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# FCC TEST REPORT

**REPORT NO.:** RF121101D25  
**MODEL NO.:** WSU202C1  
**FCC ID:** EMJTWVSU202C1  
**RECEIVED:** Nov. 1, 2012  
**TESTED:** Nov. 8 ~ 20, 2012  
**ISSUED:** Nov. 29, 2012

**APPLICANT:** PRIMAX ELECTRONICS LTD.

**ADDRESS:** No. 669, Ruey Kuang Road, Neihu, Taipei,  
Taiwan, R.O.C.

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

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,  
New Taipei City, Taiwan, R.O.C.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121101D25	Original release	Nov. 29, 2012



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## 1. CERTIFICATION

**PRODUCT:** HP Pocket Playlist  
**MODEL NO.:** WSU202C1  
**BRAND:** HP  
**APPLICANT:** PRIMAX ELECTRONICS LTD.  
**TESTED:** Nov. 8 ~ 20, 2012  
**TEST SAMPLE:** MASS-PRODUCTION  
**STANDARDS:** 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 :** Jessica Cheng , **DATE:** Nov. 29, 2012  
( Jessica Cheng / Specialist )

**APPROVED BY :** Ken Liu , **DATE:** Nov. 29, 2012  
( Ken Liu / 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 -16.66dB at 0.46388MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.1dB at 4824.00MHz.
15.247(d)	Band Edge Measurement	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	UNCERTAINTY
Conducted emissions	150kHz~30MHz	2.41 dB
Radiated emissions	30MHz ~ 1GHz	3.78 dB
	Above 1GHz	3.36 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>	HP Pocket Playlist
<b>MODEL NO.</b>	WSU202C1
<b>POWER SUPPLY</b>	5Vdc from host equipment or adapter or car charge 3.7Vdc from battery
<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:11/5.5/2/1Mbps 802.11g: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6Mbps 802.11n: up to 150Mbps
<b>OPERATING FREQUENCY</b>	2412 ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
<b>OUTPUT POWER</b>	120.2mW
<b>ANTENNA TYPE</b>	Chip antenna with 3.53dBi gain
<b>ANTENNA CONNECTOR</b>	N/A
<b>DATA CABLE</b>	Shielded USB cable (0.9m)
<b>I/O PORTS</b>	N/A
<b>ACCESSORY DEVICES</b>	Refer to user's manual

1. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

<b>Modulation Mode</b>	<b>Tx Function</b>
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

2. The EUT consumes power from a power adapter, car charge as the following:

ADAPTER	
BRAND	Yinli Electronics Co., Ltd.
MODEL	SSC-5W-05 050100
INPUT POWER	100-240Vac, 50/60Hz, 0.2A max. (AC 2-Pin)
OUTPUT POWER	5.0Vdc 1000mA (USB Cable shielded without core 0.9m)
CAR CHARGE	
BRAND	Yinli Electronics Co., Ltd.
MODEL	YLS0051A-N050050
INPUT POWER	12-24Vdc
OUTPUT POWER	5Vdc 500mA (USB Cable shielded without core 0.9m)

3. The EUT was pre-tested with the following modes:
- 2 Operating + Charging Mode (EUT + Notebook via USB cable )
  - 2 Operating + Charging Mode (EUT + Adapter )
  - 2 Operating + Charging Mode (EUT + car charge)
  - 2 Operating Mode (EUT stand-alone)

The worst emission level was found when the EUT tested under **Operating + Charging Mode (EUT + Notebook via USB cable)**, therefore, only its test data for final test.

4. The above EUT information was 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		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		



### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	RE <sup>≥</sup> 1G	RE<1G	PLC	APCM	OB	
A	√	√	√	√	√	Operating + Charging Mode (EUT + Notebook via USB cable)
B	-	-	√	-	-	Operating + Charging Mode (EUT + Adapter)

Where **RE<sup>≥</sup>1G**: Radiated Emission above 1GHz      **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement  
**OB**: Conducted Out-Band Emission Measurement

**NOTE:** The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	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
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13

#### **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)
A	802.11g	1 to 11	1	OFDM	BPSK	6.0



**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)
A & B	802.11g	1 to 11	1	OFDM	BPSK	6.0

**CONDUCTED OUT-BAND EMISSION 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)
A	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
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13

**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)
A	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
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13



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**TEST CONDITION:**

APPLICABLE TO	EUT CONFIGURE MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE <sup>≥</sup> 1G	A	24deg. C, 73%RH	120Vac, 60Hz (SYSTEM)	Rex Lai
RE<1G	A	24deg. C, 73%RH	120Vac, 60Hz (SYSTEM)	Rex Lai
PLC	A	23deg. C, 73%RH	120Vac, 60Hz (SYSTEM)	Chad Lee
	B	23deg. C, 73%RH	120Vac, 60Hz	Chad Lee
OB	A	25deg. C, 74%RH	120Vac, 60Hz (SYSTEM)	Chad Lee
APCM	A	25deg. C, 74%RH	120Vac, 60Hz (SYSTEM)	Chad Lee

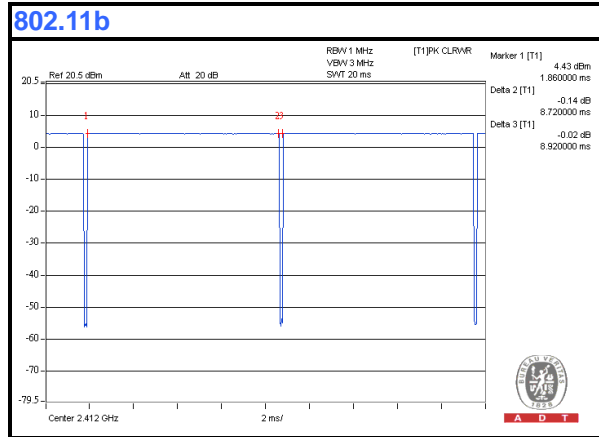


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### 3.3 DUTY CYCLE OF TEST SIGNAL

#### For 802.11b:

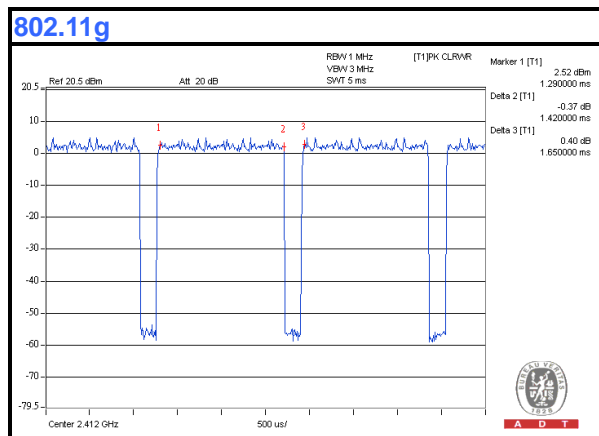
Duty cycle of test signal is > 98 %



#### 802.11g:

Duty cycle of test signal is < 98%, duty factor shall be considered.

Duty cycle =  $1.42/1.65 = 0.86$ , Duty factor =  $10 * \log(1/0.86) = 0.66$



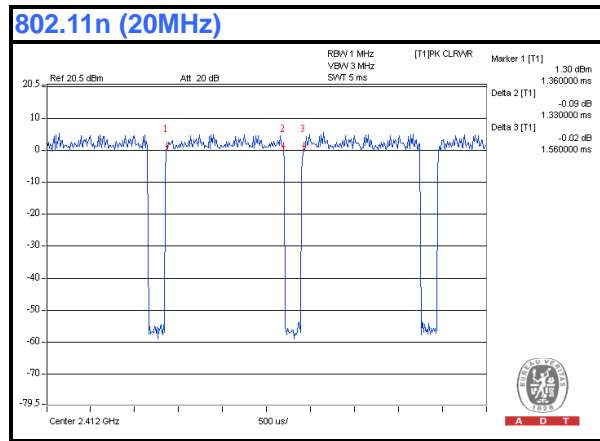


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### 802.11n (20MHz):

Duty cycle of test signal is < 98%, duty factor shall be considered.

