924.00	29.0 AV	54.0	-25.0	1.34 H	191	26.5	2.5
7	7386.00	31.7 PK	74.0	-42.3	1.55 H	196	22.3	9.4
8	7386.00	21.1 AV	54.0	-32.9	1.55 H	196	11.7	9.4
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	*2462.00	115.8 PK			1.02 V	248	117.6	-1.8
2	*2462.00	106.8 AV			1.02 V	248	108.6	-1.8
3	2483.50	73.8 PK	74.0	-0.2	1.02 V	248	75.5	-1.7
4	2483.50	50.1 AV	54.0	-3.9	1.02 V	248	51.8	-1.7
5	4924.00	42.0 PK	74.0	-32.0	1.09 V	34	39.5	2.5
6	4924.00	30.4 AV	54.0	-23.6	1.09 V	34	27.9	2.5
7	7386.00	32.4 PK	74.0	-41.6	1.45 V	202	23.0	9.4
8	7386.00	21.2 AV	54.0	-32.8	1.45 V	202	11.8	9.4

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. " * ": Fundamental frequency.

802.11ax (HE20)

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	58.7 PK	74.0	-15.3	1.59 H	241	60.3	-1.6
2	2390.00	43.3 AV	54.0	-10.7	1.59 H	241	44.9	-1.6
3	*2412.00	106.7 PK			1.57 H	246	108.4	-1.7
4	*2412.00	97.5 AV			1.57 H	246	99.2	-1.7
5	4824.00	36.9 PK	74.0	-37.1	1.34 H	202	34.6	2.3
6	4824.00	23.4 AV	54.0	-30.6	1.34 H	202	21.1	2.3
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	2390.00	73.2 PK	74.0	-0.8	1.27 V	254	74.8	-1.6
2	2390.00	52.1 AV	54.0	-1.9	1.27 V	254	53.7	-1.6
3	*2412.00	115.9 PK			1.27 V	254	117.6	-1.7
4	*2412.00	105.7 AV			1.27 V	254	107.4	-1.7
5	4824.00	42.3 PK	74.0	-31.7	1.00 V	34	40.0	2.3
6	4824.00	30.6 AV	54.0	-23.4	1.00 V	34	28.3	2.3

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2390.00	61.4 PK	74.0	-12.6	1.52 H	270	63.0	-1.6
2	2390.00	45.8 AV	54.0	-8.2	1.52 H	270	47.4	-1.6
3	*2437.00	111.7 PK			1.52 H	270	113.5	-1.8
4	*2437.00	101.7 AV			1.52 H	270	103.5	-1.8
5	2483.50	61.9 PK	74.0	-12.1	1.52 H	270	63.6	-1.7
6	2483.50	46.3 AV	54.0	-7.7	1.52 H	270	48.0	-1.7
7	4874.00	40.2 PK	74.0	-33.8	1.36 H	200	37.8	2.4
8	4874.00	28.8 AV	54.0	-25.2	1.36 H	200	26.4	2.4
9	7311.00	32.4 PK	74.0	-41.6	1.51 H	211	23.2	9.2
10	7311.00	21.5 AV	54.0	-32.5	1.51 H	211	12.3	9.2
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	2390.00	71.3 PK	74.0	-2.7	1.27 V	249	72.9	-1.6
2	2390.00	53.6 AV	54.0	-0.4	1.27 V	249	55.2	-1.6
3	*2437.00	120.7 PK			1.27 V	249	122.5	-1.8
4	*2437.00	110.7 AV			1.27 V	249	112.5	-1.8
5	2483.50	71.8 PK	74.0	-2.2	1.27 V	249	73.5	-1.7
6	2483.50	53.5 AV	54.0	-0.5	1.27 V	249	55.2	-1.7
7	4874.00	48.3 PK	74.0	-25.7	1.05 V	43	45.9	2.4
8	4874.00	36.3 AV	54.0	-17.7	1.05 V	43	33.9	2.4
9	7311.00	33.7 PK	74.0	-40.3	1.44 V	185	24.5	9.2
10	7311.00	22.2 AV	54.0	-31.8	1.44 V	185	13.0	9.2

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2462.00	106.8 PK			1.52 H	278	108.6	-1.8
2	*2462.00	97.8 AV			1.52 H	278	99.6	-1.8
3	2483.50	66.2 PK	74.0	-7.8	1.59 H	261	67.9	-1.7
4	2483.50	42.1 AV	54.0	-11.9	1.59 H	261	43.8	-1.7
5	4924.00	40.5 PK	74.0	-33.5	1.39 H	175	38.0	2.5
6	4924.00	28.9 AV	54.0	-25.1	1.39 H	175	26.4	2.5
7	7386.00	32.4 PK	74.0	-41.6	1.56 H	180	23.0	9.4
8	7386.00	21.5 AV	54.0	-32.5	1.56 H	180	12.1	9.4
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	*2462.00	116.5 PK			1.03 V	247	118.3	-1.8
2	*2462.00	105.1 AV			1.03 V	247	106.9	-1.8
3	2483.50	73.6 PK	74.0	-0.4	1.03 V	247	75.3	-1.7
4	2483.50	50.9 AV	54.0	-3.1	1.03 V	247	52.6	-1.7
5	4924.00	42.5 PK	74.0	-31.5	1.15 V	31	40.0	2.5
6	4924.00	30.7 AV	54.0	-23.3	1.15 V	31	28.2	2.5
7	7386.00	32.6 PK	74.0	-41.4	1.41 V	206	23.2	9.4
8	7386.00	21.5 AV	54.0	-32.5	1.41 V	206	12.1	9.4

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. " * ": Fundamental frequency.

802.11ax (HE40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	2390.00	64.5 PK	74.0	-9.5	1.47 H	297	66.1	-1.6
2	2390.00	46.4 AV	54.0	-7.6	1.47 H	297	48.0	-1.6
3	*2422.00	105.6 PK			1.47 H	297	107.3	-1.7
4	*2422.00	93.3 AV			1.47 H	297	95.0	-1.7
5	4844.00	40.3 PK	74.0	-33.7	1.39 H	213	38.1	2.2
6	4844.00	28.9 AV	54.0	-25.1	1.39 H	213	26.7	2.2
7	7266.00	32.4 PK	74.0	-41.6	1.48 H	201	23.4	9.0
8	7266.00	21.5 AV	54.0	-32.5	1.48 H	201	12.5	9.0
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	2390.00	71.6 PK	74.0	-2.4	1.40 V	251	73.2	-1.6
2	2390.00	53.6 AV	54.0	-0.4	1.40 V	251	55.2	-1.6
3	*2422.00	114.3 PK			1.40 V	251	116.0	-1.7
4	*2422.00	102.4 AV			1.40 V	251	104.1	-1.7
5	4844.00	47.6 PK	74.0	-26.4	1.07 V	39	45.4	2.2
6	4844.00	36.2 AV	54.0	-17.8	1.07 V	39	34.0	2.2
7	7266.00	33.0 PK	74.0	-41.0	1.45 V	176	24.0	9.0
8	7266.00	21.7 AV	54.0	-32.3	1.45 V	176	12.7	9.0

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. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

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	2390.00	60.7 PK	74.0	-13.3	1.47 H	290	62.3	-1.6
2	2390.00	45.4 AV	54.0	-8.6	1.47 H	290	47.0	-1.6
3	*2437.00	107.5 PK			1.47 H	290	109.3	-1.8
4	*2437.00	95.8 AV			1.47 H	290	97.6	-1.8
5	2483.50	62.0 PK	74.0	-12.0	1.47 H	290	63.7	-1.7
6	2483.50	46.3 AV	54.0	-7.7	1.47 H	290	48.0	-1.7
7	4874.00	40.0 PK	74.0	-34.0	1.33 H	197	37.6	2.4
8	4874.00	28.9 AV	54.0	-25.1	1.33 H	197	26.5	2.4
9	7311.00	32.2 PK	74.0	-41.8	1.45 H	199	23.0	9.2
10	7311.00	21.5 AV	54.0	-32.5	1.45 H	199	12.3	9.2
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	2390.00	71.5 PK	74.0	-2.5	1.31 V	250	73.1	-1.6
2	2390.00	53.6 AV	54.0	-0.4	1.31 V	250	55.2	-1.6
3	*2437.00	116.6 PK			1.31 V	250	118.4	-1.8
4	*2437.00	104.9 AV			1.31 V	250	106.7	-1.8
5	2483.50	71.9 PK	74.0	-2.1	1.31 V	250	73.6	-1.7
6	2483.50	53.5 AV	54.0	-0.5	1.31 V	250	55.2	-1.7
7	4874.00	47.9 PK	74.0	-26.1	1.02 V	55	45.5	2.4
8	4874.00	36.2 AV	54.0	-17.8	1.02 V	55	33.8	2.4
9	7311.00	33.8 PK	74.0	-40.2	1.39 V	184	24.6	9.2
10	7311.00	22.2 AV	54.0	-31.8	1.39 V	184	13.0	9.2

