



# FCC TEST REPORT

**REPORT NO.:** RF140619C19

**MODEL NO.:** TM1000

**FCC ID:** H9PTM1000

**RECEIVED:** Jun. 19, 2014

**TESTED:** Jun. 26 ~ Jul. 11, 2014

**ISSUED:** Jul. 15, 2014

**APPLICANT:** Symbol Technologies, Inc.

**ADDRESS:** One Motorola Plaza, Holtsville, NY 11742-1300,  
USA

**ISSUED BY:** Bureau Veritas Consumer Products Services  
(H.K.) Ltd., Taoyuan Branch

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,  
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**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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## REPORT ISSUE HISTORY RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
1	Original release.	Jul. 15, 2014



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140619C19	Original release.	Jul. 15, 2014



## 1. CERTIFICATION

**PRODUCT:** Trailer Monitoring Unit  
**MODEL NO.:** TM1000  
**BRAND:** Symbol  
**APPLICANT:** Symbol Technologies, Inc.  
**TESTED:** Jun. 26 ~ Jul. 11, 2014  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARDS:** **FCC Part 15, Subpart C (Section 15.247)**  
ANSI C63.10-2009

The above equipment (model: TM1000) 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 :** Celine Chou , **DATE :** Jul. 15, 2014  
Celine Chou / Specialist

**APPROVED BY :** Ken Liu , **DATE :** Jul. 15, 2014  
Ken Liu / Senior Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -4.35dB at 0.91858MHz.
15.205 & 209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.1dB at 70.42MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -4.1dB 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	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	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Trailer Monitoring Unit
<b>MODEL NO.</b>	TM1000
<b>POWER SUPPLY</b>	125Vac, 60Hz, 2.5A
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	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 72Mbps
<b>OPERATING FREQUENCY</b>	2412 ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11
<b>OUTPUT POWER</b>	190.546mW
<b>ANTENNA TYPE</b>	Dipole antenna with 5.69dBi gain
<b>ANTENNA CONNECTOR</b>	i-pex
<b>DATA CABLE</b>	N/A
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	N/A

**NOTE:**

1. The EUT provides one completed transmitter and one receiver.

<b>MODULATION MODE</b>	<b>TX FUNCTION</b>
<b>802.11b</b>	1TX
<b>802.11g</b>	1TX
<b>802.11n (20MHz)</b>	1TX

2. The EUT consumes power from the following power supply module.

<b>BRAND:</b>	EMERSON
<b>MODEL:</b>	LPS103-M
<b>INPUT:</b>	125Vac, 60Hz, 2.5A
<b>OUTPUT:</b>	12Vdc, 8.3A
<b>POWER CORD:</b>	1.8m cable without core attached on adapter

3. 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 (20MHz):

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≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G**: Radiated Emission above 1GHz      **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement

#### **RADIATED EMISSION TEST (ABOVE 1GHz):**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	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 (20MHz)	1 to 11	6	OFDM	BPSK	6.5



**BANDEDGE MEASUREMENT:**

- 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 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 11	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 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5

**TEST CONDITION:**

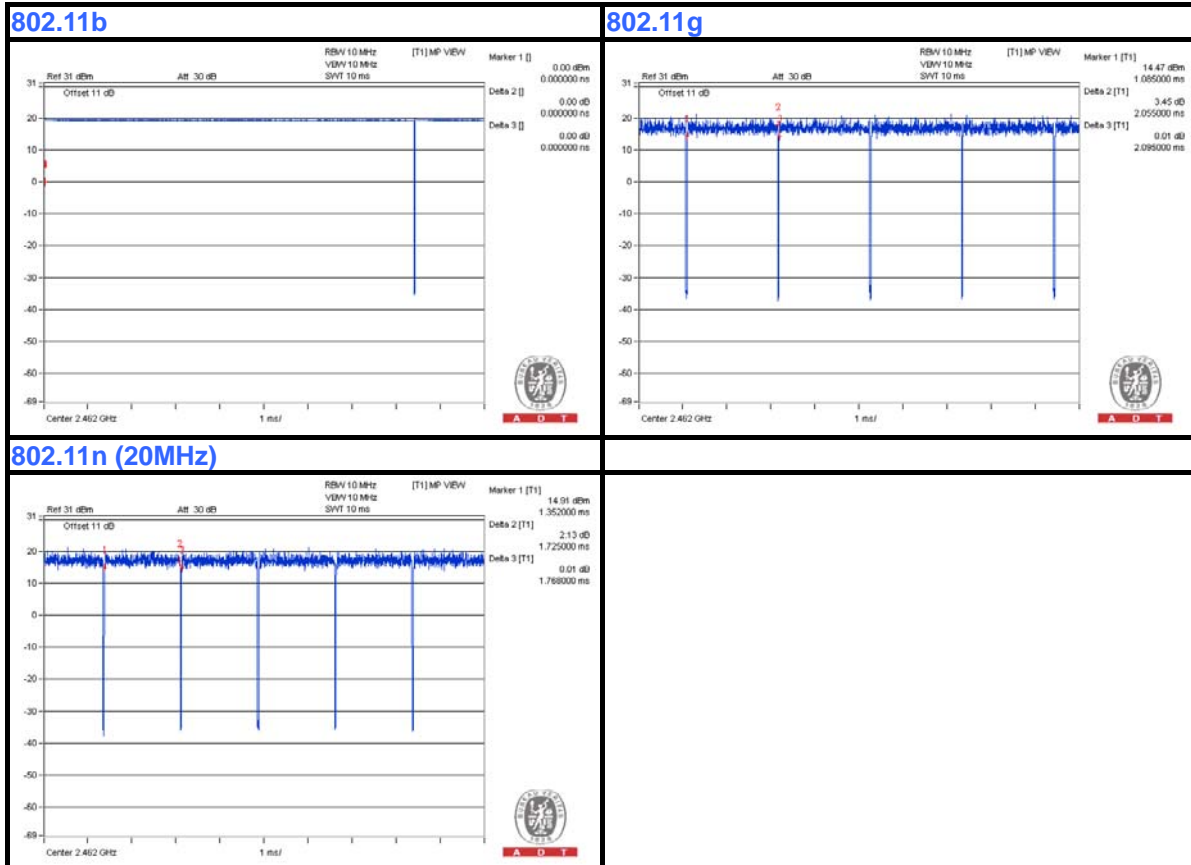
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	26deg. C, 60%RH	120Vac, 60Hz	Match Tsui
RE<1G	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui

### 3.3 DUTY CYCLE OF TEST SIGNAL

**802.11b, 802.11g:** Duty cycle of test signal is > 98 %

**802.11n (20MHz):** Duty cycle of test signal is < 98%

**802.11n (20MHz):** Duty cycle = 1.725/1.768 = 0.976, Duty factor =  $10 \cdot \log(1/0.976) = 0.11$



### 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.

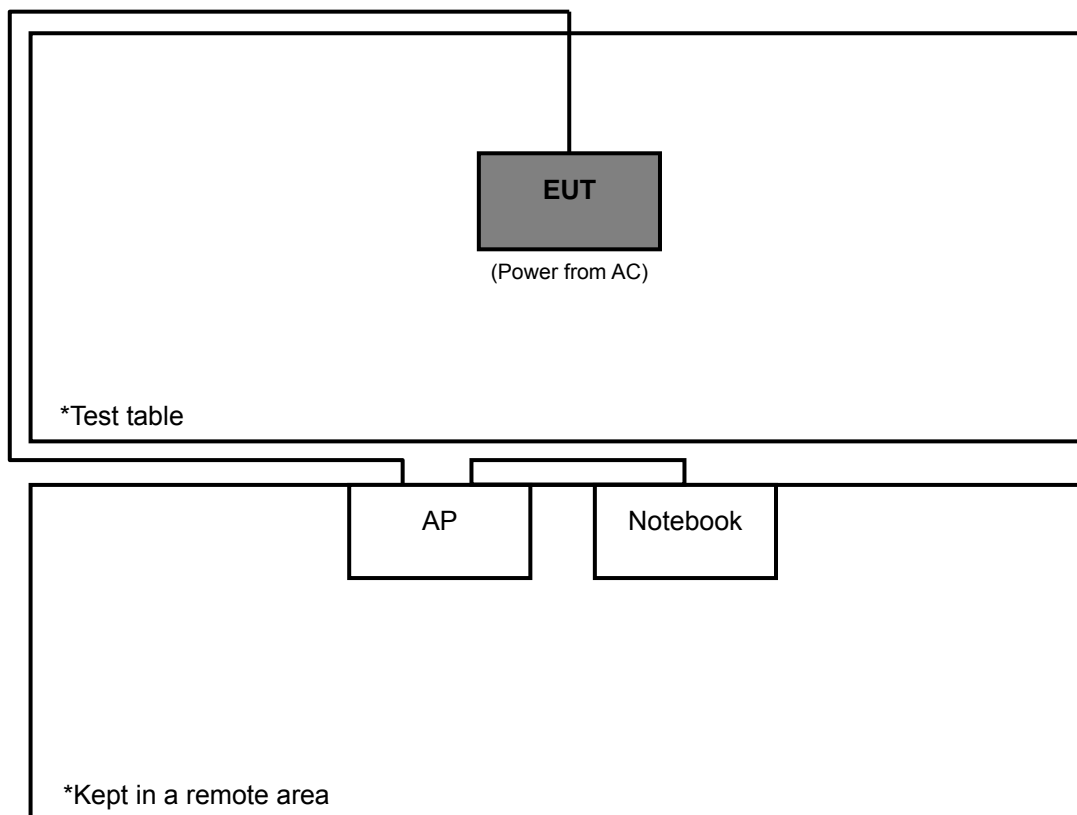
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5430	FKKCYW1	FCC Doc Approved
2	Wireless AP	D-Link	DIR868L	R3X81D8000195	FCC Doc Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m LAN cable without core.
2	1.0m LAN cable without core.

