

FCC Test Report (WLAN)

Report No.: RF170209E07

FCC ID: SER1DX

Test Model: 1DX

Received Date: Feb. 09, 2017

Test Date: Feb. 23 to Mar. 14, 2017

Issued Date: Mar. 22, 2017

Applicant: Sintai Optical (Shenzhen) Co., Ltd.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Release Control Record

Issue No.	Description	Date Issued
RF170209E07	Original release.	Mar. 22, 2017

1 Certificate of Conformity

Product: WLAN+BLE module

Brand: Sintai

Test Model: 1DX

Sample Status: ENGINEERING SAMPLE

Applicant: Sintai Optical (Shenzhen) Co., Ltd.

Test Date: Feb. 23 to Mar. 14, 2017

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 : Cindy Hsin, **Date:** Mar. 22, 2017
Cindy Hsin / Specialist

Approved by : May Chen, **Date:** Mar. 22, 2017
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 -11.78dB at 0.53281MHz.
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 2386.00MHz.
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	Antenna connector is i-pex not a standard connector.

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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.82 dB
	6GHz ~ 18GHz	4.58 dB
	18GHz ~ 40GHz	5.03 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WLAN+BLE module
Brand	Sintai
Test Model	1DX
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 3.3V
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 65Mbps
Operating Frequency	2.412 ~ 2.462GHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 11
Output Power	243.781mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. WLAN and bluetooth technology can not transmit at same time.
2. The antennas provided to the EUT, please refer to the following table:

No.	Brand	Model	Antenna Gain (dBi)	Frequency range(GHz)	Antenna Type	Connecter Type	Cable Length
1	Walsin	RFANT5220110A0T	2.66	2.4~2.4835GHz	Monopole (Chip Antenna)	N/A	N/A
2	Walsin	RFPCA280815EMAB301	1.17	2.4~2.4835GHz	PCB	I-Pex	15cm

3. 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

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		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	√	√	-	√	Chip antenna
2	√	√	√	-	PCB antenna

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz & Bandedge Measurement
RE<1G: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

NOTE: The EUT's antenna (Chip and PCB) had been pre-tested on the positioned of each 3 axis. The worst case was found when Positioned on **Y-plane**.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

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

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)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	25deg. C, 70%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	26deg. C, 70%RH	120Vac, 60Hz	Weiwei Lo
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

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

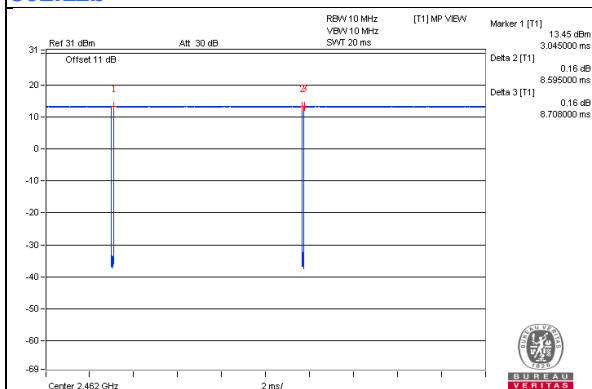
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11b: Duty cycle = $8.595/8.708 = 0.987$

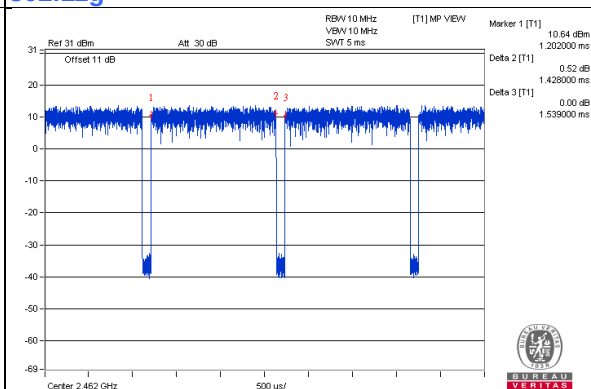
802.11g: Duty cycle = $1.428/1.539 = 0.928$, Duty factor = $10 * \log(1/0.928) = 0.33$

802.11n (HT20): Duty cycle = $1.336/1.44 = 0.928$, Duty factor = $10 * \log(1/0.928) = 0.33$

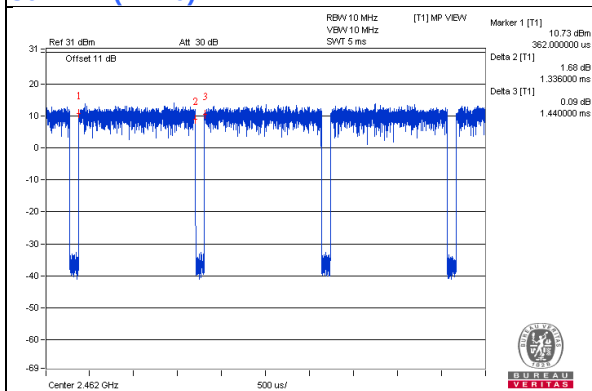
802.11b



802.11g



802.11n (HT20)



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.	Test Tool	NA	NA	NA	NA	Supplied by client
B.	Adapter	DVE	DSA-5PFU1-05 FCA 050100	1651000021	NA	Supplied by client
C.	micro SD	SanDisk	NA	TF12082	NA	Supplied by client

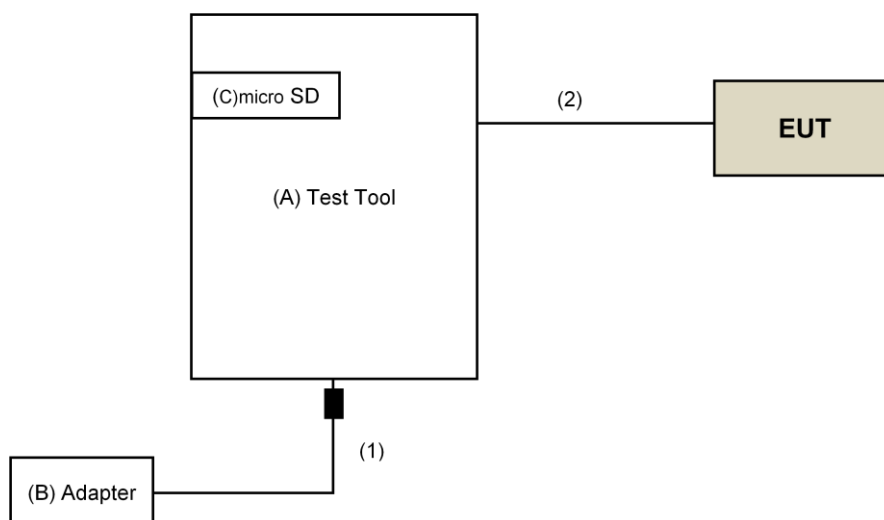
Note:

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.	USB Cable	1	0.6	Yes	1	Provided by Lab
2.	Console Cable	1	0.1	No	0	Supplied by client

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 v03r05
ANSI C63.10-2013

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

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

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 Agilent	N9038A	MY50010156	Aug. 18, 2016	Aug. 17, 2017
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 07, 2016	May 06, 2017
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 02, 2016	Apr. 01, 2017
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 30, 2016 Mar. 30, 2016	Feb. 01, 2018 Mar. 29, 2017 Mar. 29, 2017
Spectrum Analyzer Keysight	N9030A	MY54490520	July 29, 2016	July 28, 2017
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 28, 2016	June 27, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017

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. The FCC Site Registration No. is 147459
 6. The CANADA Site Registration No. is 20331-1
 8. Loop antenna was used for all emissions below 30 MHz.
- Tested Date: Feb. 23 to Mar. 14, 2017

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 detect 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:

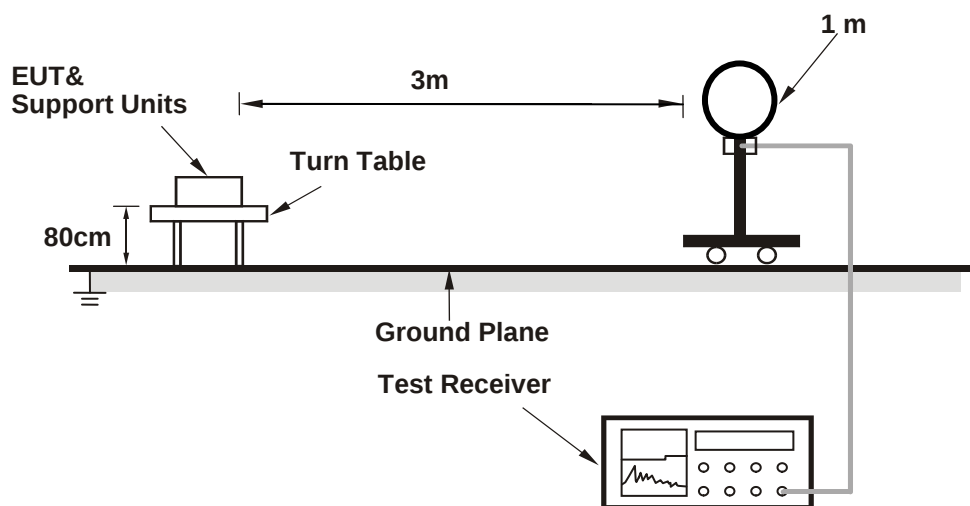
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

