RF TEST REPORT

REPORT NO.:	RF120330C20
MODEL NO.:	TL-WDR4300
FCC ID:	TE7WDR4300
IC:	8853A-WDR4300
RECEIVED:	Mar. 30, 2012
TESTED:	Apr. 06 to 14, 2012
ISSUED:	May 11, 2012

APPLICANT:	TP-LINK TECHNOLOGIES CO., LTD.
ADDRESS:	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Shennan Rd, Nanshan, Shenzhen,China

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120330C20	Original release	May 11, 2012

1. CERTIFICATION

PRODUCT:	N750 Wireless Dual Band Gigabit Router
BRAND NAME:	TP-LINK
MODEL NO.:	TL-WDR4300
TEST SAMPLE:	PROTOTYPE
APPLICANT:	TP-LINK TECHNOLOGIES CO., LTD.
TESTED:	Apr. 06 to 14, 2012
STANDARDS:	FCC Part 15, Subpart C (Section 15.247) ANSI C63.10-2009 Canada RSS-210 Issue 8 (2010-12) Canada RSS-Gen Issue 3 (2010-12)

The above equipment (Model: TL-WDR4300) 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:** May 11, 2012
(Lori Chung, Specialist)

APPROVED BY : _____ , **DATE:** May 11, 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); RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC PART 15	CANADA STANDARD			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.69dB at 0.18906MHz
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement.
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.7dB at 7311.00MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	-	Antenna Requirement	PASS	Antenna connector is SMA Male Reverse not a standard connector.

For 5GHz, 5745~5825MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247); RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC PART 15	CANADA STANDARD			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.30dB at 0.18906MHz
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.6dB at 5400.00MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Maximum Peak Output Power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	-	Antenna Requirement	PASS	Antenna connector is SMA Male Reverse not a standard connector.

NOTE: 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	2.45 dB
Radiated emissions (30MHz-1GHz)	3.81 dB
Radiated emissions (1GHz -6GHz)	5.12 dB
Radiated emissions (6GHz -18GHz)	5.32 dB
Radiated emissions (18GHz -40GHz)	5.37 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	N750 Wireless Dual Band Gigabit Router
MODEL NO.	TL-WDR4300
POWER SUPPLY	DC 12V from power adapter
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 / Annex 9** 802.11a: 5.18 ~ 5.24GHz
	For 15.247 / Annex 8 802.11b/g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407 / Annex 9** 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
	For 15.247 (2.4GHz) / Annex 8 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) **For 15.247 (5GHz) / Annex 8** 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	**For 15.407 / Annex 9** 802.11a: 19.254mW 802.11n (20MHz): 32.489mW 802.11n (40MHz): 29.849mW **For 15.247 (2.4GHz) / Annex 8** 802.11b: 135.252mW 802.11g: 744.844mW 802.11n (20MHz): 735.782mW 802.11n (40MHz): 387.576mW **For 15.247 (5GHz) / Annex 8** 802.11a: 433.106mW 802.11n (20MHz): 423.984mW 802.11n (40MHz): 422.832mW

ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter × 1

NOTE:

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

Transmitter Circuit	Model	Antenna Type	Peak Gain (dBi)		Connecter Type
			2.4GHz	5GHz	
Chain (0)	AN2450-1726RS	Omni	2	3	SMA Male Reverse
Chain (1)	AN2450-1726RS	Omni	2	3	SMA Male Reverse
Chain (2)	AN2450-1726RS	Omni	2	3	SMA Male Reverse

2. The EUT must be supplied with a power adapter and following table:

No	Brand	Model No.	Spec.
1	LEADER ELECTRONICS INC.	MU18-2120150-A1	Input: 100-240V, 0.6A, 50/60Hz Output: 12.0V, 1.5A

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

MODULATION MODE	TX/RX FUNCTION
802.11b	2Tx/2Rx
802.11g	2Tx/2Rx
802.11a	3Tx/3Rx
802.11n (20MHz)	3Tx/3Rx
802.11n (40MHz)	3Tx/3Rx

4. 2.4GHz and 5GHz technology can transmit at same time.

5. The EUT is 3 * 3 spatial MIMO (3Tx & 3Rx) without 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. For MCS 0~7 support the correlated signal function.

