FCC Test Report

Report No.:	RF190617E03B
FCC ID:	APYHRO00274
Received Date:	July 09, 2019
Test Date:	July 25 to 30, 2019
Issued Date:	Aug. 22, 2019
Applicant:	Sharp Corporation
Address:	1 Takumi-cho, Sakai-ku, Sakai City Osaka, 590-8522 Japan
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

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF190617E03B	Original release.	Aug. 22, 2019

1 Certificate of Conformity

Product:	Wireless router
Sample Status:	ENGINEERING SAMPLE
Applicant:	Sharp Corporation
Test Date:	July 25 to 30, 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:** Aug. 22, 2019

Wendy Wu / Specialist

Approved by : _____ , **Date:** Aug. 22, 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 -8.70dB at 0.50547MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.4dB 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	No antenna connector is used.
-	Occupied Bandwidth Measurement	-	Reference only

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	Wireless router
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	Refer to Note
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 300Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	247.151 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Cradle x1 (Option, Model: J03W039.02) AC Adapter x 1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

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

2. The EUT must be supplied one power adapter or Battery as the following table:

Adapter		
Model No.		Spec.
SB-AC19TCPD		Input: 100-240V, 0.7A, 50/60Hz Output: 5V/7V/9V/12V, 3.0A/3.0A/3.0A/2.25A DC output cable (Unshielded, 1.6m)
Battery		
Brand	Model No.	Spec.
NA	UBATIA301AFN2	3.85 Vdc, 4000mAh

3. For AC power conducted emissions, the EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from USB adapter (positioned: X-plane)
Mode B	Power from USB adapter (positioned: Y-plane)
Mode C	Power from USB adapter (positioned: Z-plane)
Mode D	**Power from Cradle**
Note: From the above modes, the worst case was found in **Mode D**. Therefore only the test data of the mode was recorded in this report.	

4. For radiated emissions, the EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from USB adapter (positioned: X-plane)
Mode B	Power from USB adapter (positioned: Y-plane)
Mode C	Power from USB adapter (positioned: Z-plane)
Mode D	Power from Battery (positioned: Z-plane)
Mode E	**Power from Cradle**
Note: From the above modes, the worst case was found in **Mode E**. Therefore only the test data of the mode was recorded in this report.	

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

Antenna No.	RF Chain No.	Antenna Net Gain(dBi)	Frequency range (MHz)	Antenna Type	Connector Type
1	Main	Please refer to below table	Please refer to below table	PIFA	NA
2	Aux	Please refer to below table	Please refer to below table	PIFA	NA
3	Aux / chain0	Please refer to below table	Please refer to below table	PIFA	NA
4	Aux / chain1	Please refer to below table	Please refer to below table	PIFA	NA

Antenna gain list					
Band	Freq. Range (MHz)	Gain (dBi)			
		Ant 1 (Main)	Ant 2 (Aux)	Ant 3 (Aux / chain0)	Ant 4 (Aux / chain1)
WLAN 2.4GHz	2.4~2.4835	NA	NA	-0.843	-0.484
WCDMA II (B2)	1850~1910	-2.01	-2.67	-2.67	-3.77
WCDMA IV (B4)	1710~1755	-2.63	-3.67	-3.67	-3.67
WCDMA V (B5)	824~849	-2.21	NA	NA	NA
LTE Band (2)	1850~1910	-2.01	-2.67	-2.67	-3.77
LTE Band (4)	1710~1755	-2.63	-3.67	-3.67	-3.67
LTE Band (5)	824~849	-2.21	NA	NA	NA
LTE Band (12)	698~716	-6.05	NA	NA	NA
LTE Band (17)	704~716	-6.05	NA	NA	NA

6. The EUT incorporates a MIMO function:

MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX

7. 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):

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):

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

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	11	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	11	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Test Condition:

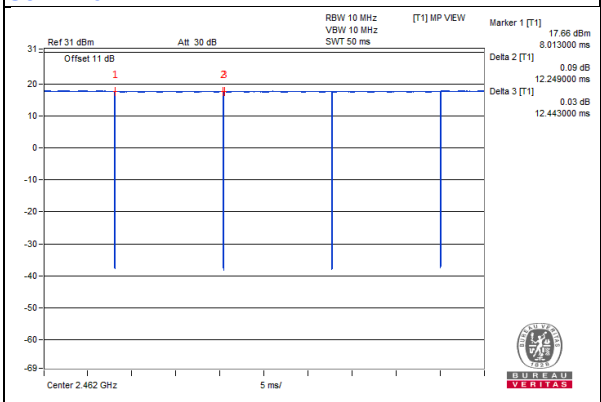
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
RE<1G	22deg. C, 69%RH	120Vac, 60Hz	Rayn Du
PLC	23deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

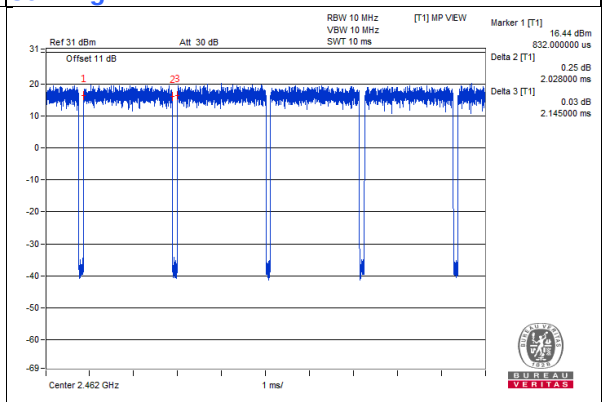
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11b: Duty cycle = 12.249 ms/12.443 ms= 0.984
802.11g: Duty cycle = 2.028 ms/2.145 ms= 0.945, Duty factor = 10 * log (1/Duty cycle) = 0.24
802.11n (HT20): Duty cycle = 1.889 ms /2.044 ms = 0.929, Duty factor = 10 * log (1/Duty cycle) = 0.32
802.11n (HT40): Duty cycle = 0.934 ms /1.063 ms = 0.894, Duty factor = 10 * log (1/Duty cycle) = 0.56

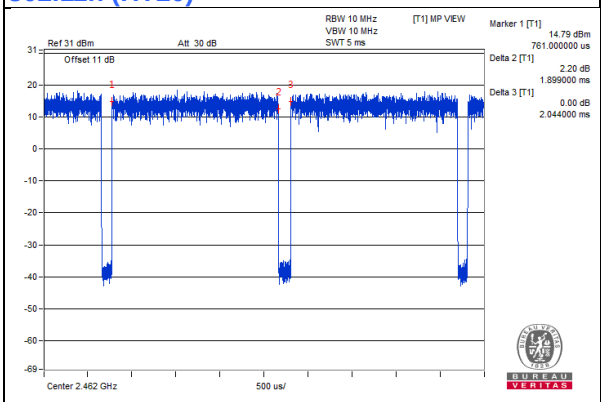
802.11b



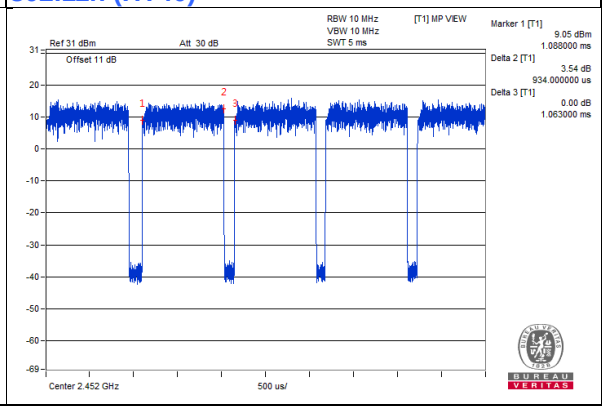
802.11g



802.11n (HT20)



802.11n (HT40)



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.

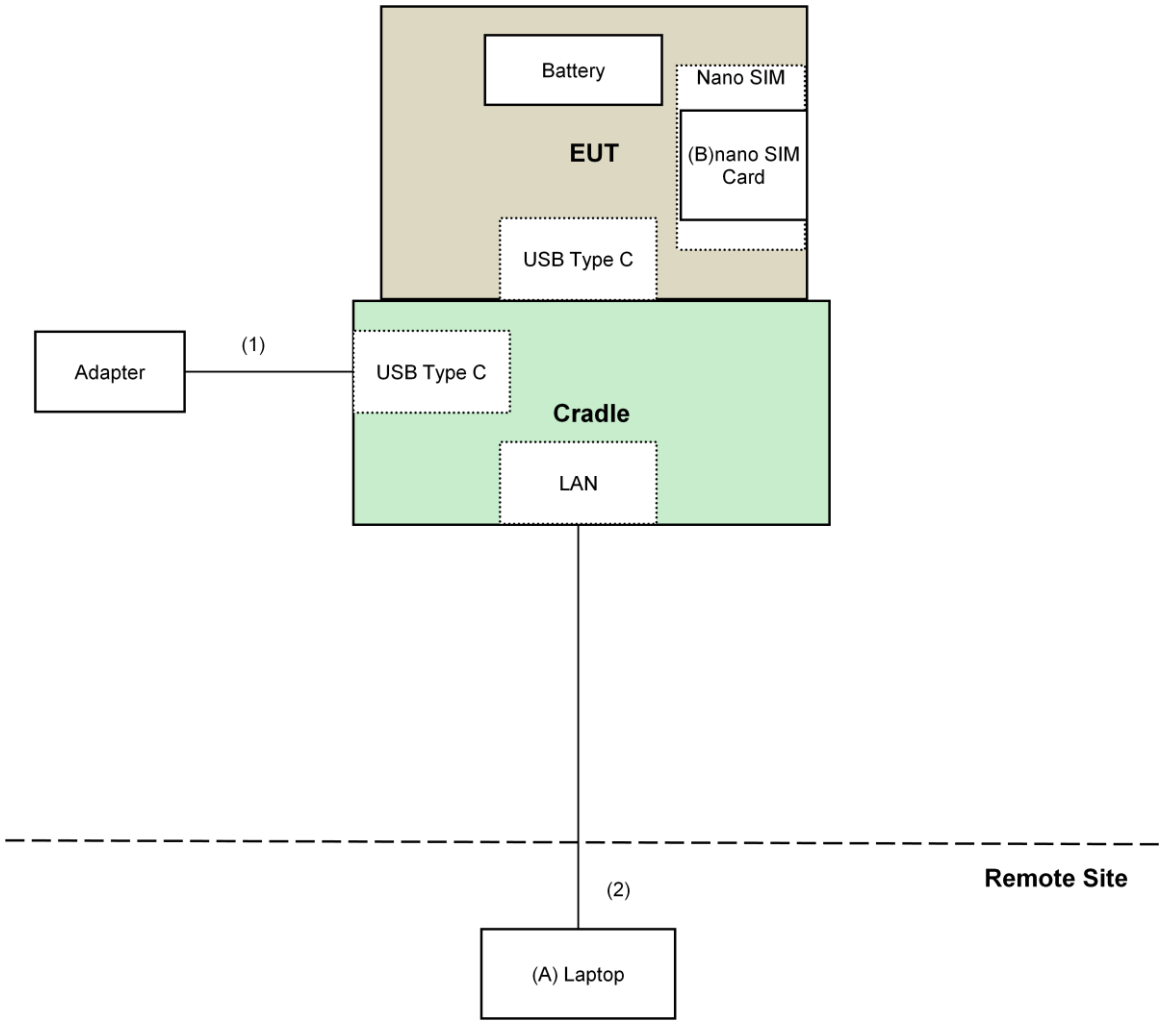
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	SIM Card	NA	NA	NA	NA	Provided by Lab

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.	DC Cable	1	1.6	No	0	Supplied by client
2.	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 20dB 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	Jan. 25, 2019	Jan. 24, 2020
Loop Antenna Electro-Metrics	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
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. 16, 2018	Aug. 15, 2019
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
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: July 25 to 30, 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:

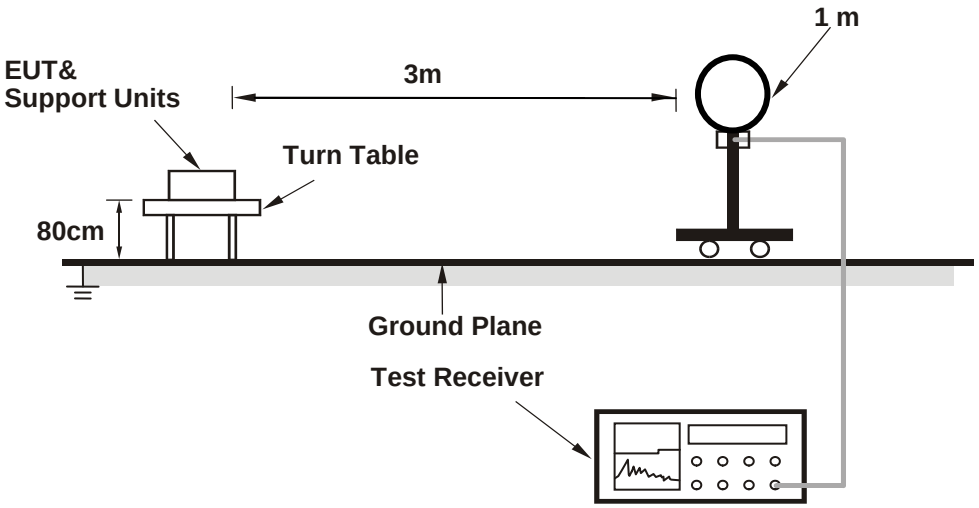
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

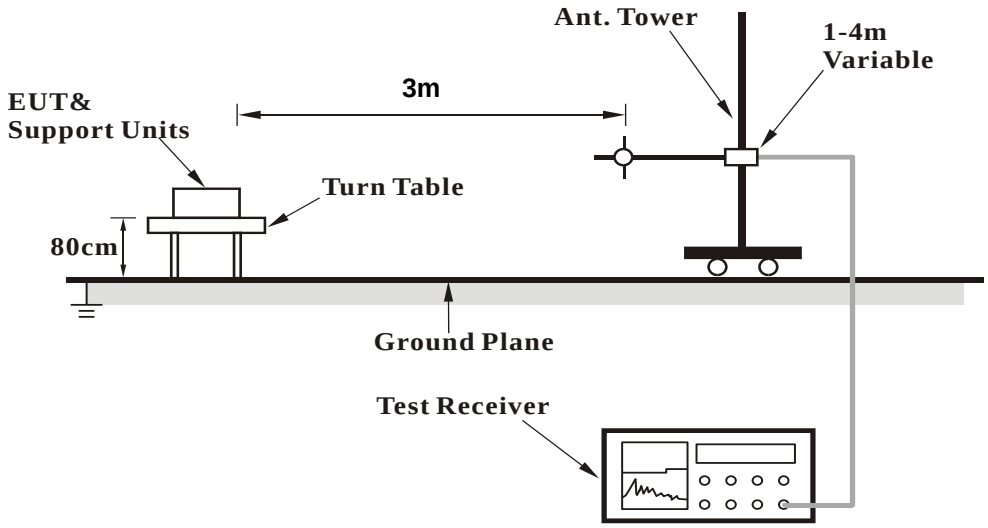
No deviation.