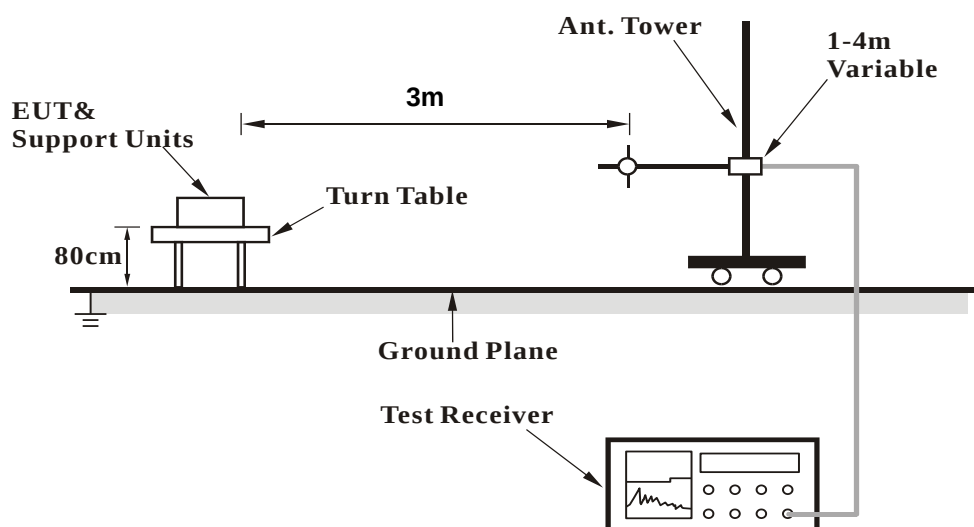
No deviation.

4.1.5 Test Setup

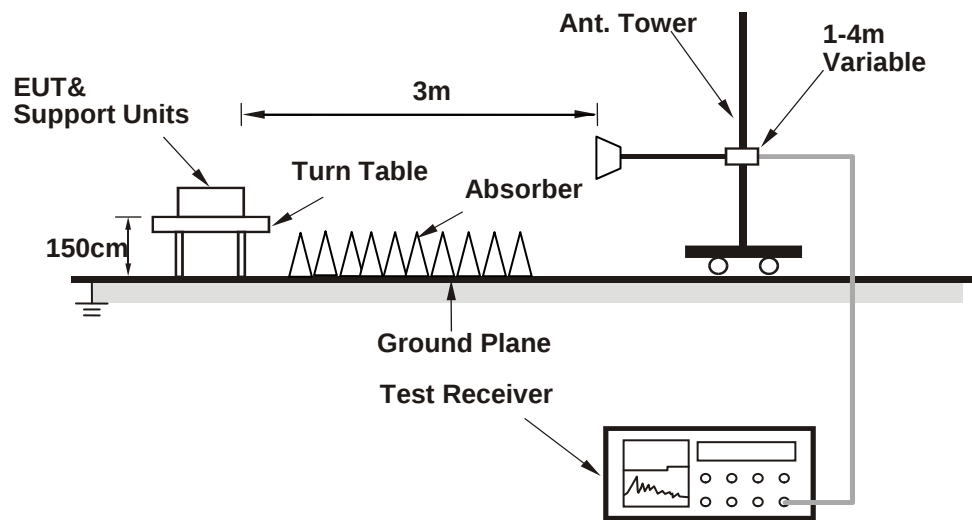
For Radiated emission below 30MHz



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

- a. Controlling software (WlanTest.txt Command) has been activated to set the EUT on specific status.

4.1.7 Test Results (Mode 1)

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	45.1 PK	74.0	-28.9	1.23 H	120	47.1	-2.0
2	2390.00	33.1 AV	54.0	-20.9	1.23 H	120	35.1	-2.0
3	*2412.00	97.2 PK			1.23 H	120	99.1	-1.9
4	*2412.00	94.9 AV			1.23 H	120	96.8	-1.9
5	4824.00	37.9 PK	74.0	-36.1	1.04 H	261	35.6	2.3
6	4824.00	31.8 AV	54.0	-22.2	1.04 H	261	29.5	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	43.1 PK	74.0	-30.9	1.50 V	277	45.1	-2.0
2	2390.00	31.2 AV	54.0	-22.8	1.50 V	277	33.2	-2.0
3	*2412.00	95.6 PK			1.50 V	277	97.5	-1.9
4	*2412.00	93.6 AV			1.50 V	277	95.5	-1.9
5	4824.00	38.8 PK	74.0	-35.2	1.05 V	302	36.5	2.3
6	4824.00	33.8 AV	54.0	-20.2	1.05 V	302	31.5	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. 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	*2437.00	97.7 PK			1.22 H	132	99.6	-1.9
2	*2437.00	95.2 AV			1.22 H	132	97.1	-1.9
3	4874.00	38.5 PK	74.0	-35.5	1.04 H	242	36.1	2.4
4	4874.00	32.1 AV	54.0	-21.9	1.04 H	242	29.7	2.4
5	7311.00	41.2 PK	74.0	-32.8	2.05 H	333	33.0	8.2
6	7311.00	32.3 AV	54.0	-21.7	2.05 H	333	24.1	8.2
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	*2437.00	95.8 PK			1.53 V	268	97.7	-1.9
2	*2437.00	94.0 AV			1.53 V	268	95.9	-1.9
3	4874.00	38.8 PK	74.0	-35.2	1.02 V	315	36.4	2.4
4	4874.00	33.9 AV	54.0	-20.1	1.02 V	315	31.5	2.4
5	7311.00	42.9 PK	74.0	-31.1	1.59 V	52	34.7	8.2
6	7311.00	33.6 AV	54.0	-20.4	1.59 V	52	25.4	8.2

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.

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	97.7 PK			1.22 H	132	99.5	-1.8
2	*2462.00	95.2 AV			1.22 H	132	97.0	-1.8
3	2483.50	44.8 PK	74.0	-29.2	1.28 H	123	46.6	-1.8
4	2483.50	33.0 AV	54.0	-21.0	1.28 H	123	34.8	-1.8
5	4924.00	37.9 PK	74.0	-36.1	1.01 H	258	35.4	2.5
6	4924.00	31.7 AV	54.0	-22.3	1.01 H	258	29.2	2.5
7	7386.00	41.5 PK	74.0	-32.5	2.05 H	323	33.1	8.4
8	7386.00	32.8 AV	54.0	-21.2	2.05 H	323	24.4	8.4
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	95.3 PK			1.50 V	253	97.1	-1.8
2	*2462.00	93.6 AV			1.50 V	253	95.4	-1.8
3	2483.50	43.2 PK	74.0	-30.8	1.53 V	268	45.0	-1.8
4	2483.50	31.1 AV	54.0	-22.9	1.53 V	268	32.9	-1.8
5	4924.00	39.1 PK	74.0	-34.9	1.00 V	316	36.6	2.5
6	4924.00	34.2 AV	54.0	-19.8	1.00 V	316	31.7	2.5
7	7386.00	43.0 PK	74.0	-31.0	1.60 V	58	34.6	8.4
8	7386.00	33.6 AV	54.0	-20.4	1.60 V	58	25.2	8.4

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
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	45.2 PK	74.0	-28.8	1.19 H	107	47.2	-2.0
2	2390.00	33.1 AV	54.0	-20.9	1.19 H	107	35.1	-2.0
3	*2412.00	93.1 PK			1.22 H	132	95.0	-1.9
4	*2412.00	88.8 AV			1.22 H	132	90.7	-1.9
5	4824.00	37.4 PK	74.0	-36.6	1.00 H	244	35.1	2.3
6	4824.00	31.5 AV	54.0	-22.5	1.00 H	244	29.2	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	53.8 PK	74.0	-20.2	1.48 V	360	55.8	-2.0
2	2390.00	39.7 AV	54.0	-14.3	1.48 V	360	41.7	-2.0
3	*2412.00	91.5 PK			1.48 V	360	93.4	-1.9
4	*2412.00	87.6 AV			1.48 V	360	89.5	-1.9
5	4824.00	42.3 PK	74.0	-31.7	1.39 V	360	40.0	2.3
6	4824.00	31.8 AV	54.0	-22.2	1.39 V	360	29.5	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. 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	*2437.00	93.7 PK			1.28 H	133	95.6	-1.9
2	*2437.00	89.2 AV			1.28 H	133	91.1	-1.9
3	4874.00	38.0 PK	74.0	-36.0	1.00 H	247	35.6	2.4
4	4874.00	31.9 AV	54.0	-22.1	1.00 H	247	29.5	2.4
5	7311.00	41.7 PK	74.0	-32.3	2.05 H	337	33.5	8.2
6	7311.00	33.0 AV	54.0	-21.0	2.05 H	337	24.8	8.2
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	*2437.00	91.1 PK			1.47 V	360	93.0	-1.9
2	*2437.00	87.3 AV			1.47 V	360	89.2	-1.9
3	4874.00	42.0 PK	74.0	-32.0	1.39 V	349	39.6	2.4
4	4874.00	31.8 AV	54.0	-22.2	1.39 V	349	29.4	2.4
5	7311.00	46.3 PK	74.0	-27.7	1.30 V	255	38.1	8.2
6	7311.00	33.8 AV	54.0	-20.2	1.30 V	255	25.6	8.2

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.

