



# FCC TEST REPORT

**REPORT NO.:** RF110907E06D

**MODEL NO.:** E800

**FCC ID:** Q87-E800

**RECEIVED:** Jan. 11, 2013

**TESTED:** Jan. 16, 2013

**ISSUED:** Jan. 21, 2013

**APPLICANT:** Cisco Consumer Products LLC

**ADDRESS:** 121 Theory Drive Irvine, CA 92617(USA)

**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110907E06D	Original release	Jan. 21, 2013

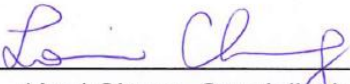


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## 1. CERTIFICATION

**PRODUCT:** Linksys E800  
**BRAND NAME:** Cisco  
**MODEL NO.:** E800  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** Cisco Consumer Products LLC  
**TESTED:** Jan. 16, 2013  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.10-2009

The above equipment (Model: E800) 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** :  , **DATE:** Jan. 21, 2013  
( Lori Chung, Specialist )

**APPROVED BY** :  , **DATE:** Jan. 21, 2013  
( May Chen, Deputy Manager )



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## 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 -2.72dB at 0.33750MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2390.0MHz
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.



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## 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:

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

Measurement	Value
Conducted emissions	2.98 dB
Radiated emissions (30MHz-1GHz)	5.69 dB
Radiated emissions (1GHz -6GHz)	3.84 dB
Radiated emissions (6GHz -18GHz)	4.09 dB
Radiated emissions (18GHz -40GHz)	4.24 dB



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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Linksys E800
<b>MODEL NO.</b>	E800
<b>POWER SUPPLY</b>	DC 12V from power adapter
<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: up to 11Mbps 802.11g: up to 54Mbps 802.11n : up to 135Mbps
<b>OPERATING FREQUENCY</b>	2.412 ~ 2.462GHz
<b>NUMBER OF CHANNEL</b>	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
<b>MAXIMUM OUTPUT POWER</b>	802.11b: 144.544mW 802.11g: 234.423mW 802.11n (HT20): 223.872mW 802.11n (HT40): 77.625mW
<b>ANTENNA TYPE</b>	Please see NOTE
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	Refer to user's manual
<b>ASSOCIATED DEVICES</b>	Adapter x 1



**NOTE:**

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

Transmitter Circuit	Gain (dBi)	Antenna Type	Connector Type	Frequency Range (MHz to MHz)	Remark
Chain (0)	4	Dipole	NA	2400~2483.5	TX/RX
Chain (1)	2	Dipole	NA	2400~2483.5	No Function

From the above antennas, antenna 1 was selected as representative mode for the test and its data was recorded in this report.

2. The EUT must be supplied with a power adapter and following five different model names could be chosen:

Adapter	Brand	Model No.	Spec.
Adapter 1	HON-KWANG	HK-Q106-A12	Input: 100-240V, 0.5A, 50/60Hz Output: DC12V, 0.5A DC output cable (unshielded, 1.5m)
Adapter 2	Leader	MU08-6120050-A1	Input: 100-240V, 0.5A, 50/60Hz Output: DC12V, 0.5A DC output cable (unshielded, 1.5m)
Adapter 3	DVE	DSA-6E-12 US 120050	Input: 100-240V, 0.2A, 50/60Hz Output: DC12V, 0.5A DC output cable (unshielded, 1.5m)
Adapter 4	SOLYTECH	CAD0612	Input: 100-240V, 0.5A, 50-60Hz Output: DC12V, 0.5A DC output cable (unshielded, 1.5m)
Adapter 5	SOLYTECH	CAD0612L	Input: 100-240V, 0.5A, 50-60Hz Output: DC12V, 0.5A DC output cable (unshielded, 1.5m)

For radiated emissions test, the EUT was pre-tested with above adapters, the worst case below 1GHz was found in adapter 3 and the worst case above 1GHz was found in adapter 2. Therefore only the test data of the adapter was recorded in this report.

3. The EUT incorporates a SISO function without beam forming.

MODULATION MODE	TX/RX FUNCTION
<b>802.11b</b>	1TX/1RX
<b>802.11g</b>	1TX/1RX
<b>802.11n (HT20)</b>	1TX/1RX
<b>802.11n (HT40)</b>	1TX/1RX

4. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 7.
5. For more detailed product features, please refer to manufacturer's specification or user's manual.



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### 3.2 DESCRIPTION OF TEST MODES

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

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



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### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE <sup>≥</sup> 1G	APCM	OB	
MODE 1	√	-	-	-	-	With adapter 1
MODE 2	√	-	√	√	√	With adapter 2
MODE 3	√	√	-	-	-	With adapter 3
MODE 4	√	-	-	-	-	With adapter 4
MODE 5	√	-	-	-	-	With adapter 5

Where **PLC:** Power Line Conducted Emission

**RE < 1G:** Radiated Emission below 1GHz

**RE <sup>≥</sup> 1G:** Radiated Emission above 1GHz

**APCM:** Antenna Port Conducted Measurement

**OB:** Conducted Out-Band Emission Measurement

**NOTE:** 1.“-”means no effect.

#### **POWER LINE CONDUCTED EMISSION TEST:**

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11n (HT20)	1 to 11	6	OFDM	BPSK	6.5

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

**ANTENNA PORT CONDUCTED 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

**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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5



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**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	27deg. C, 62%RH 26deg. C, 62%RH	120Vac, 60Hz	Eagle Chen Jyunchun Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
RE <sup>3</sup> 1G	25deg. C, 73%RH	120Vac, 60Hz	Evan Huang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Evan Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Evan Huang

### 3.3 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**  
**662911 D01 Multiple Transmitter Output**  
**ANSI C63.10-2009**

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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### 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.

For Conducted Emission Test					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP27L	7YLB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP27L	6YLB32S	FCC DoC

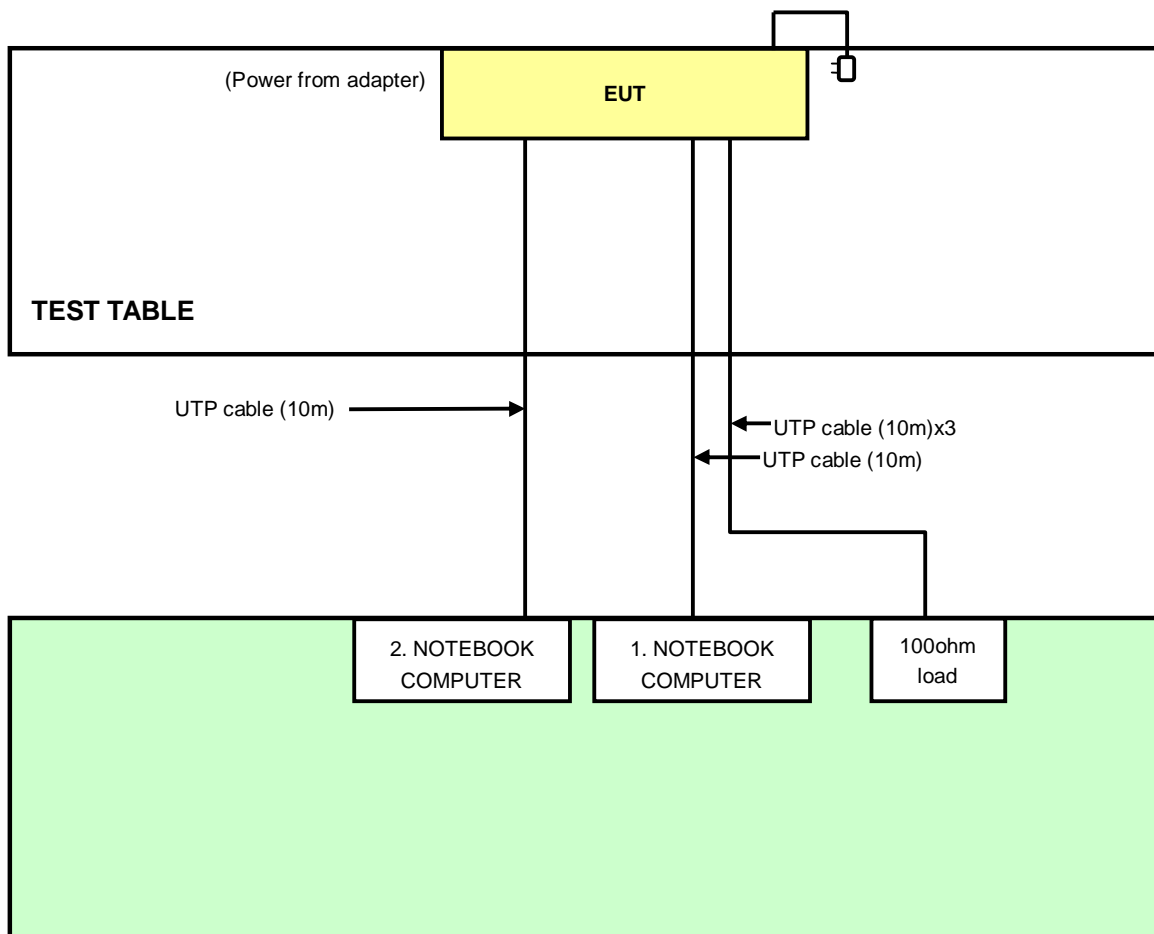
  

For Radiated Emission Test					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
3	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP Cable (10m)
2	UTP Cable (10m)
3	UTP Cable (10m)