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1-2 acted as a communication partner to transfer data.

#### 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.

## 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.



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#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Feb. 25, 2014	Feb. 24, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01911	Aug. 22, 2013	Aug. 21, 2014
Preamplifier Agilent	8447D	2944A10638	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable Worken	5D-FB	Cable-HYCH9-01	Aug. 11, 2013	Aug. 10, 2014
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
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

- 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 a 3 meters semi-anechoic chamber. 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. Height of receiving 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

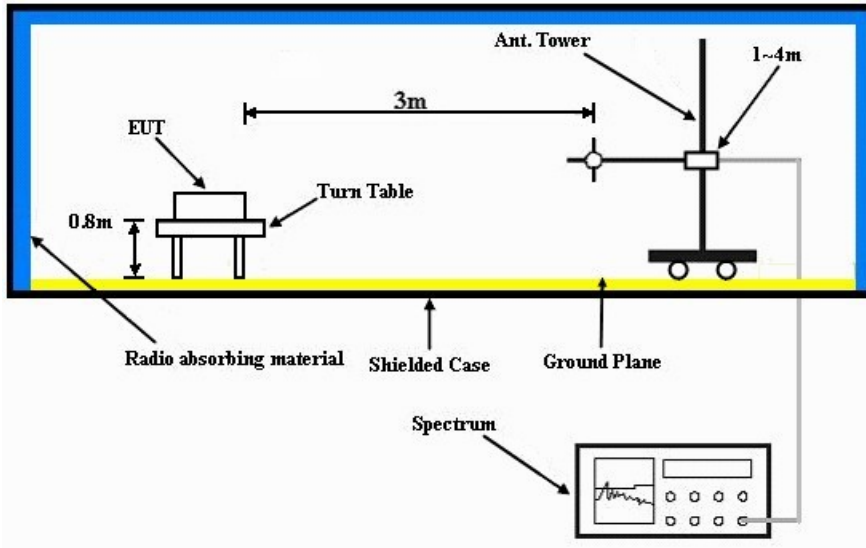
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

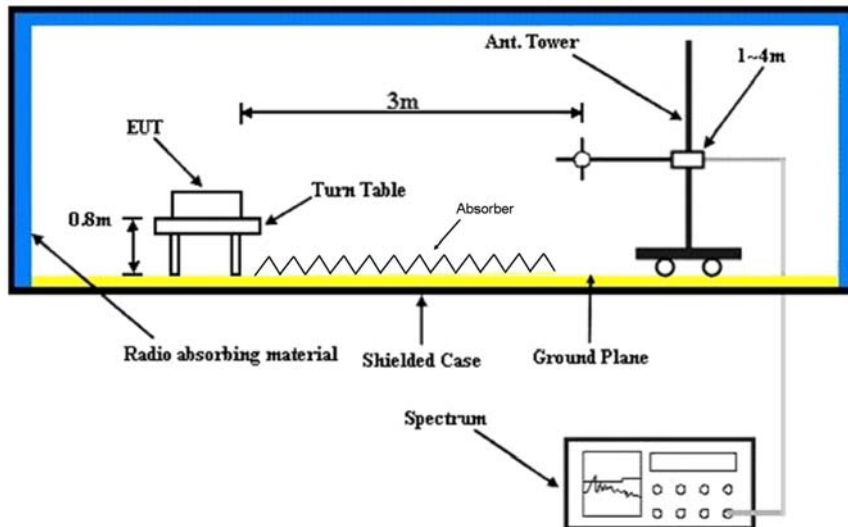
No deviation.

### 4.1.5 TEST SETUP

#### Frequency range 30MHz~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

- a. Placed the EUT on the testing table.
- b. Prepared notebooks and AP to act as communication partner and placed it outside of testing area.
- c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.



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## 4.1.7 TEST RESULTS

## ABOVE 1GHz DATA :

## 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.7 PK	74.0	-16.3	1.00 H	139	25.40	32.30
2	2390.00	47.9 AV	54.0	-6.1	1.00 H	139	15.60	32.30
3	*2412.00	99.3 PK			1.00 H	139	66.80	32.50
4	*2412.00	96.5 AV			1.00 H	139	64.00	32.50
5	4824.00	47.9 PK	74.0	-26.1	1.00 H	346	45.90	2.00
6	4824.00	39.4 AV	54.0	-14.6	1.00 H	346	37.40	2.00
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	2390.00	59.6 PK	74.0	-14.4	1.02 V	156	27.30	32.30
2	2390.00	50.1 AV	54.0	-3.9	1.02 V	156	17.80	32.30
3	*2412.00	108.5 PK			1.00 V	148	76.00	32.50
4	*2412.00	105.2 AV			1.00 V	148	72.70	32.50
5	4824.00	50.7 PK	74.0	-23.3	1.02 V	22	48.70	2.00
6	4824.00	45.5 AV	54.0	-8.5	1.02 V	22	43.50	2.00

## 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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

**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	101.1 PK			1.00 H	141	68.60	32.50
2	*2437.00	97.7 AV			1.00 H	141	65.20	32.50
3	4874.00	48.0 PK	74.0	-26.0	1.00 H	347	46.00	2.00
4	4874.00	40.7 AV	54.0	-13.3	1.00 H	347	38.70	2.00

**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	*2437.00	108.5 PK			1.00 V	157	76.00	32.50
2	*2437.00	104.8 AV			1.00 V	157	72.30	32.50
3	4874.00	50.5 PK	74.0	-23.5	1.00 V	25	48.50	2.00
4	4874.00	45.2 AV	54.0	-8.8	1.00 V	25	43.20	2.00

**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.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

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	102.4 PK			1.15 H	141	69.80	32.60
2	*2462.00	98.8 AV			1.15 H	141	66.20	32.60
3	2488.00	55.3 PK	74.0	-18.7	1.15 H	141	22.50	32.80
4	2488.00	47.0 AV	54.0	-7.0	1.15 H	141	14.20	32.80
5	4924.00	49.1 PK	74.0	-24.9	1.00 H	347	47.00	2.10
6	4924.00	41.1 AV	54.0	-12.9	1.00 H	347	39.00	2.10
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	*2462.00	109.7 PK			1.00 V	153	77.10	32.60
2	*2462.00	105.9 AV			1.00 V	153	73.30	32.60
3	2488.00	59.6 PK	74.0	-14.4	1.00 V	156	26.80	32.80
4	2488.00	49.4 AV	54.0	-4.6	1.00 V	156	16.60	32.80
5	4924.00	51.5 PK	74.0	-22.5	1.02 V	25	49.40	2.10
6	4924.00	45.8 AV	54.0	-8.2	1.02 V	25	43.70	2.10

**REMARKS:**

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)  
– Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- “ \* “: Fundamental frequency.