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	*2452.00	105.9 PK			1.51 H	312	107.7	-1.8
2	*2452.00	93.5 AV			1.51 H	312	95.3	-1.8
3	2483.50	65.5 PK	74.0	-8.5	1.51 H	312	67.2	-1.7
4	2483.50	46.2 AV	54.0	-7.8	1.51 H	312	47.9	-1.7
5	4904.00	40.2 PK	74.0	-33.8	1.28 H	203	37.7	2.5
6	4904.00	28.8 AV	54.0	-25.2	1.28 H	203	26.3	2.5
7	7356.00	32.5 PK	74.0	-41.5	1.50 H	209	23.3	9.2
8	7356.00	21.8 AV	54.0	-32.2	1.50 H	209	12.6	9.2
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	*2452.00	114.1 PK			1.03 V	249	115.9	-1.8
2	*2452.00	102.3 AV			1.03 V	249	104.1	-1.8
3	2483.50	72.8 PK	74.0	-1.2	1.03 V	249	74.5	-1.7
4	2483.50	53.4 AV	54.0	-0.6	1.03 V	249	55.1	-1.7
5	4904.00	48.2 PK	74.0	-25.8	1.04 V	59	45.7	2.5
6	4904.00	36.3 AV	54.0	-17.7	1.04 V	59	33.8	2.5
7	7356.00	34.2 PK	74.0	-39.8	1.44 V	171	25.0	9.2
8	7356.00	22.5 AV	54.0	-31.5	1.44 V	171	13.3	9.2

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.
5. " * ": Fundamental frequency.

Below 1GHz Data:

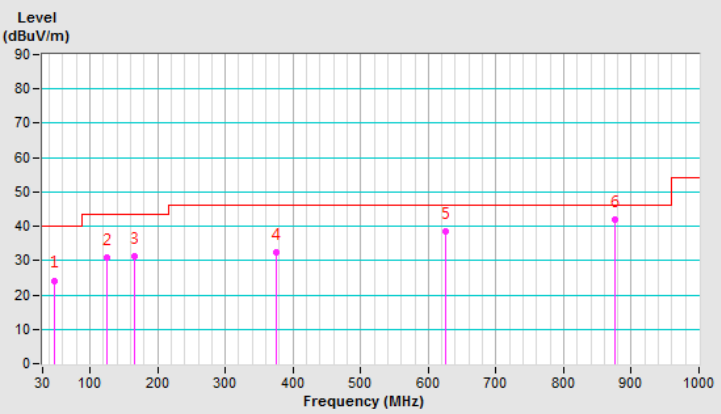
802.11b

CHANNEL	TX Channel 6	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	46.56	24.2 QP	40.0	-15.8	2.50 H	114	32.4	-8.2
2	125.01	31.0 QP	43.5	-12.5	2.50 H	317	40.4	-9.4
3	166.55	31.4 QP	43.5	-12.1	2.00 H	264	39.6	-8.2
4	375.00	32.3 QP	46.0	-13.7	2.00 H	119	37.2	-4.9
5	625.00	38.4 QP	46.0	-7.6	1.50 H	238	37.3	1.1
6	875.04	41.9 QP	46.0	-4.1	1.00 H	145	36.3	5.6

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 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.

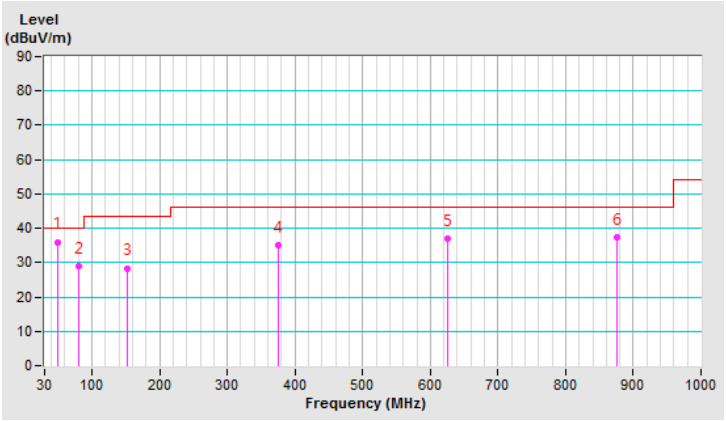


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	49.93	36.0 QP	40.0	-4.0	1.00 V	238	44.1	-8.1
2	80.54	29.1 QP	40.0	-10.9	1.50 V	312	42.1	-13.0
3	152.05	28.4 QP	43.5	-15.1	1.00 V	179	36.3	-7.9
4	375.00	34.9 QP	46.0	-11.1	1.50 V	264	39.8	-4.9
5	625.02	37.0 QP	46.0	-9.0	2.00 V	119	35.9	1.1
6	875.02	37.4 QP	46.0	-8.6	1.00 V	269	31.8	5.6

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 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 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2018	Oct. 23, 2019
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 22, 2018	Oct. 21, 2019
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	N/A	3	Oct. 22, 2018	Oct. 21, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 14, 2019	Mar. 13, 2020
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: Aug. 29, 2019

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

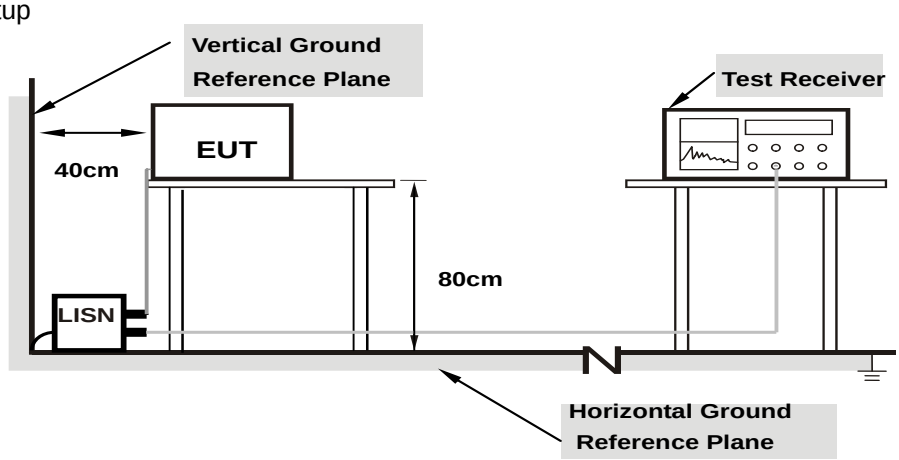
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

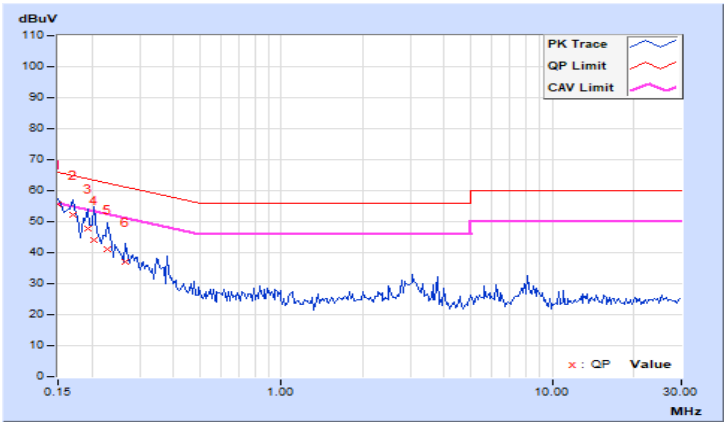
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**9.96**	**45.67**	**28.05**	**55.63**	**38.01**	**66.00**	**56.00**	**-10.37**	**-17.99**
2	0.16953	9.97	42.26	27.24	52.23	37.21	64.98	54.98	-12.75	-17.77
3	0.19297	9.97	37.84	22.30	47.81	32.27	63.91	53.91	-16.10	-21.64
4	0.20469	9.97	34.11	15.86	44.08	25.83	63.42	53.42	-19.34	-27.59
5	0.22812	9.97	31.21	14.59	41.18	24.56	62.52	52.52	-21.34	-27.96
6	0.26719	9.97	27.11	12.76	37.08	22.73	61.20	51.20	-24.12	-28.47

