

Test Report

Report No.: RF141104C31

FCC ID: H9PCCHUB1

Test Model: CC5000-10

Received Date: Nov. 04, 2014

Test Date: Mar. 26 ~ Apr. 09, 2015

Issued Date: Apr. 23, 2015

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Release Control Record

Issue No.	Description	Date Issued
RF141104C31	Original release	Apr. 23, 2015

1 Certificate of Conformity

Product: Customer Concierge

Brand: Symbol

Test Model: CC5000-10

Sample Status: Engineering sample

Applicant: Symbol Technologies Inc.

Test Date: Mar. 26 ~ Apr. 09, 2015

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2009

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 : Polly Chien, **Date:** Apr. 23, 2015
Polly Chien / Specialist

Approved by : Ken Liu, **Date:** Apr. 23, 2015
Ken Liu / Senior 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 -13.39dB at 0.43152MHz
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2483.50MHz
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

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	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Customer Concierge
Brand	Symbol
Test Model	CC5000-10
HW	EV2
SW	91.2.0.27-4AJ11-030515
FW	FUSION_A_3.01.0.0.038
Status of EUT	Engineering sample
Power Supply Rating	12Vdc (Adapter) 48Vdc (PoE)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 65.0Mbps
Operating Frequency	2412 ~ 2472MHz
Number of Channel	802.11b, 802.11g, 802.11n (HT20): 13
Output Power	193.197mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. Physically, the EUT provides 1 completed transmitter and 1 receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	1TX

2. The EUT uses following antennas.

Type	Connector	Gain (dBi)		
		2402MHz	2442MHz	2484MHz
PCB	NA	5.28	5.40	5.04

3. The EUT uses following adapter.

Brand	HIPRO
Model	HP-A0502R3D
Input Power	100-240Vac, 50-60Hz, 2.4A
Output Power	12Vdc, 4.16A
Power Line	1.8m cable with one core

3.2 Description of Test Modes

13 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency	Channel	Frequency
1	2412MHz	8	2447MHz
2	2417MHz	9	2452MHz
3	2422MHz	10	2457MHz
4	2427MHz	11	2462MHz
5	2432MHz	12	2467MHz
6	2437MHz	13	2472MHz
7	2442MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.
2. After pre-tested adapter and PoE mode, we found adapter mode was the worst case, therefore chosen for final tests and presented in the test report.

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 13	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (HT20)	1 to 13	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	19deg. C, 70%RH	120Vac, 60Hz	Jones Chang
RE $<$ 1G	19deg. C, 70%RH	120Vac, 60Hz	Jones Chang
PLC	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Hsu

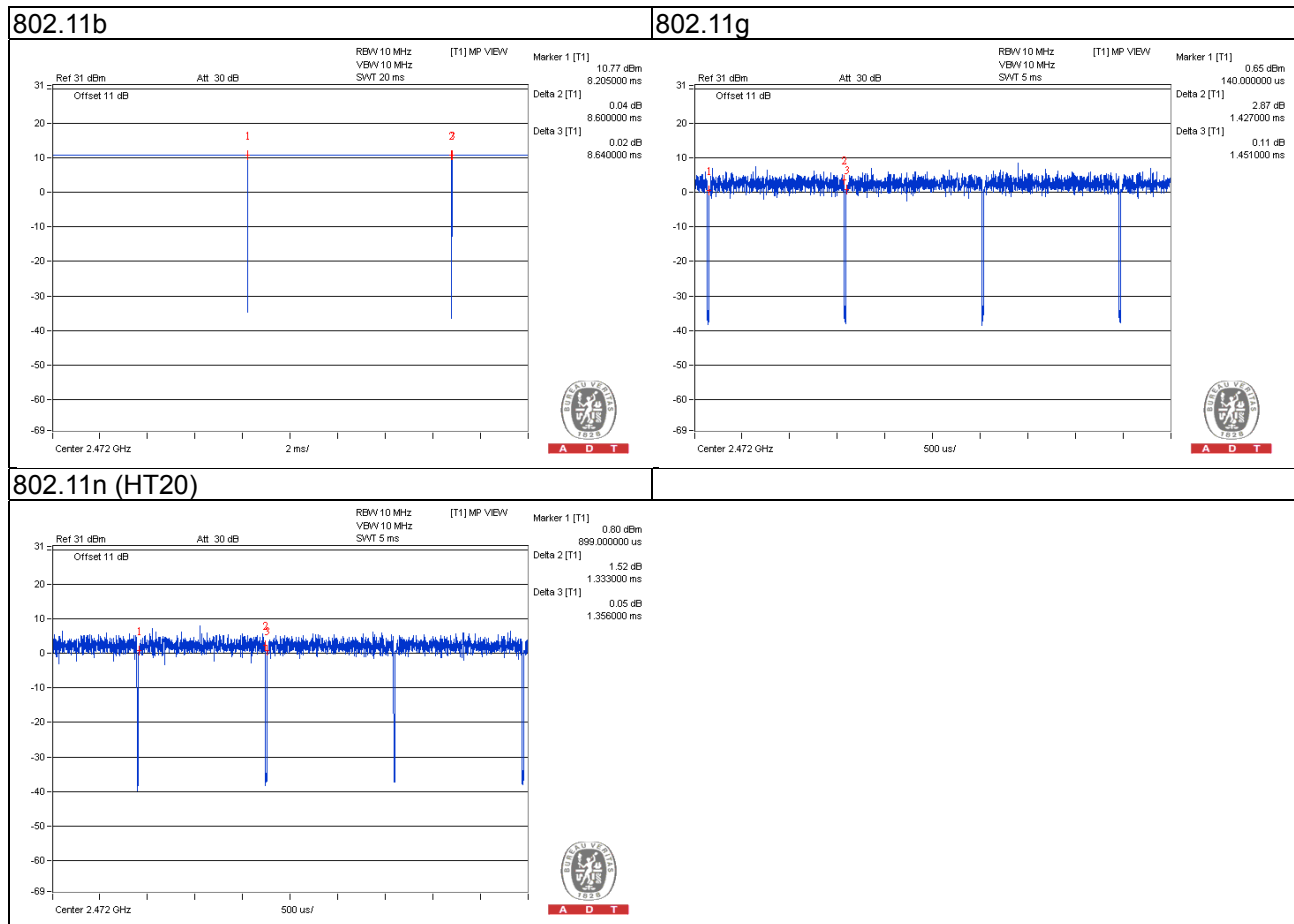
3.3 Duty Cycle of Test Signal

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

802.11b: Duty cycle = $8.600/8.640 = 0.995$

802.11g: Duty cycle = $1.427/1.451 = 0.983$

802.11n (HT20): Duty cycle = $1.333/1.356 = 0.983$



3.4 Description of Support Units

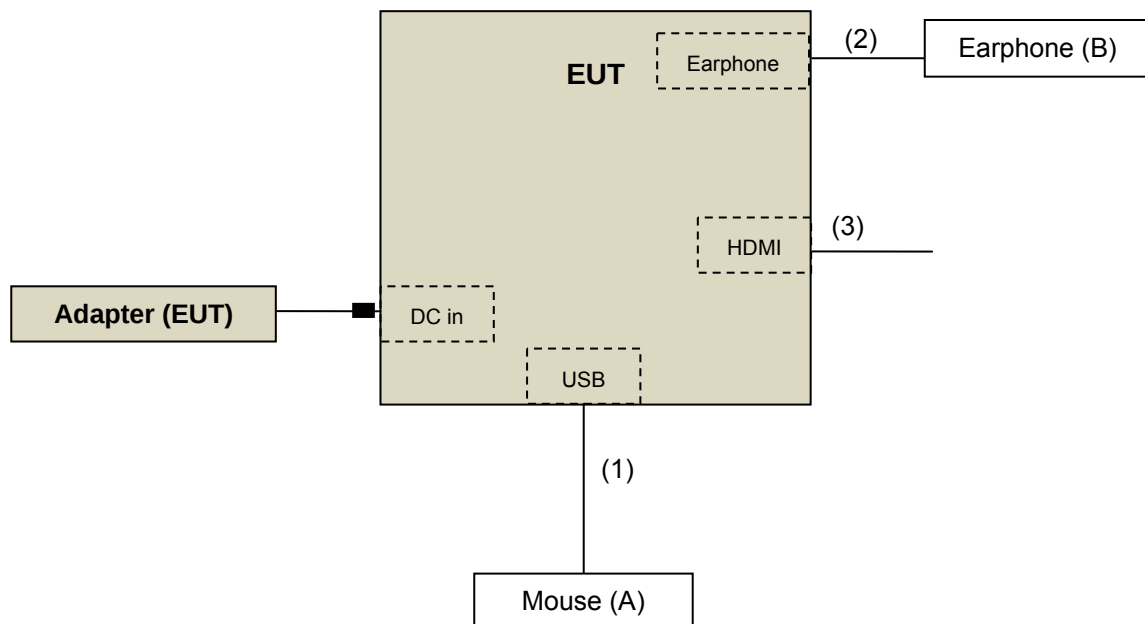
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	MOUSE	Microsoft	ITE78CJ	N/A	FCC DoC Approved	-
B.	EARPHONE	PHILIPS	HL145	N/A	N/A	-

Note: 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	1.8	Y	0	-
2.	Earphone cable	1	1.2	Y	0	-
3.	HDMI cable	1	1.8	N	0	-

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)

558074 D01 DTS Meas Guidance v03r02

ANSI C63.10-2009

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.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 01, 2014	Nov. 30, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 25, 2014	Jul. 24, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2014	Aug. 08, 2015
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable Worken	8D-FB	Cable-CH9-01	Aug. 11, 2014	Aug. 10, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015

- 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 HwaYa Chamber 9.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 215374.
5. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters 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:

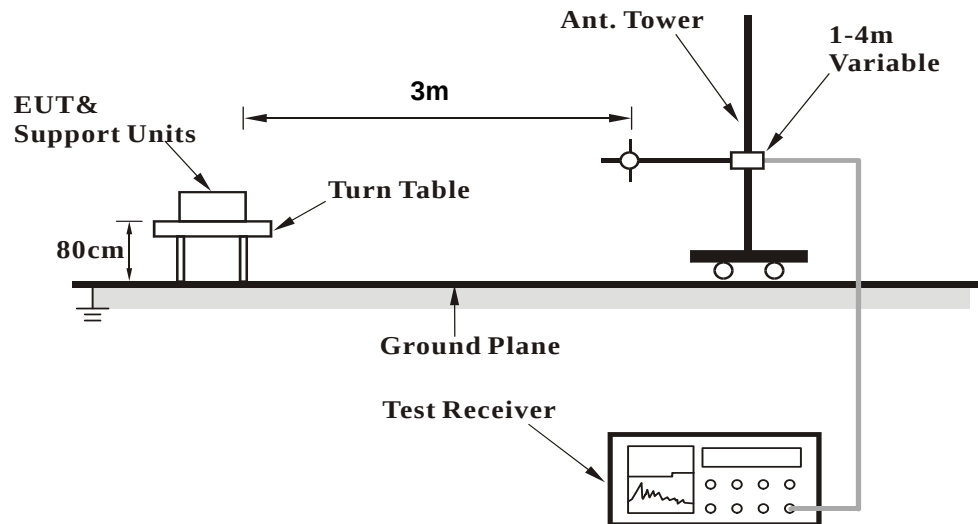
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