4.1.5 Test Setup

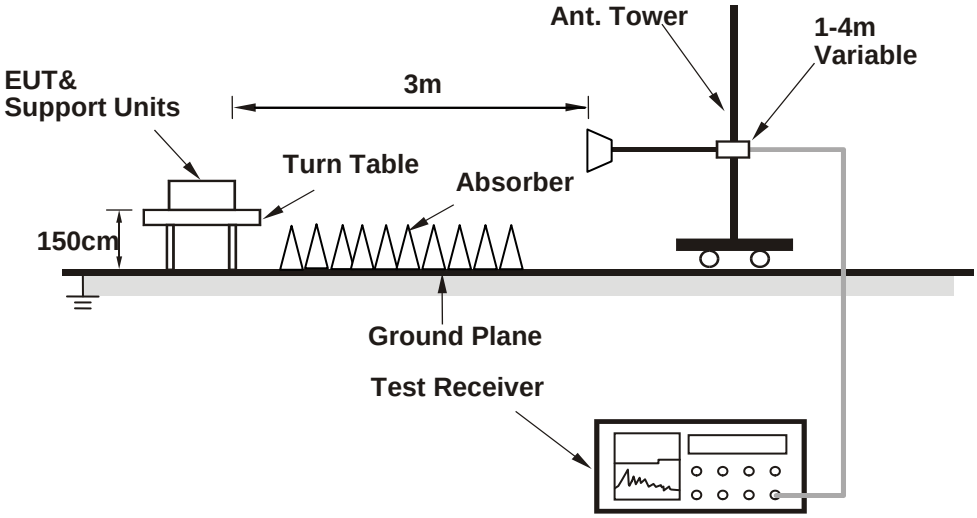
For Radiated emission below 30MHz



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. Placed the EUT on the testing table.
b. Controlling software (Qdart_conn.win.1.0_installer_00066.1) 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	51.2 PK	74.0	-22.8	1.40 H	38	52.8	-1.6
2	2390.00	39.2 AV	54.0	-14.8	1.40 H	38	40.8	-1.6
3	*2412.00	101.4 PK			1.40 H	38	103.1	-1.7
4	*2412.00	99.1 AV			1.40 H	38	100.8	-1.7
5	4824.00	43.8 PK	74.0	-30.2	2.16 H	232	41.5	2.3
6	4824.00	37.6 AV	54.0	-16.4	2.16 H	232	35.3	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	54.2 PK	74.0	-19.8	1.46 V	173	55.8	-1.6
2	2390.00	42.1 AV	54.0	-11.9	1.46 V	173	43.7	-1.6
3	*2412.00	108.3 PK			1.46 V	173	110.0	-1.7
4	*2412.00	106.3 AV			1.46 V	173	108.0	-1.7
5	4824.00	41.5 PK	74.0	-32.5	1.35 V	184	39.2	2.3
6	4824.00	32.3 AV	54.0	-21.7	1.35 V	184	30.0	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	50.9 PK	74.0	-23.1	1.45 H	38	52.5	-1.6
2	2390.00	39.1 AV	54.0	-14.9	1.45 H	38	40.7	-1.6
3	*2437.00	101.4 PK			1.45 H	38	103.2	-1.8
4	*2437.00	98.9 AV			1.45 H	38	100.7	-1.8
5	2483.50	50.5 PK	74.0	-23.5	1.45 H	38	52.2	-1.7
6	2483.50	39.0 AV	54.0	-15.0	1.45 H	38	40.7	-1.7
7	4874.00	43.9 PK	74.0	-30.1	2.10 H	218	41.5	2.4
8	4874.00	37.7 AV	54.0	-16.3	2.10 H	218	35.3	2.4
9	7311.00	44.8 PK	74.0	-29.2	1.59 H	106	35.6	9.2
10	7311.00	31.7 AV	54.0	-22.3	1.59 H	106	22.5	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	51.6 PK	74.0	-22.4	1.49 V	191	53.2	-1.6
2	2390.00	39.7 AV	54.0	-14.3	1.49 V	191	41.3	-1.6
3	*2437.00	109.2 PK			1.49 V	191	111.0	-1.8
4	*2437.00	106.9 AV			1.49 V	191	108.7	-1.8
5	2483.50	51.4 PK	74.0	-22.6	1.49 V	191	53.1	-1.7
6	2483.50	39.6 AV	54.0	-14.4	1.49 V	191	41.3	-1.7
7	4874.00	41.3 PK	74.0	-32.7	1.29 V	192	38.9	2.4
8	4874.00	32.2 AV	54.0	-21.8	1.29 V	192	29.8	2.4
9	7311.00	45.1 PK	74.0	-28.9	1.98 V	259	35.9	9.2
10	7311.00	32.5 AV	54.0	-21.5	1.98 V	259	23.3	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	101.4 PK			1.41 H	39	103.2	-1.8
2	*2462.00	99.1 AV			1.41 H	39	100.9	-1.8
3	2483.50	56.5 PK	74.0	-17.5	1.41 H	39	58.2	-1.7
4	2483.50	42.9 AV	54.0	-11.1	1.41 H	39	44.6	-1.7
5	4924.00	43.5 PK	74.0	-30.5	2.15 H	231	41.0	2.5
6	4924.00	37.5 AV	54.0	-16.5	2.15 H	231	35.0	2.5
7	7386.00	45.3 PK	74.0	-28.7	1.58 H	107	35.9	9.4
8	7386.00	32.0 AV	54.0	-22.0	1.58 H	107	22.6	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	108.7 PK			1.47 V	185	110.5	-1.8
2	*2462.00	106.5 AV			1.47 V	185	108.3	-1.8
3	2483.50	56.9 PK	74.0	-17.1	1.47 V	185	58.6	-1.7
4	2483.50	44.0 AV	54.0	-10.0	1.47 V	185	45.7	-1.7
5	4924.00	41.7 PK	74.0	-32.3	1.34 V	196	39.2	2.5
6	4924.00	32.5 AV	54.0	-21.5	1.34 V	196	30.0	2.5
7	7386.00	45.2 PK	74.0	-28.8	2.01 V	250	35.8	9.4
8	7386.00	32.5 AV	54.0	-21.5	2.01 V	250	23.1	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.

802.11g

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	51.1 PK	74.0	-22.9	1.42 H	30	52.7	-1.6
2	2390.00	38.9 AV	54.0	-15.1	1.42 H	30	40.5	-1.6
3	*2412.00	104.3 PK			1.42 H	30	106.0	-1.7
4	*2412.00	94.3 AV			1.42 H	30	96.0	-1.7
5	4824.00	41.1 PK	74.0	-32.9	2.19 H	244	38.8	2.3
6	4824.00	29.3 AV	54.0	-24.7	2.19 H	244	27.0	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	56.3 PK	74.0	-17.7	1.49 V	188	57.9	-1.6
2	2390.00	44.5 AV	54.0	-9.5	1.49 V	188	46.1	-1.6
3	*2412.00	110.4 PK			1.49 V	188	112.1	-1.7
4	*2412.00	100.4 AV			1.49 V	188	102.1	-1.7
5	4824.00	41.3 PK	74.0	-32.7	1.32 V	189	39.0	2.3
6	4824.00	29.8 AV	54.0	-24.2	1.32 V	189	27.5	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	51.9 PK	74.0	-22.1	1.40 H	31	53.5	-1.6
2	2390.00	39.9 AV	54.0	-14.1	1.40 H	31	41.5	-1.6
3	*2437.00	104.3 PK			1.40 H	31	106.1	-1.8
4	*2437.00	94.6 AV			1.40 H	31	96.4	-1.8
5	2483.50	50.9 PK	74.0	-23.1	1.40 H	31	52.6	-1.7
6	2483.50	39.0 AV	54.0	-15.0	1.40 H	31	40.7	-1.7
7	4874.00	41.4 PK	74.0	-32.6	2.16 H	246	39.0	2.4
8	4874.00	29.5 AV	54.0	-24.5	2.16 H	246	27.1	2.4
9	7311.00	44.6 PK	74.0	-29.4	1.61 H	104	35.4	9.2
10	7311.00	32.1 AV	54.0	-21.9	1.61 H	104	22.9	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	51.3 PK	74.0	-22.7	1.45 V	204	52.9	-1.6
2	2390.00	39.5 AV	54.0	-14.5	1.45 V	204	41.1	-1.6
3	*2437.00	110.0 PK			1.45 V	204	111.8	-1.8
4	*2437.00	100.2 AV			1.45 V	204	102.0	-1.8
5	2483.50	50.4 PK	74.0	-23.6	1.45 V	204	52.1	-1.7
6	2483.50	38.9 AV	54.0	-15.1	1.45 V	204	40.6	-1.7
7	4874.00	41.1 PK	74.0	-32.9	1.35 V	200	38.7	2.4
8	4874.00	29.3 AV	54.0	-24.7	1.35 V	200	26.9	2.4
9	7311.00	45.5 PK	74.0	-28.5	1.99 V	244	36.3	9.2
10	7311.00	32.7 AV	54.0	-21.3	1.99 V	244	23.5	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	104.3 PK			1.38 H	39	106.1	-1.8
2	*2462.00	94.6 AV			1.38 H	39	96.4	-1.8
3	2483.50	63.4 PK	74.0	-10.6	1.38 H	39	65.1	-1.7
4	2483.50	47.9 AV	54.0	-6.1	1.38 H	39	49.6	-1.7
5	4924.00	40.9 PK	74.0	-33.1	2.20 H	233	38.4	2.5
6	4924.00	29.2 AV	54.0	-24.8	2.20 H	233	26.7	2.5
7	7386.00	45.3 PK	74.0	-28.7	1.62 H	96	35.9	9.4
8	7386.00	32.7 AV	54.0	-21.3	1.62 H	96	23.3	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	110.4 PK			1.53 V	191	112.2	-1.8
2	*2462.00	101.1 AV			1.53 V	191	102.9	-1.8
3	2483.50	69.9 PK	74.0	-4.1	1.53 V	191	71.6	-1.7
4	2483.50	52.4 AV	54.0	-1.6	1.53 V	191	54.1	-1.7
5	4924.00	41.2 PK	74.0	-32.8	1.30 V	196	38.7	2.5
6	4924.00	29.6 AV	54.0	-24.4	1.30 V	196	27.1	2.5
7	7386.00	45.0 PK	74.0	-29.0	1.99 V	229	35.6	9.4
8	7386.00	32.4 AV	54.0	-21.6	1.99 V	229	23.0	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.

802.11n (HT20)

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	51.7 PK	74.0	-22.3	1.37 H	33	53.3	-1.6
2	2390.00	39.6 AV	54.0	-14.4	1.37 H	33	41.2	-1.6
3	*2412.00	100.2 PK			1.37 H	33	101.9	-1.7
4	*2412.00	91.1 AV			1.37 H	33	92.8	-1.7
5	4824.00	41.7 PK	74.0	-32.3	2.23 H	243	39.4	2.3
6	4824.00	30.1 AV	54.0	-23.9	2.23 H	243	27.8	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	56.5 PK	74.0	-17.5	1.56 V	196	58.1	-1.6
2	2390.00	43.9 AV	54.0	-10.1	1.56 V	196	45.5	-1.6
3	*2412.00	107.9 PK			1.56 V	196	109.6	-1.7
4	*2412.00	98.1 AV			1.56 V	196	99.8	-1.7
5	4824.00	40.9 PK	74.0	-33.1	1.37 V	207	38.6	2.3
6	4824.00	29.1 AV	54.0	-24.9	1.37 V	207	26.8	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	51.9 PK	74.0	-22.1	1.38 H	25	53.5	-1.6
2	2390.00	39.7 AV	54.0	-14.3	1.38 H	25	41.3	-1.6
3	*2437.00	99.7 PK			1.38 H	25	101.5	-1.8
4	*2437.00	90.8 AV			1.38 H	25	92.6	-1.8
5	2483.50	50.2 PK	74.0	-23.8	1.38 H	25	51.9	-1.7
6	2483.50	38.8 AV	54.0	-15.2	1.38 H	25	40.5	-1.7
7	4874.00	41.2 PK	74.0	-32.8	2.14 H	240	38.8	2.4
8	4874.00	29.1 AV	54.0	-24.9	2.14 H	240	26.7	2.4
9	7311.00	44.6 PK	74.0	-29.4	1.63 H	81	35.4	9.2
10	7311.00	31.9 AV	54.0	-22.1	1.63 H	81	22.7	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	51.3 PK	74.0	-22.7	1.58 V	184	52.9	-1.6
2	2390.00	39.6 AV	54.0	-14.4	1.58 V	184	41.2	-1.6
3	*2437.00	107.8 PK			1.58 V	184	109.6	-1.8
4	*2437.00	98.1 AV			1.58 V	184	99.9	-1.8
5	2483.50	50.9 PK	74.0	-23.1	1.58 V	184	52.6	-1.7
6	2483.50	39.3 AV	54.0	-14.7	1.58 V	184	41.0	-1.7
7	4874.00	41.1 PK	74.0	-32.9	1.32 V	213	38.7	2.4
8	4874.00	29.5 AV	54.0	-24.5	1.32 V	213	27.1	2.4
9	7311.00	45.4 PK	74.0	-28.6	1.99 V	248	36.2	9.2
10	7311.00	32.9 AV	54.0	-21.1	1.99 V	248	23.7	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	100.6 PK			1.42 H	49	102.4	-1.8
2	*2462.00	91.3 AV			1.42 H	49	93.1	-1.8
3	2483.50	57.8 PK	74.0	-16.2	1.42 H	49	59.5	-1.7
4	2483.50	43.2 AV	54.0	-10.8	1.42 H	49	44.9	-1.7
5	4924.00	41.1 PK	74.0	-32.9	2.18 H	245	38.6	2.5
6	4924.00	29.3 AV	54.0	-24.7	2.18 H	245	26.8	2.5
7	7386.00	44.8 PK	74.0	-29.2	1.61 H	99	35.4	9.4
8	7386.00	32.2 AV	54.0	-21.8	1.61 H	99	22.8	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	107.8 PK			1.47 V	192	109.6	-1.8
2	*2462.00	98.7 AV			1.47 V	192	100.5	-1.8
3	2483.50	63.8 PK	74.0	-10.2	1.47 V	192	65.5	-1.7
4	2483.50	49.1 AV	54.0	-4.9	1.47 V	192	50.8	-1.7
5	4924.00	40.8 PK	74.0	-33.2	1.35 V	210	38.3	2.5
6	4924.00	29.2 AV	54.0	-24.8	1.35 V	210	26.7	2.5
7	7386.00	45.0 PK	74.0	-29.0	2.02 V	230	35.6	9.4
8	7386.00	32.1 AV	54.0	-21.9	2.02 V	230	22.7	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.

