FCC Test Report

Report No.:	RF191118E09 R2
FCC ID:	PY319400466
Test Model:	RAX50
Series Model:	RAX45
Received Date:	Nov. 19, 2019
Test Date:	Dec. 12 to 16, 2019
Issued Date:	July 24, 2020
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
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF191118E09	Original release.	Dec. 27, 2019
RF191118E09 R1	Modified the the statement on page 1.	July 09, 2020
RF191118E09 R2	Modified the statement on page 1.	July 24, 2020

1 Certificate of Conformity

Product:	NIGHTHAWK AX6 AX5400 6-Stream WiFi Router, NIGHTHAWK AX6 AX4300 6-Stream WiFi Router
Brand:	NETGEAR
Test Model:	RAX50
Series Model:	RAX45
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	Dec. 12 to 16, 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 : Phoenix Huang , **Date:** July 24, 2020

Phoenix Huang / Specialist

Approved by : , **Date:** July 24, 2020

Clark Lin / Technical 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 -8.47dB at 0.30234MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 2390.00MHz, 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 R-SMA 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
Conducted Emissions	-	3.1 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.9 dB
	1GHz ~6GHz	5.1 dB
Radiated Emissions above 1 GHz	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	NIGHTHAWK AX6 AX5400 6-Stream WiFi Router, NIGHTHAWK AX6 AX4300 6-Stream WiFi Router
Brand	NETGEAR
Test Model	RAX50
Series Model	RAX45
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS,OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 600 Mbps 802.11ac: up to 1733.3 Mbps 802.11ax: up to 2401.9 Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 80211ax (HE20): 11 802.11n (HT40), VHT40, 80211ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 80211ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 80211ax (HE40): 4 802.11ac (VHT80), 80211ax (HE80): 2
Output Power	**Non-Beamforming Mode:** **2.412 ~ 2.462 GHz:** 917.02 mW **5.18 ~ 5.24 GHz:** 935.58 mW **5.745 ~ 5.825 GHz:** 997.865 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 874.052 mW **5.18 ~ 5.24 GHz:** 863.139 mW **5.745 ~ 5.825 GHz:** 797.393 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ-45 Cable x 1 (Unshielded, 1.8 m)

Note:

1. All models are listed as below.

Product Name	Model Name	Description
NIGHTHAWK AX6 AX5400 6-Stream WiFi Router	RAX50	The hardware are the same, just only the Link Rate is different. - Link Rate RAX50: 2.4GHz 600 Mbps, 5GHz 4800 Mbps RAX45: 2.4GHz 480 Mbps, 5GHz 3840 Mbps
NIGHTHAWK AX6 AX4300 6-Stream WiFi Router	RAX45	
Note: From the above models, model: RAX50 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	2ABL030F 1 NA	332-10758-01	Input: 100-120Vac, 1.0A, 50/60Hz Output: 12V, 2.5A DC Output cable: Unshielded, 1.8m
2	NETGEAR	AD2067F10	332-10797-01	Input: 100-120Vac, 1.0A, 50/60Hz Output: 12V, 2.5A DC Output cable: Unshielded, 1.8m
Note: From the above models, the worst AC Power Conducted Emissions and Radiated Emissions test was found in **Adapter 1**. Therefore only the test data of the modes were recorded in this report.				

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

Antenna Operation 1	Antenna Operation 2
Dual_Ant0	Dual_Ant0
Dual_Ant1	Dual_Ant1
Single_Ant2	Dual_Ant2
Single_Ant3	Dual_Ant3

From the above antenna conditions, the worst case was found in Antenna Operation 1. Therefore only the test data of the mode was recorded in this report.

5. The directional antenna gain, please refer to the following table:

Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4~2.4835	3.73	Dipole	R-SMA
5.15 ~ 5.25	6.61		
5.25 ~ 5.35	6.53		
5.47 ~ 5.725	6.64		
5.725 ~ 5.85	6.66		
Note: More detailed information, please refer to antenna specification.			

6. 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	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
802.11ac (VHT20)	4TX	4RX
802.11ac (VHT40)	4TX	4RX
802.11ac (VHT80)	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
802.11ax (HE80)	4TX	4RX

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), VHT mode for 20MHz (40MHz) and 802.11ax mode for 20MHz (40MHz), therefore the manufacturer will control the power for 802.11n mode is the same as the VHT mode or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

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

3.2 Description of Test Modes

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

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

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

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

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

Note: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

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	1	DSSS	BPSK	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	1	DSSS	BPSK	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:

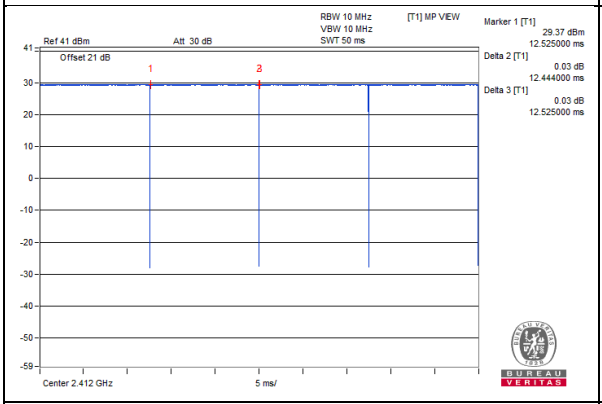
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Kevien Ko
RE<1G	25deg. C, 73%RH	120Vac, 60Hz	Kevien Ko
PLC	25deg. C, 75%RH	120Vac, 60Hz	Kevien Ko
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

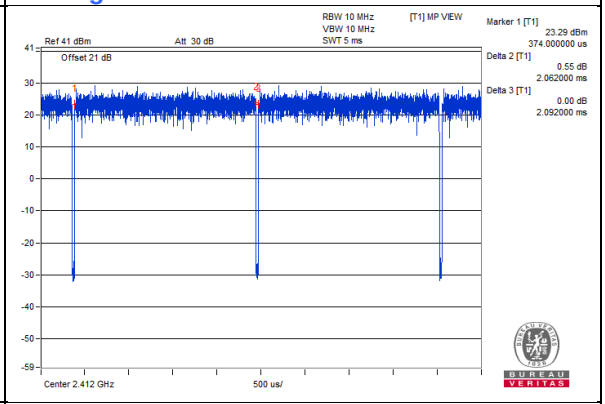
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.444/12.525 =0.994
802.11g: Duty cycle = 2.062/2.092 =0.986
802.11ax (HE20): Duty cycle = 1.485/1.52 = 0.977, Duty factor = 10 * log(1/Duty cycle) = 0.10
802.11ax (HE40): Duty cycle = 0.771/0.804 = 0.959, Duty factor = 10 * log(1/Duty cycle) = 0.18

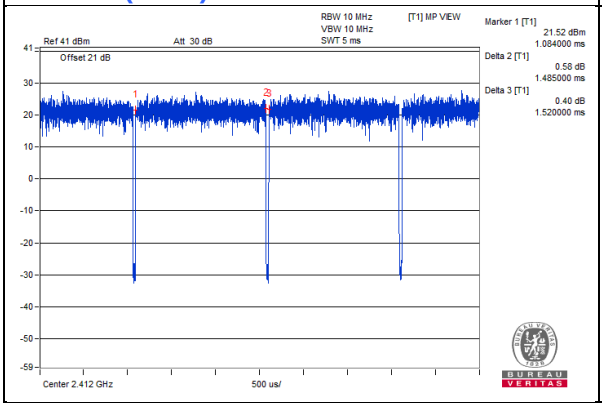
802.11b



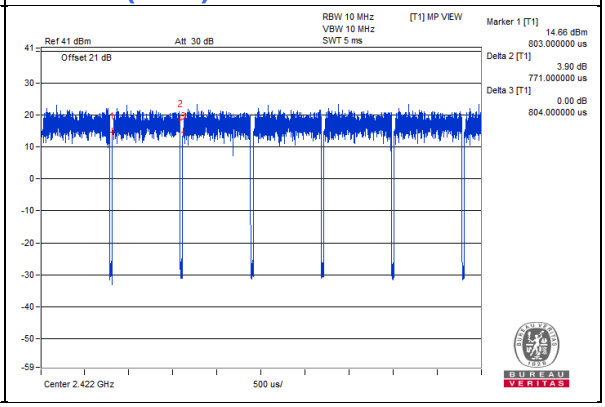
802.11g



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.

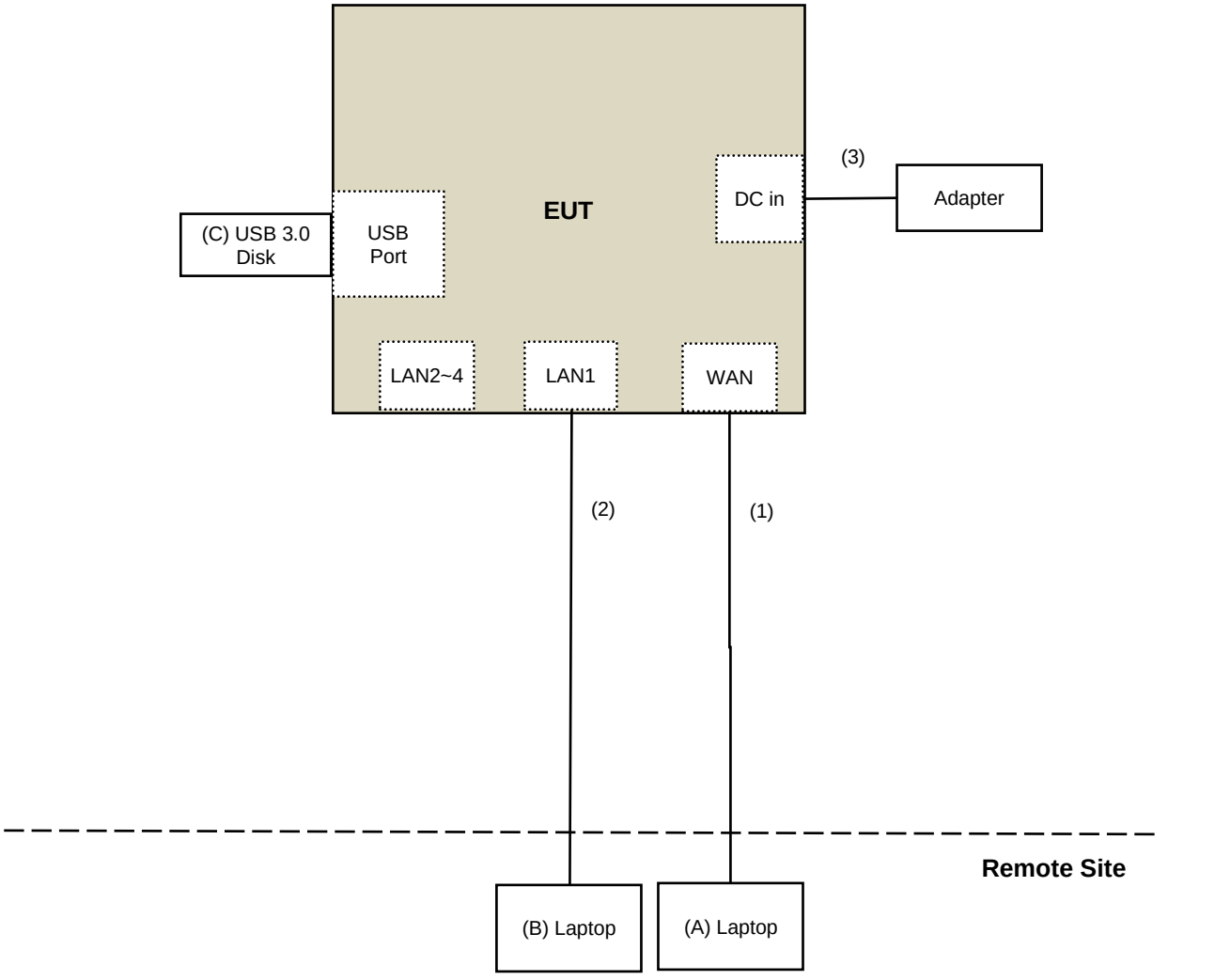
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	USB 3.0 Disk	SanDisk	MSIP-REM-TAD-SDCZ73	NA	NA	Provided by Lab