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

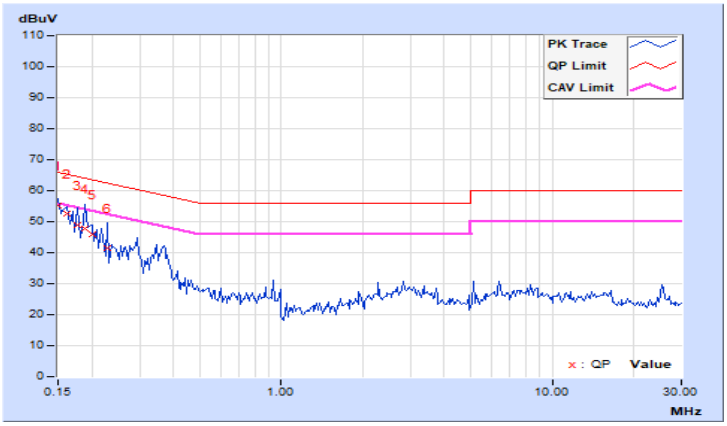


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	45.37	27.89	55.31	37.83	66.00	56.00	-10.69	-18.17
2	0.16172	9.95	42.71	24.77	52.66	34.72	65.38	55.38	-12.72	-20.66
3	0.17734	9.95	39.08	18.88	49.03	28.83	64.61	54.61	-15.58	-25.78
4	0.18906	9.95	38.01	22.16	47.96	32.11	64.08	54.08	-16.12	-21.97
5	0.20078	9.95	35.87	17.31	45.82	27.26	63.58	53.58	-17.76	-26.32
6	0.22812	9.95	31.56	14.51	41.51	24.46	62.52	52.52	-21.01	-28.06

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

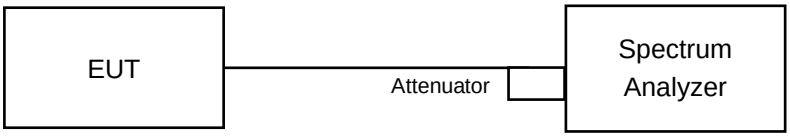


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

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 Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

CDD Mode

802.11b

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	7.08	7.10	0.5	Pass
6	2437	7.08	7.08	0.5	Pass
11	2462	7.11	7.08	0.5	Pass

802.11g

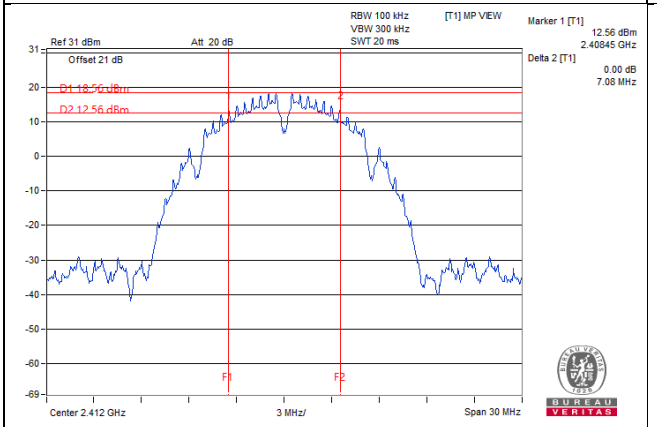
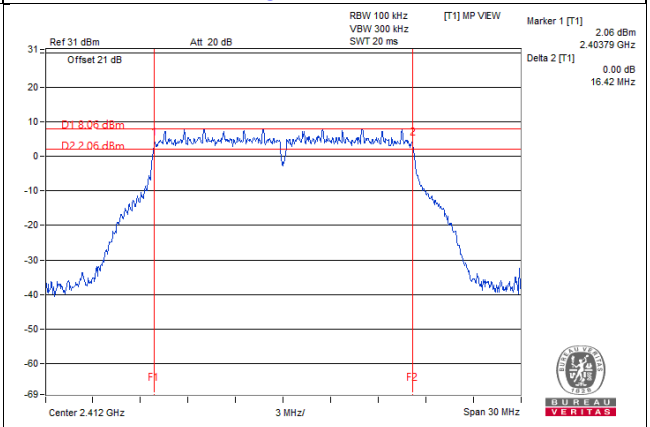
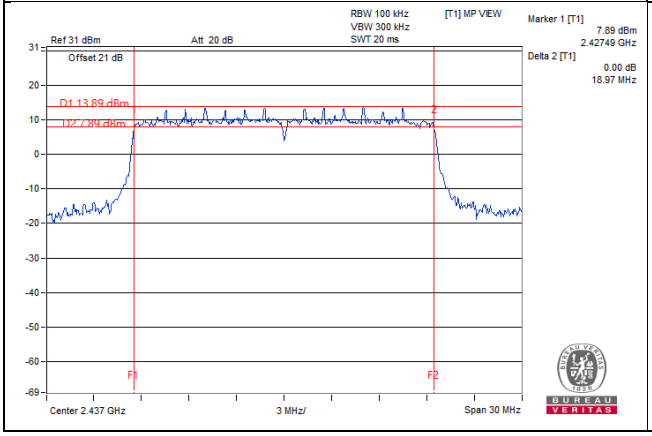
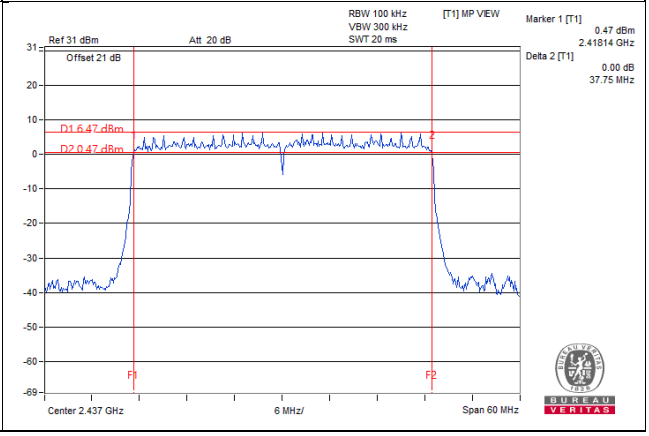
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.42	16.42	0.5	Pass
6	2437	16.43	16.42	0.5	Pass
11	2462	16.43	16.42	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	19.12	19.03	0.5	Pass
6	2437	19.00	18.97	0.5	Pass
11	2462	19.18	19.01	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.86	37.77	0.5	Pass
6	2437	37.89	37.75	0.5	Pass
9	2452	37.88	37.77	0.5	Pass

Spectrum Plot of Worst Value	
802.11b_Chain 0 / CH1	**802.11g_Chain 0 / CH1**
	
802.11ax (HE20)_Chain 1 / CH6	**802.11ax (HE40)_Chain 1 / CH6**
	

4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

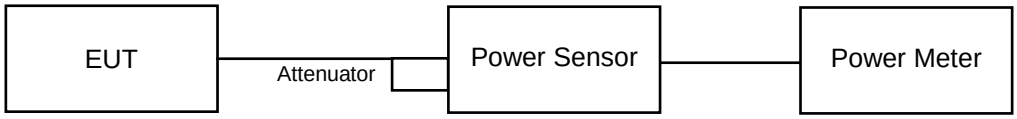
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

Non-Beamforming Mode

802.11b

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	26.05	25.74	777.69	28.91	30.00	Pass
6	2437	26.13	25.92	801.045	29.04	30.00	Pass
11	2462	25.64	25.41	713.974	28.54	30.00	Pass

802.11g

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.12	19.13	184.648	22.66	30.00	Pass
6	2437	25.93	25.17	720.594	28.58	30.00	Pass
11	2462	19.50	18.85	165.861	22.20	30.00	Pass

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.76	19.13	176.47	22.47	30.00	Pass
6	2437	25.73	24.64	665.183	28.23	30.00	Pass
11	2462	18.29	17.82	127.987	21.07	30.00	Pass

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.84	18.28	143.858	21.58	30	Pass
6	2437	20.83	20.02	221.522	23.45	30	Pass
9	2452	18.33	17.89	129.595	21.13	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.76	19.13	176.47	22.47	30	Pass
6	2437	25.73	24.64	665.183	28.23	30	Pass
11	2462	18.29	17.82	127.987	21.07	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.84	18.28	143.858	21.58	30	Pass
6	2437	20.83	20.02	221.522	23.45	30	Pass
9	2452	18.33	17.89	129.595	21.13	30	Pass

Beamforming Mode

VHT20

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.76	19.13	176.47	22.47	30	Pass
6	2437	25.23	24.14	592.844	27.73	30	Pass
11	2462	18.29	17.82	127.987	21.07	30	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power limit shall not be reduced.

VHT40

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.84	18.28	143.858	21.58	30	Pass
6	2437	20.83	20.02	221.522	23.45	30	Pass
9	2452	18.33	17.89	129.595	21.13	30	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.76	19.13	176.47	22.47	30	Pass
6	2437	25.23	24.14	592.844	27.73	30	Pass
11	2462	18.29	17.82	127.987	21.07	30	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	18.84	18.28	143.858	21.58	30	Pass
6	2437	20.83	20.02	221.522	23.45	30	Pass
9	2452	18.33	17.89	129.595	21.13	30	Pass

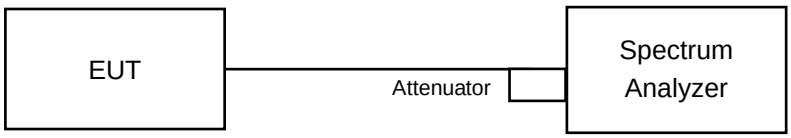
Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power limit shall not be reduced.