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	
-	√	√	√	√	√	-

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.**

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
For 5 GHz 802.11a	149 to 165	149	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	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
For 5 GHz 802.11a	149 to 165	149	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
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:

☒ 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	22deg. C, 70%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	23deg. C, 67%RH	120Vac, 60Hz	Evan Huang
RE≥1G	26deg. C, 72%RH	120Vac, 60Hz	Amos Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Amos Chuang
OB	25deg. C, 60%RH	120Vac, 60Hz	Amos Chuang

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 (Section 15.247)
ANSI C63.10-2009
Canada RSS-210 Issue 8 (2010-12)
Canada RSS-Gen Issue 3 (2010-12)

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

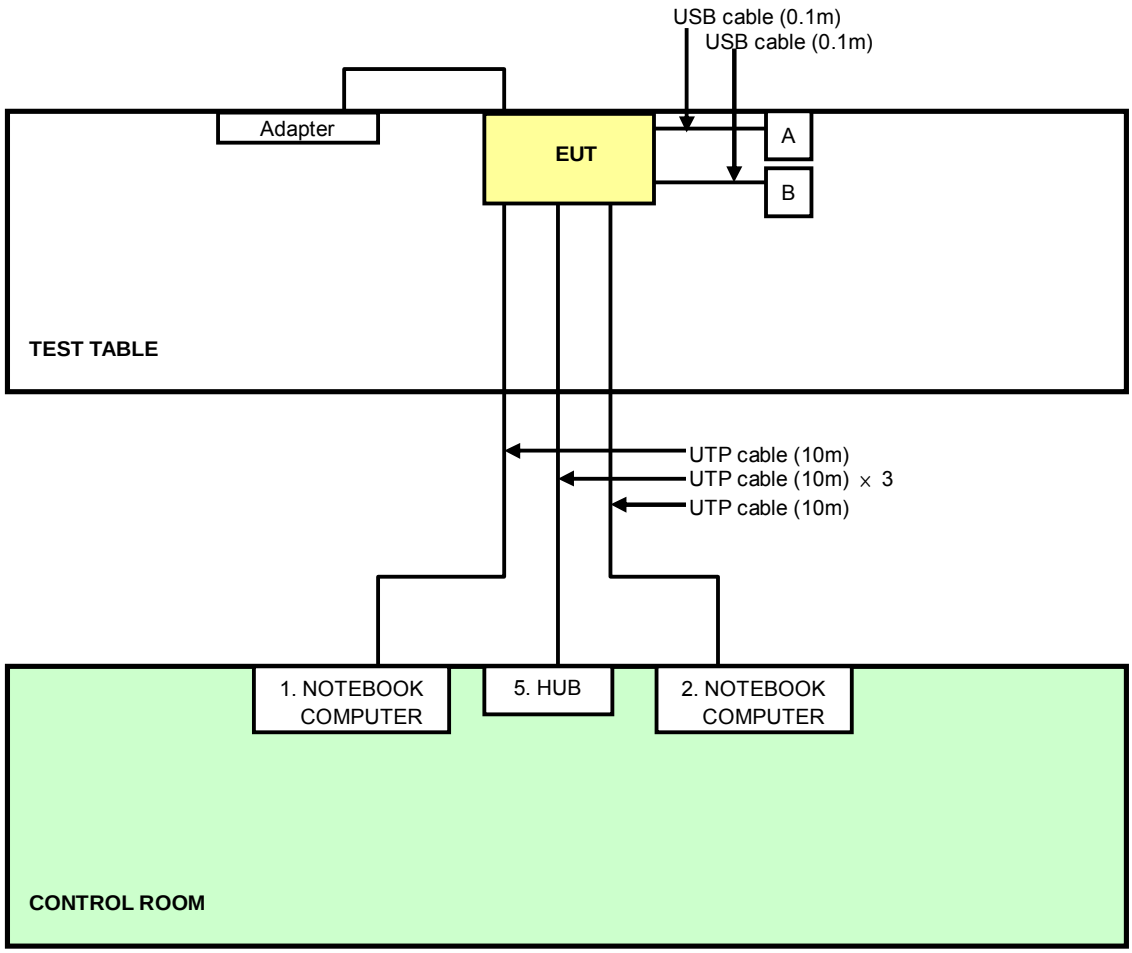
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
3	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
3	iPod	Apple	MC749TA/A	CC4DMFJUDFDM	NA
4	iPod	Apple	MC749TA/A	CC4DN25WDFDM	NA
5	HUB (For conducted emission test)	D-Link	DWL-P200	F378299000042	NA
	HUB (For other test)	ZyXEL	ES-116P	S060H02000215	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable (10m)
2	UTP cable (10m)
3	USB cable (0.1m)
4	USB cable (0.1m)
5	UTP cable (10m)

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: The item A & B are support unit 3 & 4 (iPod).