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02
KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

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. 23, 2019	Oct. 22, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 11, 2019	Nov. 10, 2020
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. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 24, 2019	Nov. 23, 2020
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. 24, 2019	Nov. 23, 2020
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
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. 4.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Dec. 12 to 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 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:

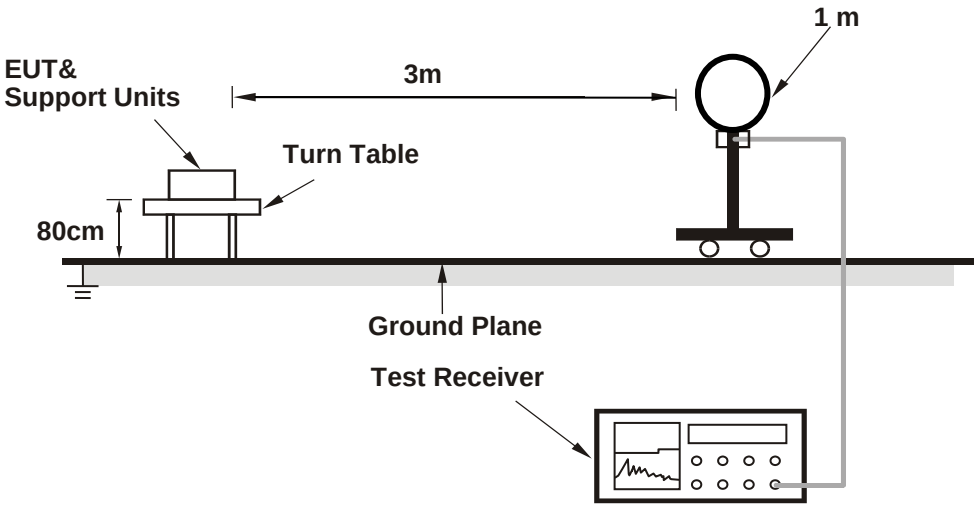
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

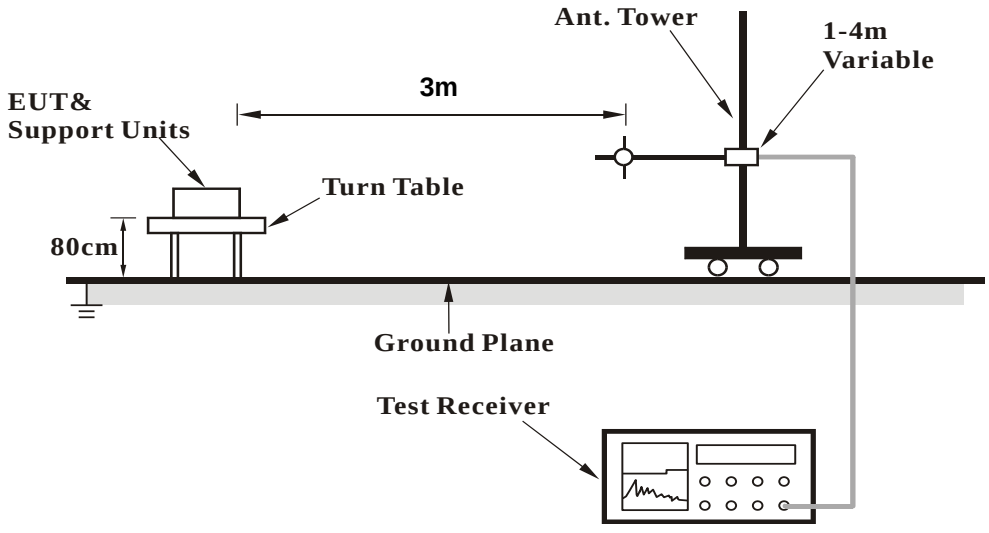
No deviation.

4.1.5 Test Setup

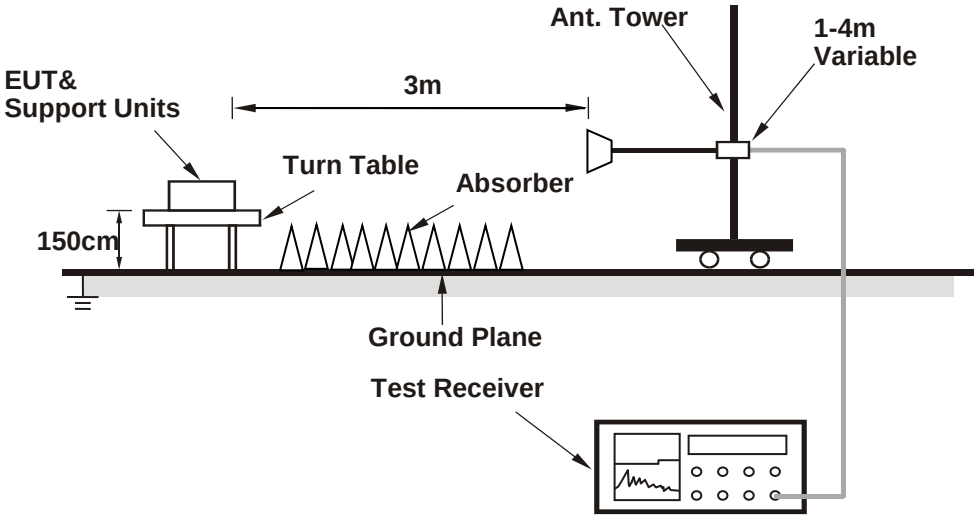
For Radiated emission below 30MHz



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 frenquency.

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	57.2 PK	74.0	-16.8	2.59 H	255	58.9	-1.7
2	2390.00	45.7 AV	54.0	-8.3	2.59 H	255	47.4	-1.7
3	*2412.00	114.6 PK			2.59 H	255	116.4	-1.8
4	*2412.00	112.5 AV			2.59 H	255	114.3	-1.8
5	4824.00	45.4 PK	74.0	-28.6	2.14 H	150	43.3	2.1
6	4824.00	43.8 AV	54.0	-10.2	2.14 H	150	41.7	2.1
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	61.8 PK	74.0	-12.2	1.95 V	155	63.5	-1.7
2	2390.00	50.9 AV	54.0	-3.1	1.95 V	155	52.6	-1.7
3	*2412.00	120.0 PK			1.95 V	155	121.8	-1.8
4	*2412.00	117.7 AV			1.95 V	155	119.5	-1.8
5	4824.00	49.5 PK	74.0	-24.5	2.37 V	32	47.4	2.1
6	4824.00	47.5 AV	54.0	-6.5	2.37 V	32	45.4	2.1

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. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	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	54.7 PK	74.0	-19.3	1.06 H	183	56.4	-1.7
2	2390.00	44.8 AV	54.0	-9.2	1.06 H	183	46.5	-1.7
3	*2437.00	115.4 PK			1.06 H	183	117.2	-1.8
4	*2437.00	113.1 AV			1.06 H	183	114.9	-1.8
5	2483.50	57.1 PK	74.0	-16.9	1.06 H	183	58.8	-1.7
6	2483.50	45.2 AV	54.0	-8.8	1.06 H	183	46.9	-1.7
7	4874.00	46.8 PK	74.0	-27.2	1.21 H	214	44.6	2.2
8	4874.00	44.2 AV	54.0	-9.8	1.21 H	214	42.0	2.2
9	7311.00	45.2 PK	74.0	-28.8	1.28 H	93	36.2	9.0
10	7311.00	35.6 AV	54.0	-18.4	1.28 H	93	26.6	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	60.9 PK	74.0	-13.1	2.26 V	157	62.6	-1.7
2	2390.00	48.2 AV	54.0	-5.8	2.26 V	157	49.9	-1.7
3	*2437.00	120.5 PK			2.26 V	157	122.3	-1.8
4	*2437.00	118.3 AV			2.26 V	157	120.1	-1.8
5	2483.50	61.8 PK	74.0	-12.2	2.26 V	157	63.5	-1.7
6	2483.50	49.3 AV	54.0	-4.7	2.26 V	157	51.0	-1.7
7	4874.00	50.5 PK	74.0	-23.5	1.72 V	250	48.3	2.2
8	4874.00	48.5 AV	54.0	-5.5	1.72 V	250	46.3	2.2
9	7311.00	46.9 PK	74.0	-27.1	1.14 V	92	37.9	9.0
10	7311.00	40.1 AV	54.0	-13.9	1.14 V	92	31.1	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 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	117.4 PK			2.04 H	285	119.2	-1.8
2	*2462.00	115.2 AV			2.04 H	285	117.0	-1.8
3	2483.50	55.1 PK	74.0	-18.9	2.04 H	285	56.8	-1.7
4	2483.50	45.4 AV	54.0	-8.6	2.04 H	285	47.1	-1.7
5	4924.00	45.7 PK	74.0	-28.3	1.92 H	130	43.4	2.3
6	4924.00	43.2 AV	54.0	-10.8	1.92 H	130	40.9	2.3
7	7386.00	45.5 PK	74.0	-28.5	2.39 H	292	36.2	9.3
8	7386.00	35.4 AV	54.0	-18.6	2.39 H	292	26.1	9.3
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	*2462.00	121.3 PK			1.96 V	180	123.1	-1.8
2	*2462.00	119.0 AV			1.96 V	180	120.8	-1.8
3	2483.50	62.3 PK	74.0	-11.7	1.96 V	180	64.0	-1.7
4	2483.50	49.7 AV	54.0	-4.3	1.96 V	180	51.4	-1.7
5	4924.00	50.7 PK	74.0	-23.3	1.10 V	290	48.4	2.3
6	4924.00	48.5 AV	54.0	-5.5	1.10 V	290	46.2	2.3
7	7386.00	46.7 PK	74.0	-27.3	2.48 V	70	37.4	9.3
8	7386.00	39.8 AV	54.0	-14.2	2.48 V	70	30.5	9.3

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.

802.11g

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	66.8 PK	74.0	-7.2	1.67 H	1	68.5	-1.7
2	2390.00	45.1 AV	54.0	-8.9	1.67 H	1	46.8	-1.7
3	*2412.00	107.4 PK			1.67 H	1	109.2	-1.8
4	*2412.00	98.2 AV			1.67 H	1	100.0	-1.8
5	4824.00	38.5 PK	74.0	-35.5	1.21 H	199	36.4	2.1
6	4824.00	26.1 AV	54.0	-27.9	1.21 H	199	24.0	2.1
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**	**73.8 PK**	**74.0**	**-0.2**	**1.55 V**	**232**	**75.5**	**-1.7**
2	2390.00	51.7 AV	54.0	-2.3	1.55 V	232	53.4	-1.7
3	*2412.00	113.8 PK			1.55 V	232	115.6	-1.8
4	*2412.00	104.1 AV			1.55 V	232	105.9	-1.8
5	4824.00	45.3 PK	74.0	-28.7	2.66 V	127	43.2	2.1
6	4824.00	35.3 AV	54.0	-18.7	2.66 V	127	33.2	2.1