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm in any 3 kHz.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. Set instrument center frequency to DTS channel center frequency.
b. Set span to at least 1.5 times the OBW.
c. Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d. Set VBW ≥3 x RBW.
e. Detector = power averaging (RMS) or sample detector (when RMS not available).
f. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g. Sweep time = auto couple.
h. Employ trace averaging (RMS) mode over a minimum of 100 traces.
i. Use the peak marker function to determine the maximum amplitude level.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-6.23	3.01	-3.22	8	Pass
	6	2437	-5.78	3.01	-2.77	8	Pass
	11	2462	-6.20	3.01	-3.19	8	Pass
1	1	2412	-5.32	3.01	-2.31	8	Pass
	6	2437	-5.35	3.01	-2.34	8	Pass
	11	2462	-5.98	3.01	-2.97	8	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power density limit shall not be reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-12.59	3.01	-9.58	8	Pass
	6	2437	-7.62	3.01	-4.61	8	Pass
	11	2462	-14.08	3.01	-11.07	8	Pass
1	1	2412	-13.34	3.01	-10.33	8	Pass
	6	2437	-6.94	3.01	-3.93	8	Pass
	11	2462	-14.24	3.01	-11.23	8	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power density limit shall not be reduced.

802.11ax (HE20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-14.13	3.01	-11.12	8	Pass
	6	2437	-8.00	3.01	-4.99	8	Pass
	11	2462	-15.83	3.01	-12.82	8	Pass
1	1	2412	-15.29	3.01	-12.28	8	Pass
	6	2437	-9.05	3.01	-6.04	8	Pass
	11	2462	-15.91	3.01	-12.90	8	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.22dBi < 6dBi, so the power density limit shall not be reduced.

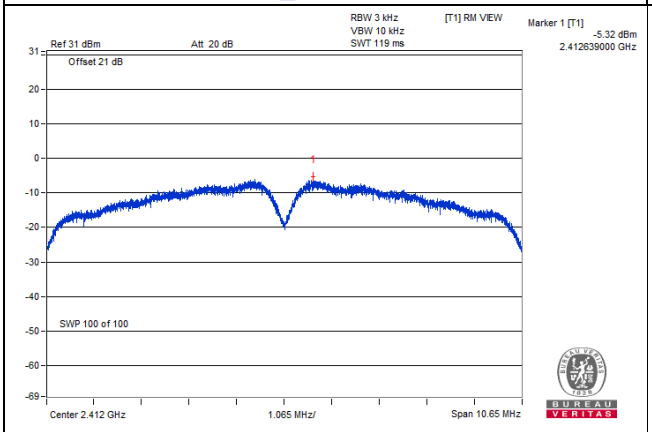
802.11ax (HE40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-18.80	3.01	-15.79	8	Pass
	6	2437	-16.52	3.01	-13.51	8	Pass
	9	2452	-19.11	3.01	-16.10	8	Pass
1	3	2422	-18.66	3.01	-15.65	8	Pass
	6	2437	-16.25	3.01	-13.24	8	Pass
	9	2452	-18.57	3.01	-15.56	8	Pass

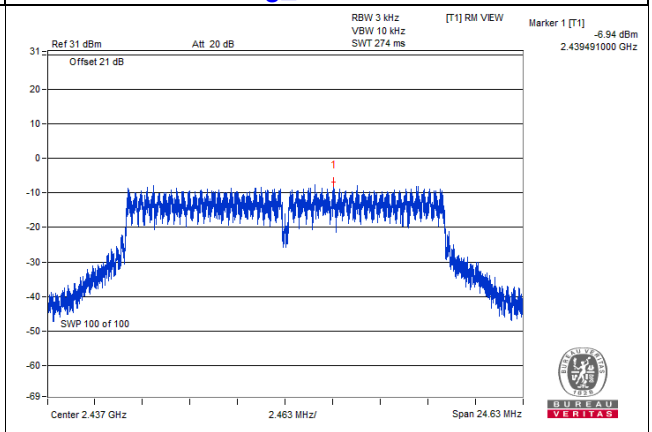
Note: 1. The directional gain = 10 log[(10$^{G0/20}$ + 10$^{G1/20}$)^2 / 2] = 4.22dBi < 6dBi, so the power density limit shall not be reduced.

Spectrum Plot of Worst Value

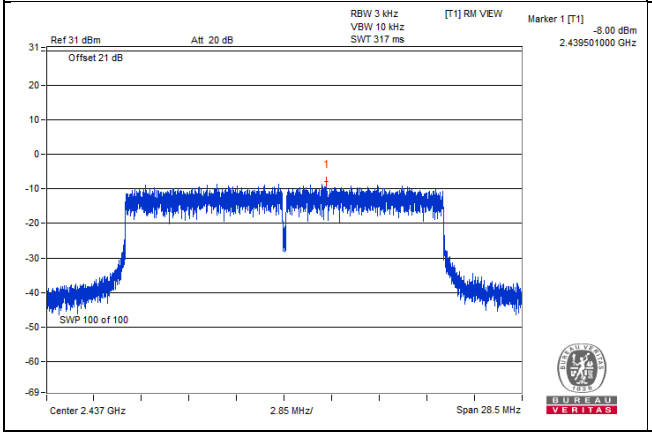
802.11b_Chain 1 / CH1



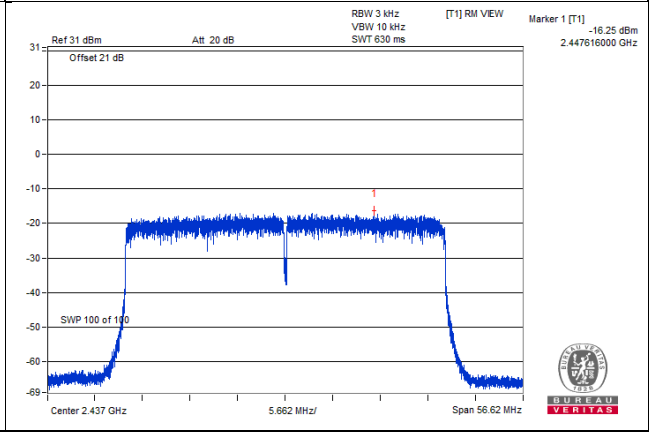
802.11g_Chain 1 / CH6



802.11ax (HE20)_Chain 0 / CH6



802.11ax (HE40)_Chain 1 / CH6

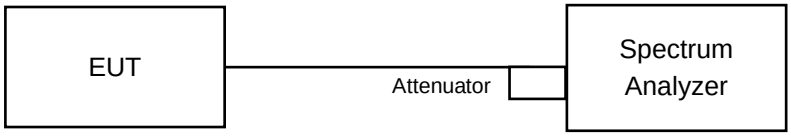


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 30dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW ≥ 300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

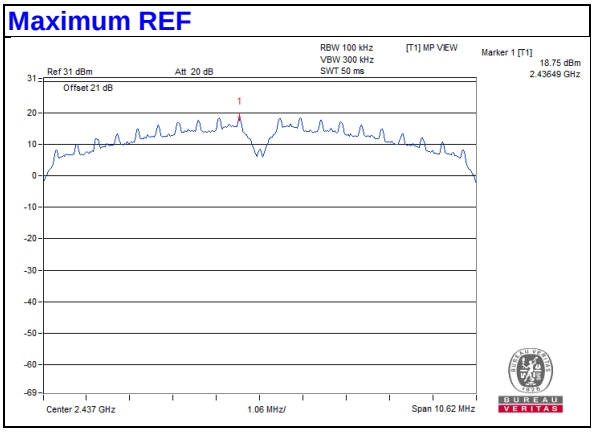
Same as Item 4.3.6

4.6.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 30dB offset below D1. It shows compliance with the requirement.