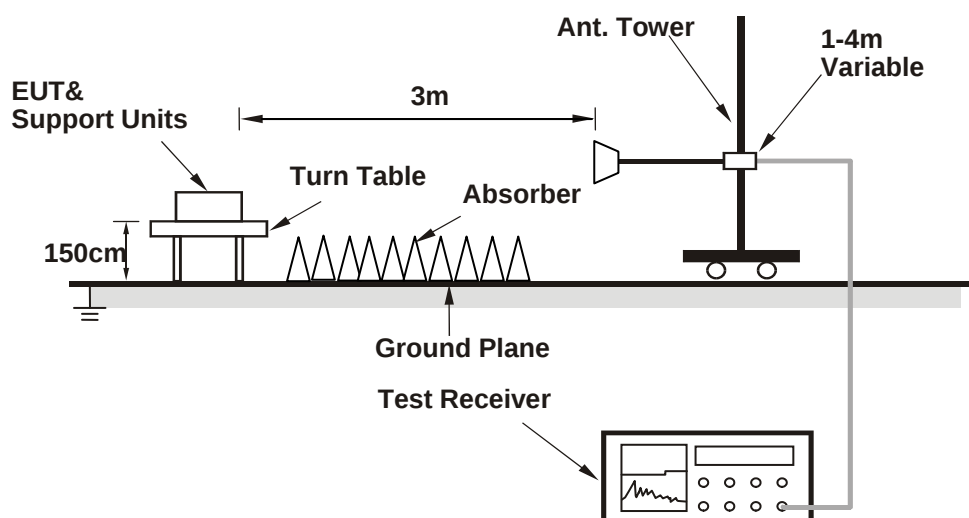
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

- Placed the EUT with earphone on testing table.
- The necessary accessories enable the system in full functions.
- Set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Worst-Case 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	59.9 PK	74.0	-14.1	1.23 H	298	27.40	32.50
2	2390.00	50.7 AV	54.0	-3.3	1.23 H	298	18.20	32.50
3	*2412.00	110.7 PK			1.37 H	284	78.10	32.60
4	*2412.00	106.6 AV			1.37 H	284	74.00	32.60
5	4824.00	50.8 PK	74.0	-23.2	1.00 H	310	44.90	5.90
6	4824.00	42.5 AV	54.0	-11.5	1.00 H	310	36.60	5.90
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	57.8 PK	74.0	-16.2	1.96 V	145	25.30	32.50
2	2390.00	46.4 AV	54.0	-7.6	1.96 V	145	13.90	32.50
3	*2412.00	103.7 PK			1.98 V	143	71.10	32.60
4	*2412.00	99.9 AV			1.98 V	143	67.30	32.60
5	4824.00	51.9 PK	74.0	-22.1	1.05 V	332	46.00	5.90
6	4824.00	45.8 AV	54.0	-8.2	1.05 V	332	39.90	5.90

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	112.0 PK			1.36 H	283	79.30	32.70
2	*2437.00	108.2 AV			1.36 H	283	75.50	32.70
3	4874.00	51.0 PK	74.0	-23.0	1.00 H	311	45.10	5.90
4	4874.00	42.9 AV	54.0	-11.1	1.00 H	311	37.00	5.90
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	104.3 PK			1.94 V	142	71.60	32.70
2	*2437.00	100.5 AV			1.94 V	142	67.80	32.70
3	4874.00	52.6 PK	74.0	-21.4	1.04 V	332	46.70	5.90
4	4874.00	46.2 AV	54.0	-7.8	1.04 V	332	40.30	5.90

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	111.7 PK			1.36 H	283	79.10	32.60
2	*2462.00	107.9 AV			1.36 H	283	75.30	32.60
3	2483.50	61.2 PK	74.0	-12.8	1.16 H	282	28.50	32.70
4	2483.50	52.9 AV	54.0	-1.1	1.16 H	282	20.20	32.70
5	4924.00	51.6 PK	74.0	-22.4	1.00 H	321	45.60	6.00
6	4924.00	43.3 AV	54.0	-10.7	1.00 H	321	37.30	6.00
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	105.5 PK			2.12 V	143	72.90	32.60
2	*2462.00	101.6 AV			2.12 V	143	69.00	32.60
3	2483.50	57.7 PK	74.0	-16.3	2.01 V	145	25.00	32.70
4	2483.50	47.7 AV	54.0	-6.3	2.01 V	145	15.00	32.70
5	4924.00	50.8 PK	74.0	-23.2	1.04 V	10	44.80	6.00
6	4924.00	45.5 AV	54.0	-8.5	1.04 V	10	39.50	6.00

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 12	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	*2467.00	107.2 PK			1.03 H	278	74.50	32.70
2	*2467.00	103.3 AV			1.03 H	278	70.60	32.70
3	2483.50	61.5 PK	74.0	-12.5	1.00 H	281	28.80	32.70
4	2483.50	52.5 AV	54.0	-1.5	1.00 H	281	19.80	32.70
5	4934.00	48.5 PK	74.0	-25.5	1.33 H	269	42.40	6.10
6	4934.00	36.9 AV	54.0	-17.1	1.33 H	269	30.80	6.10
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	*2467.00	96.0 PK			1.00 V	287	63.30	32.70
2	*2467.00	92.7 AV			1.00 V	287	60.00	32.70
3	2483.50	57.2 PK	74.0	-16.8	1.40 V	293	24.50	32.70
4	2483.50	46.0 AV	54.0	-8.0	1.40 V	293	13.30	32.70
5	4934.00	48.1 PK	74.0	-25.9	1.24 V	161	42.00	6.10
6	4934.00	36.0 AV	54.0	-18.0	1.24 V	161	29.90	6.10

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 13	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	*2472.00	103.9 PK			1.15 H	280	71.20	32.70
2	*2472.00	100.2 AV			1.15 H	280	67.50	32.70
3	2483.50	59.8 PK	74.0	-14.2	1.16 H	280	27.10	32.70
4	2483.50	52.2 AV	54.0	-1.8	1.16 H	280	19.50	32.70
5	4944.00	47.7 PK	74.0	-26.3	1.10 H	162	41.60	6.10
6	4944.00	34.8 AV	54.0	-19.2	1.10 H	162	28.70	6.10
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	*2472.00	92.7 PK			1.00 V	286	60.00	32.70
2	*2472.00	89.4 AV			1.00 V	286	56.70	32.70
3	2483.50	57.3 PK	74.0	-16.7	1.38 V	230	24.60	32.70
4	2483.50	45.5 AV	54.0	-8.5	1.38 V	230	12.80	32.70
5	4944.00	47.2 PK	74.0	-26.8	1.25 V	213	41.10	6.10
6	4944.00	34.8 AV	54.0	-19.2	1.25 V	213	28.70	6.10

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	72.2 PK	74.0	-1.8	1.22 H	289	39.70	32.50
2	2390.00	50.9 AV	54.0	-3.1	1.22 H	289	18.40	32.50
3	*2412.00	110.6 PK			1.19 H	290	78.00	32.60
4	*2412.00	100.9 AV			1.19 H	290	68.30	32.60
5	4824.00	48.4 PK	74.0	-25.6	1.23 H	301	42.50	5.90
6	4824.00	35.5 AV	54.0	-18.5	1.23 H	301	29.60	5.90
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	62.4 PK	74.0	-11.6	1.82 V	139	29.90	32.50
2	2390.00	47.9 AV	54.0	-6.1	1.82 V	139	15.40	32.50
3	*2412.00	103.0 PK			2.14 V	138	70.40	32.60
4	*2412.00	93.5 AV			2.14 V	138	60.90	32.60
5	4824.00	48.1 PK	74.0	-25.9	1.00 V	101	42.20	5.90
6	4824.00	35.0 AV	54.0	-19.0	1.00 V	101	29.10	5.90

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	113.5 PK			1.17 H	285	80.80	32.70
2	*2437.00	103.8 AV			1.17 H	285	71.10	32.70
3	4874.00	47.9 PK	74.0	-26.1	1.74 H	260	42.00	5.90
4	4874.00	34.9 AV	54.0	-19.1	1.74 H	260	29.00	5.90
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	106.1 PK			1.95 V	142	73.40	32.70
2	*2437.00	96.5 AV			1.95 V	142	63.80	32.70
3	4874.00	48.4 PK	74.0	-25.6	1.54 V	281	42.50	5.90
4	4874.00	35.3 AV	54.0	-18.7	1.54 V	281	29.40	5.90

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	110.3 PK			1.32 H	279	77.70	32.60
2	*2462.00	100.8 AV			1.32 H	279	68.20	32.60
3	2483.50	72.4 PK	74.0	-1.6	1.48 H	281	39.70	32.70
4	2483.50	51.2 AV	54.0	-2.8	1.48 H	281	18.50	32.70
5	4924.00	48.4 PK	74.0	-25.6	1.29 H	212	42.40	6.00
6	4924.00	35.3 AV	54.0	-18.7	1.29 H	212	29.30	6.00
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	102.6 PK			2.12 V	141	70.00	32.60
2	*2462.00	93.4 AV			2.12 V	141	60.80	32.60
3	2483.50	62.3 PK	74.0	-11.7	2.00 V	134	29.60	32.70
4	2483.50	47.0 AV	54.0	-7.0	2.00 V	134	14.30	32.70
5	4924.00	48.8 PK	74.0	-25.2	1.59 V	110	42.80	6.00
6	4924.00	35.5 AV	54.0	-18.5	1.59 V	110	29.50	6.00

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 12	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	*2467.00	105.9 PK			1.03 H	279	73.20	32.70
2	*2467.00	96.1 AV			1.03 H	279	63.40	32.70
3	2483.50	69.5 PK	74.0	-4.5	1.00 H	284	36.80	32.70
4	2483.50	52.2 AV	54.0	-1.8	1.00 H	284	19.50	32.70
5	4934.00	47.6 PK	74.0	-26.4	1.13 H	216	41.50	6.10
6	4934.00	34.6 AV	54.0	-19.4	1.13 H	216	28.50	6.10
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	*2467.00	98.3 PK			1.22 V	268	65.60	32.70
2	*2467.00	88.8 AV			1.22 V	268	56.10	32.70
3	2483.50	63.0 PK	74.0	-11.0	1.20 V	265	30.30	32.70
4	2483.50	47.1 AV	54.0	-6.9	1.20 V	265	14.40	32.70
5	4934.00	47.6 PK	74.0	-26.4	1.37 V	153	41.50	6.10
6	4934.00	35.0 AV	54.0	-19.0	1.37 V	153	28.90	6.10