802.11n (HT40)

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	51.5 PK	74.0	-22.5	1.31 H	21	53.1	-1.6
2	2390.00	39.5 AV	54.0	-14.5	1.31 H	21	41.1	-1.6
3	*2422.00	98.6 PK			1.31 H	21	100.3	-1.7
4	*2422.00	89.2 AV			1.31 H	21	90.9	-1.7
5	4844.00	42.0 PK	74.0	-32.0	2.16 H	237	39.8	2.2
6	4844.00	30.0 AV	54.0	-24.0	2.16 H	237	27.8	2.2
7	7266.00	45.4 PK	74.0	-28.6	1.61 H	99	36.4	9.0
8	7266.00	32.8 AV	54.0	-21.2	1.61 H	99	23.8	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	62.7 PK	74.0	-11.3	1.77 V	195	64.3	-1.6
2	2390.00	46.5 AV	54.0	-7.5	1.77 V	195	48.1	-1.6
3	*2422.00	107.2 PK			1.77 V	195	108.9	-1.7
4	*2422.00	96.9 AV			1.77 V	195	98.6	-1.7
5	4844.00	40.9 PK	74.0	-33.1	1.32 V	207	38.7	2.2
6	4844.00	29.2 AV	54.0	-24.8	1.32 V	207	27.0	2.2
7	7266.00	45.4 PK	74.0	-28.6	2.00 V	244	36.4	9.0
8	7266.00	32.9 AV	54.0	-21.1	2.00 V	244	23.9	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 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	54.2 PK	74.0	-19.8	1.39 H	34	55.8	-1.6
2	2390.00	38.1 AV	54.0	-15.9	1.39 H	34	39.7	-1.6
3	*2437.00	98.5 PK			1.39 H	34	100.3	-1.8
4	*2437.00	89.0 AV			1.39 H	34	90.8	-1.8
5	2483.50	54.1 PK	74.0	-19.9	1.39 H	34	55.8	-1.7
6	2483.50	40.2 AV	54.0	-13.8	1.39 H	34	41.9	-1.7
7	4874.00	41.5 PK	74.0	-32.5	2.18 H	244	39.1	2.4
8	4874.00	29.8 AV	54.0	-24.2	2.18 H	244	27.4	2.4
9	7311.00	44.9 PK	74.0	-29.1	1.64 H	88	35.7	9.2
10	7311.00	32.0 AV	54.0	-22.0	1.64 H	88	22.8	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	56.3 PK	74.0	-17.7	1.72 V	180	57.9	-1.6
2	2390.00	40.1 AV	54.0	-13.9	1.72 V	180	41.7	-1.6
3	*2437.00	107.2 PK			1.72 V	180	109.0	-1.8
4	*2437.00	97.2 AV			1.72 V	180	99.0	-1.8
5	2483.50	60.2 PK	74.0	-13.8	1.72 V	180	61.9	-1.7
6	2483.50	46.3 AV	54.0	-7.7	1.72 V	180	48.0	-1.7
7	4874.00	41.4 PK	74.0	-32.6	1.40 V	210	39.0	2.4
8	4874.00	29.8 AV	54.0	-24.2	1.40 V	210	27.4	2.4
9	7311.00	45.5 PK	74.0	-28.5	2.03 V	228	36.3	9.2
10	7311.00	32.8 AV	54.0	-21.2	2.03 V	228	23.6	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	97.9 PK			1.39 H	25	99.7	-1.8
2	*2452.00	88.6 AV			1.39 H	25	90.4	-1.8
3	2483.50	60.2 PK	74.0	-13.8	1.39 H	25	61.9	-1.7
4	2483.50	46.3 AV	54.0	-7.7	1.39 H	25	48.0	-1.7
5	4904.00	40.8 PK	74.0	-33.2	2.16 H	243	38.3	2.5
6	4904.00	29.2 AV	54.0	-24.8	2.16 H	243	26.7	2.5
7	7356.00	45.3 PK	74.0	-28.7	1.62 H	93	36.1	9.2
8	7356.00	32.4 AV	54.0	-21.6	1.62 H	93	23.2	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	105.9 PK			1.66 V	196	107.7	-1.8
2	*2452.00	96.1 AV			1.66 V	196	97.9	-1.8
3	2483.50	66.1 PK	74.0	-7.9	1.66 V	196	67.8	-1.7
4	**2483.50**	**52.6 AV**	**54.0**	**-1.4**	**1.66 V**	**196**	**54.3**	**-1.7**
5	4904.00	40.9 PK	74.0	-33.1	1.40 V	194	38.4	2.5
6	4904.00	29.5 AV	54.0	-24.5	1.40 V	194	27.0	2.5
7	7356.00	45.6 PK	74.0	-28.4	2.03 V	221	36.4	9.2
8	7356.00	32.9 AV	54.0	-21.1	2.03 V	221	23.7	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:

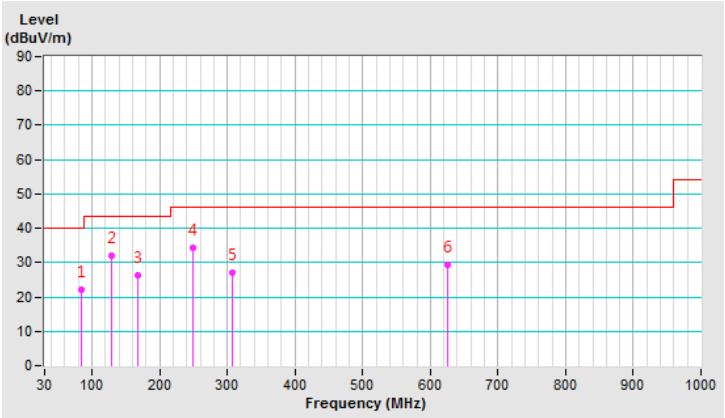
802.11g

CHANNEL	TX Channel 11	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	85.20	22.0 QP	40.0	-18.0	2.50 H	164	35.4	-13.4
2	128.41	31.9 QP	43.5	-11.6	3.00 H	105	41.1	-9.2
3	167.07	26.4 QP	43.5	-17.1	1.50 H	228	34.7	-8.3
4	250.01	34.2 QP	46.0	-11.8	1.00 H	270	42.9	-8.7
5	306.95	27.0 QP	46.0	-19.0	1.00 H	228	33.8	-6.8
6	626.24	29.2 QP	46.0	-16.8	1.50 H	162	28.1	1.1

REMARKS:

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

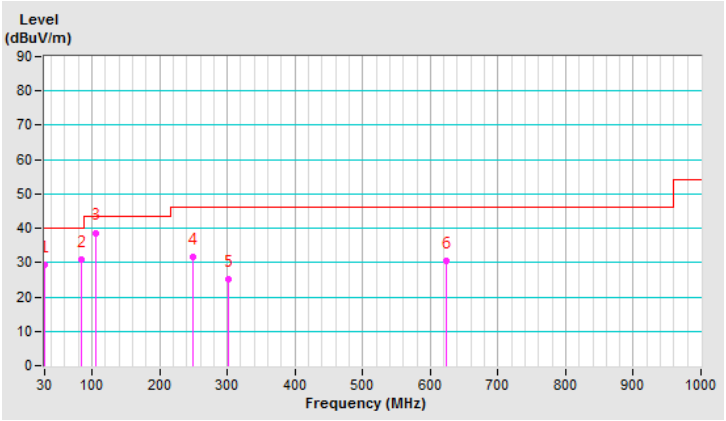


CHANNEL	TX Channel 11	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	30.68	29.4 QP	40.0	-10.6	1.00 V	127	39.1	-9.7
2	85.24	30.9 QP	40.0	-9.1	1.50 V	70	44.3	-13.4
3	105.18	38.7 QP	43.5	-4.8	1.00 V	72	49.9	-11.2
4	250.01	31.6 QP	46.0	-14.4	1.00 V	67	40.3	-8.7
5	302.10	25.0 QP	46.0	-21.0	1.50 V	207	31.9	-6.9
6	624.11	30.5 QP	46.0	-15.5	1.50 V	180	29.5	1.0

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. 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: July 30, 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.

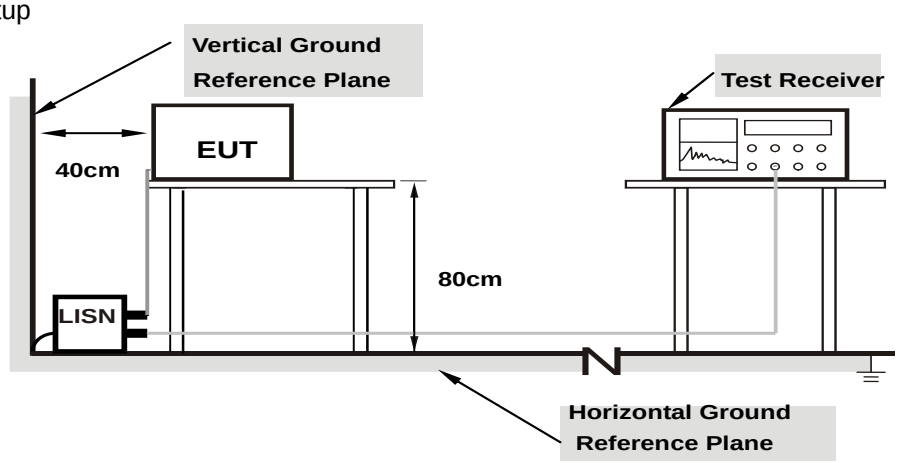
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

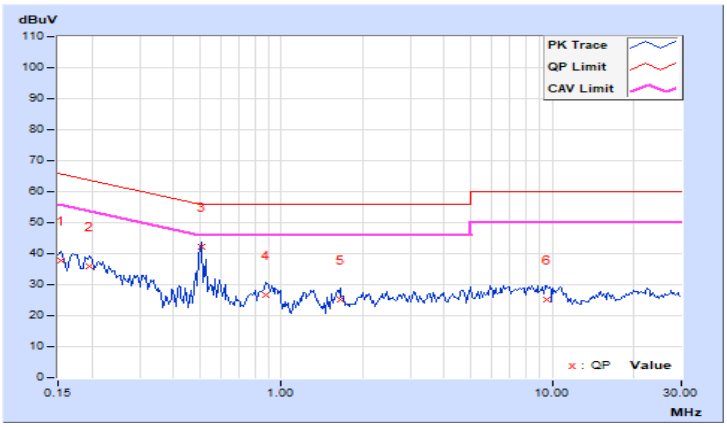
4.2.7 Test Results

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	9.97	27.65	13.76	37.62	23.73	65.79	55.79	-28.17	-32.06
2	0.19687	9.97	25.80	12.49	35.77	22.46	63.74	53.74	-27.97	-31.28
3	**0.50547**	**9.99**	**32.39**	**27.31**	**42.38**	**37.30**	**56.00**	**46.00**	**-13.62**	**-8.70**
4	0.88047	10.02	16.49	8.57	26.51	18.59	56.00	46.00	-29.49	-27.41
5	1.64844	10.08	15.19	10.41	25.27	20.49	56.00	46.00	-30.73	-25.51
6	9.55469	10.61	14.41	6.23	25.02	16.84	60.00	50.00	-34.98	-33.16

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.

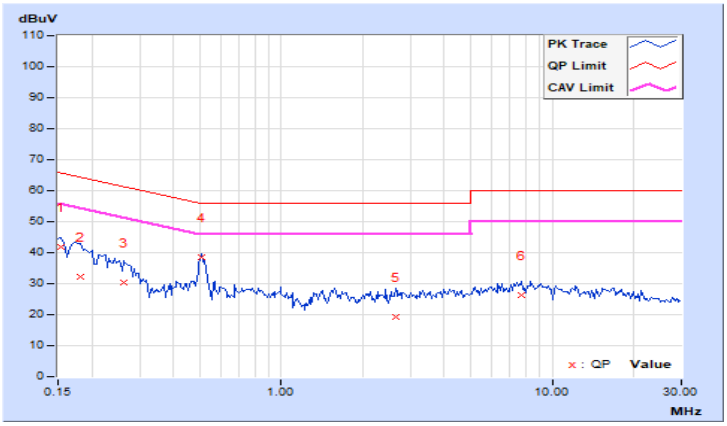


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15391	9.95	31.99	18.40	41.94	28.35	65.79	55.79	-23.85	-27.44
2	0.18125	9.95	22.23	8.47	32.18	18.42	64.43	54.43	-32.25	-36.01
3	0.26328	9.96	20.42	6.45	30.38	16.41	61.33	51.33	-30.95	-34.92
4	0.50938	9.98	28.39	26.65	38.37	36.63	56.00	46.00	-17.63	-9.37
5	2.65234	10.12	9.14	2.02	19.26	12.14	56.00	46.00	-36.74	-33.86
6	7.73047	10.41	15.90	4.52	26.31	14.93	60.00	50.00	-33.69	-35.07

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.

