

FCC TEST REPORT (15.247)

REPORT NO.: RF120524E01

MODEL NO.: WNDAP620

FCC ID: PY312200202

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TESTED: May 25 to 31, 2012

ISSUED: June 20, 2012

APPLICANT: Netgear Incorporated.

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ISSUED BY: Bureau Veritas Consumer Products Services
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120524E01	Original release	June 20, 2012

1. CERTIFICATION

PRODUCT: ProSafe 3x3 Single Radio, Dual Band Wireless-N Access Point

BRAND NAME: Netgear

MODEL NO.: WNDAP620

TEST SAMPLE: ENGINEERING SAMPLE

APPLICANT: Netgear Incorporated.

TESTED: May 25 to 31, 2012

STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (Model: WNDAP620) 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:** June 20, 2012
(Lori Chung, Specialist)

APPROVED BY :  , **DATE:** June 20, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

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 -3.84dB at 25.75453MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 4824.00MHz & 2381.00MHz
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	Antenna connector is SMA Plug Reverse not a standard connector.

For 5GHz, 5725~5850MHz Band

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 -3.90dB at 25.75781MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 5440.00MHz
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.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.25GHz RF parameters was recorded in another test report.

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	ProSafe 3x3 Single Radio, Dual Band Wireless-N Access Point
MODEL NO.	WNDAP620
POWER SUPPLY	DC 12V from power adapter or DC 56V from POE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps
OPERATING FREQUENCY	For 15.407 802.11a: 5.18 ~ 5.24GHz
	For 15.247 802.11b/g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) For 15.247 (5GHz) 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)

MAXIMUM OUTPUT POWER	For 15.407 802.11a: 14.556mW 802.11n (20MHz): 37.716mW 802.11n (40MHz): 45.508mW For 15.247 (2.4GHz) 802.11b: 163.681mW 802.11g: 587.684mW 802.11n (20MHz): 450.335mW 802.11n (40MHz): 384.450mW For 15.247 (5GHz) 802.11a: 100.739mW 802.11n (20MHz): 102.721mW 802.11n (40MHz): 92.000mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	Console cable (unshielded, 1.5m) × 1
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

NOTE:

- The EUT must be supplied with a POE or power adapter and following two different models could be chosen as following table:

Adapter			
No	Brand	Model No.	Spec.
1	NETGEAR	MV18-9120150-A1	Input: 120V, 0.5A, 60Hz Output: 12V, 1.5A DC output cable (Unshielded, 1.8m)
2	NETGEAR	SAL018F1 NA	Input: 100-120V, 0.6A, 47-63Hz Output: 12V, 1.5A DC output cable (Unshielded, 1.8m)
POE			
Brand		Model No.	Spec.
PHIHONG		POE30U-560(G)	Input: 100-240V, 0.95A, 50-60Hz Output: 56V, 0.55A
From the above two adapters and POE were pre-tested in chamber, the worse case was found in Adapter 1 . Therefore only the test data of the adapter was recorded in this report.			

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

Internal Antenna (For 2.4GHz / 5GHz)					
Transmitter Circuit	Antenna Type	Peak Gain (dBi)			
		2.4GHz	5GHz Band 1	5GHz Band 4	
Chain (0)	Dipole	2.3	5.9	5.3	
Chain (1)	Dipole	2.3	5.9	4.9	
Chain (2)	Dipole	2.3	5	5.2	
External Antenna (For 2.4GHz)					
Model	Antenna Type	Gain (dBi) (Exclude cable loss)	Cable Loss (dB)	Net Gain (dBi) (Include cable loss)	Connector Type
ANT-32405	Dipole	5	3.68	1.32	SMA Plug Reverse
From the above antennas, internal antenna was selected for testing.					

3. The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and three receivers.

MODULATION MODE	TX/RX FUNCTION
802.11b	3Tx/3Rx
802.11g	3Tx/3Rx
802.11a	3Tx/3Rx
802.11n (20MHz)	3Tx/3Rx
802.11n (40MHz)	3Tx/3Rx

4. 2.4GHz and 5GHz technology cannot transmit at same time.

5. The EUT is 3 * 3 spatial MIMO (3Tx & 3Rx) with beam forming function.

6. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.

7. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

Eleven channels are provided for 802.11b, 802.11g, 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		

Seven 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		

Operated in 5725 ~ 5850MHz band:

Five channels are provided for 802.11a, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	OB	
Mode 1	√	√	√	√	√	With adapter 1
Mode 2	√	-	-	-	-	With adapter 2
Mode 3	√	-	-	-	-	With POE

Where **PLC**: Power Line Conducted Emission

RE < 1G: Radiated Emission below 1GHz

RE ³ 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

OB: Conducted Out-Band Emission Measurement

NOTE: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane** (for below 1GHz) and **X-plane** (For above 1GHz).

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)
802.11g	1 to 11	1	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	165	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)
802.11g	1 to 11	1	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149	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
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	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
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	25deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	23deg. C, 66%RH	120Vac, 60Hz	Kent Liu
RE ³ 1G	24deg. C, 68%RH	120Vac, 60Hz	Kent Liu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Kent Liu
OB	25deg. C, 60%RH	120Vac, 60Hz	Kent Liu

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 v01

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.

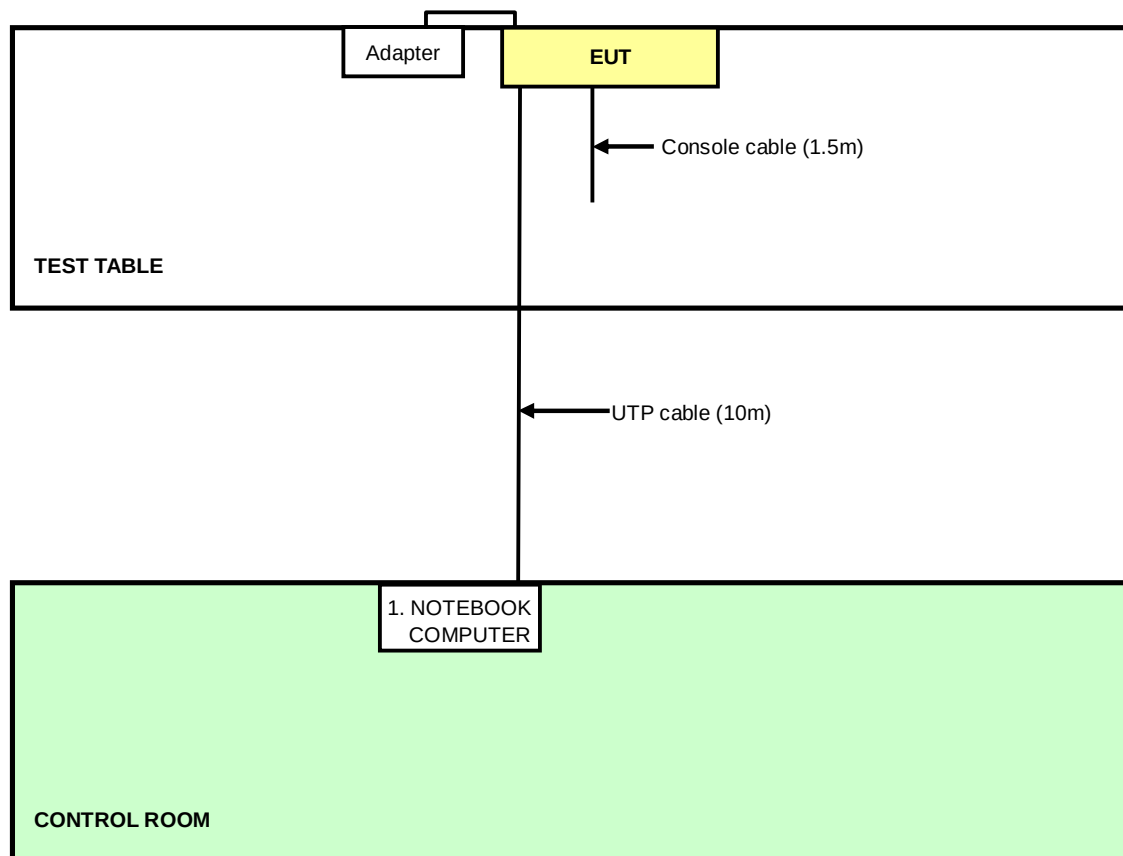
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER (For Conducted Emission test)	DELL	PP32LA	HSLB32S	FCC DoC
	NOTEBOOK COMPUTER (For Other test item)	DELL	PP32LA	FSLB32S	FCC DoC

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

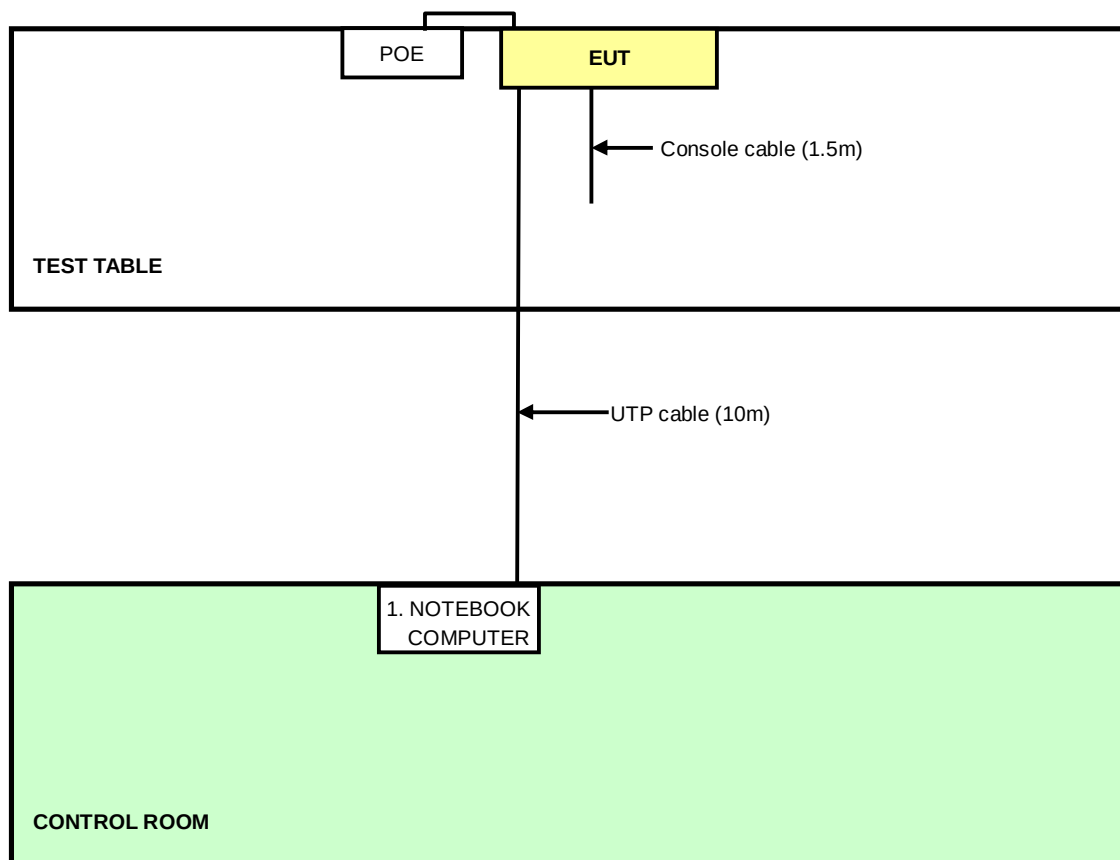
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Adapter Mode:



For POE Mode:



4. TEST TYPES AND RESULTS (802.11b & g & n, 2400 ~ 2483.5MHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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. 08, 2012	Mar. 07, 2013
Line-Impedance Stabilization Network (for EUT)	NSLK8127	8127-522	Sep. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 02, 2011	Nov. 01, 2012
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
Software	BV ADT_Cond_V7.3.7	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: May 25, 2012

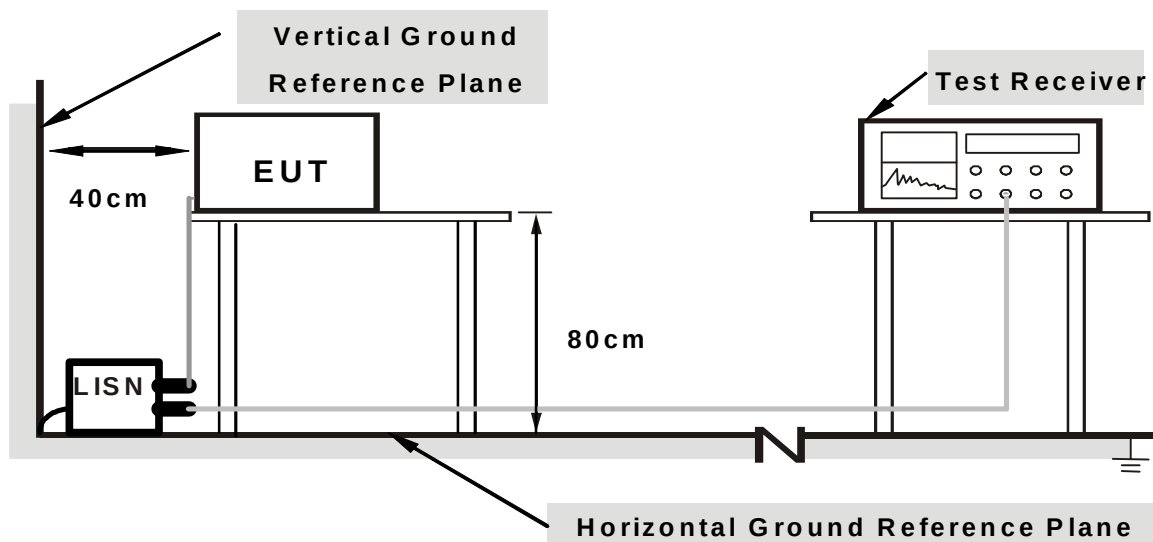
4.1.3 TEST PROCEDURES

- 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. 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) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer system (support unit 1) to act as communication partners and placed them outside of testing area.
3. The communication partners ran test program “art2_ver2_25BIN” to enable EUT under transmission/receiving condition continuously via one UTP cable transmission.