802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.6 PK	74.0	-17.4	1.42 H	140	24.30	32.30
2	2390.00	46.1 AV	54.0	-7.9	1.42 H	140	13.80	32.30
3	*2412.00	98.7 PK			1.42 H	141	66.20	32.50
4	*2412.00	88.3 AV			1.42 H	141	55.80	32.50
5	4824.00	46.1 PK	74.0	-27.9	1.00 H	360	44.10	2.00
6	4824.00	33.1 AV	54.0	-20.9	1.00 H	360	31.10	2.00

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	2390.00	58.6 PK	74.0	-15.4	1.25 V	143	26.30	32.30
2	2390.00	47.6 AV	54.0	-6.4	1.25 V	143	15.30	32.30
3	*2412.00	107.5 PK			1.00 V	156	75.00	32.50
4	*2412.00	98.1 AV			1.00 V	156	65.60	32.50
5	4824.00	46.1 PK	74.0	-27.9	1.00 V	180	44.10	2.00
6	4824.00	33.7 AV	54.0	-20.3	1.00 V	180	31.70	2.00

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)  
– Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- \* \*: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

**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	101.0 PK			1.41 H	139	68.50	32.50
2	*2437.00	91.2 AV			1.41 H	139	58.70	32.50
3	4874.00	46.1 PK	74.0	-27.9	1.00 H	180	44.10	2.00
4	4874.00	32.9 AV	54.0	-21.1	1.00 H	180	30.90	2.00

**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	*2437.00	108.0 PK			1.00 V	150	75.50	32.50
2	*2437.00	97.9 AV			1.00 V	150	65.40	32.50
3	4874.00	46.2 PK	74.0	-27.8	1.00 V	200	44.20	2.00
4	4874.00	33.2 AV	54.0	-20.8	1.00 V	200	31.20	2.00

**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.





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

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	100.5 PK			1.14 H	141	67.90	32.60
2	*2462.00	90.0 AV			1.14 H	141	57.40	32.60
3	2483.50	57.0 PK	74.0	-17.0	1.14 H	140	24.20	32.80
4	2483.50	46.6 AV	54.0	-7.4	1.14 H	140	13.80	32.80
5	4924.00	46.2 PK	74.0	-27.8	1.00 H	179	44.10	2.10
6	4924.00	34.0 AV	54.0	-20.0	1.00 H	179	31.90	2.10
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	*2462.00	108.2 PK			1.00 V	150	75.60	32.60
2	*2462.00	98.2 AV			1.00 V	150	65.60	32.60
3	2483.50	60.7 PK	74.0	-13.3	1.21 V	155	27.90	32.80
4	2483.50	48.5 AV	54.0	-5.5	1.21 V	155	15.70	32.80
5	4924.00	46.5 PK	74.0	-27.5	1.20 V	360	44.40	2.10
6	4924.00	34.2 AV	54.0	-19.8	1.20 V	360	32.10	2.10

**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 (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.0 PK	74.0	-18.0	1.00 H	135	23.70	32.30
2	2390.00	46.0 AV	54.0	-8.0	1.00 H	135	13.70	32.30
3	*2412.00	99.2 PK			1.00 H	140	66.70	32.50
4	*2412.00	88.7 AV			1.00 H	140	56.20	32.50
5	4824.00	46.1 PK	74.0	-27.9	1.10 H	350	44.10	2.00
6	4824.00	33.5 AV	54.0	-20.5	1.10 H	350	31.50	2.00
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	2390.00	65.5 PK	74.0	-8.5	1.00 V	155	33.20	32.30
2	2390.00	48.6 AV	54.0	-5.4	1.00 V	155	16.30	32.30
3	*2412.00	108.4 PK			1.00 V	150	75.90	32.50
4	*2412.00	97.5 AV			1.00 V	150	65.00	32.50
5	4824.00	46.2 PK	74.0	-27.8	1.00 V	180	44.20	2.00
6	4824.00	33.9 AV	54.0	-20.1	1.00 V	180	31.90	2.00

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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

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	101.2 PK			1.49 H	139	68.70	32.50
2	*2437.00	91.2 AV			1.49 H	139	58.70	32.50
3	4874.00	46.2 PK	74.0	-27.8	1.10 H	0	44.20	2.00
4	4874.00	33.8 AV	54.0	-20.2	1.10 H	0	31.80	2.00

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	*2437.00	108.4 PK			1.00 V	156	75.90	32.50
2	*2437.00	97.8 AV			1.00 V	156	65.30	32.50
3	4874.00	46.5 PK	74.0	-27.5	1.00 V	350	44.50	2.00
4	4874.00	33.8 AV	54.0	-20.2	1.00 V	350	31.80	2.00

**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.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH	TESTED BY	Match Tsui

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.8 PK			1.40 H	140	69.20	32.60
2	*2462.00	90.3 AV			1.40 H	140	57.70	32.60
3	2483.50	59.8 PK	74.0	-14.2	1.40 H	145	27.00	32.80
4	2483.50	47.2 AV	54.0	-6.8	1.40 H	145	14.40	32.80
5	4924.00	46.2 PK	74.0	-27.8	1.00 H	360	44.10	2.10
6	4924.00	33.7 AV	54.0	-20.3	1.00 H	360	31.60	2.10
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	*2462.00	108.6 PK			1.00 V	153	76.00	32.60
2	*2462.00	97.4 AV			1.00 V	153	64.80	32.60
3	2483.50	68.4 PK	74.0	-5.6	1.00 V	154	35.60	32.80
4	<b>2483.50</b>	<b>49.9 AV</b>	<b>54.0</b>	<b>-4.1</b>	<b>1.00 V</b>	<b>154</b>	<b>17.10</b>	<b>32.80</b>
5	4924.00	46.3 PK	74.0	-27.7	1.00 V	160	44.20	2.10
6	4924.00	34.0 AV	54.0	-20.0	1.00 V	160	31.90	2.10

**REMARKS:**

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)  
– Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- \* \*: Fundamental frequency.



**BELOW 1GHz DATA :**

**802.11b**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	89.07	37.1 QP	43.5	-6.4	2.00 H	51	56.70	-19.60
2	152.80	39.2 QP	43.5	-4.3	1.01 H	120	52.80	-13.60
3	485.46	37.2 QP	46.0	-8.8	1.51 H	215	45.80	-8.60
4	497.90	38.2 QP	46.0	-7.8	1.51 H	152	46.60	-8.40
5	623.81	37.3 QP	46.0	-8.7	1.01 H	60	43.00	-5.70
6	816.57	37.6 QP	46.0	-8.4	1.51 H	316	40.00	-2.40

**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	43.99	35.4 QP	40.0	-4.6	1.00 V	170	49.90	-14.50
2	<b>70.42</b>	<b>36.9 QP</b>	<b>40.0</b>	<b>-3.1</b>	<b>1.00 V</b>	<b>207</b>	<b>53.00</b>	<b>-16.10</b>
3	466.81	39.2 QP	46.0	-6.8	1.00 V	9	47.90	-8.70
4	623.81	38.8 QP	46.0	-7.2	1.50 V	353	44.50	-5.70
5	816.57	39.5 QP	46.0	-6.5	1.50 V	12	41.90	-2.40
6	864.76	39.0 QP	46.0	-7.0	1.00 V	27	40.70	-1.70

**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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	152.80	39.7 QP	43.5	-3.8	1.00 H	117	53.30	-13.60
2	493.24	38.8 QP	46.0	-7.2	1.50 H	217	47.20	-8.40
3	623.81	38.9 QP	46.0	-7.1	1.00 H	62	44.60	-5.70
4	670.45	37.6 QP	46.0	-8.4	1.00 H	314	42.80	-5.20
5	685.99	37.1 QP	46.0	-8.9	1.00 H	315	42.20	-5.10
6	816.57	37.7 QP	46.0	-8.3	1.50 H	313	40.10	-2.40

**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	43.99	35.0 QP	40.0	-5.0	1.01 V	15	49.50	-14.50
2	70.42	36.7 QP	40.0	-3.3	1.01 V	180	52.80	-16.10
3	480.80	39.4 QP	46.0	-6.6	1.01 V	37	48.00	-8.60
4	623.81	38.4 QP	46.0	-7.6	1.50 V	6	44.10	-5.70
5	816.57	40.9 QP	46.0	-5.1	1.01 V	15	43.30	-2.40
6	864.76	39.5 QP	46.0	-6.5	1.01 V	7	41.20	-1.70

**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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	154.36	38.9 QP	43.5	-4.6	1.00 H	121	52.50	-13.60
2	496.35	39.0 QP	46.0	-7.0	1.49 H	222	47.30	-8.30
3	623.81	38.0 QP	46.0	-8.0	1.00 H	66	43.70	-5.70
4	670.45	38.7 QP	46.0	-7.3	1.00 H	318	43.90	-5.20
5	706.20	37.0 QP	46.0	-9.0	1.00 H	322	41.80	-4.80
6	816.57	37.6 QP	46.0	-8.4	1.49 H	350	40.00	-2.40