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. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	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	66.2 PK	74.0	-7.8	1.28 H	100	67.9	-1.7
2	2390.00	47.5 AV	54.0	-6.5	1.28 H	100	49.2	-1.7
3	*2437.00	115.2 PK			1.28 H	100	117.0	-1.8
4	*2437.00	108.4 AV			1.28 H	100	110.2	-1.8
5	2483.50	67.2 PK	74.0	-6.8	1.28 H	100	68.9	-1.7
6	2483.50	48.1 AV	54.0	-5.9	1.28 H	100	49.8	-1.7
7	4874.00	38.6 PK	74.0	-35.4	1.52 H	205	36.4	2.2
8	4874.00	26.8 AV	54.0	-27.2	1.52 H	205	24.6	2.2
9	7311.00	45.1 PK	74.0	-28.9	1.94 H	159	36.1	9.0
10	7311.00	33.2 AV	54.0	-20.8	1.94 H	159	24.2	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	68.2 PK	74.0	-5.8	2.21 V	71	69.9	-1.7
2	2390.00	51.5 AV	54.0	-2.5	2.21 V	71	53.2	-1.7
3	*2437.00	121.6 PK			2.21 V	71	123.4	-1.8
4	*2437.00	112.2 AV			2.21 V	71	114.0	-1.8
5	2483.50	71.1 PK	74.0	-2.9	2.21 V	71	72.8	-1.7
6	2483.50	51.1 AV	54.0	-2.9	2.21 V	71	52.8	-1.7
7	4874.00	46.5 PK	74.0	-27.5	1.15 V	122	44.3	2.2
8	4874.00	36.2 AV	54.0	-17.8	1.15 V	122	34.0	2.2
9	7311.00	45.2 PK	74.0	-28.8	2.33 V	176	36.2	9.0
10	7311.00	33.9 AV	54.0	-20.1	2.33 V	176	24.9	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 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	111.8 PK			1.86 H	124	113.6	-1.8
2	*2462.00	101.5 AV			1.86 H	124	103.3	-1.8
3	2483.50	68.4 PK	74.0	-5.6	1.86 H	124	70.1	-1.7
4	2483.50	45.9 AV	54.0	-8.1	1.86 H	124	47.6	-1.7
5	4924.00	38.5 PK	74.0	-35.5	2.20 H	66	36.2	2.3
6	4924.00	26.3 AV	54.0	-27.7	2.20 H	66	24.0	2.3
7	7386.00	44.9 PK	74.0	-29.1	1.16 H	236	35.6	9.3
8	7386.00	32.9 AV	54.0	-21.1	1.16 H	236	23.6	9.3
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	*2462.00	117.4 PK			2.10 V	29	119.2	-1.8
2	*2462.00	107.8 AV			2.10 V	29	109.6	-1.8
3	2483.50	73.3 PK	74.0	-0.7	2.10 V	29	75.0	-1.7
4	2483.50	52.2 AV	54.0	-1.8	2.10 V	29	53.9	-1.7
5	4924.00	46.7 PK	74.0	-27.3	1.36 V	229	44.4	2.3
6	4924.00	36.2 AV	54.0	-17.8	1.36 V	229	33.9	2.3
7	7386.00	44.9 PK	74.0	-29.1	2.15 V	50	35.6	9.3
8	7386.00	32.6 AV	54.0	-21.4	2.15 V	50	23.3	9.3

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.

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	69.5 PK	74.0	-4.5	1.75 H	320	71.2	-1.7
2	2390.00	45.5 AV	54.0	-8.5	1.75 H	320	47.2	-1.7
3	*2412.00	111.8 PK			1.75 H	320	113.6	-1.8
4	*2412.00	99.5 AV			1.75 H	320	101.3	-1.8
5	4824.00	38.7 PK	74.0	-35.3	1.74 H	348	36.6	2.1
6	4824.00	25.9 AV	54.0	-28.1	1.74 H	348	23.8	2.1
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**	**73.8 PK**	**74.0**	**-0.2**	**2.03 V**	**30**	**75.5**	**-1.7**
2	2390.00	52.2 AV	54.0	-1.8	2.03 V	30	53.9	-1.7
3	*2412.00	117.4 PK			2.03 V	30	119.2	-1.8
4	*2412.00	104.2 AV			2.03 V	30	106.0	-1.8
5	4824.00	46.4 PK	74.0	-27.6	1.79 V	137	44.3	2.1
6	4824.00	35.5 AV	54.0	-18.5	1.79 V	137	33.4	2.1

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. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	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	68.1 PK	74.0	-5.9	2.20 H	161	69.8	-1.7
2	2390.00	45.9 AV	54.0	-8.1	2.20 H	161	47.6	-1.7
3	*2437.00	119.5 PK			2.20 H	161	121.3	-1.8
4	*2437.00	106.5 AV			2.20 H	161	108.3	-1.8
5	2483.50	67.2 PK	74.0	-6.8	2.20 H	161	68.9	-1.7
6	2483.50	45.6 AV	54.0	-8.4	2.20 H	161	47.3	-1.7
7	4874.00	38.4 PK	74.0	-35.6	2.41 H	281	36.2	2.2
8	4874.00	26.3 AV	54.0	-27.7	2.41 H	281	24.1	2.2
9	7311.00	45.5 PK	74.0	-28.5	1.72 H	243	36.5	9.0
10	7311.00	32.4 AV	54.0	-21.6	1.72 H	243	23.4	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	71.3 PK	74.0	-2.7	2.22 V	71	73.0	-1.7
2	2390.00	52.9 AV	54.0	-1.1	2.22 V	71	54.6	-1.7
3	*2437.00	123.5 PK			2.22 V	71	125.3	-1.8
4	*2437.00	110.7 AV			2.22 V	71	112.5	-1.8
5	2483.50	72.7 PK	74.0	-1.3	2.22 V	71	74.4	-1.7
6	2483.50	52.4 AV	54.0	-1.6	2.22 V	71	54.1	-1.7
7	4874.00	46.0 PK	74.0	-28.0	1.87 V	103	43.8	2.2
8	4874.00	36.2 AV	54.0	-17.8	1.87 V	103	34.0	2.2
9	7311.00	44.3 PK	74.0	-29.7	1.95 V	5	35.3	9.0
10	7311.00	33.3 AV	54.0	-20.7	1.95 V	5	24.3	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 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	111.9 PK			2.48 H	328	113.7	-1.8
2	*2462.00	98.4 AV			2.48 H	328	100.2	-1.8
3	2483.50	66.2 PK	74.0	-7.8	2.48 H	328	67.9	-1.7
4	2483.50	50.1 AV	54.0	-3.9	2.48 H	328	51.8	-1.7
5	4924.00	38.2 PK	74.0	-35.8	1.71 H	336	35.9	2.3
6	4924.00	26.2 AV	54.0	-27.8	1.71 H	336	23.9	2.3
7	7386.00	44.2 PK	74.0	-29.8	2.67 H	331	34.9	9.3
8	7386.00	33.3 AV	54.0	-20.7	2.67 H	331	24.0	9.3
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	*2462.00	116.8 PK			3.36 V	226	118.6	-1.8
2	*2462.00	103.9 AV			3.36 V	226	105.7	-1.8
3	2483.50	73.5 PK	74.0	-0.5	3.36 V	226	75.2	-1.7
4	2483.50	53.6 AV	54.0	-0.4	3.36 V	226	55.3	-1.7
5	4924.00	45.9 PK	74.0	-28.1	1.52 V	90	43.6	2.3
6	4924.00	35.6 AV	54.0	-18.4	1.52 V	90	33.3	2.3
7	7386.00	44.8 PK	74.0	-29.2	2.16 V	349	35.5	9.3
8	7386.00	32.8 AV	54.0	-21.2	2.16 V	349	23.5	9.3

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.

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	61.6 PK	74.0	-12.4	1.32 H	270	63.3	-1.7
2	2390.00	49.2 AV	54.0	-4.8	1.32 H	270	50.9	-1.7
3	*2422.00	105.2 PK			1.32 H	270	107.0	-1.8
4	*2422.00	97.4 AV			1.32 H	270	99.2	-1.8
5	4844.00	38.1 PK	74.0	-35.9	2.45 H	303	36.0	2.1
6	4844.00	26.1 AV	54.0	-27.9	2.45 H	303	24.0	2.1
7	7266.00	45.8 PK	74.0	-28.2	2.28 H	216	37.0	8.8
8	7266.00	33.2 AV	54.0	-20.8	2.28 H	216	24.4	8.8
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	2.35 V	27	66.4	-1.7
2	2390.00	53.7 AV	54.0	-0.3	2.35 V	27	55.4	-1.7
3	*2422.00	113.8 PK			2.35 V	27	115.6	-1.8
4	*2422.00	102.0 AV			2.35 V	27	103.8	-1.8
5	4844.00	46.2 PK	74.0	-27.8	1.66 V	42	44.1	2.1
6	4844.00	35.4 AV	54.0	-18.6	1.66 V	42	33.3	2.1
7	7266.00	45.1 PK	74.0	-28.9	1.87 V	324	36.3	8.8
8	7266.00	33.6 AV	54.0	-20.4	1.87 V	324	24.8	8.8

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.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 6	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	61.4 PK	74.0	-12.6	2.07 H	290	63.1	-1.7
2	2390.00	49.6 AV	54.0	-4.4	2.07 H	290	51.3	-1.7
3	*2437.00	108.6 PK			2.07 H	290	110.4	-1.8
4	*2437.00	97.5 AV			2.07 H	290	99.3	-1.8
5	2483.50	60.5 PK	74.0	-13.5	2.07 H	290	62.2	-1.7
6	2483.50	50.1 AV	54.0	-3.9	2.07 H	290	51.8	-1.7
7	4874.00	38.4 PK	74.0	-35.6	2.28 H	335	36.2	2.2
8	4874.00	26.0 AV	54.0	-28.0	2.28 H	335	23.8	2.2
9	7311.00	44.7 PK	74.0	-29.3	2.06 H	318	35.7	9.0
10	7311.00	33.0 AV	54.0	-21.0	2.06 H	318	24.0	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	67.5 PK	74.0	-6.5	2.02 V	69	69.2	-1.7
2	2390.00	53.5 AV	54.0	-0.5	2.02 V	69	55.2	-1.7
3	*2437.00	114.9 PK			2.02 V	69	116.7	-1.8
4	*2437.00	103.8 AV			2.02 V	69	105.6	-1.8
5	2483.50	67.2 PK	74.0	-6.8	2.02 V	69	68.9	-1.7
6	2483.50	53.6 AV	54.0	-0.4	2.02 V	69	55.3	-1.7
7	4874.00	46.0 PK	74.0	-28.0	1.86 V	149	43.8	2.2
8	4874.00	35.7 AV	54.0	-18.3	1.86 V	149	33.5	2.2
9	7311.00	44.2 PK	74.0	-29.8	2.32 V	194	35.2	9.0
10	7311.00	33.2 AV	54.0	-20.8	2.32 V	194	24.2	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 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	106.8 PK			1.16 H	281	108.6	-1.8
2	*2452.00	94.3 AV			1.16 H	281	96.1	-1.8
3	2483.50	59.9 PK	74.0	-14.1	1.16 H	281	61.6	-1.7
4	2483.50	47.2 AV	54.0	-6.8	1.16 H	281	48.9	-1.7
5	4904.00	38.4 PK	74.0	-35.6	2.24 H	95	36.2	2.2
6	4904.00	26.3 AV	54.0	-27.7	2.24 H	95	24.1	2.2
7	7356.00	44.5 PK	74.0	-29.5	1.86 H	290	35.4	9.1
8	7356.00	32.4 AV	54.0	-21.6	1.86 H	290	23.3	9.1
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	112.2 PK			2.25 V	25	114.0	-1.8
2	*2452.00	101.0 AV			2.25 V	25	102.8	-1.8
3	2483.50	65.7 PK	74.0	-8.3	2.25 V	25	67.4	-1.7
4	**2483.50**	**53.8 AV**	**54.0**	**-0.2**	**2.25 V**	**25**	**55.5**	**-1.7**
5	4904.00	45.8 PK	74.0	-28.2	1.67 V	301	43.6	2.2
6	4904.00	35.9 AV	54.0	-18.1	1.67 V	301	33.7	2.2
7	7356.00	45.3 PK	74.0	-28.7	2.03 V	280	36.2	9.1
8	7356.00	33.3 AV	54.0	-20.7	2.03 V	280	24.2	9.1

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. " * ": Fundamental frequency.

