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FCC TEST REPORT

REPORT NO.: RF120117E02

MODEL NO.: DWA-548

FCC ID: KA2WA548A1

RECEIVED: Jan. 17, 2012

TESTED: Jan. 18 to Mar. 08, 2012

ISSUED: Apr. 13, 2012

APPLICANT: D-Link Corporation

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120117E02	Original release	Apr. 13, 2012

1. CERTIFICATION

PRODUCT: Wireless N 300 PCI Express Desktop Adapter
BRAND NAME: D-Link
MODEL NO.: DWA-548
TEST SAMPLE: MASS-PRODUCTION
APPLICANT: D-Link Corporation
TESTED: Jan. 18 to Mar. 08, 2012
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.10-2009

The above equipment (Model: DWA-548) 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:** Apr. 13, 2012
(Lori Chung, Specialist)

APPROVED BY : , **DATE:** Apr. 13, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -3.88dB at 20.15684MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2483.5MHz
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 Straight Plug Reverse not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.81 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless N 300 PCI Express Desktop Adapter
MODEL NO.	DWA-548
POWER SUPPLY	DC 3.3V $\pm 10\%$ from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n (20MHz): up to 144.444Mbps 802.11n (40MHz): up to 300Mbps
OPERATING FREQUENCY	2.412 ~ 2.462GHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	802.11b: 75.9mW 802.11g: 363.1mW 802.11n (20MHz): 194.2mW 802.11n (40MHz): 200.0mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. There are two antennas provided to this EUT, please refer to the following table:

Transmitter Circuit	Manufacture	Model name	Antenna Type	Peak Gain (Included Cable loss) (dBi)	Connector Type
Chain (0)	WHA YU GROUP	C037-510982-A	Dipole	2.0	SMA Straight Plug Reverse
Chain (1)	WHA YU GROUP	C037-510982-A	Dipole	2.0	SMA Straight Plug Reverse

2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX/Rx FUNCTION
802.11b	1Tx/1Rx
802.11g	1Tx/1Rx
802.11n (20MHz)	2Tx/2Rx
802.11n (40MHz)	2Tx/2Rx

3. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) without beam forming function.
4. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
5. 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

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		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	OB	
-	√	√	√	√	√	-

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

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	6	OFDM	BPSK	6

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	MODULATIO N TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	25deg. C, 62%RH	120Vac, 60Hz	JyunChun Lin
RE<1G	25deg. C, 69%RH	120Vac, 60Hz	Frank Liu
RE ³ 1G	23deg. C, 69%RH	120Vac, 60Hz	Frank Liu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu
OB	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu



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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)

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.

3.4 DESCRIPTION OF SUPPORT UNITS

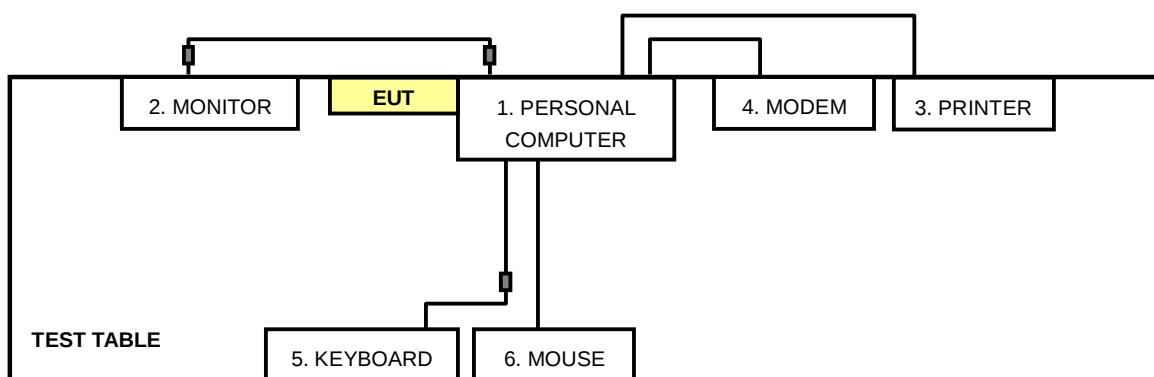
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	IBM	A65	L3B4724	FCC DoC
2	MONITOR	DELL	E2210Hc	CN-OG337R-64180-97S-OQ8S	FCC DoC
3	PRINTER	DELL	SK-8115	MY-0DJ325-71619-99B-0479	FCC DoC
4	MODEM	DELL	MOC5UO	I14066PS	IFAXDM1414
5	KEYBOARD	ACEEX	1414	0206026778	FCC DoC
6	MOUSE	EPSON	LQ-300+II	G88Y074015	FCC DoC

No.	Signal cable description
1	NA
2	VGA cable (1.4m, with 2 cores)
3	Printer cable (1.8m)
4	RS-232 cable (1m)
5	USB cable (1.5m, with 1 core)
6	USB cable (1.5m)

Note: The power cords of the above support units were unshielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 20, 2011	Sep. 19, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 05, 2011	Aug. 04, 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. A.
- 3 The VCCI Con A Registration No. is C-817.
4. Tested Date: Jan. 18, 2012

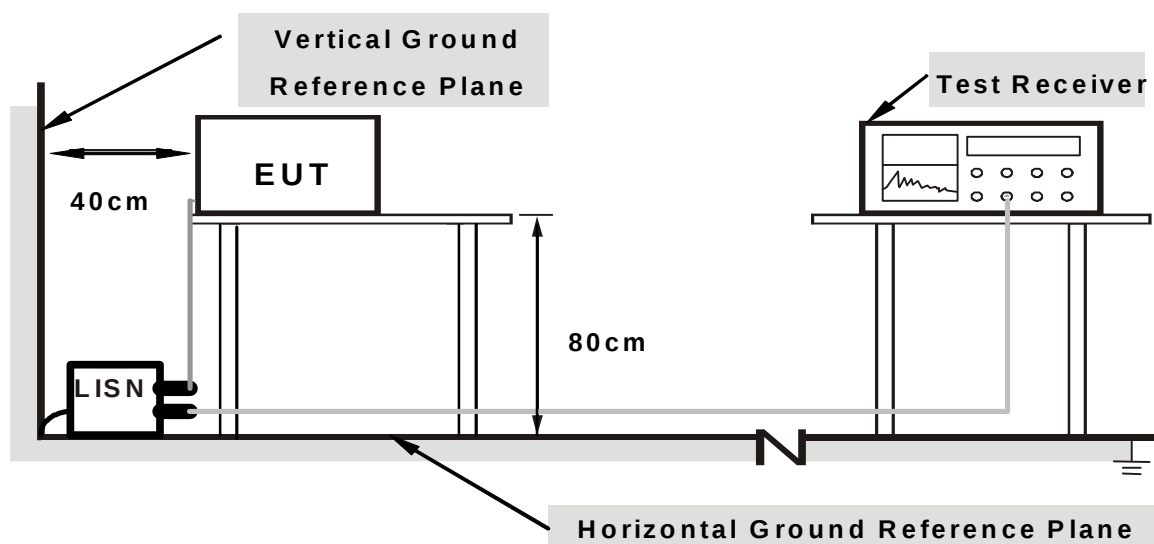
4.1.3 TEST PROCEDURES

- a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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