**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	43.99	36.2 QP	40.0	-3.8	1.01 V	65	50.70	-14.50
2	70.42	36.9 QP	40.0	-3.1	1.01 V	175	53.00	-16.10
3	508.78	39.5 QP	46.0	-6.5	1.01 V	15	47.60	-8.10
4	519.66	38.8 QP	46.0	-7.2	1.01 V	15	46.80	-8.00
5	816.57	40.9 QP	46.0	-5.1	1.01 V	15	43.30	-2.40
6	864.76	39.7 QP	46.0	-6.3	1.01 V	15	41.40	-1.70

**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



A D T

802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

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	152.80	39.5 QP	43.5	-4.0	1.00 H	131	53.10	-13.60
2	493.24	38.9 QP	46.0	-7.1	1.50 H	217	47.30	-8.40
3	628.48	37.9 QP	46.0	-8.1	1.00 H	76	43.50	-5.60
4	687.55	37.5 QP	46.0	-8.5	1.00 H	312	42.60	-5.10
5	816.57	37.7 QP	46.0	-8.3	1.50 H	319	40.10	-2.40
6	898.96	41.5 QP	46.0	-4.5	1.00 H	182	42.70	-1.20

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	42.44	34.7 QP	40.0	-5.3	1.01 V	15	49.20	-14.50
2	70.42	36.8 QP	40.0	-3.2	1.01 V	188	52.90	-16.10
3	466.81	38.2 QP	46.0	-7.8	1.01 V	15	46.90	-8.70
4	511.89	39.5 QP	46.0	-6.5	1.01 V	15	47.50	-8.00
5	816.57	40.5 QP	46.0	-5.5	1.01 V	15	42.90	-2.40
6	864.76	39.2 QP	46.0	-6.8	1.01 V	15	40.90	-1.70

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





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	151.25	38.8 QP	43.5	-4.7	1.49 H	135	52.40	-13.60
2	483.91	37.3 QP	46.0	-8.7	1.49 H	218	45.90	-8.60
3	497.90	38.5 QP	46.0	-7.5	1.49 H	147	46.90	-8.40
4	648.69	38.2 QP	46.0	-7.8	1.00 H	66	43.70	-5.50
5	656.46	37.9 QP	46.0	-8.1	1.00 H	317	43.40	-5.50
6	816.57	37.5 QP	46.0	-8.5	1.49 H	327	39.90	-2.40

**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	42.44	35.7 QP	40.0	-4.3	1.01 V	2	50.20	-14.50
2	70.42	36.4 QP	40.0	-3.6	1.01 V	185	52.50	-16.10
3	505.67	38.3 QP	46.0	-7.7	1.01 V	16	46.40	-8.10
4	623.81	38.5 QP	46.0	-7.5	1.50 V	357	44.20	-5.70
5	816.57	40.8 QP	46.0	-5.2	1.01 V	16	43.20	-2.40
6	864.76	39.6 QP	46.0	-6.4	1.01 V	8	41.30	-1.70

**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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	151.25	38.2 QP	43.5	-5.3	1.49 H	144	51.80	-13.60
2	493.24	38.9 QP	46.0	-7.1	1.49 H	215	47.30	-8.40
3	623.81	38.4 QP	46.0	-7.6	1.00 H	81	44.10	-5.70
4	670.45	37.9 QP	46.0	-8.1	1.00 H	320	43.10	-5.20
5	692.21	37.4 QP	46.0	-8.6	1.00 H	307	42.30	-4.90
6	816.57	37.8 QP	46.0	-8.2	1.49 H	330	40.20	-2.40

**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	42.44	35.5 QP	40.0	-4.5	1.01 V	88	50.00	-14.50
2	70.42	36.1 QP	40.0	-3.9	1.01 V	190	52.20	-16.10
3	508.78	40.0 QP	46.0	-6.0	1.01 V	15	48.10	-8.10
4	623.81	39.5 QP	46.0	-6.5	1.50 V	357	45.20	-5.70
5	816.57	41.2 QP	46.0	-4.8	1.01 V	15	43.60	-2.40
6	864.76	39.3 QP	46.0	-6.7	1.01 V	15	41.00	-1.70

**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



A D T

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	70.42	32.2 QP	40.0	-7.8	1.00 H	184	48.30	-16.10
2	151.25	38.1 QP	43.5	-5.4	1.49 H	129	51.70	-13.60
3	497.90	39.3 QP	46.0	-6.7	1.49 H	153	47.70	-8.40
4	637.80	37.9 QP	46.0	-8.1	1.00 H	61	43.40	-5.50
5	662.68	39.4 QP	46.0	-6.6	1.00 H	322	44.80	-5.40
6	816.57	37.9 QP	46.0	-8.1	1.49 H	338	40.30	-2.40

**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	43.99	35.1 QP	40.0	-4.9	1.01 V	10	49.60	-14.50
2	70.42	35.8 QP	40.0	-4.2	1.01 V	177	51.90	-16.10
3	507.23	38.8 QP	46.0	-7.2	1.01 V	10	46.90	-8.10
4	623.81	38.9 QP	46.0	-7.1	1.50 V	5	44.60	-5.70
5	816.57	40.8 QP	46.0	-5.2	1.01 V	10	43.20	-2.40
6	864.76	39.5 QP	46.0	-6.5	1.01 V	12	41.20	-1.70

**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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	70.42	32.0 QP	40.0	-8.0	1.00 H	165	48.10	-16.10
2	151.25	38.5 QP	43.5	-5.0	1.00 H	124	52.10	-13.60
3	496.35	38.4 QP	46.0	-7.6	1.49 H	219	46.70	-8.30
4	623.81	38.3 QP	46.0	-7.7	1.00 H	79	44.00	-5.70
5	662.68	37.1 QP	46.0	-8.9	1.00 H	320	42.50	-5.40
6	816.57	37.8 QP	46.0	-8.2	1.49 H	325	40.20	-2.40

**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	42.44	35.3 QP	40.0	-4.7	1.01 V	48	49.80	-14.50
2	70.42	36.6 QP	40.0	-3.4	1.01 V	193	52.70	-16.10
3	507.23	38.9 QP	46.0	-7.1	1.01 V	16	47.00	-8.10
4	623.81	38.9 QP	46.0	-7.1	1.50 V	10	44.60	-5.70
5	816.57	40.7 QP	46.0	-5.3	1.01 V	16	43.10	-2.40
6	864.76	39.4 QP	46.0	-6.6	1.01 V	11	41.10	-1.70

**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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH	TESTED BY	Match Tsui

**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	70.42	32.6 QP	40.0	-7.4	1.50 H	174	48.70	-16.10
2	152.80	37.6 QP	43.5	-5.9	1.00 H	140	51.20	-13.60
3	488.57	38.8 QP	46.0	-7.2	1.50 H	211	47.30	-8.50
4	637.80	38.0 QP	46.0	-8.0	1.00 H	77	43.50	-5.50
5	659.57	38.0 QP	46.0	-8.0	1.00 H	321	43.50	-5.50
6	685.99	37.4 QP	46.0	-8.6	1.00 H	324	42.50	-5.10

**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	42.44	35.0 QP	40.0	-5.0	1.01 V	345	49.50	-14.50
2	70.42	34.6 QP	40.0	-5.4	1.01 V	159	50.70	-16.10
3	466.81	38.5 QP	46.0	-7.5	1.01 V	30	47.20	-8.70
4	623.81	39.1 QP	46.0	-6.9	1.01 V	15	44.80	-5.70
5	816.57	41.1 QP	46.0	-4.9	1.01 V	15	43.50	-2.40
6	864.76	39.3 QP	46.0	-6.7	1.01 V	12	41.00	-1.70

**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 OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	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.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
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

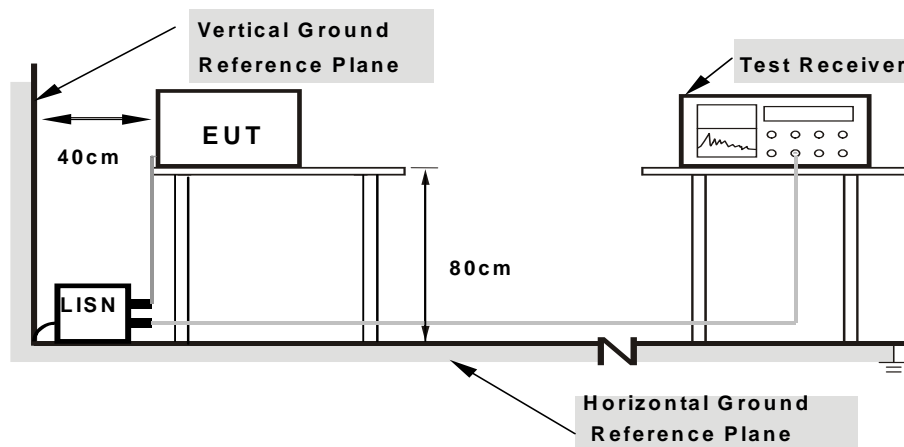
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