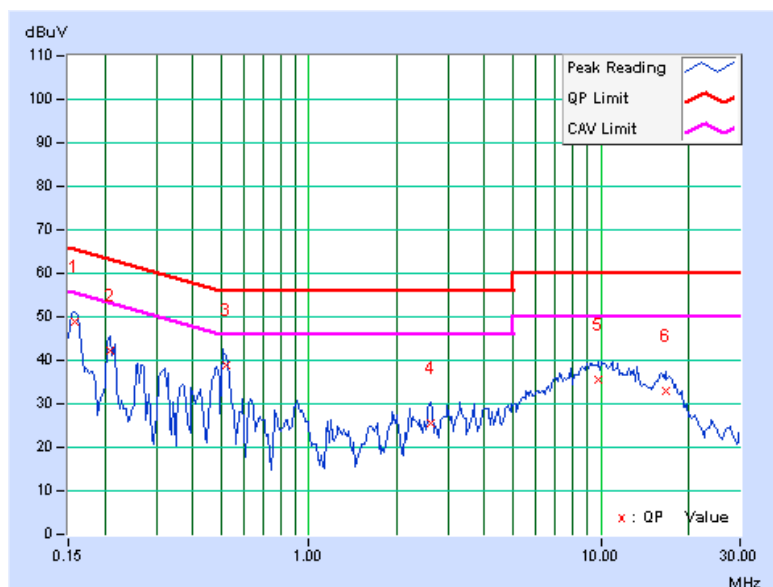
4.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.15781	0.07	48.90	43.55	48.97	43.62	65.58	55.58	-16.61	-11.96
2	0.20859	0.08	42.09	35.84	42.17	35.92	63.26	53.26	-21.09	-17.34
3	0.51859	0.12	38.59	33.09	38.71	33.21	56.00	46.00	-17.29	-12.79
4	2.60547	0.31	25.36	19.18	25.67	19.49	56.00	46.00	-30.33	-26.51
5	9.86719	0.69	34.87	29.74	35.56	30.43	60.00	50.00	-24.44	-19.57
6	16.73438	1.01	31.84	27.05	32.85	28.06	60.00	50.00	-27.15	-21.94

REMARKS:

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

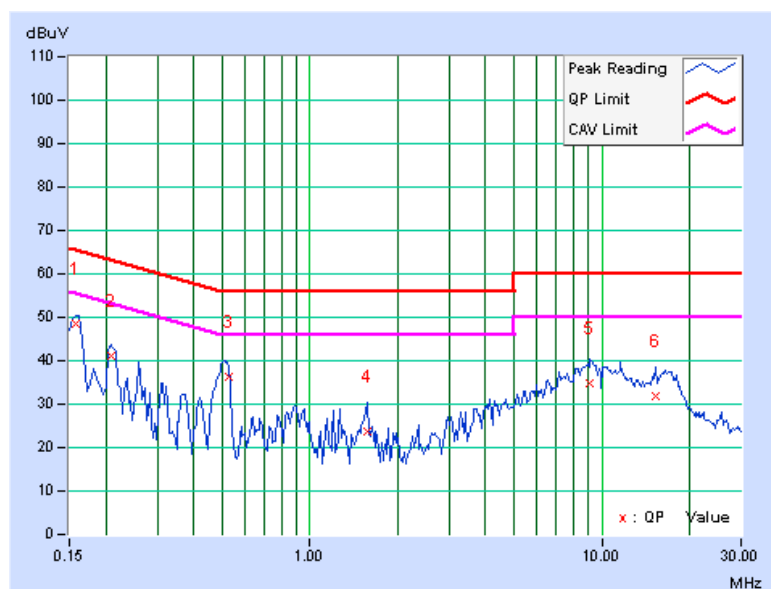


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15822	0.06	48.48	41.76	48.54	41.82	65.56	55.56	-17.02	-13.74
2	0.20859	0.07	41.10	33.25	41.17	33.32	63.26	53.26	-22.09	-19.94
3	0.52603	0.10	36.26	32.73	36.36	32.83	56.00	46.00	-19.64	-13.17
4	1.57031	0.16	23.56	15.45	23.72	15.61	56.00	46.00	-32.28	-30.39
5	9.12109	0.53	34.21	29.17	34.74	29.70	60.00	50.00	-25.26	-20.30
6	15.34375	0.85	31.15	26.32	32.00	27.17	60.00	50.00	-28.00	-22.83

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.



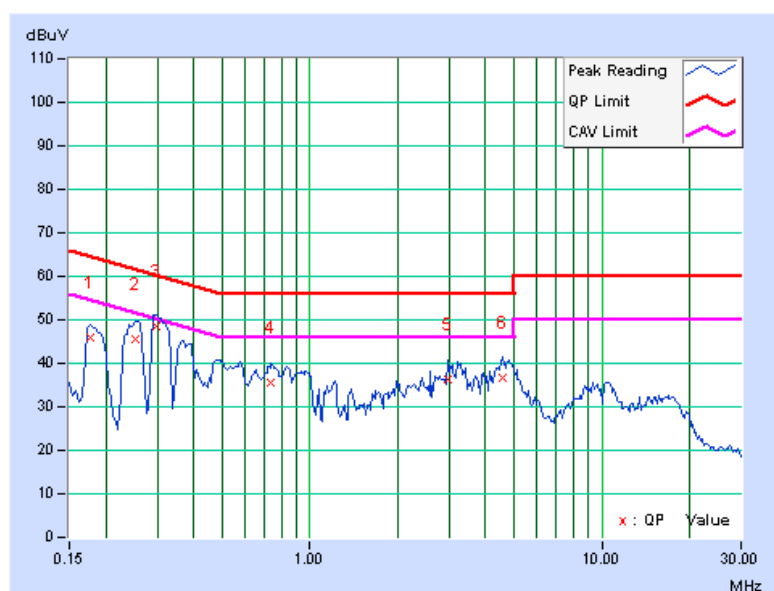
4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.17734	0.08	45.79	34.45	45.87	34.53	64.61	54.61	-18.74	-20.08
2	0.25156	0.09	45.64	36.69	45.73	36.78	61.71	51.71	-15.98	-14.93
3	0.29844	0.09	48.59	38.96	48.68	39.05	60.29	50.29	-11.60	-11.23
4	0.73594	0.13	35.47	22.63	35.60	22.76	56.00	46.00	-20.40	-23.24
5	2.96484	0.33	35.81	25.72	36.14	26.05	56.00	46.00	-19.86	-19.95
6	4.56641	0.43	36.13	28.05	36.56	28.48	56.00	46.00	-19.44	-17.52

REMARKS:

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

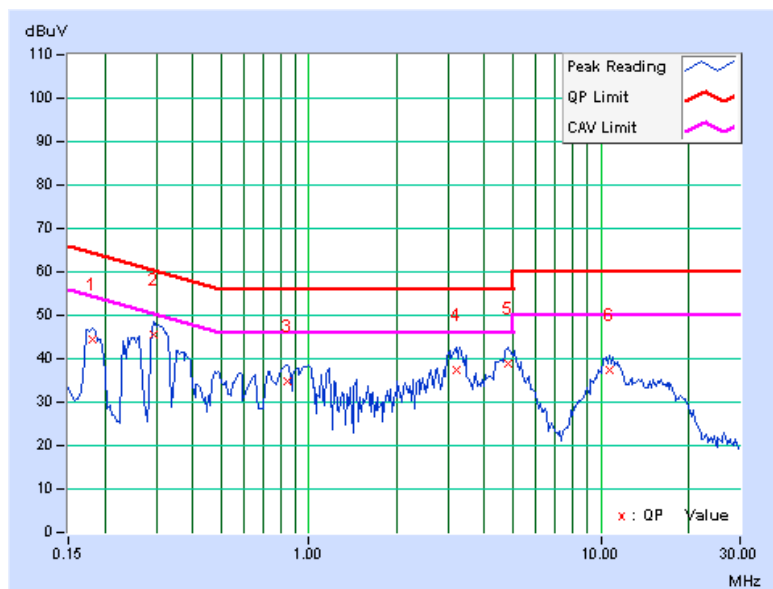


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	0.07	44.32	34.80	44.39	34.87	64.43	54.43	-20.04	-19.56
2	0.29453	0.08	45.62	33.73	45.70	33.81	60.40	50.40	-14.69	-16.58
3	0.84531	0.11	34.56	21.75	34.67	21.86	56.00	46.00	-21.33	-24.14
4	3.18750	0.26	36.98	26.05	37.24	26.31	56.00	46.00	-18.76	-19.69
5	4.81641	0.35	38.53	32.06	38.88	32.41	56.00	46.00	-17.12	-13.59
6	10.68359	0.61	36.64	32.14	37.25	32.75	60.00	50.00	-22.75	-17.25

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.



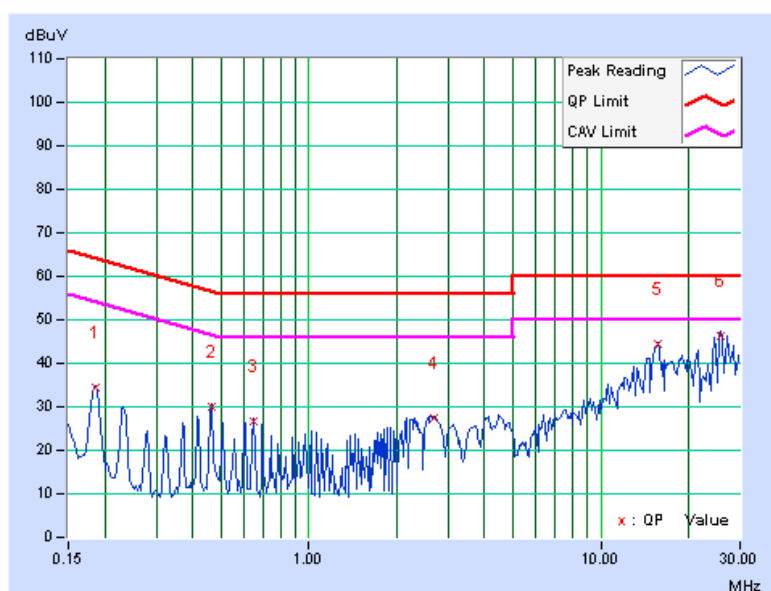
4.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.18516	0.08	34.18	33.46	34.26	33.54	64.25	54.25	-29.99	-20.71
2	0.46250	0.11	29.90	29.34	30.01	29.45	56.65	46.65	-26.63	-17.19
3	0.64622	0.13	26.52	25.54	26.65	25.67	56.00	46.00	-29.35	-20.33
4	2.68359	0.31	27.25	26.55	27.56	26.86	56.00	46.00	-28.44	-19.14
5	15.59466	0.97	43.65	42.69	44.62	43.66	60.00	50.00	-15.38	-6.34
6	25.75453	1.26	45.03	44.90	46.29	46.16	60.00	50.00	-13.71	-3.84

REMARKS:

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

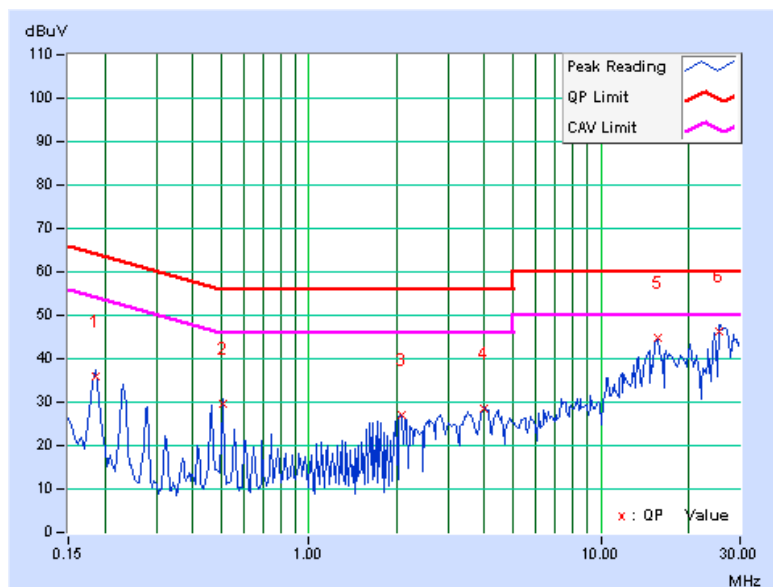


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.07	35.75	34.90	35.82	34.97	64.25	54.25	-28.43	-19.28
2	0.50938	0.10	29.45	29.35	29.55	29.45	56.00	46.00	-26.45	-16.55
3	2.08203	0.19	26.75	25.95	26.94	26.14	56.00	46.00	-29.06	-19.86
4	3.97656	0.31	28.12	27.34	28.43	27.65	56.00	46.00	-27.57	-18.35
5	15.59616	0.86	43.87	42.85	44.73	43.71	60.00	50.00	-15.27	-6.29
6	25.51953	1.19	45.15	44.86	46.34	46.05	60.00	50.00	-13.66	-3.95

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.



A D T

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
AISI Horn Antenna	AIH.8018	0000220091110	Nov. 23, 2011	Nov. 22, 2012
SCHWARZBECK Horn Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
*R&S Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 4 The test was performed in 966 Chamber No. H.
5. The FCC Site Registration No. is 797305.
- 6 The CANADA Site Registration No. is IC 7450H-3.
- 7 Tested Date: May 28 to 29, 2012

4.2.3 TEST PROCEDURES

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

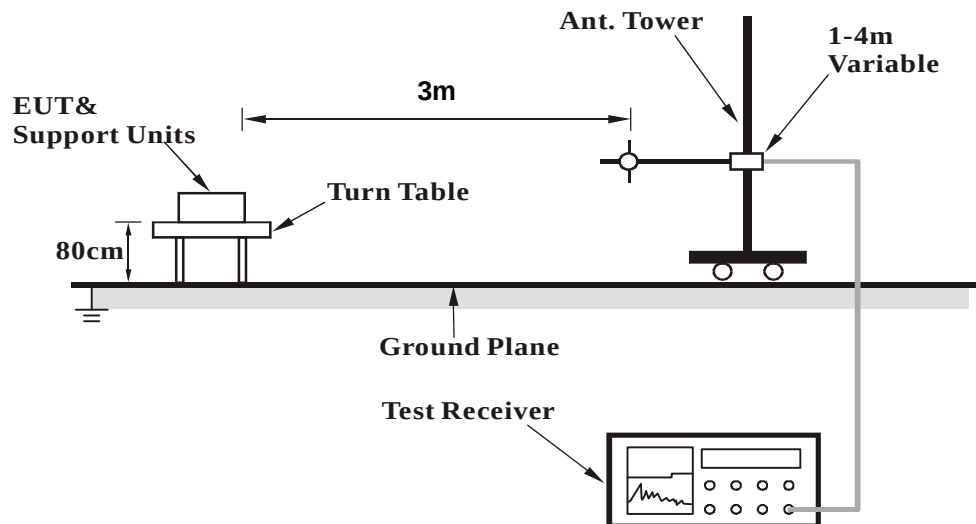
NOTE:

1. 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

802.11g

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	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	250.03	35.9 QP	46.0	-10.1	1.50 H	264	22.57	13.30
2	466.74	39.1 QP	46.0	-6.9	2.00 H	11	19.83	19.25
3	533.30	43.1 QP	46.0	-2.9	1.25 H	0	22.36	20.77
4	600.09	40.6 QP	46.0	-5.4	1.25 H	0	18.35	22.22
5	622.26	42.4 QP	46.0	-3.6	1.25 H	0	19.92	22.51
6	649.94	42.6 QP	46.0	-3.4	1.75 H	138	19.73	22.86
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	33.69	34.4 QP	40.0	-5.6	1.00 V	169	21.38	13.03
2	63.16	34.4 QP	40.0	-5.6	1.75 V	360	21.27	13.17
3	250.03	36.5 QP	46.0	-9.5	1.50 V	128	23.24	13.30
4	374.97	36.8 QP	46.0	-9.2	1.00 V	323	19.71	17.08
5	499.72	42.7 QP	46.0	-3.3	1.00 V	265	22.65	20.03
6	624.96	39.6 QP	46.0	-6.4	1.50 V	0	17.06	22.54
7	750.01	40.4 QP	46.0	-5.6	1.00 V	126	15.86	24.56

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.

ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.8 PK	74.0	-17.2	1.05 H	262	25.14	31.66
2	2390.00	44.7 AV	54.0	-9.3	1.05 H	262	13.04	31.66
3	*2412.00	102.8 PK			1.00 H	190	71.07	31.73
4	*2412.00	100.4 AV			1.00 H	190	68.67	31.73
5	4824.00	50.6 PK	74.0	-23.4	1.31 H	69	11.63	38.97
6	4824.00	46.0 AV	54.0	-8.0	1.31 H	69	7.03	38.97
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	174	26.54	31.66
2	2390.00	46.0 AV	54.0	-8.0	1.00 V	174	14.34	31.66
3	*2412.00	109.1 PK			1.00 V	174	77.37	31.73
4	*2412.00	106.5 AV			1.00 V	174	74.77	31.73
5	4824.00	56.7 PK	74.0	-17.3	1.00 V	185	17.73	38.97
6	4824.00	53.5 AV	54.0	-0.5	1.00 V	185	14.53	38.97

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.6 PK			1.00 H	186	70.79	31.81
2	*2437.00	100.3 AV			1.00 H	186	68.49	31.81
3	4874.00	51.2 PK	74.0	-22.8	1.33 H	81	12.06	39.14
4	4874.00	46.3 AV	54.0	-7.7	1.33 H	81	7.16	39.14
5	7311.00	55.0 PK	74.0	-19.0	1.25 H	108	8.37	46.63
6	7311.00	44.3 AV	54.0	-9.7	1.25 H	108	-2.33	46.63
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	109.2 PK			1.00 V	165	77.39	31.81
2	*2437.00	106.8 AV			1.00 V	165	74.99	31.81
3	4874.00	55.9 PK	74.0	-18.1	1.00 V	185	16.76	39.14
4	4874.00	53.2 AV	54.0	-0.8	1.00 V	185	14.06	39.14
5	7311.00	56.6 PK	74.0	-17.4	1.13 V	96	9.97	46.63
6	7311.00	48.6 AV	54.0	-5.4	1.13 V	96	1.97	46.63

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.8 PK			1.00 H	252	71.91	31.89
2	*2462.00	101.4 AV			1.00 H	252	69.51	31.89
3	2483.50	56.7 PK	74.0	-17.3	1.00 H	252	24.73	31.97
4	2483.50	44.6 AV	54.0	-9.4	1.00 H	252	12.63	31.97
5	4924.00	51.6 PK	74.0	-22.4	1.38 H	73	12.29	39.31
6	4924.00	47.1 AV	54.0	-6.9	1.38 H	73	7.79	39.31
7	7386.00	55.7 PK	74.0	-18.3	1.28 H	115	9.10	46.60
8	7386.00	44.7 AV	54.0	-9.3	1.28 H	115	-1.90	46.60
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	110.3 PK			1.00 V	210	78.41	31.89
2	*2462.00	108.0 AV			1.00 V	210	76.11	31.89
3	2483.50	58.4 PK	74.0	-15.6	1.00 V	210	26.43	31.97
4	2483.50	46.7 AV	54.0	-7.3	1.00 V	210	14.73	31.97
5	4924.00	57.2 PK	74.0	-16.8	1.00 V	185	17.89	39.31
6	4924.00	53.1 AV	54.0	-0.9	1.00 V	185	13.79	39.31
7	7386.00	56.1 PK	74.0	-17.9	1.18 V	102	9.50	46.60
8	7386.00	48.3 AV	54.0	-5.7	1.18 V	102	1.70	46.60

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.0 PK	74.0	-13.0	1.00 H	246	29.34	31.66
2	2390.00	47.3 AV	54.0	-6.7	1.00 H	246	15.64	31.66
3	*2412.00	103.4 PK			1.00 H	246	71.67	31.73
4	*2412.00	93.7 AV			1.00 H	246	61.97	31.73
5	4824.00	50.4 PK	74.0	-23.6	1.25 H	65	11.43	38.97
6	4824.00	39.8 AV	54.0	-14.2	1.25 H	65	0.83	38.97
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	71.6 PK	74.0	-2.4	1.00 V	17	39.94	31.66
2	2390.00	53.1 AV	54.0	-0.9	1.00 V	17	21.44	31.66
3	*2412.00	111.6 PK			1.00 V	17	79.87	31.73
4	*2412.00	101.2 AV			1.00 V	17	69.47	31.73
5	4824.00	54.5 PK	74.0	-19.5	1.00 V	184	15.53	38.97
6	4824.00	41.5 AV	54.0	-12.5	1.00 V	184	2.53	38.97

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2382.00	57.4 PK	74.0	-16.6	1.00 H	215	25.77	31.63
2	2382.00	47.3 AV	54.0	-6.7	1.00 H	215	15.67	31.63
3	*2437.00	109.4 PK			1.00 H	215	77.59	31.81
4	*2437.00	99.5 AV			1.00 H	215	67.69	31.81
5	2483.50	59.8 PK	74.0	-14.2	1.00 H	215	27.83	31.97
6	2483.50	49.4 AV	54.0	-4.6	1.00 H	215	17.43	31.97
7	4874.00	49.8 PK	74.0	-24.2	1.19 H	57	10.66	39.14
8	4874.00	39.7 AV	54.0	-14.3	1.19 H	57	0.56	39.14
9	7311.00	54.7 PK	74.0	-19.3	1.31 H	357	8.07	46.63
10	7311.00	42.1 AV	54.0	-11.9	1.31 H	357	-4.53	46.63
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	2382.00	64.3 PK	74.0	-9.7	1.16 V	150	32.67	31.63
2	2382.00	49.1 AV	54.0	-4.9	1.16 V	150	17.47	31.63
3	*2437.00	118.3 PK			1.16 V	150	86.49	31.81
4	*2437.00	107.1 AV			1.16 V	150	75.29	31.81
5	2483.50	68.6 PK	74.0	-5.4	1.16 V	150	36.63	31.97
6	2483.50	53.1 AV	54.0	-0.9	1.16 V	150	21.13	31.97
7	4874.00	56.7 PK	74.0	-17.3	1.00 V	180	17.56	39.14
8	4874.00	43.7 AV	54.0	-10.3	1.00 V	180	4.56	39.14
9	7311.00	60.2 PK	74.0	-13.8	1.57 V	332	13.57	46.63
10	7311.00	47.9 AV	54.0	-6.1	1.57 V	332	1.27	46.63

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.1 PK			1.00 H	143	70.21	31.89
2	*2462.00	91.4 AV			1.00 H	143	59.51	31.89
3	2483.50	59.1 PK	74.0	-14.9	1.00 H	143	27.13	31.97
4	2483.50	48.4 AV	54.0	-5.6	1.00 H	143	16.43	31.97
5	4924.00	49.6 PK	74.0	-24.4	1.17 H	61	10.29	39.31
6	4924.00	40.1 AV	54.0	-13.9	1.17 H	61	0.79	39.31
7	7386.00	54.7 PK	74.0	-19.3	1.37 H	360	8.10	46.60
8	7386.00	42.2 AV	54.0	-11.8	1.37 H	360	-4.40	46.60
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	109.2 PK			1.00 V	208	77.31	31.89
2	*2462.00	98.9 AV			1.00 V	208	67.01	31.89
3	2483.50	73.3 PK	74.0	-0.7	1.00 V	208	41.33	31.97
4	2483.50	50.0 AV	54.0	-4.0	1.00 V	208	18.03	31.97
5	4924.00	56.6 PK	74.0	-17.4	1.00 V	164	17.29	39.31
6	4924.00	42.8 AV	54.0	-11.2	1.00 V	164	3.49	39.31
7	7386.00	59.3 PK	74.0	-14.7	1.55 V	339	12.70	46.60
8	7386.00	46.8 AV	54.0	-7.2	1.55 V	339	0.20	46.60

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.

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.5 PK	74.0	-10.5	1.05 H	168	31.84	31.66
2	2390.00	47.1 AV	54.0	-6.9	1.05 H	168	15.44	31.66
3	*2412.00	103.4 PK			1.00 H	234	71.67	31.73
4	*2412.00	93.1 AV			1.00 H	234	61.37	31.73
5	4824.00	51.3 PK	74.0	-22.7	1.17 H	59	12.33	38.97
6	4824.00	39.7 AV	54.0	-14.3	1.17 H	59	0.73	38.97
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	70.8 PK	74.0	-3.2	1.00 V	17	39.14	31.66
2	2390.00	52.9 AV	54.0	-1.1	1.00 V	17	21.24	31.66
3	*2412.00	111.4 PK			1.00 V	17	79.67	31.73
4	*2412.00	100.4 AV			1.00 V	17	68.67	31.73
5	4824.00	54.1 PK	74.0	-19.9	1.00 V	169	15.13	38.97
6	4824.00	41.3 AV	54.0	-12.7	1.00 V	169	2.33	38.97

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.9 PK	74.0	-17.1	1.00 H	228	25.24	31.66
2	2390.00	47.0 AV	54.0	-7.0	1.00 H	228	15.34	31.66
3	*2437.00	108.8 PK			1.00 H	207	76.99	31.81
4	*2437.00	99.1 AV			1.00 H	207	67.29	31.81
5	2483.50	59.7 PK	74.0	-14.3	1.00 H	205	27.73	31.97
6	2483.50	49.0 AV	54.0	-5.0	1.00 H	205	17.03	31.97
7	4874.00	51.2 PK	74.0	-22.8	1.13 H	61	12.06	39.14
8	4874.00	39.8 AV	54.0	-14.2	1.13 H	61	0.66	39.14
9	7311.00	54.6 PK	74.0	-19.4	1.30 H	356	7.97	46.63
10	7311.00	41.7 AV	54.0	-12.3	1.30 H	356	-4.93	46.63
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	67.5 PK	74.0	-6.5	1.22 V	11	35.84	31.66
2	2390.00	53.2 AV	54.0	-0.8	1.22 V	11	21.54	31.66
3	*2437.00	117.3 PK			1.22 V	11	85.49	31.81
4	*2437.00	106.1 AV			1.22 V	11	74.29	31.81
5	2483.50	70.6 PK	74.0	-3.4	1.22 V	11	38.63	31.97
6	2483.50	52.3 AV	54.0	-1.7	1.22 V	11	20.33	31.97
7	4874.00	56.5 PK	74.0	-17.5	1.00 V	172	17.36	39.14
8	4874.00	42.4 AV	54.0	-11.6	1.00 V	172	3.26	39.14
9	7311.00	59.6 PK	74.0	-14.4	1.52 V	342	12.97	46.63
10	7311.00	47.0 AV	54.0	-7.0	1.52 V	342	0.37	46.63

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.9 PK			1.04 H	150	69.01	31.89
2	*2462.00	90.8 AV			1.04 H	150	58.91	31.89
3	2483.50	59.3 PK	74.0	-14.7	1.00 H	192	27.33	31.97
4	2483.50	48.6 AV	54.0	-5.4	1.00 H	192	16.63	31.97
5	4924.00	51.3 PK	74.0	-22.7	1.07 H	61	11.99	39.31
6	4924.00	38.9 AV	54.0	-15.1	1.07 H	61	-0.41	39.31
7	7386.00	54.2 PK	74.0	-19.8	1.25 H	360	7.60	46.60
8	7386.00	41.3 AV	54.0	-12.7	1.25 H	360	-5.30	46.60
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	109.5 PK			1.00 V	209	77.61	31.89
2	*2462.00	98.5 AV			1.00 V	209	66.61	31.89
3	2483.50	72.4 PK	74.0	-1.6	1.00 V	209	40.43	31.97
4	2483.50	50.2 AV	54.0	-3.8	1.00 V	209	18.23	31.97
5	4924.00	56.8 PK	74.0	-17.2	1.00 V	184	17.49	39.31
6	4924.00	42.4 AV	54.0	-11.6	1.00 V	184	3.09	39.31
7	7386.00	59.5 PK	74.0	-14.5	1.55 V	352	12.90	46.60
8	7386.00	46.8 AV	54.0	-7.2	1.55 V	352	0.20	46.60

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.

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2381.00	63.7 PK	74.0	-10.3	1.02 H	162	32.07	31.63
2	2381.00	45.4 AV	54.0	-8.6	1.02 H	162	13.77	31.63
3	*2422.00	98.4 PK			1.02 H	162	66.64	31.76
4	*2422.00	87.2 AV			1.02 H	162	55.44	31.76
5	4844.00	51.3 PK	74.0	-22.7	1.08 H	63	12.26	39.04
6	4844.00	38.8 AV	54.0	-15.2	1.08 H	63	-0.24	39.04
7	7266.00	54.4 PK	74.0	-19.6	1.29 H	360	7.73	46.67
8	7266.00	38.7 AV	54.0	-15.3	1.29 H	360	-7.97	46.67
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	2381.00	73.5 PK	74.0	-0.5	1.18 V	150	41.87	31.63
2	2381.00	53.2 AV	54.0	-0.8	1.18 V	150	21.57	31.63
3	*2422.00	106.3 PK			1.18 V	150	74.54	31.76
4	*2422.00	95.3 AV			1.18 V	150	63.54	31.76
5	4844.00	54.8 PK	74.0	-19.2	1.00 V	182	15.76	39.04
6	4844.00	39.4 AV	54.0	-14.6	1.00 V	182	0.36	39.04
7	7266.00	59.8 PK	74.0	-14.2	1.52 V	346	13.13	46.67
8	7266.00	46.5 AV	54.0	-7.5	1.52 V	346	-0.17	46.67

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.