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 13	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	*2472.00	95.0 PK			1.15 H	278	62.30	32.70
2	*2472.00	85.5 AV			1.15 H	278	52.80	32.70
3	2483.50	72.2 PK	74.0	-1.8	1.15 H	272	39.50	32.70
4	2483.50	50.0 AV	54.0	-4.0	1.15 H	272	17.30	32.70
5	4944.00	47.2 PK	74.0	-26.8	1.41 H	181	41.10	6.10
6	4944.00	34.3 AV	54.0	-19.7	1.41 H	181	28.20	6.10
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	*2472.00	87.5 PK			1.22 V	267	54.80	32.70
2	*2472.00	77.7 AV			1.22 V	267	45.00	32.70
3	2483.50	64.7 PK	74.0	-9.3	1.20 V	266	32.00	32.70
4	2483.50	47.0 AV	54.0	-7.0	1.20 V	266	14.30	32.70
5	4944.00	48.0 PK	74.0	-26.0	1.03 V	201	41.90	6.10
6	4944.00	34.2 AV	54.0	-19.8	1.03 V	201	28.10	6.10

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	72.6 PK	74.0	-1.4	1.22 H	287	40.10	32.50
2	2390.00	51.6 AV	54.0	-2.4	1.22 H	287	19.10	32.50
3	*2412.00	110.9 PK			1.20 H	283	78.30	32.60
4	*2412.00	100.5 AV			1.20 H	283	67.90	32.60
5	4824.00	48.1 PK	74.0	-25.9	1.37 H	300	42.20	5.90
6	4824.00	35.3 AV	54.0	-18.7	1.37 H	300	29.40	5.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.5 PK	74.0	-9.5	1.99 V	137	32.00	32.50
2	2390.00	47.6 AV	54.0	-6.4	1.99 V	137	15.10	32.50
3	*2412.00	102.4 PK			2.01 V	145	69.80	32.60
4	*2412.00	93.1 AV			2.01 V	145	60.50	32.60
5	4824.00	48.6 PK	74.0	-25.4	1.80 V	111	42.70	5.90
6	4824.00	35.7 AV	54.0	-18.3	1.80 V	111	29.80	5.90

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	112.4 PK			1.35 H	288	79.70	32.70
2	*2437.00	103.3 AV			1.35 H	288	70.60	32.70
3	4874.00	48.6 PK	74.0	-25.4	1.33 H	290	42.70	5.90
4	4874.00	35.5 AV	54.0	-18.5	1.33 H	290	29.60	5.90
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	106.1 PK			2.18 V	142	73.40	32.70
2	*2437.00	96.5 AV			2.18 V	142	63.80	32.70
3	4874.00	48.9 PK	74.0	-25.1	1.90 V	226	43.00	5.90
4	4874.00	35.8 AV	54.0	-18.2	1.90 V	226	29.90	5.90

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	110.3 PK			1.32 H	282	77.70	32.60
2	*2462.00	100.4 AV			1.32 H	282	67.80	32.60
3	2483.50	72.8 PK	74.0	-1.2	1.47 H	282	40.10	32.70
4	2483.50	52.7 AV	54.0	-1.3	1.47 H	282	20.00	32.70
5	4924.00	48.2 PK	74.0	-25.8	1.55 H	306	42.20	6.00
6	4924.00	35.3 AV	54.0	-18.7	1.55 H	306	29.30	6.00
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	103.0 PK			2.13 V	142	70.40	32.60
2	*2462.00	93.1 AV			2.13 V	142	60.50	32.60
3	2483.50	62.0 PK	74.0	-12.0	2.10 V	136	29.30	32.70
4	2483.50	47.2 AV	54.0	-6.8	2.10 V	136	14.50	32.70
5	4924.00	48.6 PK	74.0	-25.4	1.76 V	156	42.60	6.00
6	4924.00	35.5 AV	54.0	-18.5	1.76 V	156	29.50	6.00

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 12	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	*2467.00	105.6 PK			1.01 H	280	72.90	32.70
2	*2467.00	95.8 AV			1.01 H	280	63.10	32.70
3	2483.50	69.5 PK	74.0	-4.5	1.00 H	282	36.80	32.70
4	2483.50	52.6 AV	54.0	-1.4	1.00 H	282	19.90	32.70
5	4934.00	47.6 PK	74.0	-26.4	1.20 H	211	41.50	6.10
6	4934.00	34.5 AV	54.0	-19.5	1.20 H	211	28.40	6.10
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	*2467.00	97.6 PK			1.22 V	269	64.90	32.70
2	*2467.00	87.8 AV			1.22 V	269	55.10	32.70
3	2483.50	63.1 PK	74.0	-10.9	1.21 V	266	30.40	32.70
4	2483.50	47.6 AV	54.0	-6.4	1.21 V	266	14.90	32.70
5	4934.00	47.3 PK	74.0	-26.7	1.12 V	194	41.20	6.10
6	4934.00	34.4 AV	54.0	-19.6	1.12 V	194	28.30	6.10

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 13	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	*2472.00	94.8 PK			1.31 H	277	62.10	32.70
2	*2472.00	85.2 AV			1.31 H	277	52.50	32.70
3	2483.50	73.0 PK	74.0	-1.0	1.14 H	280	40.30	32.70
4	2483.50	50.3 AV	54.0	-3.7	1.14 H	280	17.60	32.70
5	4944.00	47.2 PK	74.0	-26.8	1.42 H	316	41.10	6.10
6	4944.00	34.4 AV	54.0	-19.6	1.42 H	316	28.30	6.10
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	*2472.00	87.1 PK			1.22 V	267	54.40	32.70
2	*2472.00	77.3 AV			1.22 V	267	44.60	32.70
3	2483.50	65.0 PK	74.0	-9.0	1.21 V	267	32.30	32.70
4	2483.50	47.4 AV	54.0	-6.6	1.21 V	267	14.70	32.70
5	4944.00	47.2 PK	74.0	-26.8	1.06 V	203	41.10	6.10
6	4944.00	34.0 AV	54.0	-20.0	1.06 V	203	27.90	6.10

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 Worst-Case Data:

802.11b

CHANNEL	TX Channel 1	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	32.8 QP	40.0	-7.2	1.51 H	9	47.40	-14.60
2	119.34	33.3 QP	43.5	-10.2	1.51 H	104	50.00	-16.70
3	234.05	34.5 QP	46.0	-11.5	1.51 H	279	50.10	-15.60
4	298.21	37.4 QP	46.0	-8.6	1.01 H	108	49.90	-12.50
5	420.70	41.6 QP	46.0	-4.4	2.00 H	90	51.70	-10.10
6	959.21	36.6 QP	46.0	-9.4	1.51 H	287	36.10	0.50
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	57.12	27.7 QP	40.0	-12.3	1.50 V	16	42.30	-14.60
2	103.78	25.8 QP	43.5	-17.7	1.50 V	285	44.10	-18.30
3	420.70	37.6 QP	46.0	-8.4	1.50 V	168	47.70	-10.10
4	500.42	34.3 QP	46.0	-11.7	1.00 V	132	42.70	-8.40
5	624.85	34.7 QP	46.0	-11.3	1.50 V	357	40.30	-5.60
6	959.21	36.6 QP	46.0	-9.4	1.00 V	279	36.10	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	32.1 QP	40.0	-7.9	1.99 H	280	46.70	-14.60
2	216.55	32.5 QP	46.0	-13.5	1.49 H	69	48.90	-16.40
3	298.21	37.2 QP	46.0	-8.8	1.00 H	223	49.70	-12.50
4	420.70	39.9 QP	46.0	-6.1	1.99 H	255	50.00	-10.10
5	665.68	39.2 QP	46.0	-6.8	1.00 H	62	44.30	-5.10
6	959.21	41.1 QP	46.0	-4.9	1.49 H	248	40.60	0.50
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	35.73	32.5 QP	40.0	-7.5	2.00 V	239	48.10	-15.60
2	57.12	28.9 QP	40.0	-11.1	1.01 V	204	43.50	-14.60
3	381.82	35.5 QP	46.0	-10.5	1.51 V	344	46.40	-10.90
4	500.42	32.0 QP	46.0	-14.0	2.00 V	339	40.40	-8.40
5	729.84	37.9 QP	46.0	-8.1	1.51 V	158	41.60	-3.70
6	959.21	41.4 QP	46.0	-4.6	1.01 V	277	40.90	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	31.4 QP	40.0	-8.6	1.50 H	223	46.00	-14.60
2	129.06	28.7 QP	43.5	-14.8	1.50 H	270	44.20	-15.50
3	296.27	36.3 QP	46.0	-9.7	1.01 H	217	48.90	-12.60
4	420.70	39.6 QP	46.0	-6.4	2.01 H	100	49.70	-10.10
5	665.68	37.4 QP	46.0	-8.6	1.01 H	58	42.50	-5.10
6	959.27	40.8 QP	46.0	-5.2	1.50 H	256	40.30	0.50
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	57.12	28.8 QP	40.0	-11.2	1.49 V	10	43.40	-14.60
2	103.78	25.7 QP	43.5	-17.8	1.00 V	50	44.00	-18.30
3	387.65	36.5 QP	46.0	-9.5	1.00 V	358	47.20	-10.70
4	500.42	35.5 QP	46.0	-10.5	1.49 V	161	43.90	-8.40
5	720.12	36.7 QP	46.0	-9.3	1.00 V	17	40.90	-4.20
6	959.27	41.9 QP	46.0	-4.1	1.00 V	278	41.40	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	31.3 QP	40.0	-8.7	1.50 H	9	45.90	-14.60
2	296.27	36.0 QP	46.0	-10.0	1.00 H	226	48.60	-12.60
3	420.70	38.3 QP	46.0	-7.7	1.00 H	97	48.40	-10.10
4	665.68	36.9 QP	46.0	-9.1	1.00 H	14	42.00	-5.10
5	825.11	40.3 QP	46.0	-5.7	1.00 H	155	42.20	-1.90
6	959.27	41.1 QP	46.0	-4.9	2.00 H	256	40.60	0.50
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	57.12	28.5 QP	40.0	-11.5	1.00 V	298	43.10	-14.60
2	103.78	26.9 QP	43.5	-16.6	1.00 V	293	45.20	-18.30
3	387.65	36.9 QP	46.0	-9.1	1.00 V	10	47.60	-10.70
4	749.29	36.3 QP	46.0	-9.7	1.49 V	158	39.60	-3.30
5	825.11	42.1 QP	46.0	-3.9	1.00 V	231	44.00	-1.90
6	959.21	40.7 QP	46.0	-5.3	1.00 V	279	40.20	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	31.3 QP	40.0	-8.7	1.49 H	164	45.90	-14.60
2	119.34	28.6 QP	43.5	-14.9	1.49 H	232	45.30	-16.70
3	294.32	35.7 QP	46.0	-10.3	2.00 H	218	48.30	-12.60
4	389.59	38.0 QP	46.0	-8.0	1.00 H	44	48.60	-10.60
5	825.11	39.4 QP	46.0	-6.6	1.49 H	13	41.30	-1.90
6	960.00	40.7 QP	46.0	-5.3	1.49 H	248	40.20	0.50
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	57.12	27.8 QP	40.0	-12.2	1.01 V	113	42.40	-14.60
2	383.76	35.9 QP	46.0	-10.1	1.50 V	4	46.80	-10.90
3	500.42	33.3 QP	46.0	-12.7	1.50 V	161	41.70	-8.40
4	720.12	36.8 QP	46.0	-9.2	2.01 V	16	41.00	-4.20
5	825.11	42.8 QP	46.0	-3.2	1.50 V	35	44.70	-1.90
6	960.00	40.9 QP	46.0	-5.1	1.01 V	278	40.40	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	30.8 QP	40.0	-9.2	1.49 H	167	45.40	-14.60
2	127.11	30.6 QP	43.5	-12.9	1.99 H	265	46.30	-15.70
3	294.32	35.3 QP	46.0	-10.7	1.00 H	231	47.90	-12.60
4	420.70	39.3 QP	46.0	-6.7	1.00 H	96	49.40	-10.10
5	825.11	40.3 QP	46.0	-5.7	1.00 H	168	42.20	-1.90
6	959.27	41.4 QP	46.0	-4.6	1.49 H	245	40.90	0.50
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	57.12	26.9 QP	40.0	-13.1	1.01 V	38	41.50	-14.60
2	383.76	36.6 QP	46.0	-9.4	1.01 V	13	47.50	-10.90
3	500.42	34.2 QP	46.0	-11.8	1.50 V	166	42.60	-8.40
4	716.23	36.8 QP	46.0	-9.2	1.50 V	150	41.00	-4.20
5	825.11	41.7 QP	46.0	-4.3	1.50 V	1	43.60	-1.90
6	961.21	40.9 QP	54.0	-13.1	1.01 V	279	40.40	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	31.2 QP	40.0	-8.8	1.50 H	90	45.80	-14.60
2	296.27	36.6 QP	46.0	-9.4	1.01 H	229	49.20	-12.60
3	372.09	37.7 QP	46.0	-8.3	1.01 H	106	48.70	-11.00
4	500.42	37.7 QP	46.0	-8.3	1.50 H	312	46.10	-8.40
5	665.68	37.0 QP	46.0	-9.0	1.01 H	7	42.10	-5.10
6	960.00	40.7 QP	46.0	-5.3	2.00 H	251	40.20	0.50
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	57.12	27.3 QP	40.0	-12.7	1.00 V	171	41.90	-14.60
2	385.70	36.1 QP	46.0	-9.9	1.49 V	354	46.80	-10.70
3	624.85	34.4 QP	46.0	-11.6	1.00 V	180	40.00	-5.60
4	665.68	34.9 QP	46.0	-11.1	1.00 V	155	40.00	-5.10
5	725.96	35.4 QP	46.0	-10.6	1.00 V	17	39.20	-3.80
6	961.21	41.2 QP	54.0	-12.8	1.00 V	284	40.70	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	31.2 QP	40.0	-8.8	1.49 H	153	45.80	-14.60
2	298.21	35.0 QP	46.0	-11.0	1.00 H	212	47.50	-12.50
3	420.70	38.7 QP	46.0	-7.3	2.00 H	91	48.80	-10.10
4	665.68	37.3 QP	46.0	-8.7	1.00 H	12	42.40	-5.10
5	770.67	37.7 QP	46.0	-8.3	1.00 H	197	40.30	-2.60
6	959.27	40.8 QP	46.0	-5.2	1.49 H	254	40.30	0.50
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	57.12	26.6 QP	40.0	-13.4	1.01 V	314	41.20	-14.60
2	381.82	36.8 QP	46.0	-9.2	1.01 V	16	47.70	-10.90
3	665.68	36.0 QP	46.0	-10.0	1.01 V	68	41.10	-5.10
4	722.07	36.7 QP	46.0	-9.3	1.01 V	9	40.80	-4.10
5	807.62	34.7 QP	46.0	-11.3	1.50 V	123	36.80	-2.10
6	959.27	40.9 QP	46.0	-5.1	1.01 V	276	40.40	0.50