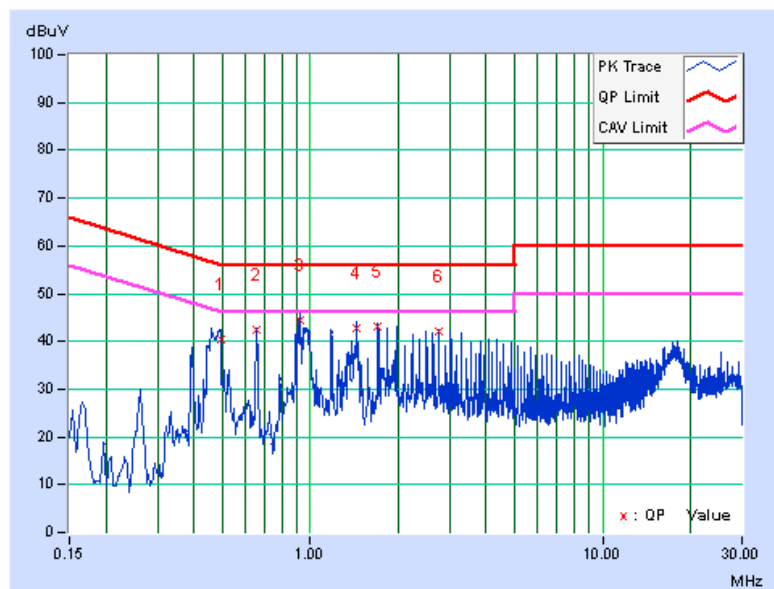
### CONDUCTED WORST-CASE DATA : 802.11n (20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.49324	0.08	40.37	25.44	40.45	25.52	56.11	46.11	-15.66	-20.59
2	0.65710	0.09	42.38	40.47	42.47	40.56	56.00	46.00	-13.53	-5.44
3	0.92007	0.11	44.31	40.63	44.42	40.74	56.00	46.00	-11.58	-5.26
4	1.44421	0.13	42.56	40.15	42.69	40.28	56.00	46.00	-13.31	-5.72
5	1.70658	0.14	42.90	39.81	43.04	39.95	56.00	46.00	-12.96	-6.05
6	2.75717	0.18	41.99	38.95	42.17	39.13	56.00	46.00	-13.83	-6.87

#### 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



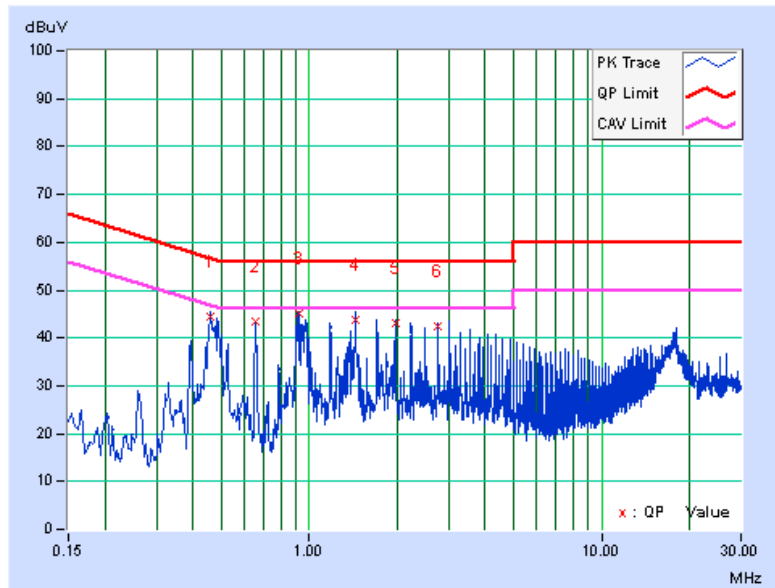


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.45889	0.07	44.44	36.67	44.51	36.74	56.71	46.71	-12.20	-9.97
2	0.65619	0.08	43.33	41.03	43.41	41.11	56.00	46.00	-12.59	-4.89
<b>3</b>	<b>0.91858</b>	<b>0.09</b>	<b>45.16</b>	<b>41.56</b>	<b>45.25</b>	<b>41.65</b>	<b>56.00</b>	<b>46.00</b>	<b>-10.75</b>	<b>-4.35</b>
4	1.44301	0.11	43.55	40.98	43.66	41.09	56.00	46.00	-12.34	-4.91
5	1.96935	0.14	42.90	40.57	43.04	40.71	56.00	46.00	-12.96	-5.29
6	2.75546	0.17	42.27	39.34	42.44	39.51	56.00	46.00	-13.56	-6.49

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

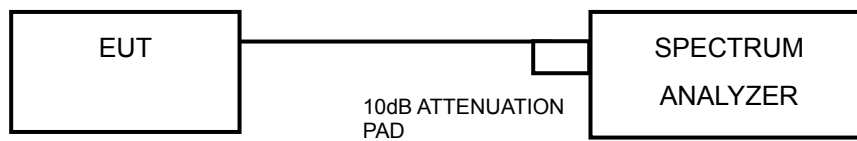


### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST SETUP



#### 4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 TEST PROCEDURE

- a. Set resolution bandwidth (RBW) = 100kHz
- b. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

#### 4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.6 EUT OPERATING CONDITIONS

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

#### 4.3.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.10	0.5	PASS
6	2437	9.09	0.5	PASS
11	2462	8.62	0.5	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.14	0.5	PASS
6	2437	14.19	0.5	PASS
11	2462	13.93	0.5	PASS

##### 802.11n (20MHz)

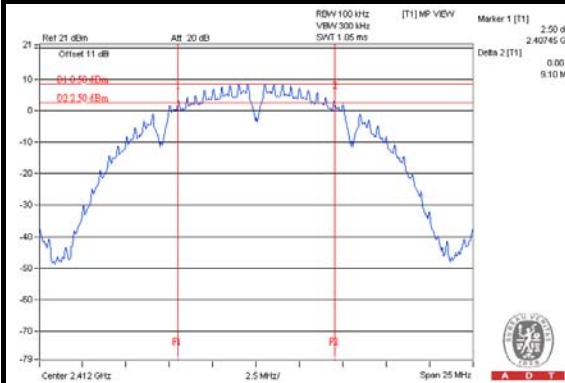
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.14	0.5	PASS
6	2437	13.93	0.5	PASS
11	2462	15.19	0.5	PASS



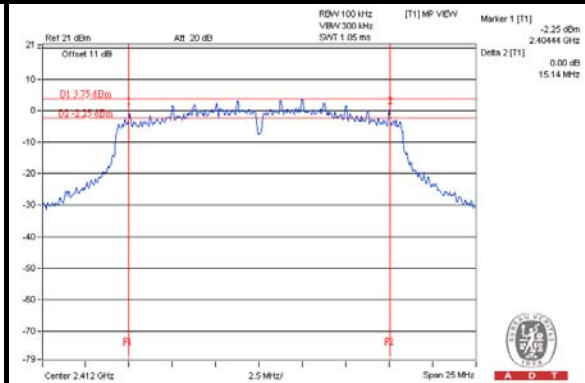
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### SPECTRUM PLOT OF WORST VALUE

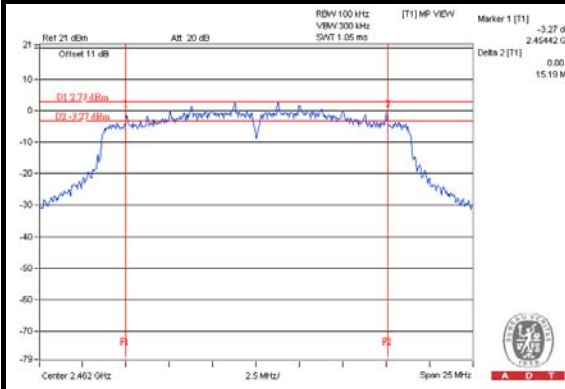
802.11b



802.11g



802.11n (20MHz)