Below 1GHz Data:

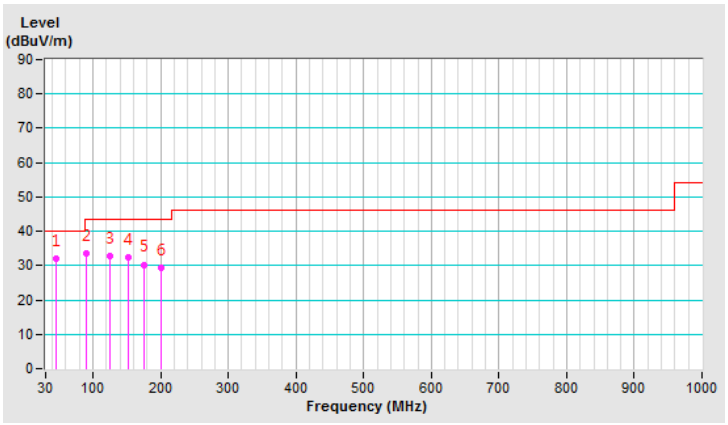
802.11b

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	45.23	31.9 QP	40.0	-8.1	2.00 H	304	39.7	-7.8
2	89.85	33.4 QP	43.5	-10.1	4.00 H	90	47.1	-13.7
3	124.99	32.8 QP	43.5	-10.7	2.00 H	360	42.2	-9.4
4	151.66	32.5 QP	43.5	-11.0	3.00 H	49	40.2	-7.7
5	175.79	30.3 QP	43.5	-13.2	2.00 H	287	39.1	-8.8
6	199.99	29.2 QP	43.5	-14.3	1.00 H	274	40.1	-10.9

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.

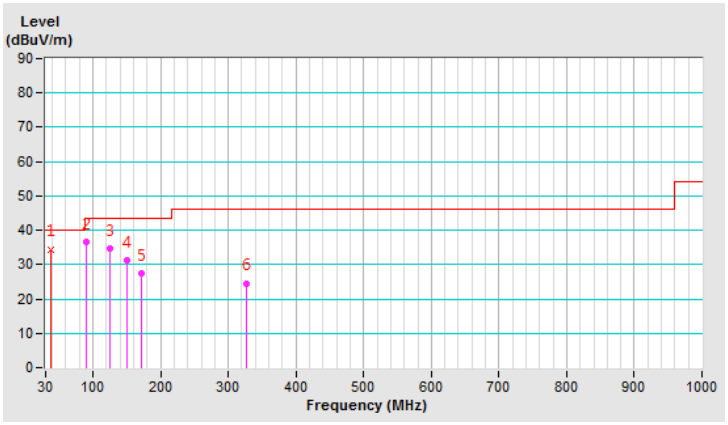


CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	38.04	34.5 QP	40.0	-5.5	1.00 V	216	42.8	-8.3
2	90.29	36.7 QP	43.5	-6.8	1.00 V	295	50.4	-13.7
3	125.01	34.7 QP	43.5	-8.8	1.00 V	107	44.1	-9.4
4	151.10	31.4 QP	43.5	-12.1	1.00 V	26	39.1	-7.7
5	171.91	27.3 QP	43.5	-16.2	1.00 V	6	35.8	-8.5
6	325.90	24.6 QP	46.0	-21.4	1.00 V	87	30.6	-6.0

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 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. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
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: Dec. 12, 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.

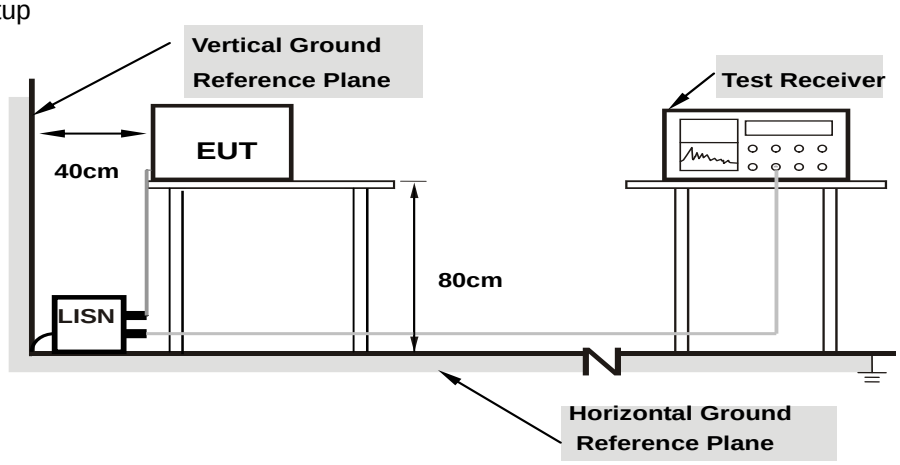
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

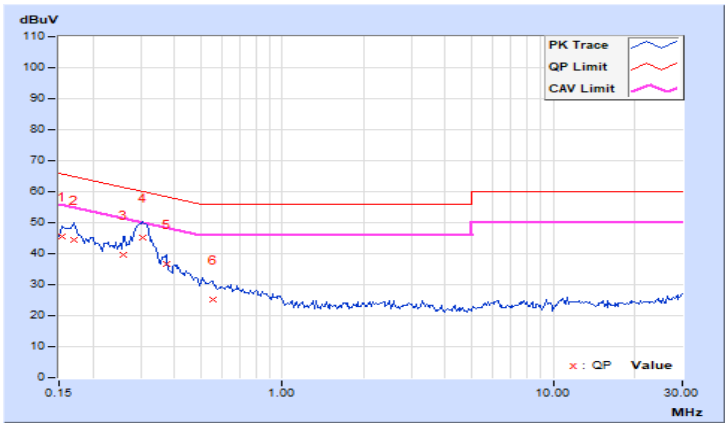
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.99	35.67	18.30	45.66	28.29	65.79	55.79	-20.13	-27.50
2	0.16953	9.99	34.62	20.07	44.61	30.06	64.98	54.98	-20.37	-24.92
3	0.25938	9.99	29.53	22.58	39.52	32.57	61.45	51.45	-21.93	-18.88
4	0.30625	10.00	35.16	28.19	45.16	38.19	60.07	50.07	-14.91	-11.88
5	0.37266	10.00	26.83	16.80	36.83	26.80	58.44	48.44	-21.61	-21.64
6	0.55234	10.01	15.03	7.89	25.04	17.90	56.00	46.00	-30.96	-28.10

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.

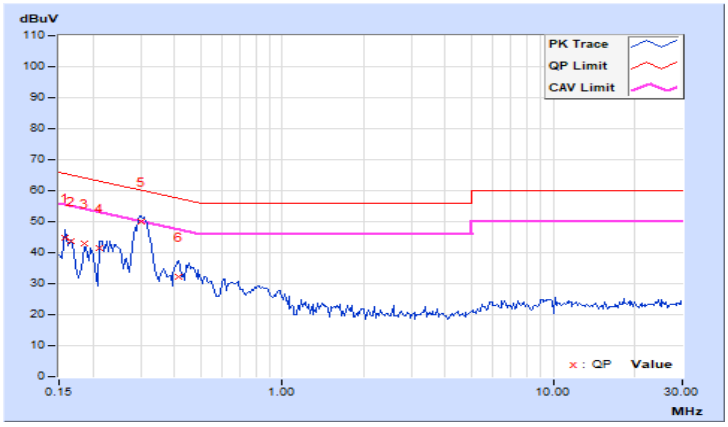


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.99	34.94	21.21	44.93	31.20	65.58	55.58	-20.65	-24.38
2	0.16562	9.99	33.77	22.54	43.76	32.53	65.18	55.18	-21.42	-22.65
3	0.18516	9.99	32.82	19.01	42.81	29.00	64.25	54.25	-21.44	-25.25
4	0.21250	9.99	31.36	23.15	41.35	33.14	63.11	53.11	-21.76	-19.97
5	**0.30234**	**10.00**	**40.09**	**31.71**	**50.09**	**41.71**	**60.18**	**50.18**	**-10.09**	**-8.47**
6	0.41563	10.01	22.18	15.56	32.19	25.57	57.54	47.54	-25.35	-21.97

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.

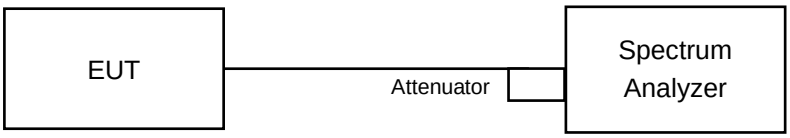


4.3 6dB Bandwidth Measurement

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

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	7.07	0.5	PASS
11	2462	7.10	7.10	0.5	PASS

802.11g

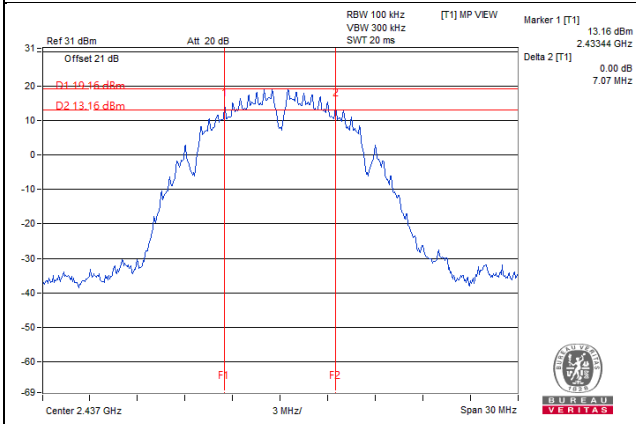
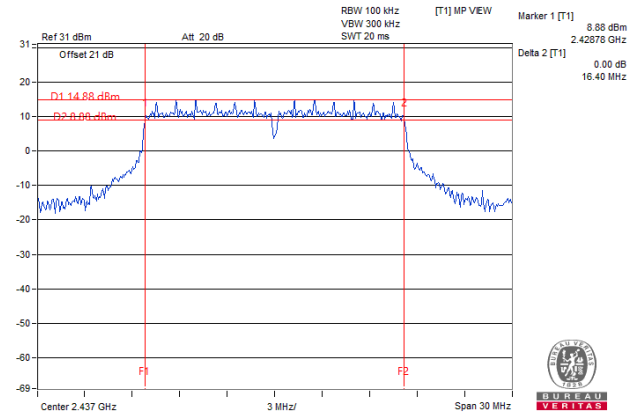
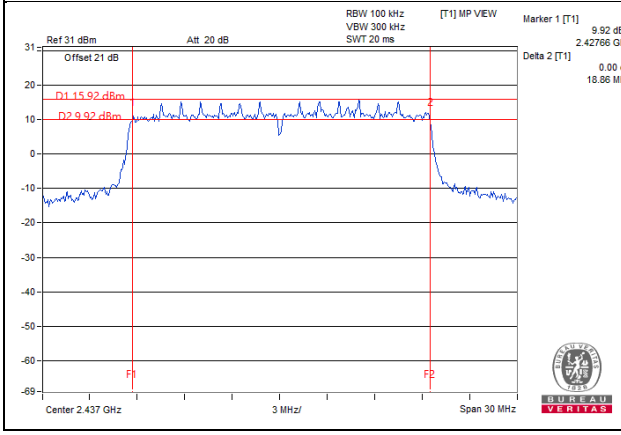
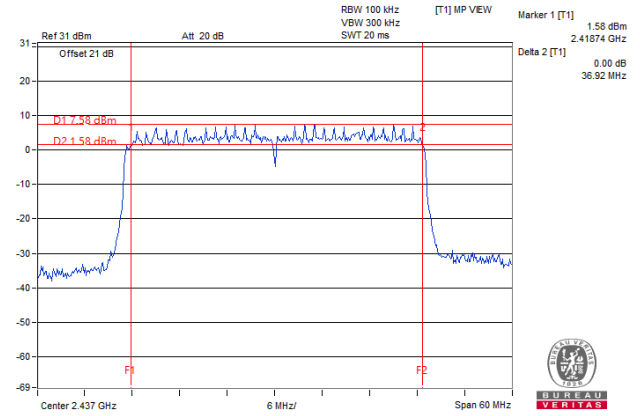
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.44	16.45	0.5	PASS
6	2437	16.40	16.40	0.5	PASS
11	2462	16.42	16.42	0.5	PASS