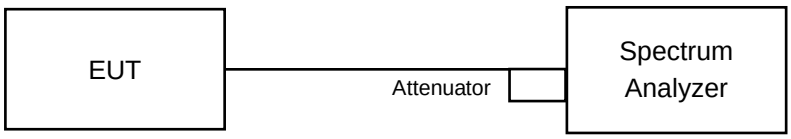


4.3 6dB Bandwidth Measurement

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 fromTest 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	8.04	8.10	0.5	PASS
6	2437	8.09	8.07	0.5	PASS
11	2462	8.09	8.11	0.5	PASS

802.11g

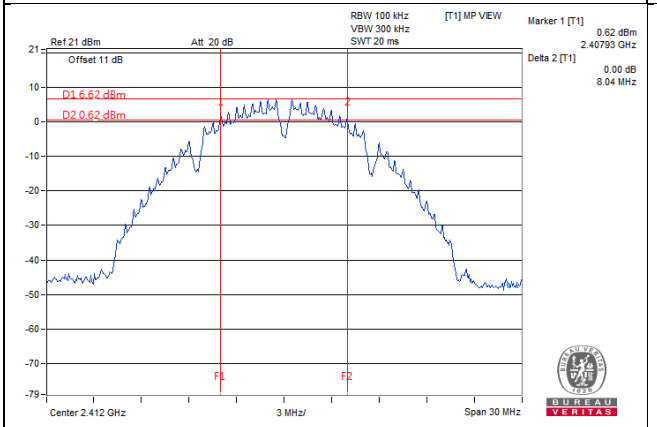
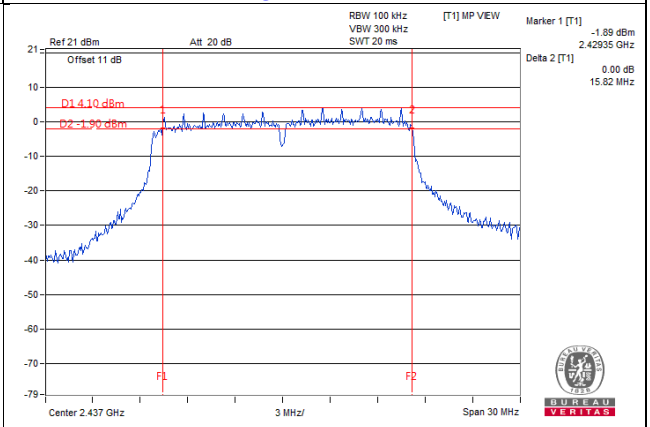
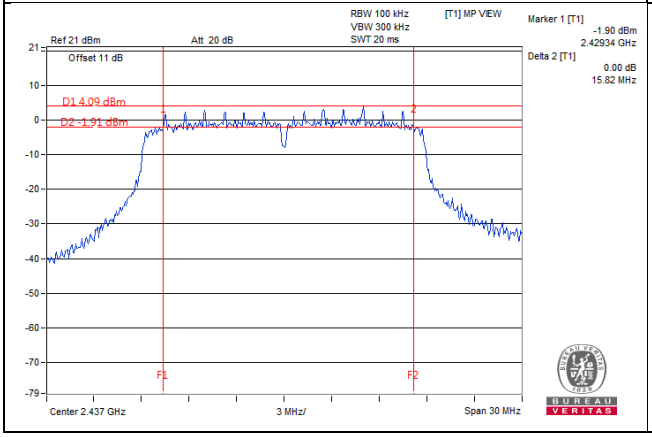
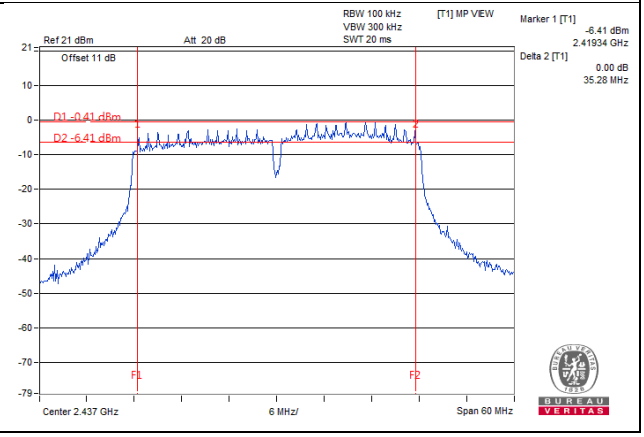
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	15.99	16.12	0.5	PASS
6	2437	15.82	16.09	0.5	PASS
11	2462	16.37	16.38	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
1	2412	16.69	16.70	0.5	Pass
6	2437	16.10	15.82	0.5	Pass
11	2462	17.19	17.27	0.5	Pass

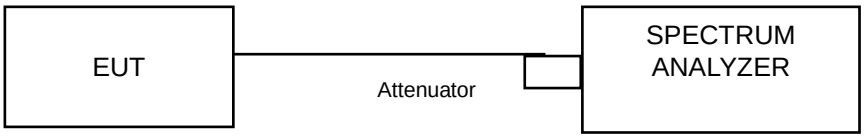
802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
3	2422	36.17	35.83	0.5	Pass
6	2437	35.28	35.50	0.5	Pass
9	2452	35.33	35.36	0.5	Pass

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH1	**802.11g / Chain 0 : CH6**
	
802.11n (HT20) / Chain 1 : CH6	**802.11n (HT40) / Chain 0 : CH6**
	

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

4.4.4 Deviation from Test Standard

No deviation.

4.4.5 EUT Operating Conditions

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

4.4.6 Test Results

802.11b

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
1	2412	12.96	12.96
6	2437	12.84	12.96
11	2462	13.32	13.20

802.11g

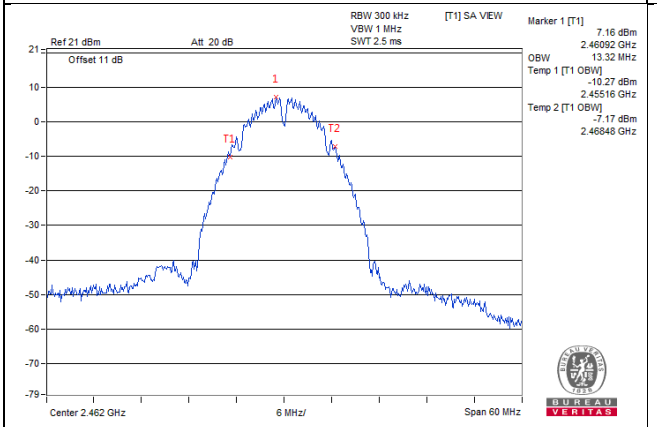
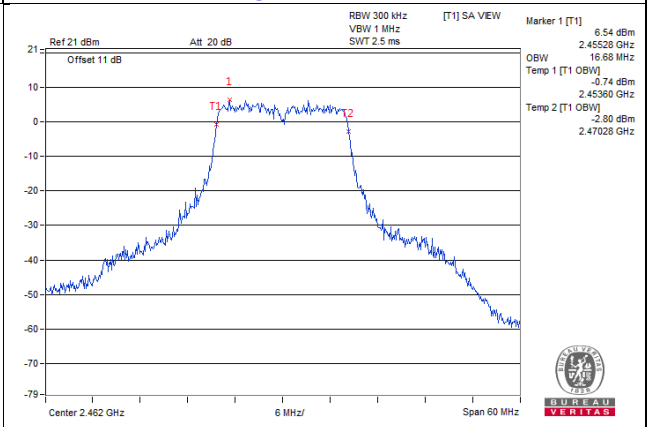
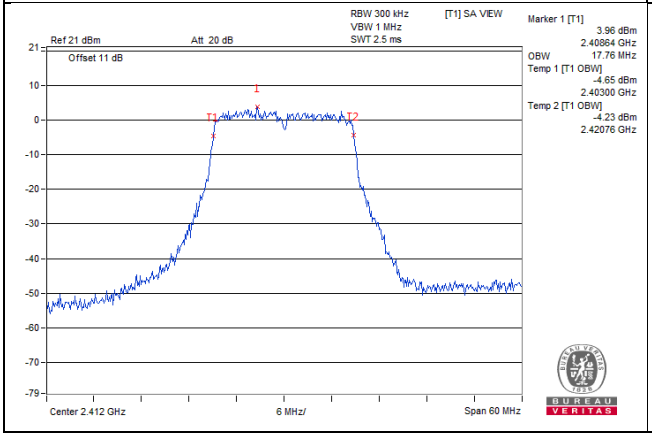
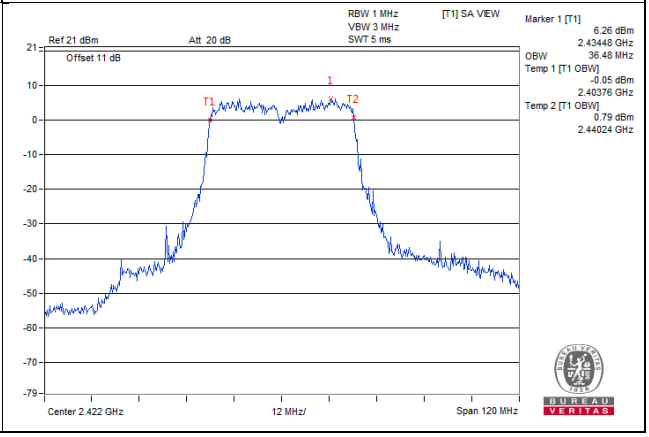
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
1	2412	16.56	16.56
6	2437	16.56	16.56
11	2462	16.68	16.56

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
1	2412	17.76	17.76
6	2437	17.52	17.64
11	2462	17.76	17.64

802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
3	2422	36.48	36.48
6	2437	36.48	36.24
9	2452	36.24	36.48

Spectrum Plot of Worst Value	
802.11b / Chain 0 : CH11	**802.11g / Chain 0 : CH11**
	
802.11n (HT20) / Chain 0 : CH1	**802.11n (HT40) / Chain 0 : CH3**
	

4.5 Conducted Output Power Measurement

4.5.1 Limits of Conducted Output Power Measurement

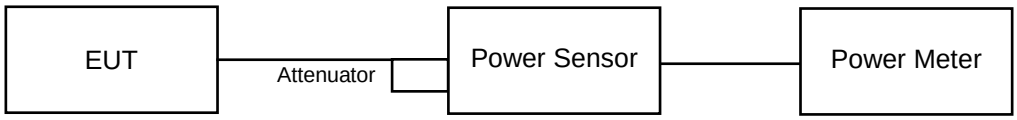
For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

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.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as Item 4.3.6.

4.5.7 Test Results

FOR PEAK POWER

802.11b

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	16.96	17.82	110.193	20.42	30.00	Pass
6	2437	17.05	18.68	124.489	20.95	30.00	Pass
11	2462	16.85	18.30	116.025	20.65	30.00	Pass

802.11g

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	20.49	21.31	247.151	23.93	30.00	Pass
6	2437	19.80	21.29	230.085	23.62	30.00	Pass
11	2462	20.05	21.16	231.775	23.65	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	18.32	19.22	151.48	21.80	30.00	Pass
6	2437	18.21	20.59	180.773	22.57	30.00	Pass
11	2462	18.35	20.23	173.83	22.40	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	17.83	20.31	168.073	22.25	30.00	Pass
6	2437	18.74	19.75	169.223	22.28	30.00	Pass
9	2452	18.24	19.56	157.046	21.96	30.00	Pass

FOR AVERAGE POWER

802.11b

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.42	15.25	61.166	17.87
6	2437	14.49	16.16	69.424	18.42
11	2462	14.33	15.82	65.296	18.15

802.11g

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	14.48	15.47	63.291	18.01
6	2437	14.12	15.78	63.667	18.04
11	2462	14.21	15.77	64.12	18.07

802.11n (HT20)

Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
1	2412	12.15	13.16	37.107	15.69
6	2437	12.27	14.05	42.276	16.26
11	2462	12.47	13.83	41.815	16.21

802.11n (HT40)

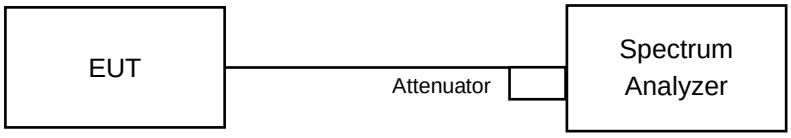
Chan.	Frequency (MHz)	Avg. Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
3	2422	12.25	13.94	41.562	16.19
6	2437	12.28	13.76	40.672	16.09
9	2452	12.21	13.33	38.162	15.82

4.6 Power Spectral Density Measurement

4.6.1 Limits of Power Spectral Density Measurement

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

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

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

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

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	-7.02	3.01	-4.01	8.00	Pass
	6	2437	-6.85	3.01	-3.84	8.00	Pass
	11	2462	-7.22	3.01	-4.21	8.00	Pass
1	1	2412	-5.96	3.01	-2.95	8.00	Pass
	6	2437	-4.57	3.01	-1.56	8.00	Pass
	11	2462	-5.88	3.01	-2.87	8.00	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =2.35dBi < 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	-10.19	3.01	-7.18	8.00	Pass
	6	2437	-10.74	3.01	-7.73	8.00	Pass
	11	2462	-10.98	3.01	-7.97	8.00	Pass
1	1	2412	-9.60	3.01	-6.59	8.00	Pass
	6	2437	-9.11	3.01	-6.10	8.00	Pass
	11	2462	-9.41	3.01	-6.40	8.00	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =2.35dBi < 6dBi , so the power density limit shall not be reduced.

802.11n (HT20)

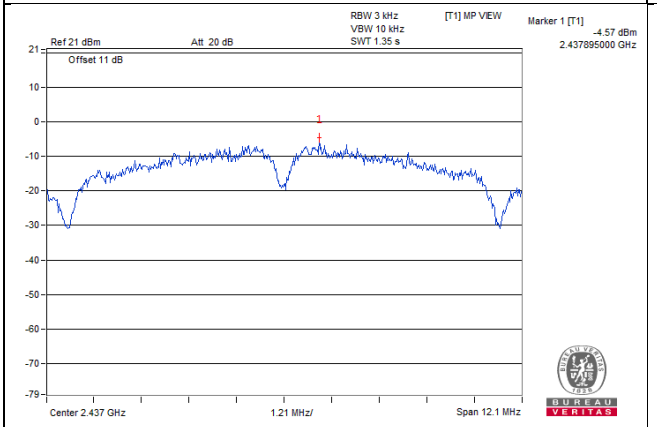
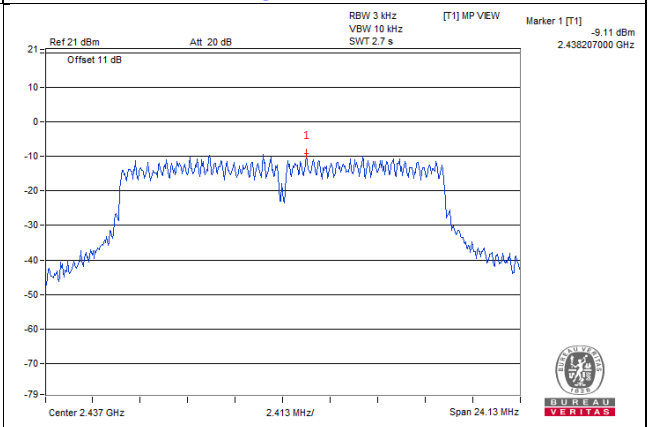
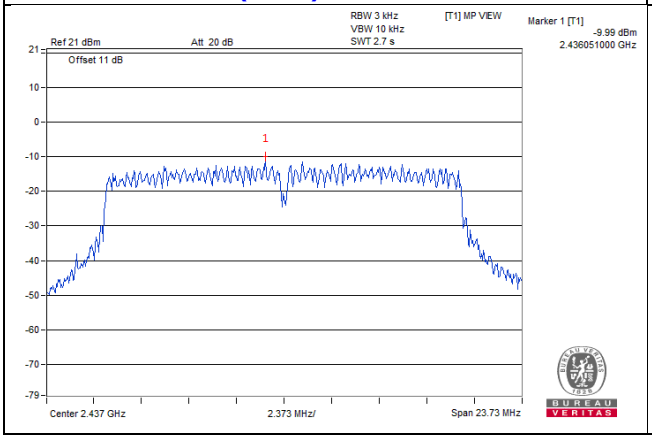
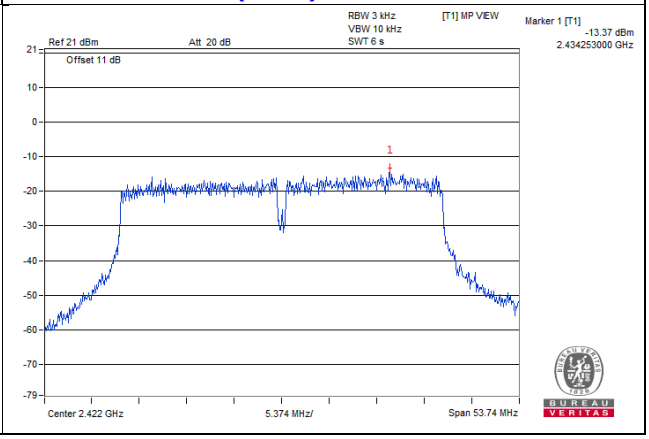
TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
0	1	2412	-12.69	3.01	-9.68	8.00	Pass
	6	2437	-12.17	3.01	-9.16	8.00	Pass
	11	2462	-12.61	3.01	-9.60	8.00	Pass
1	1	2412	-12.29	3.01	-9.28	8.00	Pass
	6	2437	-9.99	3.01	-6.98	8.00	Pass
	11	2462	-12.06	3.01	-9.05	8.00	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =2.35dBi < 6dBi , so the power density limit shall not be reduced.