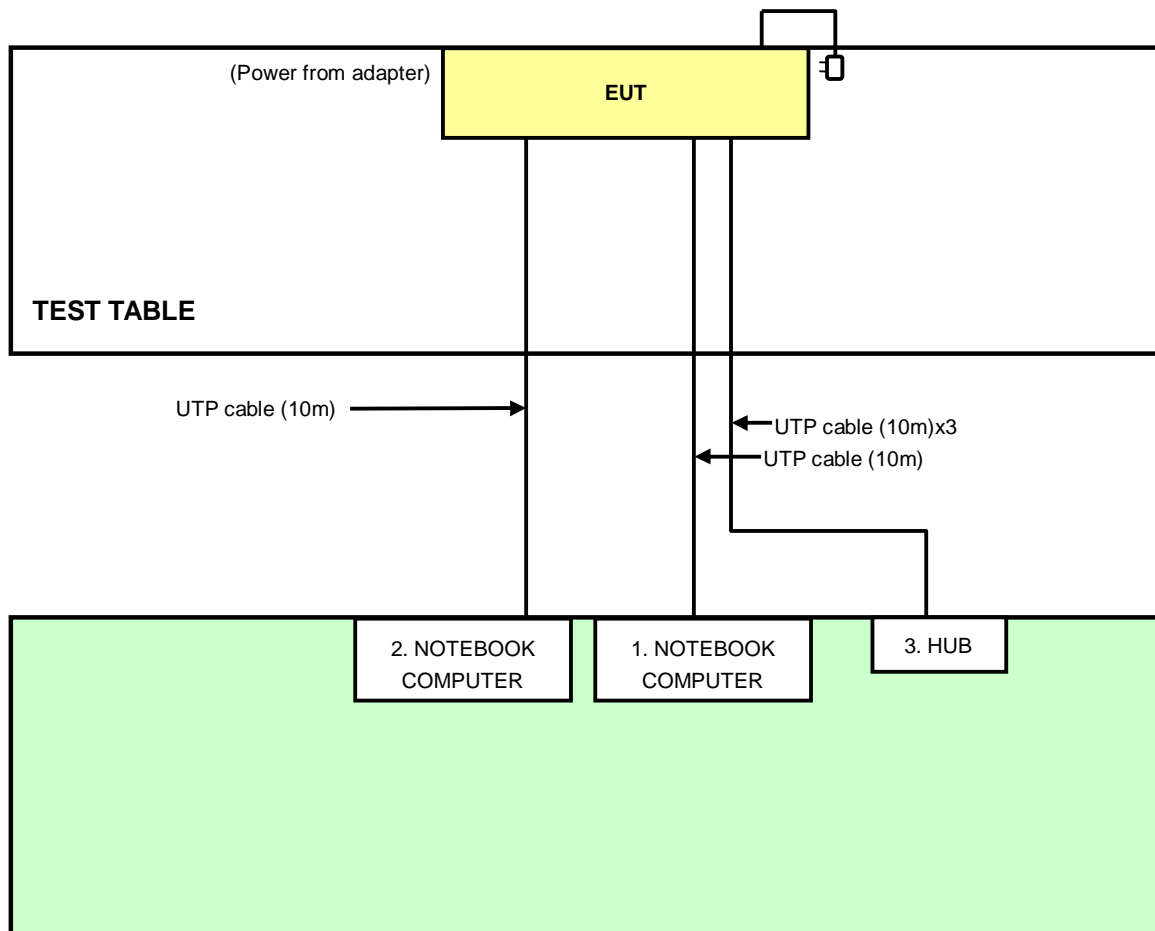
### 3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission test:





**For Radiated Emission test:**



## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 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 0.50 MHz.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 12, 2012	Mar. 11, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 06, 2012	Sep. 05, 2013
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08, 2012	June 07, 2013
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 28, 2012	Aug. 27, 2013
50 ohms Terminator	50	EMC-3	Sep. 25, 2012	Sep. 24, 2013
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 Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Jan. 16, 2013

#### 4.1.3 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.
- b. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- d. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

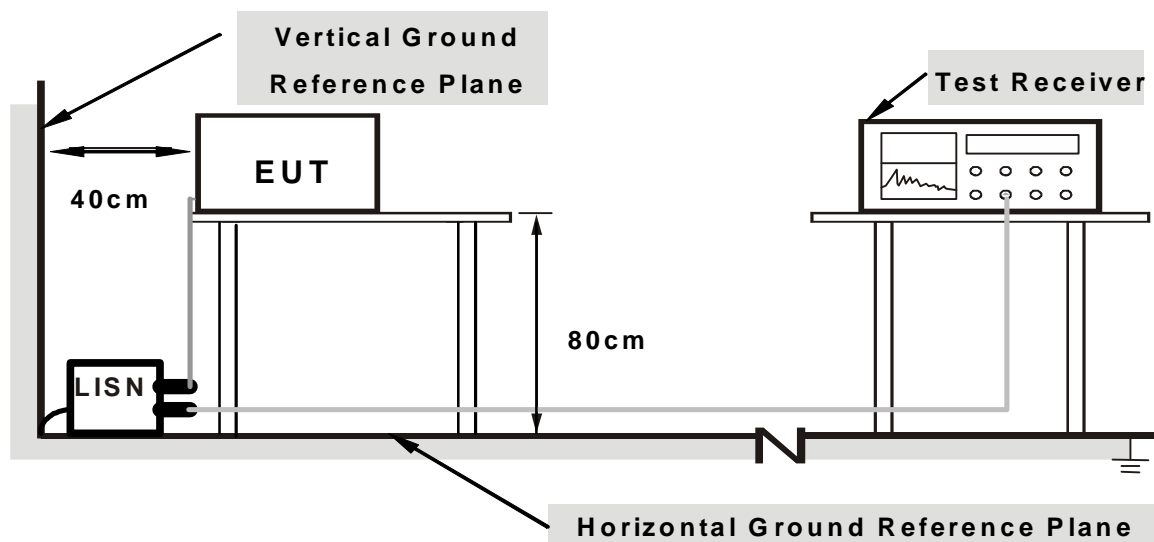
**NOTE:**

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer systems (support units 1~2) to act as communication partners and placed them outside of testing area.
3. The communication partners ran test program “Telnet Paste(E1200V2 command.txt)” to enable EUT under transmission/receiving condition continuously via UTP cables transmission.

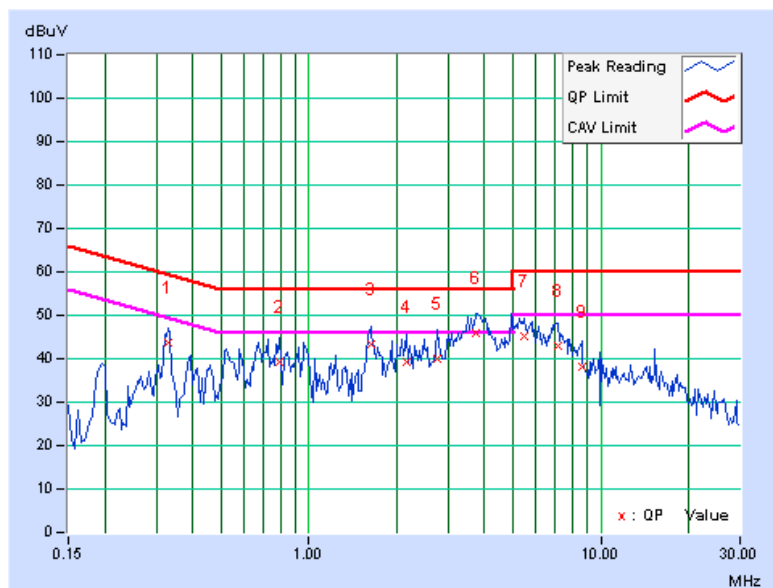
### 4.1.7 TEST RESULTS (MODE 1)

<b>PHASE</b>	Line (L)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
--------------	----------	--------------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.32968	9.70	33.91	24.86	43.61	34.56	59.46
2	0.79452	9.70	29.38	17.16	39.08	26.86	56.00	46.00	-16.92	-19.14
3	1.62502	9.71	33.45	22.86	43.16	32.57	56.00	46.00	-12.84	-13.43
4	2.15627	9.71	29.67	20.52	39.38	30.23	56.00	46.00	-16.62	-15.77
5	2.75003	9.73	30.38	20.76	40.11	30.49	56.00	46.00	-15.89	-15.51
6	3.73437	9.74	36.25	27.83	45.99	37.57	56.00	46.00	-10.01	-8.43
7	5.44144	9.78	35.36	26.85	45.14	36.63	60.00	50.00	-14.86	-13.37
8	7.15233	9.82	33.19	25.24	43.01	35.06	60.00	50.00	-16.99	-14.94
9	8.58591	9.85	28.23	20.75	38.08	30.60	60.00	50.00	-21.92	-19.40

**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.





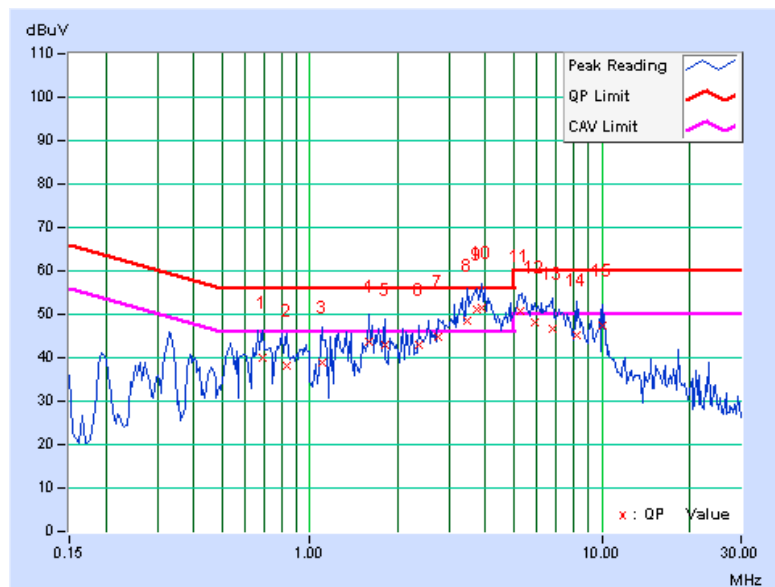
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<b>PHASE</b>	Neutral (N)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin [dB]	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.68905	9.74	30.16	18.49	39.90	28.23	56.00	46.00	-16.10	-17.77
2	0.83357	9.75	28.35	15.63	38.10	25.38	56.00	46.00	-17.90	-20.62
3	1.10158	9.75	29.14	21.53	38.89	31.28	56.00	46.00	-17.11	-14.72
4	1.59373	9.76	33.86	23.17	43.62	32.93	56.00	46.00	-12.38	-13.07
5	1.80855	9.77	33.18	22.31	42.95	32.08	56.00	46.00	-13.05	-13.92
6	2.35548	9.78	33.19	22.56	42.97	32.34	56.00	46.00	-13.03	-13.66
7	2.76564	9.78	35.19	23.35	44.97	33.13	56.00	46.00	-11.03	-12.87
8	3.44921	9.79	38.64	26.43	48.43	36.22	56.00	46.00	-7.57	-9.78
9	3.74606	9.80	41.19	29.26	50.99	39.06	56.00	46.00	-5.01	-6.94
10	3.88284	9.80	41.77	30.21	51.57	40.01	56.00	46.00	-4.43	-5.99
11	5.25782	9.84	40.73	29.52	50.57	39.36	60.00	50.00	-9.43	-10.64
12	5.89061	9.86	38.34	27.73	48.20	37.59	60.00	50.00	-11.80	-12.41
13	6.80079	9.89	36.68	26.14	46.57	36.03	60.00	50.00	-13.43	-13.97
14	8.16015	9.93	35.08	21.68	45.01	31.61	60.00	50.00	-14.99	-18.39
15	10.06253	9.99	37.53	31.05	47.52	41.04	60.00	50.00	-12.48	-8.96