4.TEST TYPES AND RESULTS (802.11b & g, 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: Apr. 06, 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.

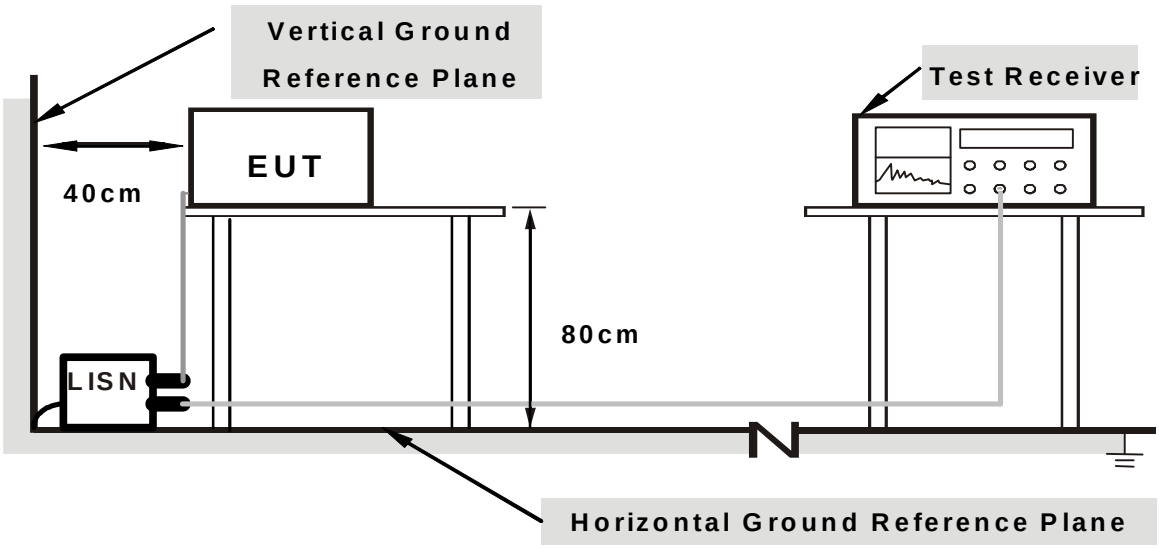
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

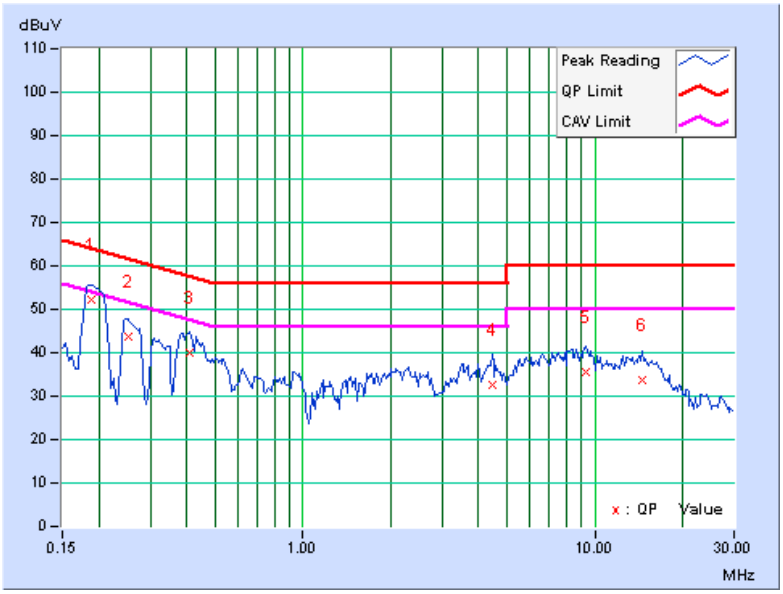
1. Placed the EUT on testing table.
2. Prepared other computer system (support unit 1) to act as communication partners.
3. The communication partners ran test program “artgui.exe” to enable EUT under transmission/receiving condition continuously.