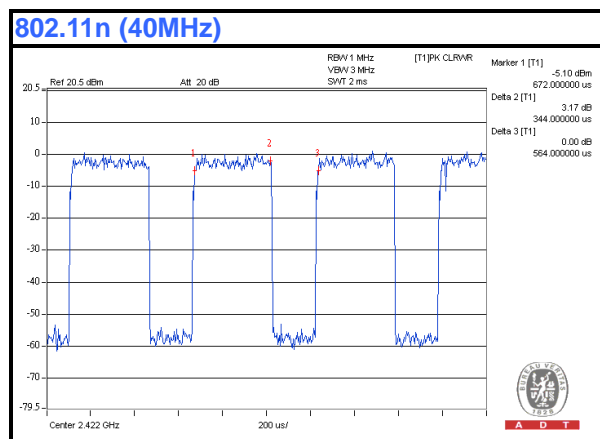
Duty cycle =  $1.33/1.56 = 0.85$ , Duty factor =  $10 * \log(1/0.85) = 0.71$



### 802.11n (40MHz):

Duty cycle of test signal is < 98%, duty factor shall be considered.

Duty cycle =  $0.344/0.564 = 0.61$ , Duty factor =  $10 * \log(1/0.61) = 2.15$



### 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.

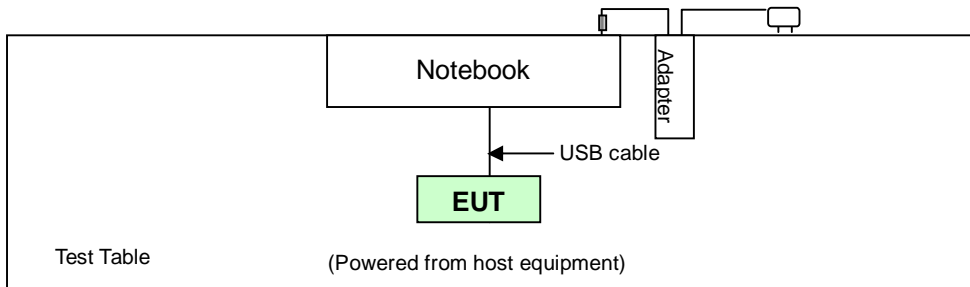
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	510m	1KZ1G1S	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

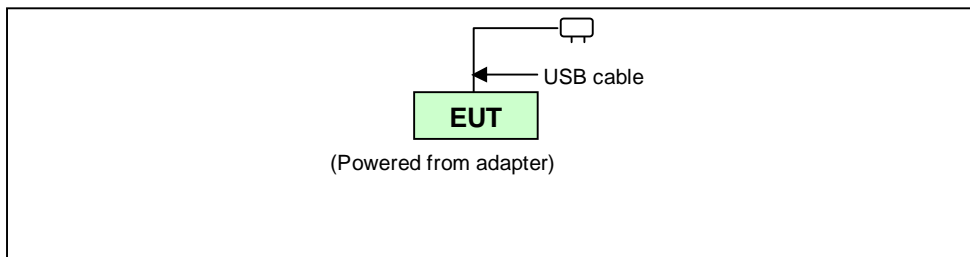
**NOTE:** All power cords of the above support units are non-shielded (1.8m).

#### 3.4.1 CONFIGURATION OF SYSTEM UNDER TEST

**FOR MODE A:**



**FOR MODE B:**





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### 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 v02**

**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.



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#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	Feb. 29, 2012	Feb. 28, 2013
HP Preamplifier	8449B	3008A01201	Feb. 29, 2012	Feb. 28, 2013
Agilent Spectrum Analyzer	E4446A	MY46180403	Jun. 13, 2012	Jun. 12, 2013
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Oct. 11, 2012	Oct. 10, 2013
Schwarzbeck Antenna	VULB 9168	137	Apr. 03, 2012	Apr. 02, 2013
Schwarzbeck Antenna	VHBA 9123	480	May 22, 2012	May 21, 2013
ADT. Turn Table	TT100	0306	NA	NA
ADT. Tower	AT100	0306	NA	NA
Software	ADT_Radiated_V 7.6.15.9.2	NA	NA	NA
SUHNER RF cable	SF102	CABLE-CH6	Aug. 19, 2012	Aug. 18, 2013
Schwarzbeck Horn Antenna	BBHA 9120-D1	D130	May 18, 2012	May 17, 2013
Highpass filter Wainwright Instruments	WHK 3.1/18G-10SS	SN 8	NA	NA
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	May 09, 2012	May 08, 2013
Anritsu Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013
Anritsu Power Meter	ML2495A	0842014	Apr. 28, 2012	Apr. 27, 2013

- 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 horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Chamber No. 6.
4. The Industry Canada Reference No. IC 7450E-6.
5. The FCC Site Registration No. is 447212.



### 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. 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 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.

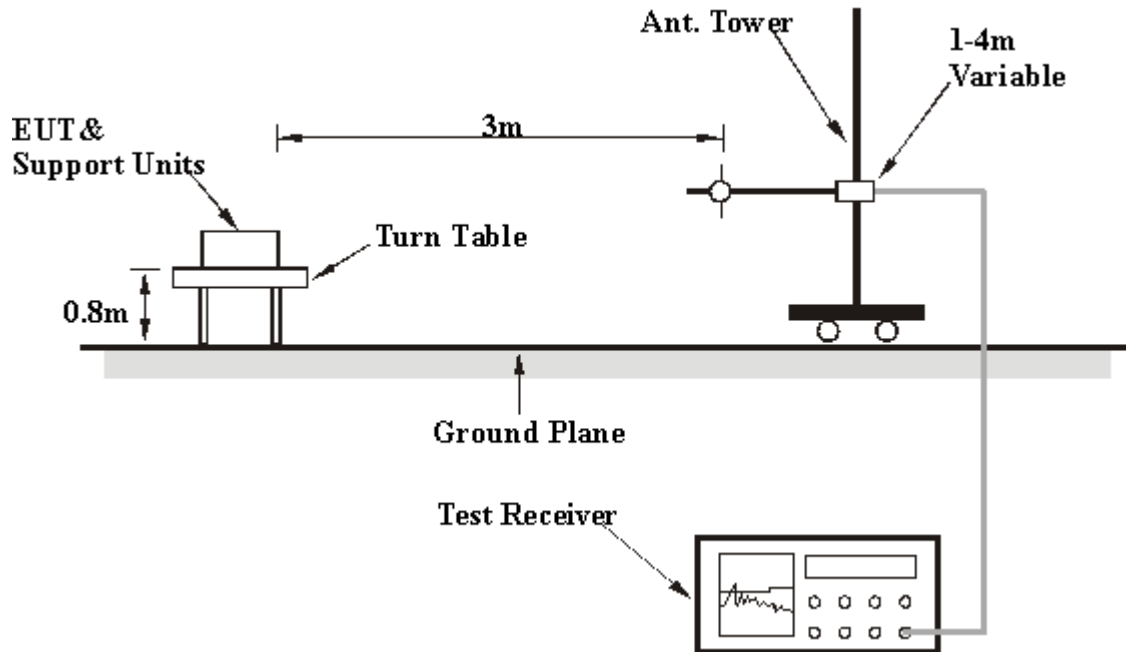
**NOTE:**

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 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.1.5 TEST SETUP



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

### 4.1.6 EUT OPERATING CONDITIONS

Set the EUT under transmission/receiving condition continuously at specific channel frequency.