**REMARKS:**

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



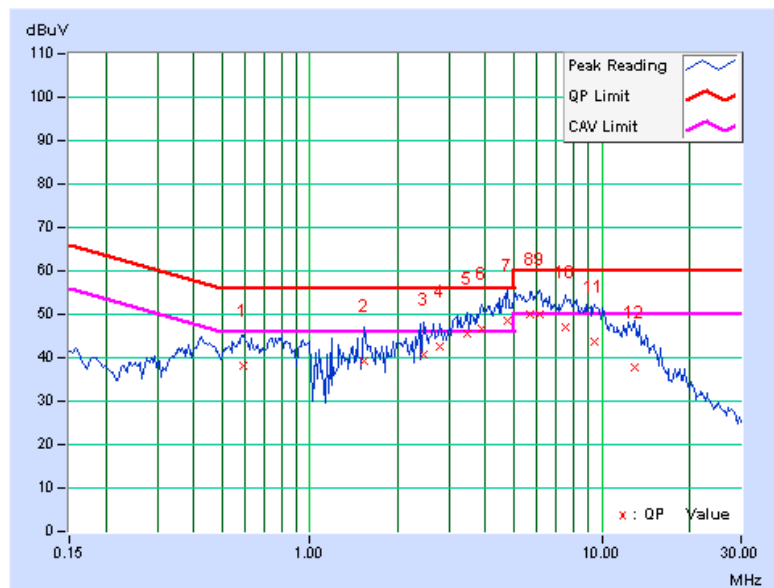
### 4.1.8 TEST RESULTS (MODE 2)

<b>PHASE</b>	Line (L)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. (dB)	AV. (dB)
	1	0.59534	9.70	28.27	20.49	37.97	30.19	56.00	46.00	-18.03
2	1.53517	9.71	29.46	19.49	39.17	29.20	56.00	46.00	-16.83	-16.80
3	2.46874	9.72	31.16	22.25	40.88	31.97	56.00	46.00	-15.12	-14.03
4	2.77347	9.73	32.73	24.19	42.46	33.92	56.00	46.00	-13.54	-12.08
5	3.44923	9.74	35.79	27.36	45.53	37.10	56.00	46.00	-10.47	-8.90
6	3.89064	9.75	36.90	28.52	46.65	38.27	56.00	46.00	-9.35	-7.73
7	4.77736	9.77	38.79	30.61	48.56	40.38	56.00	46.00	-7.44	-5.62
8	5.67576	9.79	40.15	31.99	49.94	41.78	60.00	50.00	-10.06	-8.22
9	6.11326	9.80	40.38	32.56	50.18	42.36	60.00	50.00	-9.82	-7.64
10	7.46877	9.83	37.36	29.47	47.19	39.30	60.00	50.00	-12.81	-10.70
11	9.40623	9.87	33.96	24.16	43.83	34.03	60.00	50.00	-16.17	-15.97
12	12.99606	9.89	27.99	18.35	37.88	28.24	60.00	50.00	-22.12	-21.76

**REMARKS:**

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





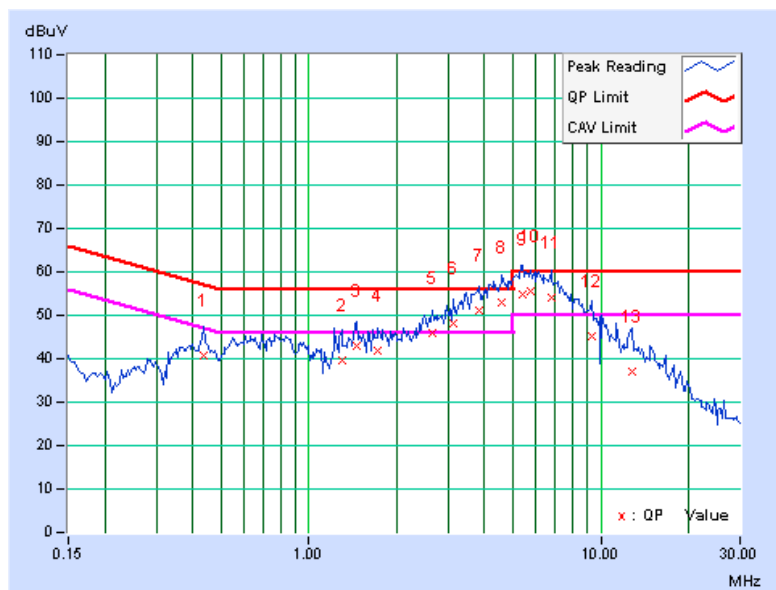
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<b>PHASE</b>	Neutral (N)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin [dB]	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.43513	9.74	31.17	23.86	40.91	33.60	57.15
2	1.29689	9.76	29.96	20.74	39.72	30.50	56.00	46.00	-16.28	-15.50
3	1.44921	9.76	33.26	25.38	43.02	35.14	56.00	46.00	-12.98	-10.86
4	1.73046	9.76	31.97	22.45	41.73	32.21	56.00	46.00	-14.27	-13.79
5	2.63284	9.78	36.17	25.38	45.95	35.16	56.00	46.00	-10.05	-10.84
6	3.11717	9.79	38.31	27.36	48.10	37.15	56.00	46.00	-7.90	-8.85
7	3.82814	9.80	41.49	30.88	51.29	40.68	56.00	46.00	-4.71	-5.32
8	4.57815	9.82	43.14	32.17	52.96	41.99	56.00	46.00	-3.04	-4.01
9	5.40235	9.84	45.13	33.86	54.97	43.70	60.00	50.00	-5.03	-6.30
10	5.76952	9.86	45.87	34.26	55.73	44.12	60.00	50.00	-4.27	-5.88
11	6.76956	9.89	44.31	33.03	54.20	42.92	60.00	50.00	-5.80	-7.08
12	9.26564	9.97	35.29	25.73	45.26	35.70	60.00	50.00	-14.74	-14.30
13	12.84768	10.04	27.16	15.79	37.20	25.83	60.00	50.00	-22.80	-24.17

**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.







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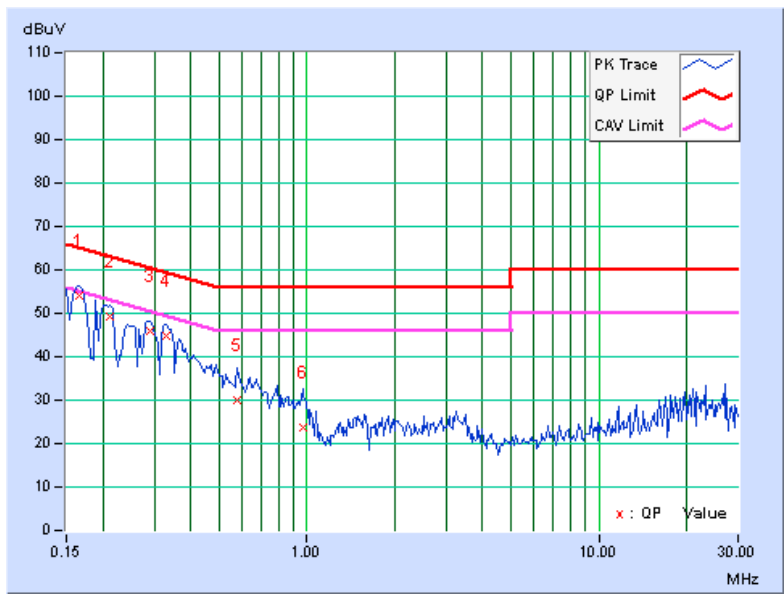
4.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.09	54.08	46.02	54.17	46.11	65.18	55.18	-11.00	-9.06
2	0.21250	0.11	48.98	38.18	49.09	38.29	63.11	53.11	-14.01	-14.81
3	0.29063	0.13	45.74	35.30	45.87	35.43	60.51	50.51	-14.63	-15.07
4	0.32969	0.14	44.50	34.18	44.64	34.32	59.46	49.46	-14.82	-15.14
5	0.57969	0.17	29.72	18.10	29.89	18.27	56.00	46.00	-26.11	-27.73
6	0.97031	0.21	23.50	11.24	23.71	11.45	56.00	46.00	-32.29	-34.55

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.

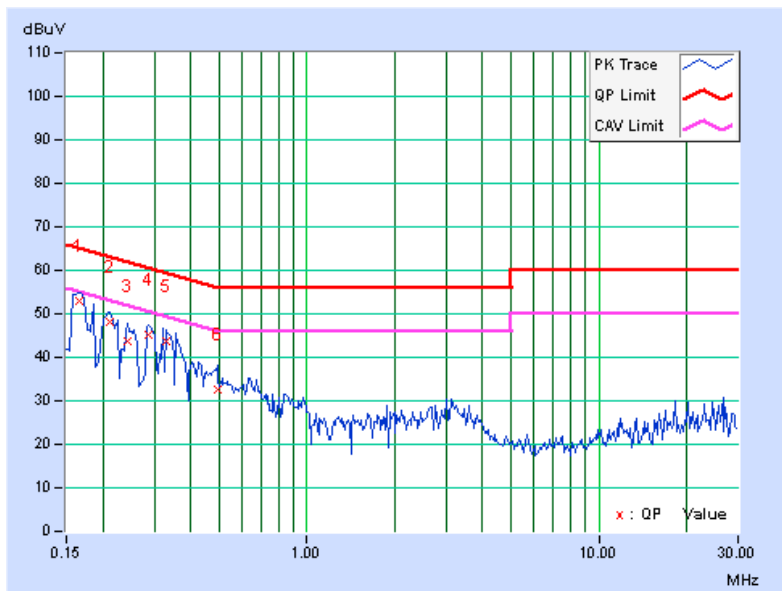


<b>PHASE</b>	Neutral (N)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		[dB]	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.09	52.90	44.60	52.99	44.69	65.18	55.18	-12.18	-10.48
2	0.21250	0.11	47.98	36.90	48.09	37.01	63.11	53.11	-15.01	-16.09
3	0.24375	0.12	43.40	31.10	43.52	31.22	61.97	51.97	-18.45	-20.75
4	0.28672	0.13	45.08	32.20	45.21	32.33	60.62	50.62	-15.41	-18.29
5	0.32969	0.14	43.56	31.76	43.70	31.90	59.46	49.46	-15.76	-17.56
6	0.49375	0.16	32.34	20.94	32.50	21.10	56.10	46.10	-23.60	-25.00