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	19.11	19.02	0.5	Pass
6	2437	19.05	18.86	0.5	Pass
11	2462	19.08	19.03	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	37.48	37.52	0.5	Pass
6	2437	37.68	36.92	0.5	Pass
9	2452	37.72	36.96	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 0 : CH6**
	
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

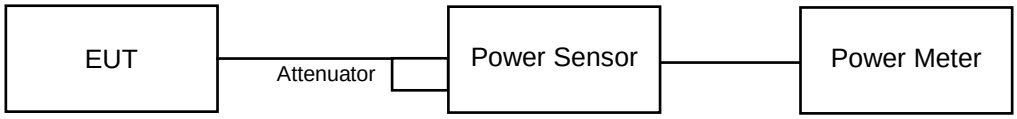
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	26.04	27.12	917.02	29.62	30	Pass
6	2437	26.06	26.82	884.484	29.47	30	Pass
11	2462	26.04	26.52	850.536	29.30	30	Pass

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.99	21.53	300.358	24.78	30	Pass
6	2437	26.29	26.09	832.041	29.20	30	Pass
11	2462	21.96	21.57	300.585	24.78	30	Pass

VHT20

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.16	19.95	202.608	23.07	30	Pass
6	2437	26.27	26.20	840.512	29.25	30	Pass
11	2462	20.14	19.93	201.677	23.05	30	Pass

VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.43	19.18	170.494	22.32	30	Pass
6	2437	21.45	21.40	277.675	24.44	30	Pass
9	2452	19.28	19.01	164.339	22.16	30	Pass

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.36	20.11	211.208	23.25	30	Pass
6	2437	26.43	26.38	874.052	29.42	30	Pass
11	2462	20.35	20.12	211.195	23.25	30	Pass

802.11ax (HE40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.60	19.39	178.097	22.51	30	Pass
6	2437	21.64	21.60	290.425	24.63	30	Pass
9	2452	19.47	19.21	171.88	22.35	30	Pass

Beamforming Mode

VHT20

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.16	19.95	202.608	23.07	30	Pass
6	2437	26.27	26.20	840.512	29.25	30	Pass
11	2462	20.14	19.93	201.677	23.05	30	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi, so the power limit shall not be reduced.

VHT40

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.43	19.18	170.494	22.32	30	Pass
6	2437	21.45	21.40	277.675	24.44	30	Pass
9	2452	19.28	19.01	164.339	22.16	30	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.36	20.11	211.208	23.25	30	Pass
6	2437	26.43	26.38	874.052	29.42	30	Pass
11	2462	20.35	20.12	211.195	23.25	30	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE40)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	19.60	19.39	178.097	22.51	30	Pass
6	2437	21.64	21.60	290.425	24.63	30	Pass
9	2452	19.47	19.21	171.88	22.35	30	Pass

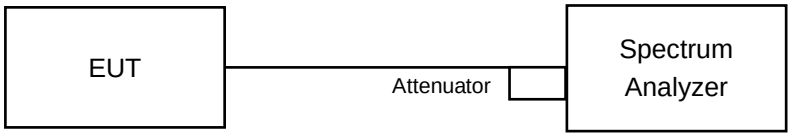
Note: 1. Directional gain = 3.73dBi < 6dBi, so the power limit shall not be reduced.

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

For 802.11b, 802.11g

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.

For 802.11ax (HE20), 802.11ax (HE40)

a) Measure the duty cycle (x).
b) Set instrument center frequency to DTS channel center frequency.
c) Set span to at least 1.5 times the OBW.
d) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
e) Set VBW ≥3 x RBW.
f) Detector = power averaging (RMS) or sample detector (when RMS not available).
g) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
h) Sweep time = auto couple.
i) Do not use sweep triggering. Allow sweep to “free run”.
j) Employ trace averaging (RMS) mode over a minimum of 100 traces.
k) Use the peak marker function to determine the maximum amplitude level.
l) Add 10 log (1/x), where x is the duty cycle measured in step (a, to the measured PSD to compute the average PSD during the actual transmission time.

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	-3.62	3.01	-0.61	8	Pass
	6	2437	-4.05	3.01	-1.04	8	Pass
	11	2462	-3.74	3.01	-0.73	8	Pass
1	1	2412	-3.26	3.01	-0.25	8	Pass
	6	2437	-4.08	3.01	-1.07	8	Pass
	11	2462	-3.04	3.01	-0.03	8	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi , so the power density limit shall not be reduced.

802.11g

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-8.55	3.01	-5.54	8	Pass
	6	2437	-5.89	3.01	-2.88	8	Pass
	11	2462	-7.10	3.01	-4.09	8	Pass
1	1	2412	-8.24	3.01	-5.23	8	Pass
	6	2437	-4.20	3.01	-1.19	8	Pass
	11	2462	-9.48	3.01	-6.47	8	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi , so the power density limit shall not be reduced.

802.11ax (HE20)

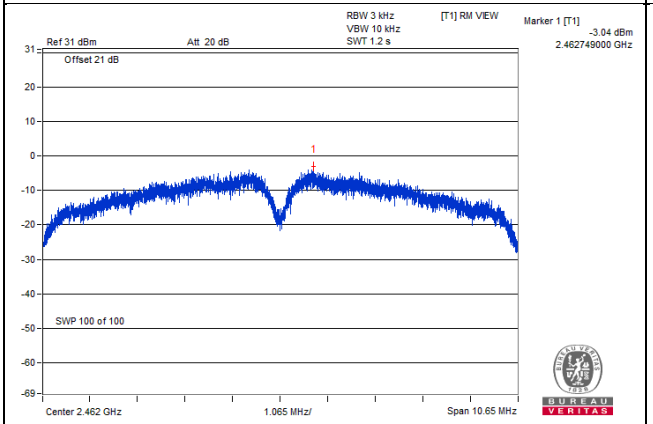
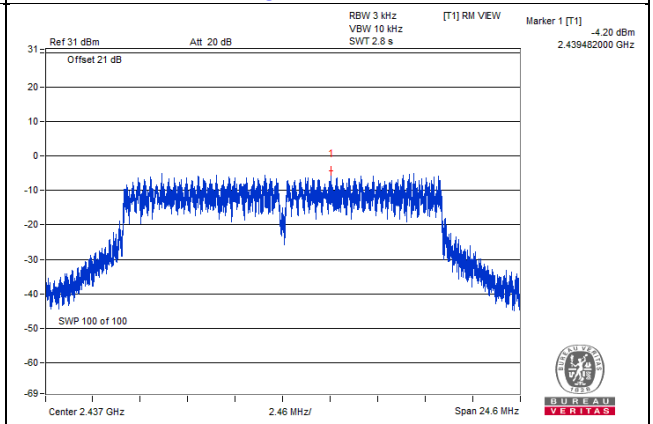
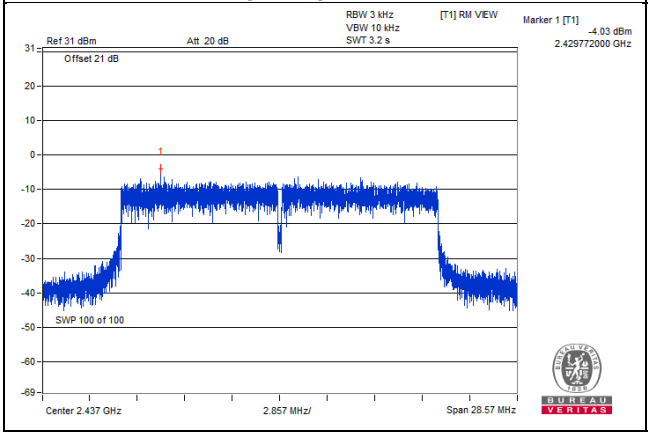
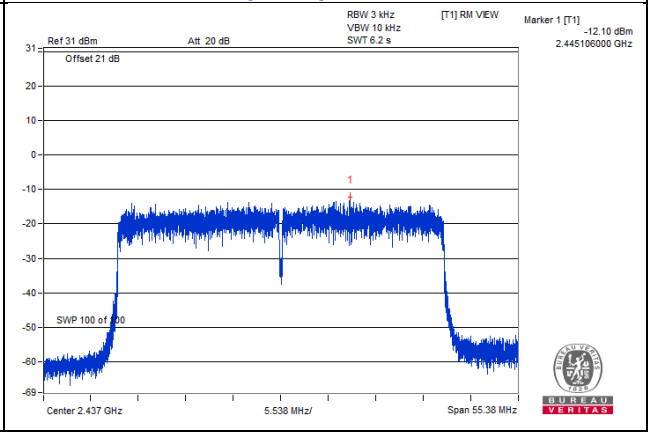
TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-11.51	3.01	0.10	-8.40	8	Pass
	6	2437	-4.03	3.01	0.10	-0.92	8	Pass
	11	2462	-10.28	3.01	0.10	-7.17	8	Pass
1	1	2412	-11.91	3.01	0.10	-8.80	8	Pass
	6	2437	-5.86	3.01	0.10	-2.75	8	Pass
	11	2462	-12.47	3.01	0.10	-9.36	8	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi , so the power density limit shall not be reduced.
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

TX chain	Channel	Freq. (MHz)	PSD W/O Duty Factor (dBm/3kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	3	2422	-15.81	3.01	0.18	-12.62	8	Pass
	6	2437	-13.46	3.01	0.18	-10.27	8	Pass
	9	2452	-15.97	3.01	0.18	-12.78	8	Pass
1	3	2422	-16.87	3.01	0.18	-13.68	8	Pass
	6	2437	-12.10	3.01	0.18	-8.91	8	Pass
	9	2452	-16.46	3.01	0.18	-13.27	8	Pass

Note: 1. Directional gain = 3.73dBi < 6dBi , so the power density limit shall not be reduced.
2. Refer to section 3.3 for duty cycle spectrum plot.

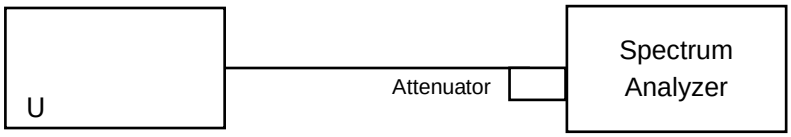
Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH11	**802.11g / Chain 1 : CH6**
	
802.11ax (HE20) / Chain 0 : CH6	**802.11ax (HE40) / Chain 1 : CH6**
	

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

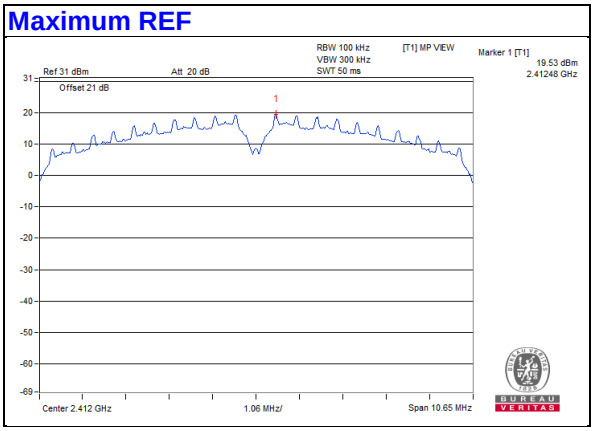
Same as Item 4.3.6

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.