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## 4.1.7 TEST RESULTS

### TEST MODE A

### BELOW 1GHz WORST-CASE DATA

#### 802.11g

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	181.97	28.5 QP	43.5	-15.0	1.16 H	221	15.87	12.63
2	232.08	34.3 QP	46.0	-11.7	1.53 H	121	21.72	12.62
3	285.43	39.0 QP	46.0	-7.0	1.43 H	79	23.89	15.09
4	469.73	32.7 QP	46.0	-13.4	1.00 H	283	12.35	20.30
5	599.07	34.9 QP	46.0	-11.1	1.00 H	107	11.75	23.18
6	815.73	35.6 QP	46.0	-10.5	2.17 H	239	8.80	26.75

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	72.03	33.3 QP	40.0	-6.7	1.27 V	102	21.36	11.95
2	285.43	27.2 QP	46.0	-18.8	1.06 V	325	12.12	15.09
3	472.97	31.0 QP	46.0	-15.0	1.37 V	82	10.60	20.39
4	597.45	36.0 QP	46.0	-10.1	1.00 V	333	12.80	23.15
5	639.48	33.1 QP	46.0	-12.9	1.92 V	198	9.27	23.82
6	799.53	34.7 QP	46.0	-11.3	1.13 V	113	8.21	26.50

#### 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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

## ABOVE 1GHz DATA

### 802.11b

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	59.1 PK	74.0	-14.9	1.00 H	157	28.89	30.24
2	2390.00	46.1 AV	54.0	-7.9	1.00 H	157	15.83	30.24
3	*2412.00	100.3 PK			1.18 H	158	69.98	30.33
4	*2412.00	96.9 AV			1.18 H	158	66.54	30.33
5	4824.00	50.9 PK	74.0	-23.1	1.17 H	344	14.24	36.64
6	4824.00	45.8 AV	54.0	-8.3	1.17 H	344	9.11	36.64
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	-16.3	1.00 V	3	27.51	30.24
2	2390.00	44.0 AV	54.0	-10.0	1.00 V	3	13.77	30.24
3	*2412.00	93.4 PK			1.00 V	3	63.09	30.33
4	*2412.00	89.8 AV			1.00 V	3	59.46	30.33
5	4824.00	55.1 PK	74.0	-18.9	1.00 V	194	18.50	36.64
6	4824.00	51.9 AV	54.0	-2.1	1.00 V	194	15.23	36.64

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



A D T

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	102.2 PK			1.00 H	189	71.74	30.42
2	*2437.00	98.3 AV			1.00 H	189	67.83	30.42
3	4874.00	48.7 PK	74.0	-25.3	1.20 H	330	11.92	36.77
4	4874.00	41.1 AV	54.0	-13.0	1.20 H	330	4.28	36.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.8 PK			1.02 V	351	65.37	30.42
2	*2437.00	91.0 AV			1.02 V	351	60.61	30.42
3	4874.00	53.0 PK	74.0	-21.0	1.00 V	98	16.25	36.77
4	4874.00	49.3 AV	54.0	-4.7	1.00 V	98	12.53	36.77

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



A D T

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.6 PK			1.06 H	260	70.13	30.50
2	*2462.00	96.5 AV			1.06 H	260	66.04	30.50
3	2483.50	57.7 PK	74.0	-16.4	1.06 H	260	27.08	30.57
4	2483.50	44.3 AV	54.0	-9.7	1.06 H	260	13.73	30.57
5	4924.00	48.4 PK	74.0	-25.6	1.00 H	124	11.49	36.90
6	4924.00	40.0 AV	54.0	-14.0	1.00 H	124	3.07	36.90
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	*2462.00	93.2 PK			1.00 V	82	62.69	30.50
2	*2462.00	89.0 AV			1.00 V	82	58.53	30.50
3	2483.50	55.7 PK	74.0	-18.3	1.00 V	82	25.16	30.57
4	2483.50	44.3 AV	54.0	-9.7	1.00 V	82	13.73	30.57
5	4924.00	53.2 PK	74.0	-20.8	1.00 V	316	16.34	36.90
6	4924.00	48.5 AV	54.0	-5.5	1.00 V	316	11.57	36.90

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





A D T

802.11g

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.4 PK	74.0	-11.6	1.09 H	245	32.20	30.24
2	2390.00	47.3 AV	54.0	-6.7	1.09 H	245	17.02	30.24
3	*2412.00	104.3 PK			1.09 H	245	73.97	30.33
4	*2412.00	92.0 AV			1.09 H	245	61.64	30.33
5	4824.00	53.3 PK	74.0	-20.7	1.00 H	213	16.65	36.64
6	4824.00	39.7 AV	54.0	-14.3	1.00 H	213	3.09	36.64
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	58.7 PK	74.0	-15.3	1.04 V	284	28.44	30.24
2	2390.00	45.5 AV	54.0	-8.6	1.04 V	284	15.21	30.24
3	*2412.00	94.9 PK			1.04 V	284	64.56	30.33
4	*2412.00	84.5 AV			1.04 V	284	54.21	30.33
5	4824.00	62.3 PK	74.0	-11.7	1.00 V	199	25.66	36.64
6	4824.00	46.4 AV	54.0	-7.6	1.00 V	199	9.75	36.64

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



A D T

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	104.1 PK			1.03 H	260	73.64	30.42
2	*2437.00	92.6 AV			1.03 H	260	62.19	30.42
3	4874.00	53.4 PK	74.0	-20.6	1.00 H	15	16.63	36.77
4	4874.00	39.8 AV	54.0	-14.2	1.00 H	15	3.07	36.77
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	94.5 PK			1.00 V	180	64.10	30.42
2	*2437.00	82.7 AV			1.00 V	180	52.32	30.42
3	4874.00	59.4 PK	74.0	-14.6	1.00 V	207	22.63	36.77
4	4874.00	45.8 AV	54.0	-8.2	1.00 V	207	9.02	36.77

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



A D T

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.4 PK			1.06 H	261	73.91	30.50
2	*2462.00	92.7 AV			1.06 H	261	62.16	30.50
3	2483.50	57.1 PK	74.0	-17.0	1.06 H	261	26.48	30.57
4	2483.50	44.5 AV	54.0	-9.5	1.06 H	261	13.95	30.57
5	4924.00	50.5 PK	74.0	-23.5	1.00 H	158	13.59	36.90
6	4924.00	36.3 AV	54.0	-17.7	1.00 H	158	-0.56	36.90
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	*2462.00	94.5 PK			1.00 V	16	64.03	30.50
2	*2462.00	82.3 AV			1.00 V	16	51.79	30.50
3	2483.50	56.4 PK	74.0	-17.6	1.00 V	16	25.85	30.57
4	2483.50	44.0 AV	54.0	-10.0	1.00 V	16	13.42	30.57
5	4924.00	54.6 PK	74.0	-19.4	1.00 V	199	17.69	36.90
6	4924.00	38.7 AV	54.0	-15.3	1.00 V	199	1.79	36.90

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



A D T

802.11n (20MHz)

<b>CHANNEL</b>	TX Channel 1	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	63.3 PK	74.0	-10.7	1.09 H	260	33.06	30.24
2	2390.00	48.4 AV	54.0	-5.6	1.09 H	260	18.20	30.24
3	*2412.00	104.2 PK			1.09 H	260	73.89	30.33
4	*2412.00	92.4 AV			1.09 H	260	62.05	30.33
5	4824.00	54.1 PK	74.0	-19.9	1.02 H	159	17.46	36.64
6	4824.00	39.5 AV	54.0	-14.6	1.02 H	159	2.81	36.64
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	58.2 PK	74.0	-15.8	1.00 V	82	27.97	30.24
2	2390.00	45.6 AV	54.0	-8.4	1.00 V	82	15.32	30.24
3	*2412.00	94.6 PK			1.00 V	82	64.29	30.33
4	*2412.00	83.1 AV			1.00 V	82	52.79	30.33
5	4824.00	59.3 PK	74.0	-14.7	1.18 V	256	22.66	36.64
6	4824.00	44.5 AV	54.0	-9.5	1.18 V	256	7.88	36.64