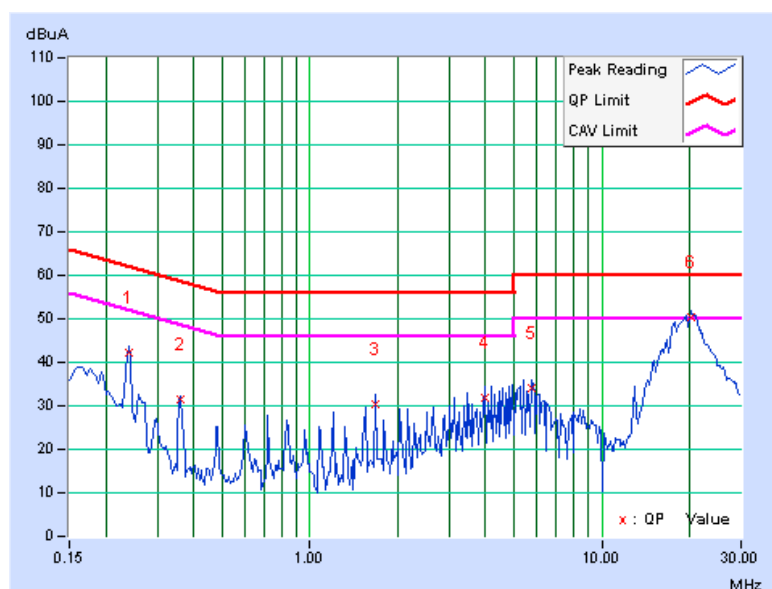
1. Placed the EUT on testing table.
2. Prepared computer system (support unit 1) to act as communication partner.
3. The communication partner ran test program “RT5x9x V1.0.7.0” to enable EUT under transmission/receiving condition continuously.

4.1.7 TEST RESULTS

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 (uV)]	[dB (uV)]	[dB (uV)]	(dB)	(dB)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.23984	0.06	42.29	42.04	42.35	42.10	62.10	52.10	-19.75	-10.00
2	0.36094	0.07	31.33	30.44	31.40	30.51	58.71	48.71	-27.31	-18.20
3	1.67969	0.15	30.17	29.39	30.32	29.54	56.00	46.00	-25.68	-16.46
4	3.96278	0.29	31.72	30.18	32.01	30.47	56.00	46.00	-23.99	-15.53
5	5.76203	0.33	33.76	32.87	34.09	33.20	60.00	50.00	-25.91	-16.80
6	20.15684	0.66	49.78	45.46	50.44	46.12	60.00	50.00	-9.56	-3.88

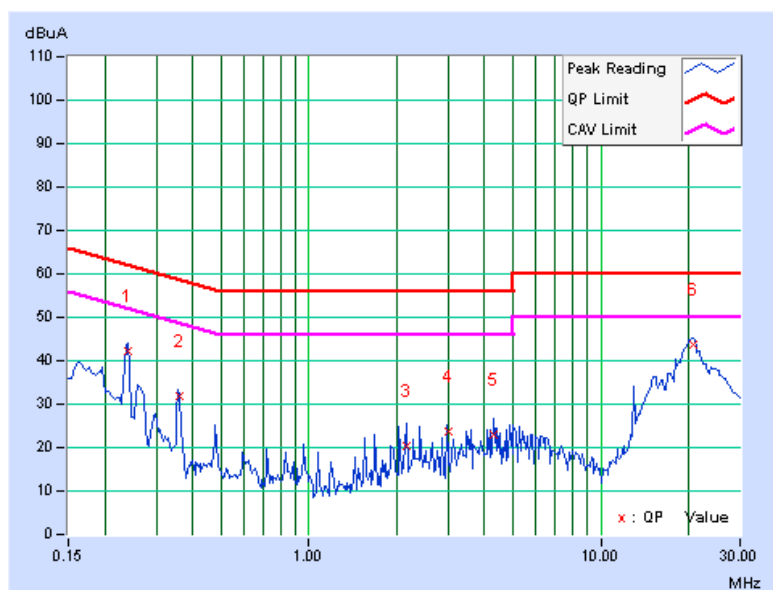
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.23984	0.07	42.17	41.70	42.24	41.77	62.10	52.10	-19.86	-10.33
2	0.35953	0.08	31.72	31.37	31.80	31.45	58.74	48.74	-26.94	-17.29
3	2.15709	0.18	20.37	18.41	20.55	18.59	56.00	46.00	-35.45	-27.41
4	2.99591	0.22	23.34	21.12	23.56	21.34	56.00	46.00	-32.44	-24.66
5	4.30931	0.28	22.56	20.66	22.84	20.94	56.00	46.00	-33.16	-25.06
6	20.70697	0.66	43.10	38.10	43.76	38.76	60.00	50.00	-16.24	-11.24

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



4.2 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.

4.2.2 TEST INSTRUMENTS

For below 1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 12, 2011	July 11, 2012
Agilent Pre-Selector	N9039A	MY46520311	July 12, 2011	July 11, 2012
Agilent Signal Generator	N5181A	MY49060517	July 12, 2011	July 11, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 14, 2011	Nov. 13, 2012
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 26, 2011	Dec. 25, 2012
RF Cable	NA	CHGCAB_001	Oct. 07, 2011	Oct. 06, 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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5. The VCCI Site Registration No. is G-137.
6. The CANADA Site Registration No. is IC 7450H-2.
7. Tested Date: Jan. 30 to Mar. 08, 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. 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.

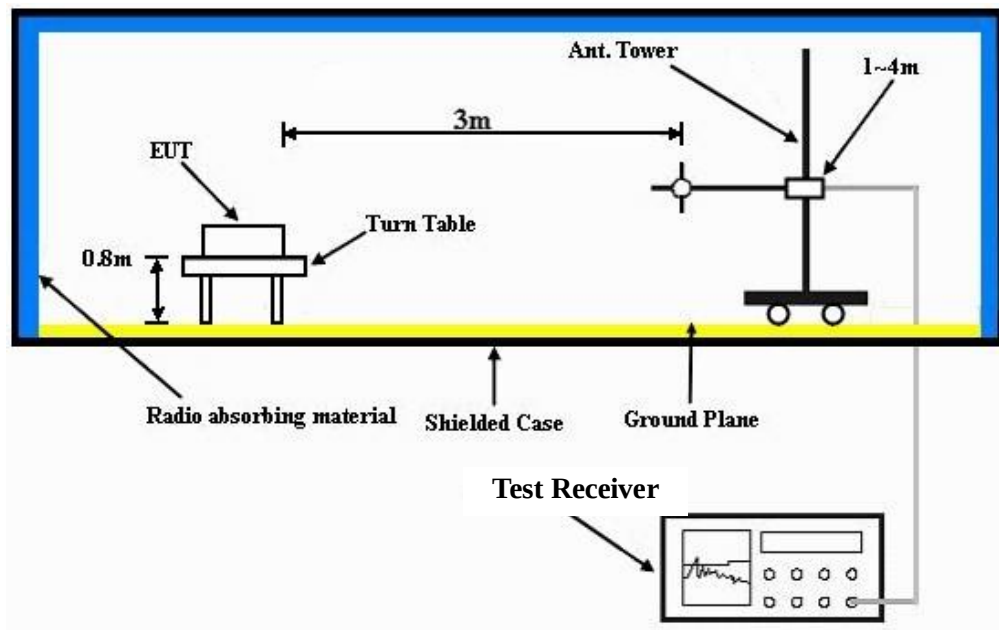
NOTE:

