

FCC Test Report

Report No.: RF180112E02

FCC ID: MQT-XC60

Test Model: XC60

Received Date: Jan. 12, 2018

Test Date: Jan. 23 to Feb. 07, 2018

Issued Date: Apr. 02, 2018

Applicant: XAC AUTOMATION CORP.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RF180112E02	Original release.	Apr. 02, 2018

1 Certificate of Conformity

Product: Cradle

Brand: XAC

Test Model: XC60

Sample Status: ENGINEERING SAMPLE

Applicant: XAC AUTOMATION CORP.

Test Date: Jan. 23 to Feb. 07, 2018

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 : Mary Ko , **Date:** Apr. 02, 2018
Mary Ko / Specialist

Approved by : May Chen , **Date:** Apr. 02, 2018
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 -13.17dB at 0.15781MHz.
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 4874.00MHz.
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.

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) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Cradle
Brand	XAC
Test Model	XC60
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n: up to 150Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7
Output Power	75.336mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The antenna provided to the EUT, please refer to the following table:

Brand	Model	Antenna net gain include (dBi)	Frequency range (GHz)	Antenna type	Connector type
Cirotech	03A40D5M00J0210	2	2.4~2.4835	Chip	None

2. The EUT incorporates a SISO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX	1RX
802.11g	6 ~ 54Mbps	1TX	1RX
802.11n (HT20)	MCS 0~7	1TX	1RX
802.11n (HT40)	MCS 0~7	1TX	1RX

3. The EUT must be supplied with a power adapter (only for test) as following table:

Brand	Model No.	Spec.
MOSO	MSA-C2000IC12.0-24P-US	Input: 100-240V, 0.7A, 50/60Hz Output: 12V, 2A DC cable: 1.5m, unshielded

4. 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	6	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	6	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

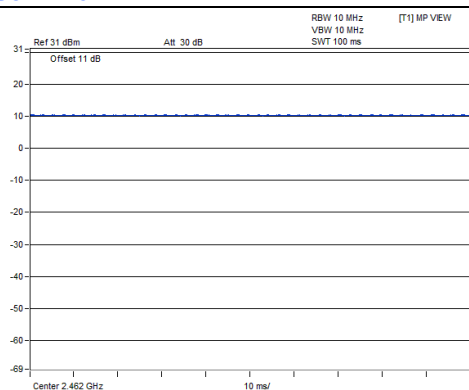
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	22deg. C, 68%RH	120Vac, 60Hz	Frank Chuang
RE $<$ 1G	24deg. C, 66%RH	120Vac, 60Hz	Frank Chuang
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

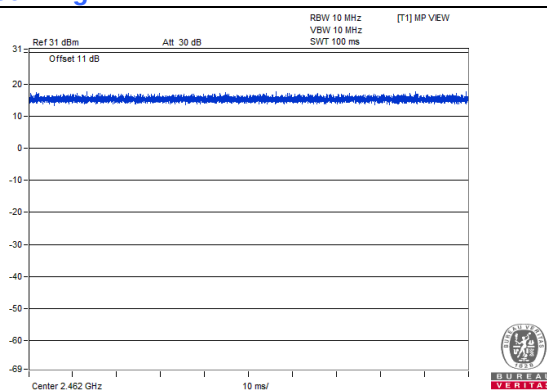
3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.

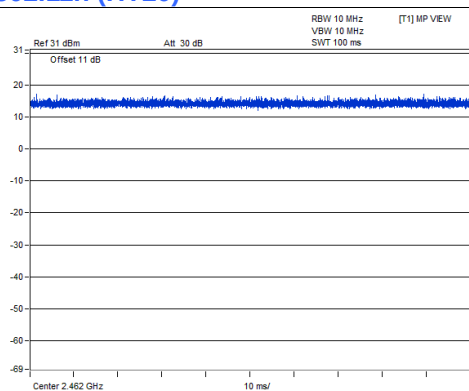
802.11b



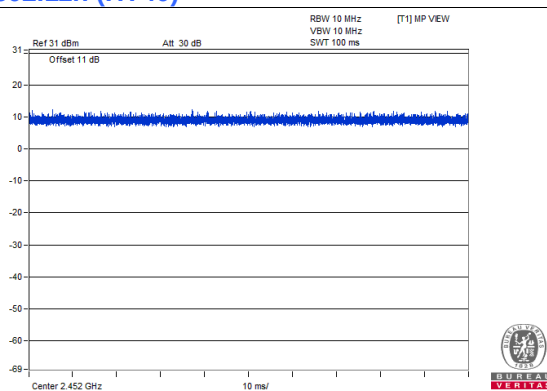
802.11g



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.	Adapter	NA	NA	NA	NA	Supplied by client
C.	I-Pod	Apple	MD778TA/A	CC4JMFLOF4T1	NA	Provided by Lab
D.	Terminal	E200NP	NA	NA	NA	Supplied by client

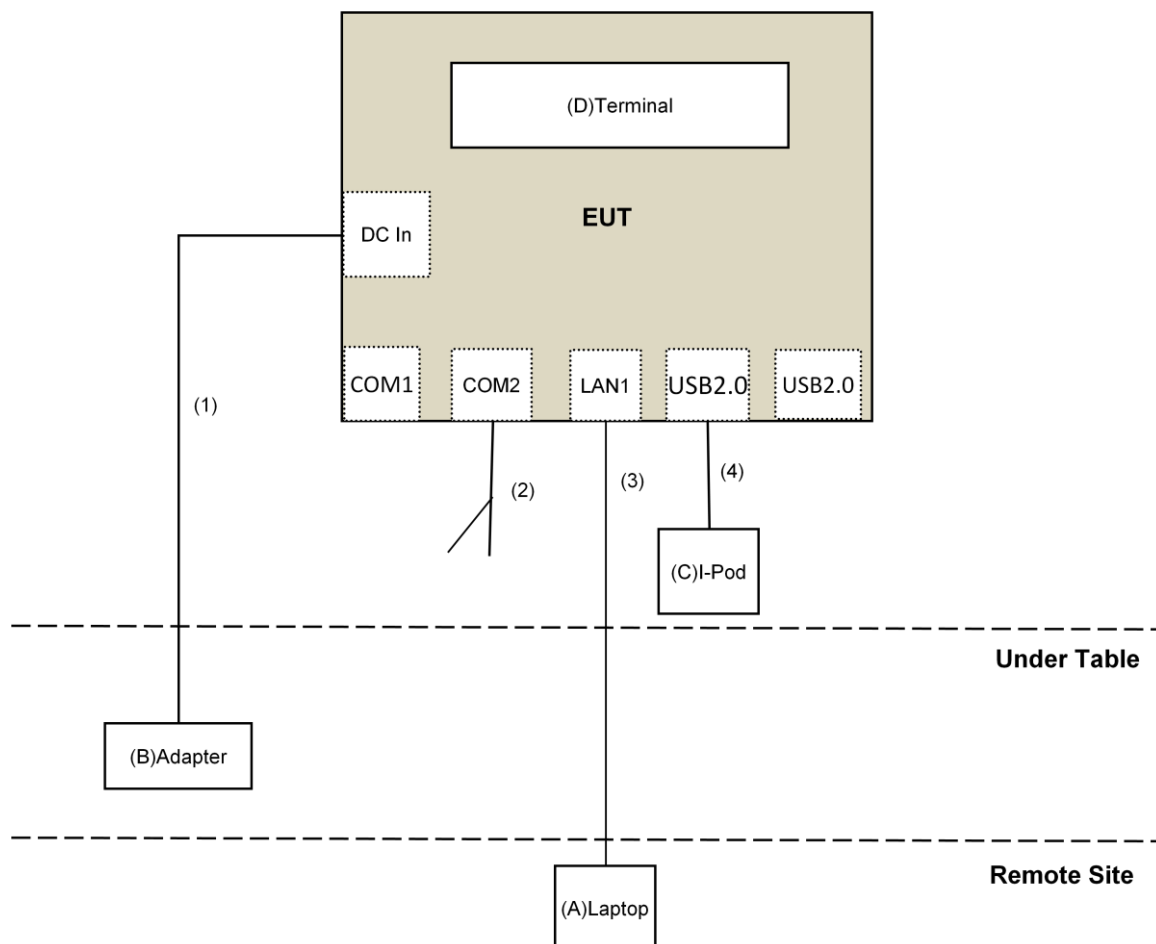
Note:

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	1.5	No	1	Supplied by client
2.	RJ-12 Cable	1	1.2	No	0	Supplied by client
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	USB Cable	1	0.1	Yes	0	Provided by Lab

Note: The core(s) is(are) originally attached to the cable(s).