802.11n (HT40)

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	-15.94	3.01	-12.93	8.00	Pass
	6	2437	-15.68	3.01	-12.67	8.00	Pass
	9	2452	-15.62	3.01	-12.61	8.00	Pass
1	3	2422	-13.37	3.01	-10.36	8.00	Pass
	6	2437	-13.96	3.01	-10.95	8.00	Pass
	9	2452	-15.28	3.01	-12.27	8.00	Pass

Note: 1. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =2.35dBi < 6dBi , so the power density limit shall not be reduced.

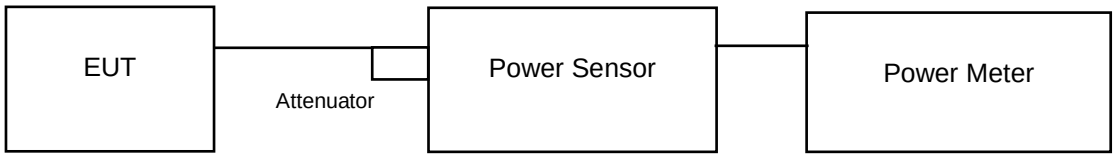
Spectrum Plot of Worst Value	
802.11b / Chain 1 : CH6	**802.11g / Chain 1 : CH6**
	
802.11n (HT20) / Chain 1 : CH6	**802.11n (HT40) / Chain 1 : CH3**
	

4.7 Conducted Out of Band Emission Measurement

4.7.1 Limits of Conducted Out of Band Emission Measurement

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 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.