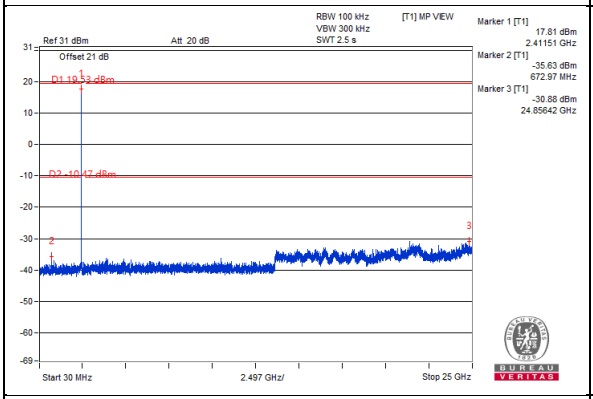
802.11b

Maximum REF

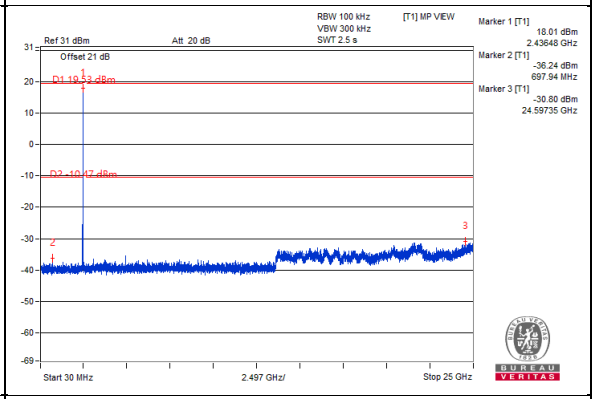


Chain 0

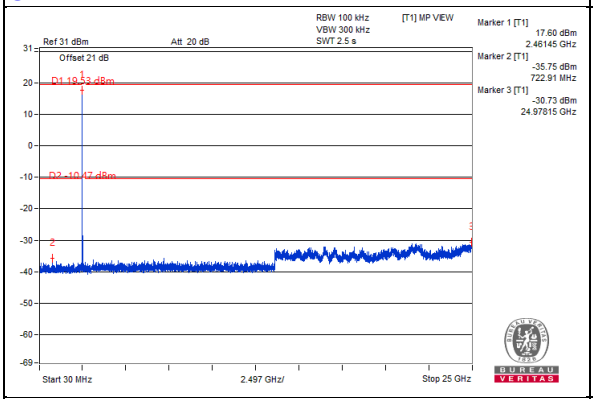
CH 1



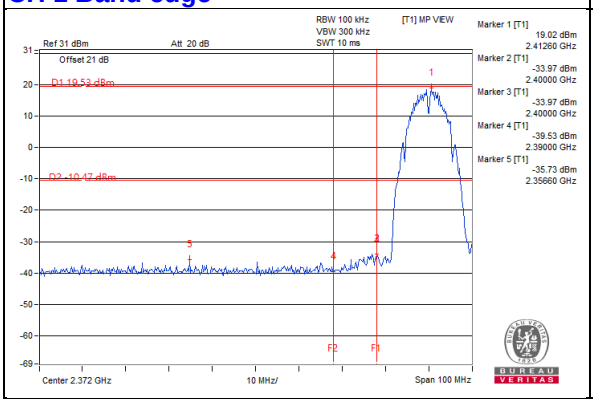
CH 6



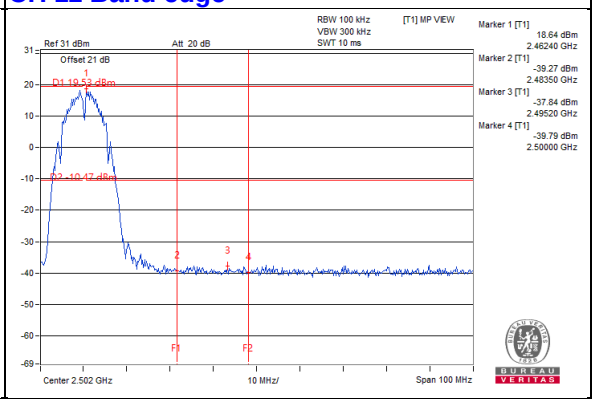
CH 11



CH 1 Band edge

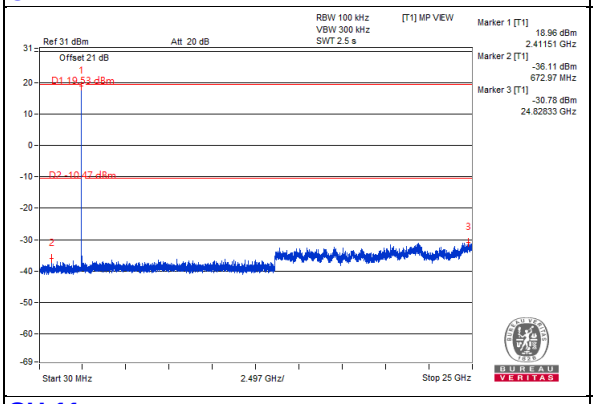


CH 11 Band edge

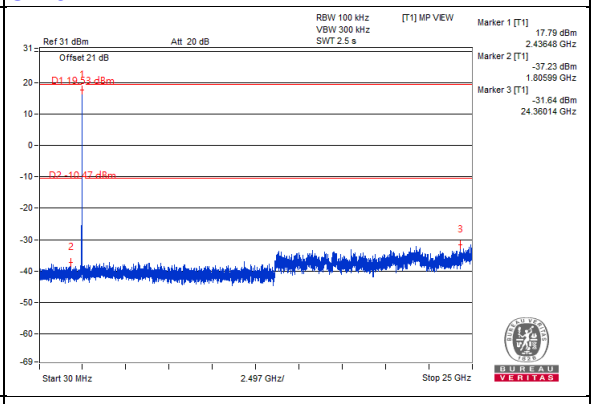


Chain 1

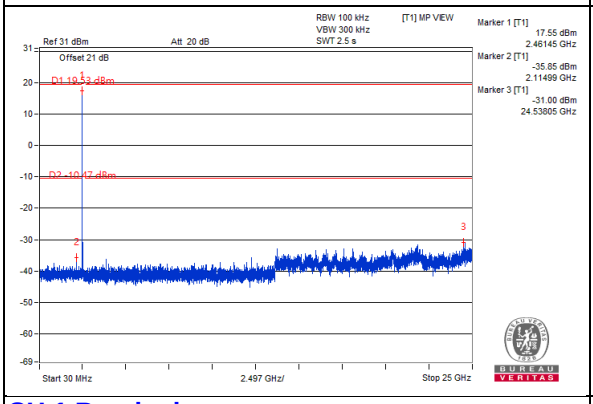
CH 1



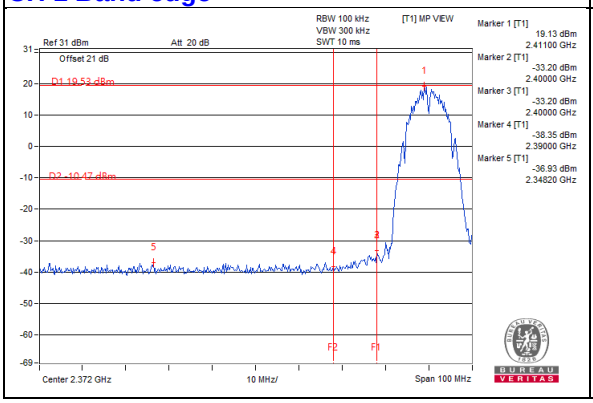
CH 6



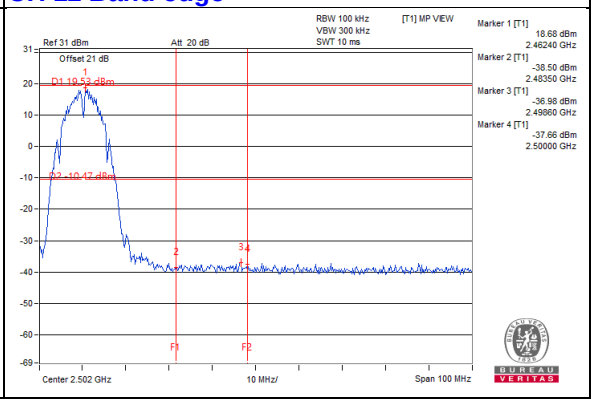
CH 11



CH 1 Band edge

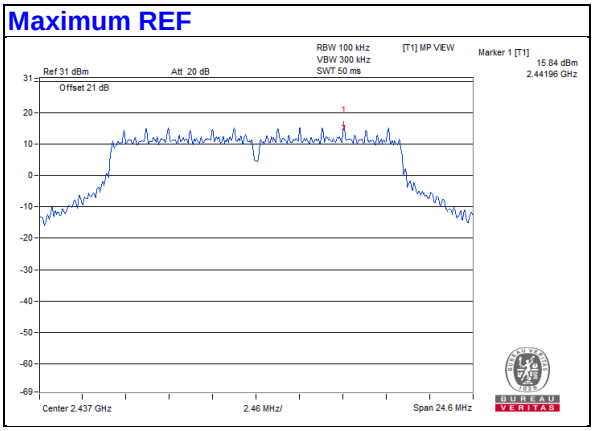


CH 11 Band edge



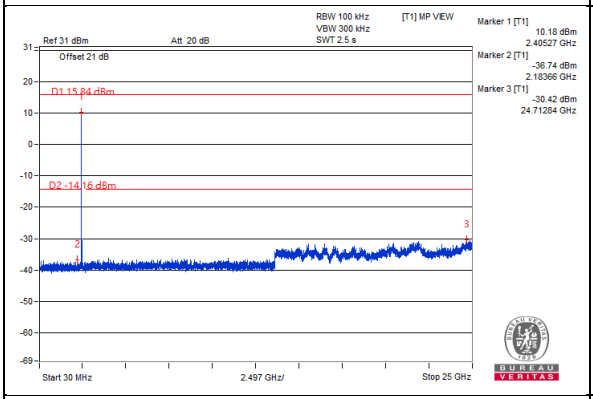