**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.



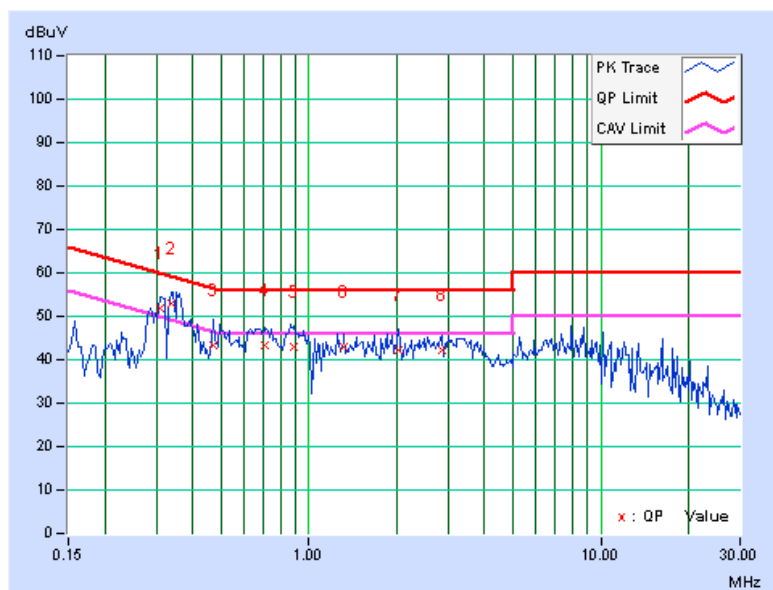
#### 4.1.10 TEST RESULTS (MODE 4)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.31016	0.14	51.62	45.38	51.76	45.52	59.97	49.97	-8.21	-4.45
<b>2</b>	<b>0.33750</b>	<b>0.14</b>	<b>52.86</b>	<b>46.40</b>	<b>53.00</b>	<b>46.54</b>	<b>59.26</b>	<b>49.26</b>	<b>-6.26</b>	<b>-2.72</b>
3	0.47031	0.17	43.22	34.76	43.39	34.93	56.51	46.51	-13.12	-11.58
4	0.70859	0.19	43.26	33.32	43.45	33.51	56.00	46.00	-12.55	-12.49
5	0.88828	0.20	42.94	33.00	43.14	33.20	56.00	46.00	-12.86	-12.80
6	1.32422	0.23	42.62	33.66	42.85	33.89	56.00	46.00	-13.15	-12.11
7	2.03906	0.27	41.98	31.48	42.25	31.75	56.00	46.00	-13.75	-14.25
8	2.85547	0.32	41.74	32.72	42.06	33.04	56.00	46.00	-13.94	-12.96

**REMARKS:**

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

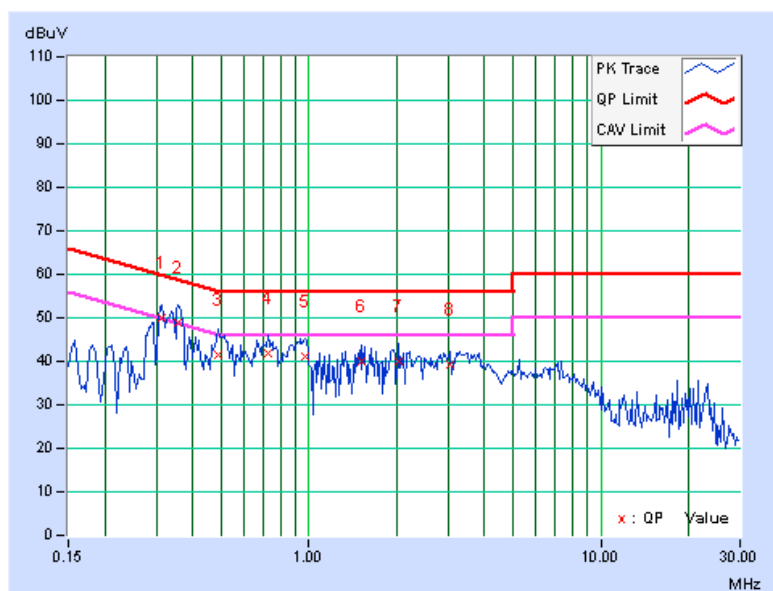


<b>PHASE</b>	Neutral (N)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.31406	0.14	49.96	43.70	50.10	43.84	59.86	49.86	-9.76	-6.02
2	0.35703	0.15	48.84	39.62	48.99	39.77	58.80	48.80	-9.81	-9.03
3	0.48594	0.16	41.44	33.30	41.60	33.46	56.24	46.24	-14.63	-12.77
4	0.72422	0.18	41.56	33.90	41.74	34.08	56.00	46.00	-14.26	-11.92
5	0.96641	0.19	40.92	30.78	41.11	30.97	56.00	46.00	-14.89	-15.03
6	1.51953	0.22	39.88	31.18	40.10	31.40	56.00	46.00	-15.90	-14.60
7	2.03125	0.25	39.60	29.84	39.85	30.09	56.00	46.00	-16.15	-15.91
8	3.03125	0.30	39.12	30.36	39.42	30.66	56.00	46.00	-16.58	-15.34

**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.



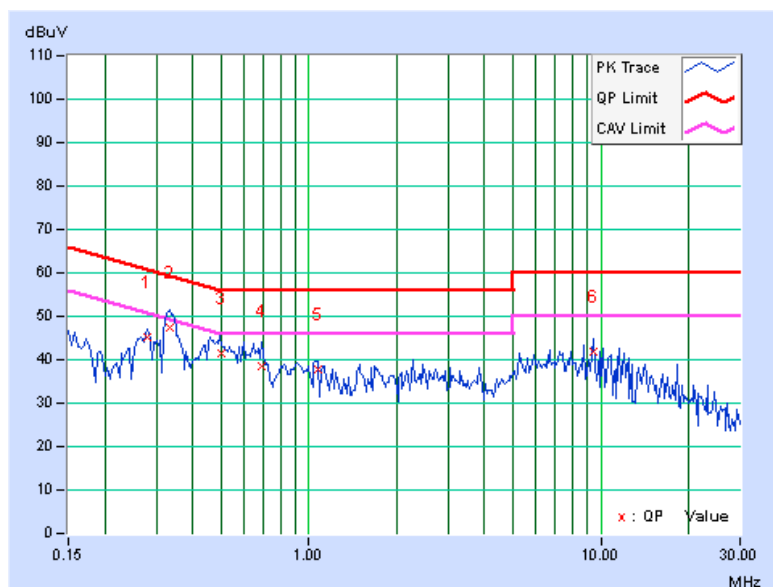
#### 4.1.11 TEST RESULTS (MODE 5)

<b>PHASE</b>	Line (L)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.27891	0.13	45.22	39.52	45.35	39.65	60.85	50.85	-15.50	-11.20
2	0.33359	0.14	47.18	33.74	47.32	33.88	59.36	49.36	-12.04	-15.48
3	0.50000	0.17	41.18	32.06	41.35	32.23	56.00	46.00	-14.65	-13.77
4	0.68906	0.18	38.42	30.66	38.60	30.84	56.00	46.00	-17.40	-15.16
5	1.07031	0.21	37.66	28.66	37.87	28.87	56.00	46.00	-18.13	-17.13
6	9.38672	0.71	41.20	35.72	41.91	36.43	60.00	50.00	-18.09	-13.57

#### 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.

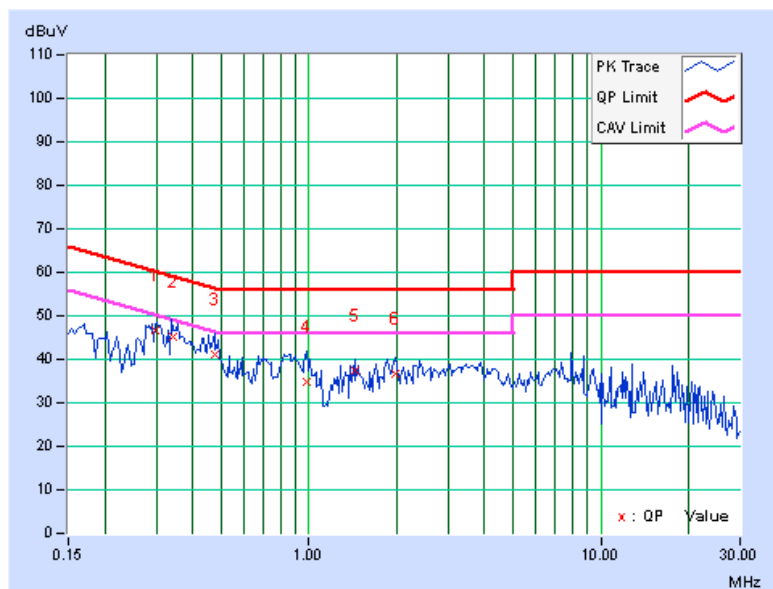


<b>PHASE</b>	Neutral (N)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.29844	0.13	46.46	39.54	46.59	39.67	60.29	50.29	-13.69	-10.61
2	0.34425	0.15	44.98	39.80	45.13	39.95	59.10	49.10	-13.97	-9.15
3	0.47422	0.16	40.86	34.68	41.02	34.84	56.44	46.44	-15.42	-11.60
4	0.97813	0.19	34.54	25.24	34.73	25.43	56.00	46.00	-21.27	-20.57
5	1.44141	0.22	37.04	29.68	37.26	29.90	56.00	46.00	-18.74	-16.10
6	1.98047	0.25	36.44	27.72	36.69	27.97	56.00	46.00	-19.31	-18.03