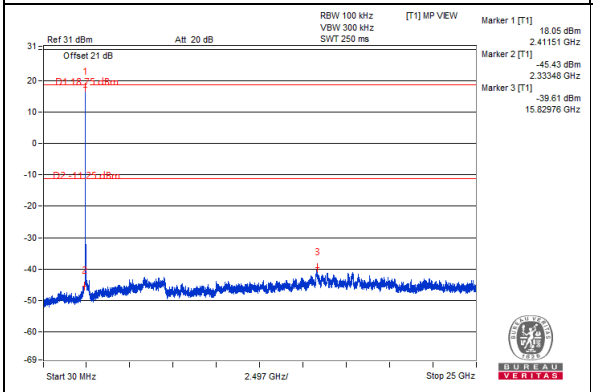
802.11b

Maximum REF

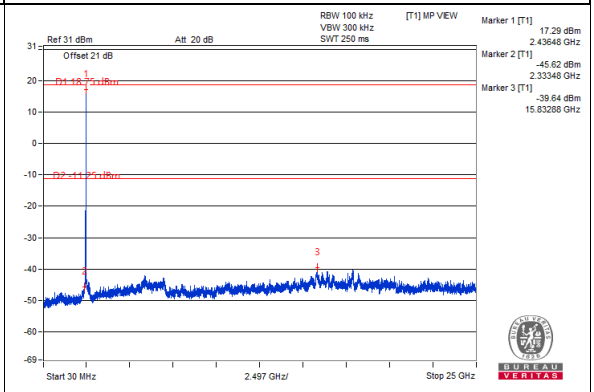


Chain 0

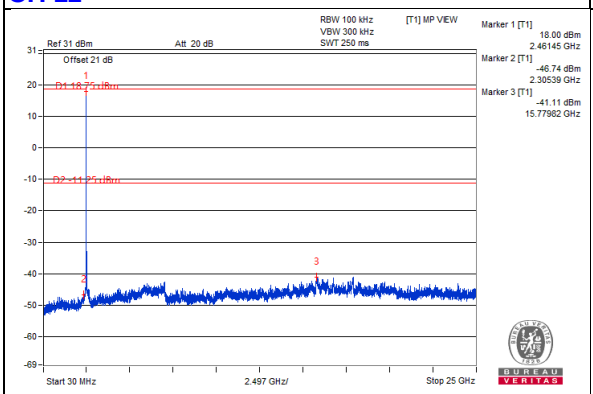
CH 1



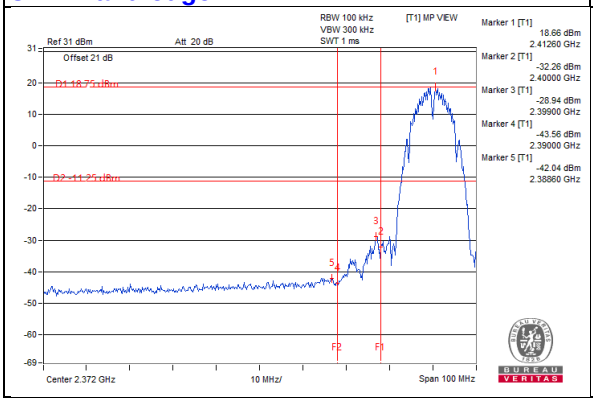
CH 6



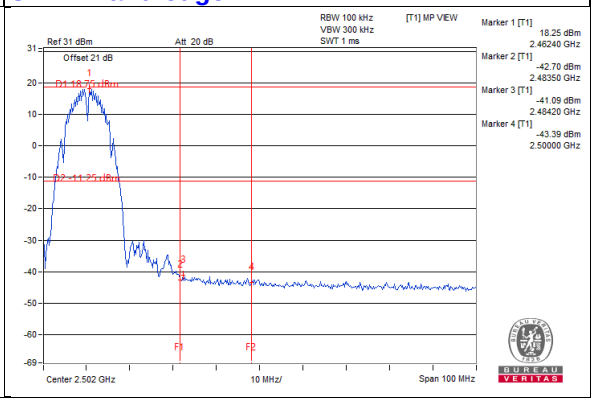
CH 11



CH 1 Band edge

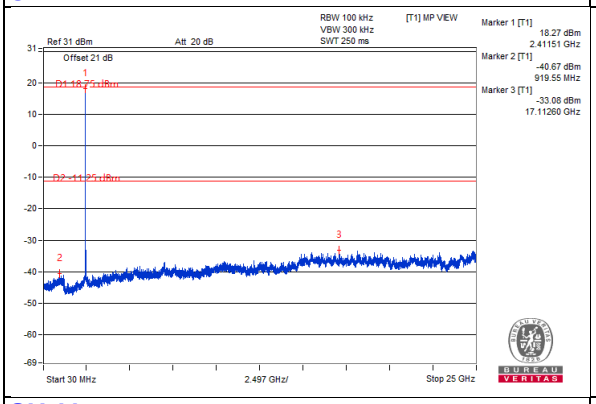


CH 11 Band edge

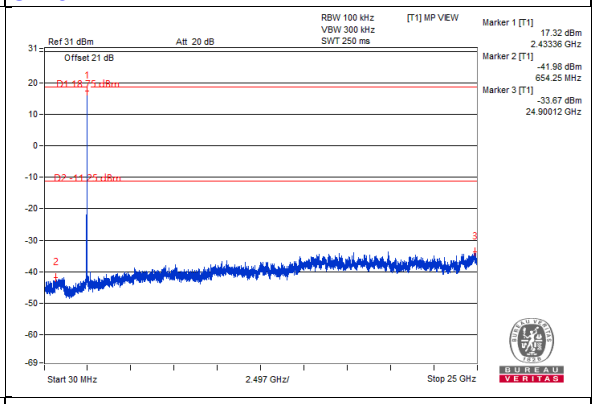


Chain 1

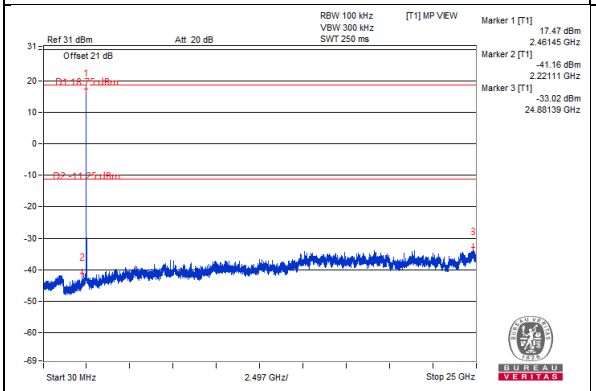
CH 1



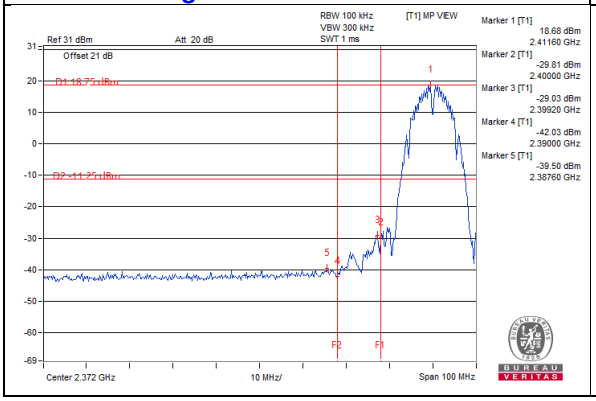
CH 6



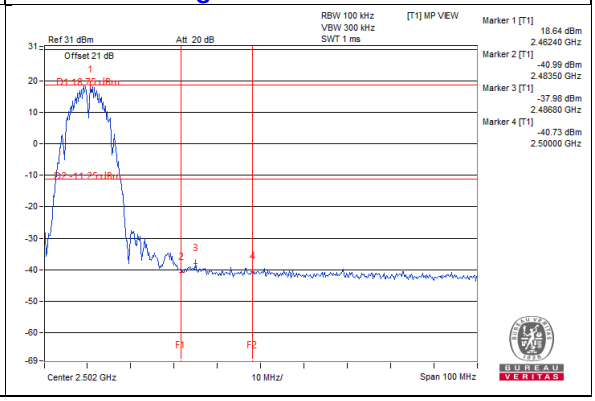
CH 11



CH 1 Band edge

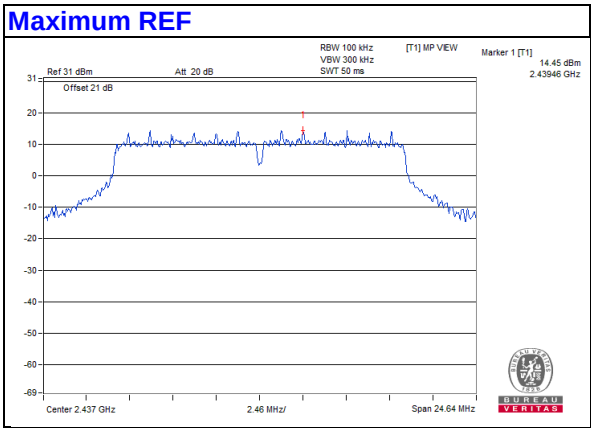


CH 11 Band edge



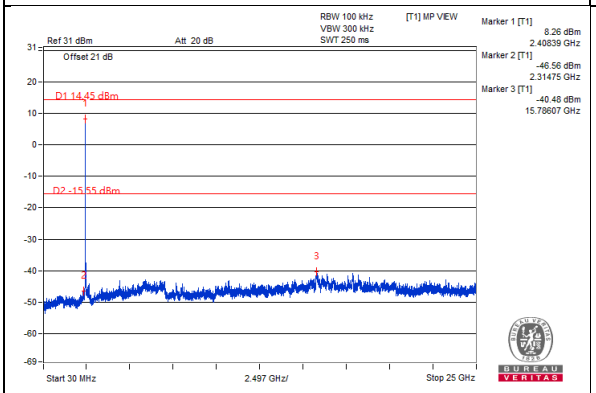