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 DTS Meas Guidance v04
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

For power output test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. The CANADA Site Registration No. is 20331-1
4. Tested Date: Jan. 23, 2018

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Loop Antenna ^(*) TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Jan. 29, 2018 Jan. 29, 2018 Jan. 29, 2018	Jan. 28, 2019 Jan. 28, 2019 Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. Loop antenna was used for all emissions below 30 MHz.
5. The CANADA Site Registration No. is 20331-1
6. Tested Date: Feb. 06 to 07, 2018

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. Both X and Y axes 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:

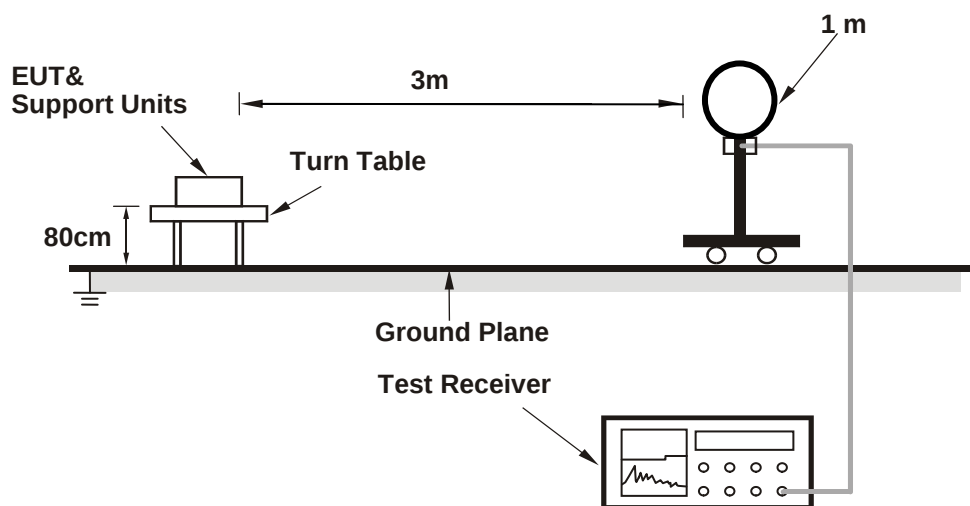
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) 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

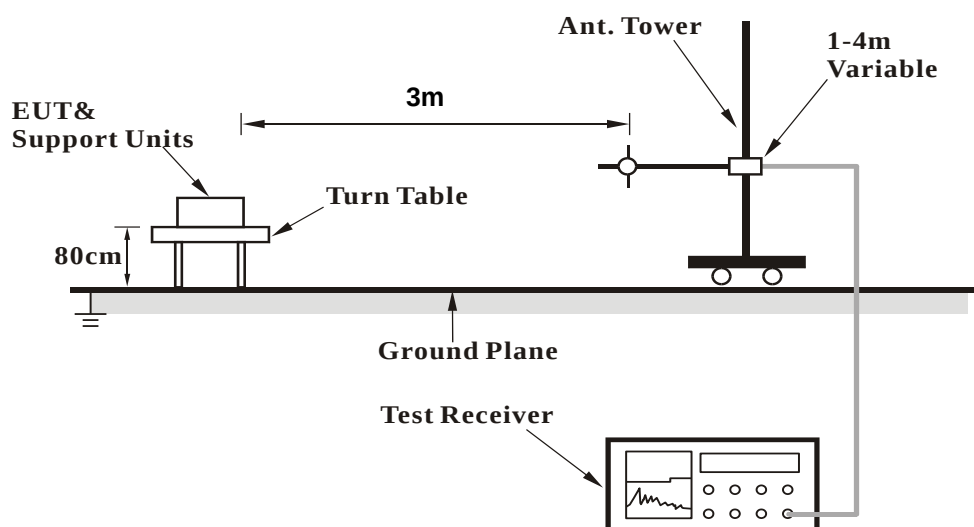
No deviation.

4.1.5 Test Setup

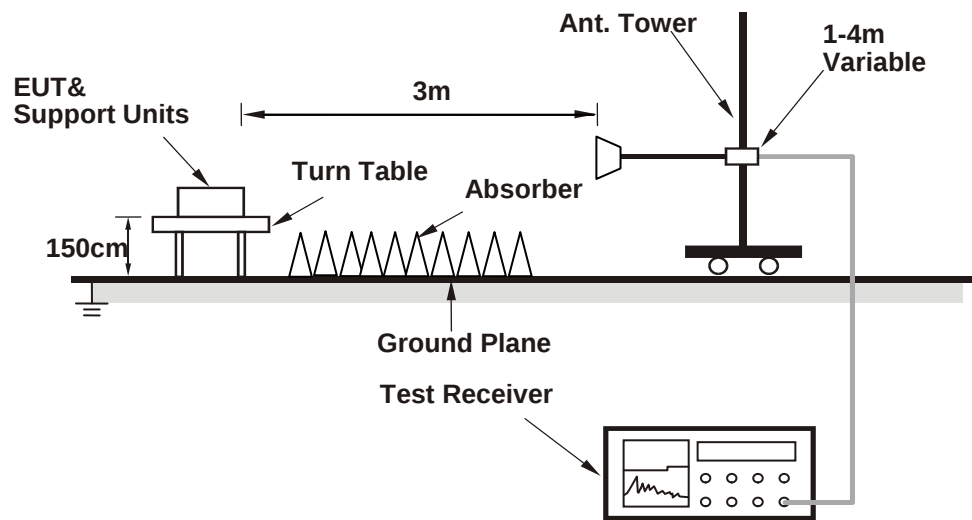
For Radiated emission below 30MHz



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

- Connected the EUT with the laptop which is placed on remote site.
- Controlling software (HyperTerminal paste XC50_ RF mode command) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data :

802.11b

CHANNEL	TX Channel 1	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	53.1 PK	74.0	-20.9	1.00 H	99	54.3	-1.2
2	2390.00	41.5 AV	54.0	-12.5	1.00 H	99	42.7	-1.2
3	*2412.00	94.3 PK			1.00 H	99	95.6	-1.3
4	*2412.00	92.2 AV			1.00 H	99	93.5	-1.3
5	4824.00	41.7 PK	74.0	-32.3	1.49 H	348	38.6	3.1
6	4824.00	36.4 AV	54.0	-17.6	1.49 H	348	33.3	3.1
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	52.9 PK	74.0	-21.1	1.44 V	58	54.1	-1.2
2	2390.00	40.5 AV	54.0	-13.5	1.44 V	58	41.7	-1.2
3	*2412.00	83.7 PK			1.44 V	58	85.0	-1.3
4	*2412.00	81.4 AV			1.44 V	58	82.7	-1.3
5	4824.00	40.5 PK	74.0	-33.5	3.16 V	287	37.4	3.1
6	4824.00	35.1 AV	54.0	-18.9	3.16 V	287	32.0	3.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	53.0 PK	74.0	-21.0	1.03 H	98	54.2	-1.2
2	2390.00	41.2 AV	54.0	-12.8	1.03 H	98	42.4	-1.2
3	*2437.00	93.2 PK			1.03 H	98	94.8	-1.6
4	*2437.00	91.1 AV			1.03 H	98	92.7	-1.6
5	2483.50	53.4 PK	74.0	-20.6	1.03 H	98	54.9	-1.5
6	2483.50	41.1 AV	54.0	-12.9	1.03 H	98	42.6	-1.5
7	4874.00	42.7 PK	74.0	-31.3	1.06 H	62	39.5	3.2
8	4874.00	38.4 AV	54.0	-15.6	1.06 H	62	35.2	3.2
9	7311.00	42.0 PK	74.0	-32.0	1.26 H	341	33.1	8.9
10	7311.00	31.7 AV	54.0	-22.3	1.26 H	341	22.8	8.9

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	53.1 PK	74.0	-20.9	1.38 V	51	54.3	-1.2
2	2390.00	40.8 AV	54.0	-13.2	1.38 V	51	42.0	-1.2
3	*2437.00	82.5 PK			1.38 V	51	84.1	-1.6
4	*2437.00	80.5 AV			1.38 V	51	82.1	-1.6
5	2483.50	53.2 PK	74.0	-20.8	1.38 V	51	54.7	-1.5
6	2483.50	40.5 AV	54.0	-13.5	1.38 V	51	42.0	-1.5
7	4874.00	40.3 PK	74.0	-33.7	2.28 V	291	37.1	3.2
8	4874.00	35.1 AV	54.0	-18.9	2.28 V	291	31.9	3.2
9	7311.00	42.4 PK	74.0	-31.6	1.84 V	27	33.5	8.9
10	7311.00	32.0 AV	54.0	-22.0	1.84 V	27	23.1	8.9

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	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	*2462.00	95.0 PK			1.16 H	55	96.6	-1.6
2	*2462.00	92.7 AV			1.16 H	55	94.3	-1.6
3	2483.50	53.6 PK	74.0	-20.4	1.16 H	55	55.1	-1.5
4	2483.50	41.2 AV	54.0	-12.8	1.16 H	55	42.7	-1.5
5	4924.00	44.3 PK	74.0	-29.7	1.02 H	64	41.0	3.3
6	4924.00	41.2 AV	54.0	-12.8	1.02 H	64	37.9	3.3
7	7386.00	42.2 PK	74.0	-31.8	1.83 H	248	33.0	9.2
8	7386.00	31.6 AV	54.0	-22.4	1.83 H	248	22.4	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	*2462.00	83.8 PK			1.33 V	53	85.4	-1.6
2	*2462.00	81.5 AV			1.33 V	53	83.1	-1.6
3	2483.50	54.0 PK	74.0	-20.0	1.33 V	53	55.5	-1.5
4	2483.50	41.0 AV	54.0	-13.0	1.33 V	53	42.5	-1.5
5	4924.00	43.2 PK	74.0	-30.8	1.49 V	224	39.9	3.3
6	4924.00	39.4 AV	54.0	-14.6	1.49 V	224	36.1	3.3
7	7386.00	42.4 PK	74.0	-31.6	1.85 V	349	33.2	9.2
8	7386.00	31.8 AV	54.0	-22.2	1.85 V	349	22.6	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11g

CHANNEL	TX Channel 1	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	66.2 PK	74.0	-7.8	1.01 H	72	67.4	-1.2
2	2390.00	52.2 AV	54.0	-1.8	1.01 H	72	53.4	-1.2
3	*2412.00	104.5 PK			1.01 H	72	105.8	-1.3
4	*2412.00	95.4 AV			1.01 H	72	96.7	-1.3
5	4824.00	60.1 PK	74.0	-13.9	1.25 H	290	57.0	3.1
6	4824.00	49.2 AV	54.0	-4.8	1.25 H	290	46.1	3.1
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	62.5 PK	74.0	-11.5	2.73 V	305	63.7	-1.2
2	2390.00	49.8 AV	54.0	-4.2	2.73 V	305	51.0	-1.2
3	*2412.00	96.2 PK			2.73 V	305	97.5	-1.3
4	*2412.00	87.1 AV			2.73 V	305	88.4	-1.3
5	4824.00	58.9 PK	74.0	-15.1	1.22 V	129	55.8	3.1
6	4824.00	46.0 AV	54.0	-8.0	1.22 V	129	42.9	3.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	56.7 PK	74.0	-17.3	1.00 H	58	57.9	-1.2
2	2390.00	45.3 AV	54.0	-8.7	1.00 H	58	46.5	-1.2
3	*2437.00	104.1 PK			1.00 H	58	105.7	-1.6
4	*2437.00	94.8 AV			1.00 H	58	96.4	-1.6
5	2483.50	53.6 PK	74.0	-20.4	1.00 H	58	55.1	-1.5
6	2483.50	40.8 AV	54.0	-13.2	1.00 H	58	42.3	-1.5
7	4874.00	60.0 PK	74.0	-14.0	1.02 H	274	56.8	3.2
8	4874.00	49.1 AV	54.0	-4.9	1.02 H	274	45.9	3.2
9	7311.00	43.8 PK	74.0	-30.2	2.75 H	306	34.9	8.9
10	7311.00	31.4 AV	54.0	-22.6	2.75 H	306	22.5	8.9