4.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.18906**	**0.10**	**52.29**	**38.67**	**52.39**	**38.77**	**64.08**	**54.08**	**-11.69**	**-15.31**
2	0.25156	0.11	43.76	30.16	43.87	30.27	61.71	51.71	-17.84	-21.44
3	0.40834	0.13	39.88	28.98	40.01	29.11	57.68	47.68	-17.67	-18.57
4	4.43750	0.46	32.19	25.29	32.65	25.75	56.00	46.00	-23.35	-20.25
5	9.34375	0.73	34.66	27.06	35.39	27.79	60.00	50.00	-24.61	-22.21
6	14.53516	0.96	32.73	26.91	33.69	27.87	60.00	50.00	-26.31	-22.13

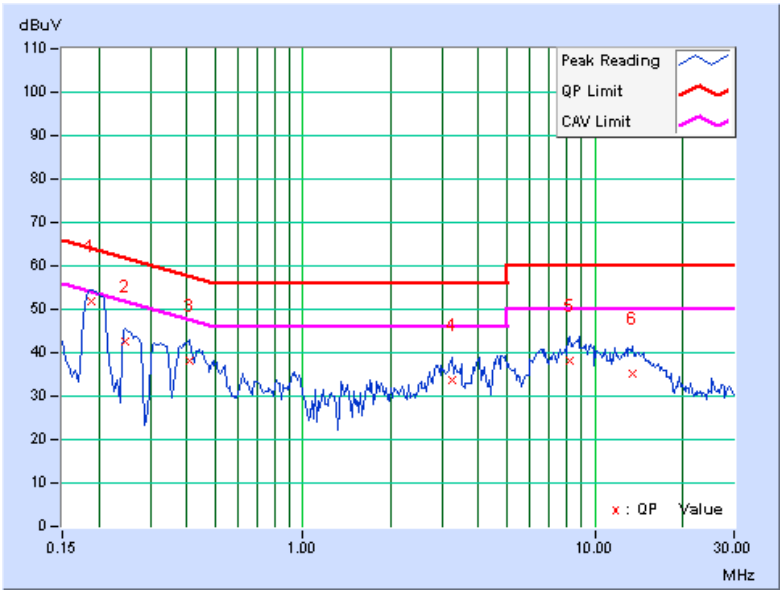
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18906	0.09	51.84	38.01	51.93	38.10	64.08	54.08	-12.15	-15.98
2	0.24766	0.10	42.62	27.46	42.72	27.56	61.84	51.84	-19.12	-24.28
3	0.40781	0.12	38.00	27.44	38.12	27.56	57.69	47.69	-19.57	-20.13
4	3.23438	0.30	33.55	27.85	33.85	28.15	56.00	46.00	-22.15	-17.85
5	8.23828	0.55	37.52	30.06	38.07	30.61	60.00	50.00	-21.93	-19.39
6	13.40234	0.79	34.29	28.39	35.08	29.18	60.00	50.00	-24.92	-20.82

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.

4.2.2 TEST INSTRUMENTS

For below 1GHz test:

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. 09, 2012	Apr. 08, 2013
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: Apr. 11, 2012

For above 1GHz test:

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
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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Apr. 13, 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 a 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.