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	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTIO N FACTOR (dB/m)
1	148.42	24.3 QP	43.5	-19.2	2.00 H	75	9.68	14.62
2	443.89	27.2 QP	46.0	-18.8	2.00 H	1	8.20	18.99
3	527.97	35.9 QP	46.0	-10.1	1.50 H	127	14.96	20.96
4	564.32	31.4 QP	46.0	-14.6	1.50 H	113	9.57	21.80
5	699.56	35.5 QP	46.0	-10.5	1.00 H	117	12.45	23.05
6	766.12	32.7 QP	46.0	-13.3	1.00 H	143	7.83	24.89
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)	CORRECTIO N FACTOR (dB/m)
1	30.36	26.0 QP	40.0	-14.0	1.50 V	360	13.05	12.94
2	147.83	24.1 QP	43.5	-19.4	1.00 V	92	9.49	14.60
3	527.97	38.6 QP	46.0	-7.4	1.00 V	81	17.63	20.96
4	633.01	37.1 QP	46.0	-8.9	1.00 V	100	14.37	22.72
5	699.56	34.2 QP	46.0	-11.8	2.00 V	187	11.16	23.05
6	940.55	32.0 QP	46.0	-14.0	1.00 V	164	4.33	27.69

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.

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)	CORRECTIO N FACTOR (dB/m)
1	2333.70	57.5 PK	74.0	-16.5	1.46 H	301	26.09	31.41
2	2333.70	46.8 AV	54.0	-7.2	1.46 H	301	15.39	31.41
3	*2412.00	100.6 PK			1.45 H	300	68.94	31.66
4	*2412.00	98.4 AV			1.45 H	300	66.74	31.66
5	4824.00	48.3 PK	74.0	-25.7	1.30 H	58	9.23	39.07
6	4824.00	36.4 AV	54.0	-17.6	1.30 H	58	-2.67	39.07
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)	CORRECTIO N FACTOR (dB/m)
1	2333.70	60.4 PK	74.0	-13.6	1.55 V	177	28.99	31.41
2	2333.70	53.2 AV	54.0	-0.8	1.55 V	177	21.79	31.41
3	*2412.00	104.7 PK			1.45 V	357	73.04	31.66
4	*2412.00	102.6 AV			1.45 V	357	70.94	31.66
5	4824.00	50.4 PK	74.0	-23.6	1.06 V	22	11.33	39.07
6	4824.00	43.1 AV	54.0	-10.9	1.06 V	22	4.03	39.07

- 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)	CORRECTIO N FACTOR (dB/m)
1	2359.30	56.3 PK	74.0	-17.7	1.43 H	300	24.81	31.49
2	2359.30	46.5 AV	54.0	-7.5	1.43 H	300	15.01	31.49
3	*2437.00	99.5 PK			1.42 H	301	67.75	31.75
4	*2437.00	97.1 AV			1.42 H	301	65.35	31.75
5	4874.00	48.1 PK	74.0	-25.9	1.30 H	51	8.87	39.23
6	4874.00	36.1 AV	54.0	-17.9	1.30 H	51	-3.13	39.23
7	7311.00	55.6 PK	74.0	-18.4	1.26 H	311	9.03	46.57
8	7311.00	44.0 AV	54.0	-10.0	1.26 H	311	-2.57	46.57
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)	CORRECTIO N FACTOR (dB/m)
1	2359.30	62.6 PK	74.0	-11.4	1.18 V	20	31.11	31.49
2	2359.30	53.1 AV	54.0	-0.9	1.18 V	20	21.61	31.49
3	*2437.00	104.3 PK			1.41 V	350	72.55	31.75
4	*2437.00	102.1 AV			1.41 V	350	70.35	31.75
5	4874.00	50.7 PK	74.0	-23.3	1.06 V	19	11.47	39.23
6	4874.00	42.7 AV	54.0	-11.3	1.06 V	19	3.47	39.23
7	7311.00	55.7 PK	74.0	-18.3	1.17 V	206	9.13	46.57
8	7311.00	43.8 AV	54.0	-10.2	1.17 V	206	-2.77	46.57

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)	CORRECTIO N FACTOR (dB/m)
1	2380.30	57.8 PK	74.0	-16.2	1.48 H	295	26.24	31.56
2	2380.30	45.6 AV	54.0	-8.4	1.48 H	295	14.04	31.56
3	*2462.00	98.9 PK			1.49 H	296	67.07	31.83
4	*2462.00	96.5 AV			1.49 H	296	64.67	31.83
5	2483.50	57.8 PK	74.0	-16.2	1.49 H	267	25.90	31.90
6	2483.50	46.9 AV	54.0	-7.1	1.49 H	267	15.00	31.90
7	4924.00	48.6 PK	74.0	-25.4	1.28 H	52	9.21	39.39
8	4924.00	36.8 AV	54.0	-17.2	1.28 H	52	-2.59	39.39
9	7386.00	55.9 PK	74.0	-18.1	1.22 H	297	9.43	46.47
10	7386.00	44.1 AV	54.0	-9.9	1.22 H	297	-2.37	46.47
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)	CORRECTIO N FACTOR (dB/m)
1	2380.30	60.7 PK	74.0	-13.3	1.18 V	20	29.14	31.56
2	2380.30	53.3 AV	54.0	-0.7	1.18 V	20	21.74	31.56
3	*2462.00	103.4 PK			1.42 V	351	71.57	31.83
4	*2462.00	101.3 AV			1.42 V	351	69.47	31.83
5	2483.50	57.6 PK	74.0	-16.4	1.42 V	351	25.70	31.90
6	2483.50	44.6 AV	54.0	-9.4	1.42 V	351	12.70	31.90
7	4924.00	50.5 PK	74.0	-23.5	1.00 V	21	11.11	39.39
8	4924.00	42.6 AV	54.0	-11.4	1.00 V	21	3.21	39.39
9	7386.00	55.2 PK	74.0	-18.8	1.21 V	219	8.73	46.47
10	7386.00	43.6 AV	54.0	-10.4	1.21 V	219	-2.87	46.47

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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	60.3 PK	74.0	-13.7	1.69 H	304	28.71	31.59
2	2390.00	47.2 AV	54.0	-6.8	1.69 H	304	15.61	31.59
3	*2412.00	101.1 PK			1.69 H	304	69.44	31.66
4	*2412.00	92.2 AV			1.69 H	304	60.54	31.66
5	4824.00	48.2 PK	74.0	-25.8	1.23 H	58	9.13	39.07
6	4824.00	36.5 AV	54.0	-17.5	1.23 H	58	-2.57	39.07
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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	68.7 PK	74.0	-5.3	1.24 V	20	37.11	31.59
2	2390.00	53.2 AV	54.0	-0.8	1.24 V	20	21.61	31.59
3	*2412.00	108.5 PK			1.24 V	20	76.84	31.66
4	*2412.00	98.7 AV			1.24 V	20	67.04	31.66
5	4824.00	49.0 PK	74.0	-25.0	1.05 V	18	9.93	39.07
6	4824.00	36.8 AV	54.0	-17.2	1.05 V	18	-2.27	39.07