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	54.0 PK	74.0	-20.0	2.73 V	328	55.2	-1.2
2	2390.00	43.1 AV	54.0	-10.9	2.73 V	328	44.3	-1.2
3	*2437.00	95.7 PK			2.73 V	328	97.3	-1.6
4	*2437.00	86.6 AV			2.73 V	328	88.2	-1.6
5	2483.50	53.2 PK	74.0	-20.8	2.73 V	328	54.7	-1.5
6	2483.50	40.2 AV	54.0	-13.8	2.73 V	328	41.7	-1.5
7	4874.00	59.2 PK	74.0	-14.8	1.96 V	127	56.0	3.2
8	4874.00	46.5 AV	54.0	-7.5	1.96 V	127	43.3	3.2
9	7311.00	43.9 PK	74.0	-30.1	2.46 V	18	35.0	8.9
10	7311.00	30.7 AV	54.0	-23.3	2.46 V	18	21.8	8.9

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	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	*2462.00	102.1 PK			1.00 H	60	103.7	-1.6
2	*2462.00	92.2 AV			1.00 H	60	93.8	-1.6
3	2483.50	60.2 PK	74.0	-13.8	1.00 H	60	61.7	-1.5
4	2483.50	46.4 AV	54.0	-7.6	1.00 H	60	47.9	-1.5
5	4924.00	56.5 PK	74.0	-17.5	2.39 H	134	53.2	3.3
6	4924.00	43.6 AV	54.0	-10.4	2.39 H	134	40.3	3.3
7	7386.00	43.8 PK	74.0	-30.2	2.79 H	342	34.6	9.2
8	7386.00	31.2 AV	54.0	-22.8	2.79 H	342	22.0	9.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	93.8 PK			2.77 V	338	95.4	-1.6
2	*2462.00	84.2 AV			2.77 V	338	85.8	-1.6
3	2483.50	55.5 PK	74.0	-18.5	2.77 V	338	57.0	-1.5
4	2483.50	42.1 AV	54.0	-11.9	2.77 V	338	43.6	-1.5
5	4924.00	55.1 PK	74.0	-18.9	1.93 V	202	51.8	3.3
6	4924.00	42.3 AV	54.0	-11.7	1.93 V	202	39.0	3.3
7	7386.00	43.7 PK	74.0	-30.3	2.41 V	141	34.5	9.2
8	7386.00	30.4 AV	54.0	-23.6	2.41 V	141	21.2	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT20)

CHANNEL	TX Channel 1	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	65.9 PK	74.0	-8.1	1.01 H	55	67.1	-1.2
2	2390.00	49.3 AV	54.0	-4.7	1.01 H	55	50.5	-1.2
3	*2412.00	100.6 PK			1.01 H	55	101.9	-1.3
4	*2412.00	92.7 AV			1.01 H	55	94.0	-1.3
5	4824.00	60.7 PK	74.0	-13.3	2.48 H	97	57.6	3.1
6	4824.00	48.0 AV	54.0	-6.0	2.48 H	97	44.9	3.1
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	59.8 PK	74.0	-14.2	1.68 V	338	61.0	-1.2
2	2390.00	45.3 AV	54.0	-8.7	1.68 V	338	46.5	-1.2
3	*2412.00	94.1 PK			1.68 V	338	95.4	-1.3
4	*2412.00	84.2 AV			1.68 V	338	85.5	-1.3
5	4824.00	57.8 PK	74.0	-16.2	2.75 V	131	54.7	3.1
6	4824.00	44.9 AV	54.0	-9.1	2.75 V	131	41.8	3.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	56.4 PK	74.0	-17.6	1.00 H	102	57.6	-1.2
2	2390.00	44.8 AV	54.0	-9.2	1.00 H	102	46.0	-1.2
3	*2437.00	104.3 PK			1.00 H	102	105.9	-1.6
4	*2437.00	95.9 AV			1.00 H	102	97.5	-1.6
5	2483.50	52.8 PK	74.0	-21.2	1.00 H	102	54.3	-1.5
6	2483.50	40.7 AV	54.0	-13.3	1.00 H	102	42.2	-1.5
7	4874.00	67.7 PK	74.0	-6.3	2.87 H	289	64.5	3.2
8	4874.00	53.8 AV	54.0	-0.2	2.87 H	289	50.6	3.2
9	7311.00	55.5 PK	74.0	-18.5	2.77 H	125	46.6	8.9
10	7311.00	42.1 AV	54.0	-11.9	2.77 H	125	33.2	8.9

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	54.6 PK	74.0	-19.4	1.64 V	331	55.8	-1.2
2	2390.00	42.1 AV	54.0	-11.9	1.64 V	331	43.3	-1.2
3	*2437.00	96.7 PK			1.64 V	331	98.3	-1.6
4	*2437.00	86.6 AV			1.64 V	331	88.2	-1.6
5	2483.50	52.7 PK	74.0	-21.3	1.64 V	331	54.2	-1.5
6	2483.50	40.6 AV	54.0	-13.4	1.64 V	331	42.1	-1.5
7	4874.00	60.1 PK	74.0	-13.9	1.05 V	64	56.9	3.2
8	4874.00	47.6 AV	54.0	-6.4	1.05 V	64	44.4	3.2
9	7311.00	55.0 PK	74.0	-19.0	2.74 V	343	46.1	8.9
10	7311.00	41.6 AV	54.0	-12.4	2.74 V	343	32.7	8.9

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 11	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	*2462.00	98.2 PK			1.10 H	60	99.8	-1.6
2	*2462.00	90.1 AV			1.10 H	60	91.7	-1.6
3	2483.50	59.7 PK	74.0	-14.3	1.10 H	60	61.2	-1.5
4	2483.50	43.6 AV	54.0	-10.4	1.10 H	60	45.1	-1.5
5	4924.00	58.6 PK	74.0	-15.4	2.41 H	351	55.3	3.3
6	4924.00	44.9 AV	54.0	-9.1	2.41 H	351	41.6	3.3
7	7386.00	52.8 PK	74.0	-21.2	2.76 H	147	43.6	9.2
8	7386.00	40.3 AV	54.0	-13.7	2.76 H	147	31.1	9.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	92.1 PK			1.62 V	332	93.7	-1.6
2	*2462.00	81.9 AV			1.62 V	332	83.5	-1.6
3	2483.50	53.6 PK	74.0	-20.4	1.62 V	332	55.1	-1.5
4	2483.50	40.7 AV	54.0	-13.3	1.62 V	332	42.2	-1.5
5	4924.00	55.4 PK	74.0	-18.6	1.01 V	166	52.1	3.3
6	4924.00	41.9 AV	54.0	-12.1	1.01 V	166	38.6	3.3
7	7386.00	52.7 PK	74.0	-21.3	2.79 V	280	43.5	9.2
8	7386.00	40.1 AV	54.0	-13.9	2.79 V	280	30.9	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.6 PK	74.0	-14.4	1.18 H	55	60.8	-1.2
2	2390.00	46.2 AV	54.0	-7.8	1.18 H	55	47.4	-1.2
3	*2422.00	94.4 PK			1.18 H	55	95.9	-1.5
4	*2422.00	86.1 AV			1.18 H	55	87.6	-1.5
5	4844.00	47.8 PK	74.0	-26.2	2.33 H	124	44.7	3.1
6	4844.00	36.2 AV	54.0	-17.8	2.33 H	124	33.1	3.1
7	7266.00	43.0 PK	74.0	-31.0	2.41 H	113	34.1	8.9
8	7266.00	32.5 AV	54.0	-21.5	2.41 H	113	23.6	8.9
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	60.1 PK	74.0	-13.9	2.87 V	142	61.3	-1.2
2	2390.00	43.7 AV	54.0	-10.3	2.87 V	142	44.9	-1.2
3	*2422.00	90.6 PK			2.87 V	142	92.1	-1.5
4	*2422.00	82.2 AV			2.87 V	142	83.7	-1.5
5	4844.00	46.3 PK	74.0	-27.7	1.47 V	287	43.2	3.1
6	4844.00	34.2 AV	54.0	-19.8	1.47 V	287	31.1	3.1
7	7266.00	42.7 PK	74.0	-31.3	1.32 V	284	33.8	8.9
8	7266.00	32.2 AV	54.0	-21.8	1.32 V	284	23.3	8.9

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	66.7 PK	74.0	-7.3	1.21 H	56	67.9	-1.2
2	2390.00	52.5 AV	54.0	-1.5	1.21 H	56	53.7	-1.2
3	*2437.00	99.4 PK			1.21 H	56	101.0	-1.6
4	*2437.00	90.9 AV			1.21 H	56	92.5	-1.6
5	2483.50	57.8 PK	74.0	-16.2	1.21 H	56	59.3	-1.5
6	2483.50	43.5 AV	54.0	-10.5	1.21 H	56	45.0	-1.5
7	4874.00	49.5 PK	74.0	-24.5	1.44 H	37	46.3	3.2
8	4874.00	39.3 AV	54.0	-14.7	1.44 H	37	36.1	3.2
9	7311.00	42.4 PK	74.0	-31.6	2.28 H	107	33.5	8.9
10	7311.00	32.0 AV	54.0	-22.0	2.28 H	107	23.1	8.9