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	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	57.12	31.2 QP	40.0	-8.8	1.50 H	9	45.80	-14.60
2	420.70	39.7 QP	46.0	-6.3	1.00 H	250	49.80	-10.10
3	500.42	38.0 QP	46.0	-8.0	1.50 H	225	46.40	-8.40
4	665.68	39.2 QP	46.0	-6.8	1.00 H	12	44.30	-5.10
5	784.28	37.8 QP	46.0	-8.2	1.00 H	191	40.10	-2.30
6	959.27	40.7 QP	46.0	-5.3	2.00 H	251	40.20	0.50
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	57.12	27.5 QP	40.0	-12.5	1.00 V	345	42.10	-14.60
2	383.76	35.2 QP	46.0	-10.8	1.49 V	157	46.10	-10.90
3	500.42	33.7 QP	46.0	-12.3	1.49 V	163	42.10	-8.40
4	582.08	34.7 QP	46.0	-11.3	1.49 V	151	41.40	-6.70
5	665.68	36.8 QP	46.0	-9.2	1.00 V	86	41.90	-5.10
6	959.27	40.4 QP	46.0	-5.6	1.00 V	279	39.90	0.50

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.

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.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	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 test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

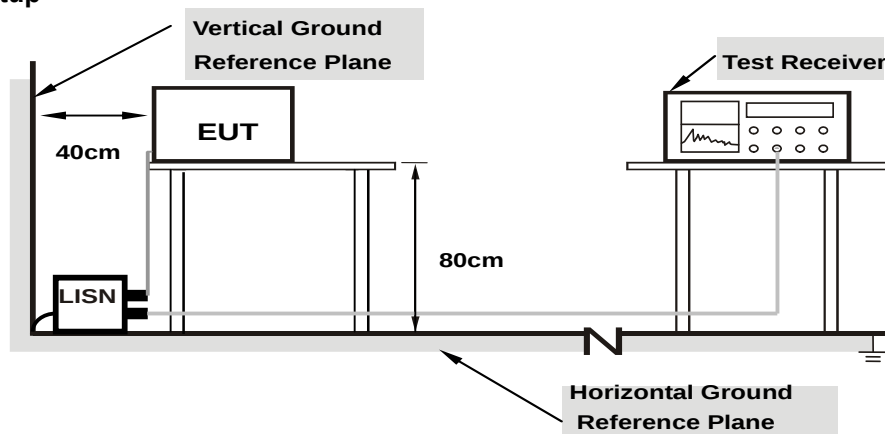
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

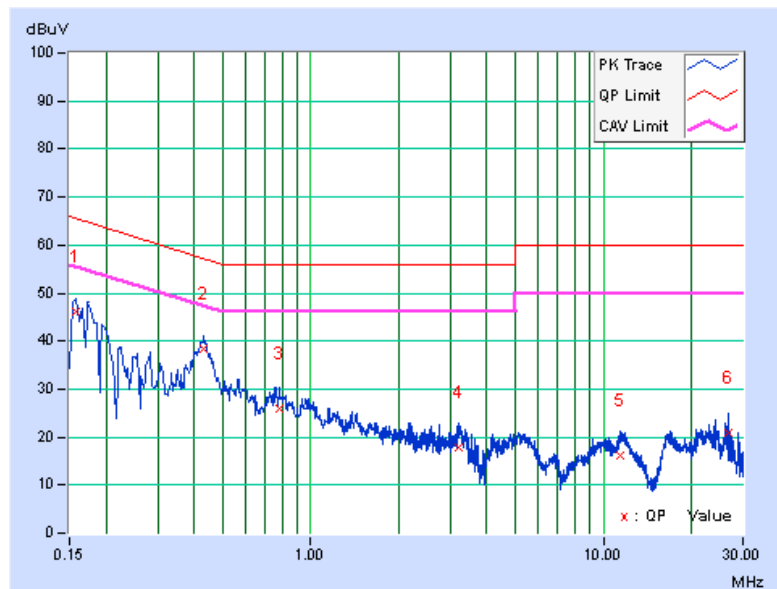
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15719	0.19	45.85	33.45	46.04	33.64	65.61	55.61	-19.57	-21.97
2	0.43152	0.22	38.01	33.61	38.23	33.83	57.22	47.22	-18.99	-13.39
3	0.78342	0.23	25.75	20.50	25.98	20.73	56.00	46.00	-30.02	-25.27
4	3.19589	0.28	17.41	9.95	17.69	10.23	56.00	46.00	-38.31	-35.77
5	11.42644	0.49	15.69	9.88	16.18	10.37	60.00	50.00	-43.82	-39.63
6	26.64127	0.81	20.16	14.06	20.97	14.87	60.00	50.00	-39.03	-35.13

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.

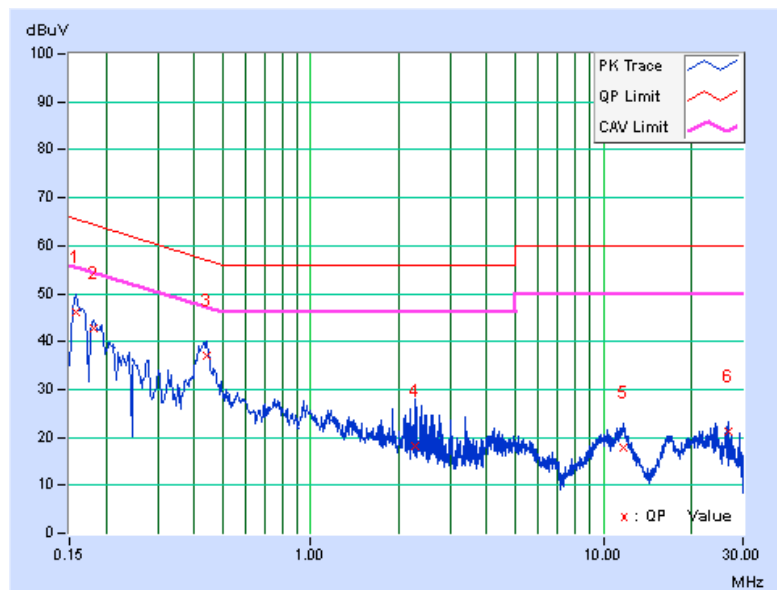


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15719	0.08	45.97	33.02	46.05	33.10	65.61	55.61	-19.56	-22.51
2	0.18122	0.08	42.72	29.49	42.80	29.57	64.43	54.43	-21.63	-24.86
3	0.43924	0.09	36.92	32.50	37.01	32.59	57.08	47.08	-20.07	-14.49
4	2.26922	0.14	17.99	9.44	18.13	9.58	56.00	46.00	-37.87	-36.42
5	11.71578	0.39	17.39	11.59	17.78	11.98	60.00	50.00	-42.22	-38.02
6	26.66371	0.67	20.52	16.21	21.19	16.88	60.00	50.00	-38.81	-33.12

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.