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



A D T

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	105.8 PK			1.08 H	260	75.37	30.42
2	*2437.00	94.5 AV			1.08 H	260	64.12	30.42
3	4874.00	54.3 PK	74.0	-19.7	1.02 H	15	17.52	36.77
4	4874.00	38.9 AV	54.0	-15.2	1.02 H	15	2.08	36.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.3 PK			1.00 V	178	64.92	30.42
2	*2437.00	85.2 AV			1.00 V	178	54.77	30.42
3	4874.00	59.0 PK	74.0	-15.1	1.12 V	201	22.18	36.77
4	4874.00	43.7 AV	54.0	-10.3	1.12 V	201	6.90	36.77

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



A D T

<b>CHANNEL</b>	TX Channel 11	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.0 PK			1.05 H	259	73.53	30.50
2	*2462.00	95.1 AV			1.05 H	259	64.58	30.50
3	2483.50	57.3 PK	74.0	-16.7	1.05 H	259	26.76	30.57
4	2483.50	44.9 AV	54.0	-9.1	1.05 H	259	14.29	30.57
5	4924.00	49.9 PK	74.0	-24.1	1.00 H	159	13.02	36.90
6	4924.00	35.6 AV	54.0	-18.4	1.00 H	159	-1.27	36.90
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	*2462.00	94.1 PK			1.00 V	177	63.58	30.50
2	*2462.00	83.8 AV			1.00 V	177	53.29	30.50
3	2483.50	56.7 PK	74.0	-17.3	1.00 V	177	26.13	30.57
4	2483.50	43.7 AV	54.0	-10.3	1.00 V	177	13.15	30.57
5	4924.00	54.2 PK	74.0	-19.9	1.00 V	200	17.25	36.90
6	4924.00	38.9 AV	54.0	-15.1	1.00 V	200	1.96	36.90

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



A D T

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.8 PK	74.0	-8.2	1.05 H	257	35.58	30.24
2	2390.00	49.7 AV	54.0	-4.3	1.05 H	257	19.48	30.24
3	*2422.00	103.6 PK			1.05 H	257	73.20	30.36
4	*2422.00	90.1 AV			1.05 H	257	59.72	30.36
5	4844.00	49.1 PK	74.0	-24.9	1.07 H	95	12.45	36.69
6	4844.00	35.7 AV	54.0	-18.3	1.07 H	95	-1.02	36.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.5 PK	74.0	-13.5	1.04 V	83	30.26	30.24
2	2390.00	46.6 AV	54.0	-7.4	1.04 V	83	16.39	30.24
3	*2422.00	95.5 PK			1.04 V	84	65.18	30.36
4	*2422.00	83.6 AV			1.04 V	84	53.26	30.36
5	4844.00	54.8 PK	74.0	-19.2	1.09 V	270	18.13	36.69
6	4844.00	38.7 AV	54.0	-15.3	1.09 V	270	1.99	36.69

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



A D T

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	103.2 PK			1.07 H	259	72.76	30.42
2	*2437.00	88.1 AV			1.07 H	259	57.63	30.42
3	4874.00	53.4 PK	74.0	-20.6	1.00 H	15	16.62	36.77
4	4874.00	37.7 AV	54.0	-16.3	1.00 H	15	0.95	36.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.0 PK			1.02 V	180	64.58	30.42
2	*2437.00	81.3 AV			1.02 V	180	50.83	30.42
3	4874.00	60.2 PK	74.0	-13.8	1.00 V	199	23.42	36.77
4	4874.00	44.5 AV	54.0	-9.5	1.00 V	199	7.76	36.77

**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).
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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<b>CHANNEL</b>	TX Channel 9	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	98.2 PK			1.07 H	260	67.69	30.47
2	*2452.00	85.9 AV			1.07 H	260	55.42	30.47
3	2483.50	59.5 PK	74.0	-14.6	1.07 H	260	28.88	30.57
4	2483.50	45.9 AV	54.0	-8.1	1.07 H	260	15.34	30.57
5	4904.00	49.7 PK	74.0	-24.3	1.00 H	16	12.86	36.85
6	4904.00	34.8 AV	54.0	-19.2	1.00 H	16	-2.07	36.85
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	90.3 PK			1.00 V	177	59.78	30.47
2	*2452.00	76.3 AV			1.00 V	177	45.83	30.47
3	2483.50	56.9 PK	74.0	-17.1	1.00 V	177	26.36	30.57
4	2483.50	44.5 AV	54.0	-9.5	1.00 V	177	13.90	30.57
5	4904.00	56.4 PK	74.0	-17.6	1.00 V	207	19.56	36.85
6	4904.00	39.5 AV	54.0	-14.5	1.00 V	207	2.65	36.85

**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).
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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## 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.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100276	Jan. 04, 2012	Jan. 03, 2013
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100219	Nov. 24, 2011	Nov. 23, 2012
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 24, 2011	Nov. 23, 2012
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100218	Dec. 08, 2011	Dec. 07, 2012
Software	ADT_Cond_V7.3.7	NA	NA	NA
Software	ADT_ISN_V7.3.7	NA	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	Feb. 20, 2012	Feb. 19, 2013
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 22, 2012	Feb. 21, 2013

- 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 Shielded Room No. 10.  
 3. The VCCI Site Registration No. C-1852.

### 4.2.3 TEST PROCEDURES

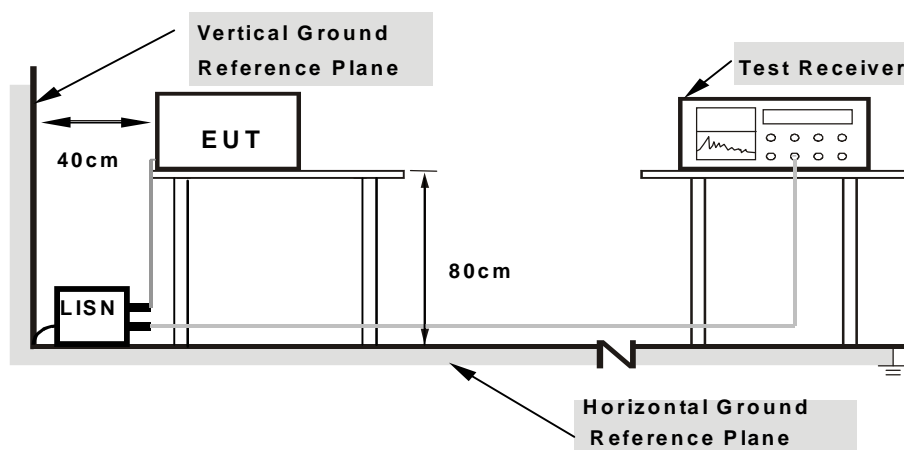
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

##### For Mode A:

- a. Connected the EUT to Notebook via USB cable placed on testing table.
- b. Turn on the power of all equipment.
- c. Notebook ran a test program (provided by manufacture) to enable EUT under transmitting condition at specific channel continuously.
- d. Set the EUT under transmitting and charging condition.

##### For Mode B

- a. Connected the EUT with adapter placed on testing table.
- b. Set the EUT under transmission/receiving condition continuously at specific channel frequency.
- c. Set the EUT under transmitting and charging condition.