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	61.6 PK	74.0	-12.4	2.88 V	150	62.8	-1.2
2	2390.00	46.2 AV	54.0	-7.8	2.88 V	150	47.4	-1.2
3	*2437.00	95.3 PK			2.88 V	150	96.9	-1.6
4	*2437.00	86.6 AV			2.88 V	150	88.2	-1.6
5	2483.50	52.8 PK	74.0	-21.2	2.88 V	150	54.3	-1.5
6	2483.50	40.5 AV	54.0	-13.5	2.88 V	150	42.0	-1.5
7	4874.00	48.7 PK	74.0	-25.3	2.28 V	292	45.5	3.2
8	4874.00	37.8 AV	54.0	-16.2	2.28 V	292	34.6	3.2
9	7311.00	42.6 PK	74.0	-31.4	1.28 V	119	33.7	8.9
10	7311.00	31.9 AV	54.0	-22.1	1.28 V	119	23.0	8.9

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	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	*2452.00	93.7 PK			1.04 H	59	95.3	-1.6
2	*2452.00	84.9 AV			1.04 H	59	86.5	-1.6
3	2483.50	53.2 PK	74.0	-20.8	1.04 H	59	54.7	-1.5
4	2483.50	40.7 AV	54.0	-13.3	1.04 H	59	42.2	-1.5
5	4904.00	45.2 PK	74.0	-28.8	1.35 H	174	41.9	3.3
6	4904.00	34.5 AV	54.0	-19.5	1.35 H	174	31.2	3.3
7	7356.00	42.7 PK	74.0	-31.3	2.47 H	88	33.6	9.1
8	7356.00	32.1 AV	54.0	-21.9	2.47 H	88	23.0	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	89.8 PK			2.91 V	136	91.4	-1.6
2	*2452.00	80.1 AV			2.91 V	136	81.7	-1.6
3	2483.50	52.9 PK	74.0	-21.1	2.91 V	136	54.4	-1.5
4	2483.50	40.5 AV	54.0	-13.5	2.91 V	136	42.0	-1.5
5	4904.00	46.0 PK	74.0	-28.0	1.45 V	189	42.7	3.3
6	4904.00	33.8 AV	54.0	-20.2	1.45 V	189	30.5	3.3
7	7356.00	41.2 PK	74.0	-32.8	1.32 V	289	32.1	9.1
8	7356.00	31.5 AV	54.0	-22.5	1.32 V	289	22.4	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

Below 1GHz Data:

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	98.87	27.8 QP	43.5	-15.7	2.00 H	267	40.5	-12.7
2	124.38	29.0 QP	43.5	-14.5	1.50 H	270	38.7	-9.7
3	174.19	31.3 QP	43.5	-12.2	1.50 H	176	40.3	-9.0
4	297.70	28.5 QP	46.0	-17.5	1.00 H	328	35.9	-7.4
5	329.92	30.3 QP	46.0	-15.7	1.00 H	322	36.5	-6.2
6	625.51	29.7 QP	46.0	-16.3	1.00 H	360	29.8	-0.1
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	50.01	30.2 QP	40.0	-9.8	1.50 V	164	38.1	-7.9
2	138.25	26.1 QP	43.5	-17.4	1.00 V	282	34.6	-8.5
3	176.57	25.9 QP	43.5	-17.6	1.50 V	319	35.2	-9.3
4	297.09	25.7 QP	46.0	-20.3	1.50 V	346	33.1	-7.4
5	332.03	26.2 QP	46.0	-19.8	1.50 V	2	32.5	-6.3
6	672.96	31.5 QP	46.0	-14.5	1.50 V	196	31.1	0.4

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

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	Nov. 01, 2017	Oct. 31, 2018
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
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 Shielded Room No. 1.
- 3 Tested Date: Jan. 24, 2018

4.2.3 Test Procedures

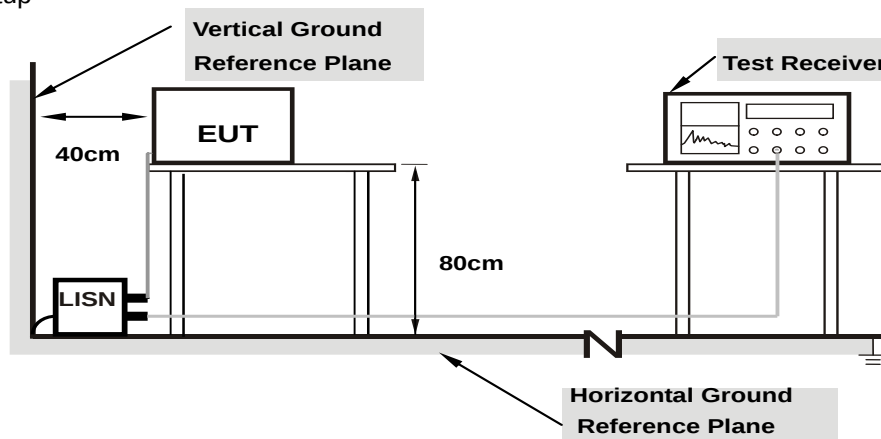
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.14	41.01	26.31	51.15	36.45	65.79	55.79	-14.64	-19.34
2	0.20078	10.15	36.41	20.82	46.56	30.97	63.58	53.58	-17.02	-22.61
3	0.26719	10.17	33.70	18.42	43.87	28.59	61.20	51.20	-17.33	-22.61
4	0.32188	10.18	31.54	22.91	41.72	33.09	59.66	49.66	-17.94	-16.57
5	0.35313	10.19	34.04	19.02	44.23	29.21	58.89	48.89	-14.66	-19.68
6	0.40781	10.20	31.58	14.82	41.78	25.02	57.69	47.69	-15.91	-22.67
7	0.48203	10.21	28.30	12.04	38.51	22.25	56.30	46.30	-17.79	-24.05
8	0.52891	10.21	26.44	13.16	36.65	23.37	56.00	46.00	-19.35	-22.63
9	0.67734	10.22	23.06	13.26	33.28	23.48	56.00	46.00	-22.72	-22.52
10	4.30078	10.46	18.11	11.78	28.57	22.24	56.00	46.00	-27.43	-23.76

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)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.05	42.36	25.21	52.41	35.26	65.58	55.58	-13.17	-20.32
2	0.22031	10.06	37.29	21.00	47.35	31.06	62.81	52.81	-15.46	-21.75
3	0.25547	10.06	36.18	18.76	46.24	28.82	61.58	51.58	-15.34	-22.76
4	0.31406	10.08	33.46	19.59	43.54	29.67	59.86	49.86	-16.32	-20.19
5	0.35313	10.09	32.93	15.01	43.02	25.10	58.89	48.89	-15.87	-23.79
6	0.42344	10.10	31.36	15.01	41.46	25.11	57.38	47.38	-15.92	-22.27
7	0.54063	10.10	26.80	14.78	36.90	24.88	56.00	46.00	-19.10	-21.12
8	0.61875	10.11	24.96	15.68	35.07	25.79	56.00	46.00	-20.93	-20.21
9	7.05469	10.47	17.51	11.85	27.98	22.32	60.00	50.00	-32.02	-27.68

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.

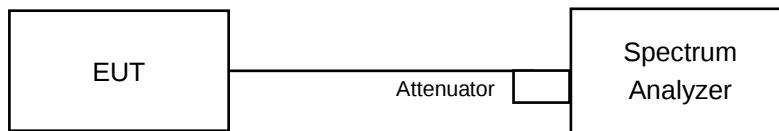


4.3 6dB Bandwidth Measurement

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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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
1	2412	9.60	0.5	Pass
6	2437	9.11	0.5	Pass
11	2462	9.56	0.5	Pass

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	16.36	0.5	Pass
6	2437	16.43	0.5	Pass
11	2462	16.44	0.5	Pass

802.11n (HT20)

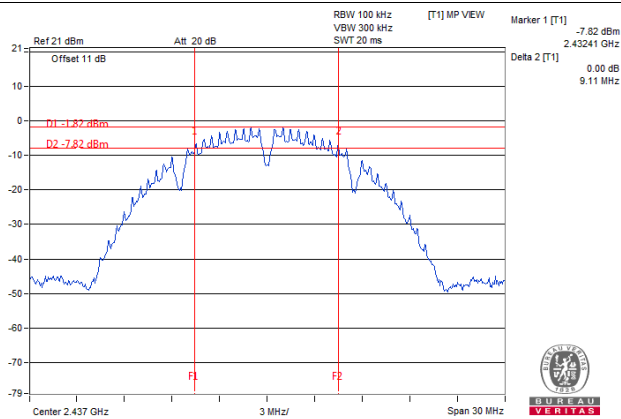
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	17.38	0.5	Pass
6	2437	17.61	0.5	Pass
11	2462	17.40	0.5	Pass

802.11n (HT40)

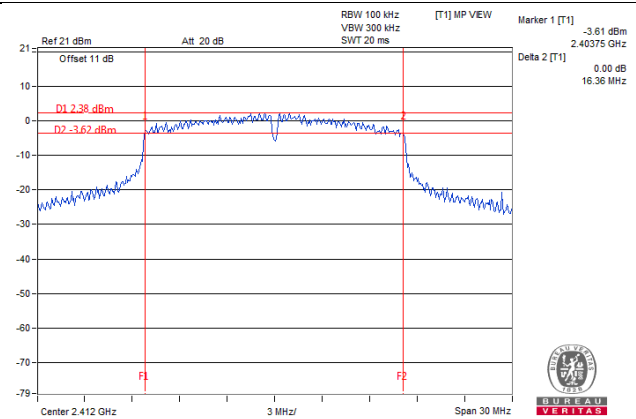
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	2422	35.17	0.5	Pass
6	2437	36.04	0.5	Pass
9	2452	35.57	0.5	Pass