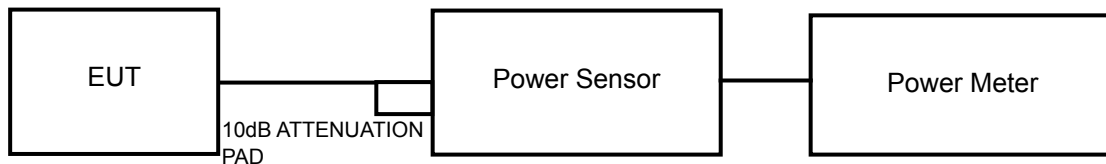


## 4.4 CONDUCTED OUTPUT POWER

### 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 (dBm)				LIMIT (dBm)	PASS/ FAIL
		1Mbps	2Mbps	5.5Mbps	11Mbps		
1	2412	19.57	19.56	19.53	19.39	30	PASS
6	2437	19.89	19.65	19.32	19.32	30	PASS
11	2462	19.85	19.80	19.63	19.68	30	PASS

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)			
		1Mbps	2Mbps	5.5Mbps	11Mbps
1	2412	90.573	90.365	89.743	86.896
6	2437	97.499	92.257	85.507	85.507
11	2462	96.605	95.499	91.833	92.897

##### 802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)								LIMIT (dBm)	PASS/ FAIL
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps		
1	2412	22.33	22.12	21.85	22.07	22.18	21.81	21.53	21.59	30	PASS
6	2437	22.51	22.47	22.38	22.11	22.21	21.984	21.77	21.64	30	PASS
11	2462	21.37	21.32	21.07	21.11	21.14	21.05	20.94	21.01	30	PASS

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)							
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	2412	171.002	162.930	153.109	161.065	165.196	151.705	142.233	144.212
6	2437	178.238	176.604	172.982	162.555	166.341	157.906	150.314	145.881
11	2462	137.088	135.519	127.938	129.122	130.017	127.350	124.165	126.183



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### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (dBm)								LIMIT (dBm)	PASS/ FAIL
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7		
1	2412	22.46	22.43	22.31	22.32	22.45	22.41	22.37	22.20	30	PASS
6	2437	22.80	22.76	22.69	22.72	22.79	22.72	22.63	21.44	30	PASS
11	2462	21.22	21.2	20.96	20.93	21.11	21.04	21.00	21.03	30	PASS

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	2412	176.198	174.985	170.216	170.608	175.792	174.181	172.584	165.959
6	2437	<b>190.546</b>	188.799	185.780	187.068	190.108	187.068	183.231	139.316
11	2462	132.434	131.826	124.738	123.880	129.122	127.057	125.893	126.765





**FOR AVERAGE POWER**

**802.11b**

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			
		1Mbps	2Mbps	5.5Mbps	11Mbps
1	2412	17.47	17.46	17.46	17.44
6	2437	17.46	17.45	17.41	17.42
11	2462	17.75	17.74	17.72	17.74

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)			
		1Mbps	2Mbps	5.5Mbps	11Mbps
1	2412	55.847	55.719	55.719	55.463
6	2437	55.719	55.590	55.081	55.208
11	2462	59.566	59.429	59.156	59.429

**802.11g**

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)							
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	2412	14.37	14.15	14.13	14.12	14.15	14.07	14.17	14.11
6	2437	14.71	14.65	14.61	14.52	14.59	14.48	14.36	14.31
11	2462	13.12	13.09	12.89	13.01	13.05	13.00	12.94	13.02

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)							
		6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
1	2412	27.353	26.002	25.882	25.823	26.002	25.527	26.122	25.763
6	2437	29.580	29.174	28.907	28.314	28.774	28.054	27.290	26.977
11	2462	20.512	20.370	19.454	19.999	20.184	19.953	19.679	20.045



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### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	2412	14.54	14.52	14.42	14.41	14.52	14.47	14.45	13.51
6	2437	14.63	14.60	14.57	14.55	14.60	14.55	14.51	13.64
11	2462	13.54	13.51	13.47	13.49	13.51	13.48	13.45	13.04

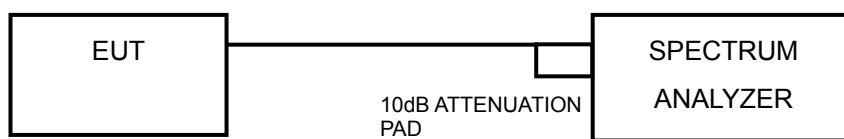
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)							
		MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	2412	28.445	28.314	27.669	27.606	28.314	27.990	27.861	22.439
6	2437	29.040	28.840	28.642	28.510	28.840	28.510	28.249	23.121
11	2462	22.594	22.439	22.233	22.336	22.439	22.284	22.131	20.137

## 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 the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

### 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	-4.92	8	PASS
6	2437	-5.18	8	PASS
11	2462	-5.46	8	PASS

### 802.11g

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.20	8	PASS
6	2437	-10.22	8	PASS
11	2462	-11.58	8	PASS

### 802.11n (20MHz)

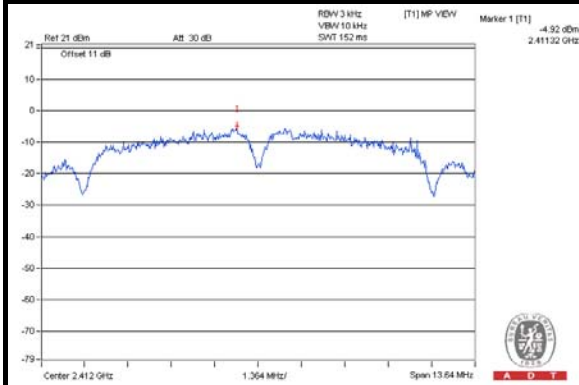
Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.58	8	PASS
6	2437	-10.77	8	PASS
11	2462	-11.64	8	PASS



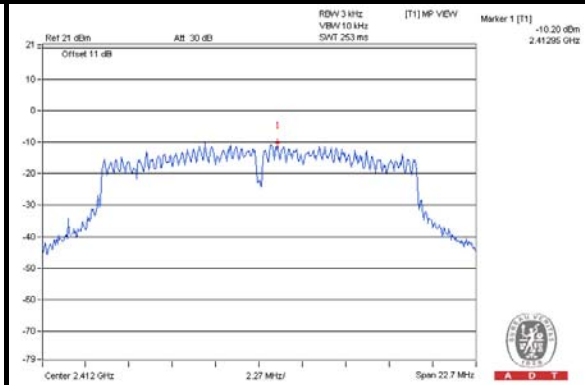
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### SPECTRUM PLOT OF WORST VALUE

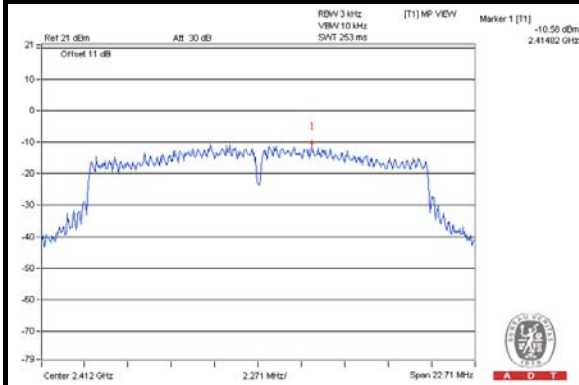
**802.11b**



**802.11g**



**802.11n (20MHz)**

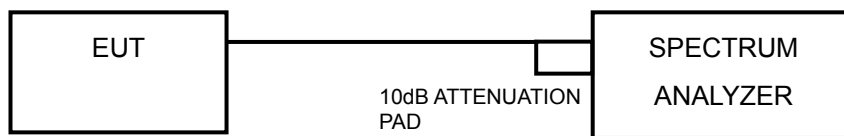


## 4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

### 4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  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

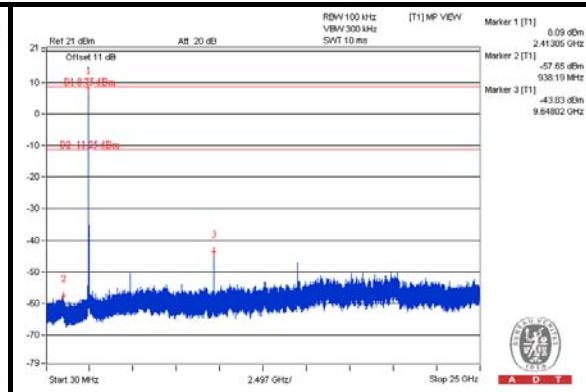
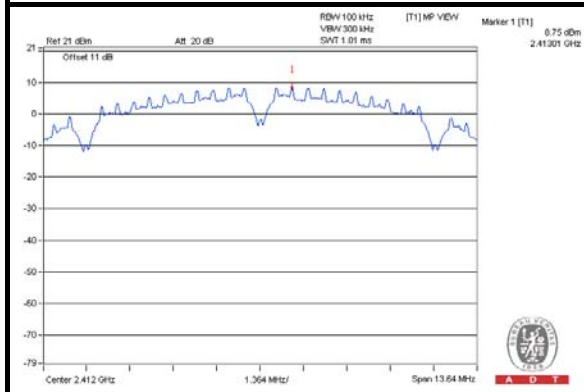
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