### 4.2.7 TEST RESULTS

TEST MODE A

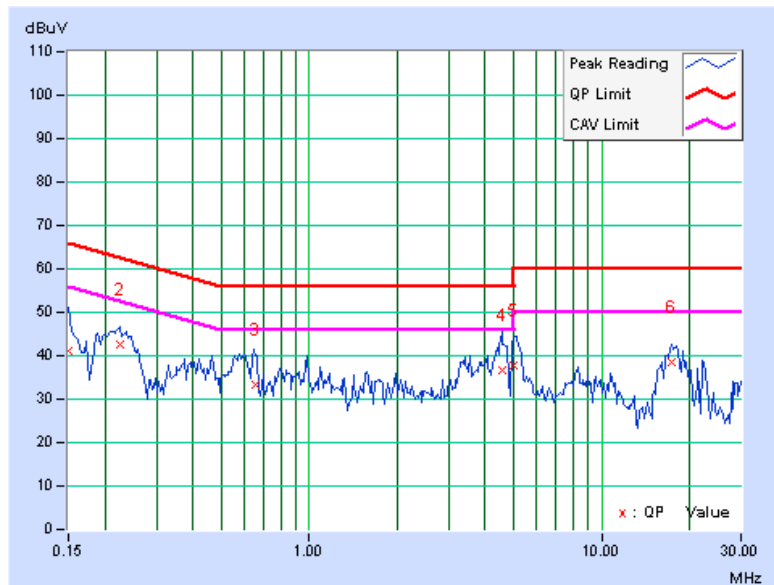
CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

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	0.15000	0.15	41.04	-	41.19	-	66.00	56.00	-24.81	-
2	0.22422	0.15	42.58	-	42.73	-	62.66	52.66	-19.93	-
3	0.65432	0.21	33.07	-	33.28	-	56.00	46.00	-22.72	-
4	4.57031	0.45	36.25	-	36.70	-	56.00	46.00	-19.30	-
5	5.00000	0.47	37.17	-	37.64	-	56.00	46.00	-18.36	-
6	17.45313	1.14	37.55	-	38.69	-	60.00	50.00	-21.31	-

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.





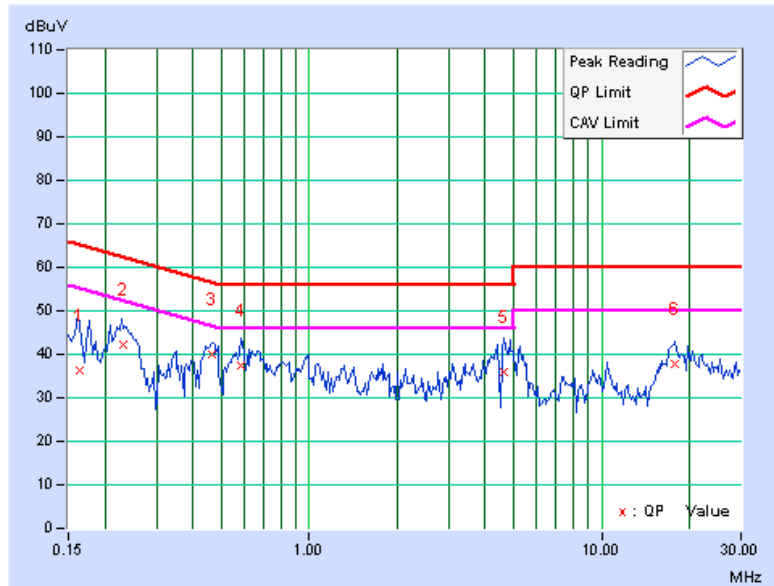
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PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

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	0.16300	0.14	36.34	-	36.48	-	65.31	55.31	-28.83	-
2	0.23067	0.16	41.94	-	42.10	-	62.43	52.43	-20.33	-
<b>3</b>	<b>0.46388</b>	<b>0.19</b>	<b>39.77</b>	-	<b>39.96</b>	-	<b>56.62</b>	<b>46.62</b>	<b>-16.66</b>	-
4	0.58487	0.20	37.03	-	37.23	-	56.00	46.00	-18.77	-
5	4.65880	0.41	35.35	-	35.76	-	56.00	46.00	-20.24	-
6	17.89972	0.87	36.73	-	37.60	-	60.00	50.00	-22.40	-

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.





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**TEST MODE B**

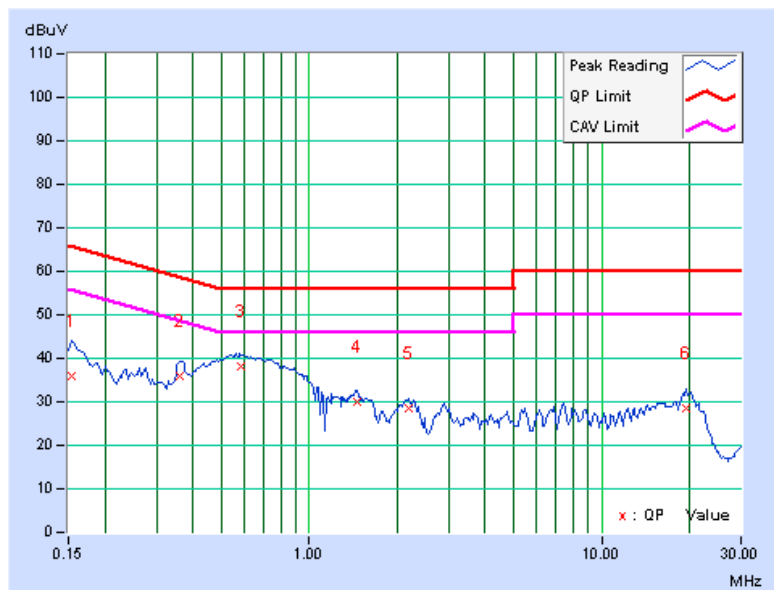
**CONDUCTED WORST-CASE DATA : 802.11g**

<b>PHASE</b>	Line 1	<b>6dB BANDWIDTH</b>	9kHz
--------------	--------	----------------------	------

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	0.15391	0.15	35.81	-	35.96	-	65.79
2	0.36232	0.18	35.58	-	35.76	-	58.68	48.68	-22.91	-
3	0.58097	0.20	37.81	-	38.01	-	56.00	46.00	-17.99	-
4	1.45831	0.26	29.87	-	30.13	-	56.00	46.00	-25.87	-
5	2.19659	0.30	28.21	-	28.51	-	56.00	46.00	-27.49	-
6	19.43338	1.24	27.37	-	28.61	-	60.00	50.00	-31.39	-

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.





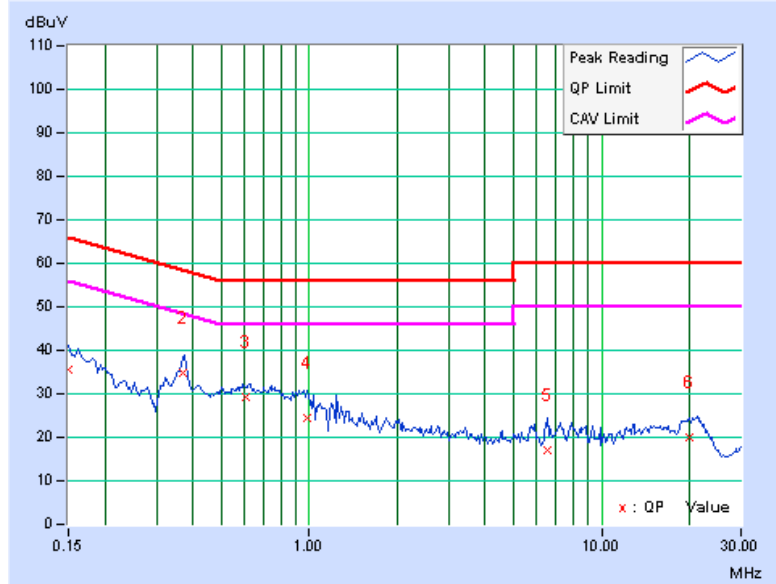
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PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

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	0.15000	0.14	35.40	-	35.54	-	66.00	56.00	-30.46	-
2	0.36987	0.18	34.45	-	34.63	-	58.50	48.50	-23.87	-
3	0.60325	0.20	29.23	-	29.43	-	56.00	46.00	-26.57	-
4	0.98417	0.23	24.07	-	24.30	-	56.00	46.00	-31.70	-
5	6.51316	0.48	16.51	-	16.99	-	60.00	50.00	-43.01	-
6	20.05987	0.93	18.99	-	19.92	-	60.00	50.00	-40.08	-

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.