802.11g

Maximum REF

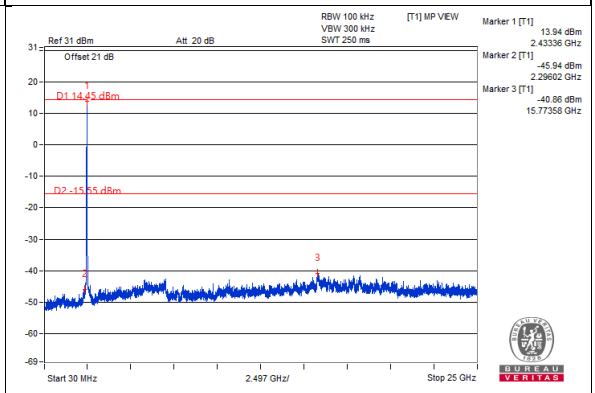


Chain 0

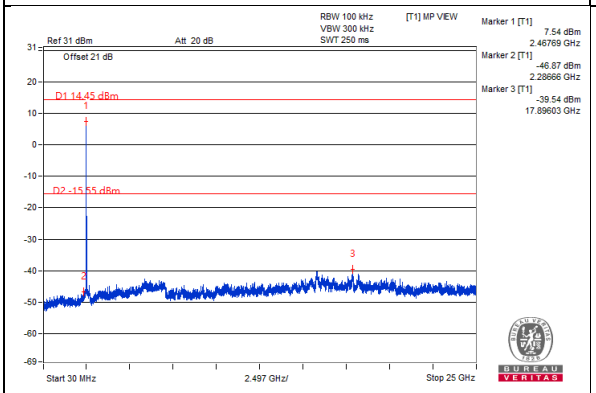
CH 1



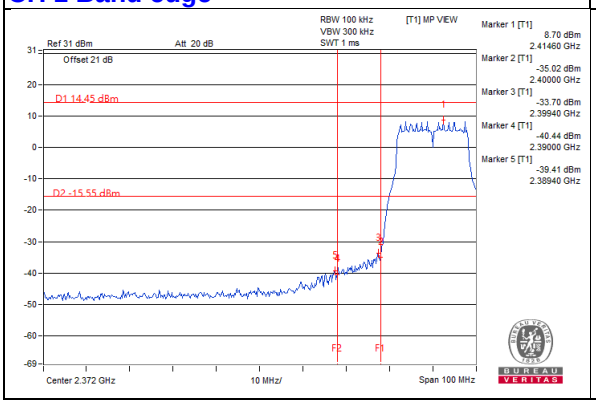
CH 6



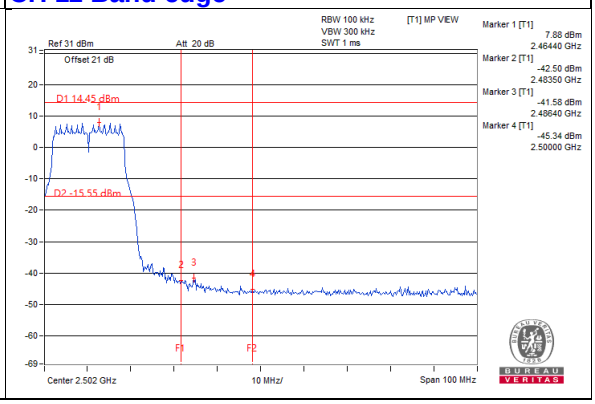
CH 11



CH 1 Band edge

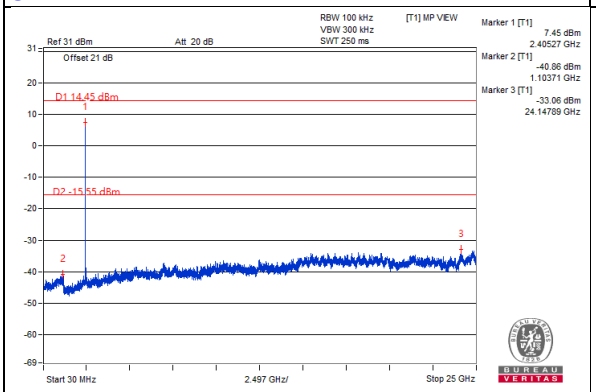


CH 11 Band edge

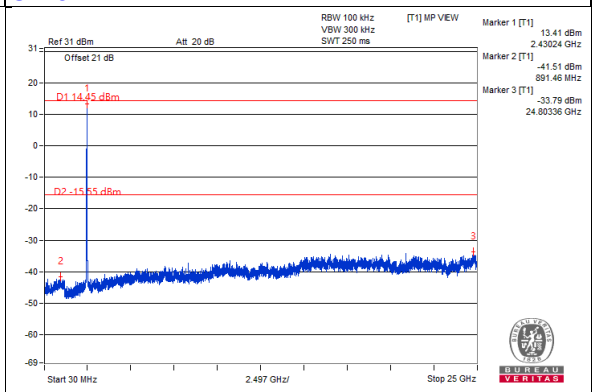


Chain 1

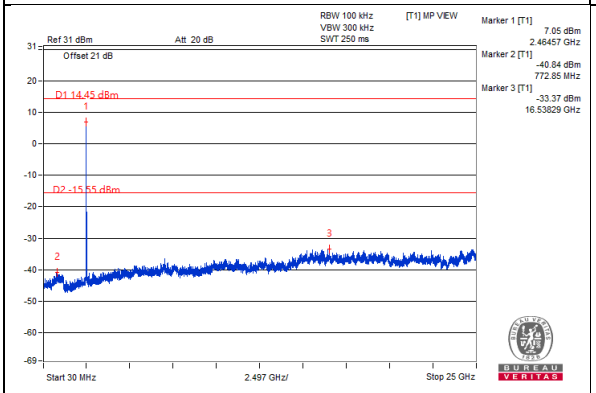
CH 1



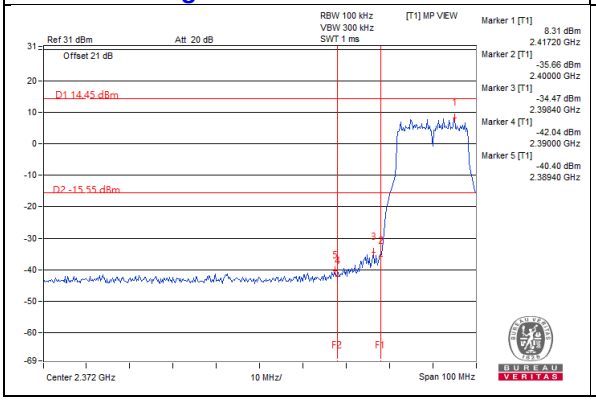
CH 6



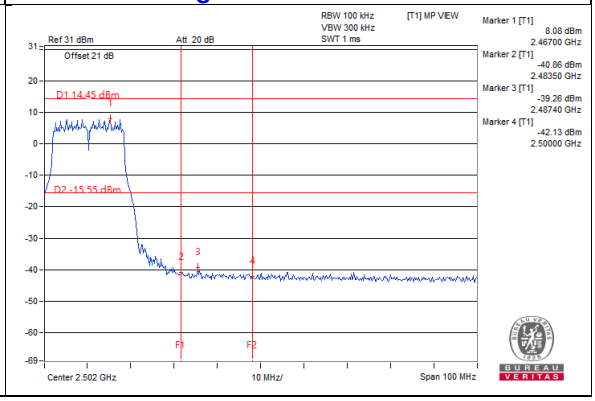
CH 11



CH 1 Band edge

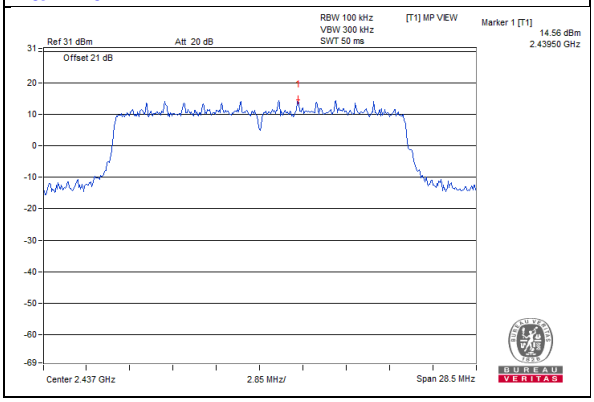


CH 11 Band edge



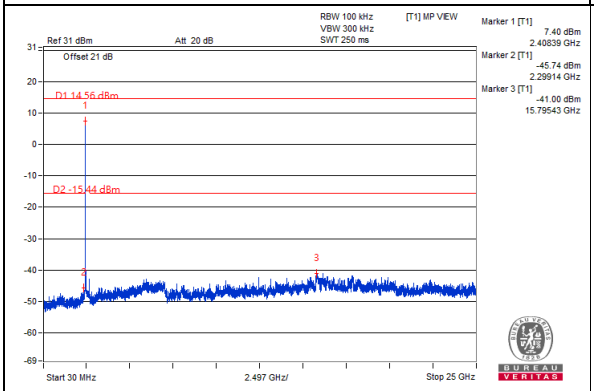
802.11ax (HE20)