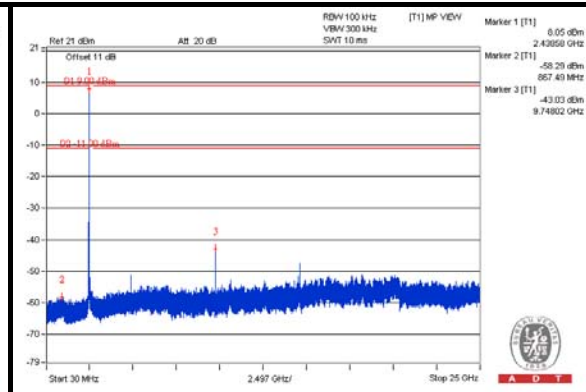
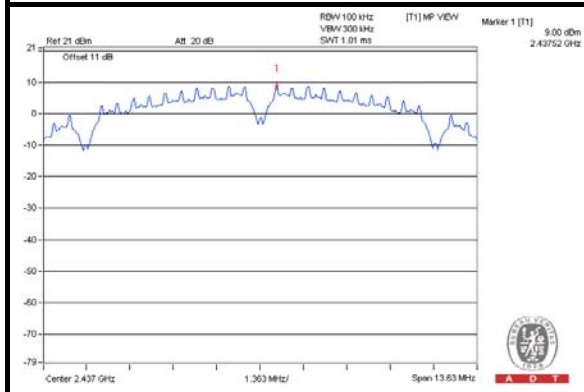
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### 802.11b

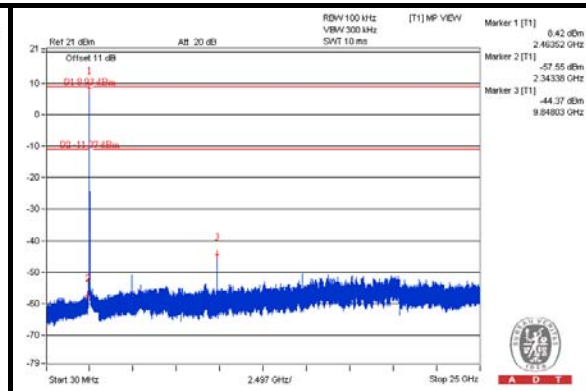
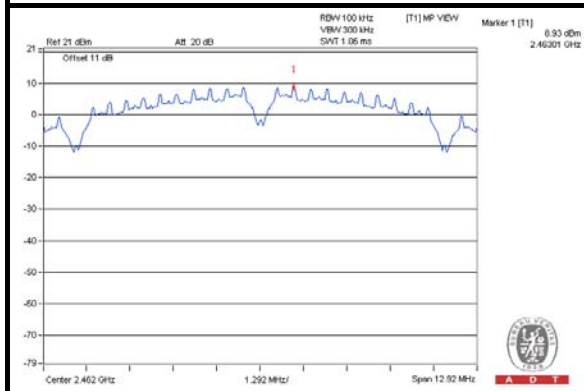
#### CH 1



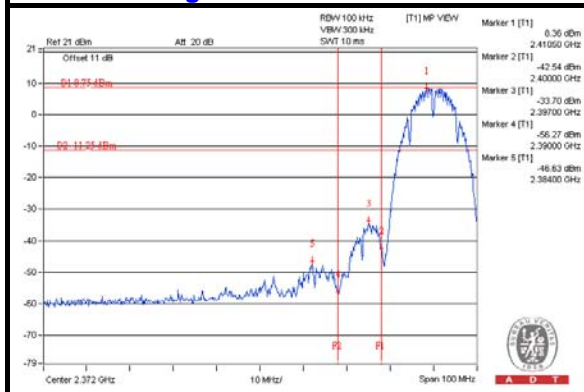
#### CH 6



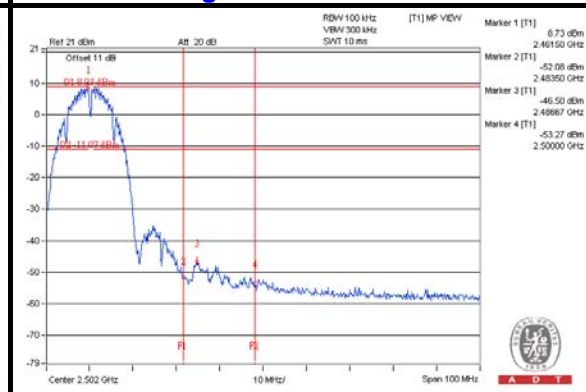
#### CH 11



#### CH 1 Band edge



#### CH 11 Band edge



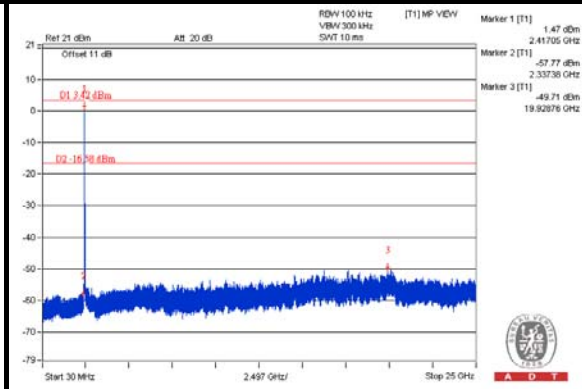
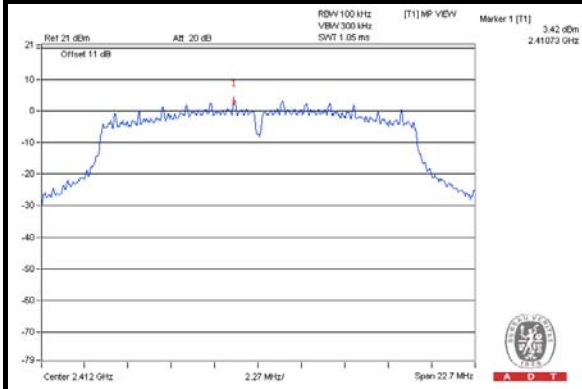




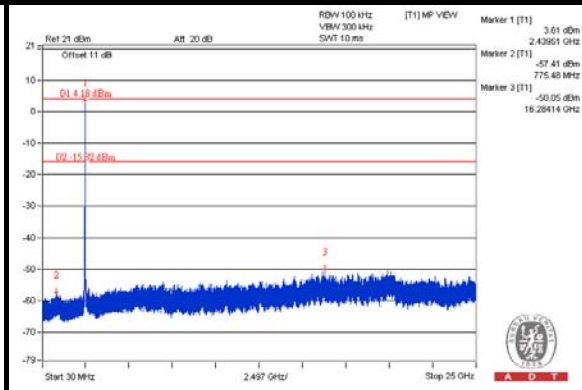
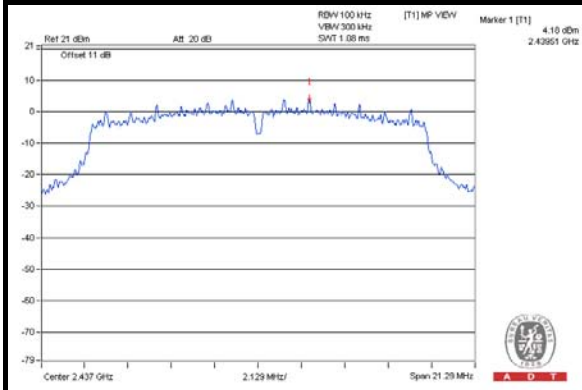
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### 802.11g