Spectrum Plot of Worst Value

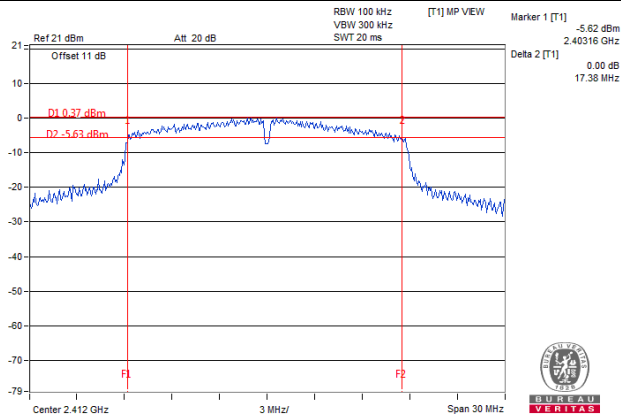
802.11b / CH6



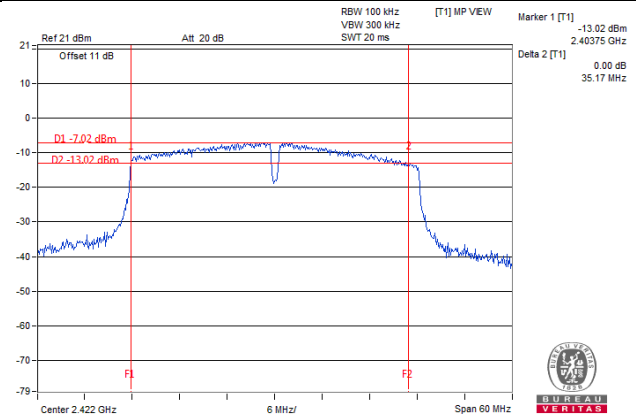
802.11g / CH1



802.11n (HT20) / CH1

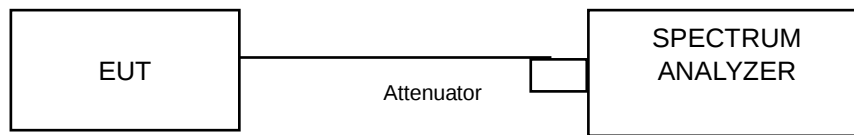


802.11n (HT40) / CH3



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)
1	2412	14.16
6	2437	14.28
11	2462	14.28

802.11g

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
1	2412	17.16
6	2437	17.28
11	2462	16.80

802.11n (HT20)

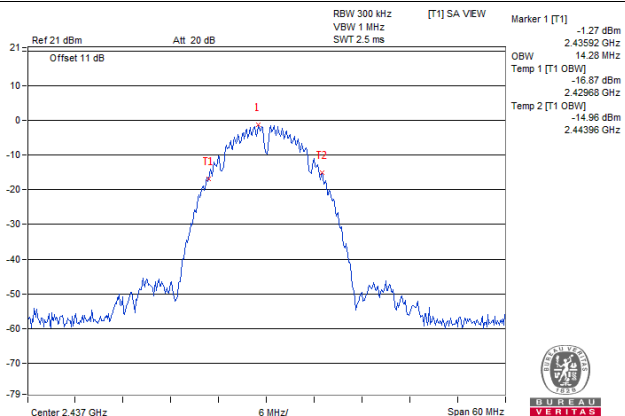
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
1	2412	18.36
6	2437	23.40
11	2462	18.00

802.11n (HT40)

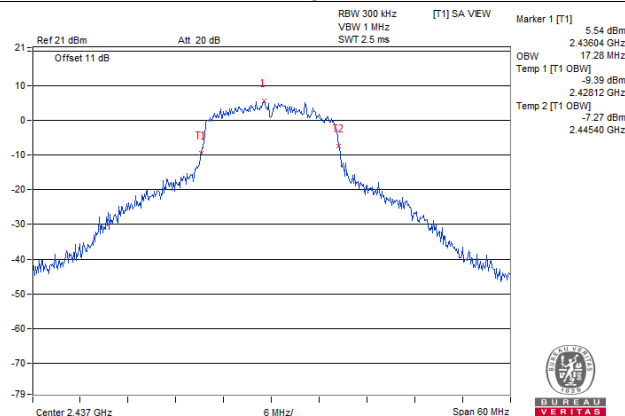
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
3	2422	36.24
6	2437	38.64
9	2452	36.00

Spectrum Plot of Worst Value

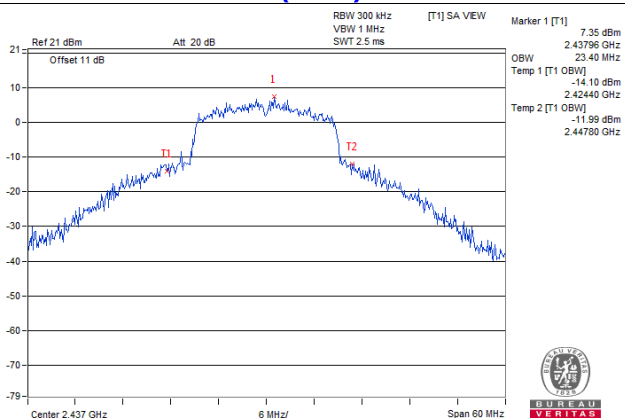
802.11b / CH6



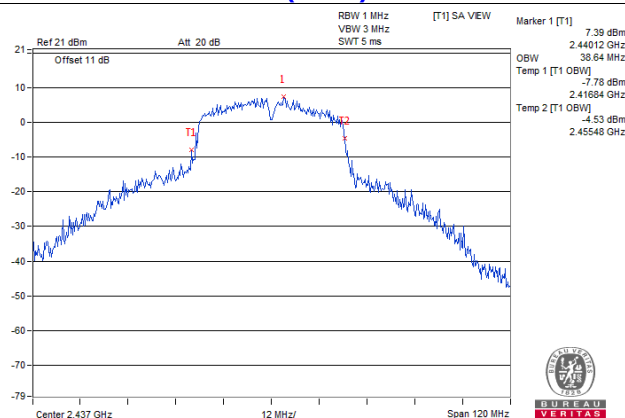
802.11g / CH6



802.11n (HT20) / CH6



802.11n (HT40) / CH6

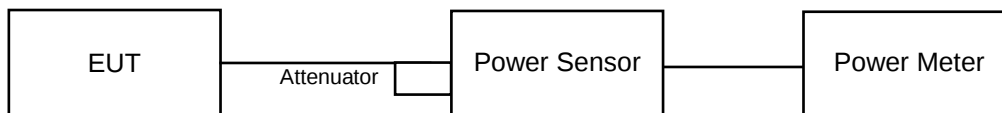


4.5 Conducted Output Power Measurement

4.5.1 Limits of Conducted Output Power Measurement

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

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

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

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	8.185	9.13	30	Pass
6	2437	7.261	8.61	30	Pass
11	2462	9.036	9.56	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	72.611	18.61	30	Pass
6	2437	75.336	18.77	30	Pass
11	2462	51.761	17.14	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	55.976	17.48	30	Pass
6	2437	64.417	18.09	30	Pass
11	2462	41.02	16.13	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
3	2422	41.4	16.17	30	Pass
6	2437	55.335	17.43	30	Pass
9	2452	35.237	15.47	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	5.176	7.14
6	2437	4.539	6.57
11	2462	5.794	7.63

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	20.989	13.22
6	2437	21.577	13.34
11	2462	12.706	11.04

802.11n (HT20)

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	17.061	12.32
6	2437	23.823	13.77
11	2462	10.328	10.14

802.11n (HT40)

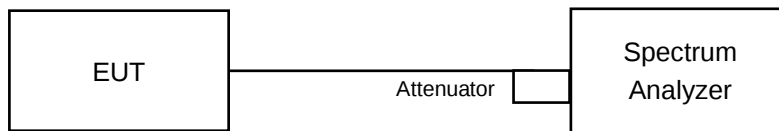
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	2422	7.112	8.52
6	2437	14.894	11.73
9	2452	5.023	7.01

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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set the VBW $\geq 3 \times \text{RBW}$.
- 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

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-14.49	8	Pass
6	2437	-15.35	8	Pass
11	2462	-15.08	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-10.47	8	Pass
6	2437	-11.18	8	Pass
11	2462	-12.57	8	Pass

802.11n (HT20)

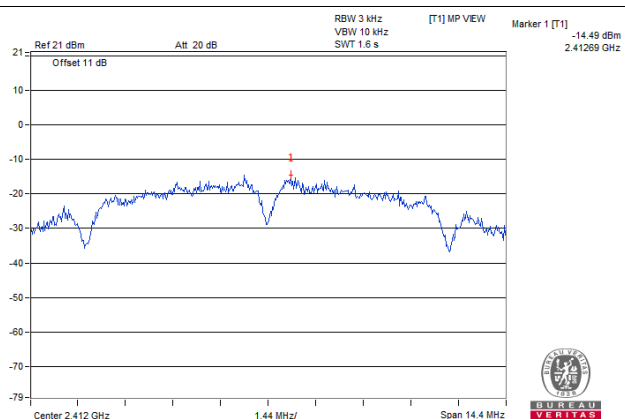
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-11.47	8	Pass
6	2437	-10.21	8	Pass
11	2462	-13.07	8	Pass

802.11n (HT40)

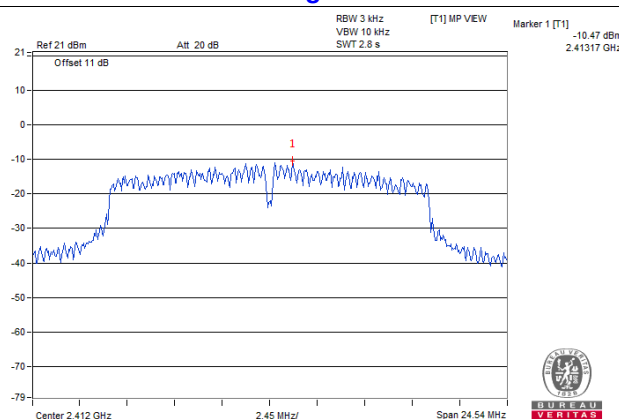
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
3	2422	-19.61	8	Pass
6	2437	-13.69	8	Pass
9	2452	-19.56	8	Pass