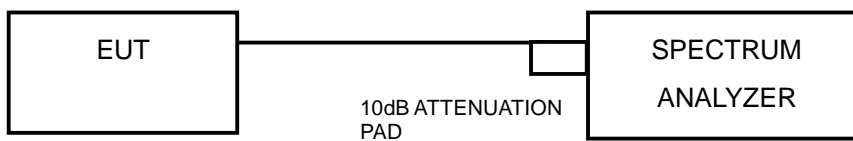


### 4.3 6dB BANDWIDTH MEASUREMENT

#### 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) = approximately 1% of the emission bandwidth
- 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.



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### 4.3.7 TEST RESULTS

#### TEST MODE A

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
<b>802.11b</b>				
1	2412	10.07	0.5	PASS
6	2437	10.09	0.5	PASS
11	2462	10.11	0.5	PASS
<b>802.11g</b>				
1	2412	16.62	0.5	PASS
6	2437	16.58	0.5	PASS
11	2462	16.58	0.5	PASS
<b>802.11n (20MHz)</b>				
1	2412	17.87	0.5	PASS
6	2437	17.70	0.5	PASS
11	2462	17.66	0.5	PASS
<b>802.11n (40MHz)</b>				
3	2422	35.88	0.5	PASS
6	2437	35.98	0.5	PASS
9	2452	36.50	0.5	PASS

## 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)

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

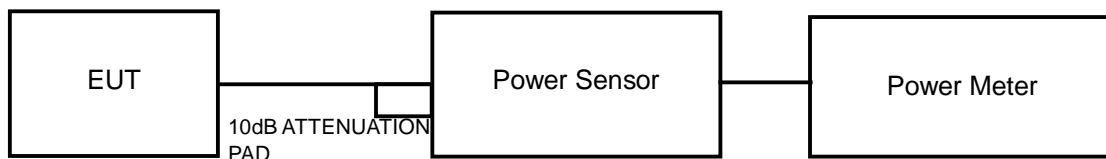
Array Gain = 0 dB (i.e., no array gain) for  $NANT \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any NANT;

Array Gain =  $5 \log(NANT/NSS)$  dB or 3 dB, whichever is less for 20-MHz channel widths with  $NANT \geq 5$ .

For power measurements on all other devices: Array Gain =  $10 \log(NANT/NSS)$  dB.

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

### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



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## 4.4.7 TEST RESULTS

### TEST MODE A

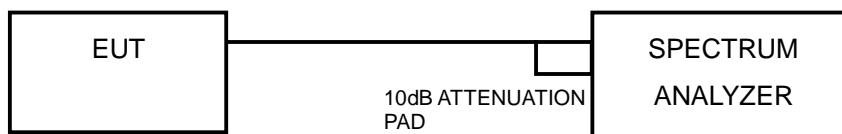
CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)	POWER OUTPUT (mW)	POWER LIMIT (dBm)	PASS / FAIL
<b>802.11b</b>					
1	2412	16.6	45.7	30	PASS
6	2437	17.1	51.3	30	PASS
11	2462	16.1	40.7	30	PASS
<b>802.11g</b>					
1	2412	19.7	93.3	30	PASS
6	2437	20.7	117.5	30	PASS
11	2462	20.0	100.0	30	PASS
<b>802.11n (20MHz)</b>					
1	2412	20.7	117.5	30	PASS
6	2437	20.8	<b>120.2</b>	30	PASS
11	2462	20.4	109.6	30	PASS
<b>802.11n (40MHz)</b>					
3	2422	20.3	107.2	30	PASS
6	2437	20.2	104.7	30	PASS
9	2452	19.1	81.3	30	PASS

## 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.
- Record the max value and add 10 log (1/duty cycle)

### 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

#### TEST MODE A

CHAN.	CHAN. FREQ. (MHz)	TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
<b>802.11b</b>						
1	2412	-11.20	0	-11.20	8	PASS
6	2437	-12.98	0	-12.98	8	PASS
11	2462	-12.73	0	-12.73	8	PASS
<b>802.11g</b>						
1	2412	-11.12	0.66	-10.46	8	PASS
6	2437	-10.67	0.66	-10.01	8	PASS
11	2462	-11.83	0.66	-11.17	8	PASS
<b>802.11n (20MHz)</b>						
1	2412	-11.85	0.71	-11.14	8	PASS
6	2437	-10.25	0.71	-9.54	8	PASS
11	2462	-9.89	0.71	-9.18	8	PASS
<b>802.11n (40MHz)</b>						
3	2422	-12.60	2.15	-10.45	8	PASS
6	2437	-14.09	2.15	-11.94	8	PASS
9	2452	-14.55	2.15	-12.40	8	PASS

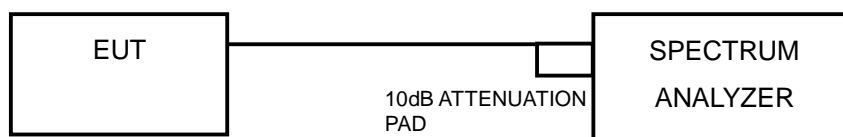
**NOTE:** Refer to section 3.3 for duty cycle spectrum plot.

## 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.



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## **MEASUREMENT PROCEDURE OOB**

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. 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.





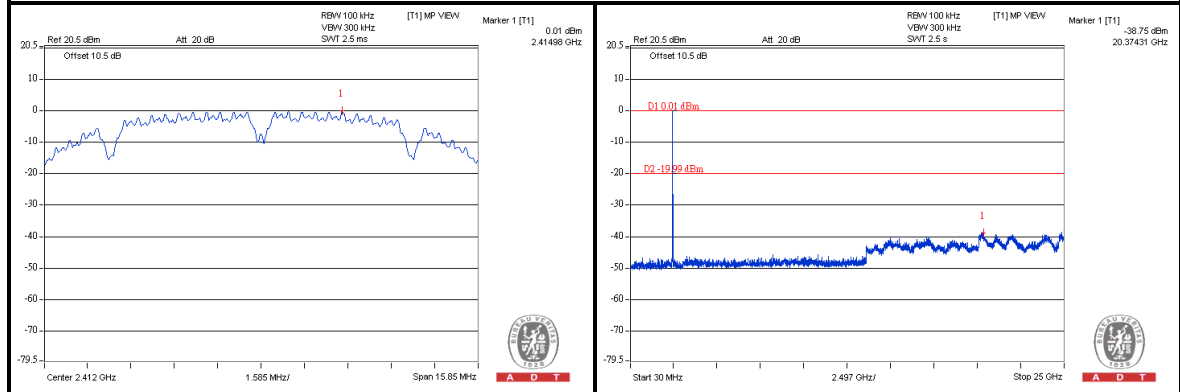
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## 4.6.8 TEST RESULTS