- 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)	CORRECTIO N FACTOR (dB/m)
1	2360.00	58.3 PK	74.0	-15.7	1.69 H	304	26.81	31.49
2	2360.00	47.0 AV	54.0	-7.0	1.69 H	304	15.51	31.49
3	*2437.00	102.6 PK			1.69 H	299	70.85	31.75
4	*2437.00	93.6 AV			1.69 H	299	61.85	31.75
5	2489.20	58.9 PK	74.0	-15.1	1.69 H	304	26.98	31.92
6	2489.20	47.8 AV	54.0	-6.2	1.69 H	304	15.88	31.92
7	4874.00	47.8 PK	74.0	-26.2	1.30 H	50	8.57	39.23
8	4874.00	36.3 AV	54.0	-17.7	1.30 H	50	-2.93	39.23
9	7311.00	52.6 PK	74.0	-21.4	1.26 H	313	6.03	46.57
10	7311.00	40.9 AV	54.0	-13.1	1.26 H	313	-5.67	46.57
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)	CORRECTIO N FACTOR (dB/m)
1	2360.00	63.5 PK	74.0	-10.5	1.18 V	21	32.01	31.49
2	2360.00	53.1 AV	54.0	-0.9	1.18 V	21	21.61	31.49
3	*2437.00	107.5 PK			1.17 V	352	75.75	31.75
4	*2437.00	99.3 AV			1.17 V	352	67.55	31.75
5	2489.20	63.4 PK	74.0	-10.6	1.16 V	352	31.48	31.92
6	2489.20	53.2 AV	54.0	-0.8	1.16 V	352	21.28	31.92
7	4874.00	48.6 PK	74.0	-25.4	1.07 V	22	9.37	39.23
8	4874.00	36.5 AV	54.0	-17.5	1.07 V	22	-2.73	39.23
9	7311.00	53.4 PK	74.0	-20.6	1.18 V	200	6.83	46.57
10	7311.00	40.9 AV	54.0	-13.1	1.18 V	200	-5.67	46.57

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)	CORRECTIO N FACTOR (dB/m)
1	*2462.00	101.7 PK			1.64 H	297	69.87	31.83
2	*2462.00	92.9 AV			1.64 H	297	61.07	31.83
3	2483.50	64.9 PK	74.0	-9.1	1.57 H	297	33.00	31.90
4	2483.50	47.9 AV	54.0	-6.1	1.57 H	297	16.00	31.90
5	4924.00	48.4 PK	74.0	-25.6	1.25 H	53	9.01	39.39
6	4924.00	36.7 AV	54.0	-17.3	1.25 H	53	-2.69	39.39
7	7386.00	53.3 PK	74.0	-20.7	1.31 H	325	6.83	46.47
8	7386.00	41.4 AV	54.0	-12.6	1.31 H	325	-5.07	46.47
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)	CORRECTIO N FACTOR (dB/m)
1	*2462.00	105.1 PK			1.38 V	351	73.27	31.83
2	*2462.00	96.3 AV			1.38 V	351	64.47	31.83
3	2483.50	70.0 PK	74.0	-4.0	1.38 V	351	38.10	31.90
4	2483.50	52.2 AV	54.0	-1.8	1.38 V	351	20.30	31.90
5	4924.00	48.8 PK	74.0	-25.2	1.07 V	29	9.41	39.39
6	4924.00	36.9 AV	54.0	-17.1	1.07 V	29	-2.49	39.39
7	7386.00	53.0 PK	74.0	-21.0	1.13 V	188	6.53	46.47
8	7386.00	40.8 AV	54.0	-13.2	1.13 V	188	-5.67	46.47

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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	59.7 PK	74.0	-14.3	1.47 H	146	28.11	31.59
2	2390.00	46.9 AV	54.0	-7.1	1.47 H	146	15.31	31.59
3	*2412.00	102.4 PK			1.47 H	146	70.74	31.66
4	*2412.00	92.7 AV			1.47 H	146	61.04	31.66
5	4824.00	48.0 PK	74.0	-26.0	1.37 H	38	8.93	39.07
6	4824.00	35.9 AV	54.0	-18.1	1.37 H	38	-3.17	39.07
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)	CORRECTIO N FACTOR (dB/m)
1	2360.10	67.0 PK	74.0	-7.0	1.17 V	29	35.51	31.49
2	2360.10	53.3 AV	54.0	-0.7	1.17 V	29	21.81	31.49
3	*2412.00	109.8 PK			1.17 V	29	78.14	31.66
4	*2412.00	101.3 AV			1.17 V	29	69.64	31.66
5	4824.00	49.2 PK	74.0	-24.8	1.29 V	312	10.13	39.07
6	4824.00	36.4 AV	54.0	-17.6	1.29 V	312	-2.67	39.07

- 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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	57.9 PK	74.0	-16.1	1.43 H	144	26.31	31.59
2	2390.00	45.7 AV	54.0	-8.3	1.43 H	144	14.11	31.59
3	*2437.00	101.8 PK			1.43 H	144	70.05	31.75
4	*2437.00	92.2 AV			1.43 H	144	60.45	31.75
5	2483.50	57.1 PK	74.0	-16.9	1.45 H	140	25.20	31.90
6	2483.50	45.4 AV	54.0	-8.6	1.45 H	140	13.50	31.90
7	4874.00	48.4 PK	74.0	-25.6	1.38 H	52	9.17	39.23
8	4874.00	36.3 AV	54.0	-17.7	1.38 H	52	-2.93	39.23
9	7311.00	52.7 PK	74.0	-21.3	1.23 H	20	6.13	46.57
10	7311.00	41.1 AV	54.0	-12.9	1.23 H	20	-5.47	46.57
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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	61.8 PK	74.0	-12.2	1.15 V	32	30.21	31.59
2	2390.00	52.6 AV	54.0	-1.4	1.15 V	32	21.01	31.59
3	*2437.00	108.1 PK			1.16 V	29	76.35	31.75
4	*2437.00	99.5 AV			1.16 V	29	67.75	31.75
5	2483.50	63.1 PK	74.0	-10.9	1.15 V	32	31.20	31.90
6	2483.50	53.5 AV	54.0	-0.5	1.15 V	32	21.60	31.90
7	4874.00	48.7 PK	74.0	-25.3	1.23 V	311	9.47	39.23
8	4874.00	36.3 AV	54.0	-17.7	1.23 V	311	-2.93	39.23
9	7311.00	52.5 PK	74.0	-21.5	1.16 V	80	5.93	46.57
10	7311.00	41.0 AV	54.0	-13.0	1.16 V	80	-5.57	46.57