**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.



## 4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

### 4.2.1 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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#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Sep. 03, 2012	Sep. 02, 2013
Pre-Selector Agilent	N9039A	MY46520310	Sep. 03, 2012	Sep. 02, 2013
Signal Generator Agilent	N5181A	MY49060347	July 24, 2012	July 23, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 27, 2012	Nov. 26, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 26, 2012	Dec. 25, 2013
RF Cable	NA	CHHCAB_001	Oct. 07, 2012	Oct. 06, 2013
Software	ADT_Radiated_V8.7.05	NA	NA	NA
Antenna Tower & Turn Table CT	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
- 5 The CANADA Site Registration No. is IC 7450H-3.
- 6 Tested Date: Jan. 16, 2013



#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

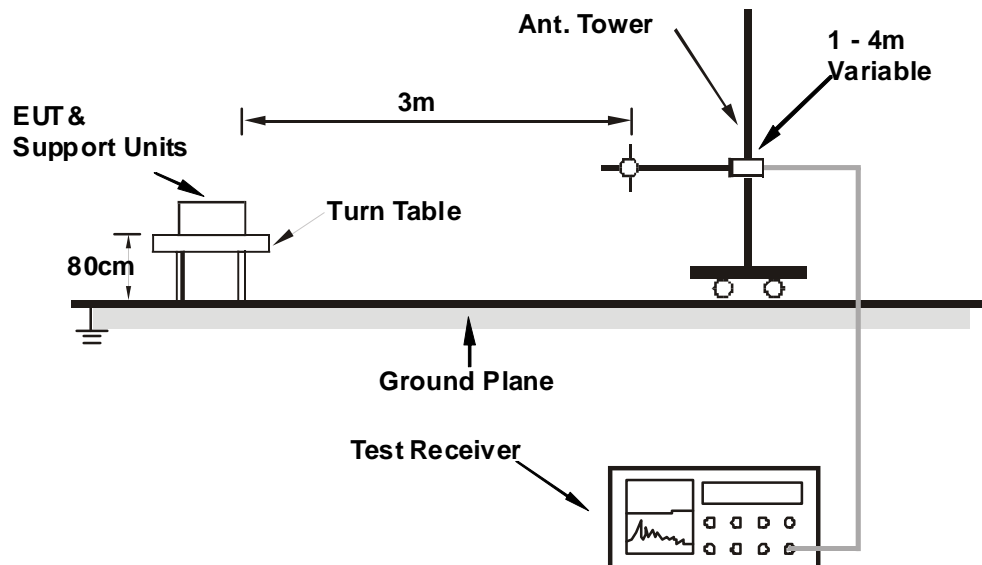
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. 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



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

### BELOW 1GHz WORST-CASE DATA

#### 802.11n (HT20)

<b>CHANNEL</b>	TX Channel 6	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	Below 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	143.33	33.4 QP	43.5	-10.1	2.00 H	253	19.07	14.31
2	250.03	34.2 QP	46.0	-11.8	1.00 H	287	20.87	13.30
3	300.00	30.0 QP	46.0	-16.0	1.00 H	49	14.66	15.30
4	399.95	35.5 QP	46.0	-10.5	1.00 H	129	17.78	17.70
5	599.97	34.1 QP	46.0	-11.9	1.50 H	181	11.90	22.22
6	899.93	37.6 QP	46.0	-8.4	2.00 H	211	10.52	27.04

#### 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	143.33	33.0 QP	43.5	-10.5	1.00 V	71	18.66	14.31
2	250.03	29.1 QP	46.0	-16.9	1.00 V	78	15.78	13.30
3	374.97	33.5 QP	46.0	-12.5	1.00 V	0	16.39	17.08
4	500.02	42.5 QP	46.0	-3.6	1.00 V	279	22.41	20.04
5	599.97	32.4 QP	46.0	-13.6	1.00 V	35	10.17	22.22
6	899.93	35.5 QP	46.0	-10.6	1.50 V	185	8.41	27.04

#### 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	57.0 PK	74.0	-17.0	1.00 H	245	25.79	31.21
2	2390.00	45.3 AV	54.0	-8.7	1.00 H	245	14.09	31.21
3	*2412.00	107.1 PK			1.00 H	244	75.83	31.27
4	*2412.00	104.6 AV			1.00 H	244	73.33	31.27
5	4824.00	51.3 PK	74.0	-22.7	1.51 H	141	11.88	39.42
6	4824.00	47.9 AV	54.0	-6.1	1.51 H	141	8.48	39.42

**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	59.3 PK	74.0	-14.7	1.00 V	113	28.09	31.21
2	2390.00	47.8 AV	54.0	-6.2	1.00 V	113	16.59	31.21
3	*2412.00	111.1 PK			1.01 V	115	79.83	31.27
4	*2412.00	108.7 AV			1.01 V	115	77.43	31.27
5	4824.00	53.2 PK	74.0	-20.8	1.20 V	2	13.78	39.42
6	4824.00	50.8 AV	54.0	-3.2	1.20 V	2	11.38	39.42

**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	102.6 PK			1.24 H	80	71.26	31.34
2	*2437.00	100.0 AV			1.24 H	80	68.66	31.34
3	4874.00	50.9 PK	74.0	-23.1	1.49 H	131	11.28	39.62
4	4874.00	47.4 AV	54.0	-6.6	1.49 H	131	7.78	39.62
5	7311.00	51.5 PK	74.0	-22.5	1.17 H	40	7.40	44.10
6	7311.00	43.9 AV	54.0	-10.1	1.17 H	40	-0.20	44.10

**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	*2437.00	111.2 PK			1.02 V	113	79.86	31.34
2	*2437.00	108.7 AV			1.02 V	113	77.36	31.34
3	4874.00	54.3 PK	74.0	-19.7	1.32 V	8	14.68	39.62
4	4874.00	52.1 AV	54.0	-1.9	1.32 V	8	12.48	39.62
5	7311.00	54.2 PK	74.0	-19.8	1.56 V	348	10.10	44.10
6	7311.00	48.8 AV	54.0	-5.2	1.56 V	348	4.70	44.10

**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).
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	104.8 PK			1.00 H	246	73.40	31.40
2	*2462.00	102.4 AV			1.00 H	246	71.00	31.40
3	2483.50	57.3 PK	74.0	-16.7	1.00 H	245	25.84	31.46
4	2483.50	45.6 AV	54.0	-8.4	1.00 H	245	14.14	31.46
5	4924.00	51.5 PK	74.0	-22.5	1.45 H	320	11.68	39.82
6	4924.00	48.0 AV	54.0	-6.0	1.45 H	320	8.18	39.82
7	7386.00	51.1 PK	74.0	-22.9	1.53 H	40	6.92	44.18
8	7386.00	39.9 AV	54.0	-14.1	1.53 H	40	-4.28	44.18

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	110.7 PK			1.02 V	112	79.30	31.40
2	*2462.00	108.0 AV			1.02 V	112	76.60	31.40
3	2483.50	60.2 PK	74.0	-13.8	1.02 V	112	28.74	31.46
4	2483.50	48.5 AV	54.0	-5.5	1.02 V	112	17.04	31.46
5	4924.00	55.3 PK	74.0	-18.7	1.33 V	14	15.48	39.82
6	4924.00	53.0 AV	54.0	-1.0	1.33 V	14	13.18	39.82
7	7386.00	52.9 PK	74.0	-21.1	1.45 V	246	8.72	44.18
8	7386.00	46.4 AV	54.0	-7.6	1.45 V	246	2.22	44.18

**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.

**802.11g**

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

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.8 PK	74.0	-16.2	1.29 H	14	26.59	31.21
2	2390.00	46.0 AV	54.0	-8.0	1.29 H	14	14.79	31.21
3	*2412.00	106.5 PK			1.00 H	245	75.23	31.27
4	*2412.00	94.8 AV			1.00 H	245	63.53	31.27
5	4824.00	54.3 PK	74.0	-19.7	1.00 H	68	14.88	39.42
6	4824.00	41.1 AV	54.0	-12.9	1.00 H	68	1.68	39.42
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	68.9 PK	74.0	-5.1	1.00 V	115	37.69	31.21
2	2390.00	52.6 AV	54.0	-1.4	1.00 V	115	21.39	31.21
3	*2412.00	110.5 PK			1.00 V	114	79.23	31.27
4	*2412.00	99.2 AV			1.00 V	114	67.93	31.27
5	4824.00	54.4 PK	74.0	-19.6	1.00 V	338	14.98	39.42
6	4824.00	41.2 AV	54.0	-12.8	1.00 V	338	1.78	39.42

**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	110.2 PK			1.00 H	247	78.86	31.34
2	*2437.00	98.6 AV			1.00 H	247	67.26	31.34
3	4874.00	47.3 PK	74.0	-26.7	1.17 H	65	7.68	39.62
4	4874.00	35.4 AV	54.0	-18.6	1.17 H	65	-4.22	39.62
5	7311.00	53.8 PK	74.0	-20.2	1.17 H	41	9.70	44.10
6	7311.00	40.5 AV	54.0	-13.5	1.17 H	41	-3.60	44.10

**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	*2437.00	115.3 PK			1.00 V	113	83.96	31.34
2	*2437.00	102.7 AV			1.00 V	113	71.36	31.34
3	4874.00	52.0 PK	74.0	-22.0	1.17 V	9	12.38	39.62
4	4874.00	38.6 AV	54.0	-15.4	1.17 V	9	-1.02	39.62
5	7311.00	58.3 PK	74.0	-15.7	1.56 V	335	14.20	44.10
6	7311.00	43.8 AV	54.0	-10.2	1.56 V	335	-0.30	44.10

**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).
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	104.9 PK			1.00 H	247	73.50	31.40
2	*2462.00	93.5 AV			1.00 H	247	62.10	31.40
3	2483.50	64.0 PK	74.0	-10.0	1.00 H	248	32.54	31.46
4	2483.50	47.2 AV	54.0	-6.8	1.00 H	248	15.74	31.46
5	4924.00	54.1 PK	74.0	-19.9	1.02 H	55	14.28	39.82
6	4924.00	41.1 AV	54.0	-12.9	1.02 H	55	1.28	39.82
7	7386.00	53.8 PK	74.0	-20.2	1.02 H	12	9.62	44.18
8	7386.00	41.8 AV	54.0	-12.2	1.02 H	12	-2.38	44.18