802.11g

Maximum REF

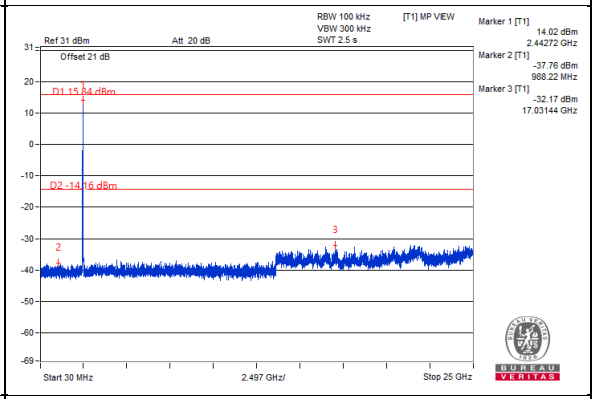


Chain 0

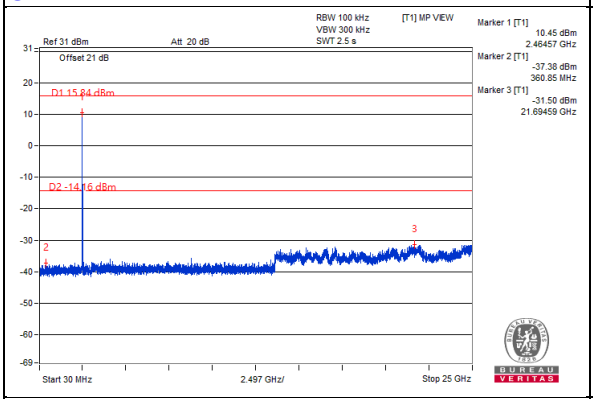
CH 1



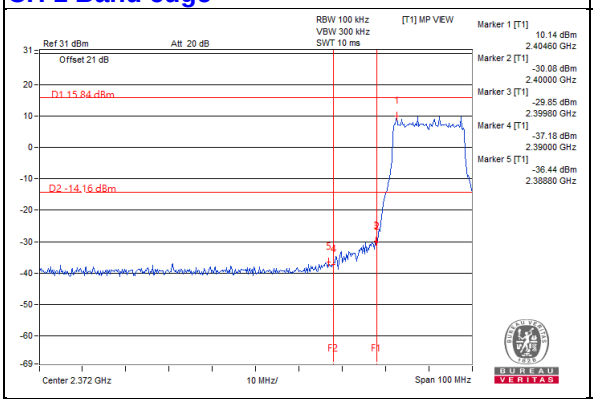
CH 6



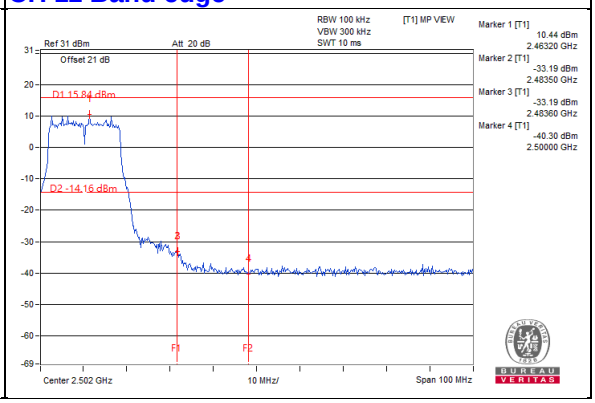
CH 11



CH 1 Band edge

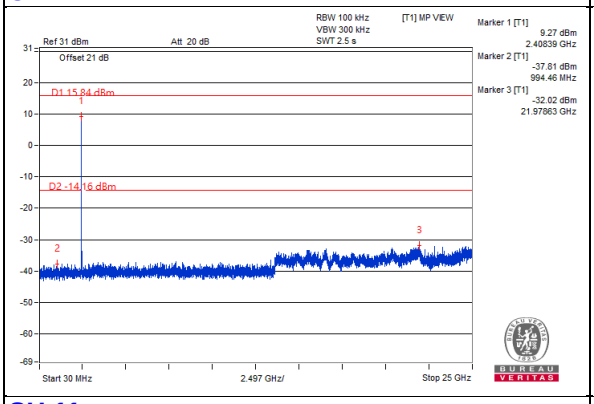


CH 11 Band edge

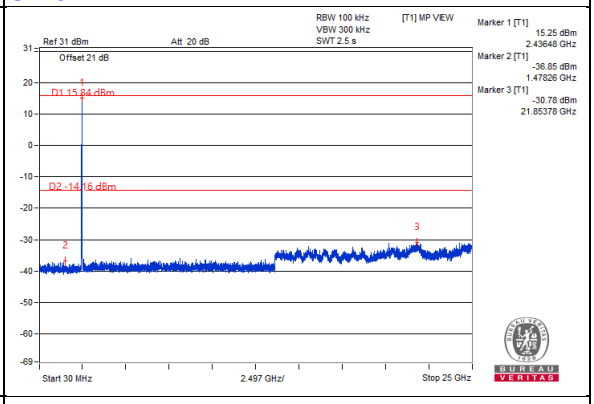


Chain 1

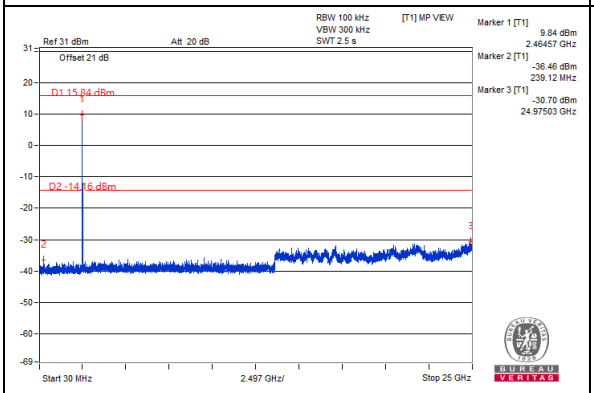
CH 1



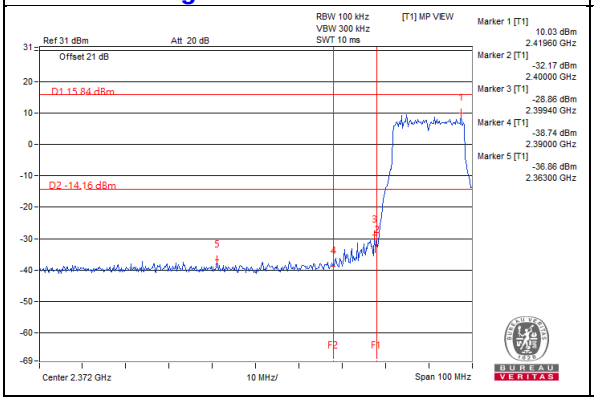
CH 6



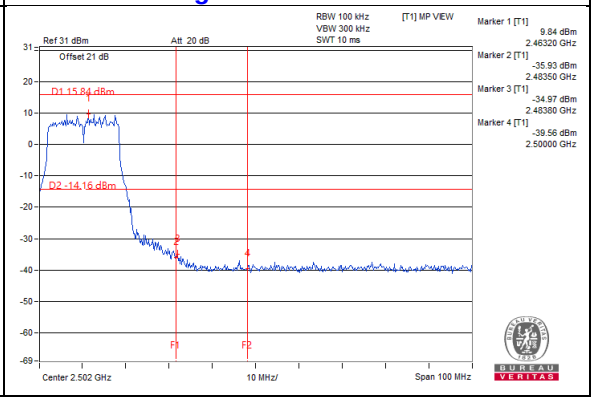
CH 11



CH 1 Band edge

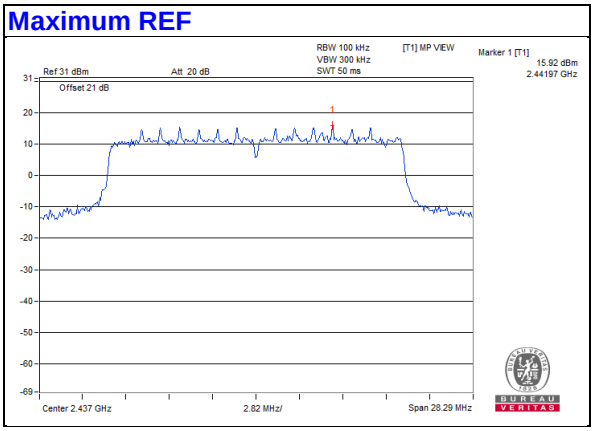


CH 11 Band edge



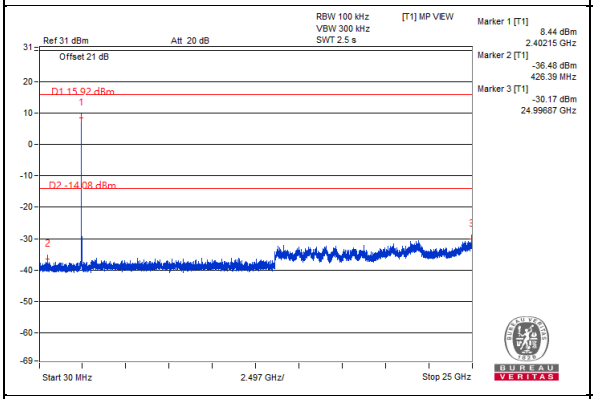
802.11ax (HE20)