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)	CORRECTIO N FACTOR (dB/m)
1	*2462.00	100.2 PK			1.41 H	146	68.37	31.83
2	*2462.00	91.1 AV			1.41 H	146	59.27	31.83
3	2483.50	57.1 PK	74.0	-16.9	1.41 H	146	25.20	31.90
4	2483.50	44.8 AV	54.0	-9.2	1.41 H	146	12.90	31.90
5	4924.00	47.9 PK	74.0	-26.1	1.32 H	46	8.51	39.39
6	4924.00	35.8 AV	54.0	-18.2	1.32 H	46	-3.59	39.39
7	7386.00	53.3 PK	74.0	-20.7	1.21 H	19	6.83	46.47
8	7386.00	41.5 AV	54.0	-12.5	1.21 H	19	-4.97	46.47
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)	CORRECTIO N FACTOR (dB/m)
1	*2462.00	108.5 PK			1.20 V	53	76.67	31.83
2	*2462.00	99.3 AV			1.20 V	53	67.47	31.83
3	2483.50	72.7 PK	74.0	-1.3	1.08 V	295	40.80	31.90
4	2483.50	50.8 AV	54.0	-3.2	1.08 V	295	18.90	31.90
5	4924.00	48.4 PK	74.0	-25.6	1.28 V	324	9.01	39.39
6	4924.00	35.9 AV	54.0	-18.1	1.28 V	324	-3.49	39.39
7	7386.00	52.8 PK	74.0	-21.2	1.19 V	85	6.33	46.47
8	7386.00	41.0 AV	54.0	-13.0	1.19 V	85	-5.47	46.47

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)	CORRECTIO N FACTOR (dB/m)
1	2389.20	57.8 PK	74.0	-16.2	1.45 H	147	26.21	31.59
2	2389.20	45.9 AV	54.0	-8.1	1.45 H	147	14.31	31.59
3	*2422.00	96.2 PK			1.45 H	147	64.51	31.69
4	*2422.00	87.1 AV			1.45 H	147	55.41	31.69
5	4844.00	47.1 PK	74.0	-26.9	1.34 H	36	7.97	39.13
6	4844.00	35.7 AV	54.0	-18.3	1.34 H	36	-3.43	39.13
7	7266.00	52.9 PK	74.0	-21.1	1.26 H	14	6.30	46.60
8	7266.00	41.0 AV	54.0	-13.0	1.26 H	14	-5.60	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)	CORRECTIO N FACTOR (dB/m)
1	2389.20	66.6 PK	74.0	-7.4	1.20 V	29	35.01	31.59
2	2389.20	53.1 AV	54.0	-0.9	1.20 V	29	21.51	31.59
3	*2422.00	105.6 PK			1.20 V	29	73.91	31.69
4	*2422.00	96.8 AV			1.20 V	29	65.11	31.69
5	4844.00	47.3 PK	74.0	-26.7	1.30 V	306	8.17	39.13
6	4844.00	35.8 AV	54.0	-18.2	1.30 V	306	-3.33	39.13
7	7266.00	51.7 PK	74.0	-22.3	1.27 V	93	5.10	46.60
8	7266.00	40.4 AV	54.0	-13.6	1.27 V	93	-6.20	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.



A D T

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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.45 H	141	25.91	31.59
2	2390.00	46.2 AV	54.0	-7.8	1.45 H	141	14.61	31.59
3	*2437.00	99.3 PK			1.43 H	144	67.55	31.75
4	*2437.00	89.9 AV			1.43 H	144	58.15	31.75
5	2483.50	58.6 PK	74.0	-15.4	1.43 H	144	26.70	31.90
6	2483.50	45.9 AV	54.0	-8.1	1.43 H	144	14.00	31.90
7	4874.00	47.5 PK	74.0	-26.5	1.33 H	49	8.27	39.23
8	4874.00	36.1 AV	54.0	-17.9	1.33 H	49	-3.13	39.23
9	7311.00	52.8 PK	74.0	-21.2	1.20 H	20	6.23	46.57
10	7311.00	40.9 AV	54.0	-13.1	1.20 H	20	-5.67	46.57
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)	CORRECTIO N FACTOR (dB/m)
1	2390.00	64.8 PK	74.0	-9.2	1.18 V	28	33.21	31.59
2	2390.00	52.3 AV	54.0	-1.7	1.18 V	28	20.71	31.59
3	*2437.00	107.2 PK			1.18 V	30	75.45	31.75
4	*2437.00	99.0 AV			1.18 V	30	67.25	31.75
5	2483.50	71.2 PK	74.0	-2.8	1.08 V	296	39.30	31.90
6	2483.50	53.0 AV	54.0	-1.0	1.08 V	296	21.10	31.90
7	4874.00	47.5 PK	74.0	-26.5	1.30 V	311	8.27	39.23
8	4874.00	36.2 AV	54.0	-17.8	1.30 V	311	-3.03	39.23
9	7311.00	52.3 PK	74.0	-21.7	1.23 V	90	5.73	46.57
10	7311.00	40.9 AV	54.0	-13.1	1.23 V	90	-5.67	46.57

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)	CORRECTIO N FACTOR (dB/m)
1	*2452.00	95.9 PK			1.44 H	144	64.10	31.80
2	*2452.00	86.5 AV			1.44 H	144	54.70	31.80
3	2483.50	56.6 PK	74.0	-17.4	1.44 H	143	24.70	31.90
4	2483.50	45.4 AV	54.0	-8.6	1.44 H	143	13.50	31.90
5	4904.00	46.9 PK	74.0	-27.1	1.37 H	29	7.58	39.32
6	4904.00	35.6 AV	54.0	-18.4	1.37 H	29	-3.72	39.32
7	7356.00	53.3 PK	74.0	-20.7	1.30 H	23	6.79	46.51
8	7356.00	41.4 AV	54.0	-12.6	1.30 H	23	-5.11	46.51
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)	CORRECTIO N FACTOR (dB/m)
1	*2452.00	105.0 PK			1.19 V	29	73.20	31.80
2	*2452.00	95.7 AV			1.19 V	29	63.90	31.80
3	2483.50	67.6 PK	74.0	-6.4	1.19 V	29	35.70	31.90
4	2483.50	53.3 AV	54.0	-0.7	1.19 V	29	21.40	31.90
5	4904.00	46.9 PK	74.0	-27.1	1.27 V	295	7.58	39.32
6	4904.00	35.5 AV	54.0	-18.5	1.27 V	295	-3.82	39.32
7	7356.00	51.5 PK	74.0	-22.5	1.32 V	81	4.99	46.51
8	7356.00	40.4 AV	54.0	-13.6	1.32 V	81	-6.11	46.51

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	FSP 40	100060	May 11, 2011	May 10, 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 : Mar. 07, 2012

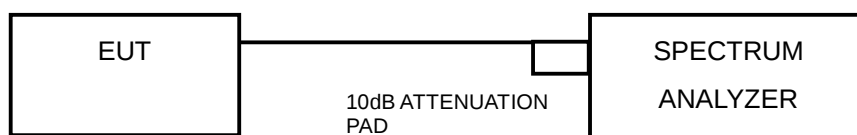
4.3.3 TEST PROCEDURE

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	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	11.68	0.5	PASS
6	2437	11.47	0.5	PASS
11	2462	11.53	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.59	0.5	PASS
6	2437	16.51	0.5	PASS
11	2462	16.51	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.60	17.61	0.5	PASS
6	2437	17.52	17.62	0.5	PASS
11	2462	17.62	17.58	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.41	36.32	0.5	PASS
6	2437	36.37	36.36	0.5	PASS
9	2452	36.34	36.33	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
Peak Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 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 : Mar. 07, 2012