Spectrum Plot of Worst Value

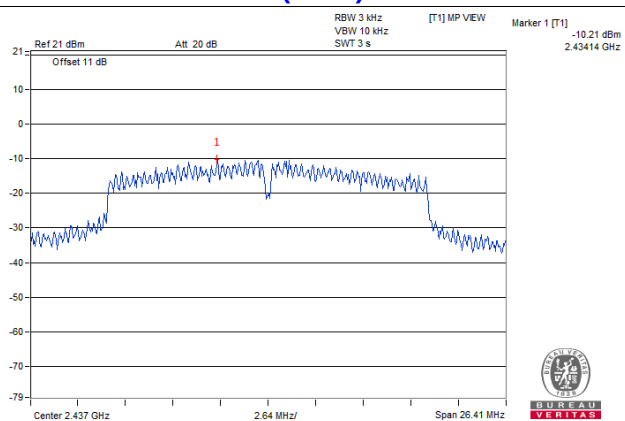
802.11b / CH1



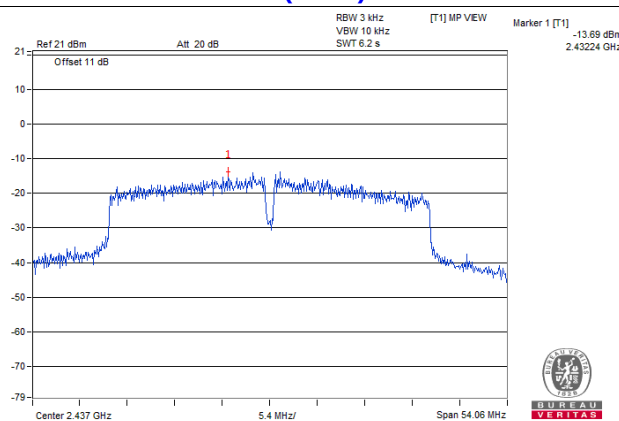
802.11g / CH1



802.11n (HT20) / CH6



802.11n (HT40) / CH6

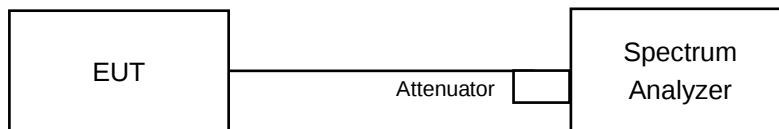


4.7 Conducted Out of Band Emission Measurement

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 $\geq$ 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 OOB

1. Set RBW = 100 kHz.
2. Set VBW $\geq$ 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

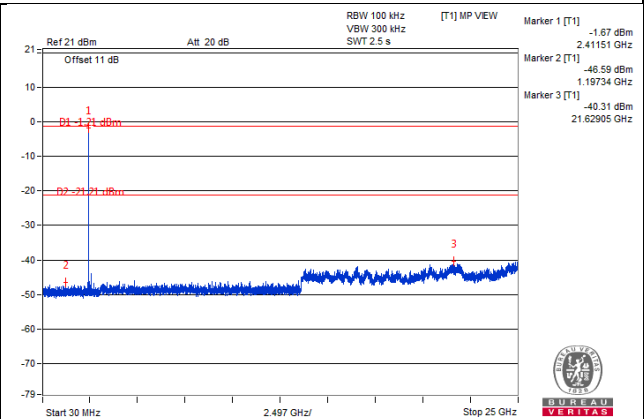
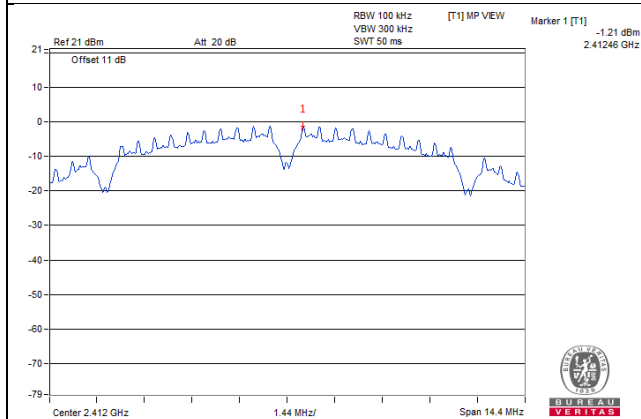
Same as Item 4.3.6

4.7.7 Test Results

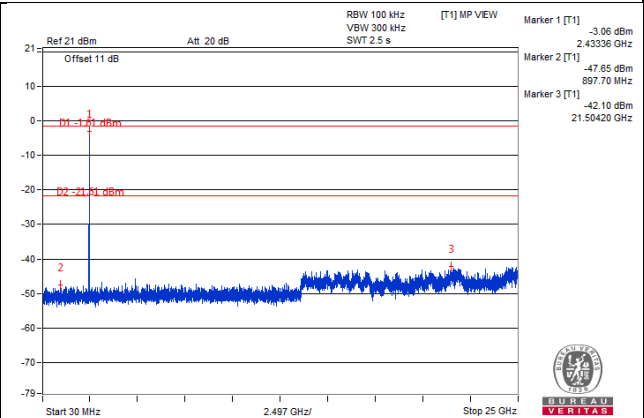
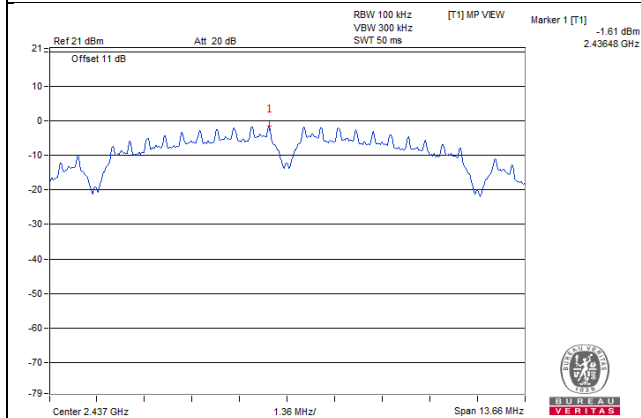
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

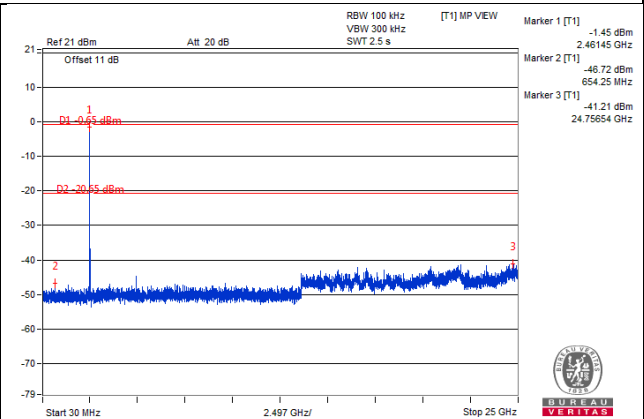
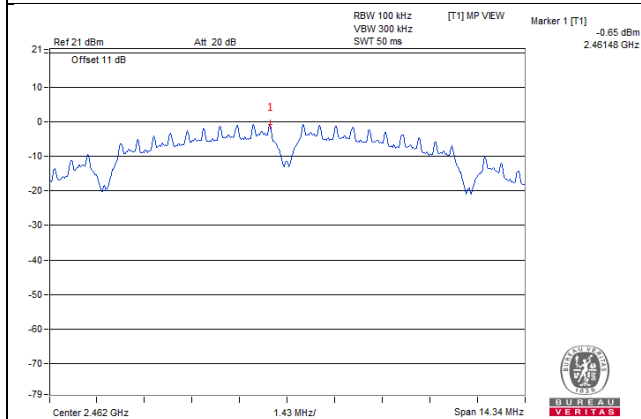
CH 1



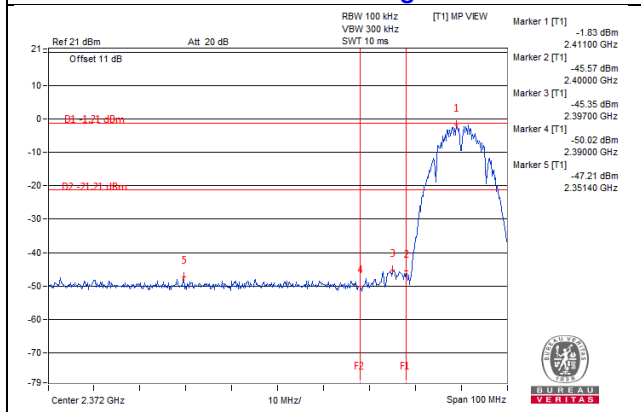
CH 6



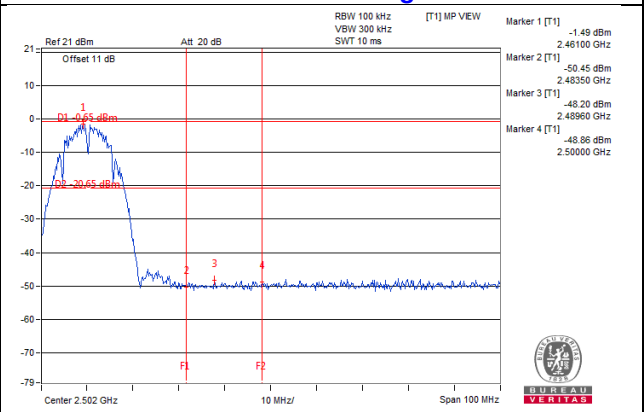
CH 11



CH 1 Band edge

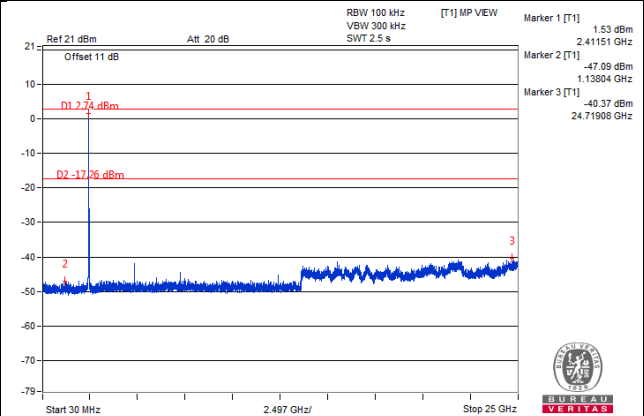
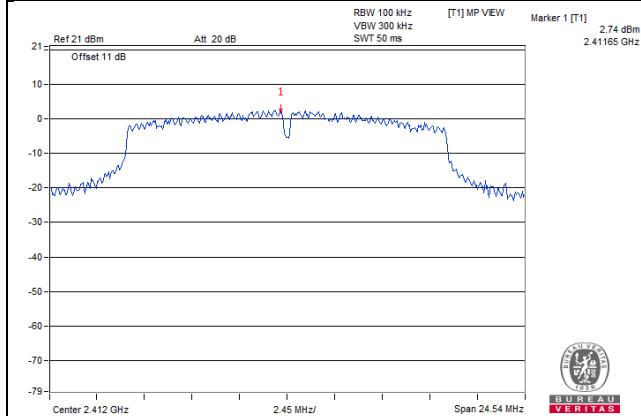