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	111.1 PK			1.02 V	113	79.70	31.40
2	*2462.00	98.3 AV			1.02 V	113	66.90	31.40
3	2483.50	72.0 PK	74.0	-2.0	1.02 V	113	40.54	31.46
4	2483.50	52.5 AV	54.0	-1.5	1.02 V	113	21.04	31.46
5	4924.00	54.5 PK	74.0	-19.5	1.02 V	330	14.68	39.82
6	4924.00	41.3 AV	54.0	-12.7	1.02 V	330	1.48	39.82
7	7386.00	52.7 PK	74.0	-21.3	1.00 V	215	8.52	44.18
8	7386.00	41.9 AV	54.0	-12.1	1.00 V	215	-2.28	44.18

**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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802.11n (HT20)

<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	2389.00	64.8 PK	74.0	-9.2	1.38 H	16	33.59	31.21
2	2389.00	47.3 AV	54.0	-6.7	1.38 H	16	16.09	31.21
3	*2412.00	104.9 PK			1.42 H	16	73.63	31.27
4	*2412.00	93.7 AV			1.42 H	16	62.43	31.27
5	4824.00	53.7 PK	74.0	-20.3	1.00 H	69	14.28	39.42
6	4824.00	40.5 AV	54.0	-13.5	1.00 H	69	1.08	39.42

**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	69.6 PK	74.0	-4.4	1.00 V	114	38.39	31.21
2	2390.00	53.1 AV	54.0	-0.9	1.00 V	114	21.89	31.21
3	*2412.00	109.4 PK			1.00 V	114	78.13	31.27
4	*2412.00	97.8 AV			1.00 V	114	66.53	31.27
5	4824.00	53.6 PK	74.0	-20.4	1.00 V	35	14.18	39.42
6	4824.00	41.1 AV	54.0	-12.9	1.00 V	35	1.68	39.42

**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 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	113.5 PK			1.00 H	248	82.16	31.34
2	*2437.00	102.4 AV			1.00 H	248	71.06	31.34
3	4874.00	49.5 PK	74.0	-24.5	1.63 H	333	9.88	39.62
4	4874.00	37.4 AV	54.0	-16.6	1.63 H	333	-2.22	39.62
5	7311.00	52.7 PK	74.0	-21.3	1.18 H	40	8.60	44.10
6	7311.00	39.7 AV	54.0	-14.3	1.18 H	40	-4.40	44.10

**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	*2437.00	113.7 PK			1.00 V	279	82.36	31.34
2	*2437.00	102.7 AV			1.00 V	279	71.36	31.34
3	4874.00	54.7 PK	74.0	-19.3	1.16 V	12	15.08	39.62
4	4874.00	41.4 AV	54.0	-12.6	1.16 V	12	1.78	39.62
5	7311.00	55.8 PK	74.0	-18.2	1.70 V	16	11.70	44.10
6	7311.00	41.5 AV	54.0	-12.5	1.70 V	16	-2.60	44.10

**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).
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 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	102.9 PK			1.32 H	9	71.50	31.40
2	*2462.00	90.2 AV			1.32 H	9	58.80	31.40
3	2483.90	66.5 PK	74.0	-7.5	1.32 H	13	35.04	31.46
4	2483.90	46.1 AV	54.0	-7.9	1.32 H	13	14.64	31.46
5	4924.00	53.6 PK	74.0	-20.4	1.06 H	83	13.78	39.82
6	4924.00	40.7 AV	54.0	-13.3	1.06 H	83	0.88	39.82
7	7386.00	54.1 PK	74.0	-19.9	1.05 H	22	9.92	44.18
8	7386.00	41.9 AV	54.0	-12.1	1.05 H	22	-2.28	44.18

**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	109.6 PK			1.04 V	114	78.20	31.40
2	*2462.00	99.1 AV			1.04 V	114	67.70	31.40
3	2483.50	71.4 PK	74.0	-2.6	1.04 V	111	39.94	31.46
4	2483.50	52.4 AV	54.0	-1.6	1.04 V	111	20.94	31.46
5	4924.00	53.3 PK	74.0	-20.7	1.00 V	48	13.48	39.82
6	4924.00	41.0 AV	54.0	-13.0	1.00 V	48	1.18	39.82
7	7386.00	52.7 PK	74.0	-21.3	1.00 V	203	8.52	44.18
8	7386.00	42.0 AV	54.0	-12.0	1.00 V	203	-2.18	44.18

**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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802.11n (HT40)

<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	2388.50	65.5 PK	74.0	-8.5	1.29 H	166	34.29	31.21
2	2388.50	49.2 AV	54.0	-4.8	1.29 H	166	17.99	31.21
3	*2422.00	99.3 PK			1.29 H	166	68.00	31.30
4	*2422.00	88.0 AV			1.29 H	166	56.70	31.30
5	4844.00	53.4 PK	74.0	-20.6	1.02 H	88	13.90	39.50
6	4844.00	40.6 AV	54.0	-13.4	1.02 H	88	1.10	39.50
7	7266.00	53.8 PK	74.0	-20.2	1.01 H	11	9.74	44.06
8	7266.00	41.7 AV	54.0	-12.3	1.01 H	11	-2.36	44.06

**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	2389.07	65.2 PK	74.0	-8.8	1.06 V	81	33.99	31.21
2	2389.07	53.2 AV	54.0	-0.8	1.06 V	81	21.99	31.21
3	*2422.00	104.9 PK			1.06 V	81	73.60	31.30
4	*2422.00	93.3 AV			1.06 V	81	62.00	31.30
5	4844.00	53.3 PK	74.0	-20.7	1.02 V	58	13.80	39.50
6	4844.00	40.9 AV	54.0	-13.1	1.02 V	58	1.40	39.50
7	7266.00	52.5 PK	74.0	-21.5	1.01 V	201	8.44	44.06
8	7266.00	42.0 AV	54.0	-12.0	1.01 V	201	-2.06	44.06

**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 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	2390.00	72.9 PK	74.0	-1.1	1.00 H	294	41.69	31.21
2	2390.00	52.7 AV	54.0	-1.3	1.00 H	294	21.49	31.21
3	*2437.00	108.1 PK			1.00 H	291	76.76	31.34
4	*2437.00	93.7 AV			1.00 H	291	62.36	31.34
5	2483.50	69.5 PK	74.0	-4.5	1.00 H	296	38.04	31.46
6	2483.50	51.8 AV	54.0	-2.2	1.00 H	296	20.34	31.46
7	4874.00	53.3 PK	74.0	-20.7	1.01 H	89	13.68	39.62
8	4874.00	40.8 AV	54.0	-13.2	1.01 H	89	1.18	39.62
9	7311.00	53.8 PK	74.0	-20.2	1.03 H	4	9.70	44.10
10	7311.00	41.9 AV	54.0	-12.1	1.03 H	4	-2.20	44.10

**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	2390.00	73.5 PK	74.0	-0.5	1.04 V	81	42.29	31.21
2	2390.00	52.8 AV	54.0	-1.2	1.04 V	81	21.59	31.21
3	*2437.00	107.4 PK			1.04 V	81	76.06	31.34
4	*2437.00	96.3 AV			1.04 V	81	64.96	31.34
5	2483.50	72.8 PK	74.0	-1.2	1.00 V	112	41.34	31.46
6	2483.50	52.4 AV	54.0	-1.6	1.00 V	112	20.94	31.46
7	4874.00	53.7 PK	74.0	-20.3	1.00 V	49	14.08	39.62
8	4874.00	41.1 AV	54.0	-12.9	1.00 V	49	1.48	39.62
9	7311.00	52.4 PK	74.0	-21.6	1.05 V	214	8.30	44.10
10	7311.00	42.1 AV	54.0	-11.9	1.05 V	214	-2.00	44.10

**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).
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	98.6 PK			1.00 H	293	67.22	31.38
2	*2452.00	87.3 AV			1.00 H	293	55.92	31.38
3	2484.90	61.8 PK	74.0	-12.2	1.00 H	293	30.34	31.46
4	2484.90	47.2 AV	54.0	-6.8	1.00 H	293	15.74	31.46
5	4904.00	54.2 PK	74.0	-19.8	1.06 H	10	14.46	39.74
6	4904.00	42.2 AV	54.0	-11.8	1.06 H	10	2.46	39.74
7	7356.00	53.7 PK	74.0	-20.3	1.09 H	11	9.55	44.15
8	7356.00	41.9 AV	54.0	-12.1	1.09 H	11	-2.25	44.15

**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	105.9 PK			1.01 V	112	74.52	31.38
2	*2452.00	94.3 AV			1.01 V	112	62.92	31.38
3	2484.40	71.3 PK	74.0	-2.7	1.01 V	112	39.84	31.46
4	2484.40	53.2 AV	54.0	-0.8	1.01 V	112	21.74	31.46
5	4904.00	52.5 PK	74.0	-21.5	1.08 V	217	12.76	39.74
6	4904.00	42.3 AV	54.0	-11.7	1.08 V	217	2.56	39.74
7	7356.00	52.5 PK	74.0	-21.5	1.08 V	227	8.35	44.15
8	7356.00	42.2 AV	54.0	-11.8	1.08 V	227	-1.95	44.15

**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.

### 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100060	May 09, 2012	May 10, 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. Tested date : Jan. 16, 2013

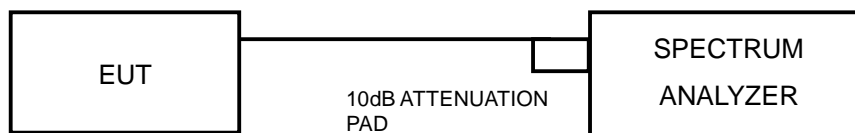
#### 4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. 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

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 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

##### 802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.38	0.5	PASS
6	2437	8.41	0.5	PASS
11	2462	8.38	0.5	PASS

##### 802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.51	0.5	PASS
6	2437	16.50	0.5	PASS
11	2462	16.57	0.5	PASS

##### 802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.72	0.5	PASS
6	2437	17.69	0.5	PASS
11	2462	17.72	0.5	PASS

##### 802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	36.17	0.5	PASS
6	2437	36.07	0.5	PASS
9	2452	36.15	0.5	PASS

## 4.4 CONDUCTED OUTPUT POWER MEASUREMENT

### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 10, 2012	May 09, 2013
Peak Power Sensor	MA2411B	0738172	May 10, 2012	May 09, 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. Tested date : Jan. 16, 2013