CHANNEL	TX Channel 6	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.1 PK	74.0	-8.9	1.01 H	158	33.44	31.66
2	2390.00	47.4 AV	54.0	-6.6	1.01 H	158	15.74	31.66
3	*2437.00	98.4 PK			1.01 H	158	66.59	31.81
4	*2437.00	88.1 AV			1.01 H	158	56.29	31.81
5	2483.50	66.4 PK	74.0	-7.6	1.01 H	158	34.43	31.97
6	2483.50	48.5 AV	54.0	-5.5	1.01 H	158	16.53	31.97
7	4874.00	51.4 PK	74.0	-22.6	1.08 H	53	12.26	39.14
8	4874.00	39.2 AV	54.0	-14.8	1.08 H	53	0.06	39.14
9	7311.00	53.5 PK	74.0	-20.5	1.30 H	360	6.87	46.63
10	7311.00	39.7 AV	54.0	-14.3	1.30 H	360	-6.93	46.63
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	66.4 PK	74.0	-7.6	1.17 V	151	34.74	31.66
2	2390.00	52.2 AV	54.0	-1.8	1.17 V	151	20.54	31.66
3	*2437.00	110.3 PK			1.17 V	151	78.49	31.81
4	*2437.00	97.6 AV			1.17 V	151	65.79	31.81
5	2483.50	71.6 PK	74.0	-2.4	1.17 V	151	39.63	31.97
6	2483.50	52.3 AV	54.0	-1.7	1.17 V	151	20.33	31.97
7	4874.00	54.4 PK	74.0	-19.6	1.00 V	167	15.26	39.14
8	4874.00	39.2 AV	54.0	-14.8	1.00 V	167	0.06	39.14
9	7311.00	59.9 PK	74.0	-14.1	1.48 V	343	13.27	46.63
10	7311.00	46.4 AV	54.0	-7.6	1.48 V	343	-0.23	46.63

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.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	96.8 PK			1.01 H	162	64.94	31.86
2	*2452.00	87.2 AV			1.01 H	162	55.34	31.86
3	2483.50	64.1 PK	74.0	-9.9	1.01 H	162	32.13	31.97
4	2483.50	45.8 AV	54.0	-8.2	1.01 H	162	13.83	31.97
5	4904.00	50.3 PK	74.0	-23.7	1.12 H	68	11.06	39.24
6	4904.00	38.5 AV	54.0	-15.5	1.12 H	68	-0.74	39.24
7	7356.00	52.1 PK	74.0	-21.9	1.31 H	354	5.49	46.61
8	7356.00	38.7 AV	54.0	-15.3	1.31 H	354	-7.91	46.61
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			1.17 V	18	74.04	31.86
2	*2452.00	94.2 AV			1.17 V	18	62.34	31.86
3	2483.50	72.3 PK	74.0	-1.7	1.17 V	18	40.33	31.97
4	2483.50	50.7 AV	54.0	-3.3	1.17 V	18	18.73	31.97
5	4904.00	55.2 PK	74.0	-18.8	1.00 V	177	15.96	39.24
6	4904.00	39.7 AV	54.0	-14.3	1.00 V	177	0.46	39.24
7	7356.00	57.6 PK	74.0	-16.4	1.53 V	360	10.99	46.61
8	7356.00	41.5 AV	54.0	-12.5	1.53 V	360	-5.11	46.61

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	100036	Dec. 14, 2011	Dec. 13, 2012

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 : May 31, 2012

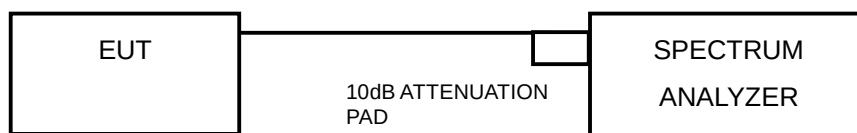
4.3.3 TEST PROCEDURE

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.

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	10.67	10.63	10.94	0.5	PASS
6	2437	10.72	10.45	10.39	0.5	PASS
11	2462	10.34	10.72	10.80	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.52	16.59	16.53	0.5	PASS
6	2437	16.57	16.61	16.60	0.5	PASS
11	2462	16.48	16.60	16.60	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.79	17.84	17.79	0.5	PASS
6	2437	17.83	17.76	17.83	0.5	PASS
11	2462	17.77	17.88	17.83	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	36.93	37.10	36.76	0.5	PASS
6	2437	36.74	37.27	36.81	0.5	PASS
9	2452	37.28	36.73	37.03	0.5	PASS

4.4 CONDUCTED OUTPUT POWER

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)

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 : May 31, 2012

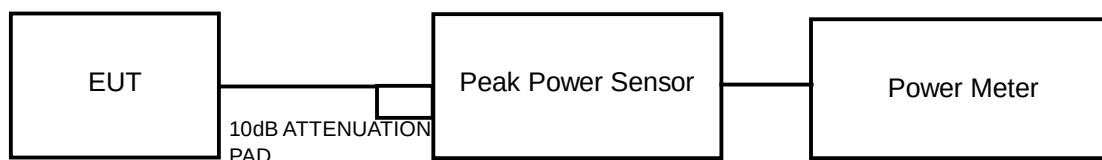
4.4.3 TEST PROCEDURES

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

4.4.7 TEST RESULTS

802.11b

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	16.10	14.98	14.20	98.518	19.94	28.93	PASS
6	2437	16.40	15.60	14.30	106.875	20.29	28.93	PASS
11	2462	18.70	16.80	16.20	163.681	22.14	28.93	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 7.07

The effective legacy gain is 7.07 dBi, therefore the limit needs to reduce.

802.11g

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	21.20	20.90	19.90	352.577	25.47	28.93	PASS
6	2437	23.20	23.50	21.90	587.684	27.69	28.93	PASS
11	2462	20.70	19.40	19.20	287.762	24.59	28.93	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 7.07

The effective legacy gain is 7.07 dBi, therefore the limit needs to reduce.

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	21.00	20.30	20.00	333.045	25.23	30	PASS
6	2437	23.30	21.20	20.20	450.335	26.54	30	PASS
11	2462	21.30	20.50	19.80	342.597	25.35	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	21.10	20.10	19.70	324.479	25.11	30	PASS
6	2437	21.70	21.20	20.20	384.450	25.85	30	PASS
9	2452	20.20	19.90	18.90	280.062	24.47	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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012

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 : May 31, 2012

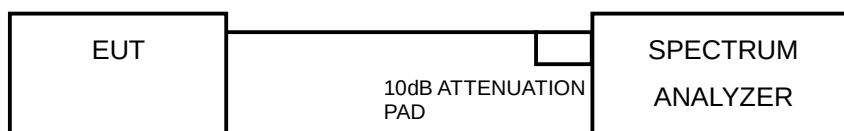
4.5.3 TEST PROCEDURE

1. Set the RBW = 100 kHz, VBW = 300 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 power level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

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

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	5.53	-9.70	4.77	-4.93	6.93	PASS
	6	2437	4.99	-10.24	4.77	-5.47	6.93	PASS
	11	2462	5.98	-9.25	4.77	-4.48	6.93	PASS
1	1	2412	2.31	-12.92	4.77	-8.15	6.93	PASS
	6	2437	3.95	-11.28	4.77	-6.51	6.93	PASS
	11	2462	4.61	-10.62	4.77	-5.85	6.93	PASS
2	1	2412	1.81	-13.42	4.77	-8.65	6.93	PASS
	6	2437	4.43	-10.80	4.77	-6.03	6.93	PASS
	11	2462	3.53	-11.70	4.77	-6.93	6.93	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 7.07

The effective legacy gain is 7.07 dBi, therefore the limit needs to reduce.

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	0.03	-15.20	4.77	-10.43	6.93	PASS
	6	2437	5.11	-10.12	4.77	-5.35	6.93	PASS
	11	2462	-1.14	-16.37	4.77	-11.60	6.93	PASS
1	1	2412	-1.39	-16.62	4.77	-11.85	6.93	PASS
	6	2437	4.57	-10.66	4.77	-5.89	6.93	PASS
	11	2462	-2.67	-17.90	4.77	-13.13	6.93	PASS
2	1	2412	-2.06	-17.29	4.77	-12.52	6.93	PASS
	6	2437	3.87	-11.36	4.77	-6.59	6.93	PASS
	11	2462	-3.30	-18.53	4.77	-13.76	6.93	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)

Effective Legacy Gain (dBi) = 7.07

The effective legacy gain is 7.07 dBi, therefore the limit needs to reduce.

**A D T****802.11n (20MHz)**

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-0.53	-15.76	4.77	-10.99	8	PASS
	6	2437	4.98	-10.25	4.77	-5.48	8	PASS
	11	2462	-1.11	-16.34	4.77	-11.57	8	PASS
1	1	2412	-1.85	-17.08	4.77	-12.31	8	PASS
	6	2437	4.36	-10.87	4.77	-6.10	8	PASS
	11	2462	-2.94	-18.17	4.77	-13.40	8	PASS
2	1	2412	-2.16	-17.39	4.77	-12.62	8	PASS
	6	2437	3.86	-11.37	4.77	-6.60	8	PASS
	11	2462	-3.74	-18.97	4.77	-14.20	8	PASS

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-3.21	-18.44	4.77	-13.67	8	PASS
	6	2437	-2.51	-17.74	4.77	-12.97	8	PASS
	9	2452	-5.97	-21.20	4.77	-16.43	8	PASS
1	3	2422	-5.66	-20.89	4.77	-16.12	8	PASS
	6	2437	-3.46	-18.69	4.77	-13.92	8	PASS
	9	2452	-6.94	-22.17	4.77	-17.40	8	PASS
2	3	2422	-5.82	-21.05	4.77	-16.28	8	PASS
	6	2437	-5.21	-20.44	4.77	-15.67	8	PASS
	9	2452	-7.98	-23.21	4.77	-18.44	8	PASS

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below -20dB 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	100036	Dec. 14, 2011	Dec. 13, 2012

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 : May 31, 2012

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.

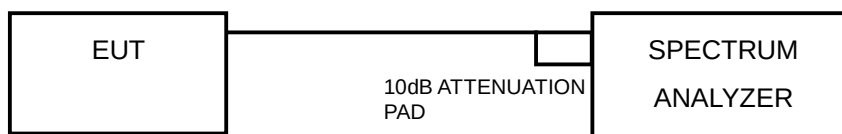
MEASUREMENT PROCEDURE OOB

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 conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

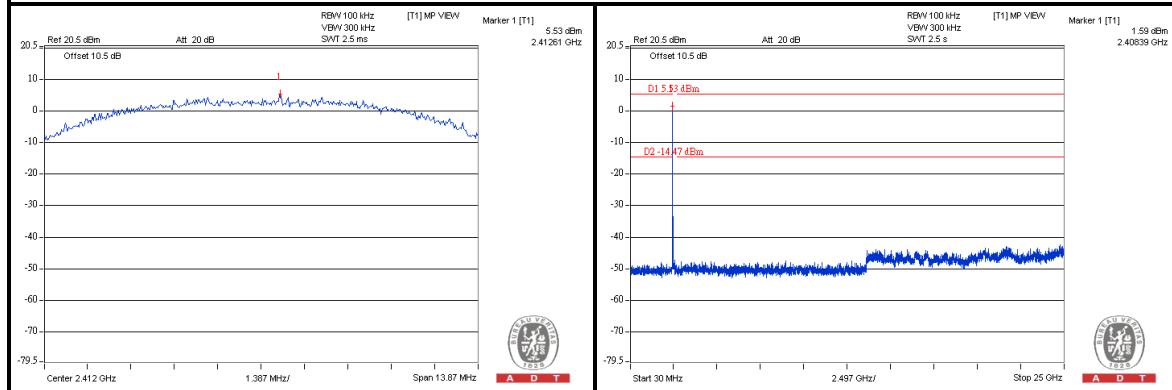
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