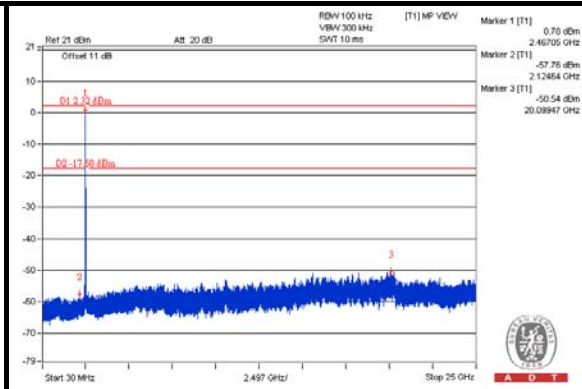
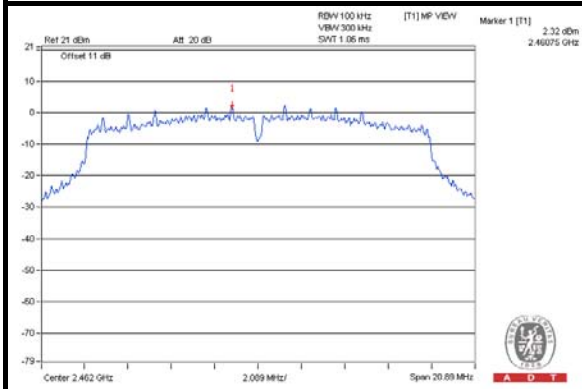
#### CH 1



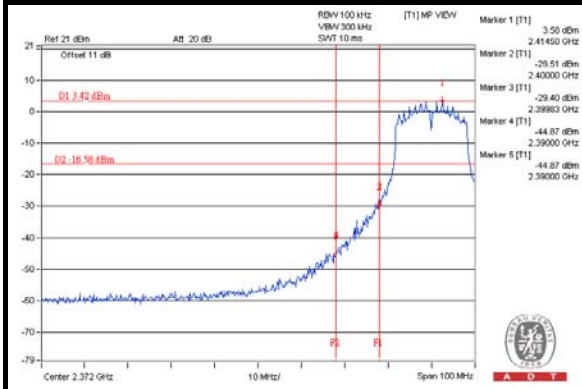
#### CH 6



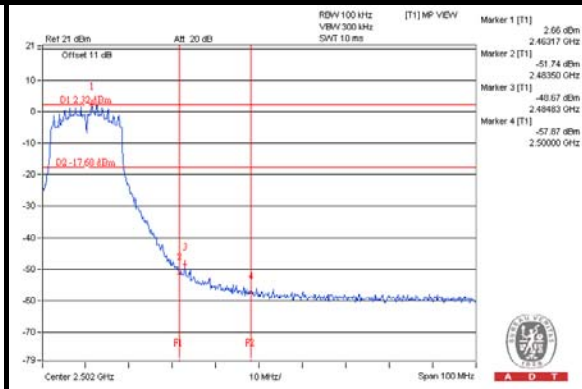
#### CH 11



#### CH 1 Band edge



#### CH 11 Band edge

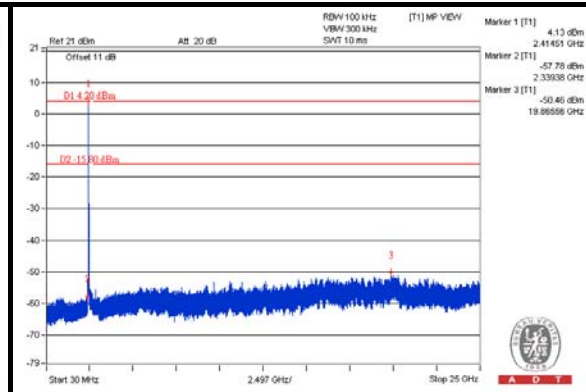
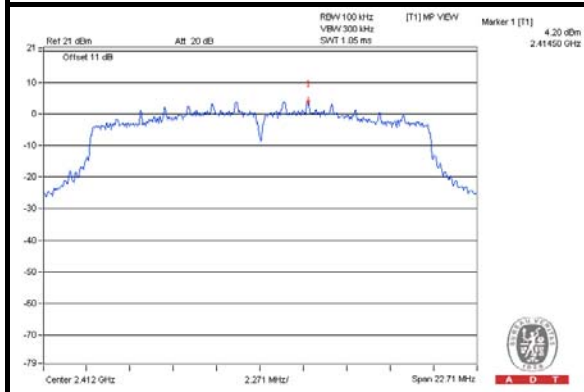




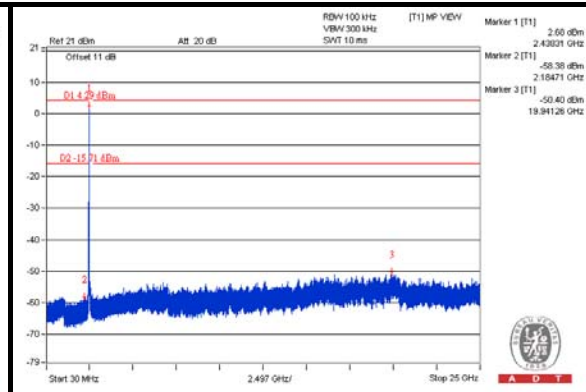
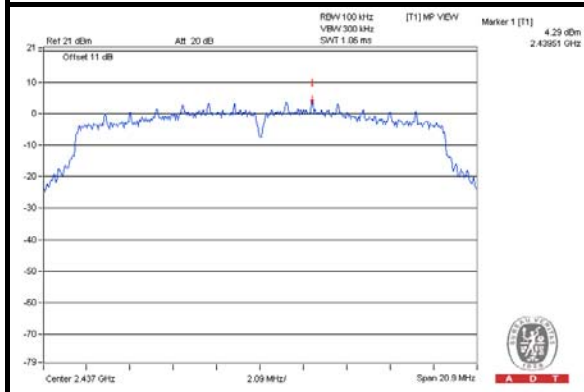
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### 802.11n (20MHz)

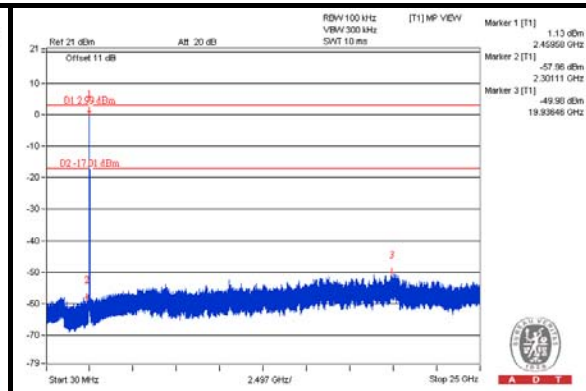
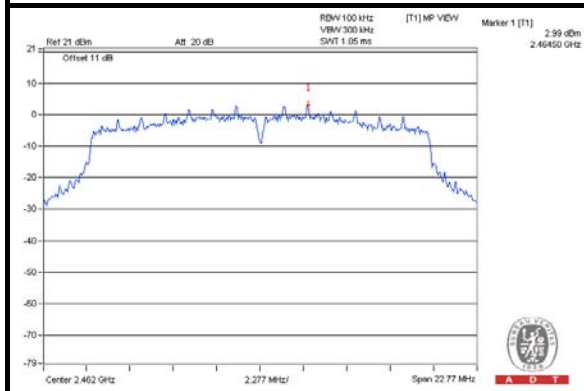
#### CH 1



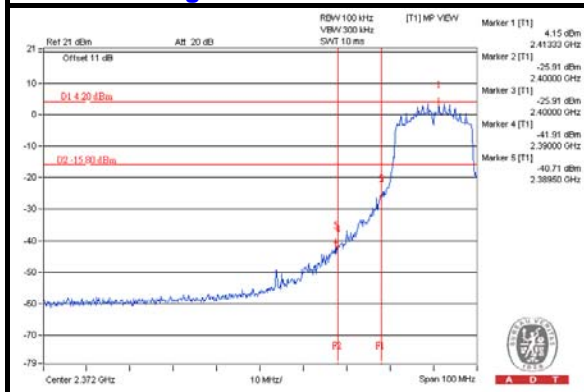
#### CH 6



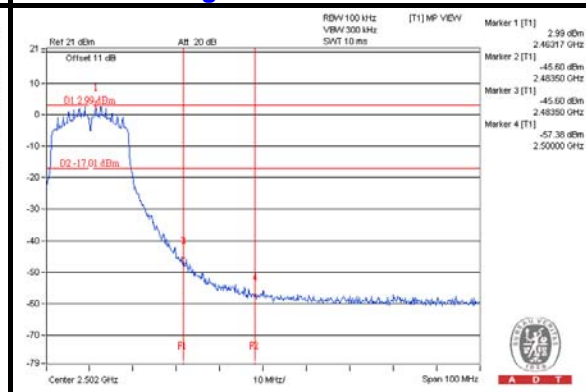
#### CH 11



#### CH 1 Band edge



#### CH 11 Band edge



## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



## 6. 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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Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3270892

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://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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## **7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**