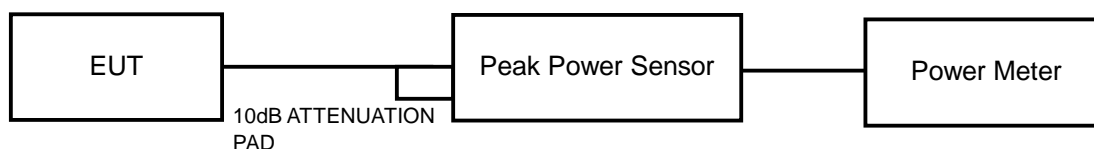
### 4.4.3 TEST PROCEDURES

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.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.4.5 TEST SETUP



### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



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#### 4.4.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	141.254	21.5	30	PASS
6	2437	144.544	21.6	30	PASS
11	2462	125.893	21.0	30	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	112.202	20.5	30	PASS
6	2437	234.423	23.7	30	PASS
11	2462	125.893	21.0	30	PASS

##### 802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	104.713	20.2	30	PASS
6	2437	223.872	23.5	30	PASS
11	2462	93.325	19.7	30	PASS

##### 802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
3	2422	56.234	17.5	30	PASS
6	2437	77.625	18.9	30	PASS
9	2452	66.069	18.2	30	PASS



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## 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100060	May 09, 2012	May 10, 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. Tested date : Jan. 16, 2013

### 4.5.3 TEST PROCEDURE

1. Set the RBW = 3 kHz, VBW =10 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum amplitude level.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.5.5 TEST SETUP



### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



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#### 4.5.7 TEST RESULTS

##### 802.11b

Channel	FREQUENCY (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-5.14	8	PASS
6	2437	-4.16	8	PASS
11	2462	-4.51	8	PASS

##### 802.11g

Channel	FREQUENCY (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-13.02	8	PASS
6	2437	-8.54	8	PASS
11	2462	-11.32	8	PASS

##### 802.11n (HT20)

Channel	FREQUENCY (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.10	8	PASS
6	2437	-7.86	8	PASS
11	2462	-13.34	8	PASS

##### 802.11n (HT40)

Channel	FREQUENCY (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
3	2422	-19.09	8	PASS
6	2437	-13.87	8	PASS
9	2452	-18.08	8	PASS



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## 4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100060	May 09, 2012	May 10, 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. Tested date : Jan. 16, 2013

### 4.6.3 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.

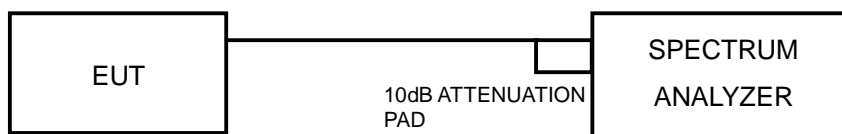
## MEASUREMENT PROCEDURE OOB

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

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 TEST SETUP



### 4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

### 4.6.7 TEST RESULTS

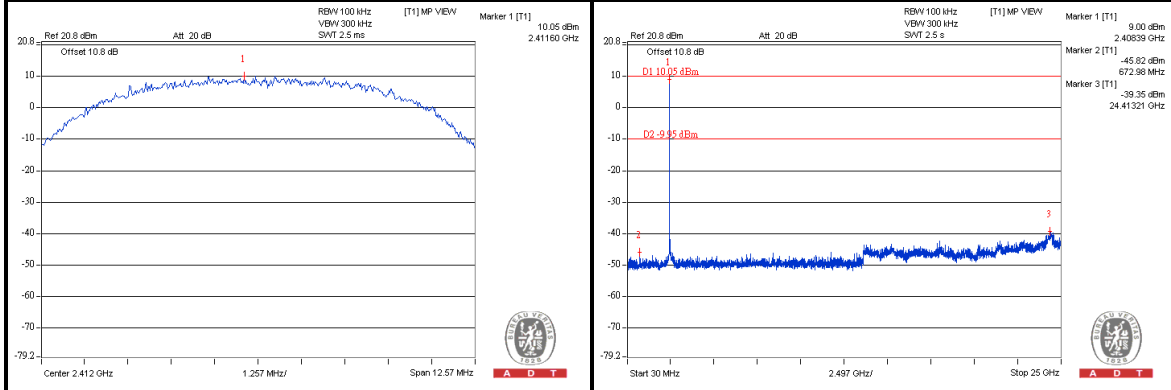
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



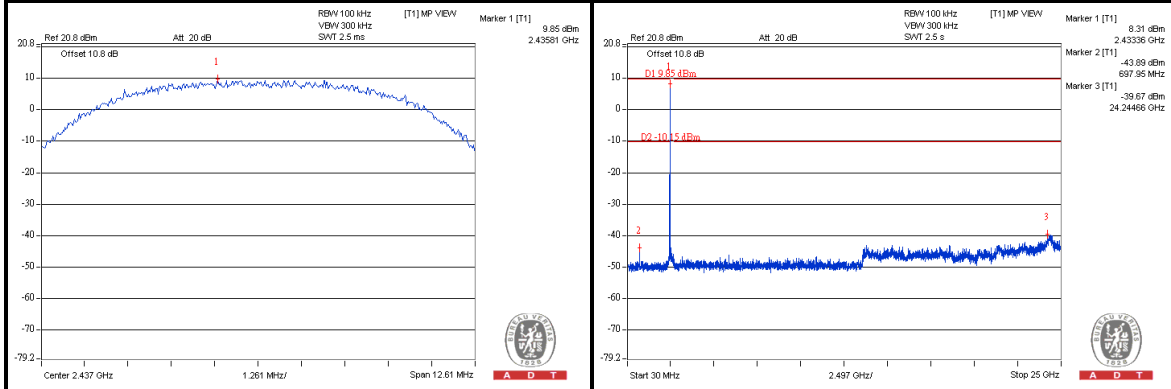
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### 802.11b

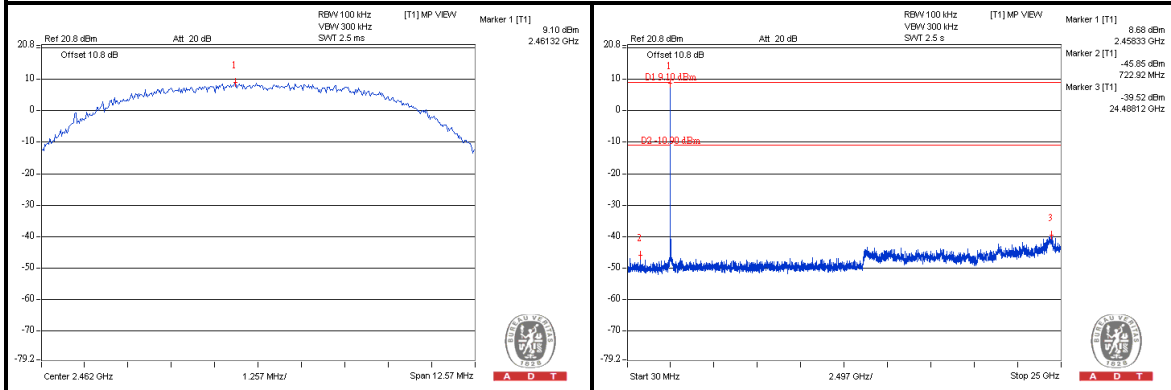
#### CH 1



#### CH 6



#### CH 11



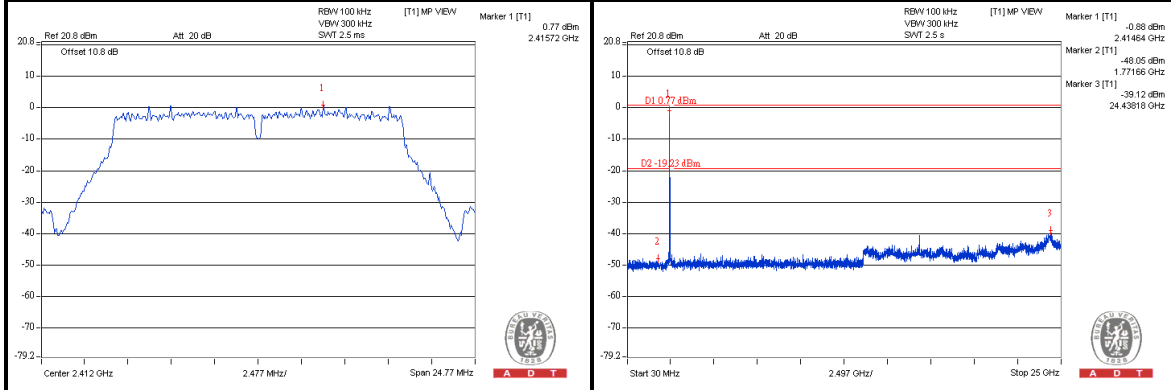




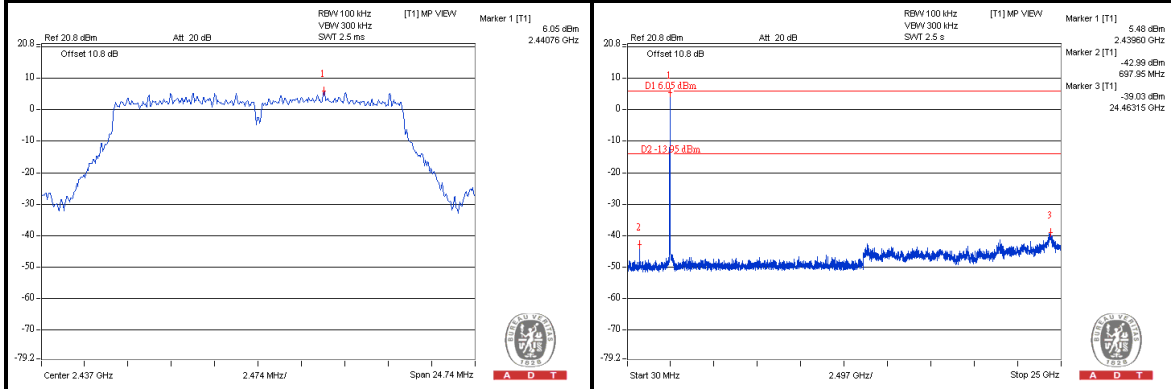
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### 802.11g