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	93.3 PK			1.16 H	142	95.1	-1.8
2	*2462.00	88.8 AV			1.16 H	142	90.6	-1.8
3	2483.50	44.4 PK	74.0	-29.6	1.30 H	137	46.2	-1.8
4	2483.50	32.7 AV	54.0	-21.3	1.30 H	137	34.5	-1.8
5	4924.00	37.4 PK	74.0	-36.6	1.00 H	244	34.9	2.5
6	4924.00	31.5 AV	54.0	-22.5	1.00 H	244	29.0	2.5
7	7386.00	41.5 PK	74.0	-32.5	2.03 H	337	33.1	8.4
8	7386.00	32.6 AV	54.0	-21.4	2.03 H	337	24.2	8.4
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	91.7 PK			1.44 V	360	93.5	-1.8
2	*2462.00	87.6 AV			1.44 V	360	89.4	-1.8
3	2483.50	53.5 PK	74.0	-20.5	1.42 V	360	55.3	-1.8
4	2483.50	39.3 AV	54.0	-14.7	1.42 V	360	41.1	-1.8
5	4924.00	41.4 PK	74.0	-32.6	1.44 V	360	38.9	2.5
6	4924.00	31.5 AV	54.0	-22.5	1.44 V	360	29.0	2.5
7	7386.00	47.2 PK	74.0	-26.8	1.29 V	263	38.8	8.4
8	7386.00	34.2 AV	54.0	-19.8	1.29 V	263	25.8	8.4

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
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	45.7 PK	74.0	-28.3	1.15 H	114	47.7	-2.0
2	2390.00	33.3 AV	54.0	-20.7	1.15 H	114	35.3	-2.0
3	*2412.00	92.8 PK			1.21 H	152	94.7	-1.9
4	*2412.00	88.4 AV			1.21 H	152	90.3	-1.9
5	4824.00	37.0 PK	74.0	-37.0	1.00 H	245	34.7	2.3
6	4824.00	31.4 AV	54.0	-22.6	1.00 H	245	29.1	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.9 PK	74.0	-20.1	1.49 V	360	55.9	-2.0
2	2390.00	39.8 AV	54.0	-14.2	1.49 V	360	41.8	-2.0
3	*2412.00	91.5 PK			1.44 V	360	93.4	-1.9
4	*2412.00	87.4 AV			1.44 V	360	89.3	-1.9
5	4824.00	41.7 PK	74.0	-32.3	1.41 V	348	39.4	2.3
6	4824.00	31.3 AV	54.0	-22.7	1.41 V	348	29.0	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. 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	*2437.00	93.6 PK			1.31 H	137	95.5	-1.9
2	*2437.00	89.4 AV			1.31 H	137	91.3	-1.9
3	4874.00	37.8 PK	74.0	-36.2	1.00 H	232	35.4	2.4
4	4874.00	31.6 AV	54.0	-22.4	1.00 H	232	29.2	2.4
5	7311.00	41.4 PK	74.0	-32.6	2.02 H	352	33.2	8.2
6	7311.00	32.6 AV	54.0	-21.4	2.02 H	352	24.4	8.2
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	*2437.00	91.1 PK			1.47 V	360	93.0	-1.9
2	*2437.00	87.5 AV			1.47 V	360	89.4	-1.9
3	4874.00	41.1 PK	74.0	-32.9	1.38 V	345	38.7	2.4
4	4874.00	31.3 AV	54.0	-22.7	1.38 V	345	28.9	2.4
5	7311.00	46.8 PK	74.0	-27.2	1.29 V	282	38.6	8.2
6	7311.00	33.7 AV	54.0	-20.3	1.29 V	282	25.5	8.2

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.

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	93.0 PK			1.14 H	135	94.8	-1.8
2	*2462.00	88.6 AV			1.14 H	135	90.4	-1.8
3	2483.50	44.1 PK	74.0	-29.9	1.32 H	127	45.9	-1.8
4	2483.50	32.3 AV	54.0	-21.7	1.32 H	127	34.1	-1.8
5	4924.00	37.0 PK	74.0	-37.0	1.00 H	236	34.5	2.5
6	4924.00	31.1 AV	54.0	-22.9	1.00 H	236	28.6	2.5
7	7386.00	41.4 PK	74.0	-32.6	2.03 H	337	33.0	8.4
8	7386.00	32.4 AV	54.0	-21.6	2.03 H	337	24.0	8.4
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	91.8 PK			1.47 V	360	93.6	-1.8
2	*2462.00	87.7 AV			1.47 V	360	89.5	-1.8
3	2483.50	53.4 PK	74.0	-20.6	1.44 V	360	55.2	-1.8
4	2483.50	39.4 AV	54.0	-14.6	1.44 V	360	41.2	-1.8
5	4924.00	41.5 PK	74.0	-32.5	1.39 V	350	39.0	2.5
6	4924.00	31.6 AV	54.0	-22.4	1.39 V	350	29.1	2.5
7	7386.00	46.6 PK	74.0	-27.4	1.25 V	269	38.2	8.4
8	7386.00	33.8 AV	54.0	-20.2	1.25 V	269	25.4	8.4

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
5. " * ": Fundamental frequency.

Below 1GHz Data:

802.11n (HT20)

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	216.00	37.4 QP	43.5	-6.1	1.50 H	278	48.8	-11.4
2	288.00	34.1 QP	46.0	-11.9	1.00 H	278	41.8	-7.7
3	360.02	38.5 QP	46.0	-7.5	1.00 H	339	44.4	-5.9
4	432.02	34.8 QP	46.0	-11.2	1.00 H	309	38.6	-3.8
5	503.99	37.0 QP	46.0	-9.0	2.00 H	179	39.5	-2.5
6	648.01	34.1 QP	46.0	-11.9	1.50 H	254	33.8	0.3
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	45.96	29.8 QP	40.0	-10.2	1.00 V	190	38.3	-8.5
2	104.91	25.7 QP	43.5	-17.8	1.00 V	282	37.4	-11.7
3	216.00	30.8 QP	43.5	-12.7	1.00 V	247	42.2	-11.4
4	288.00	28.9 QP	46.0	-17.1	1.50 V	5	36.6	-7.7
5	359.99	31.9 QP	46.0	-14.1	1.00 V	360	38.0	-6.1
6	503.99	30.5 QP	46.0	-15.5	1.50 V	70	33.0	-2.5

REMARKS:

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

4.1.8 Test Results (Mode 2)

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	2386.00	57.4 PK	74.0	-16.6	1.00 H	179	59.4	-2.0
2	2386.00	53.8 AV	54.0	-0.2	1.00 H	179	55.8	-2.0
3	*2412.00	102.9 PK			1.00 H	179	104.8	-1.9
4	*2412.00	101.0 AV			1.00 H	179	102.9	-1.9
5	4824.00	38.7 PK	74.0	-35.3	1.00 H	232	36.4	2.3
6	4824.00	32.3 AV	54.0	-21.7	1.00 H	232	30.0	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	2386.00	56.7 PK	74.0	-17.3	2.77 V	122	58.7	-2.0
2	2386.00	53.0 AV	54.0	-1.0	2.77 V	122	55.0	-2.0
3	*2412.00	101.7 PK			2.77 V	122	103.6	-1.9
4	*2412.00	99.5 AV			2.77 V	122	101.4	-1.9
5	4824.00	41.9 PK	74.0	-32.1	1.41 V	344	39.6	2.3
6	4824.00	31.7 AV	54.0	-22.3	1.41 V	344	29.4	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. 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	45.1 PK	74.0	-28.9	1.00 H	174	47.1	-2.0
2	2390.00	35.3 AV	54.0	-18.7	1.00 H	174	37.3	-2.0
3	*2437.00	101.6 PK			1.00 H	174	103.5	-1.9
4	*2437.00	99.5 AV			1.00 H	174	101.4	-1.9
5	2483.50	46.4 PK	74.0	-27.6	1.00 H	174	48.2	-1.8
6	2483.50	40.0 AV	54.0	-14.0	1.00 H	174	41.8	-1.8
7	4874.00	38.5 PK	74.0	-35.5	1.00 H	225	36.1	2.4
8	4874.00	32.1 AV	54.0	-21.9	1.00 H	225	29.7	2.4
9	7311.00	42.1 PK	74.0	-31.9	2.00 H	343	33.9	8.2
10	7311.00	33.0 AV	54.0	-21.0	2.00 H	343	24.8	8.2

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	47.9 PK	74.0	-26.1	2.28 V	127	49.9	-2.0
2	2390.00	35.9 AV	54.0	-18.1	2.28 V	127	37.9	-2.0
3	*2437.00	102.8 PK			2.28 V	127	104.7	-1.9
4	*2437.00	101.6 AV			2.28 V	127	103.5	-1.9
5	2483.50	46.1 PK	74.0	-27.9	2.28 V	127	47.9	-1.8
6	2483.50	35.0 AV	54.0	-19.0	2.28 V	127	36.8	-1.8
7	4874.00	41.8 PK	74.0	-32.2	1.39 V	341	39.4	2.4
8	4874.00	31.7 AV	54.0	-22.3	1.39 V	341	29.3	2.4
9	7311.00	46.3 PK	74.0	-27.7	1.24 V	294	38.1	8.2
10	7311.00	33.2 AV	54.0	-20.8	1.24 V	294	25.0	8.2

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.