Maximum REF

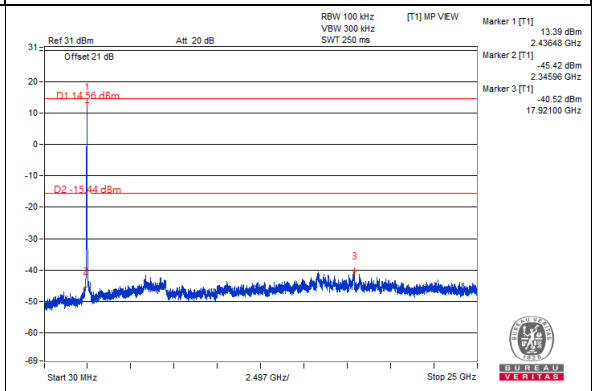


Chain 0

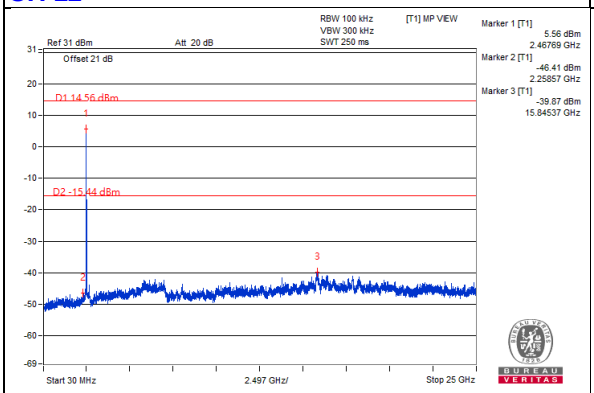
CH 1



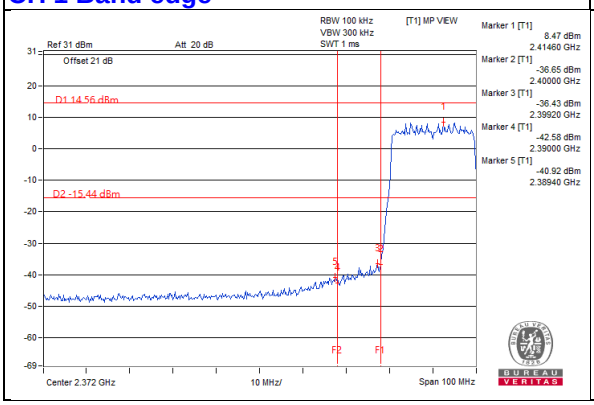
CH 6



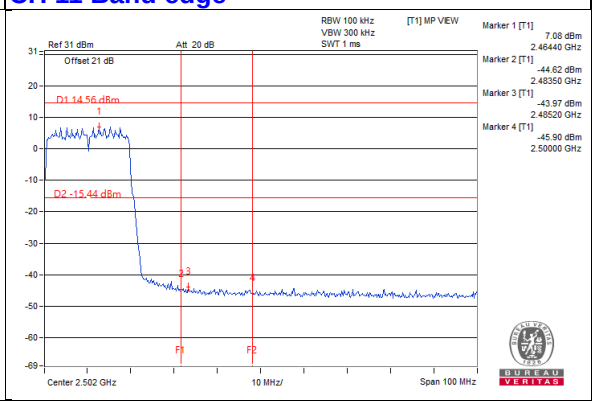
CH 11



CH 1 Band edge

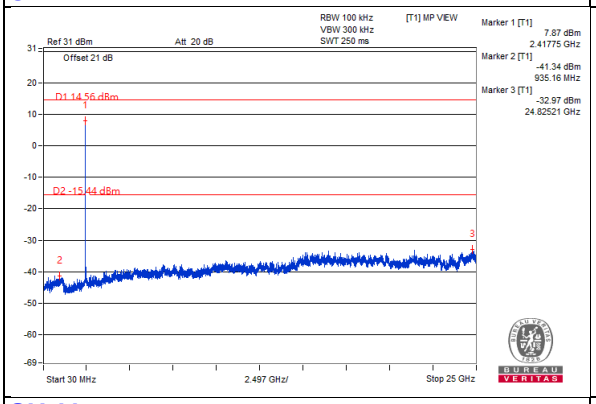


CH 11 Band edge

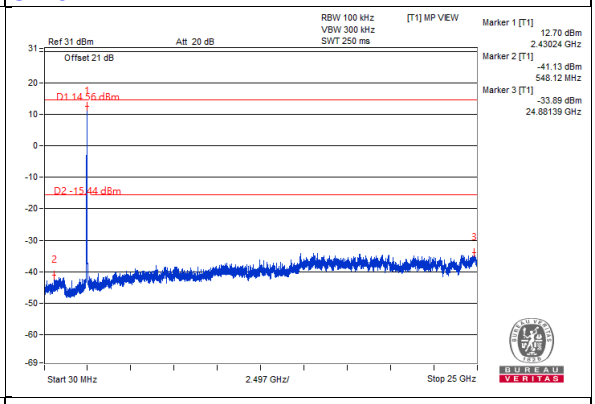


Chain 1

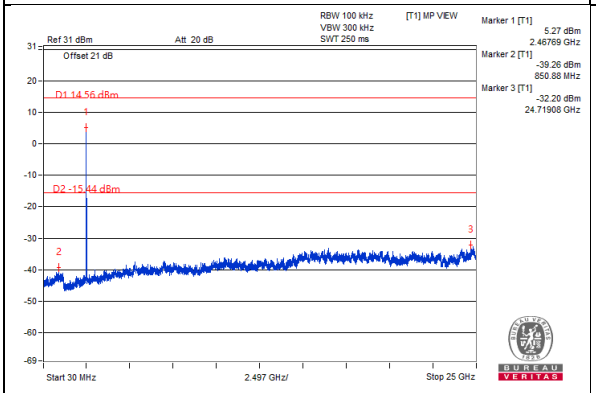
CH 1



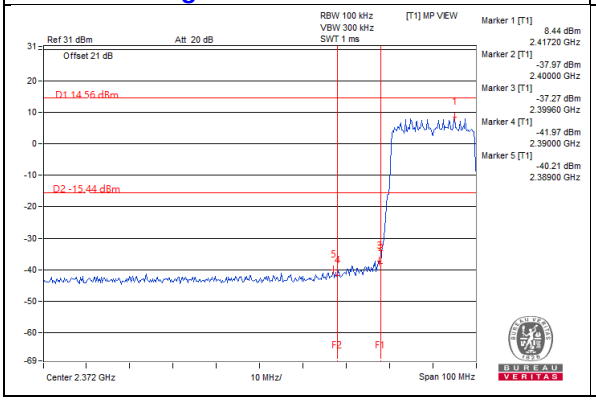
CH 6



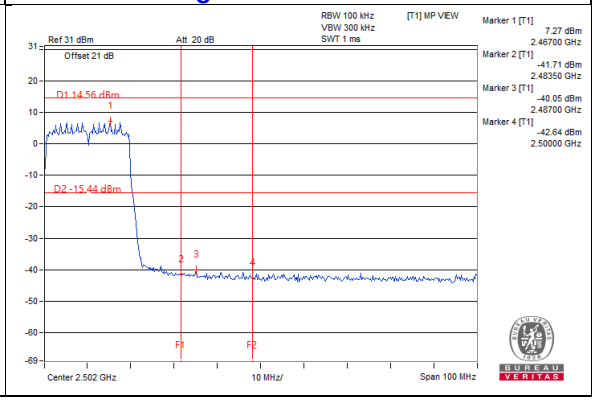
CH 11



CH 1 Band edge

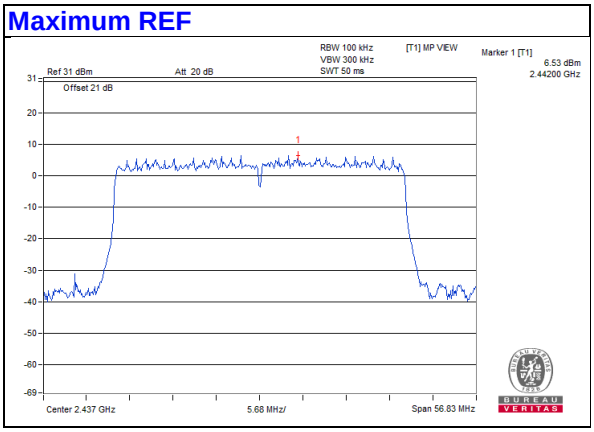


CH 11 Band edge



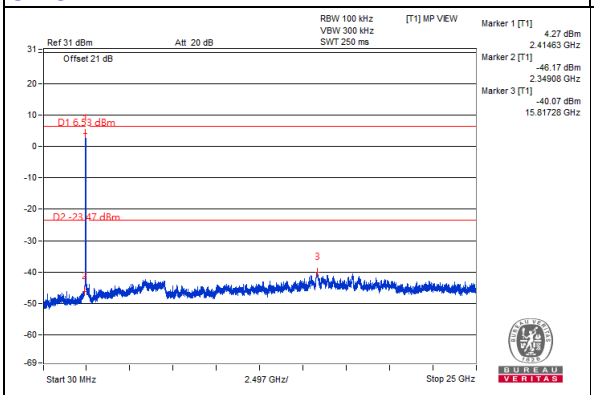
802.11ax (HE40)