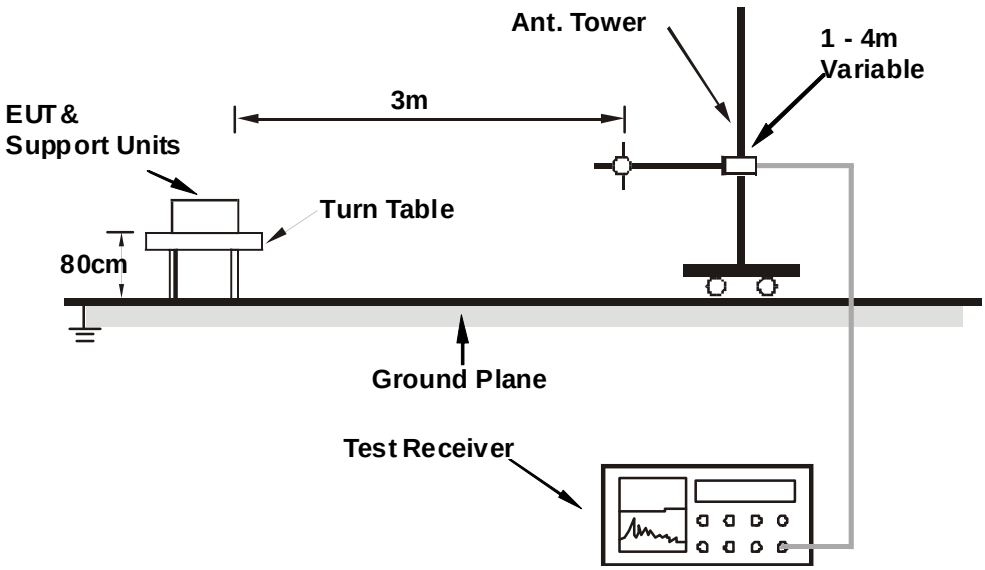
NOTE:

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

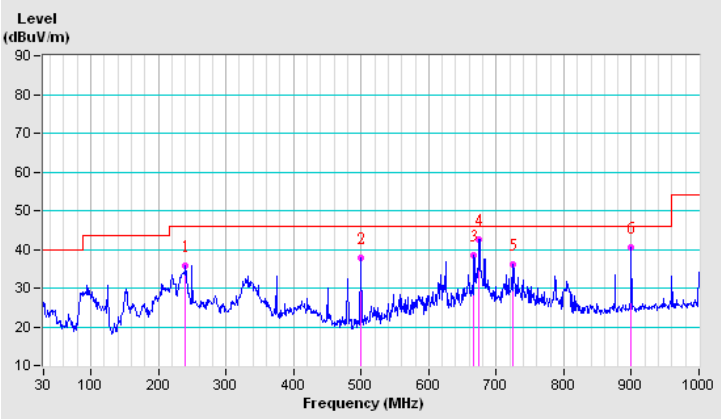
802.11g

CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	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	239.96	35.8 QP	46.0	-10.2	1.25 H	276	22.39	13.44
2	500.02	37.9 QP	46.0	-8.1	1.50 H	360	17.30	20.63
3	667.23	38.6 QP	46.0	-7.5	1.25 H	200	15.19	23.36
4	675.05	42.5 QP	46.0	-3.5	1.25 H	183	19.07	23.45
5	725.02	36.0 QP	46.0	-10.0	1.00 H	11	11.77	24.25
6	900.05	40.5 QP	46.0	-5.5	1.50 H	170	13.00	27.46

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.

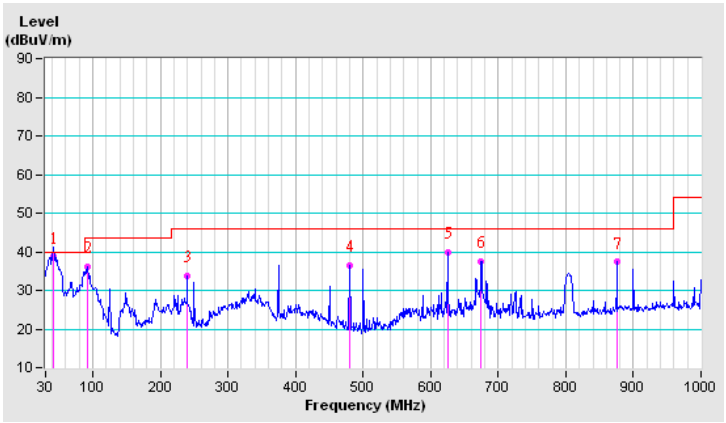


CHANNEL	TX Channel 6	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

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	41.49	38.7 QP	40.0	-1.3	1.00 V	49	23.11	15.55
2	91.22	36.2 QP	43.5	-7.3	1.50 V	275	24.81	11.40
3	240.08	33.7 QP	46.0	-12.3	1.50 V	21	20.29	13.45
4	480.01	36.6 QP	46.0	-9.4	1.00 V	293	16.43	20.16
5	624.96	40.0 QP	46.0	-6.0	1.75 V	168	17.10	22.89
6	675.05	37.5 QP	46.0	-8.5	1.75 V	131	14.01	23.45
7	875.06	37.3 QP	46.0	-8.7	1.25 V	178	10.25	27.08