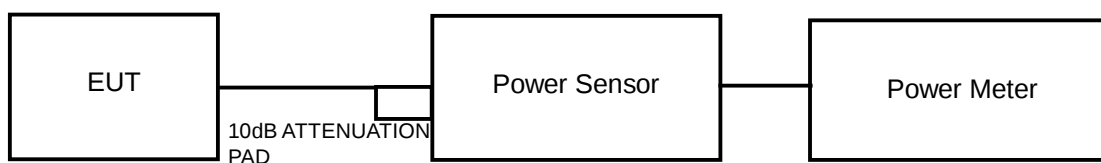
4.4.3 TEST PROCEDURES

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

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	75.9	18.8	30	PASS
6	2437	70.8	18.5	30	PASS
11	2462	52.5	17.2	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	316.2	25.0	30	PASS
6	2437	363.1	25.6	30	PASS
11	2462	223.9	23.5	30	PASS

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	20.3	19.4	194.2	22.9	30	PASS
6	2437	19.5	19.2	172.3	22.4	30	PASS
11	2462	19.3	19.0	164.5	22.2	30	PASS

802.11n (40MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	17.6	16.9	106.5	20.3	30	PASS
6	2437	20.0	20.0	200.0	23.0	30	PASS
9	2452	17.0	17.0	100.2	20.0	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	FSP 40	100060	May 11, 2011	May 10, 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 : Mar. 07, 2012

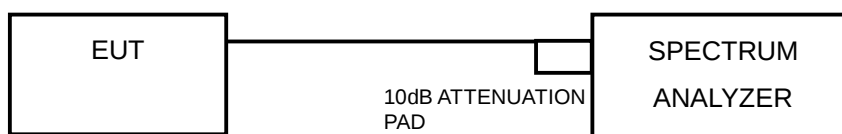
4.5.3 TEST PROCEDURE

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

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	8.2	-7.1	8	PASS
6	2437	6.3	-8.9	8	PASS
11	2462	6.9	-8.3	8	PASS

802.11g

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	3.7	-11.5	8	PASS
6	2437	4.6	-10.7	8	PASS
11	2462	2.0	-13.2	8	PASS

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-0.4	-15.7	3.0	-12.7	8	PASS
	6	2437	-0.9	-16.1	3.0	-13.1	8	PASS
	11	2462	-0.9	-16.1	3.0	-13.1	8	PASS
1	1	2412	2.4	-12.8	3.0	-9.8	8	PASS
	6	2437	2.0	-13.3	3.0	-10.3	8	PASS
	11	2462	1.7	-13.5	3.0	-10.5	8	PASS

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-4.9	-20.2	3.0	-17.2	8	PASS
	6	2437	-2.6	-17.8	3.0	-14.8	8	PASS
	9	2452	-5.6	-20.8	3.0	-17.8	8	PASS
1	3	2422	-3.4	-18.7	3.0	-15.7	8	PASS
	6	2437	0.0	-15.3	3.0	-12.3	8	PASS
	9	2452	-3.0	-18.2	3.0	-15.2	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	FSP 40	100060	May 11, 2011	May 10, 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 : Mar. 07, 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.

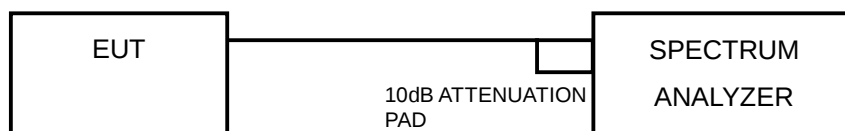
MEASUREMENT PROCEDURE OOB

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.

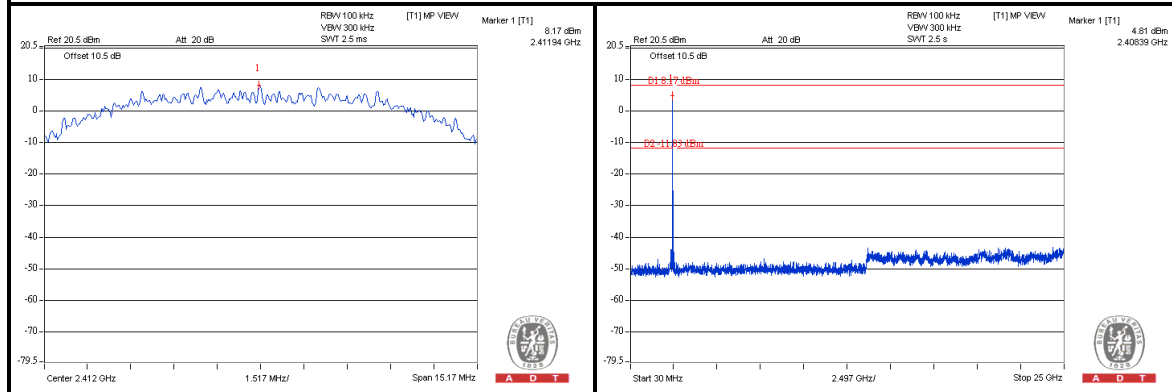
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



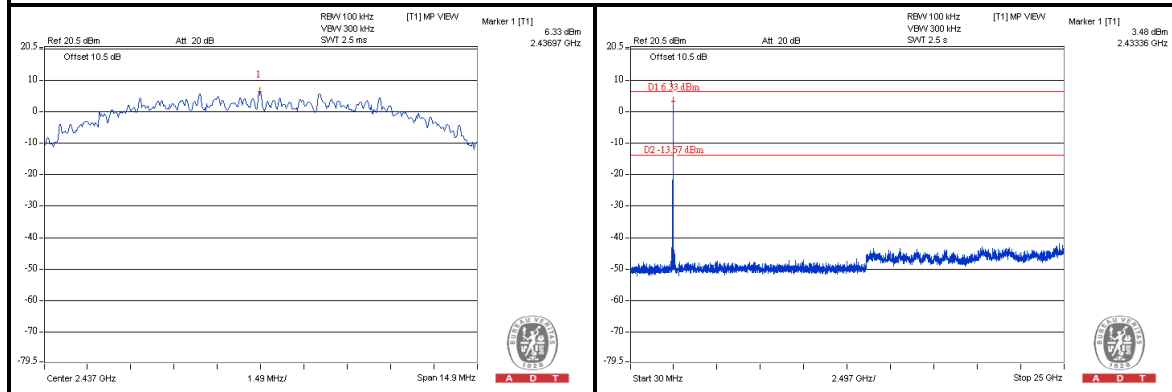
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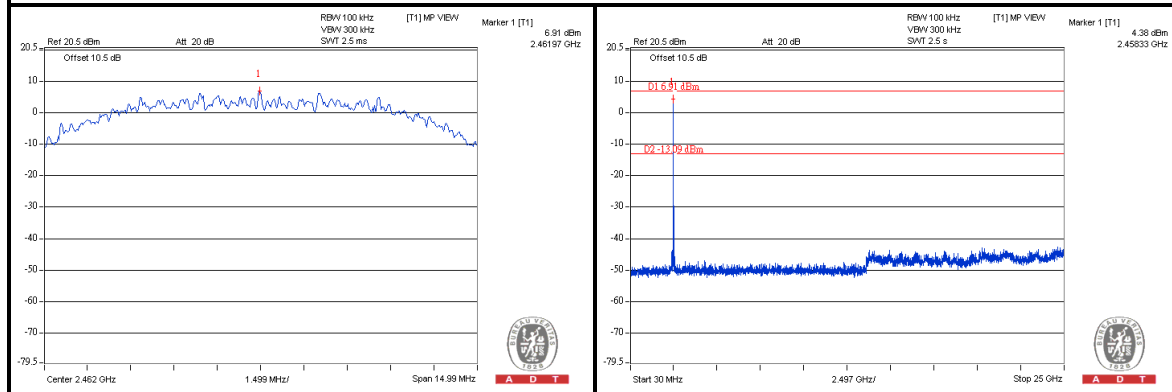
CH 1