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	104.7 PK			1.00 H	170	106.5	-1.8
2	*2462.00	101.6 AV			1.00 H	170	103.4	-1.8
3	2489.20	57.5 PK	74.0	-16.5	1.00 H	170	59.2	-1.7
4	2489.20	51.1 AV	54.0	-2.9	1.00 H	170	52.8	-1.7
5	4924.00	39.8 PK	74.0	-34.2	1.00 H	360	37.3	2.5
6	4924.00	32.5 AV	54.0	-21.5	1.00 H	360	30.0	2.5
7	7386.00	44.9 PK	74.0	-29.1	1.10 H	202	36.5	8.4
8	7386.00	36.5 AV	54.0	-17.5	1.10 H	202	28.1	8.4
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	102.9 PK			2.25 V	128	104.7	-1.8
2	*2462.00	100.7 AV			2.25 V	128	102.5	-1.8
3	2483.50	56.4 PK	74.0	-17.6	2.25 V	128	58.2	-1.8
4	2483.50	52.0 AV	54.0	-2.0	2.25 V	128	53.8	-1.8
5	4924.00	39.0 PK	74.0	-35.0	2.40 V	360	36.5	2.5
6	4924.00	32.3 AV	54.0	-21.7	2.40 V	360	29.8	2.5
7	7386.00	46.1 PK	74.0	-27.9	2.30 V	360	37.7	8.4
8	7386.00	38.8 AV	54.0	-15.2	2.30 V	360	30.4	8.4

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
5. " * ": Fundamental frequency.

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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	59.6 PK	74.0	-14.4	1.45 H	211	61.6	-2.0
2	2390.00	47.0 AV	54.0	-7.0	1.45 H	211	49.0	-2.0
3	*2412.00	99.9 PK			1.45 H	211	101.8	-1.9
4	*2412.00	92.1 AV			1.45 H	211	94.0	-1.9
5	4824.00	39.6 PK	74.0	-34.4	1.01 H	360	37.3	2.3
6	4824.00	32.9 AV	54.0	-21.1	1.01 H	360	30.6	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	60.2 PK	74.0	-13.8	1.40 V	181	62.2	-2.0
2	2390.00	47.8 AV	54.0	-6.2	1.40 V	181	49.8	-2.0
3	*2412.00	100.4 PK			1.40 V	181	102.3	-1.9
4	*2412.00	92.5 AV			1.40 V	181	94.4	-1.9
5	4824.00	38.6 PK	74.0	-35.4	2.39 V	360	36.3	2.3
6	4824.00	32.0 AV	54.0	-22.0	2.39 V	360	29.7	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. 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	*2437.00	101.9 PK			1.00 H	195	103.8	-1.9
2	*2437.00	93.7 AV			1.00 H	195	95.6	-1.9
3	4874.00	39.5 PK	74.0	-34.5	1.05 H	360	37.1	2.4
4	4874.00	32.5 AV	54.0	-21.5	1.05 H	360	30.1	2.4
5	7311.00	44.6 PK	74.0	-29.4	1.04 H	189	36.4	8.2
6	7311.00	36.4 AV	54.0	-17.6	1.04 H	189	28.2	8.2
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	*2437.00	102.3 PK			2.05 V	144	104.2	-1.9
2	*2437.00	93.9 AV			2.05 V	144	95.8	-1.9
3	4874.00	38.7 PK	74.0	-35.3	2.44 V	360	36.3	2.4
4	4874.00	32.0 AV	54.0	-22.0	2.44 V	360	29.6	2.4
5	7311.00	46.6 PK	74.0	-27.4	2.33 V	358	38.4	8.2
6	7311.00	39.0 AV	54.0	-15.0	2.33 V	358	30.8	8.2

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.

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	102.9 PK			1.31 H	198	104.7	-1.8
2	*2462.00	94.6 AV			1.31 H	198	96.4	-1.8
3	2483.50	67.9 PK	74.0	-6.1	1.31 H	198	69.7	-1.8
4	2483.50	52.5 AV	54.0	-1.5	1.31 H	198	54.3	-1.8
5	4924.00	40.3 PK	74.0	-33.7	1.00 H	358	37.8	2.5
6	4924.00	33.0 AV	54.0	-21.0	1.00 H	358	30.5	2.5
7	7386.00	44.6 PK	74.0	-29.4	1.15 H	212	36.2	8.4
8	7386.00	36.2 AV	54.0	-17.8	1.15 H	212	27.8	8.4
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	103.7 PK			2.02 V	148	105.5	-1.8
2	*2462.00	95.2 AV			2.02 V	148	97.0	-1.8
3	2483.50	70.2 PK	74.0	-3.8	2.02 V	148	72.0	-1.8
4	2483.50	53.7 AV	54.0	-0.3	2.02 V	148	55.5	-1.8
5	4924.00	38.9 PK	74.0	-35.1	2.42 V	360	36.4	2.5
6	4924.00	32.1 AV	54.0	-21.9	2.42 V	360	29.6	2.5
7	7386.00	46.1 PK	74.0	-27.9	2.27 V	360	37.7	8.4
8	7386.00	38.9 AV	54.0	-15.1	2.27 V	360	30.5	8.4

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
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	62.8 PK	74.0	-11.2	1.10 H	155	64.8	-2.0
2	2390.00	49.2 AV	54.0	-4.8	1.10 H	155	51.2	-2.0
3	*2412.00	100.1 PK			1.10 H	155	102.0	-1.9
4	*2412.00	91.7 AV			1.10 H	155	93.6	-1.9
5	4824.00	39.6 PK	74.0	-34.4	1.11 H	360	37.3	2.3
6	4824.00	32.4 AV	54.0	-21.6	1.11 H	360	30.1	2.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.3 PK	74.0	-13.7	2.21 V	192	62.3	-2.0
2	2390.00	49.1 AV	54.0	-4.9	2.21 V	192	51.1	-2.0
3	*2412.00	99.6 PK			2.21 V	192	101.5	-1.9
4	*2412.00	91.3 AV			2.21 V	192	93.2	-1.9
5	4824.00	38.6 PK	74.0	-35.4	2.44 V	360	36.3	2.3
6	4824.00	32.2 AV	54.0	-21.8	2.44 V	360	29.9	2.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	*2437.00	97.3 PK			1.05 H	158	99.2	-1.9
2	*2437.00	90.6 AV			1.05 H	158	92.5	-1.9
3	4874.00	39.4 PK	74.0	-34.6	1.00 H	354	37.0	2.4
4	4874.00	32.0 AV	54.0	-22.0	1.00 H	354	29.6	2.4
5	7311.00	44.4 PK	74.0	-29.6	1.15 H	189	36.2	8.2
6	7311.00	36.1 AV	54.0	-17.9	1.15 H	189	27.9	8.2
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	*2437.00	99.4 PK			2.20 V	193	101.3	-1.9
2	*2437.00	91.4 AV			2.20 V	193	93.3	-1.9
3	4874.00	38.7 PK	74.0	-35.3	2.39 V	360	36.3	2.4
4	4874.00	31.9 AV	54.0	-22.1	2.39 V	360	29.5	2.4
5	7311.00	45.8 PK	74.0	-28.2	2.26 V	360	37.6	8.2
6	7311.00	38.4 AV	54.0	-15.6	2.26 V	360	30.2	8.2

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.

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	100.2 PK			1.00 H	166	102.0	-1.8
2	*2462.00	92.8 AV			1.00 H	166	94.6	-1.8
3	2483.50	68.5 PK	74.0	-5.5	1.00 H	166	70.3	-1.8
4	2483.50	52.8 AV	54.0	-1.2	1.00 H	166	54.6	-1.8
5	4924.00	39.8 PK	74.0	-34.2	1.03 H	360	37.3	2.5
6	4924.00	32.6 AV	54.0	-21.4	1.03 H	360	30.1	2.5
7	7386.00	44.9 PK	74.0	-29.1	1.06 H	200	36.5	8.4
8	7386.00	36.5 AV	54.0	-17.5	1.06 H	200	28.1	8.4
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	103.1 PK			2.40 V	190	104.9	-1.8
2	*2462.00	94.8 AV			2.40 V	190	96.6	-1.8
3	2483.50	68.4 PK	74.0	-5.6	2.40 V	190	70.2	-1.8
4	2483.50	53.5 AV	54.0	-0.5	2.40 V	190	55.3	-1.8
5	4924.00	39.1 PK	74.0	-34.9	2.39 V	360	36.6	2.5
6	4924.00	32.5 AV	54.0	-21.5	2.39 V	360	30.0	2.5
7	7386.00	46.5 PK	74.0	-27.5	2.30 V	348	38.1	8.4
8	7386.00	39.2 AV	54.0	-14.8	2.30 V	348	30.8	8.4

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
5. " * ": Fundamental frequency.