CH 11 Band edge

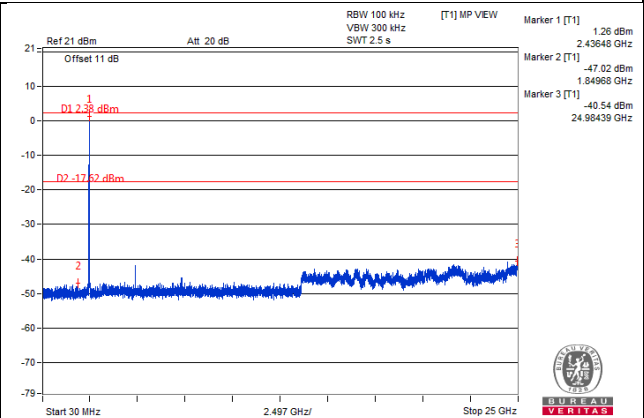
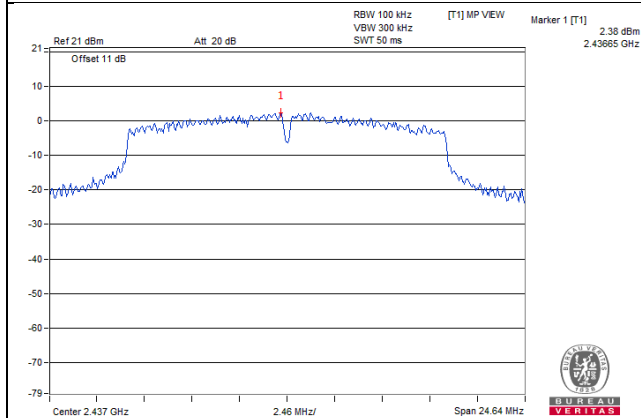


802.11g

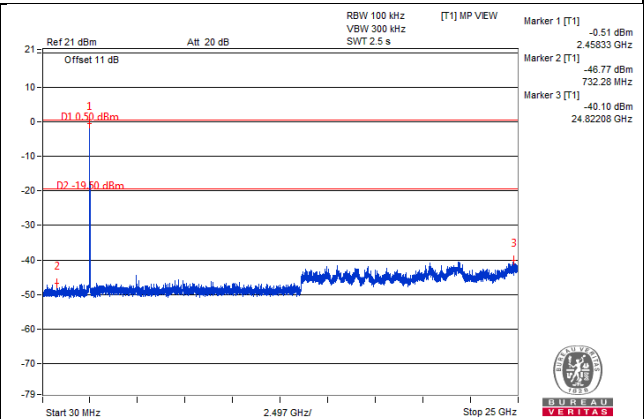
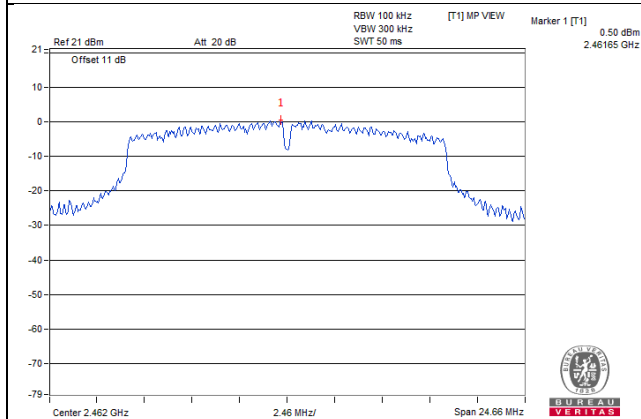
CH 1



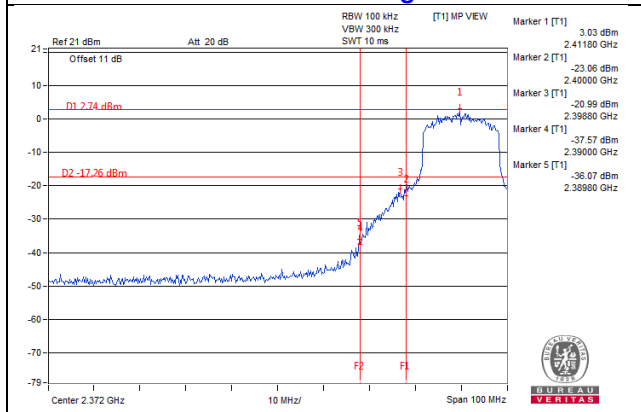
CH 6



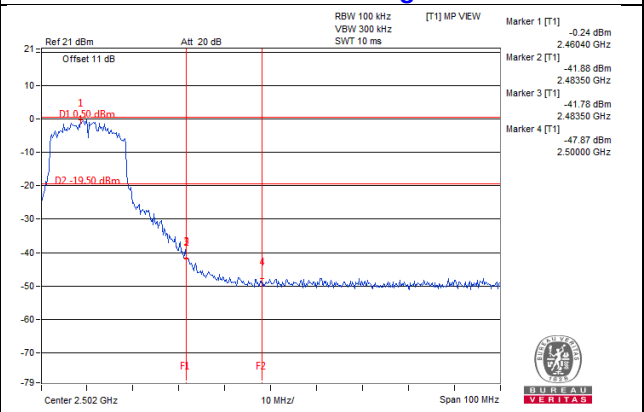
CH 11



CH 1 Band edge

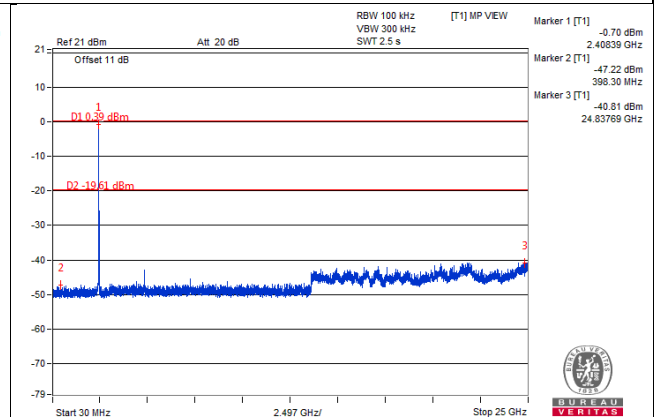
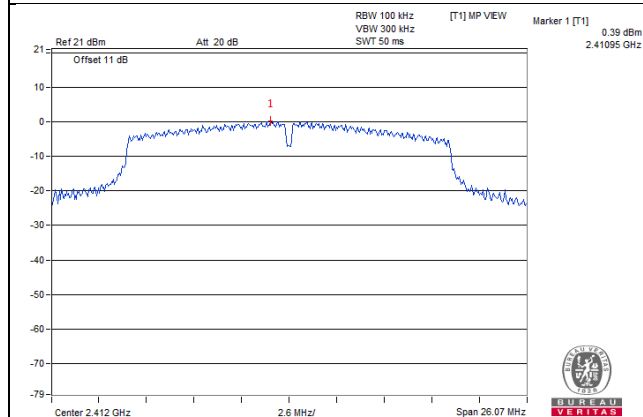


CH 11 Band edge

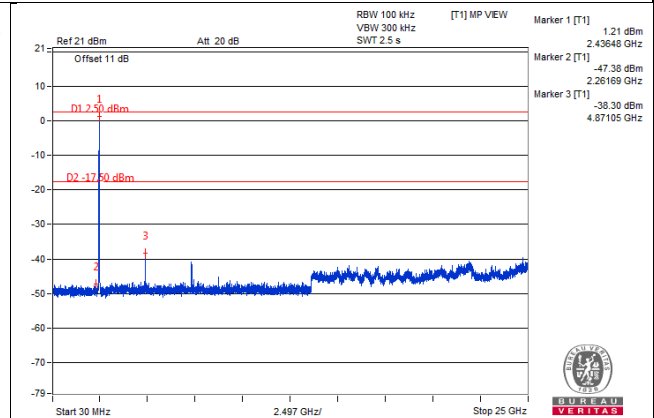
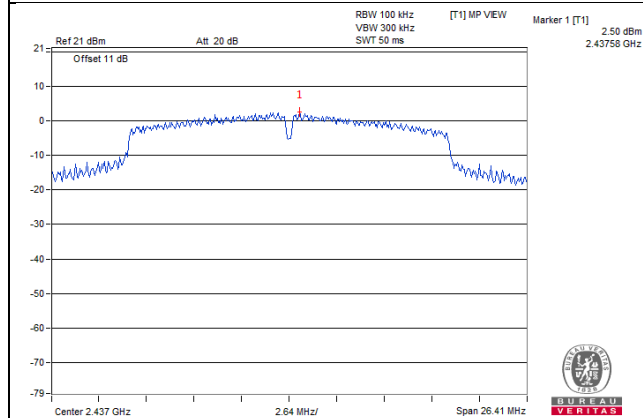


802.11n (HT20)