Maximum REF

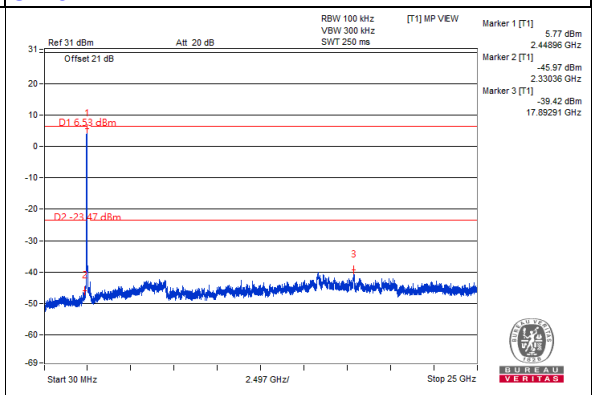


Chain 0

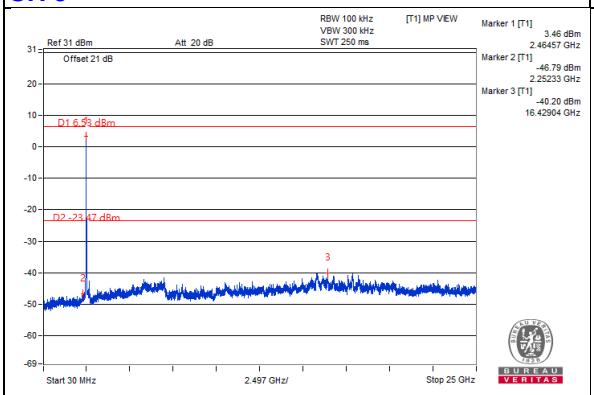
CH 3



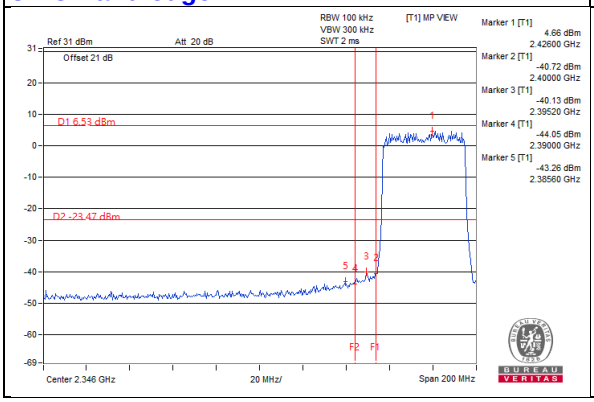
CH 6



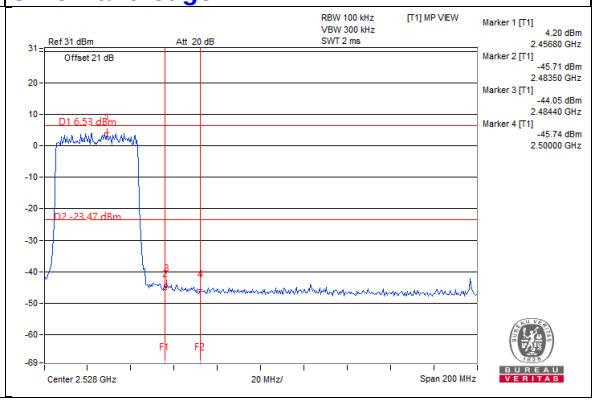
CH 9



CH 3 Band edge

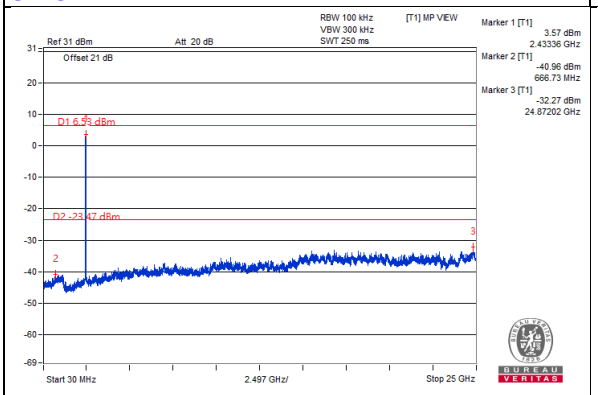


CH 9 Band edge

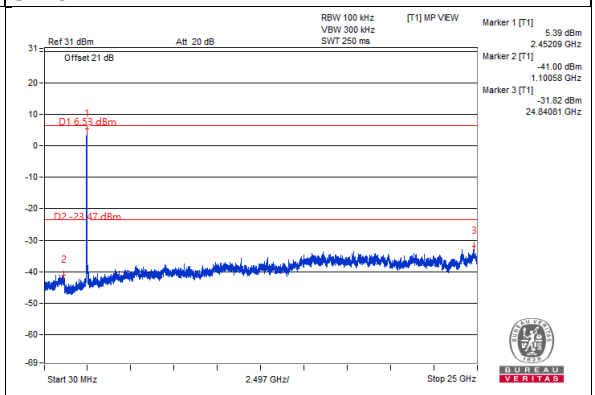


Chain 1

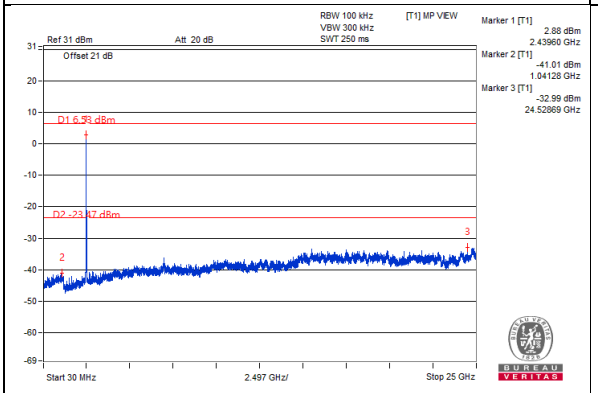
CH 3



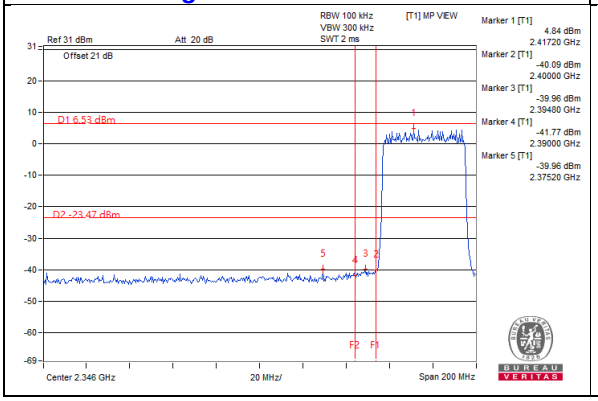
CH 6



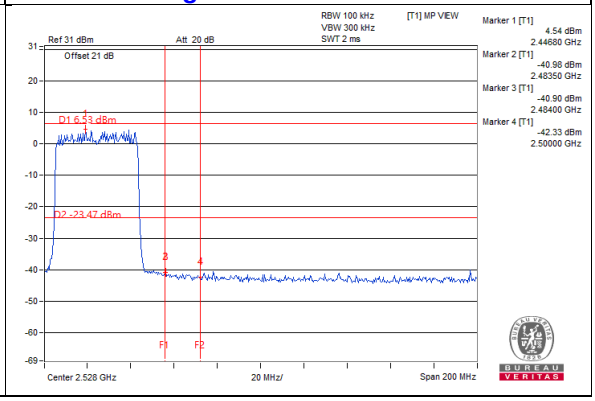
CH 9



CH 3 Band edge



CH 9 Band edge



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:

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

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