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

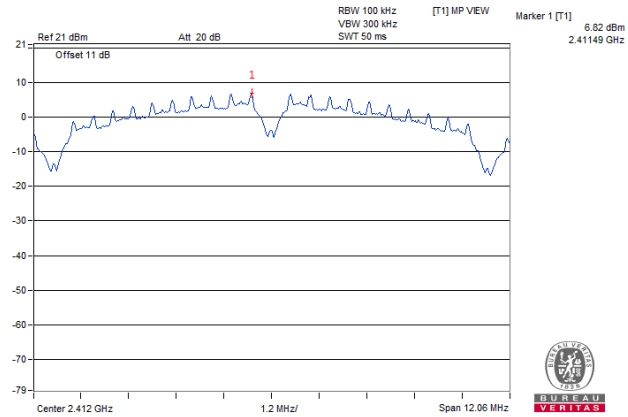
Same as Item 4.3.6

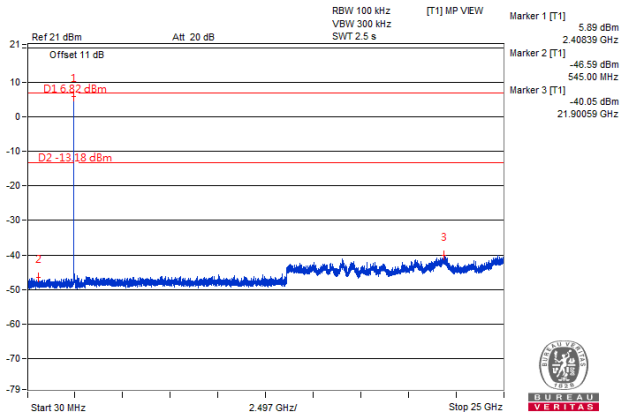
4.7.7 Test Results

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

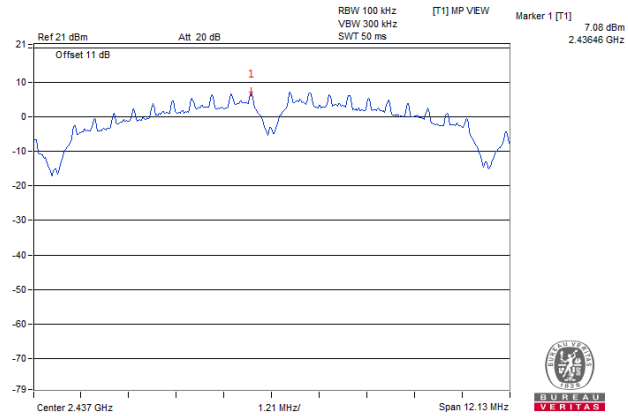
802.11b - Chain 0

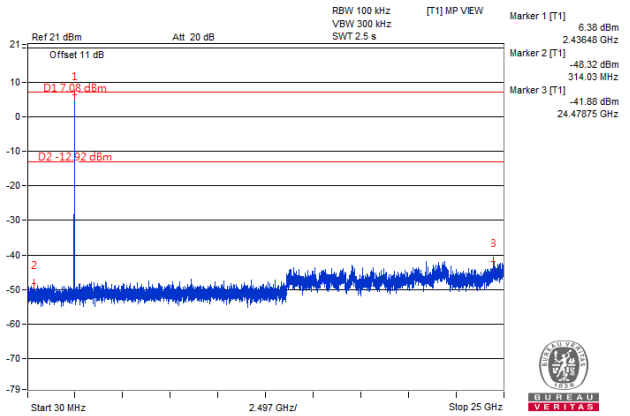
CH 1



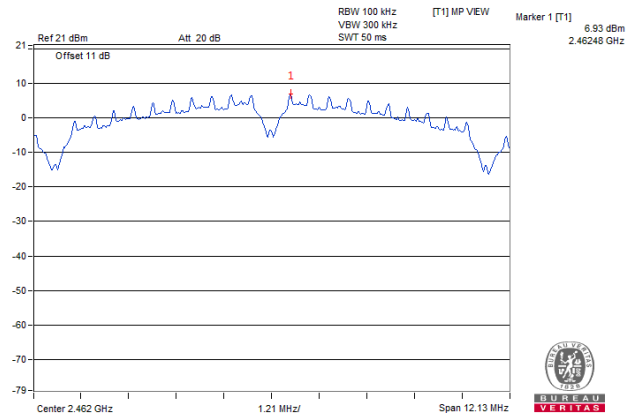


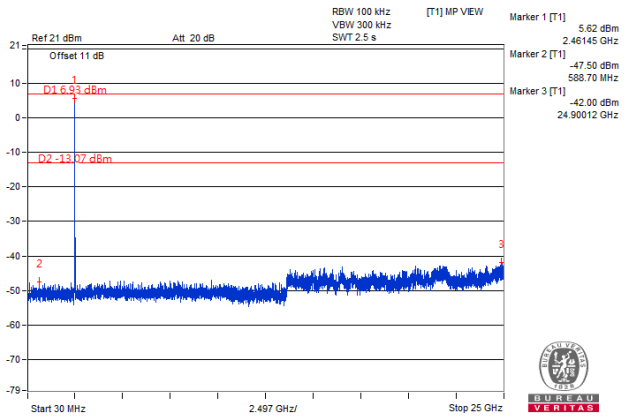
CH 6



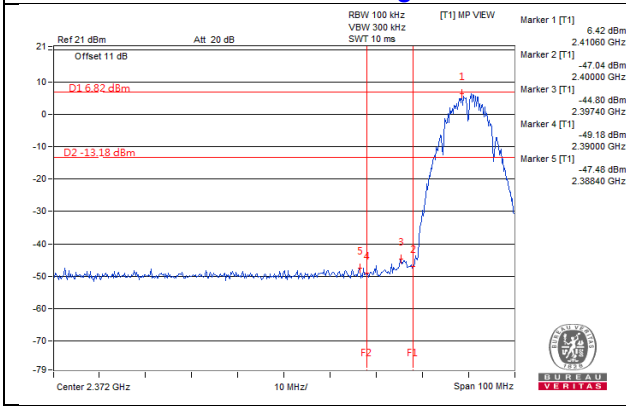


CH 11

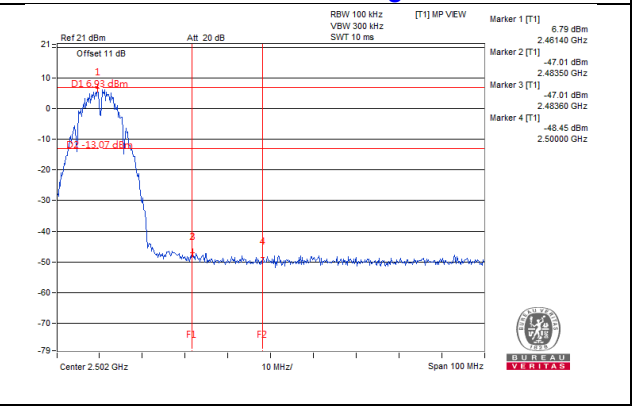




CH 1 Band edge

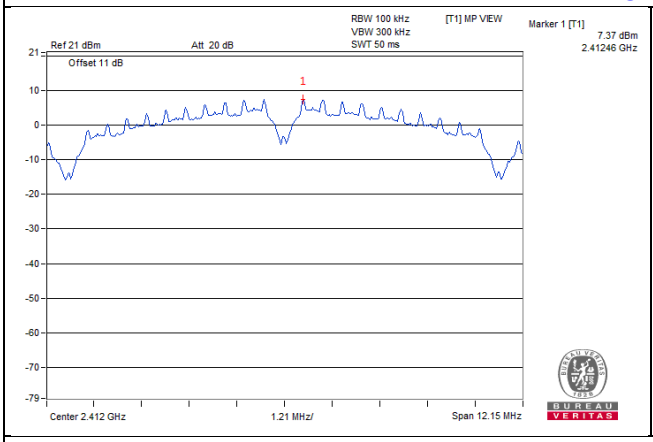


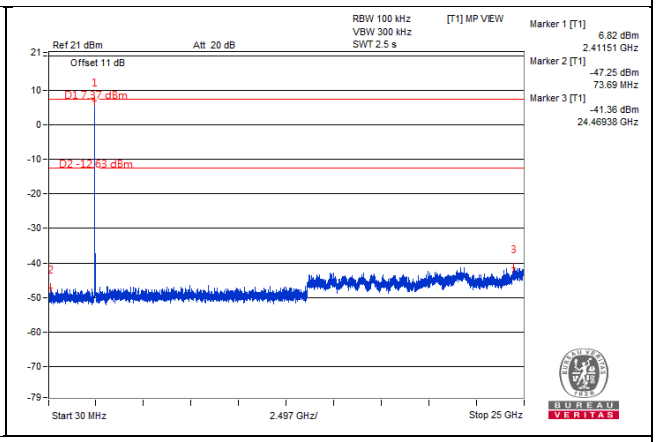
CH 11 Band edge



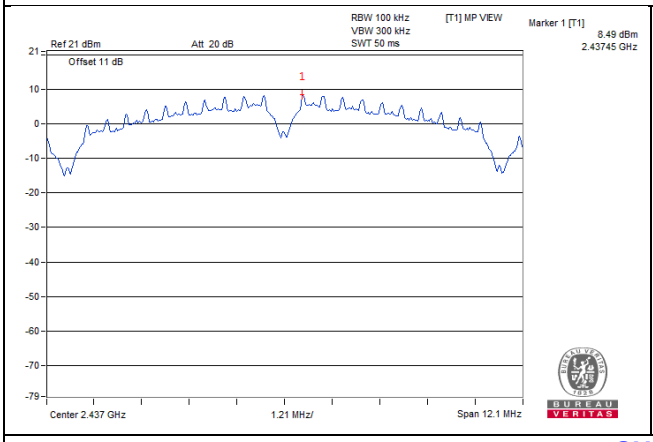
Chain 1

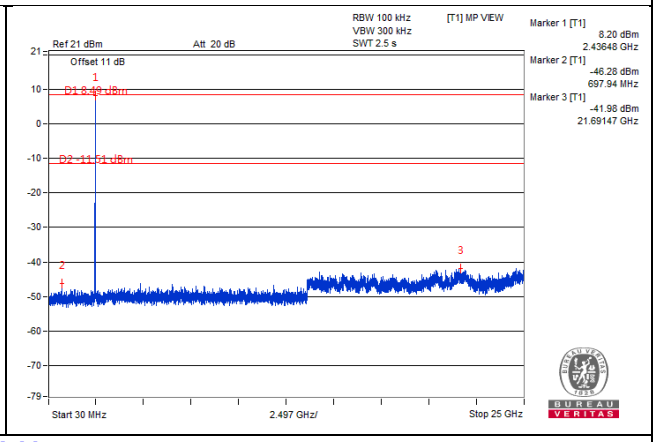
CH 1



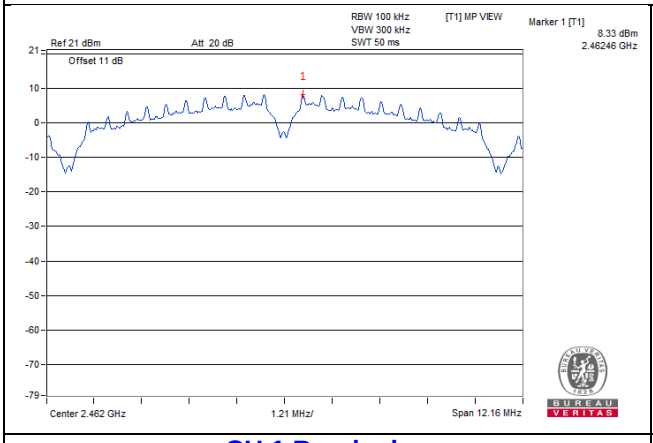


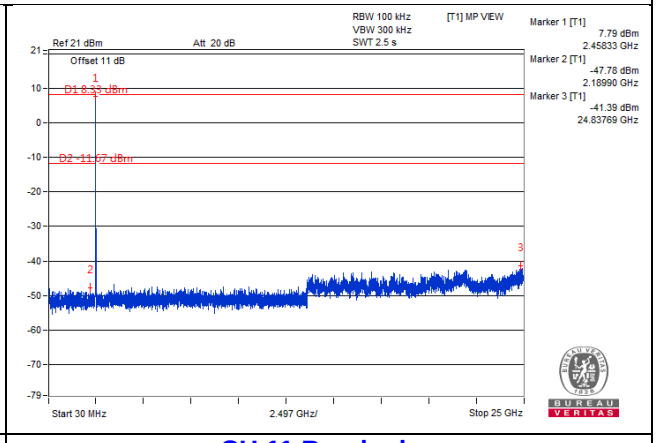
CH 6



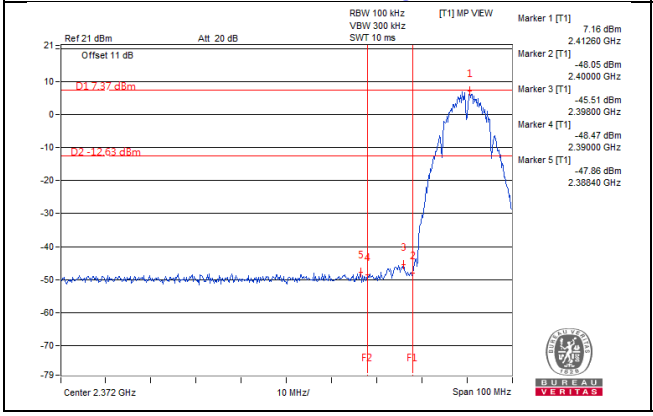


CH 11

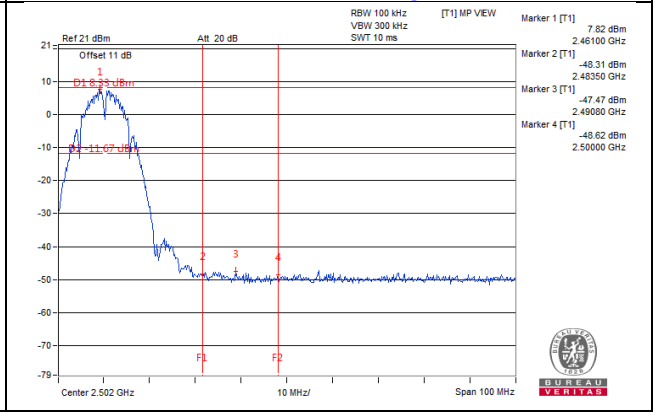




CH 1 Band edge

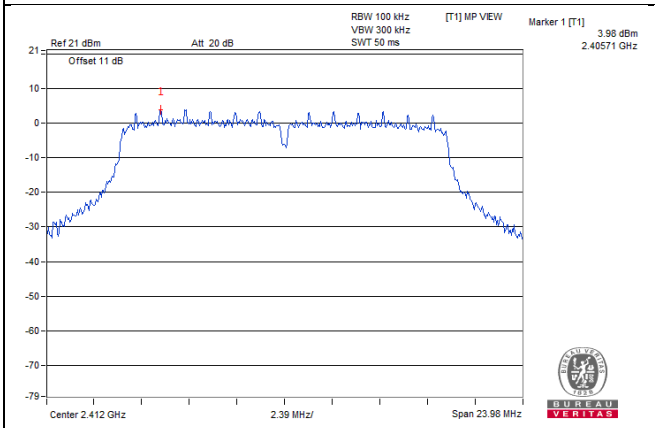


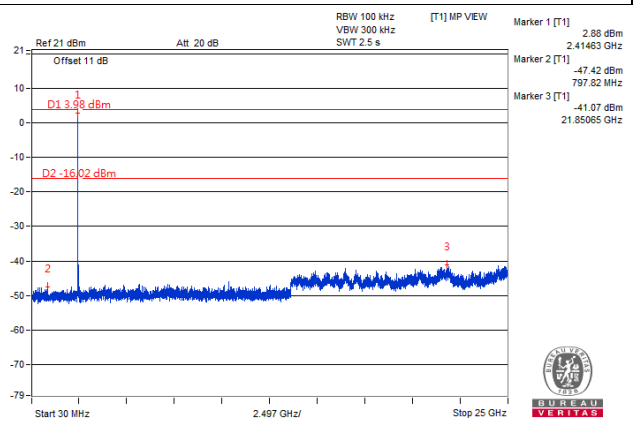
CH 11 Band edge



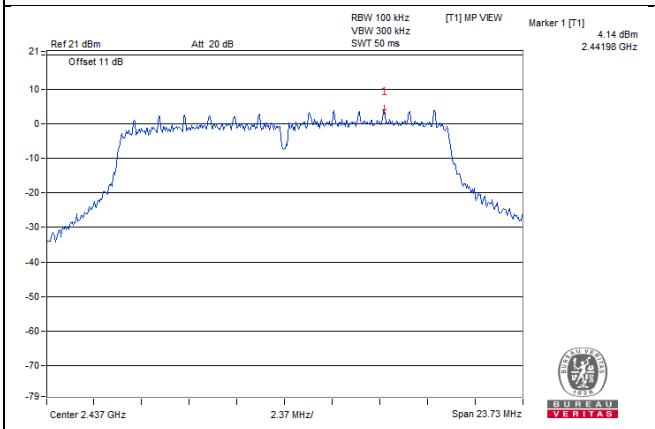
802.11g - Chain 0

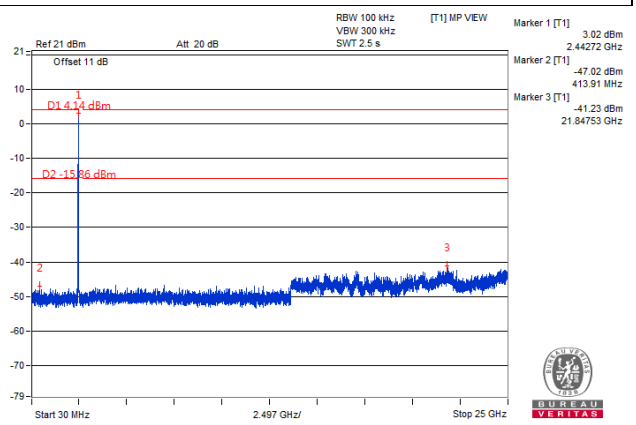
CH 1



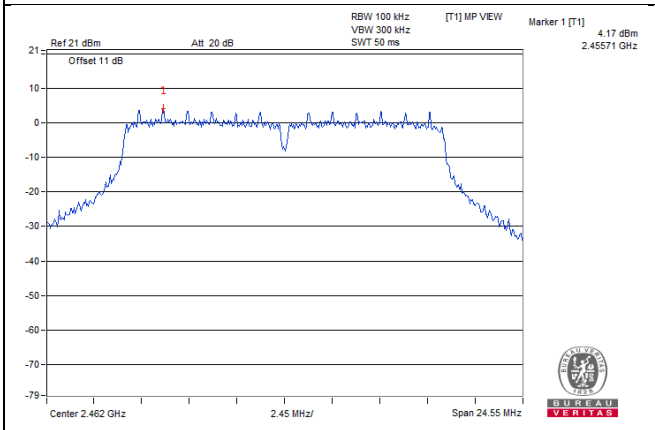


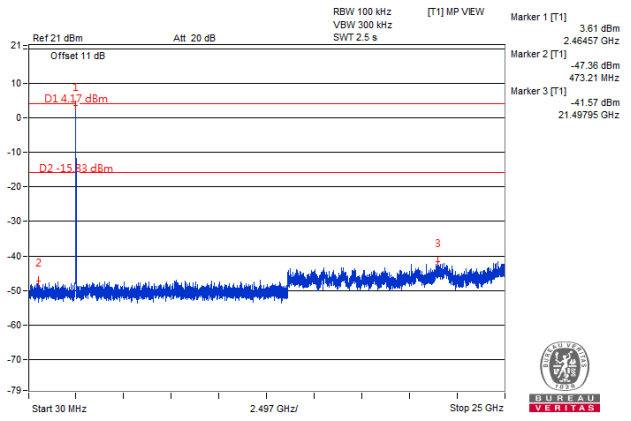
CH 6