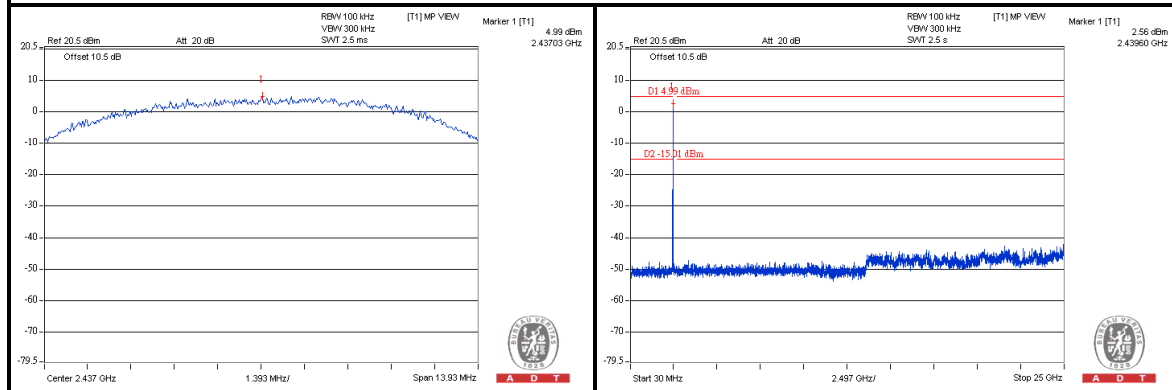
A D T

802.11b

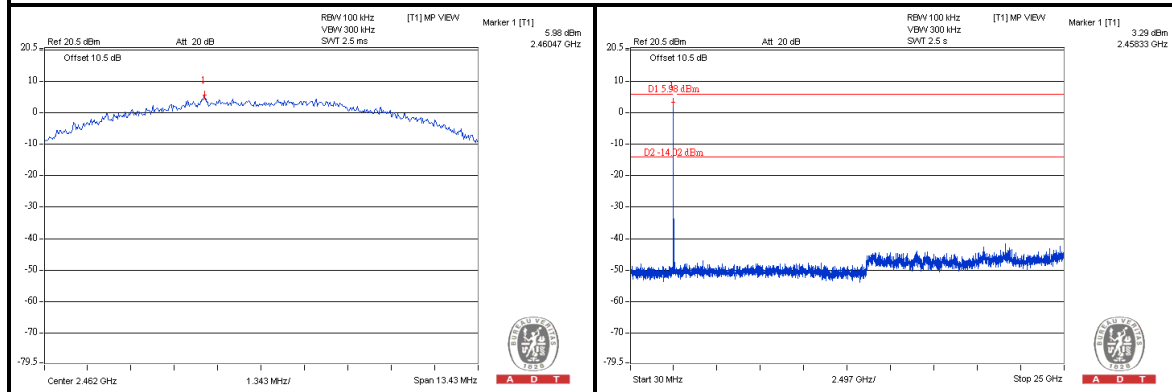
CH 1



CH 6



CH 11

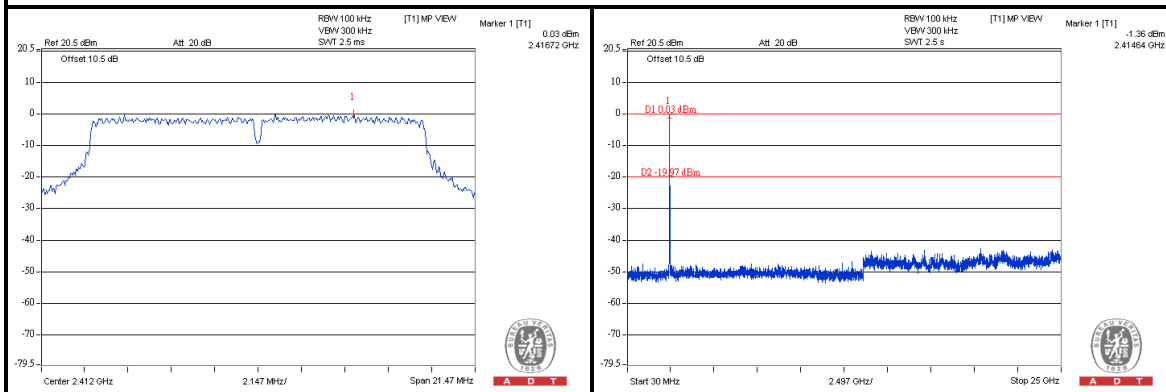




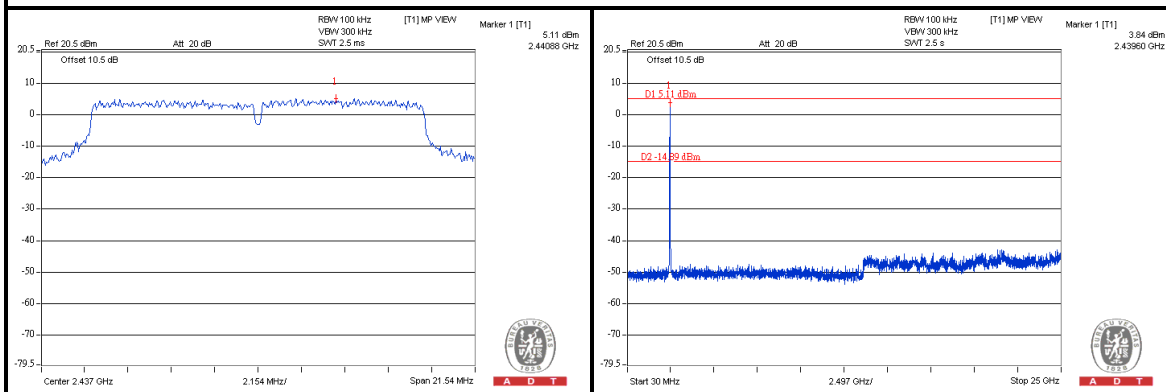
A D T

802.11g

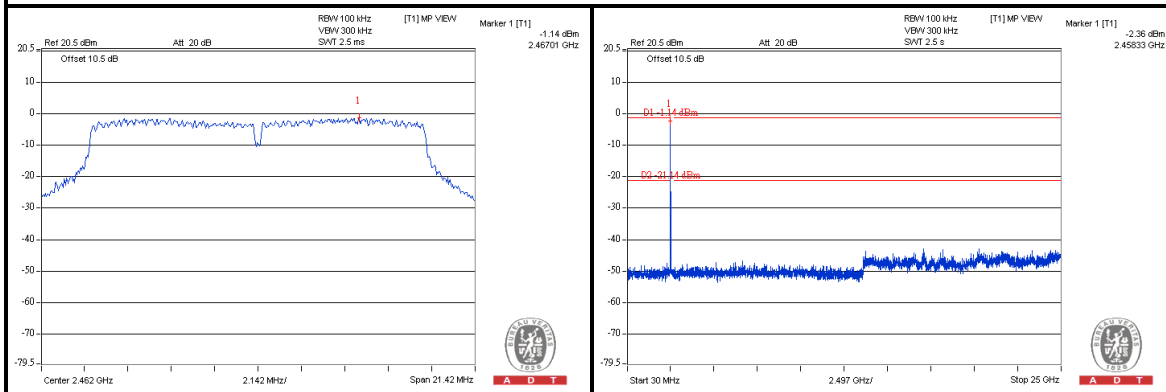
CH 1



CH 6



CH 11

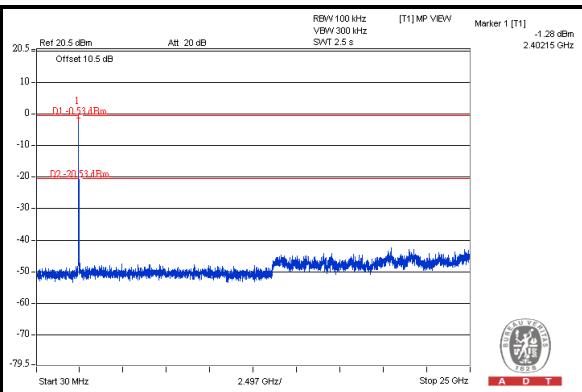
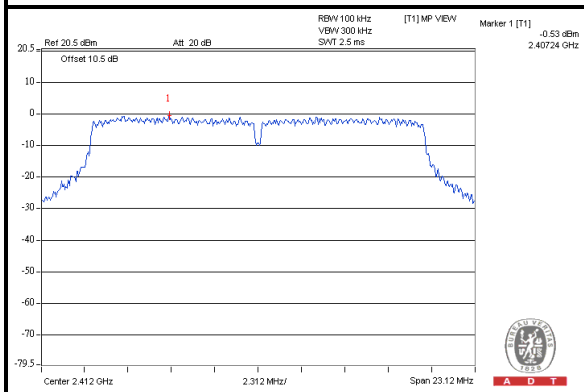




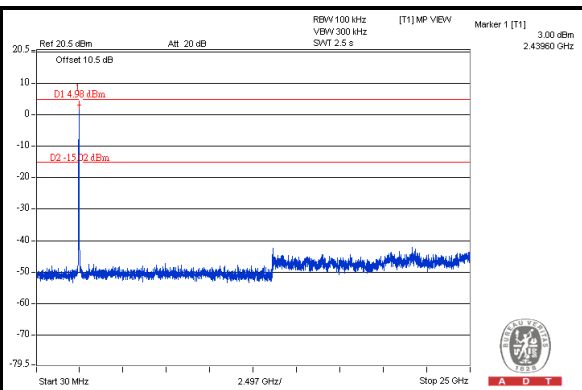
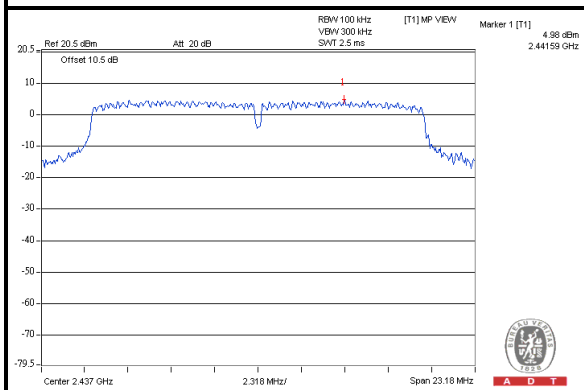
A D T

802.11n (20MHz)

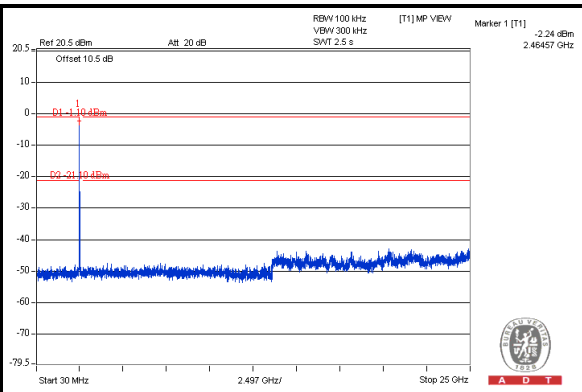
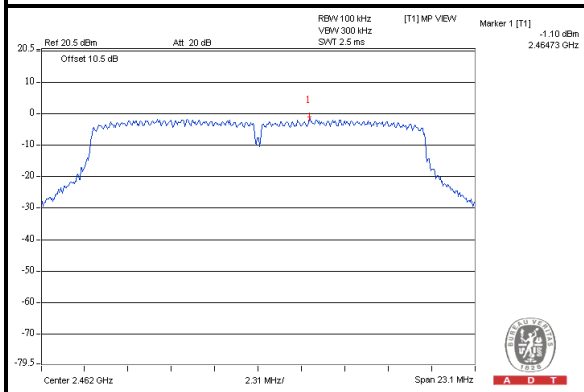
CH 1



CH 6



CH 11

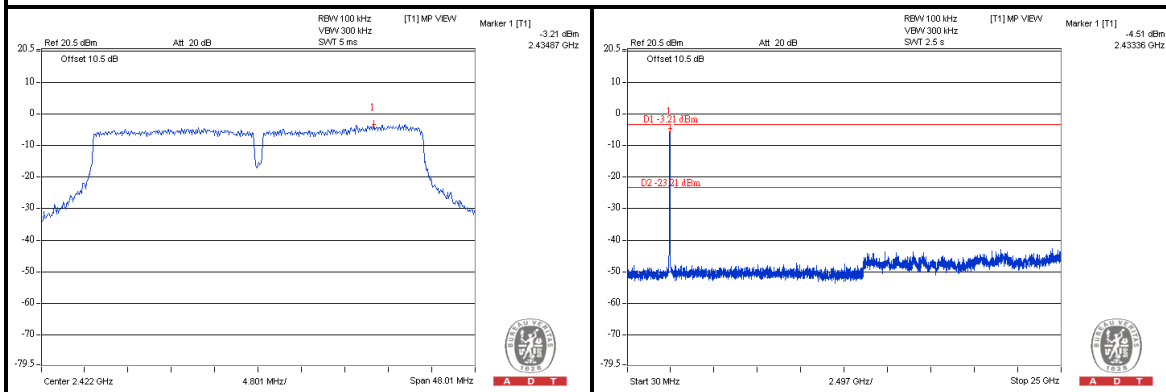




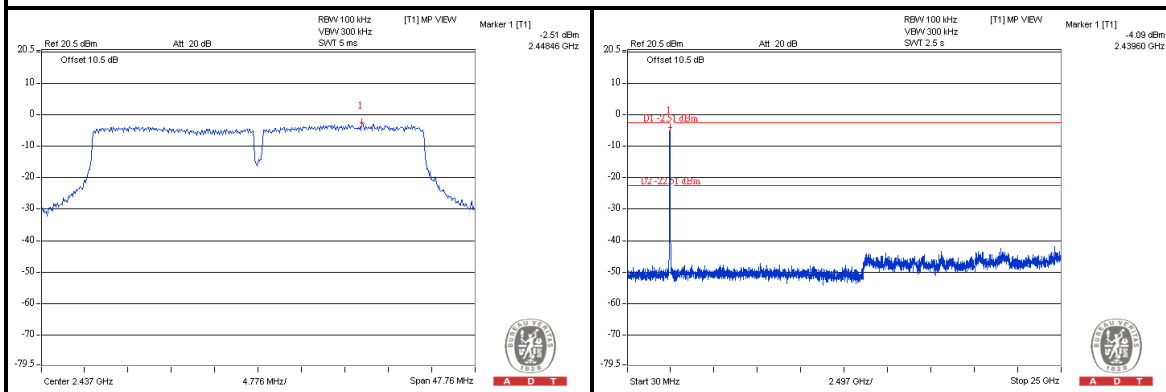
A D T

802.11n (40MHz)

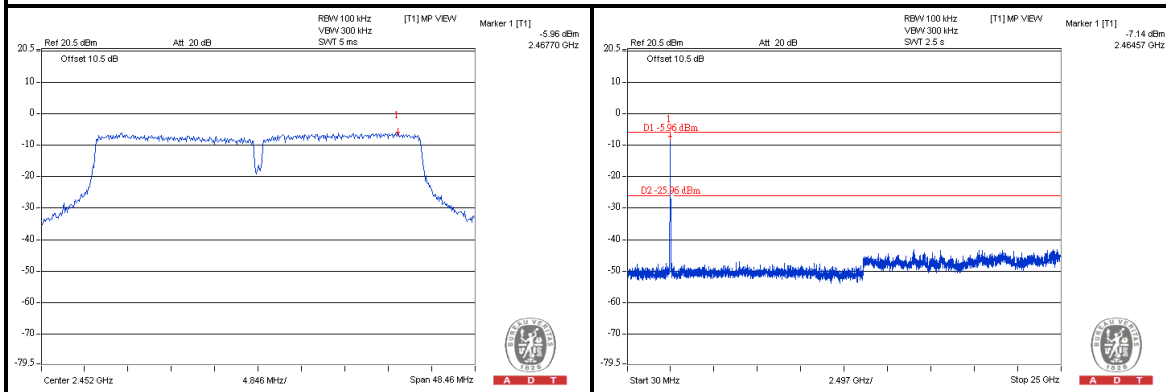
CH 3



CH 6



CH 9



5. TEST TYPES AND RESULTS (802.11a & n, 5725~5850MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	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.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 08, 2012	Mar. 07, 2013
Line-Impedance Stabilization Network (for EUT)	NSLK8127	8127-522	Sep. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 02, 2011	Nov. 01, 2012
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
Software	BV ADT_Cond_V7.3.7	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: May 25, 2012