Below 1GHz Data:

802.11n (HT20)

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	216.00	33.7 QP	43.5	-9.8	1.50 H	270	45.1	-11.4
2	288.02	33.2 QP	46.0	-12.8	1.00 H	281	40.9	-7.7
3	360.02	33.6 QP	46.0	-12.4	1.00 H	305	39.5	-5.9
4	432.02	31.5 QP	46.0	-14.5	1.00 H	297	35.3	-3.8
5	504.01	32.2 QP	46.0	-13.8	2.00 H	275	34.7	-2.5
6	647.99	33.9 QP	46.0	-12.1	1.50 H	261	33.6	0.3
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	48.58	26.3 QP	40.0	-13.7	1.00 V	360	34.6	-8.3
2	111.09	26.0 QP	43.5	-17.5	1.00 V	317	37.0	-11.0
3	216.02	31.4 QP	46.0	-14.6	1.00 V	246	42.8	-11.4
4	288.00	26.2 QP	46.0	-19.8	1.00 V	230	33.9	-7.7
5	360.02	26.5 QP	46.0	-19.5	1.00 V	360	32.4	-5.9
6	648.01	30.0 QP	46.0	-16.0	1.50 V	313	29.7	0.3

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. 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	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 20, 2016	June 19, 2017
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: Feb. 23, 2017

4.2.3 Test Procedures

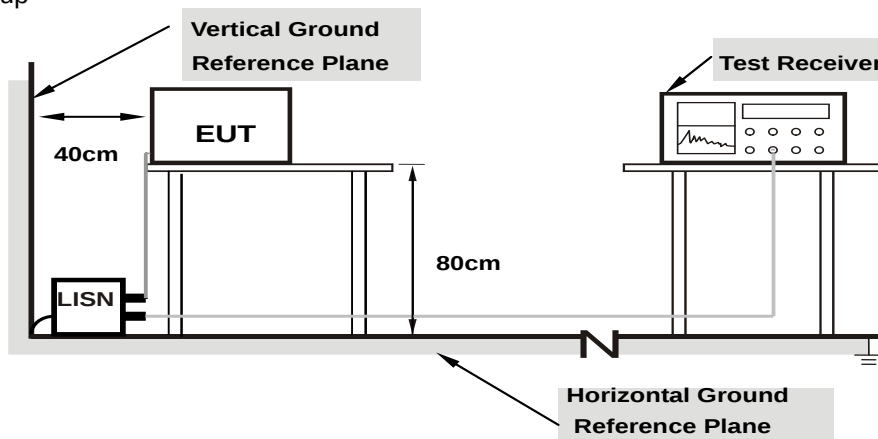
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

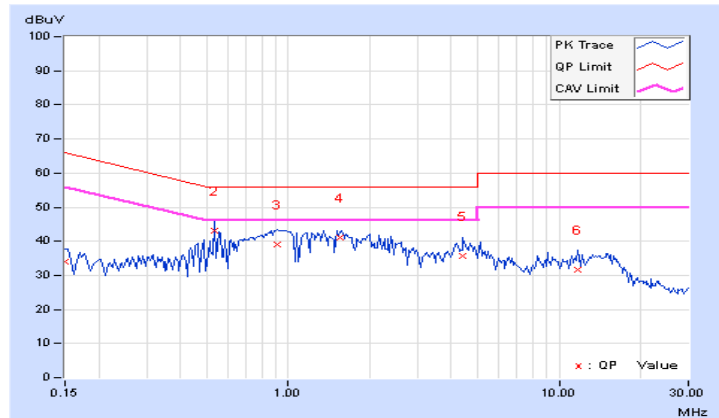
4.2.7 Test Results

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

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	0.15000	10.20	23.92	13.94	34.12	24.14	66.00	56.00	-31.88	-31.86
2	0.53281	10.25	32.92	23.97	43.17	34.22	56.00	46.00	-12.83	-11.78
3	0.91563	10.29	28.82	16.90	39.11	27.19	56.00	46.00	-16.89	-18.81
4	1.55469	10.29	30.84	20.05	41.13	30.34	56.00	46.00	-14.87	-15.66
5	4.40234	10.34	25.42	17.34	35.76	27.68	56.00	46.00	-20.24	-18.32
6	11.74219	10.93	20.67	12.11	31.60	23.04	60.00	50.00	-28.40	-26.96

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.

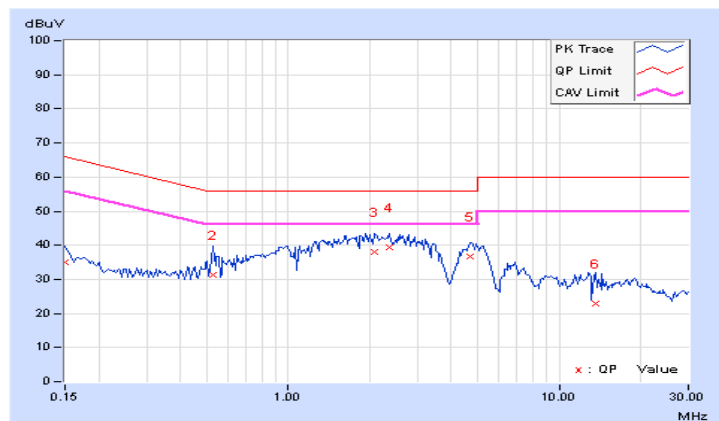


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	-----------------------------------

No	Freq. [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	0.15000	10.19	24.81	13.76	35.00	23.95	66.00	56.00	-31.00	-32.05
2	0.52500	10.24	21.22	11.67	31.46	21.91	56.00	46.00	-24.54	-24.09
3	2.09375	10.31	27.74	15.46	38.05	25.77	56.00	46.00	-17.95	-20.23
4	2.35156	10.29	29.03	19.77	39.32	30.06	56.00	46.00	-16.68	-15.94
5	4.71484	10.27	26.37	15.84	36.64	26.11	56.00	46.00	-19.36	-19.89
6	13.61328	10.96	11.96	5.66	22.92	16.62	60.00	50.00	-37.08	-33.38

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.

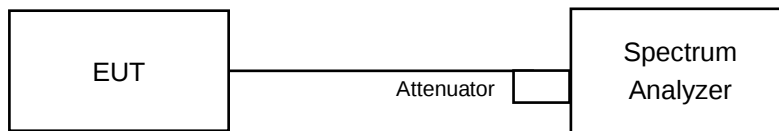


4.3 6dB Bandwidth Measurement

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	9.07	0.5	PASS
6	2437	9.56	0.5	PASS
11	2462	9.59	0.5	PASS

802.11g

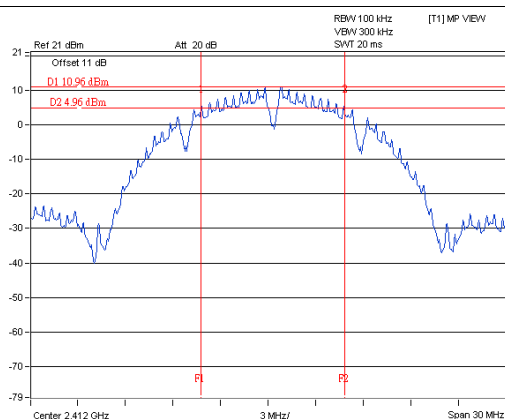
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.18	0.5	PASS
6	2437	15.17	0.5	PASS
11	2462	15.18	0.5	PASS

802.11n (HT20)

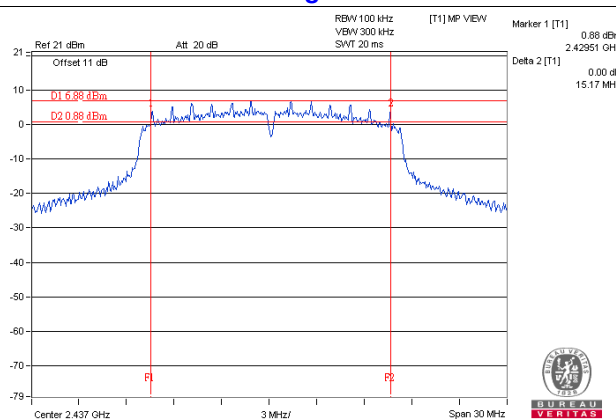
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.18	0.5	Pass
6	2437	15.18	0.5	Pass
11	2462	15.19	0.5	Pass