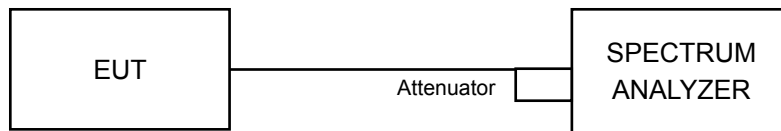


4.3 6dB Bandwidth Measurement

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	10.05	0.5	PASS
6	2437	10.09	0.5	PASS
11	2462	10.07	0.5	PASS
12	2467	9.56	0.5	PASS
13	2472	9.56	0.5	PASS

802.11g

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.17	0.5	PASS
6	2437	16.39	0.5	PASS
11	2462	15.15	0.5	PASS
12	2467	15.17	0.5	PASS
13	2472	15.16	0.5	PASS

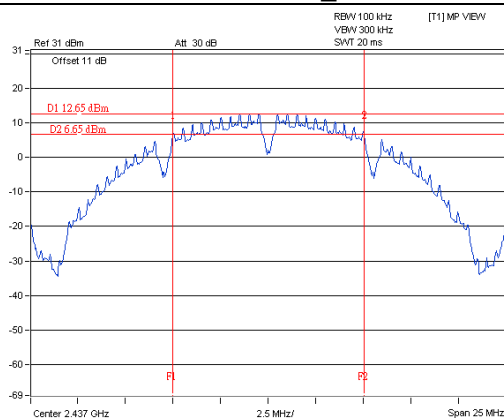
802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
1	2412	15.18	0.5	PASS
6	2437	15.17	0.5	PASS
11	2462	15.15	0.5	PASS
12	2467	15.17	0.5	PASS
13	2472	15.17	0.5	PASS

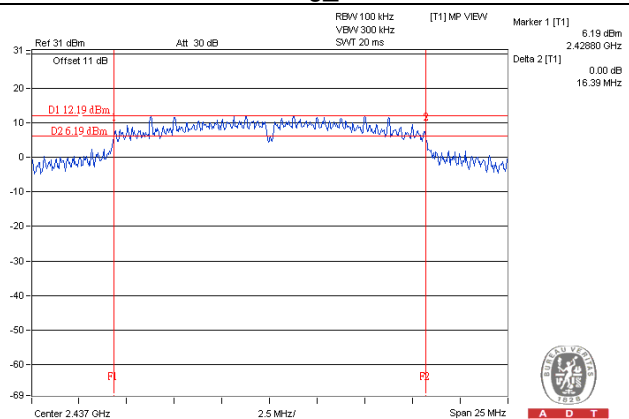
Spectrum Plot of Worst Value

802.11b_CH6

802.11g_CH6

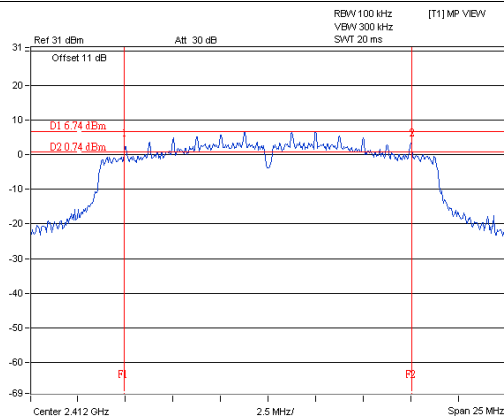


A D T



A D T

802.11n (HT20)_CH1



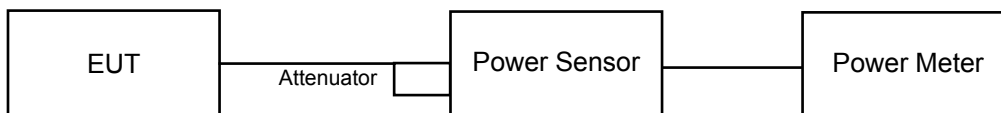
A D T

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.

- Set the RBW $\geq$ DTS bandwidth.
- Set VBW $\geq 3 \times$ RBW.
- Set span $\geq 3 \times$ RBW
- Sweep time = auto couple.
- Detector = peak.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use peak marker function to determine the peak amplitude 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	176.604	22.47	30	Pass
6	2437	184.927	22.67	30	Pass
11	2462	190.546	22.80	30	Pass
12	2467	20.893	13.20	30	Pass
13	2472	11.776	10.71	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	153.462	21.86	30	Pass
6	2437	193.197	22.86	30	Pass
11	2462	138.357	21.41	30	Pass
12	2467	31.550	14.99	30	Pass
13	2472	3.170	5.01	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
1	2412	165.196	22.18	30	Pass
6	2437	192.752	22.85	30	Pass
11	2462	131.826	21.20	30	Pass
12	2467	29.717	14.73	30	Pass
13	2472	5.521	7.42	30	Pass

FOR AVERAGE POWER

802.11b

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	162.181	22.10
6	2437	170.608	22.32
11	2462	174.181	22.41
12	2467	13.183	11.20
13	2472	7.228	8.59

802.11g

Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	44.361	16.47
6	2437	86.497	19.37
11	2462	26.669	14.26
12	2467	7.780	8.91
13	2472	0.692	-1.60

802.11n (HT20)

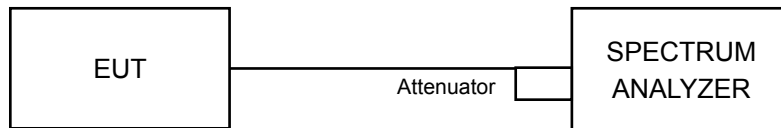
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
1	2412	43.551	16.39
6	2437	82.604	19.17
11	2462	25.410	14.05
12	2467	6.683	8.25
13	2472	0.646	-1.90

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)	Limit (dBm)	Pass /Fail
1	2412	-0.74	8	Pass
6	2437	-0.36	8	Pass
11	2462	0.16	8	Pass
12	2467	-10.69	8	Pass
13	2472	-14.13	8	Pass

802.11g

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-7.21	8	Pass
6	2437	-1.90	8	Pass
11	2462	-9.34	8	Pass
12	2467	-14.57	8	Pass
13	2472	-23.01	8	Pass

802.11n (HT20)

Channel	Freq. (MHz)	PSD (dBm)	Limit (dBm)	Pass /Fail
1	2412	-7.66	8	Pass
6	2437	-5.10	8	Pass
11	2462	-8.96	8	Pass
12	2467	-14.68	8	Pass
13	2472	-23.23	8	Pass

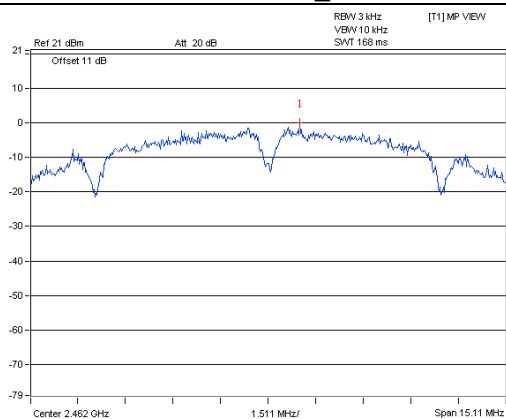


A D T

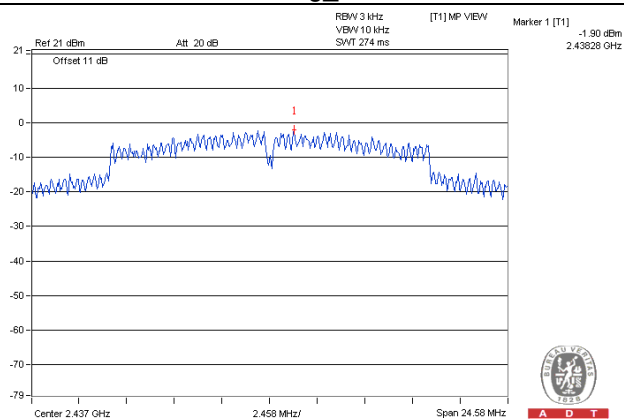
Spectrum Plot of Worst Value

802.11b_CH11

802.11g_CH6

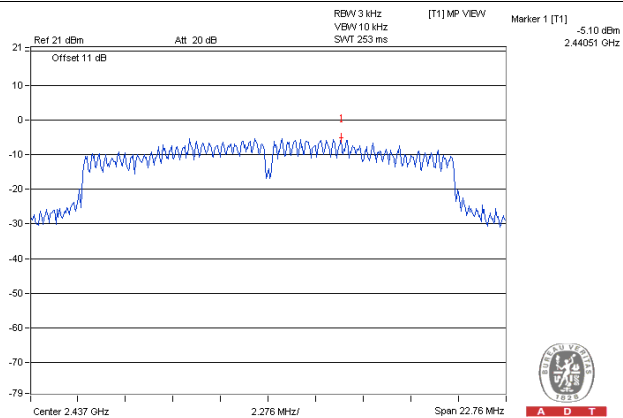


A D T



A D T

802.11n (HT20)_CH6



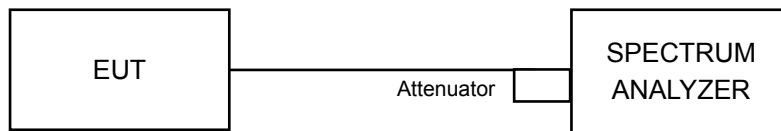
A D T

4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

Below 20dB 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 = average.
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. Ensure that the number of measurement points $\geq$ span/RBW
4. According to measurement points to set differ measurement span.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

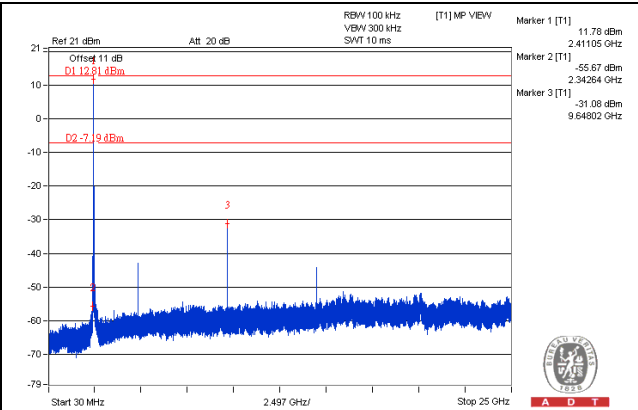
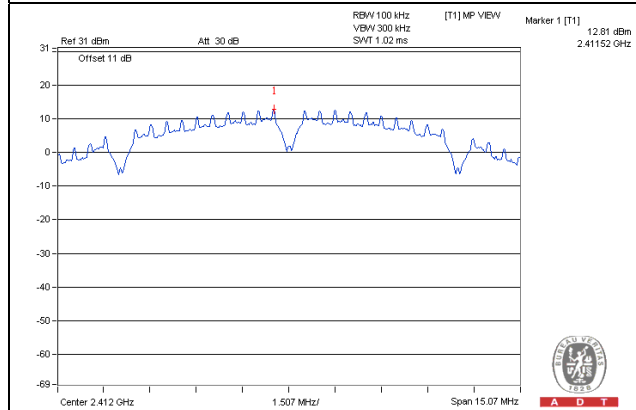
Same as Item 4.3.6