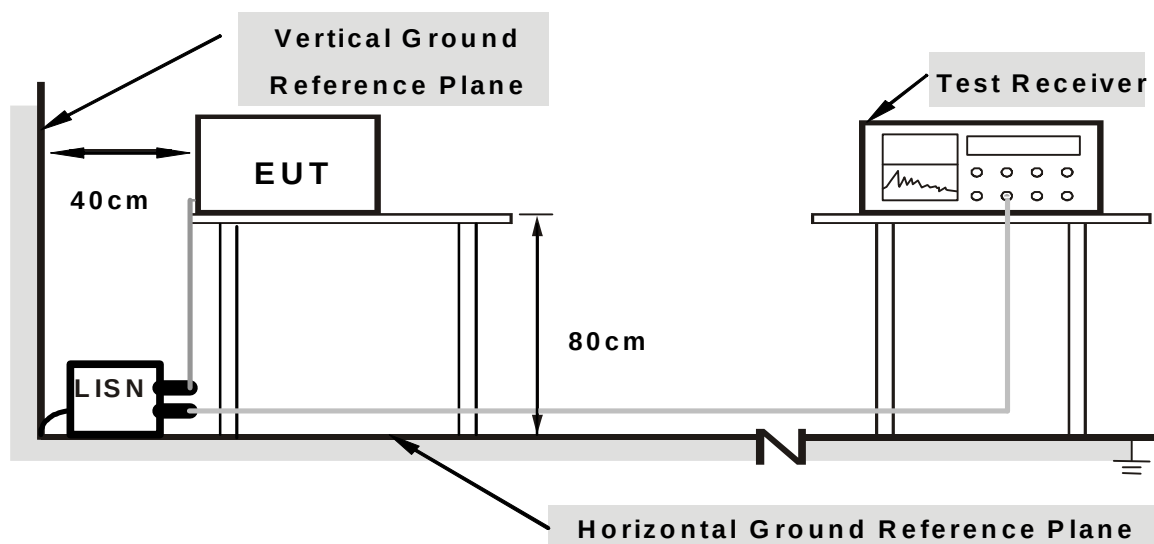
5.1.3 TEST PROCEDURES

- 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. 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) were not recorded.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

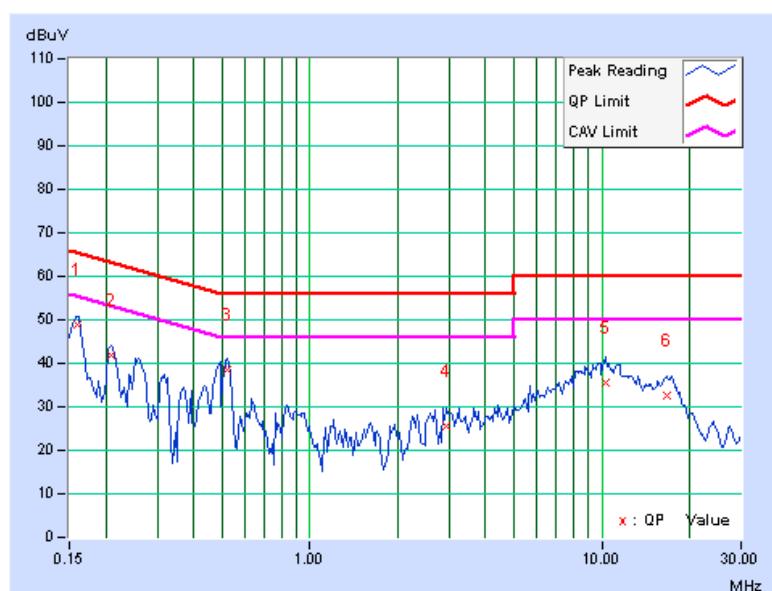
5.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.15934	0.07	48.82	43.29	48.89	43.36	65.50	55.50	-16.61	-12.14
2	0.20859	0.08	41.93	35.46	42.01	35.54	63.26	53.26	-21.25	-17.72
3	0.52109	0.12	38.43	33.86	38.55	33.98	56.00	46.00	-17.45	-12.02
4	2.91797	0.33	25.34	19.54	25.67	19.87	56.00	46.00	-30.33	-26.13
5	10.35938	0.72	34.81	29.80	35.53	30.52	60.00	50.00	-24.47	-19.48
6	16.71094	1.01	31.74	26.93	32.75	27.94	60.00	50.00	-27.25	-22.06

REMARKS:

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

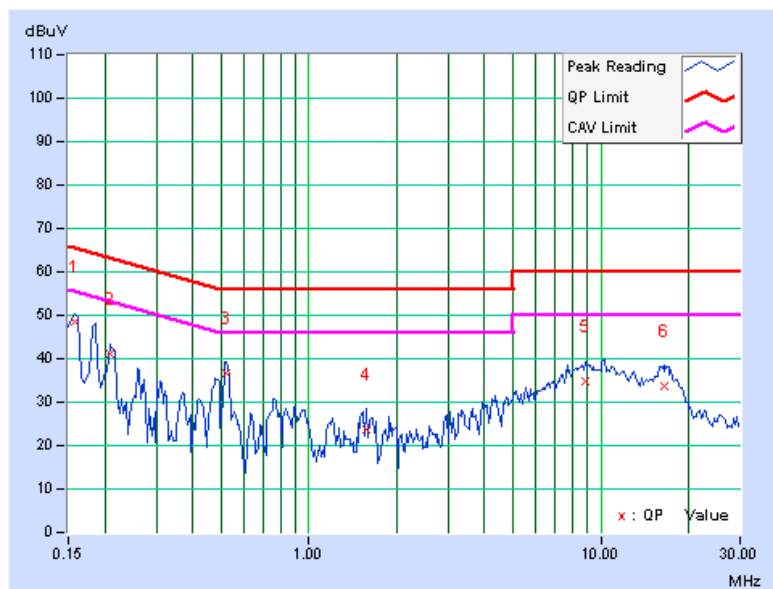


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.06	48.46	41.78	48.52	41.84	65.58	55.58	-17.06	-13.74
2	0.20859	0.07	41.06	33.38	41.13	33.45	63.26	53.26	-22.13	-19.81
3	0.52109	0.10	36.48	31.71	36.58	31.81	56.00	46.00	-19.42	-14.19
4	1.57422	0.16	23.52	15.47	23.68	15.63	56.00	46.00	-32.32	-30.37
5	8.85156	0.52	34.23	28.85	34.75	29.37	60.00	50.00	-25.25	-20.63
6	16.42578	0.90	32.74	28.10	33.64	29.00	60.00	50.00	-26.36	-21.00

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.



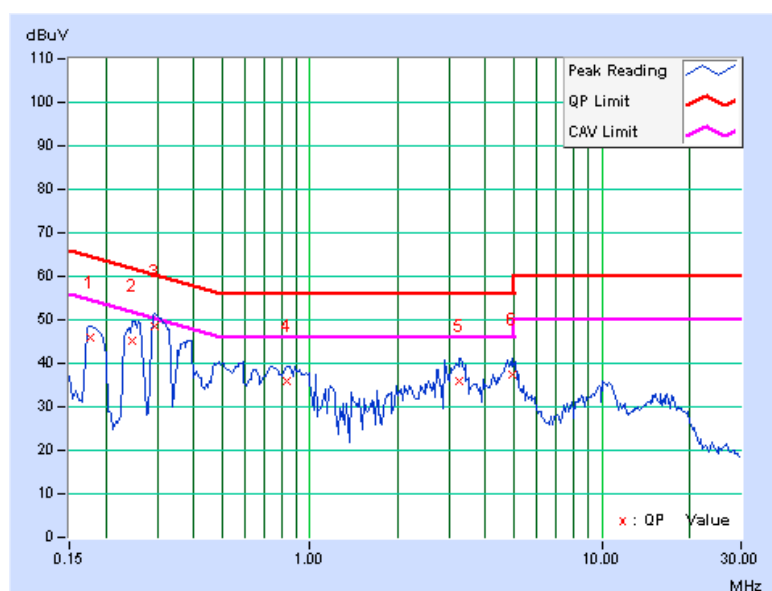
5.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.17734	0.08	45.97	34.53	46.05	34.61	64.61	54.61	-18.56	-20.00
2	0.24766	0.09	45.26	36.46	45.35	36.55	61.84	51.84	-16.49	-15.29
3	0.29453	0.09	48.53	37.07	48.62	37.16	60.40	50.40	-11.77	-13.23
4	0.83750	0.14	35.65	24.08	35.79	24.22	56.00	46.00	-20.21	-21.78
5	3.25391	0.35	35.51	24.81	35.86	25.16	56.00	46.00	-20.14	-20.84
6	4.93359	0.45	36.88	30.28	37.33	30.73	56.00	46.00	-18.67	-15.27

REMARKS:

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

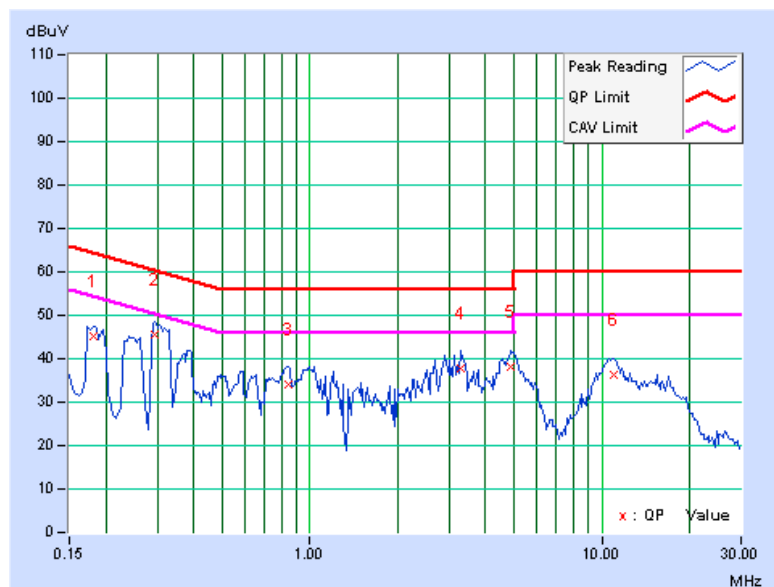


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18125	0.07	44.95	35.08	45.02	35.15	64.43	54.43	-19.41	-19.28
2	0.29453	0.08	45.44	33.51	45.52	33.59	60.40	50.40	-14.87	-16.80
3	0.84531	0.11	34.06	21.46	34.17	21.57	56.00	46.00	-21.83	-24.43
4	3.30859	0.27	37.62	25.62	37.89	25.89	56.00	46.00	-18.11	-20.11
5	4.86328	0.35	37.91	31.01	38.26	31.36	56.00	46.00	-17.74	-14.64
6	11.00000	0.62	35.75	30.92	36.37	31.54	60.00	50.00	-23.63	-18.46

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.



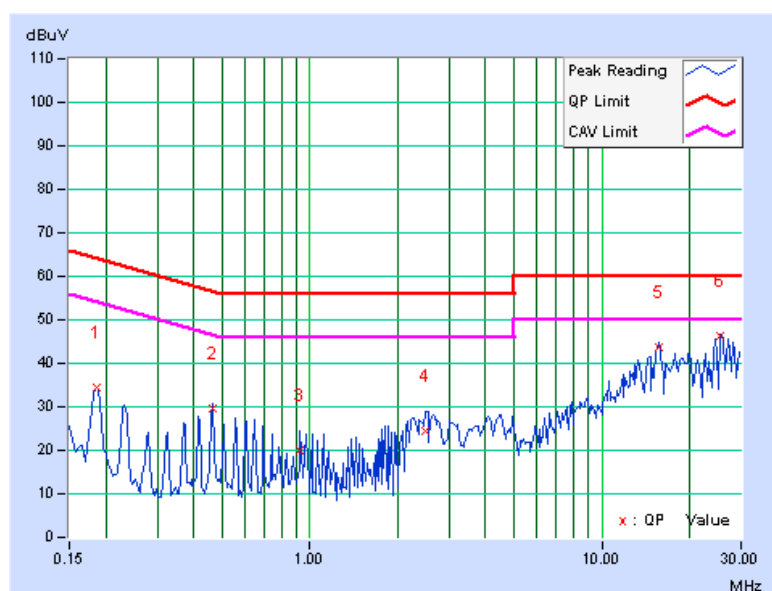
5.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.18516	0.08	34.20	33.50	34.28	33.58	64.25	54.25	-29.97	-20.67
2	0.46250	0.11	29.42	29.36	29.53	29.47	56.65	46.65	-27.11	-17.17
3	0.92734	0.15	19.75	18.70	19.90	18.85	56.00	46.00	-36.10	-27.15
4	2.50000	0.30	24.18	23.56	24.48	23.86	56.00	46.00	-31.52	-22.14
5	15.59563	0.97	42.81	42.36	43.78	43.33	60.00	50.00	-16.22	-6.67
6	25.51953	1.25	44.91	44.48	46.16	45.73	60.00	50.00	-13.84	-4.27

REMARKS:

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

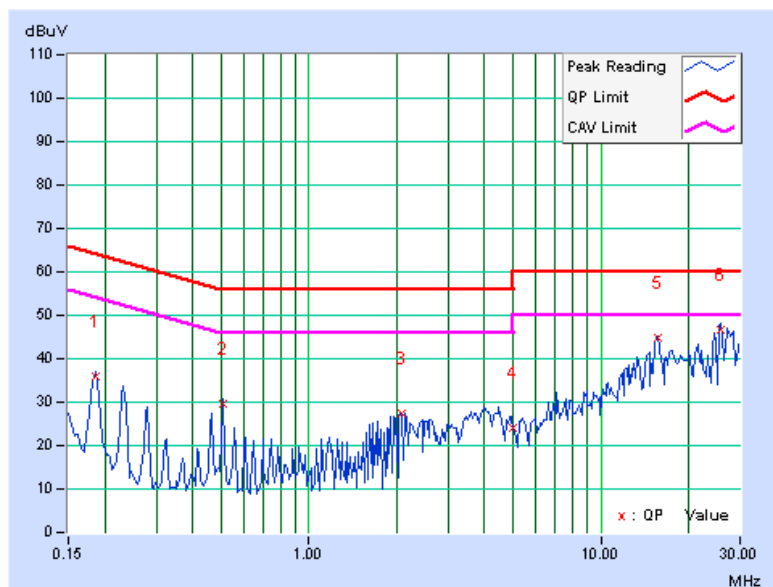


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.07	35.77	34.94	35.84	35.01	64.25	54.25	-28.41	-19.24
2	0.50938	0.10	29.49	29.37	29.59	29.47	56.00	46.00	-26.41	-16.53
3	2.08203	0.19	27.10	26.19	27.29	26.38	56.00	46.00	-28.71	-19.62
4	4.99625	0.35	23.76	23.12	24.11	23.47	56.00	46.00	-31.89	-22.53
5	15.59500	0.86	43.85	43.05	44.71	43.91	60.00	50.00	-15.29	-6.09
6	25.75781	1.20	45.47	44.90	46.67	46.10	60.00	50.00	-13.33	-3.90

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.



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION 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.