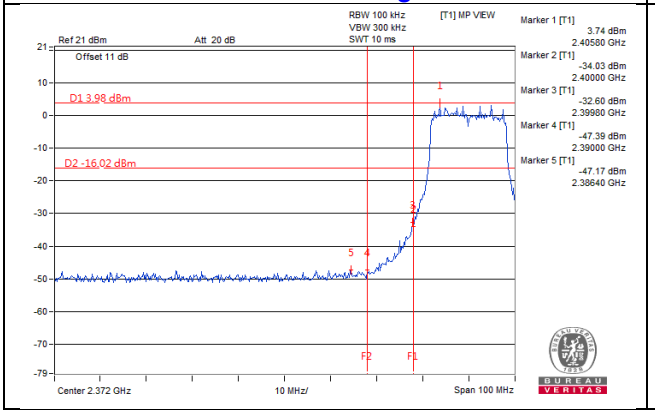


CH 11

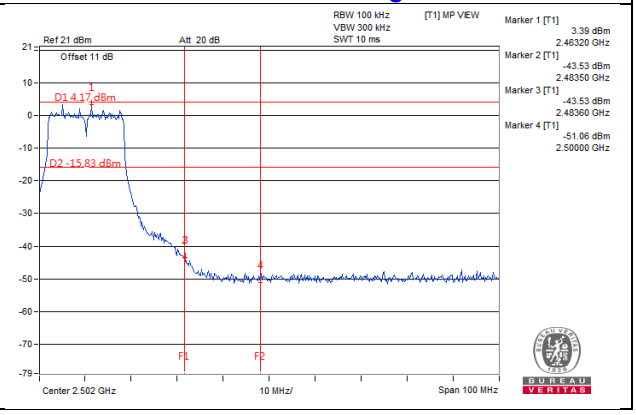




CH 1 Band edge

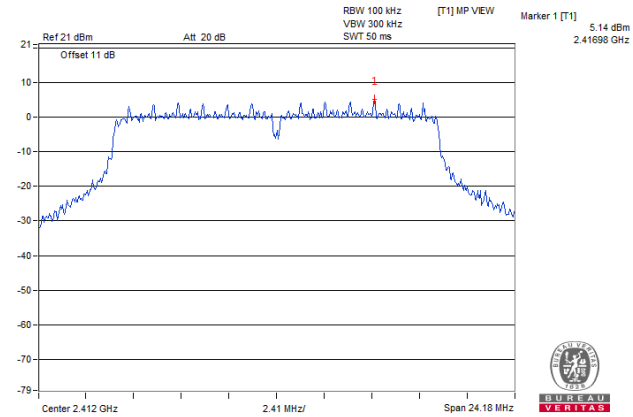


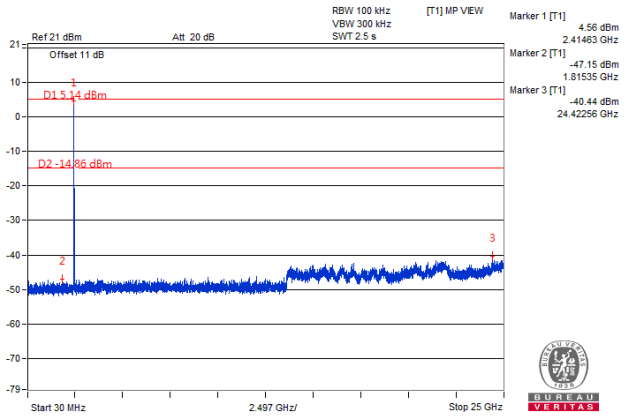
CH 11 Band edge



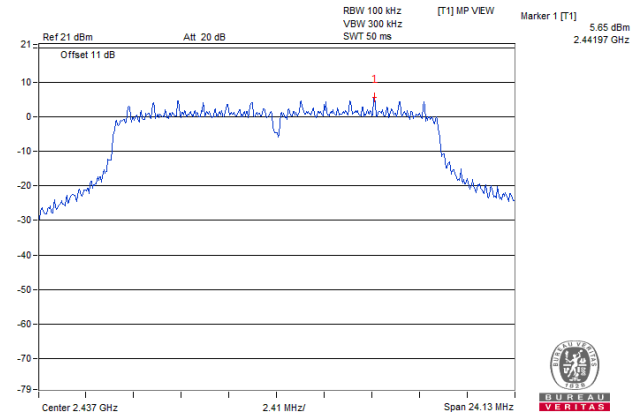
Chain 1

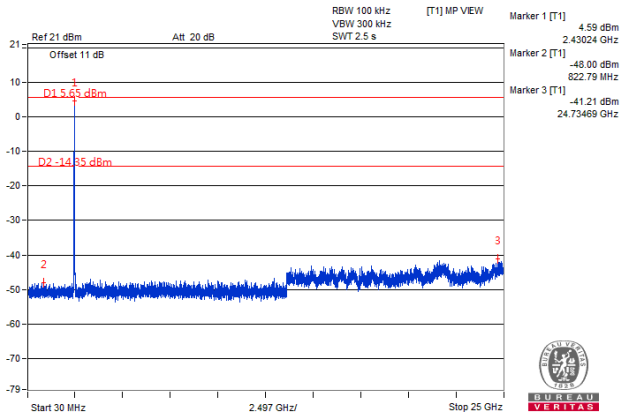
CH 1



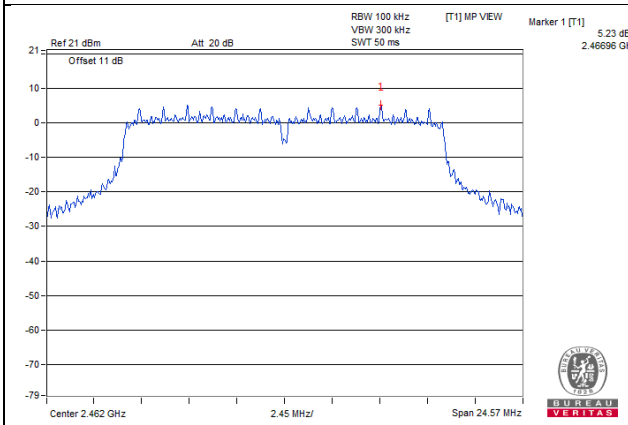


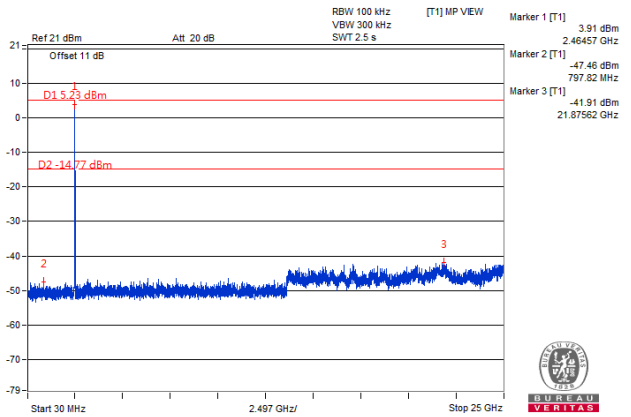
CH 6



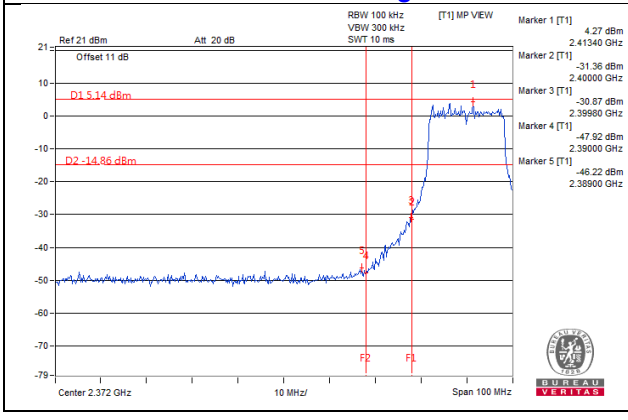


CH 11

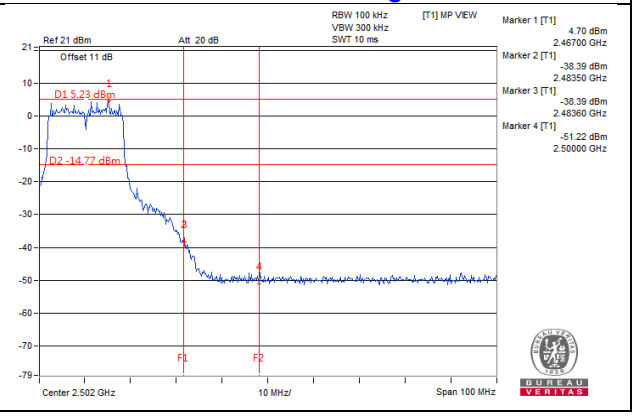




CH 1 Band edge

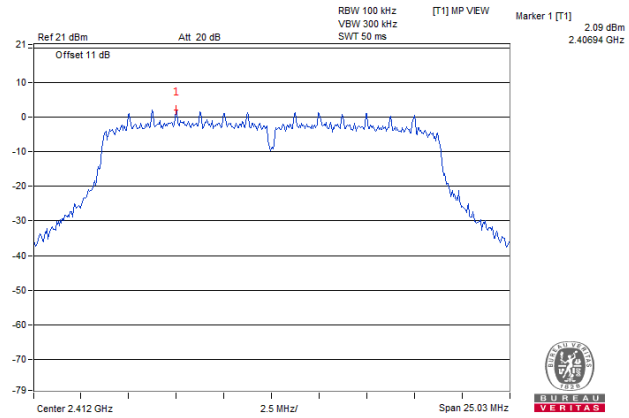


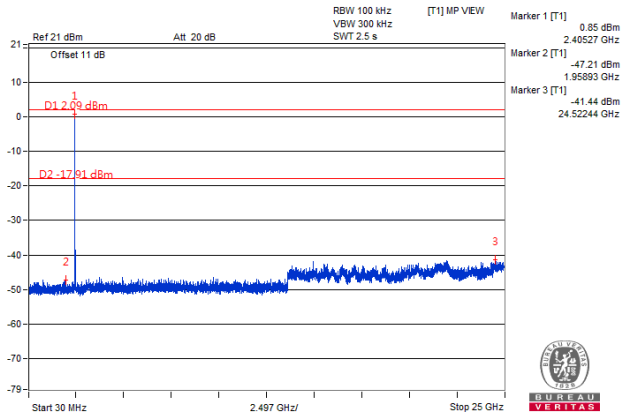
CH 11 Band edge



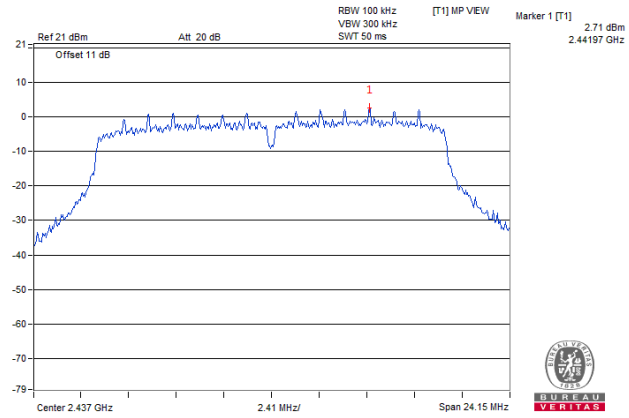
802.11n (HT20) - Chain 0

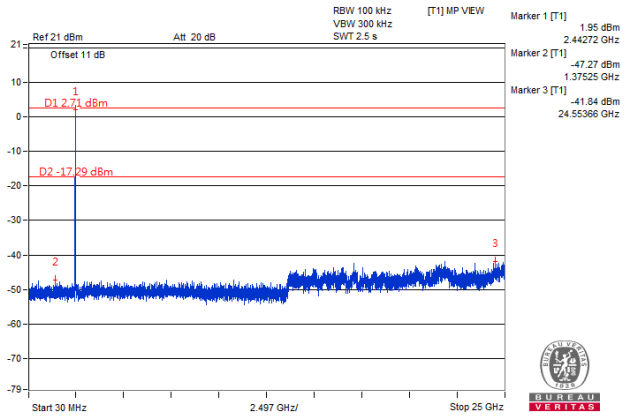
CH 1



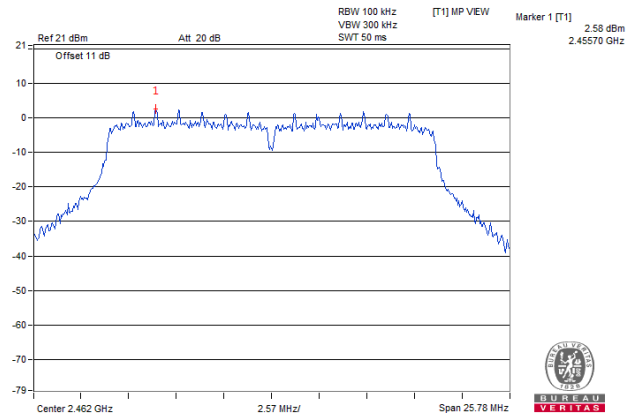


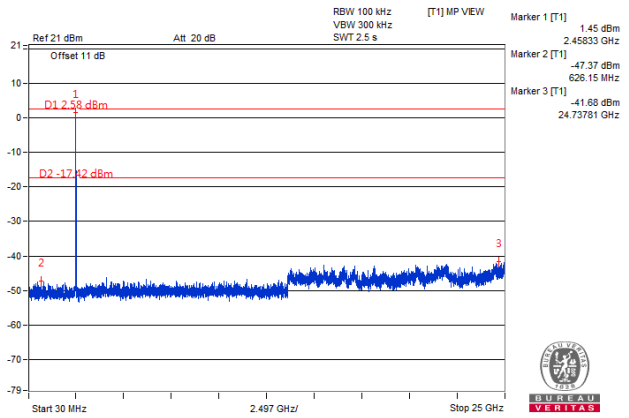
CH 6



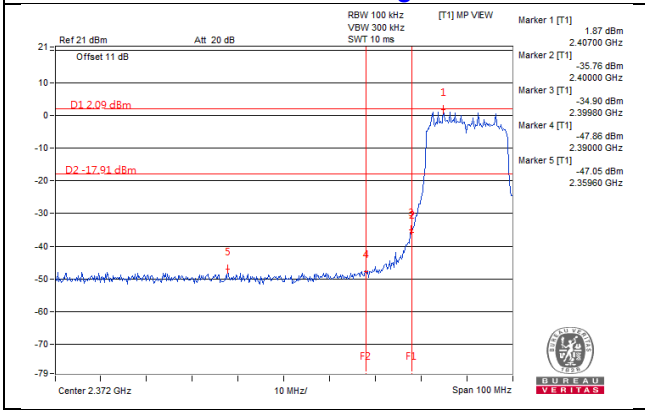


CH 11

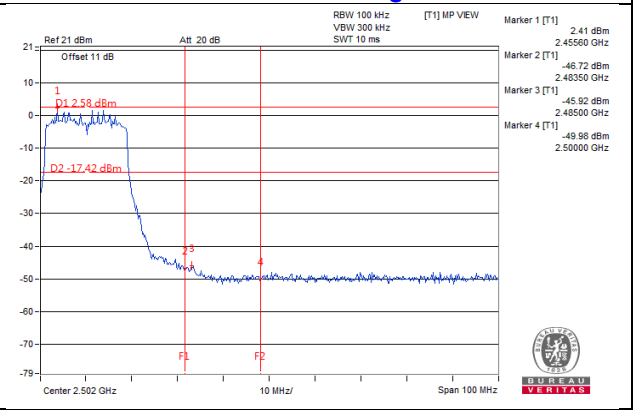




CH 1 Band edge

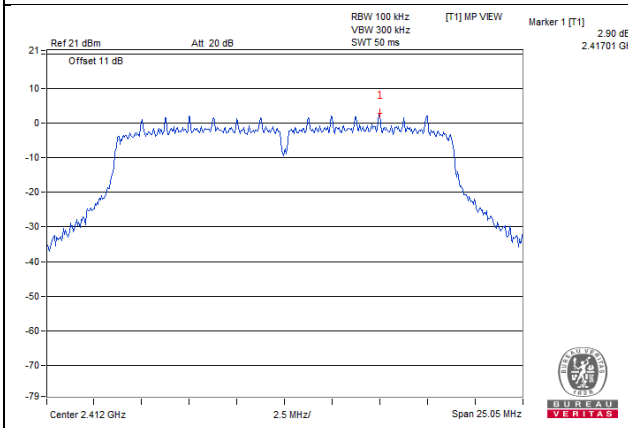


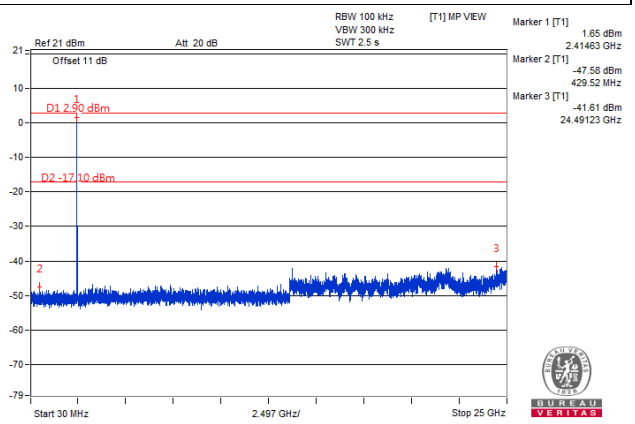
CH 11 Band edge



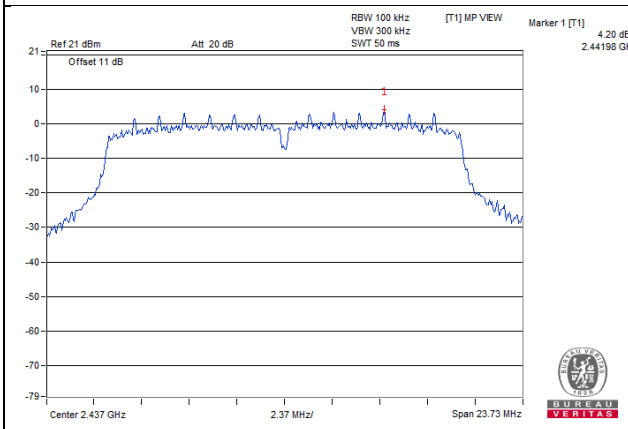
Chain 1

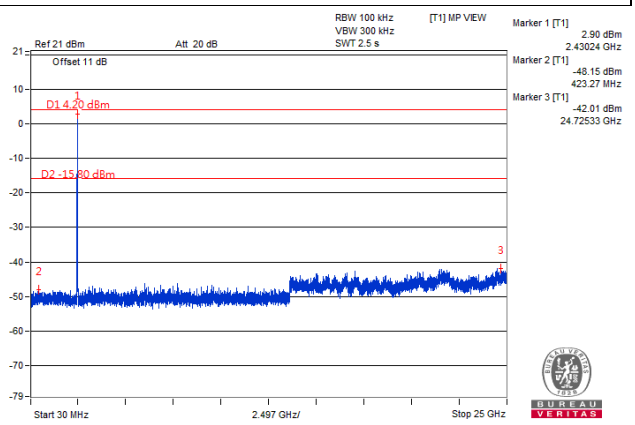
CH 1



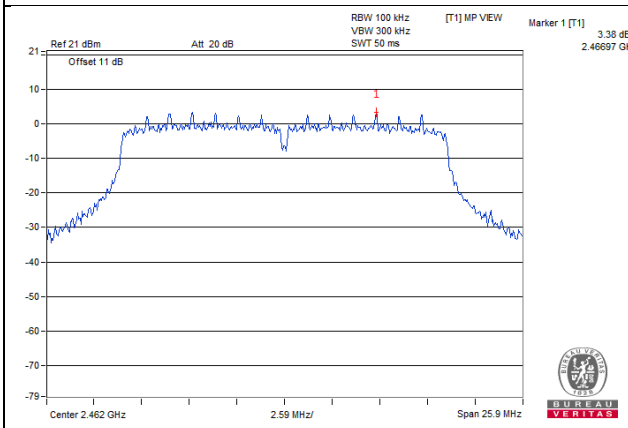


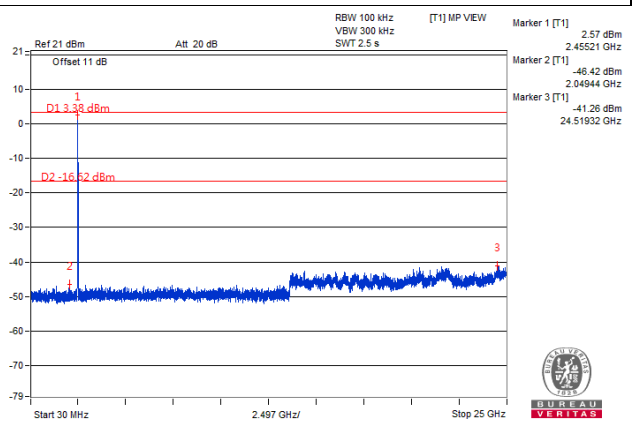
CH 6



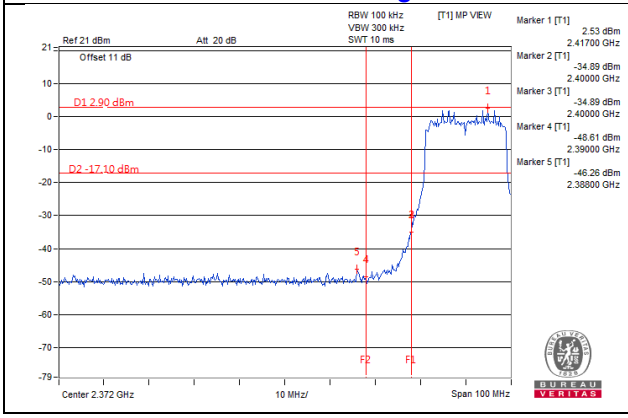


CH 11