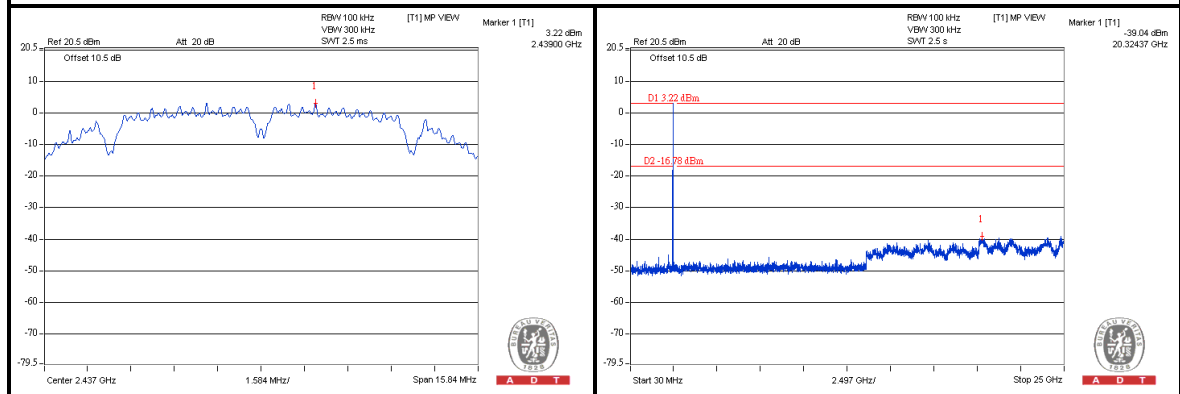
### TEST MODE A

802.11b

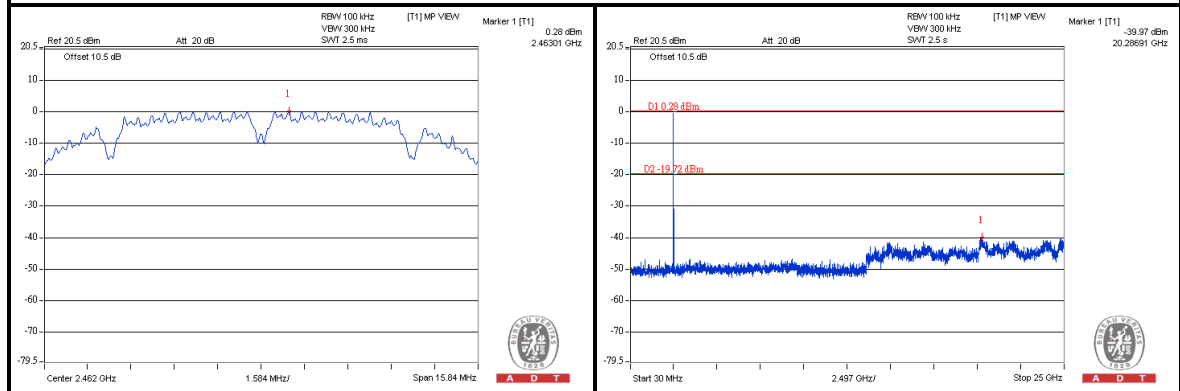
#### CH 1



#### CH 6



#### CH 11

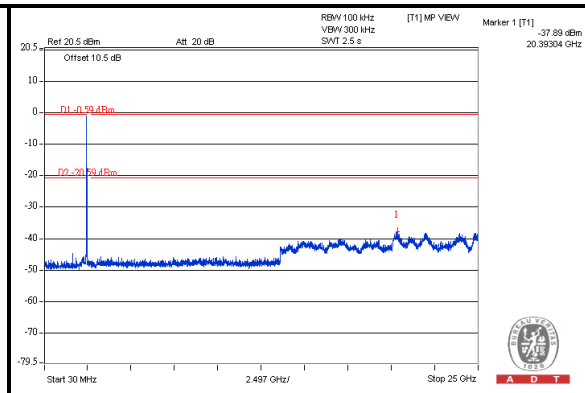
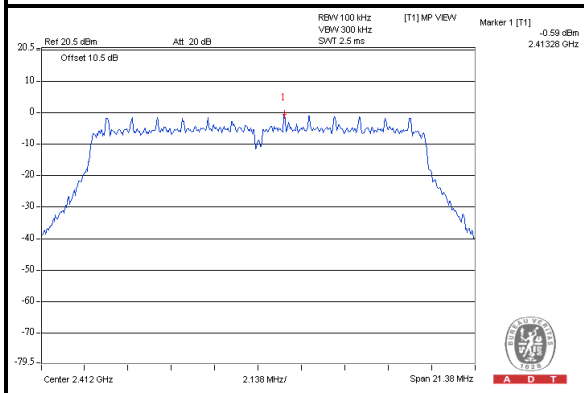




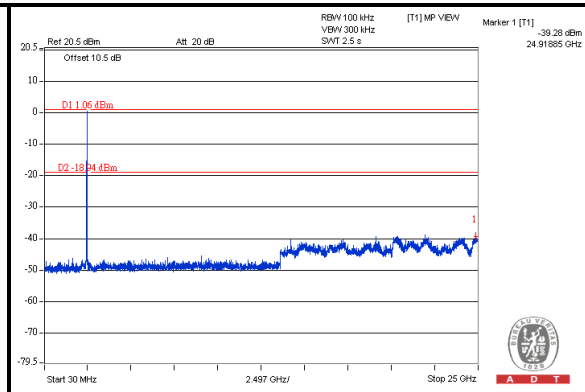
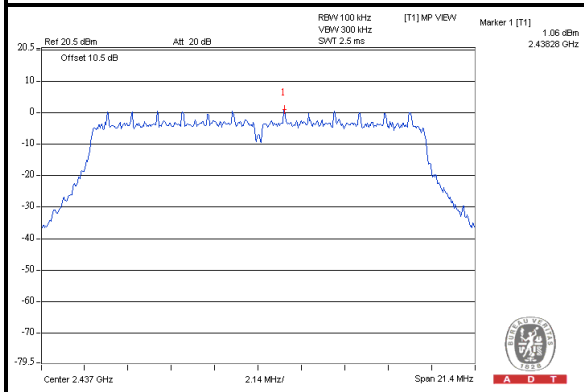
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802.11g

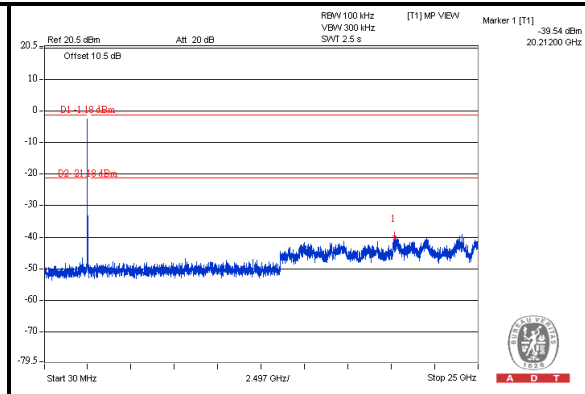
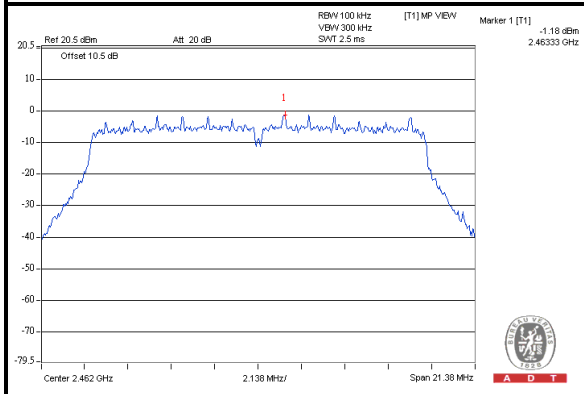
### CH 1



### CH 6



### CH 11

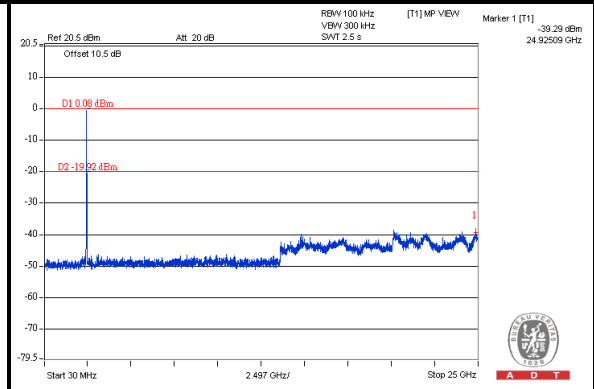
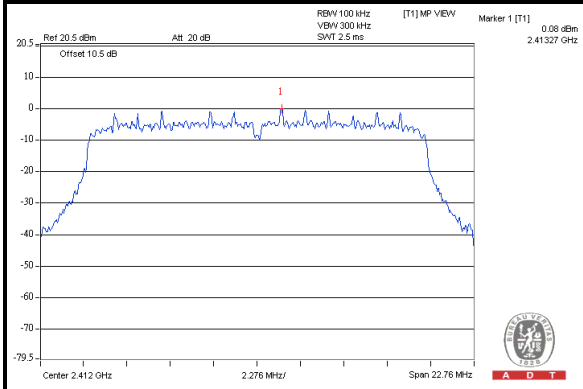