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
AISI Horn Antenna	AIH.8018	0000220091110	Nov. 23, 2011	Nov. 22, 2012
SCHWARZBECK Horn Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
*R&S Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in 966 Chamber No. H.
5. The FCC Site Registration No. is 797305.
6. The CANADA Site Registration No. is IC 7450H-3.
7. Tested Date: May 28 to 29, 2012

5.2.3 TEST PROCEDURES

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

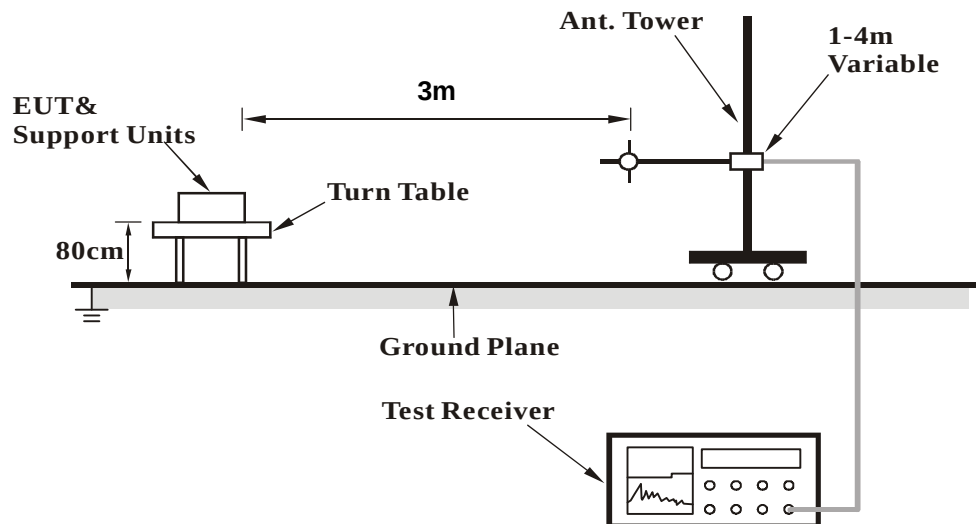
NOTE:

1. 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.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (20MHz)

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	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	250.12	37.5 QP	46.0	-8.6	1.00 H	310	24.15	13.30
2	295.00	38.5 QP	46.0	-7.6	1.00 H	3	23.35	15.10
3	472.00	38.5 QP	46.0	-7.6	2.00 H	0	19.08	19.37
4	575.00	39.5 QP	46.0	-6.5	1.50 H	152	17.86	21.68
5	605.40	39.9 QP	46.0	-6.1	1.50 H	0	17.58	22.29
6	751.00	40.1 QP	46.0	-5.9	1.00 H	193	15.52	24.58
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	40.20	33.8 QP	40.0	-6.3	1.00 V	118	19.94	13.81
2	275.00	38.5 QP	46.0	-7.6	1.50 V	225	24.14	14.31
3	374.80	38.2 QP	46.0	-7.8	1.25 V	320	21.13	17.08
4	525.00	39.8 QP	46.0	-6.3	1.25 V	177	19.16	20.59
5	624.98	39.8 QP	46.0	-6.3	1.75 V	349	17.21	22.54
6	749.48	39.8 QP	46.0	-6.2	1.50 V	360	15.23	24.55

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.

ABOVE 1GHz DATA

802.11a

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	57.5 PK	74.0	-16.5	1.47 H	160	16.79	40.71
2	5440.00	50.3 AV	54.0	-3.7	1.47 H	160	9.59	40.71
3	*5745.00	108.5 PK			1.54 H	86	66.95	41.55
4	*5745.00	98.4 AV			1.54 H	86	56.85	41.55
5	11490.00	65.3 PK	74.0	-8.7	1.06 H	29	17.59	47.71
6	11490.00	50.5 AV	54.0	-3.5	1.06 H	29	2.79	47.71

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	5440.00	57.7 PK	74.0	-16.3	1.00 V	215	16.99	40.71
2	5440.00	47.7 AV	54.0	-6.3	1.00 V	215	6.99	40.71
3	*5745.00	109.3 PK			1.10 V	317	67.75	41.55
4	*5745.00	99.1 AV			1.10 V	317	57.55	41.55
5	11490.00	67.9 PK	74.0	-6.1	1.11 V	14	20.19	47.71
6	11490.00	52.6 AV	54.0	-1.4	1.11 V	14	4.89	47.71

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.
6. The limit value is defined as per 15.247.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	60.9 PK	74.0	-13.1	1.47 H	166	20.19	40.71
2	5440.00	52.3 AV	54.0	-1.7	1.47 H	166	11.59	40.71
3	*5785.00	107.8 PK			1.51 H	79	66.12	41.68
4	*5785.00	97.6 AV			1.51 H	79	55.92	41.68
5	11570.00	65.7 PK	74.0	-8.3	1.09 H	16	17.95	47.75
6	11570.00	50.1 AV	54.0	-3.9	1.09 H	16	2.35	47.75
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	5440.00	57.2 PK	74.0	-16.8	1.00 V	229	16.49	40.71
2	5440.00	47.5 AV	54.0	-6.5	1.00 V	229	6.79	40.71
3	*5785.00	108.6 PK			1.06 V	305	66.92	41.68
4	*5785.00	98.6 AV			1.06 V	305	56.92	41.68
5	11570.00	69.2 PK	74.0	-4.8	1.09 V	13	21.45	47.75
6	11570.00	52.9 AV	54.0	-1.1	1.09 V	13	5.15	47.75

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.
6. The limit value is defined as per 15.247.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	62.4 PK	74.0	-11.6	1.47 H	160	21.69	40.71
2	5440.00	52.3 AV	54.0	-1.7	1.47 H	160	11.59	40.71
3	*5825.00	105.8 PK			1.47 H	280	64.02	41.78
4	*5825.00	95.6 AV			1.47 H	280	53.82	41.78
5	11650.00	65.2 PK	74.0	-8.8	1.13 H	25	17.37	47.83
6	11650.00	50.1 AV	54.0	-3.9	1.13 H	25	2.27	47.83
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	5440.00	61.7 PK	74.0	-12.3	1.47 V	203	20.99	40.71
2	5440.00	51.6 AV	54.0	-2.4	1.47 V	203	10.89	40.71
3	*5825.00	108.1 PK			1.44 V	178	66.32	41.78
4	*5825.00	97.8 AV			1.44 V	178	56.02	41.78
5	11650.00	68.1 PK	74.0	-5.9	1.09 V	13	20.27	47.83
6	11650.00	53.1 AV	54.0	-0.9	1.09 V	13	5.27	47.83

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.
6. The limit value is defined as per 15.247.

802.11n (20MHz)

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	62.9 PK	74.0	-11.1	1.47 H	159	22.19	40.71
2	5440.00	53.5 AV	54.0	-0.5	1.47 H	159	12.79	40.71
3	*5745.00	107.8 PK			1.54 H	80	66.25	41.55
4	*5745.00	97.9 AV			1.54 H	80	56.35	41.55
5	11490.00	63.0 PK	74.0	-11.0	1.10 H	32	15.29	47.71
6	11490.00	51.0 AV	54.0	-3.0	1.10 H	32	3.29	47.71
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	5440.00	57.7 PK	74.0	-16.3	1.00 V	230	16.99	40.71
2	5440.00	47.9 AV	54.0	-6.1	1.00 V	230	7.19	40.71
3	*5745.00	108.7 PK			1.09 V	304	67.15	41.55
4	*5745.00	98.9 AV			1.09 V	304	57.35	41.55
5	11490.00	67.6 PK	74.0	-6.4	1.15 V	15	19.89	47.71
6	11490.00	51.5 AV	54.0	-2.5	1.15 V	15	3.79	47.71

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.
6. The limit value is defined as per 15.247.

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	62.1 PK	74.0	-11.9	1.47 H	158	21.39	40.71
2	5440.00	53.3 AV	54.0	-0.7	1.47 H	158	12.59	40.71
3	*5785.00	107.7 PK			1.57 H	74	66.02	41.68
4	*5785.00	97.2 AV			1.57 H	74	55.52	41.68
5	11570.00	65.2 PK	74.0	-8.8	1.09 H	5	17.45	47.75
6	11570.00	49.8 AV	54.0	-4.2	1.09 H	5	2.05	47.75
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	5440.00	57.6 PK	74.0	-16.4	1.00 V	231	16.89	40.71
2	5440.00	48.0 AV	54.0	-6.0	1.00 V	231	7.29	40.71
3	*5785.00	108.5 PK			1.04 V	310	66.82	41.68
4	*5785.00	97.6 AV			1.04 V	310	55.92	41.68
5	11570.00	69.9 PK	74.0	-4.1	1.15 V	16	22.15	47.75
6	11570.00	53.3 AV	54.0	-0.7	1.15 V	16	5.55	47.75

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.
6. The limit value is defined as per 15.247.

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	63.2 PK	74.0	-10.8	1.48 H	159	22.49	40.71
2	5440.00	53.3 AV	54.0	-0.7	1.48 H	159	12.59	40.71
3	*5825.00	105.3 PK			1.47 H	278	63.52	41.78
4	*5825.00	95.8 AV			1.47 H	278	54.02	41.78
5	11650.00	64.8 PK	74.0	-9.2	1.14 H	19	16.97	47.83
6	11650.00	49.8 AV	54.0	-4.2	1.14 H	19	1.97	47.83
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	5440.00	57.6 PK	74.0	-16.4	1.00 V	234	16.89	40.71
2	5440.00	47.7 AV	54.0	-6.3	1.00 V	234	6.99	40.71
3	*5825.00	107.9 PK			1.46 V	182	66.12	41.78
4	*5825.00	97.2 AV			1.46 V	182	55.42	41.78
5	11650.00	69.4 PK	74.0	-4.6	1.15 V	14	21.57	47.83
6	11650.00	53.1 AV	54.0	-0.9	1.15 V	14	5.27	47.83

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.
6. The limit value is defined as per 15.247.

802.11n (40MHz)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	62.2 PK	74.0	-11.8	1.47 H	160	21.49	40.71
2	5440.00	52.7 AV	54.0	-1.3	1.47 H	160	11.99	40.71
3	*5755.00	107.4 PK			1.50 H	92	65.81	41.59
4	*5755.00	94.7 AV			1.50 H	92	53.11	41.59
5	11510.00	61.0 PK	74.0	-13.0	1.15 H	45	13.28	47.72
6	11510.00	47.9 AV	54.0	-6.1	1.15 H	45	0.18	47.72
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	5440.00	57.3 PK	74.0	-16.7	1.00 V	238	16.59	40.71
2	5440.00	47.3 AV	54.0	-6.7	1.00 V	238	6.59	40.71
3	*5755.00	106.1 PK			1.06 V	306	64.51	41.59
4	*5755.00	95.6 AV			1.06 V	306	54.01	41.59
5	11510.00	64.5 PK	74.0	-9.5	1.10 V	30	16.78	47.72
6	11510.00	49.8 AV	54.0	-4.2	1.10 V	30	2.08	47.72

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.
6. The limit value is defined as per 15.247.



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CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		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	5440.00	62.7 PK	74.0	-11.3	1.47 H	160	21.99	40.71
2	5440.00	53.5 AV	54.0	-0.5	1.47 H	160	12.79	40.71
3	*5795.00	105.7 PK			1.46 H	263	64.00	41.70
4	*5795.00	93.2 AV			1.46 H	263	51.50	41.70
5	11590.00	62.7 PK	74.0	-11.3	1.11 H	16	14.94	47.76
6	11590.00	47.1 AV	54.0	-6.9	1.11 H	16	-0.66	47.76
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	5400.00	57.0 PK	74.0	-17.0	1.00 V	225	16.39	40.61
2	5400.00	47.0 AV	54.0	-7.0	1.00 V	225	6.39	40.61
3	*5795.00	105.2 PK			1.41 V	188	63.50	41.70
4	*5795.00	94.2 AV			1.41 V	188	52.50	41.70
5	11590.00	67.1 PK	74.0	-6.9	1.13 V	5	19.34	47.76
6	11590.00	50.2 AV	54.0	-3.8	1.13 V	5	2.44	47.76

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.
6. The limit value is defined as per 15.247.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012

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 : May 31, 2012

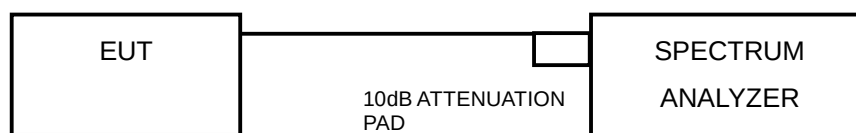
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.61	16.64	16.65	0.5	PASS
157	5785	16.62	16.66	16.65	0.5	PASS
165	5825	16.58	16.59	16.58	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.78	17.76	17.85	0.5	PASS
157	5785	17.85	17.79	17.85	0.5	PASS
165	5825	17.82	17.86	17.87	0.5	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	37.35	36.61	37.16	0.5	PASS
159	5795	37.12	36.89	36.74	0.5	PASS

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 MHz band: 1 Watt (30dBm)

5.4.2 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 : May 31, 2012

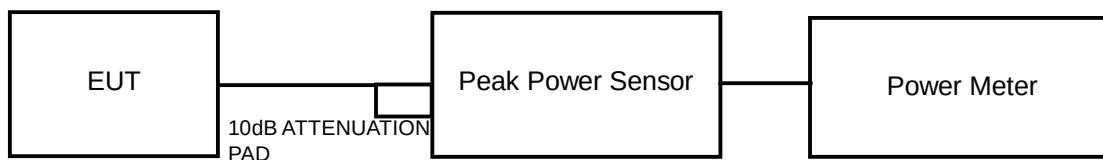
5.4.3 TEST PROCEDURES

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.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.4.7 TEST RESULTS

802.11a

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	14.80	15.20	13.50	85.700	19.33	26.09	PASS
157	5785	15.70	14.20	15.00	95.080	19.78	26.09	PASS
165	5825	16.00	13.60	15.80	100.739	20.03	26.09	PASS

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3]$

Effective Legacy Gain (dBi) = 9.91

The effective legacy gain is 9.91 dBi, therefore the limit needs to reduce.