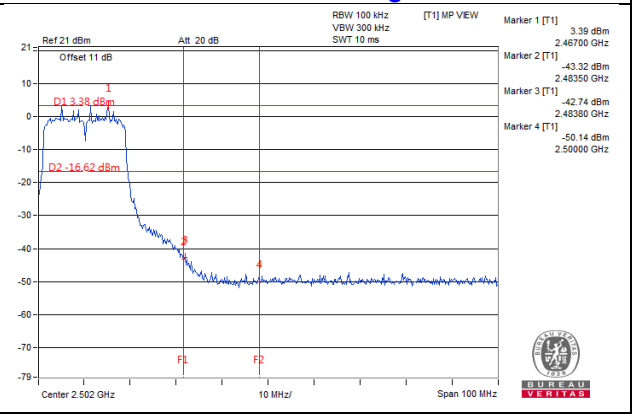




CH 1 Band edge

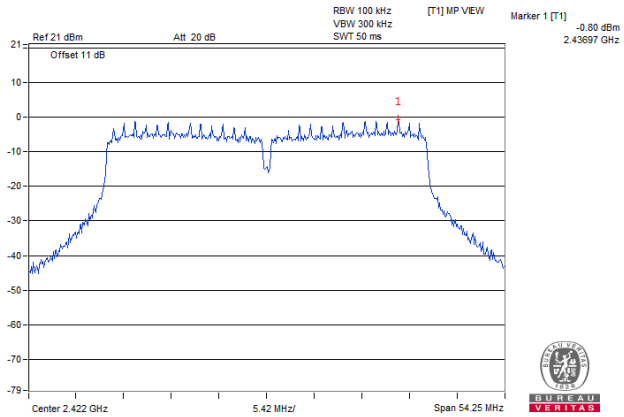


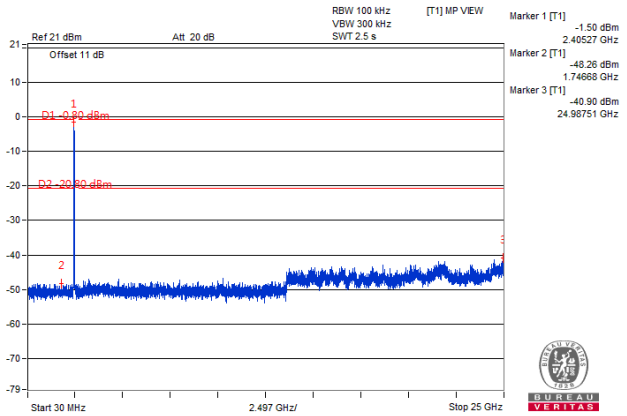
CH 11 Band edge



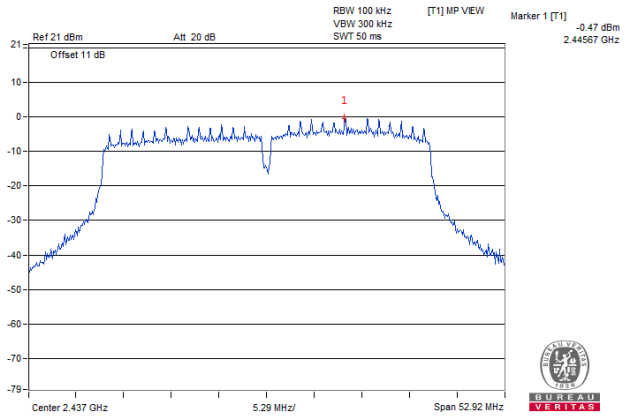
802.11n (HT40) - Chain 0

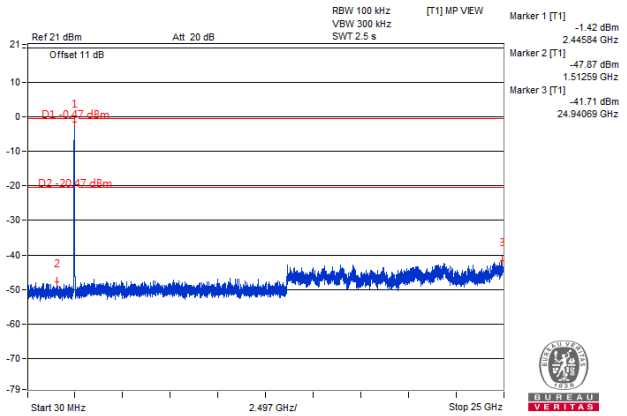
CH 3



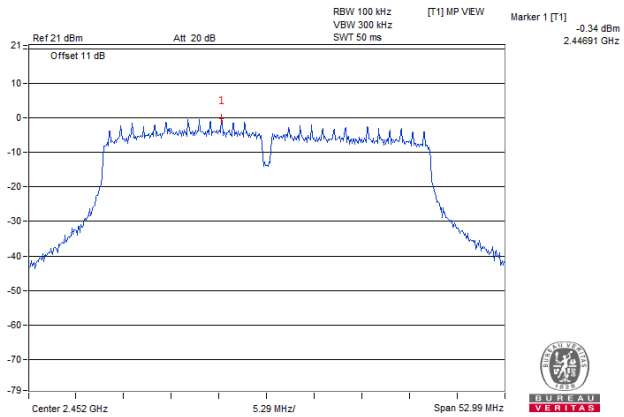


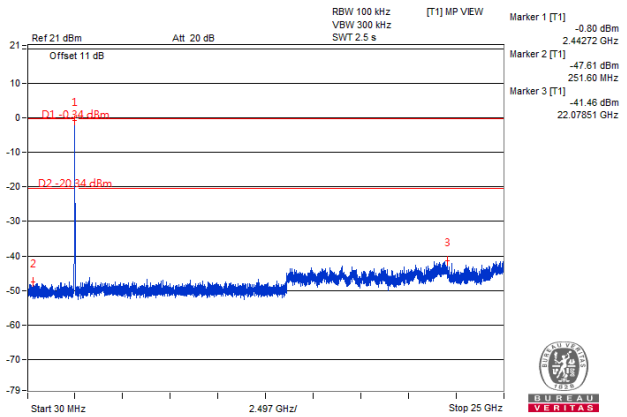
CH 6



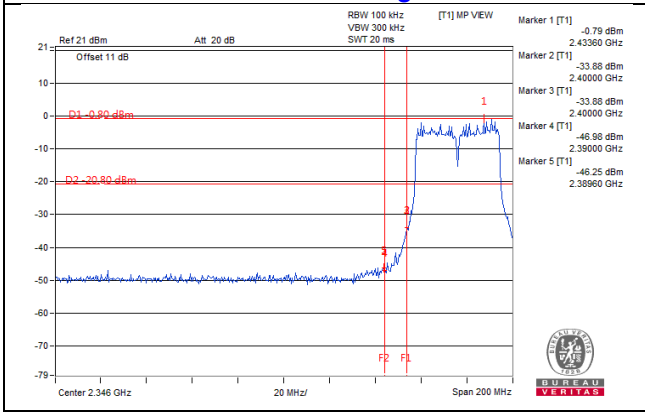


CH 9

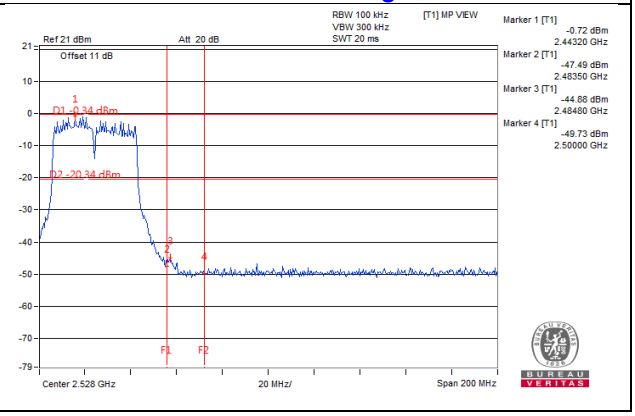




CH 3 Band edge

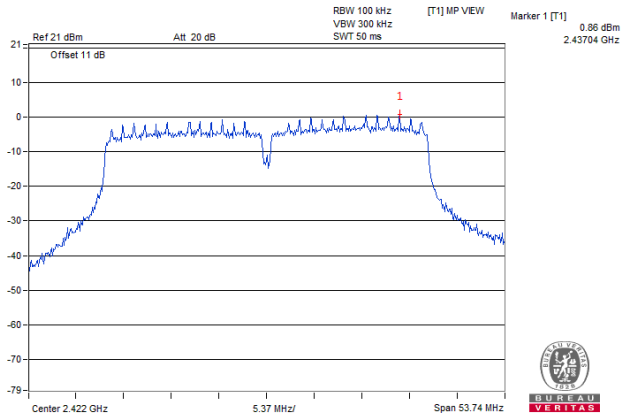


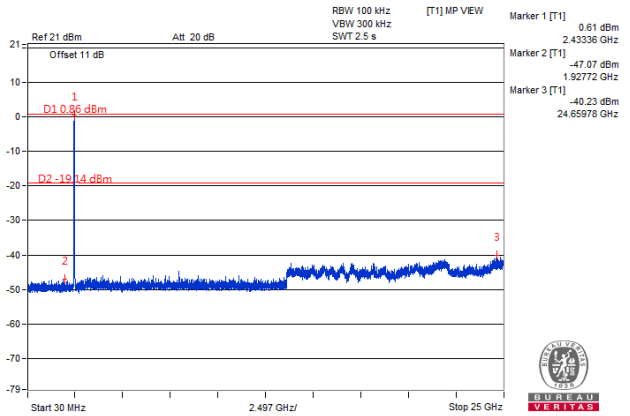
CH 9 Band edge



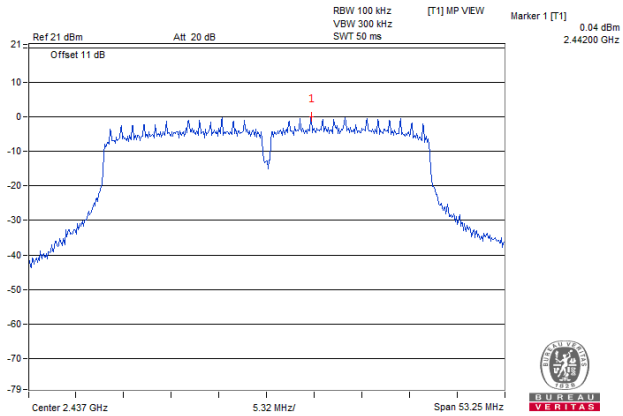
Chain 1

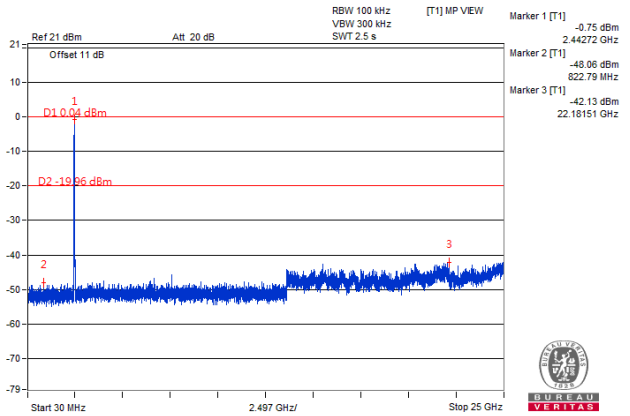
CH 3



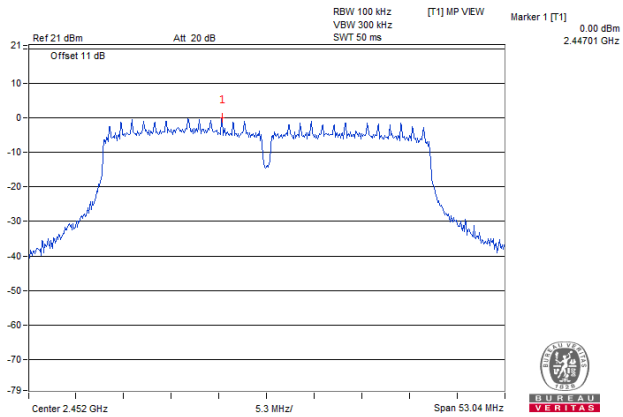


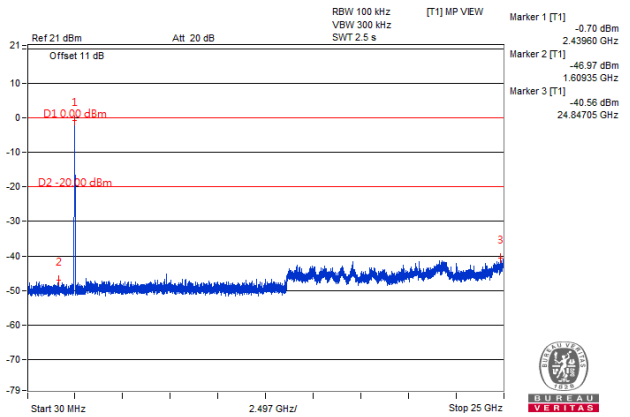
CH 6



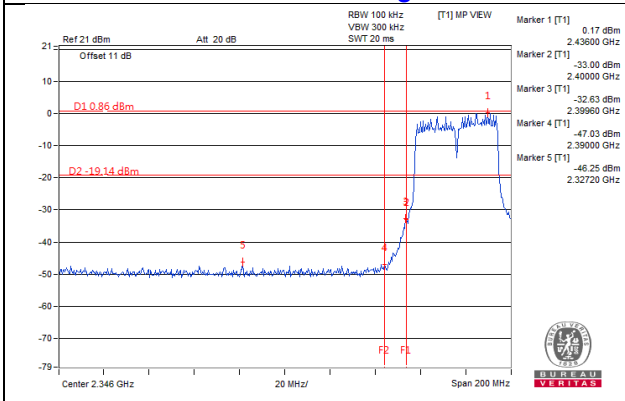


CH 9

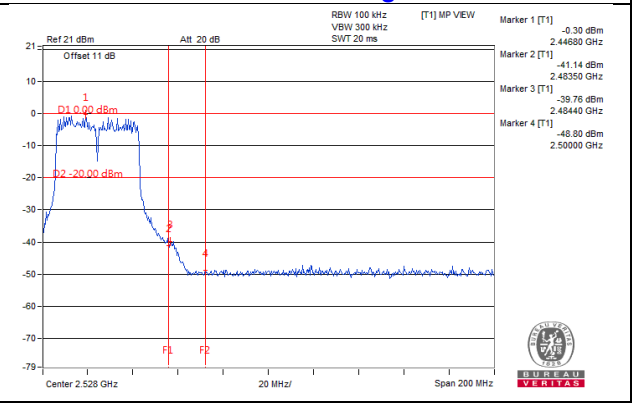




CH 3 Band edge



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:

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

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

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

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

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

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