4.6.7 Test Results

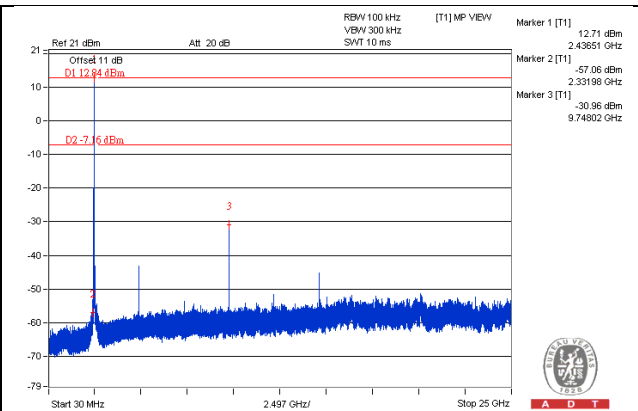
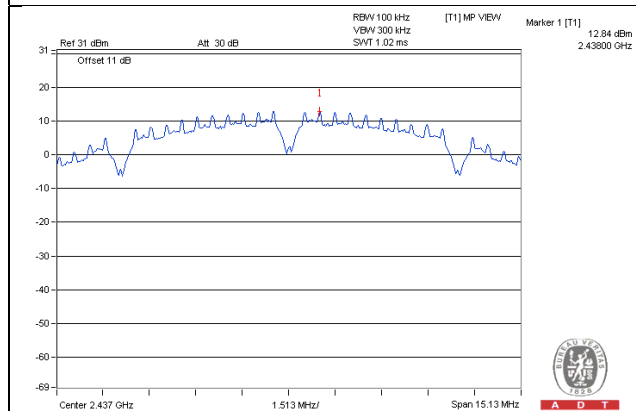
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.

802.11b

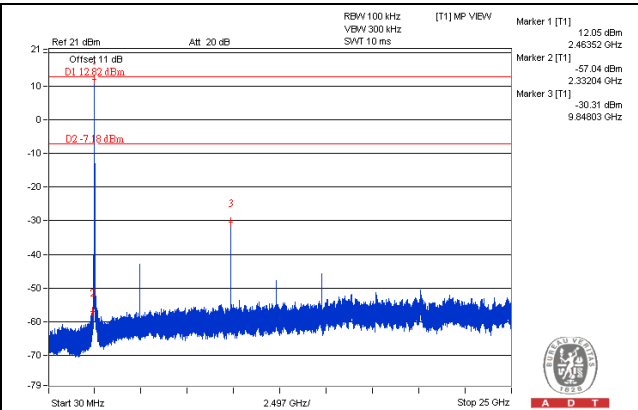
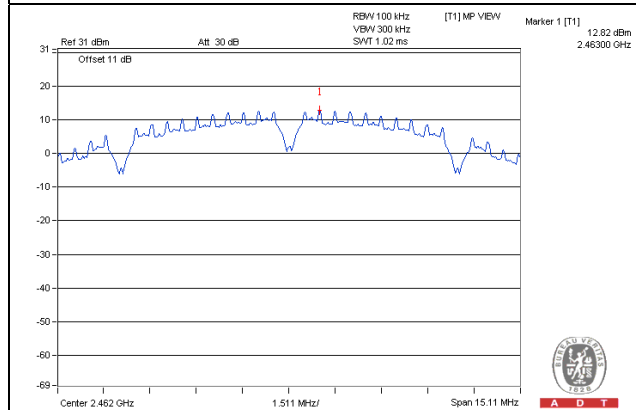
CH 1



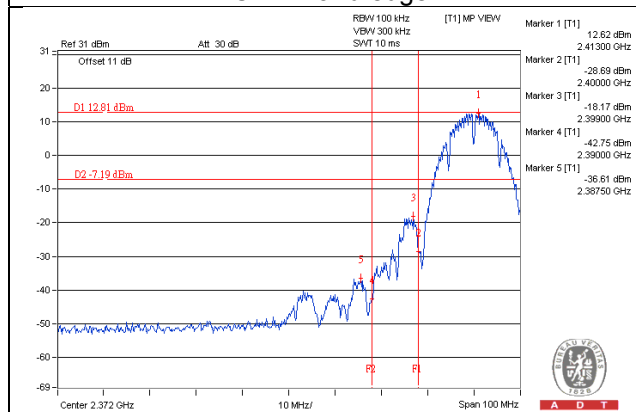
CH 6



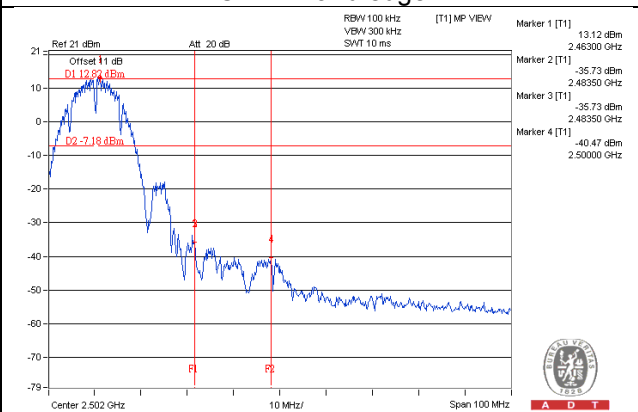
CH 11



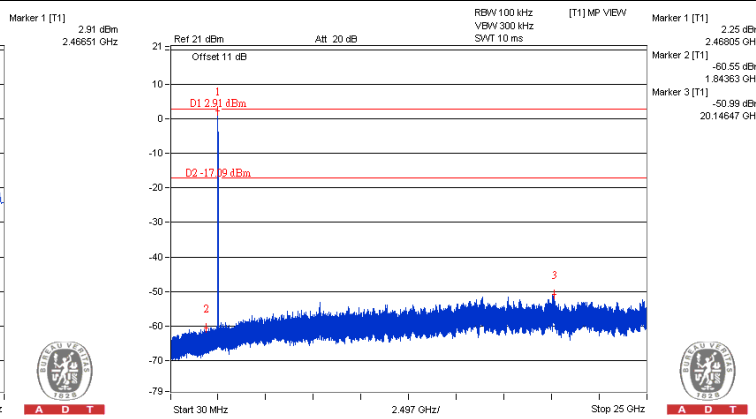
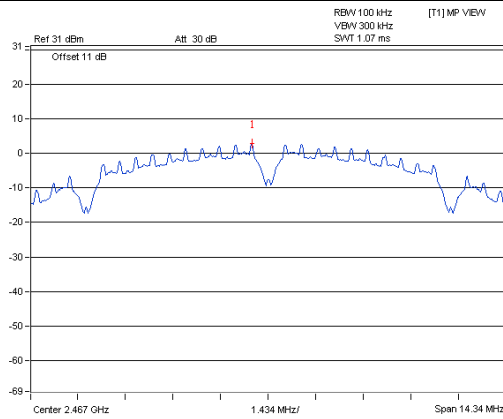
CH 1 Band edge



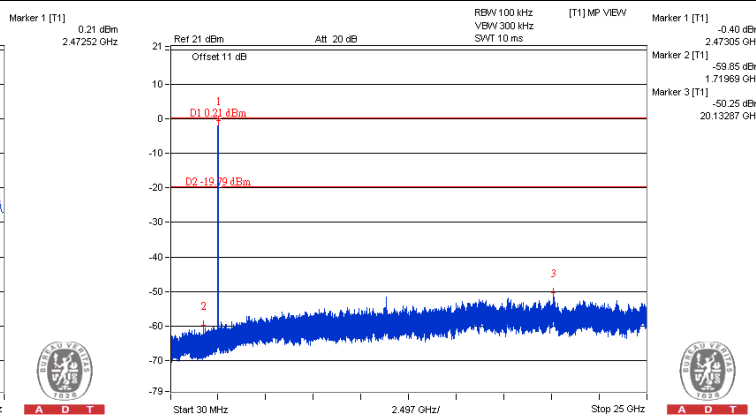
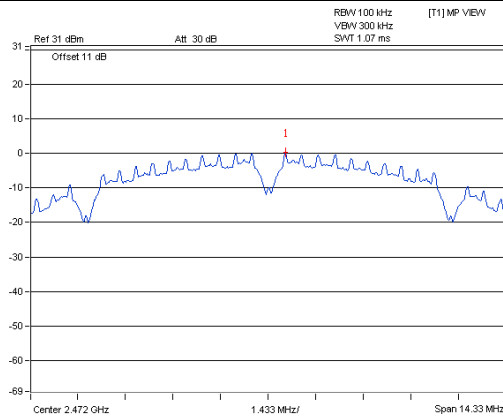
CH 11 Band edge