Spectrum Plot of Worst Value

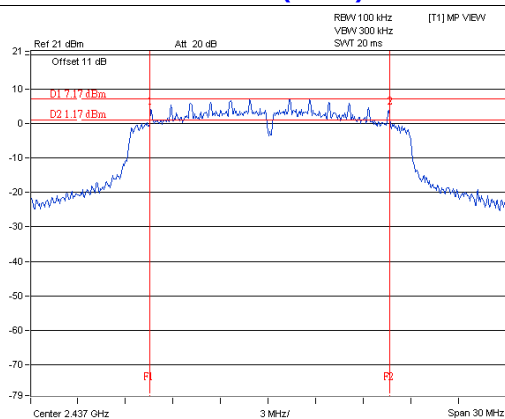
802.11b / CH1



802.11g / CH6



802.11n (HT20) / CH6

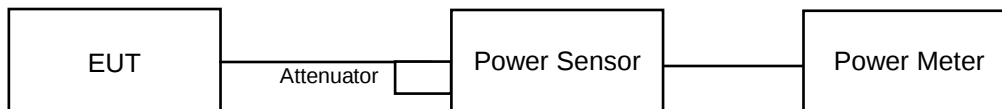


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

FOR PEAK POWER

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	106.17	20.26	30	Pass
6	2437	100.693	20.03	30	Pass
11	2462	103.276	20.14	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	232.274	23.66	30	Pass
6	2437	240.436	23.81	30	Pass
11	2462	226.464	23.55	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	204.174	23.10	30	Pass
6	2437	243.781	23.87	30	Pass
11	2462	221.309	23.45	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	69.183	18.40
6	2437	64.863	18.12
11	2462	66.222	18.21

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	57.544	17.60
6	2437	58.21	17.65
11	2462	51.523	17.12

802.11n (HT20)

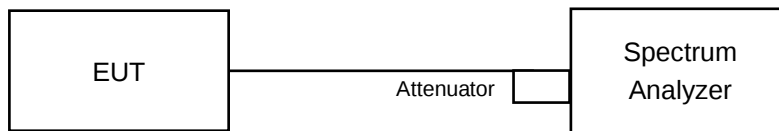
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	58.21	17.65
6	2437	60.395	17.81
11	2462	52	17.16

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- Set the VBW $\geq 3 \times \text{RBW}$.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6

4.5.7 Test Results

802.11b

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-3.82	8	Pass
6	2437	-5.42	8	Pass
11	2462	-4.28	8	Pass

802.11g

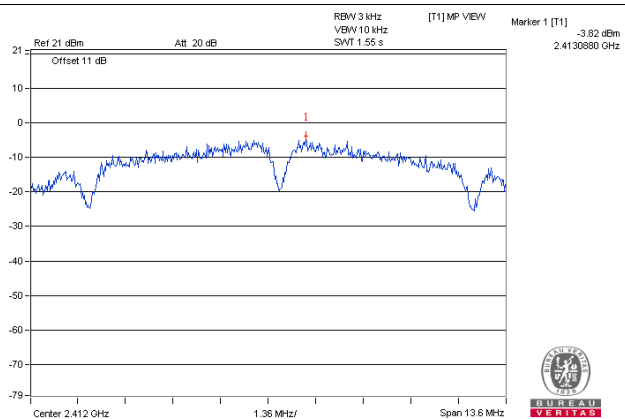
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-8.30	8	Pass
6	2437	-9.16	8	Pass
11	2462	-9.19	8	Pass

802.11n (HT20)

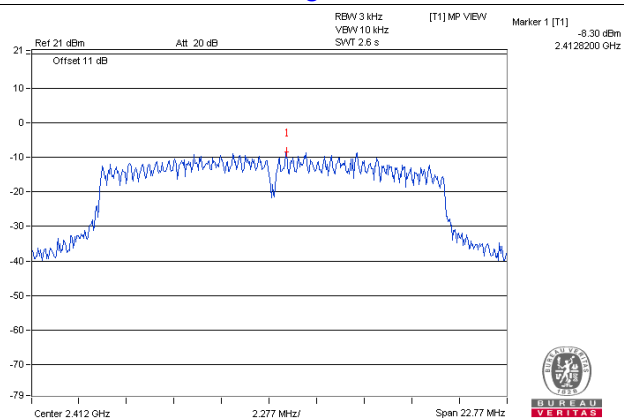
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass /Fail
1	2412	-8.01	8	Pass
6	2437	-8.12	8	Pass
11	2462	-8.81	8	Pass

Spectrum Plot of Worst Value

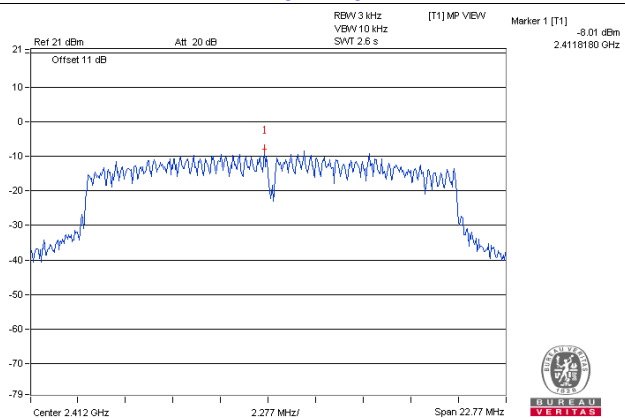
802.11b / CH1



802.11g / CH1



802.11n (HT20) / CH1

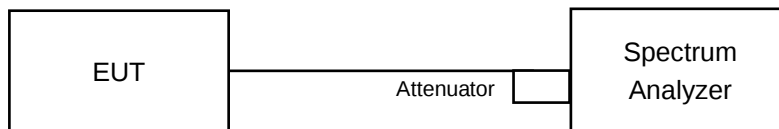


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

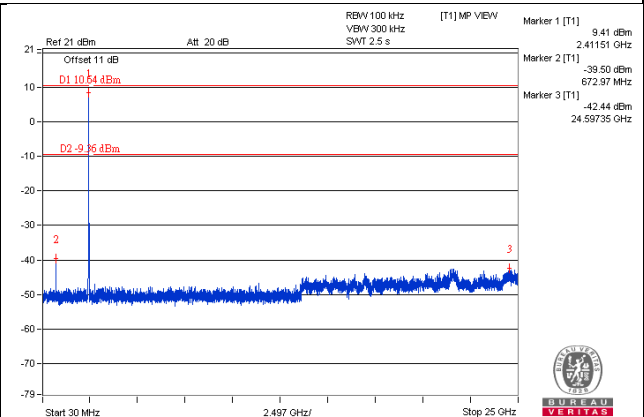
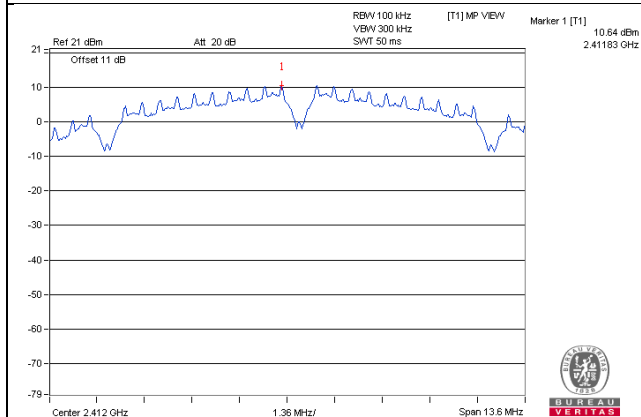
Same as Item 4.3.6

4.6.7 Test Results

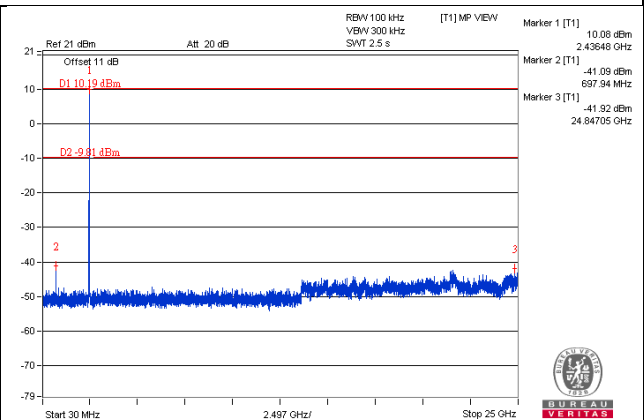
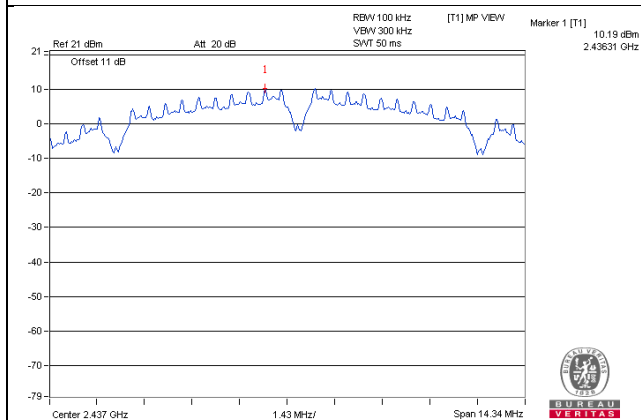
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