CH 6



CH 11

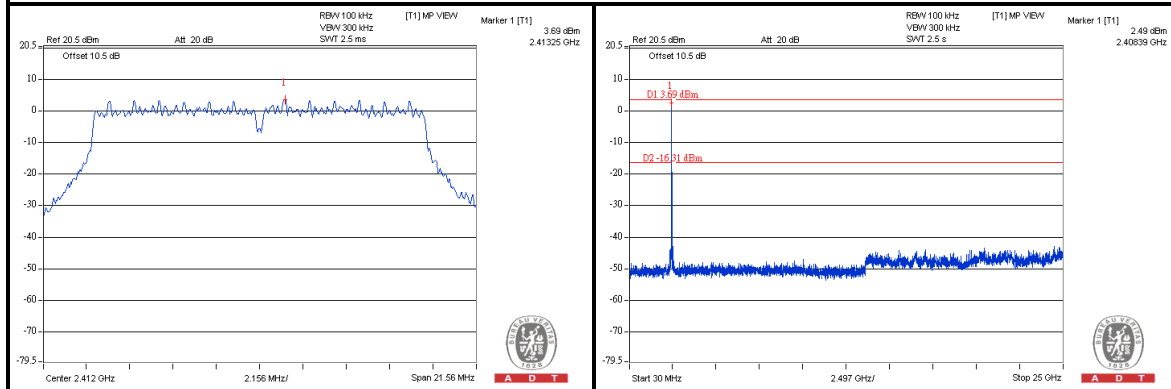




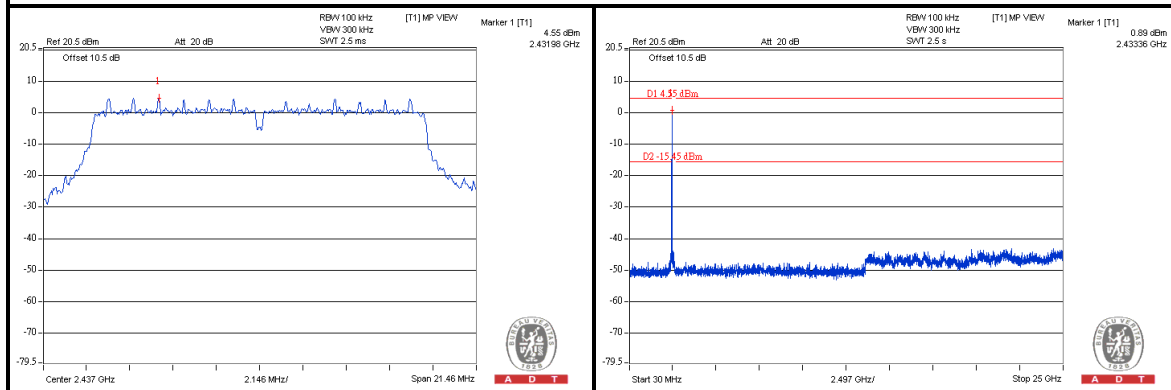
A D T

802.11g

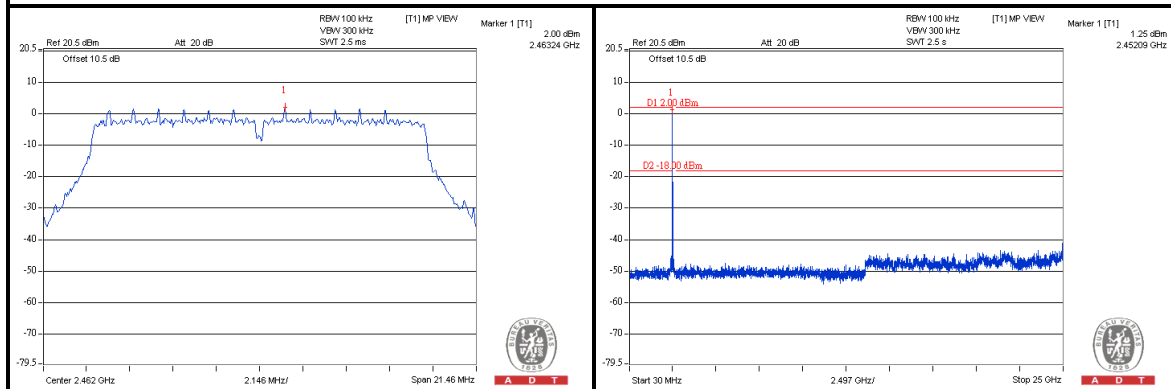
CH 1



CH 6



CH 11

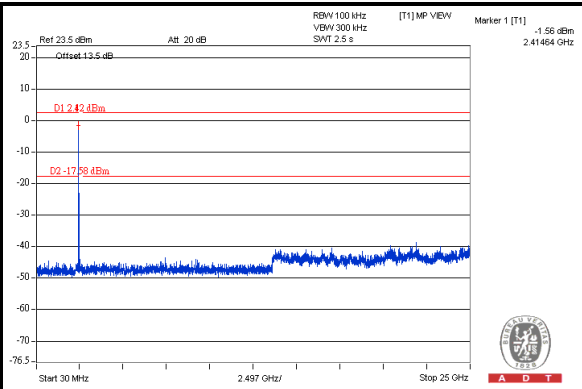
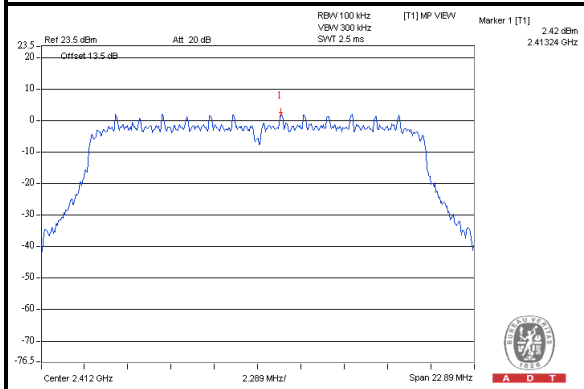