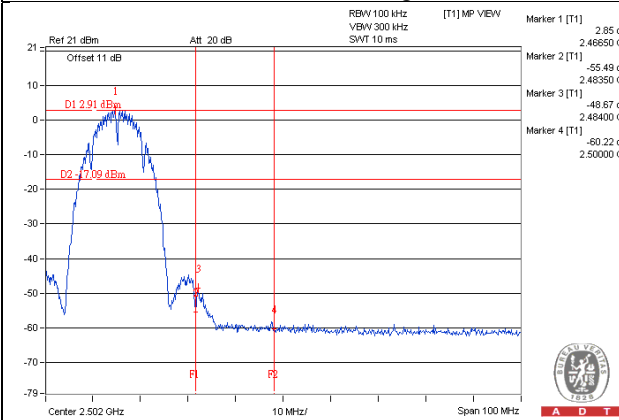
CH 12



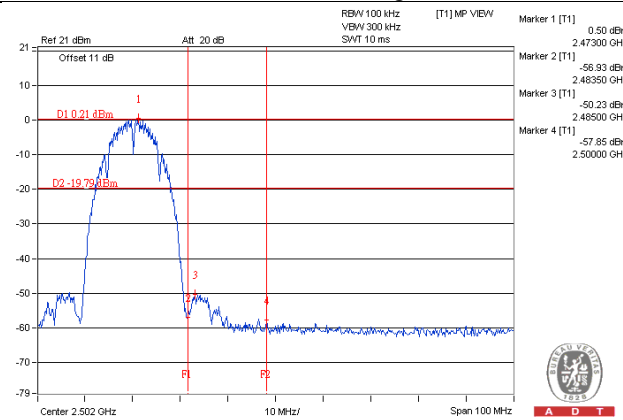
CH 13



CH 12 Band edge

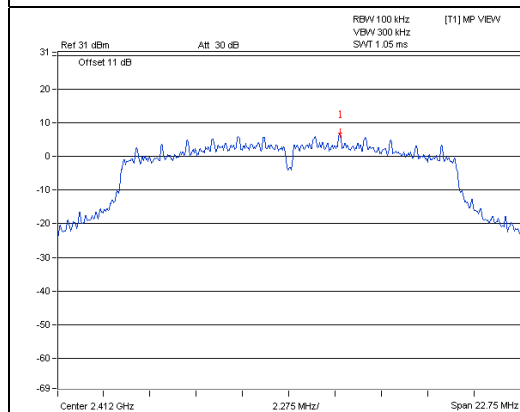


CH 13 Band edge

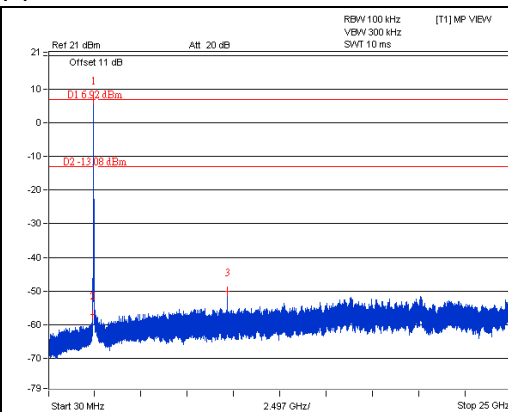


802.11g

CH 1

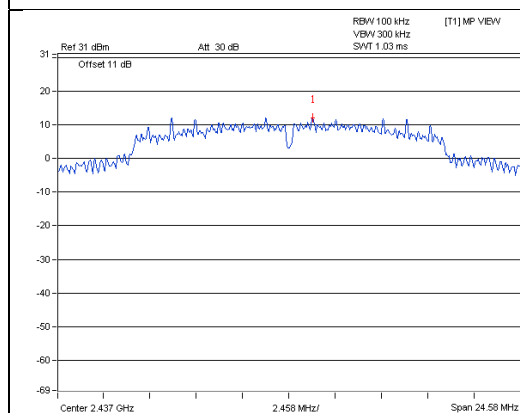


A D T

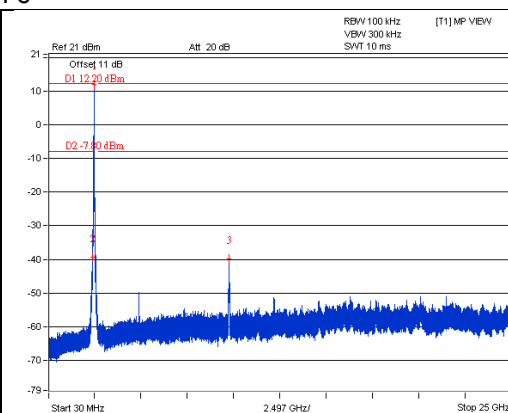


A D T

CH 6

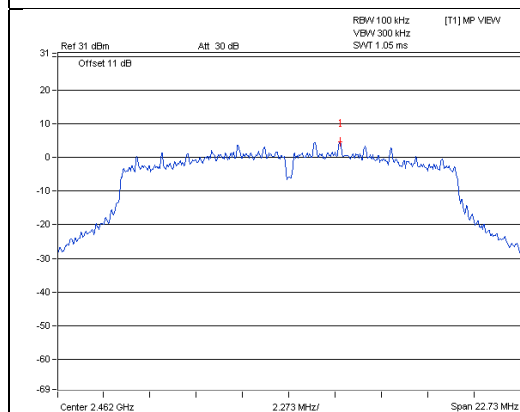


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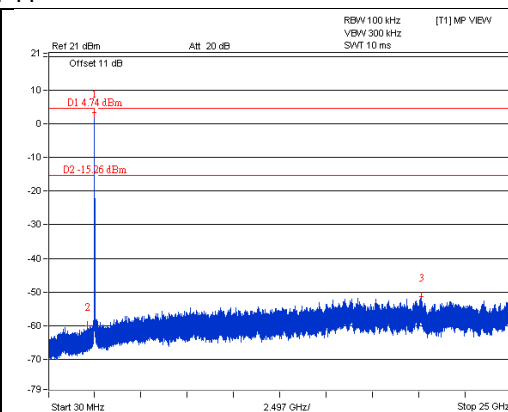


A D T

CH 11

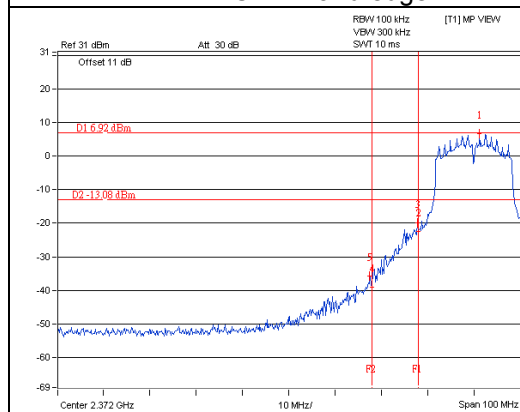


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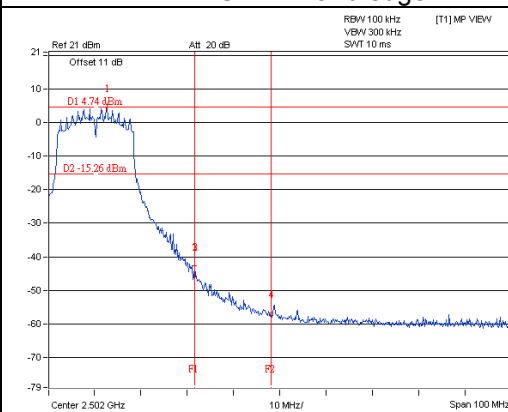
A D T

CH 1 Band edge



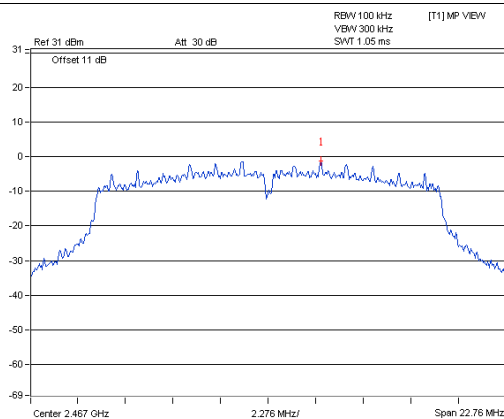
A D T

CH 11 Band edge

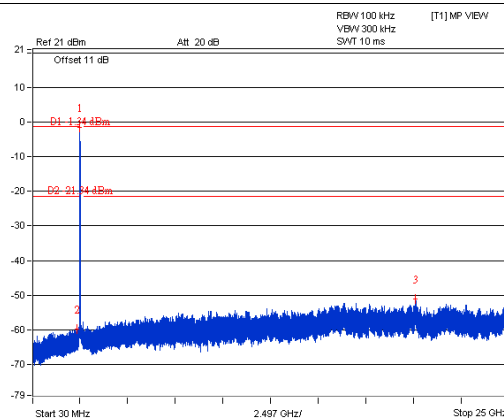


A D T

CH 12

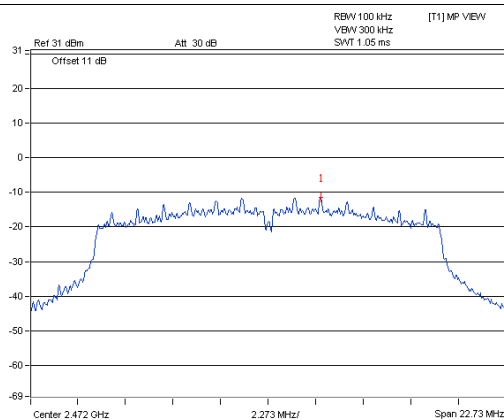


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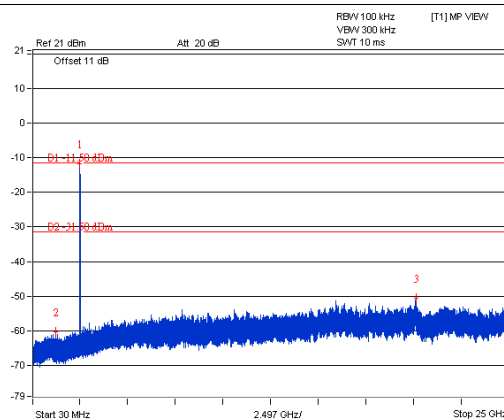


A D T

CH 13

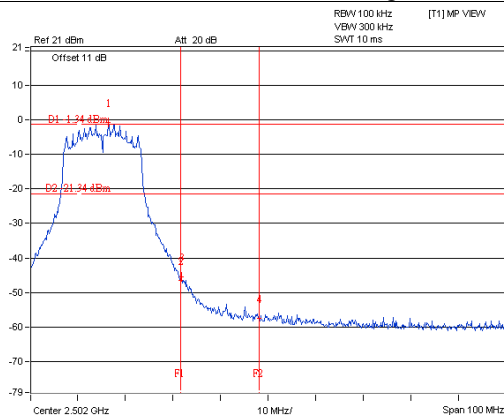


A D T



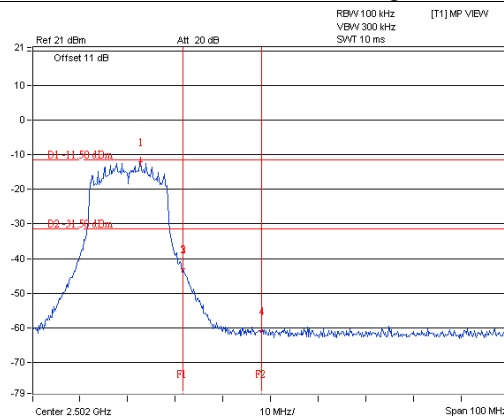
A D T

CH 12 Band edge



A D T

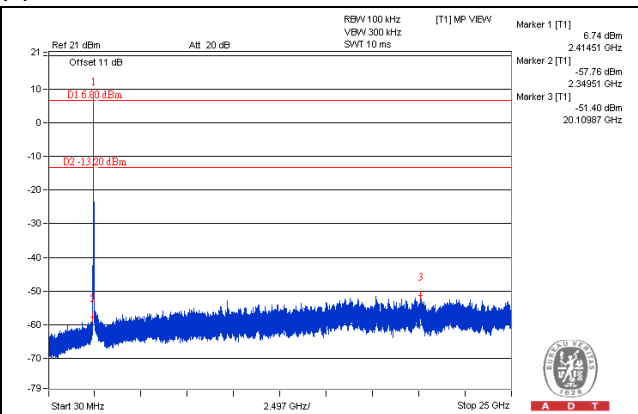
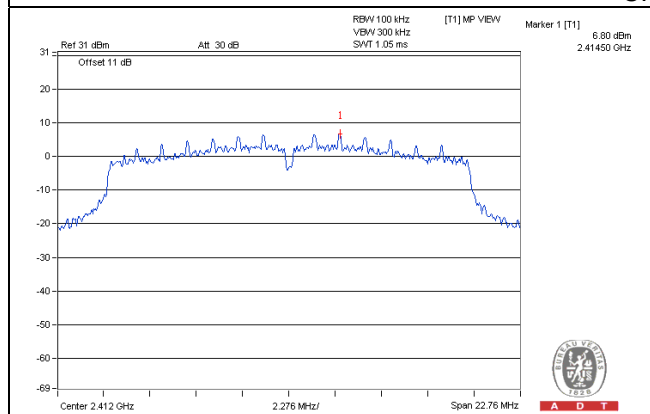
CH 13 Band edge