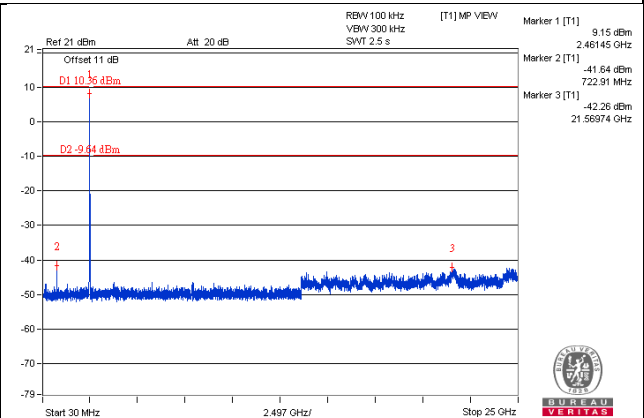
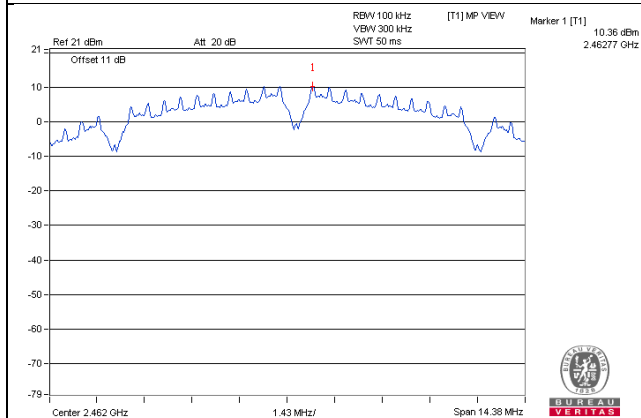
CH 1



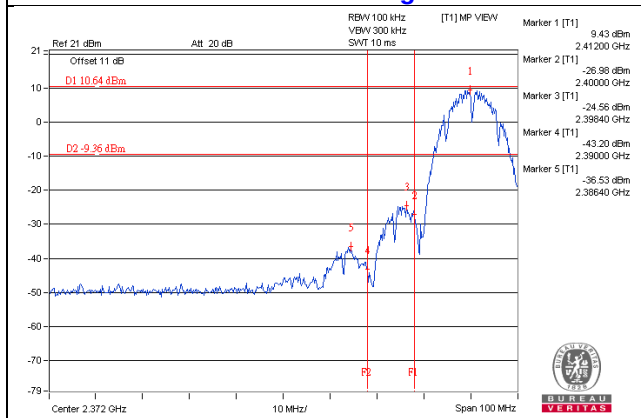
CH 6



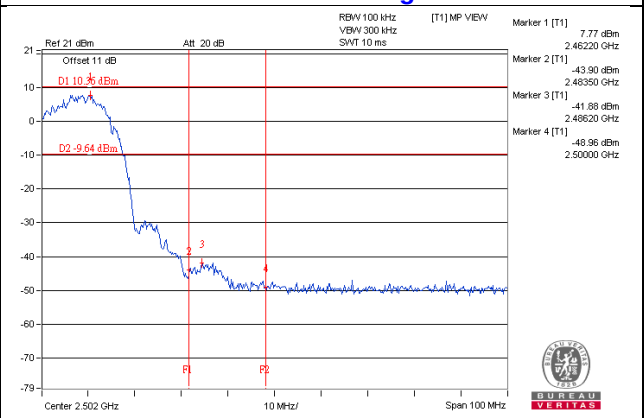
CH 11



CH 1 Band edge

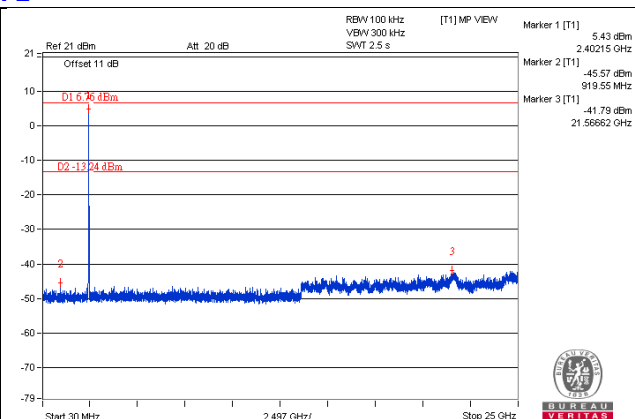
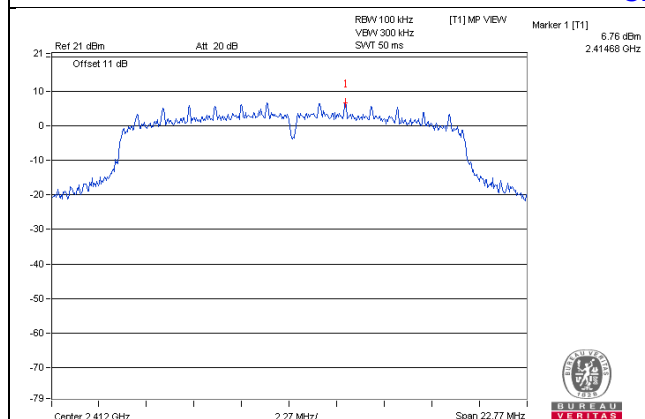


CH 11 Band edge

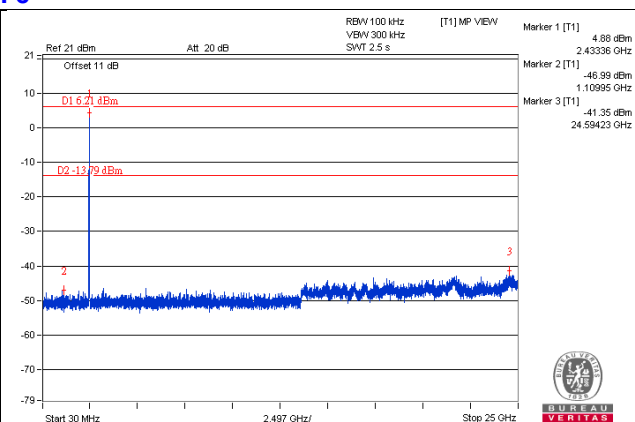
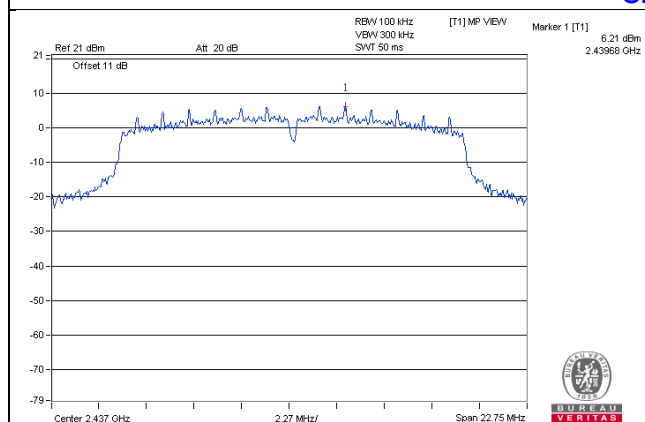


802.11g

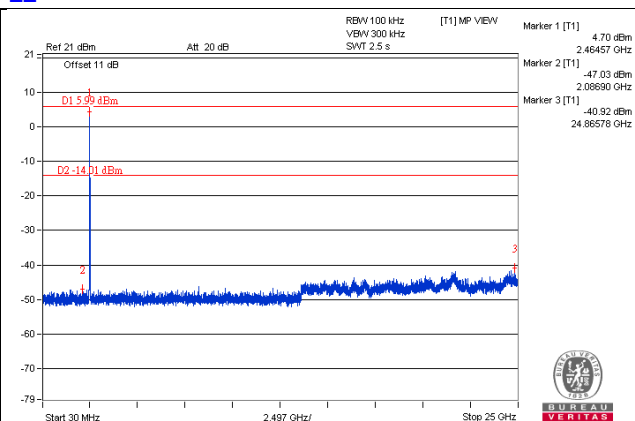
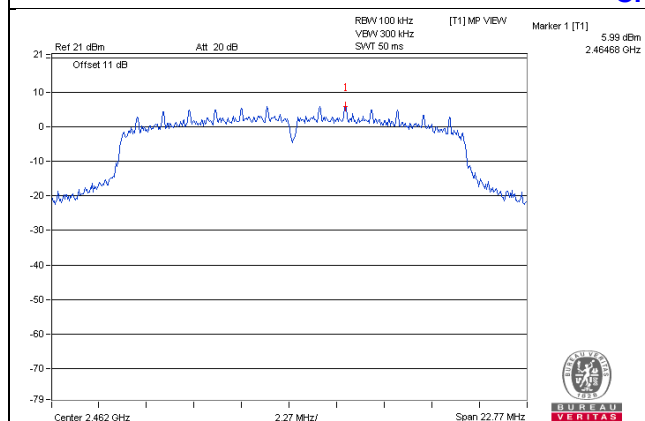
CH 1