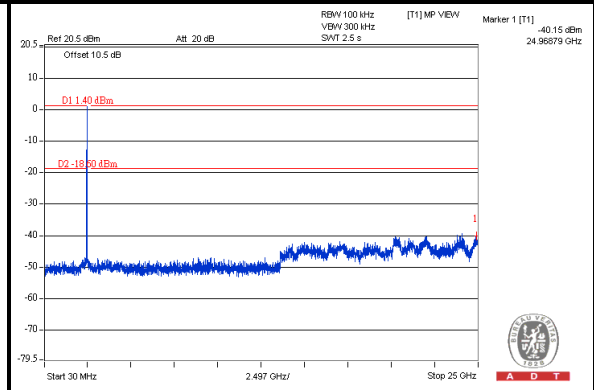
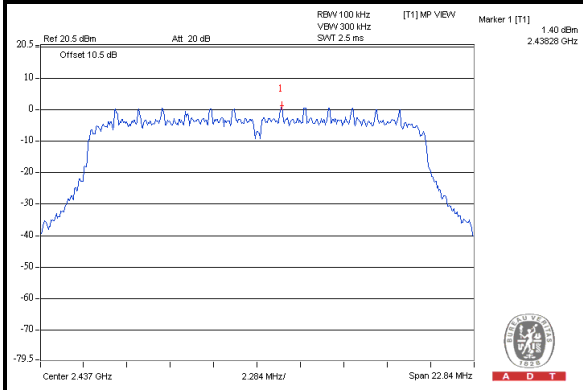
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### 802.11n (20MHz)

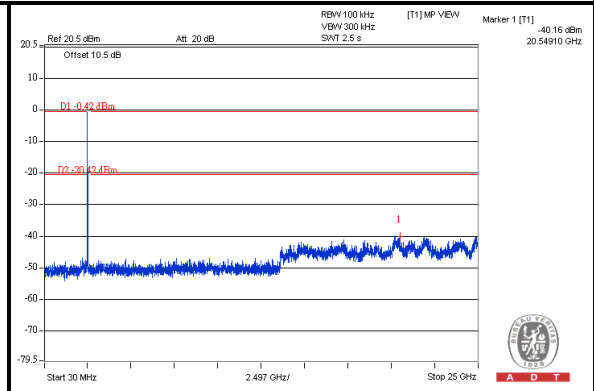
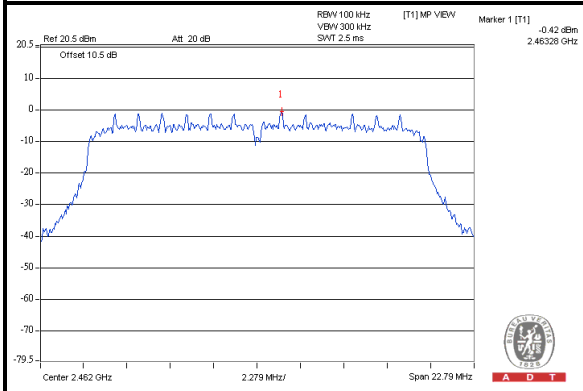
#### CH 1



#### CH 6



#### CH 11

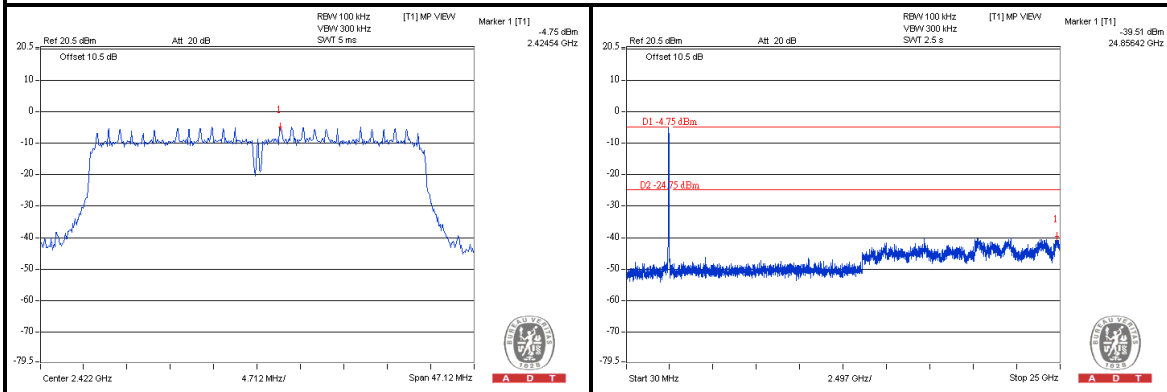




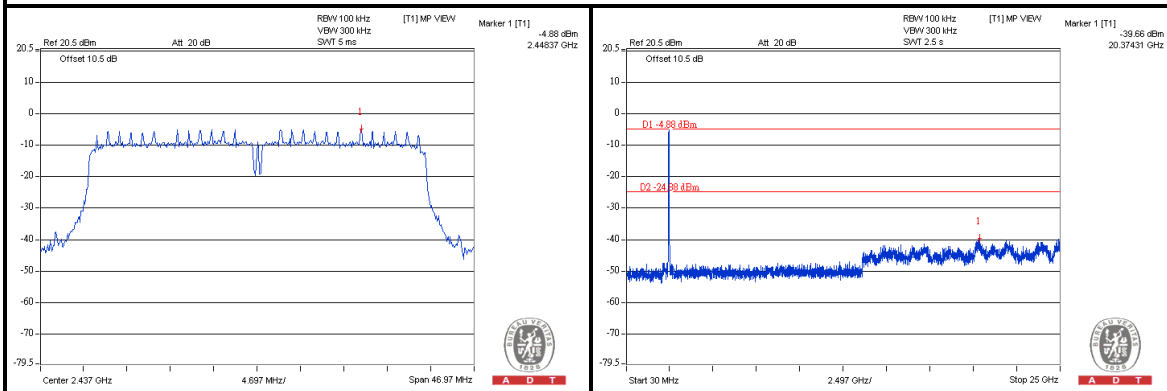
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### 802.11n (40MHz)

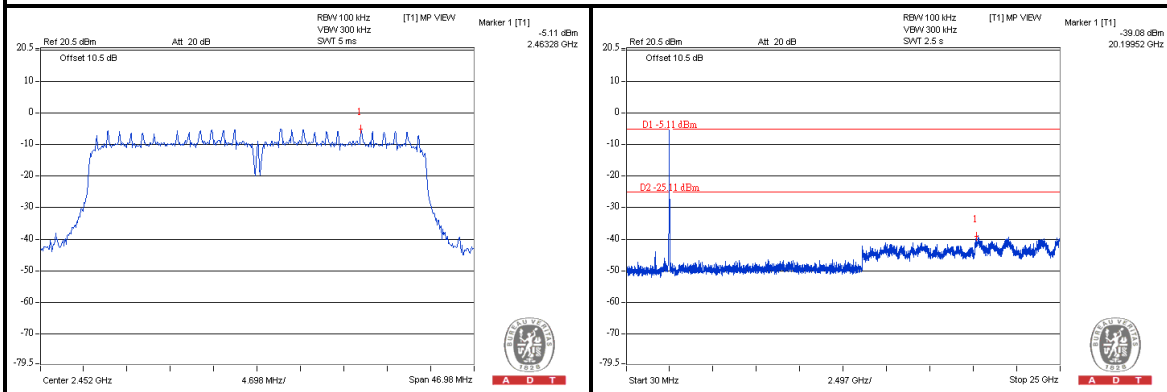
#### CH 3



#### CH 6



#### CH 9





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## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## 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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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 modifications were made to the EUT by the lab during the test.

**---END---**