Maximum REF

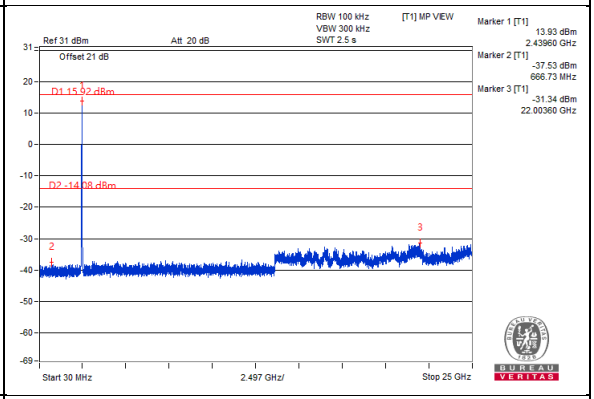


Chain 0

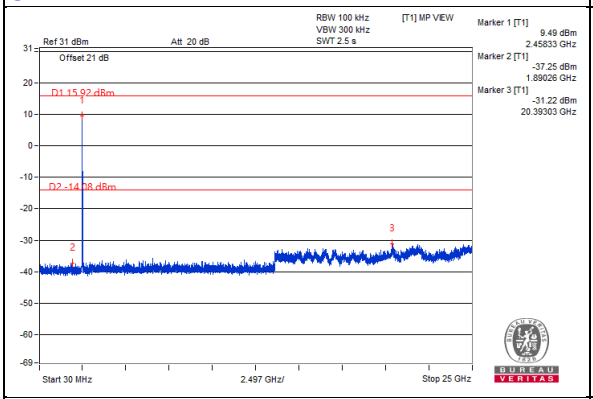
CH 1



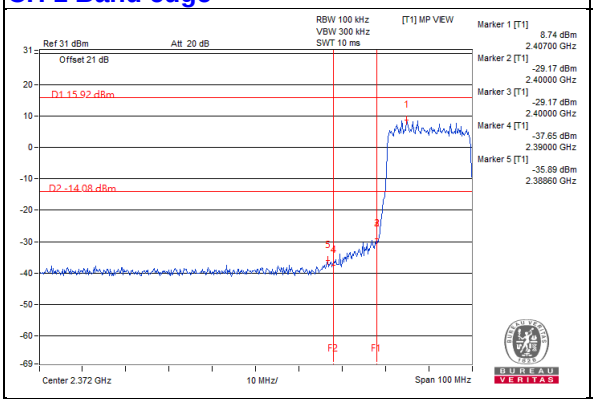
CH 6



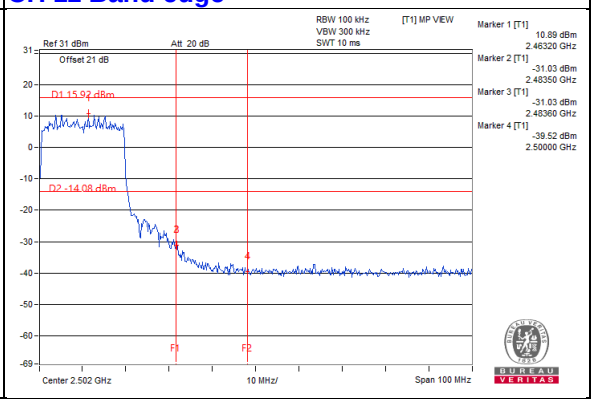
CH 11



CH 1 Band edge

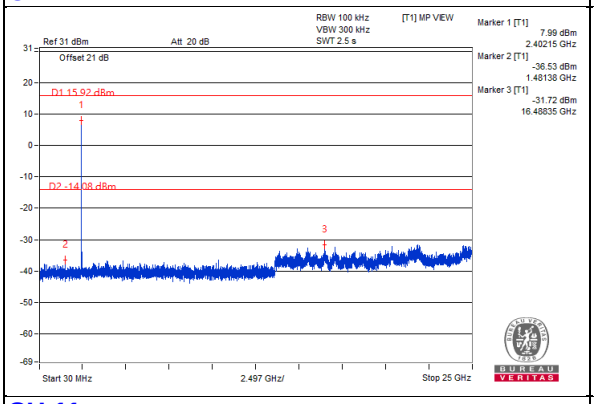


CH 11 Band edge

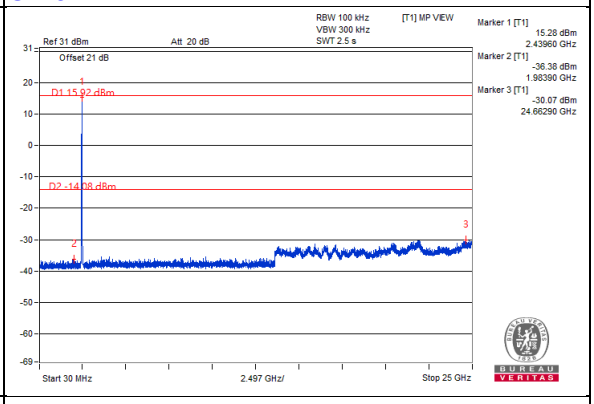


Chain 1

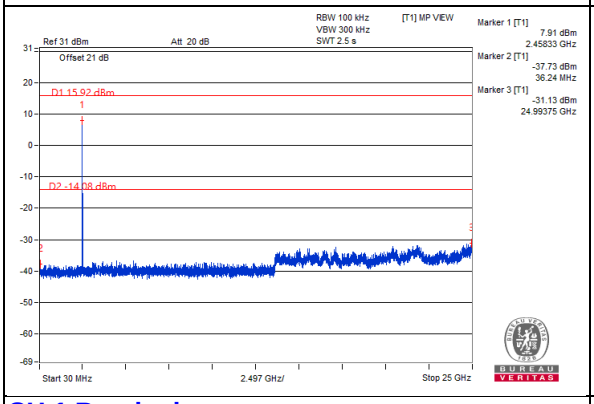
CH 1



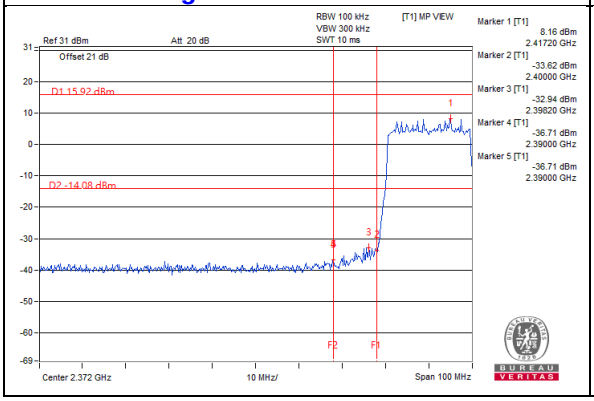
CH 6



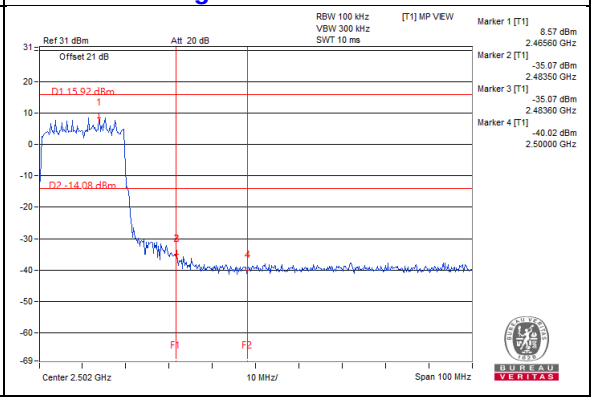
CH 11



CH 1 Band edge

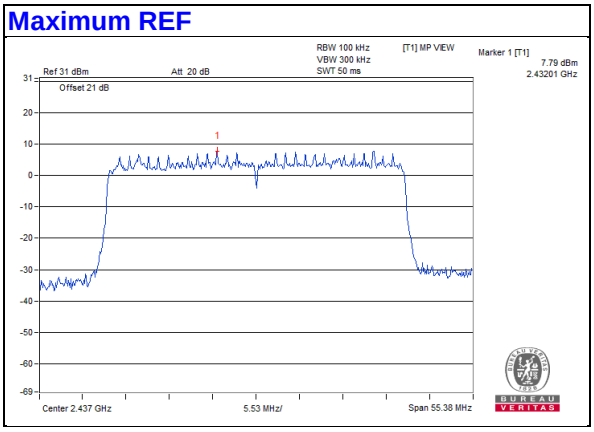


CH 11 Band edge



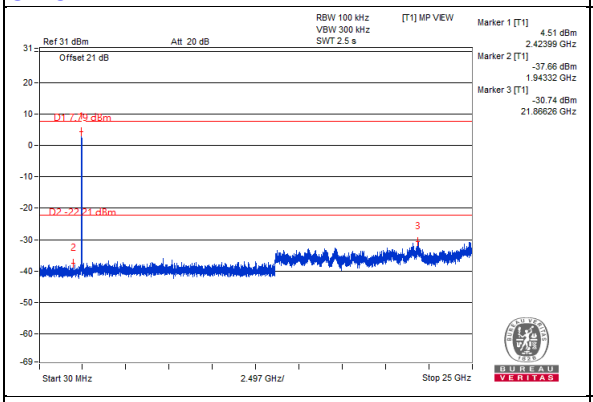
802.11ax (HE40)

Maximum REF

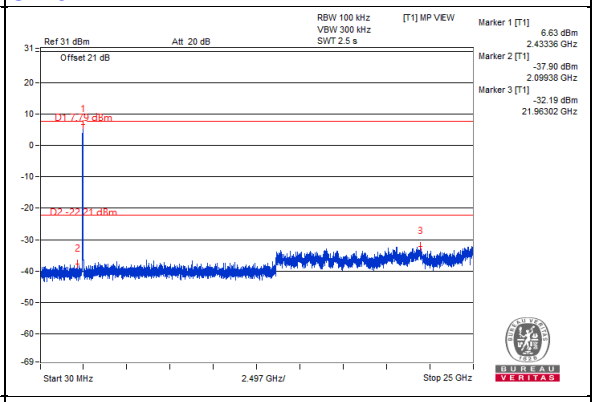


Chain 0

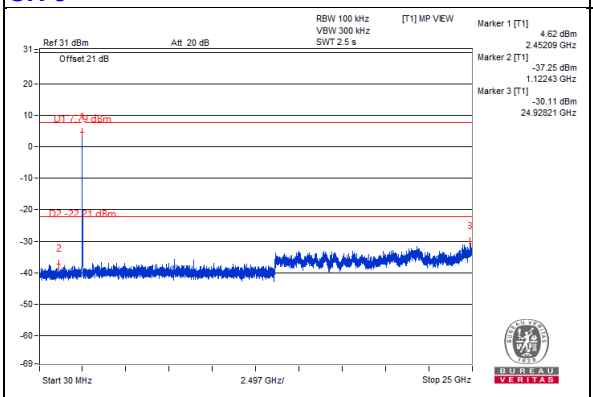
CH 3



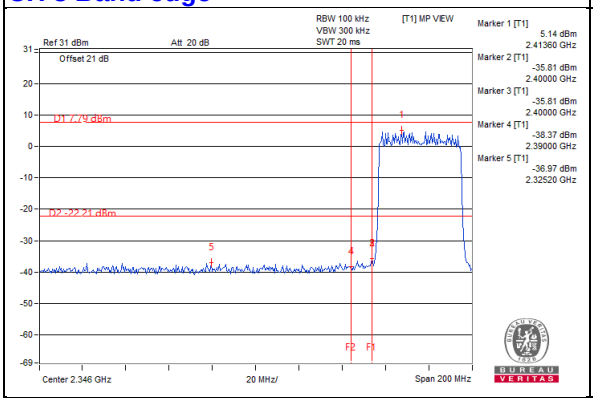
CH 6



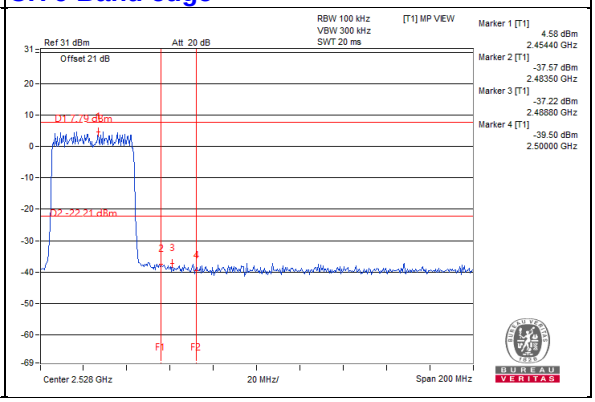
CH 9



CH 3 Band edge

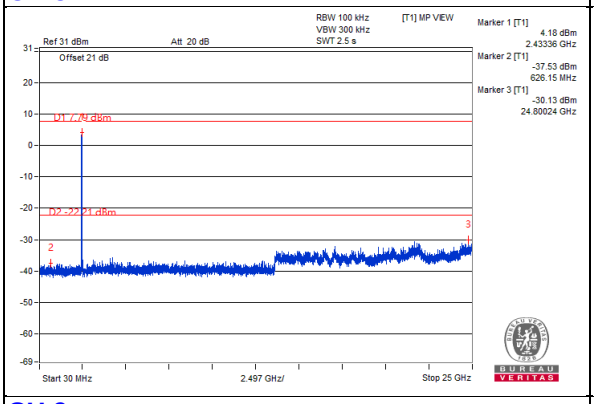


CH 9 Band edge

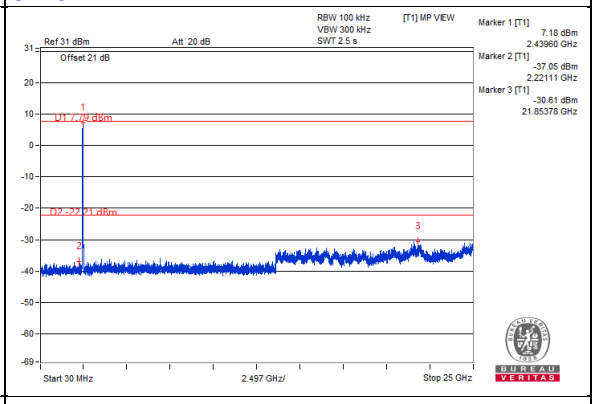


Chain 1

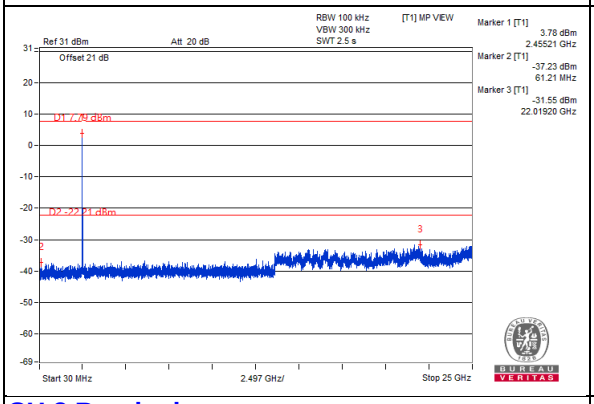
CH 3



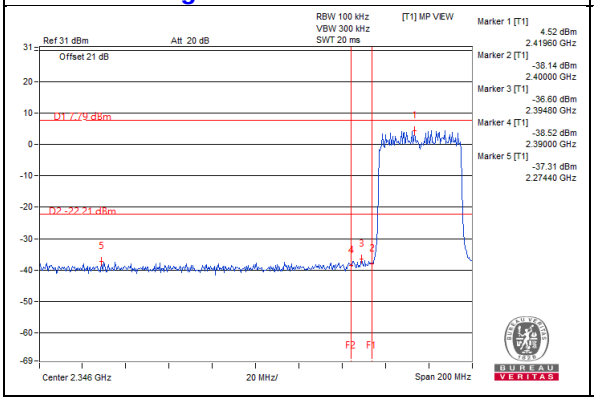
CH 6



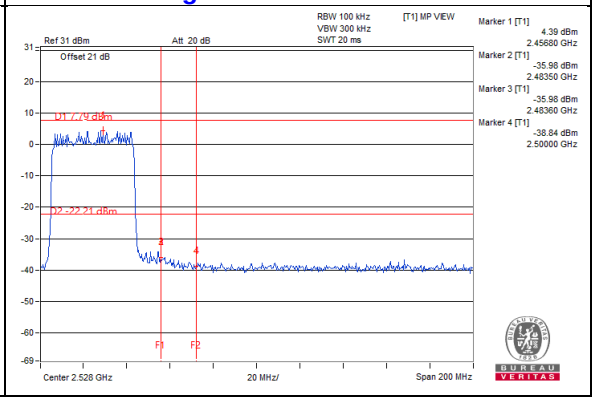
CH 9



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 accredited and approved 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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