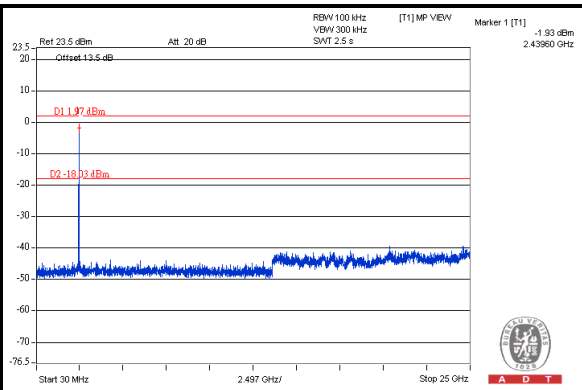
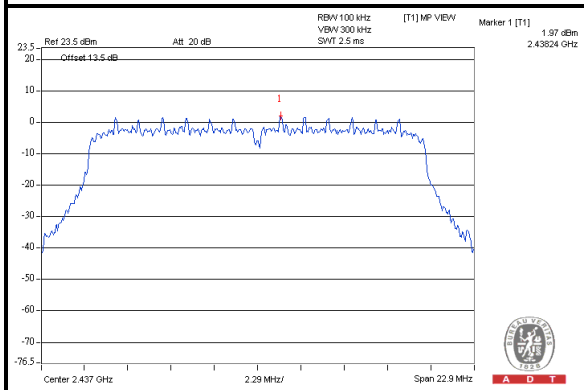
A D T

802.11n (20MHz)

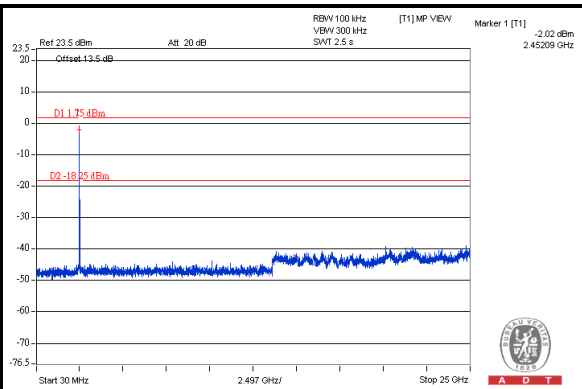
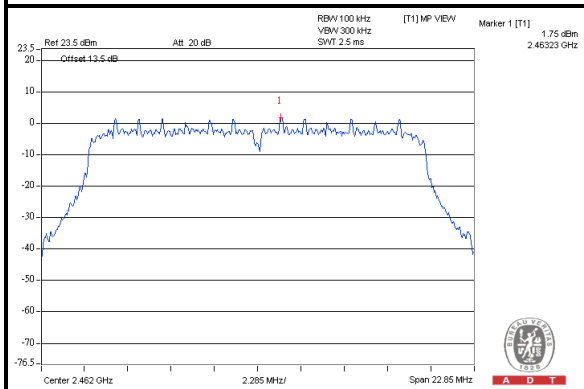
CH 1



CH 6



CH 11

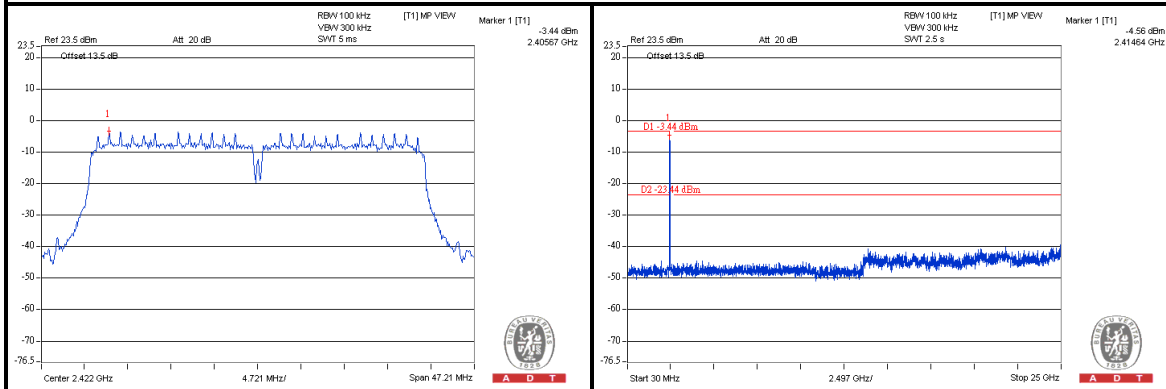




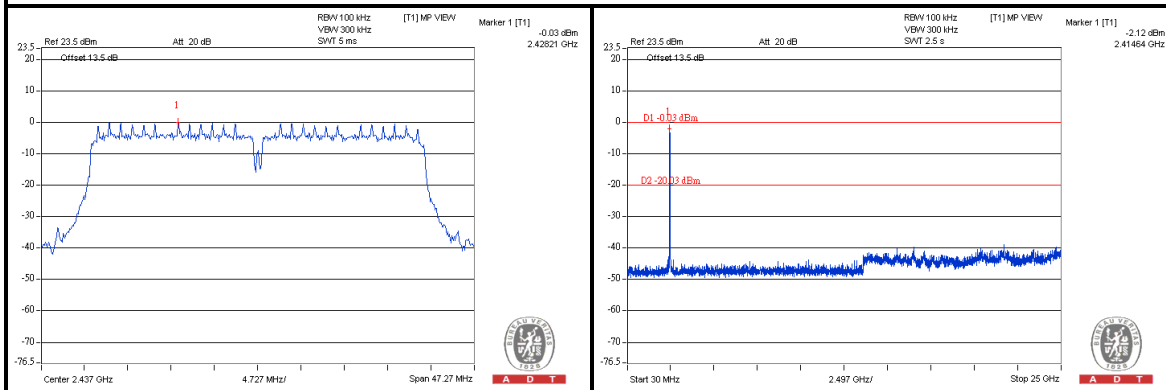
A D T

802.11n (40MHz)

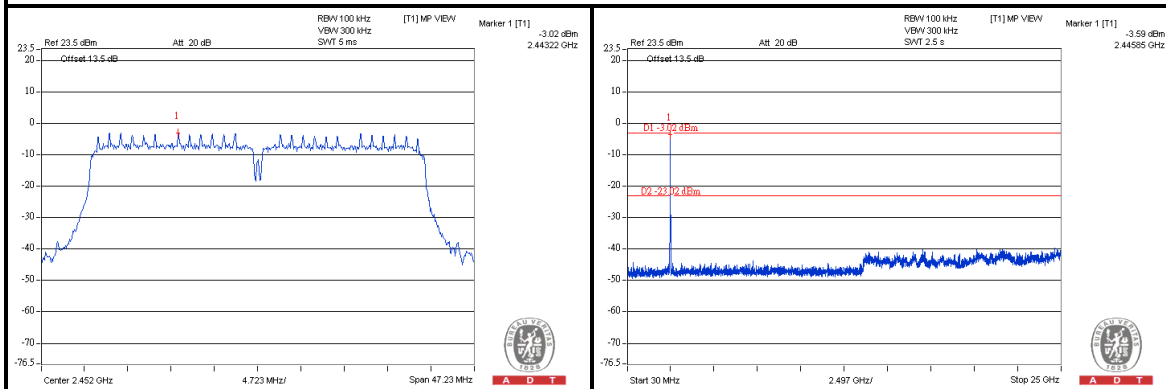
CH 3



CH 6



CH 9



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5.phtml.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

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Email: service.adt@tw.bureauveritas.com

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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7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

--- END ---