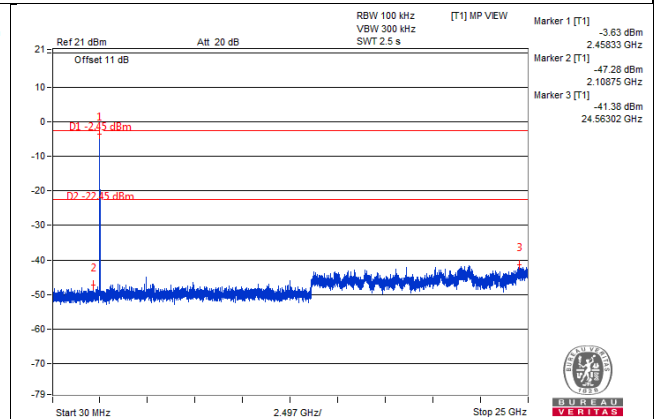
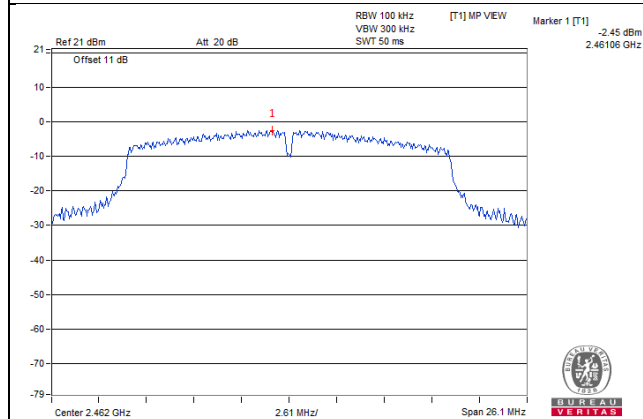
CH 1



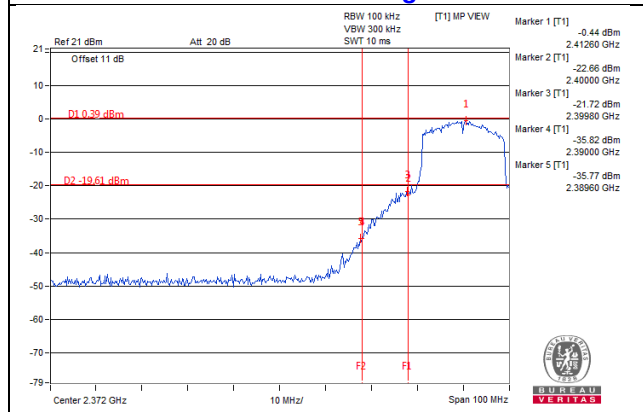
CH 6



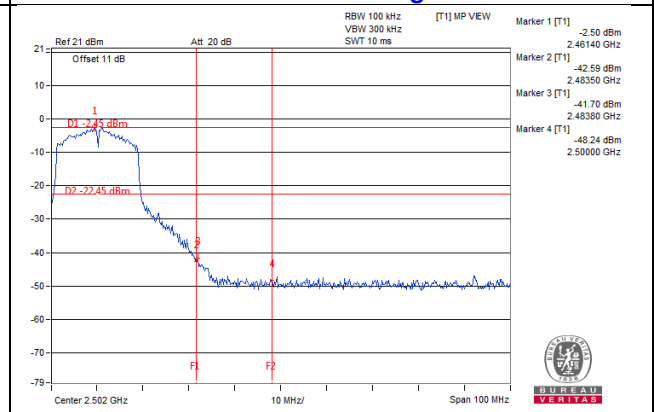
CH 11



CH 1 Band edge

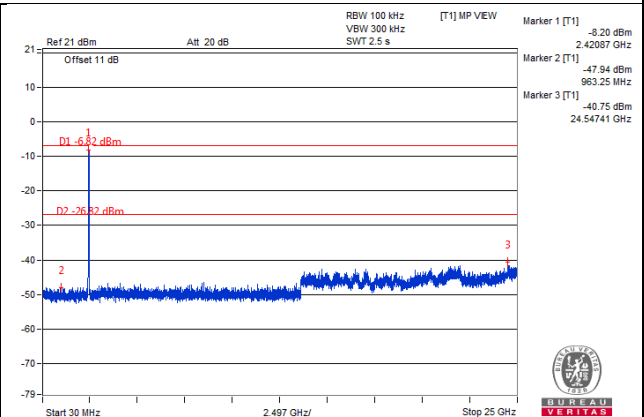
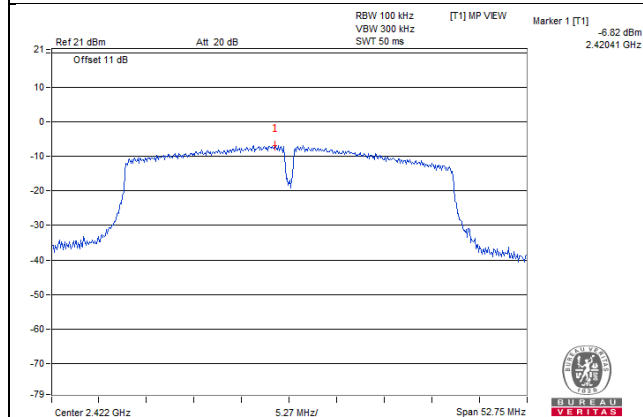


CH 11 Band edge

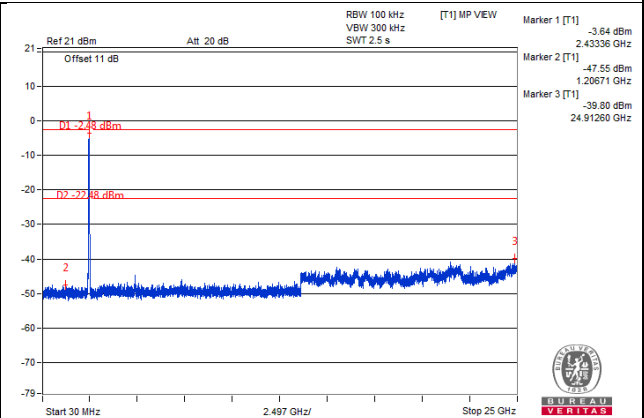
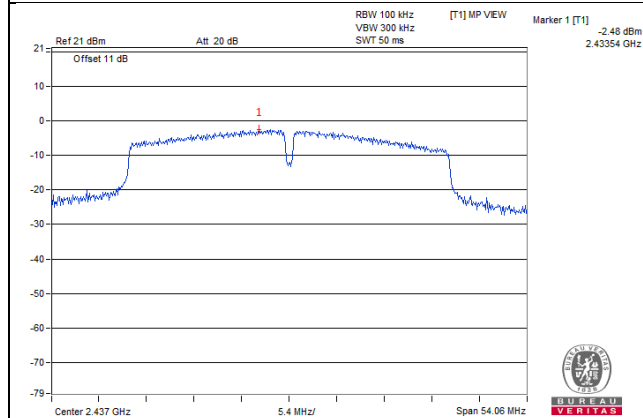


802.11n (HT40)

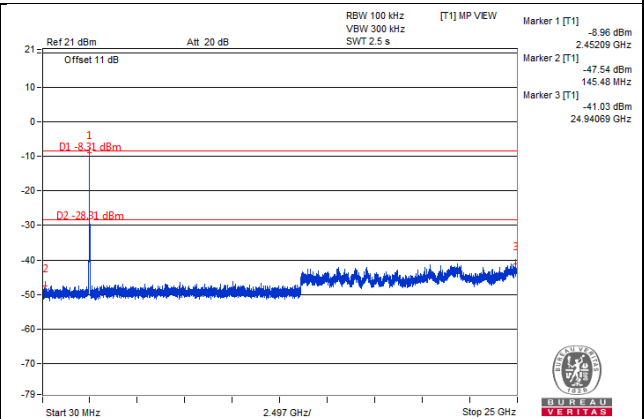
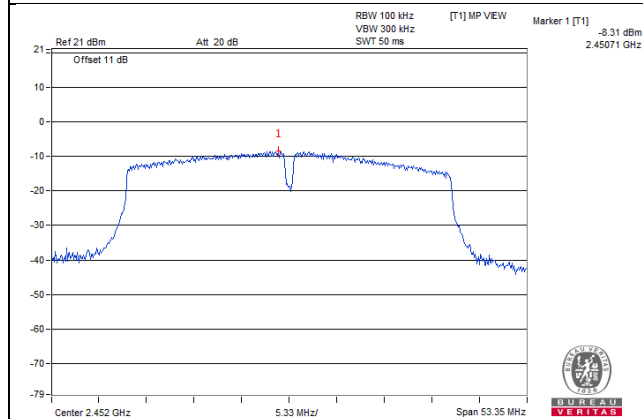
CH 3



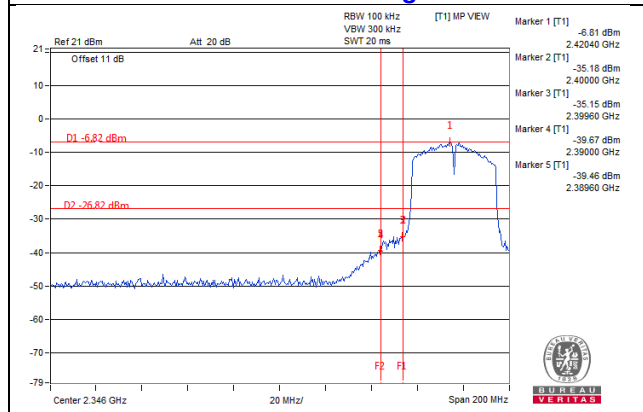
CH 6



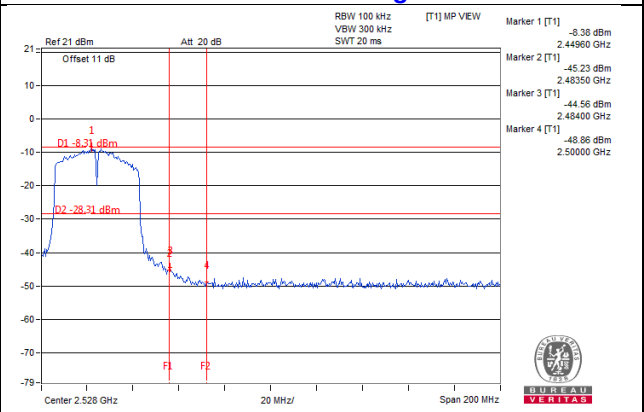
CH 9



CH 3 Band edge



CH 9 Band edge



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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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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