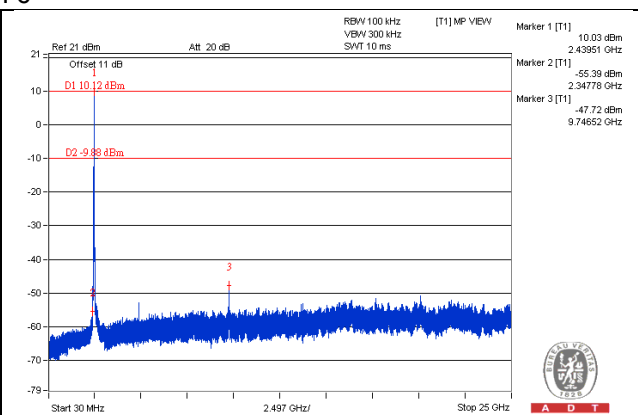
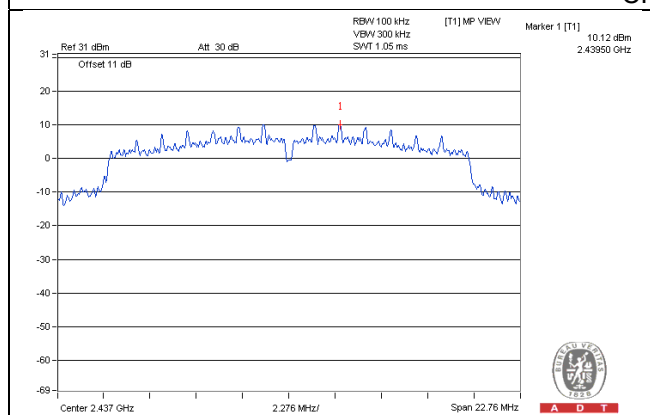
A D T

802.11n (HT20)

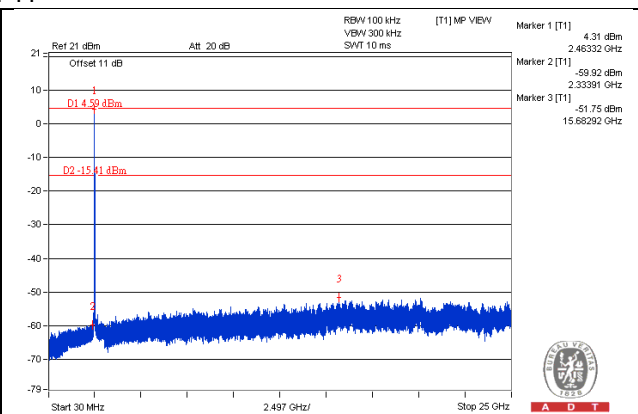
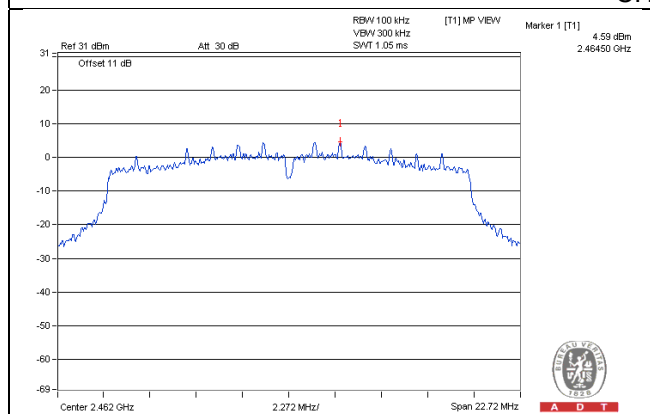
CH 1



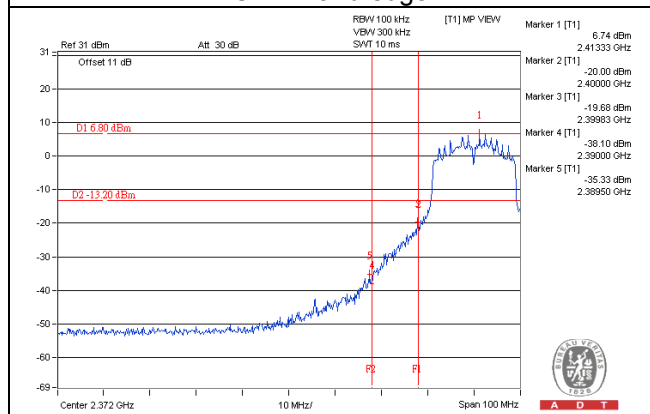
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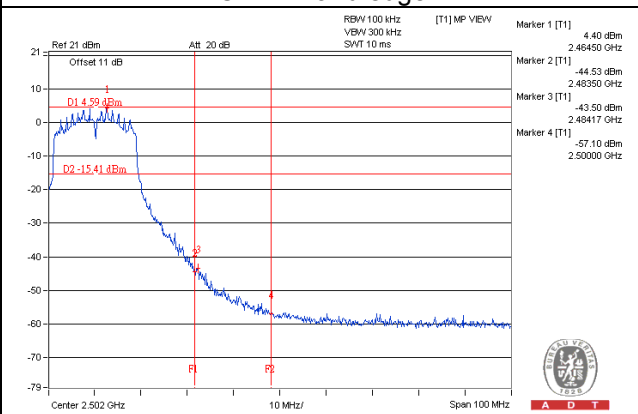
CH 11



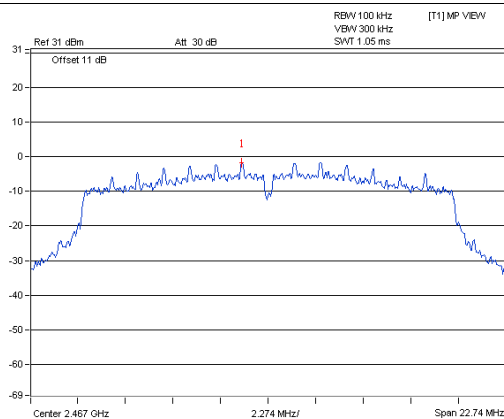
CH 1 Band edge



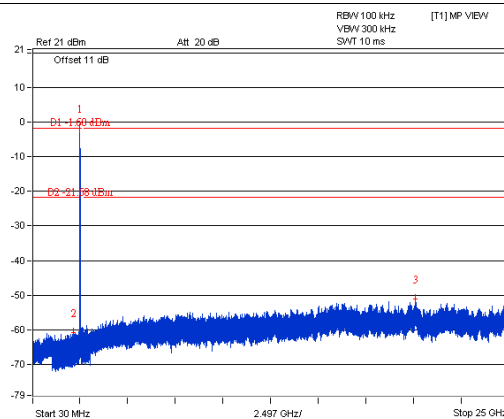
CH 11 Band edge



CH 12

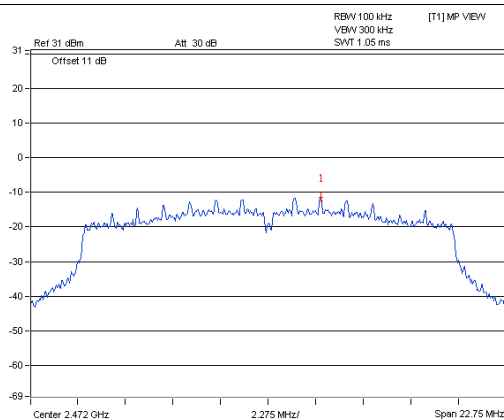


A D T

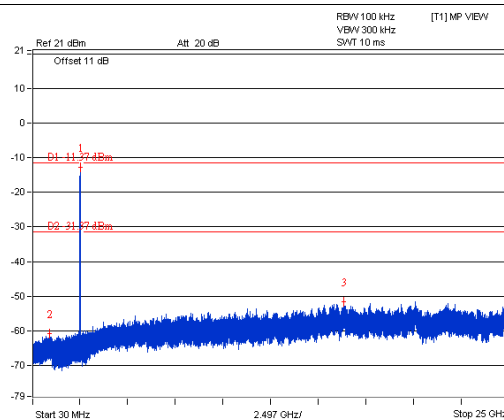


A D T

CH 13

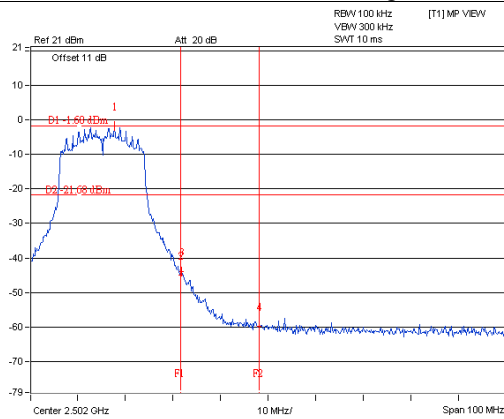


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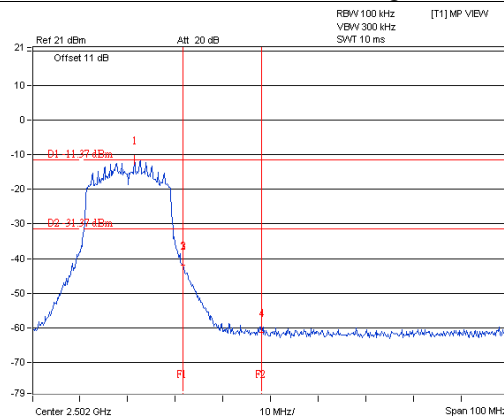
A D T

CH 12 Band edge



A D T

CH 13 Band edge



A D T

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:

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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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