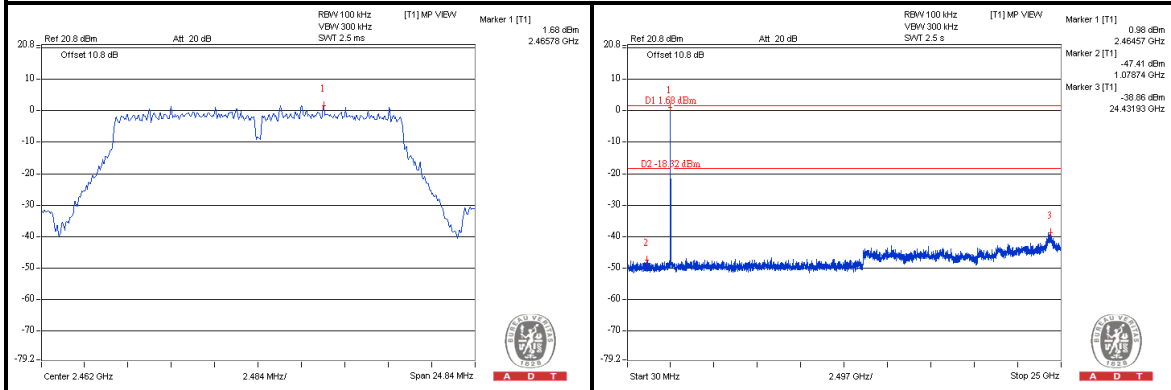
#### CH 1



#### CH 6



#### CH 11

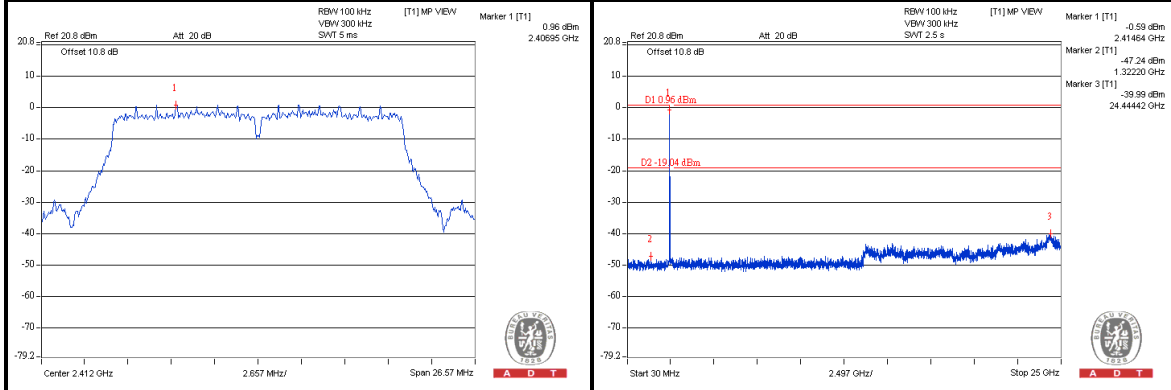




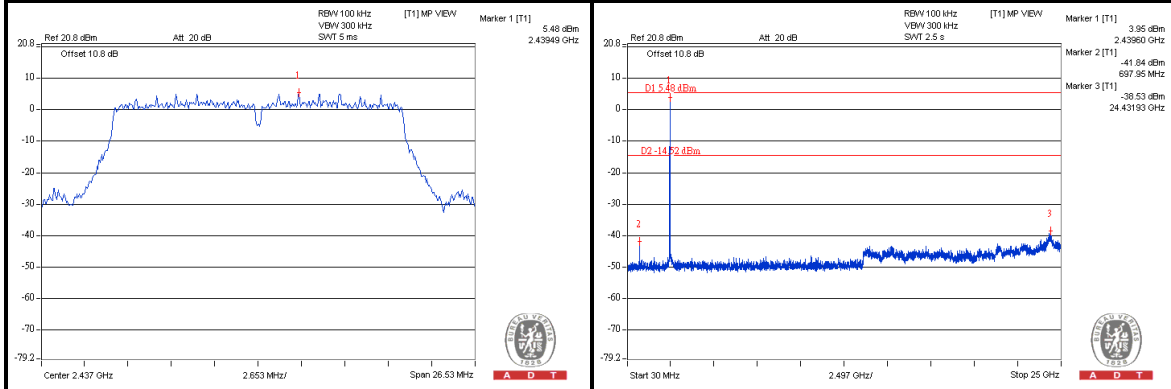
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### 802.11n (HT20)

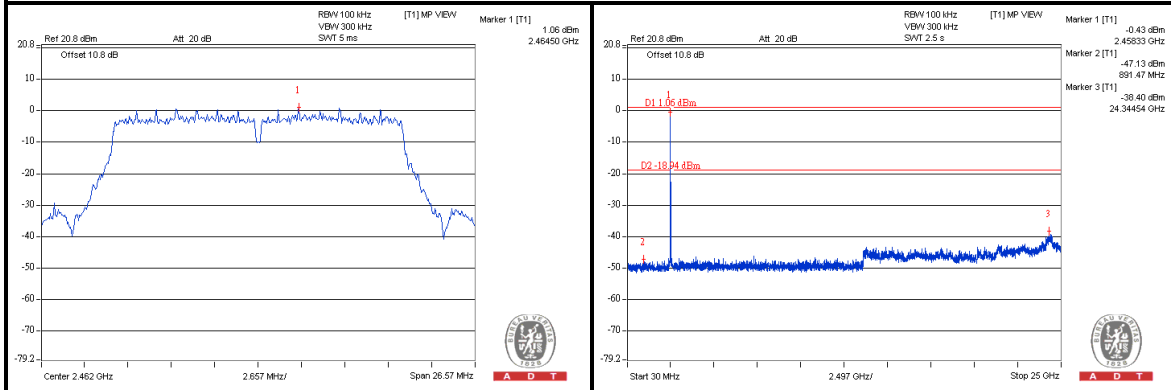
#### CH 1



#### CH 6



#### CH 11

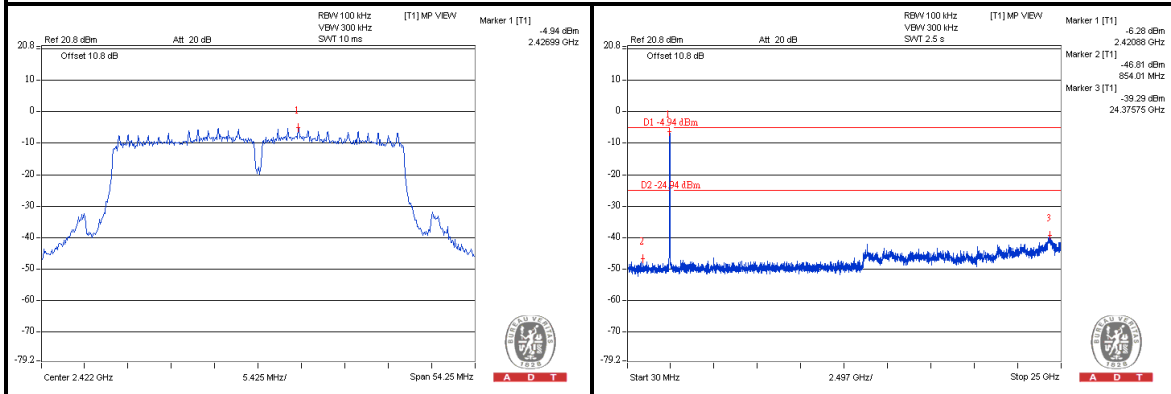




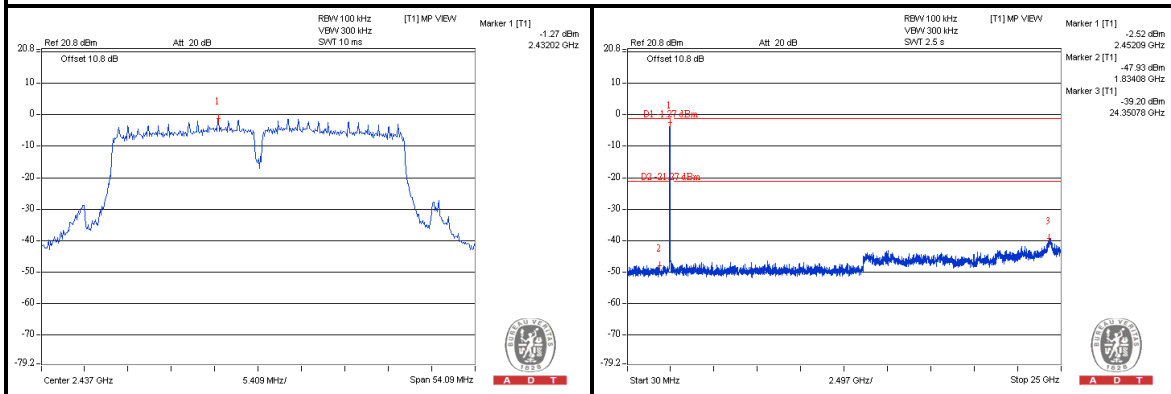
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### 802.11n (HT40)

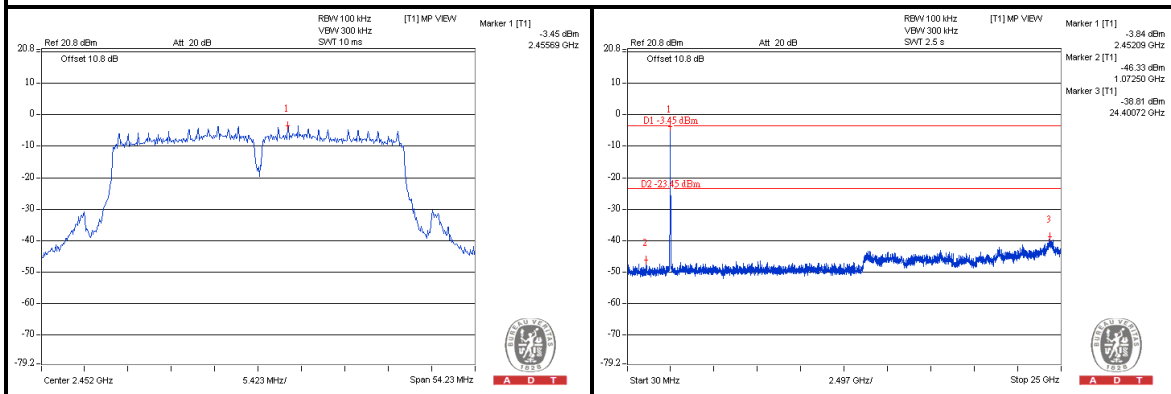
#### CH 3



#### CH 6



#### CH 9



## 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:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

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

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

--- END ---