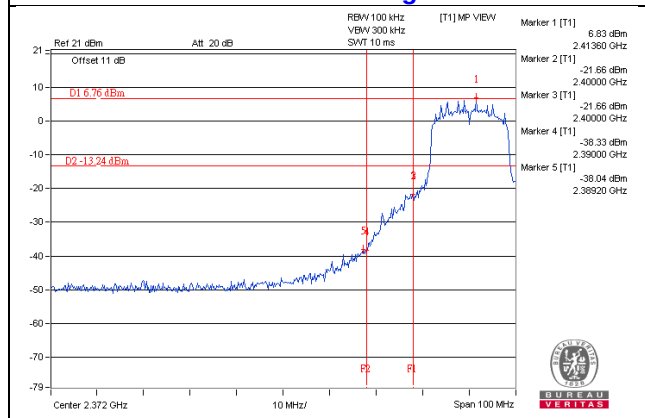
CH 6



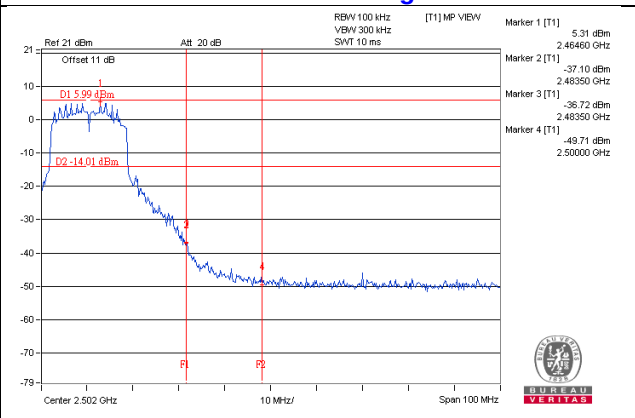
CH 11



CH 1 Band edge

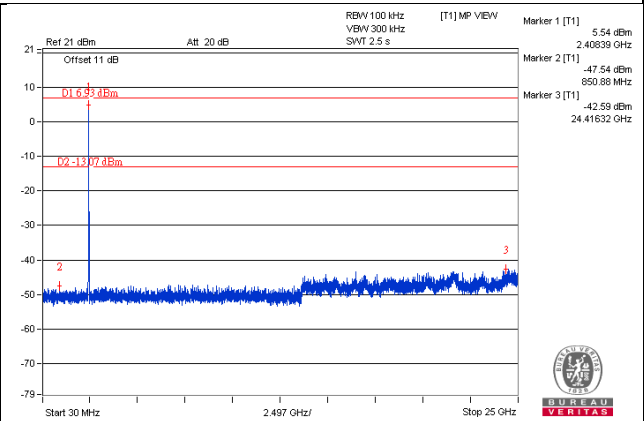
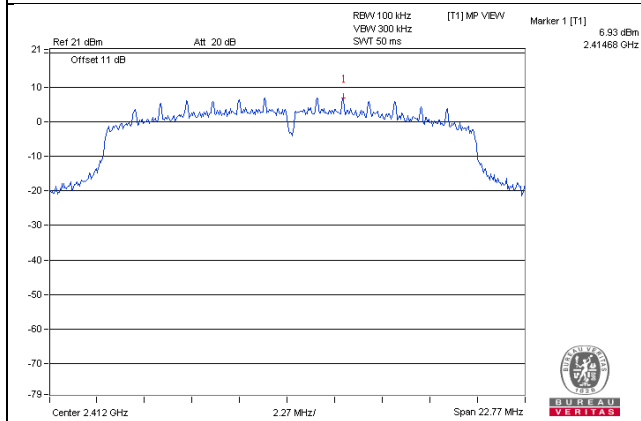


CH 11 Band edge

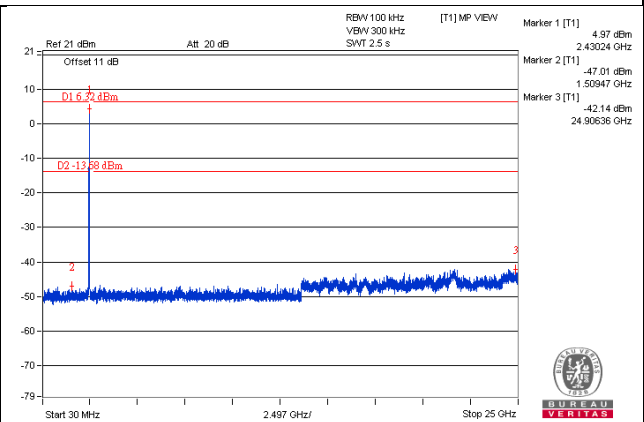
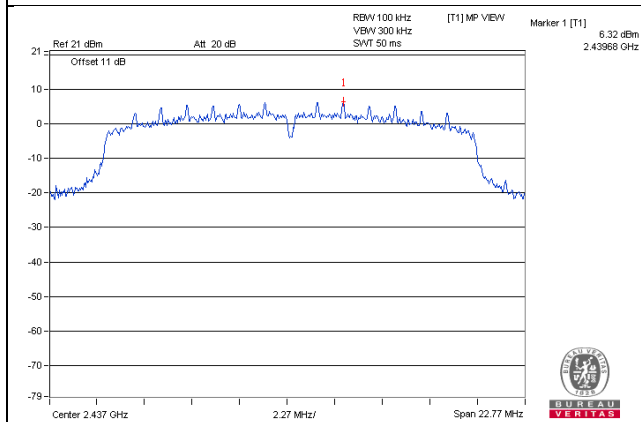


802.11n (HT20)

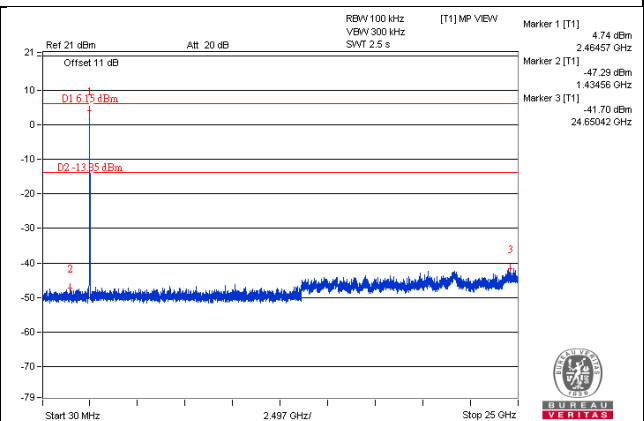
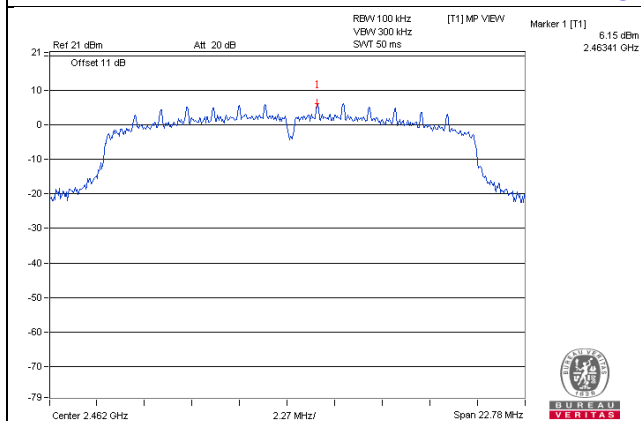
CH 1



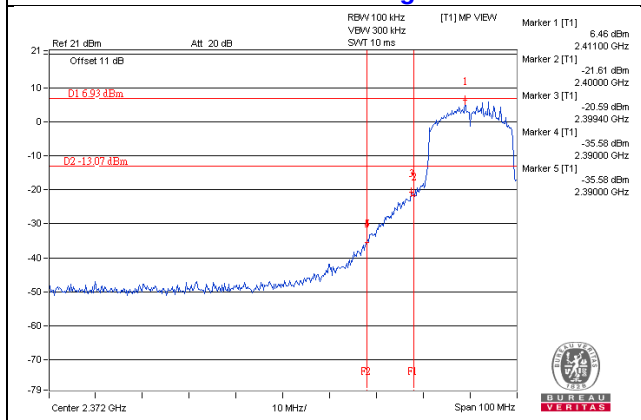
CH 6



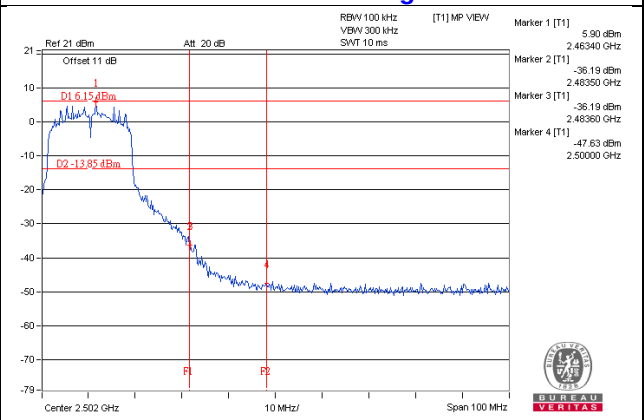
CH 11



CH 1 Band edge



CH 11 Band edge



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 accredited and approved according to ISO/IEC 17025.

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

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Tel: 886-3-3183232

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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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