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	13.40	14.90	14.50	80.965	19.08	30	PASS
157	5785	15.30	14.10	15.20	92.701	19.67	30	PASS
165	5825	16.30	13.60	15.70	102.721	20.12	30	PASS

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	14.60	14.70	14.60	87.192	19.40	30	PASS
159	5795	15.40	13.70	15.30	92.000	19.64	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012

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 : May 31, 2012

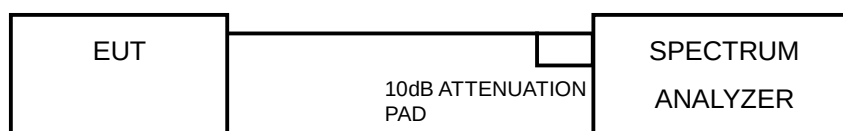
5.5.3 TEST PROCEDURE

1. Set the RBW = 100 kHz, VBW = 300 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 power level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-2.42	-17.65	4.77	-12.88	4.09	PASS
	157	5785	-3.52	-18.75	4.77	-13.98	4.09	PASS
	165	5825	-4.05	-19.28	4.77	-14.51	4.09	PASS
1	149	5745	-3.43	-18.66	4.77	-13.89	4.09	PASS
	157	5785	-5.80	-21.03	4.77	-16.26	4.09	PASS
	165	5825	-7.67	-22.90	4.77	-18.13	4.09	PASS
2	149	5745	-2.91	-18.14	4.77	-13.37	4.09	PASS
	157	5785	-2.68	-17.91	4.77	-13.14	4.09	PASS
	165	5825	-3.42	-18.65	4.77	-13.88	4.09	PASS

Note: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3]$

Effective Legacy Gain (dBi) = 9.91

The effective legacy gain is 9.91 dBi, therefore the limit needs to reduce.

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-3.43	-18.66	4.77	-13.89	8	PASS
	157	5785	-3.98	-19.21	4.77	-14.44	8	PASS
	165	5825	-4.67	-19.90	4.77	-15.13	8	PASS
1	149	5745	-4.26	-19.49	4.77	-14.72	8	PASS
	157	5785	-6.25	-21.48	4.77	-16.71	8	PASS
	165	5825	-8.23	-23.46	4.77	-18.69	8	PASS
2	149	5745	-4.15	-19.38	4.77	-14.61	8	PASS
	157	5785	-3.64	-18.87	4.77	-14.10	8	PASS
	165	5825	-3.62	-18.85	4.77	-14.08	8	PASS



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802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-6.63	-21.86	4.77	-17.09	8	PASS
	159	5795	-8.25	-23.48	4.77	-18.71	8	PASS
1	151	5755	-7.58	-22.81	4.77	-18.04	8	PASS
	159	5795	-10.81	-26.04	4.77	-21.27	8	PASS
2	151	5755	-6.96	-22.19	4.77	-17.42	8	PASS
	159	5795	-7.14	-22.37	4.77	-17.60	8	PASS

5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012

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 : May 31, 2012

5.6.3 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.

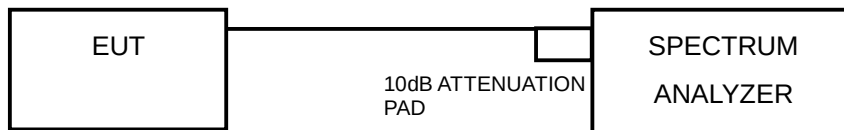
MEASUREMENT PROCEDURE OOB

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.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

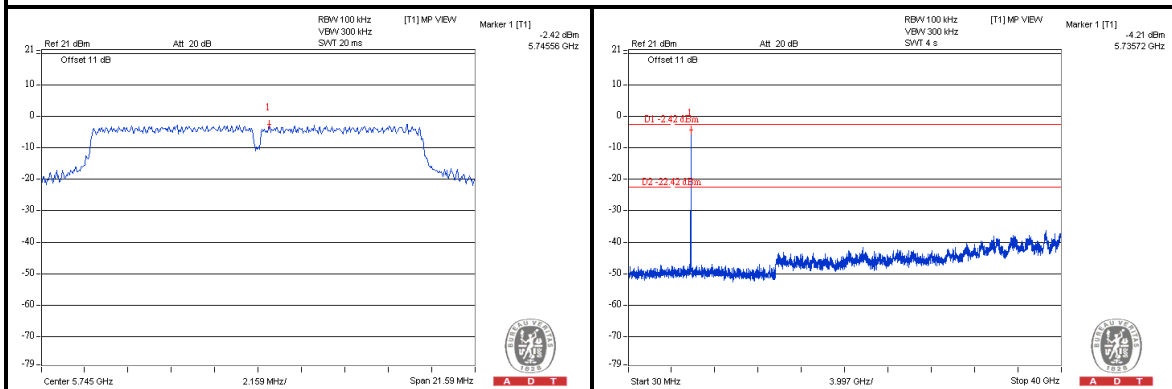
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



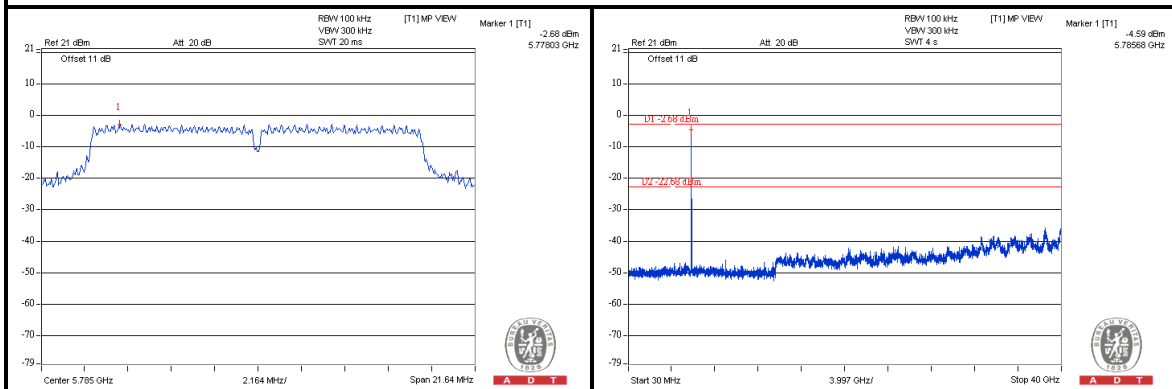
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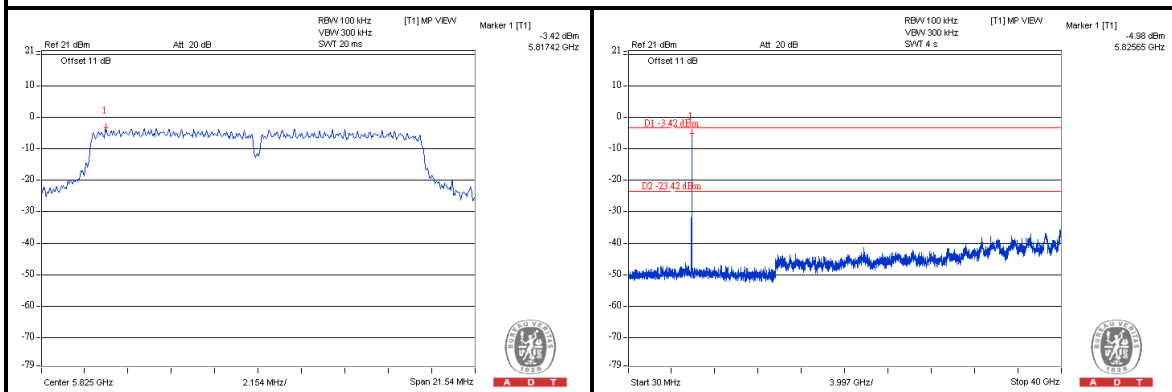
CH 149



CH 157



CH 165

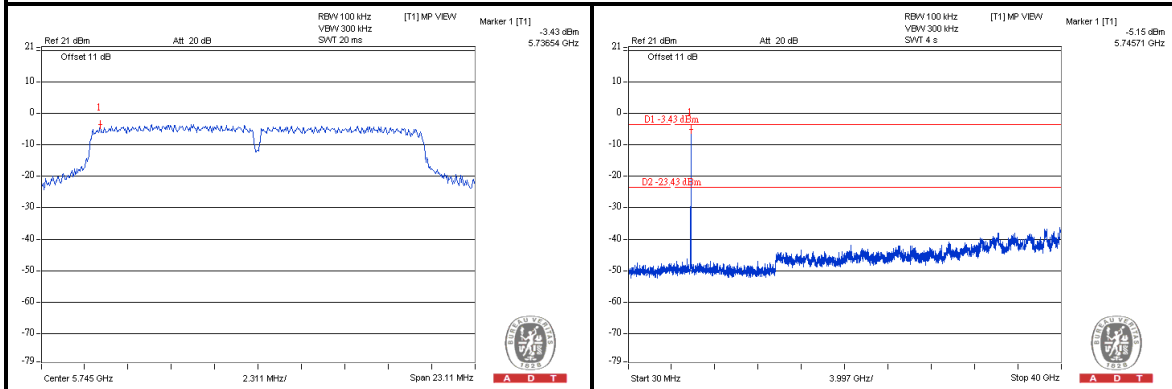




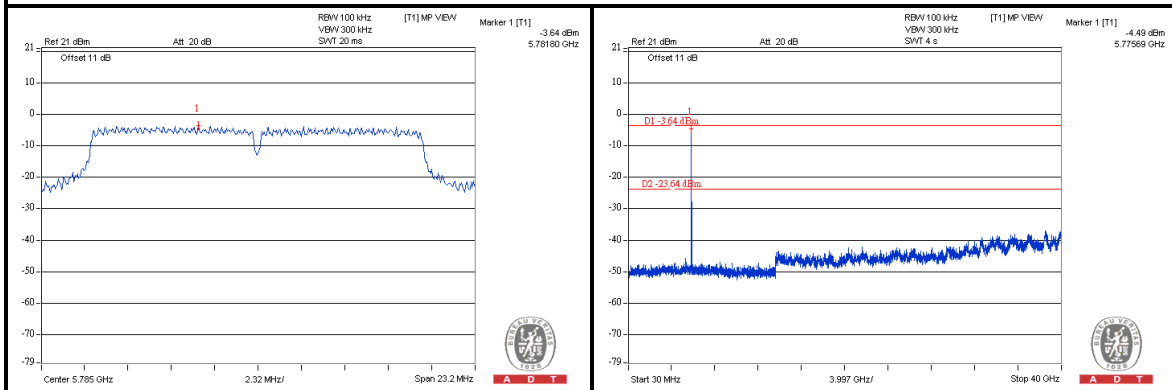
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802.11n (20MHz)

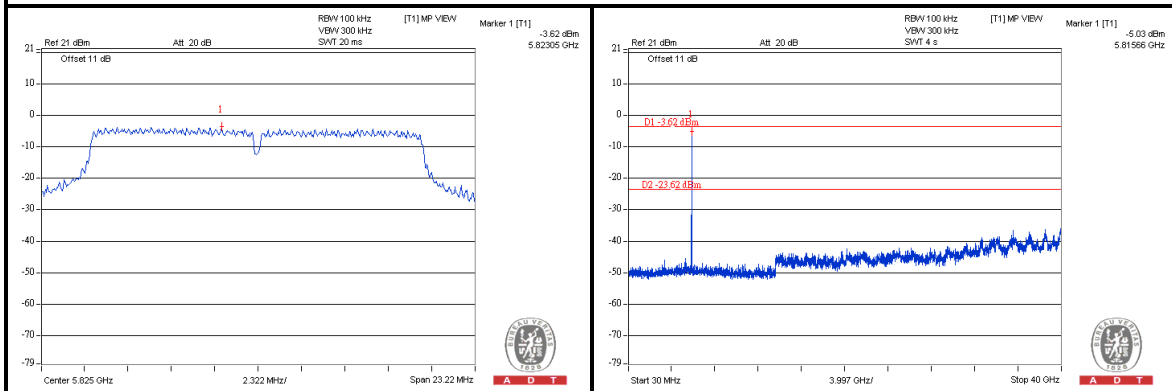
CH 149



CH 157

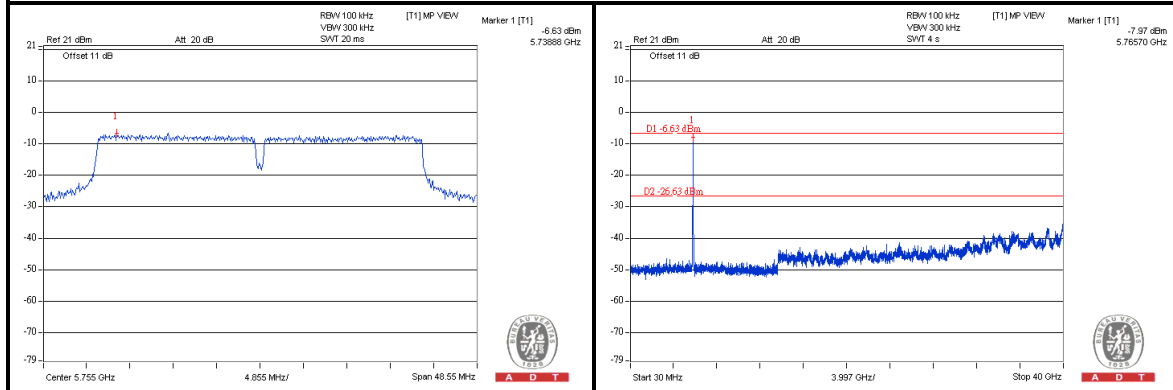


CH 165

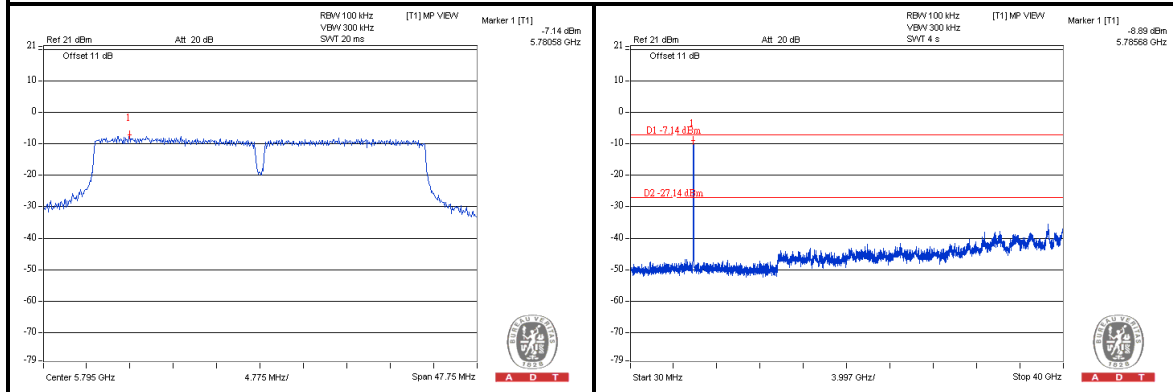


802.11n (40MHz)

CH 151



CH 159



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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7. 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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Tel: 886-2-26052180

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Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.



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8. 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.

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