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

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	55.2 PK	74.0	-18.8	1.35 H	30	27.93	27.27
2	2390.00	44.1 AV	54.0	-9.9	1.35 H	30	16.83	27.27
3	*2412.00	101.5 PK			1.39 H	23	74.23	27.27
4	*2412.00	99.0 AV			1.39 H	23	71.73	27.27
5	4824.00	51.5 PK	74.0	-22.5	1.00 H	197	24.23	27.27
6	4824.00	46.7 AV	54.0	-7.3	1.00 H	197	19.43	27.27
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	58.5 PK	74.0	-15.5	1.02 V	184	31.23	27.27
2	2390.00	46.3 AV	54.0	-7.7	1.02 V	184	19.03	27.27
3	*2412.00	108.7 PK			1.01 V	188	81.43	27.27
4	*2412.00	106.3 AV			1.01 V	188	79.03	27.27
5	4824.00	56.1 PK	74.0	-17.9	1.03 V	243	28.83	27.27
6	4824.00	52.9 AV	54.0	-1.1	1.03 V	243	25.63	27.27

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	100.7 PK			1.38 H	15	73.43	27.27
2	*2437.00	98.1 AV			1.38 H	15	70.83	27.27
3	4874.00	50.1 PK	74.0	-23.9	1.00 H	210	22.83	27.27
4	4874.00	45.6 AV	54.0	-8.4	1.00 H	210	18.33	27.27
5	7311.00	55.6 PK	74.0	-18.4	1.50 H	26	28.33	27.27
6	7311.00	46.8 AV	54.0	-7.2	1.50 H	26	19.53	27.27
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	109.3 PK			1.01 V	183	82.03	27.27
2	*2437.00	106.6 AV			1.01 V	183	79.33	27.27
3	4874.00	56.3 PK	74.0	-17.7	1.03 V	245	29.03	27.27
4	4874.00	53.2 AV	54.0	-0.8	1.03 V	245	25.93	27.27
5	7311.00	53.6 PK	74.0	-20.4	1.22 V	16	26.33	27.27
6	7311.00	41.3 AV	54.0	-12.7	1.22 V	16	14.03	27.27

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	99.2 PK			1.37 H	16	71.93	27.27
2	*2462.00	96.9 AV			1.37 H	16	69.63	27.27
3	2483.50	56.9 PK	74.0	-17.1	1.37 H	15	29.63	27.27
4	2483.50	44.6 AV	54.0	-9.4	1.37 H	15	17.33	27.27
5	4924.00	50.8 PK	74.0	-23.2	1.00 H	230	23.53	27.27
6	4924.00	46.2 AV	54.0	-7.8	1.00 H	230	18.93	27.27
7	7386.00	56.2 PK	74.0	-17.8	1.56 H	19	28.93	27.27
8	7386.00	46.6 AV	54.0	-7.4	1.56 H	19	19.33	27.27
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	181	81.93	27.27
2	*2462.00	106.5 AV			1.00 V	181	79.23	27.27
3	2483.50	60.6 PK	74.0	-13.4	1.00 V	180	33.33	27.27
4	2483.50	49.1 AV	54.0	-4.9	1.00 V	180	21.83	27.27
5	4924.00	56.0 PK	74.0	-18.0	1.04 V	240	28.73	27.27
6	4924.00	52.9 AV	54.0	-1.1	1.04 V	240	25.63	27.27
7	7386.00	54.7 PK	74.0	-19.3	1.23 V	15	27.43	27.27
8	7386.00	42.1 AV	54.0	-11.9	1.23 V	15	14.83	27.27

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	61.4 PK	74.0	-12.6	1.00 H	21	34.13	27.27
2	2390.00	47.5 AV	54.0	-6.5	1.00 H	21	20.23	27.27
3	*2412.00	102.4 PK			1.00 H	24	75.13	27.27
4	*2412.00	91.4 AV			1.00 H	24	64.13	27.27
5	4824.00	48.3 PK	74.0	-25.7	1.17 H	159	21.03	27.27
6	4824.00	36.7 AV	54.0	-17.3	1.17 H	159	9.43	27.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.1 PK	74.0	-4.9	1.35 V	82	41.83	27.27
2	2390.00	52.4 AV	54.0	-1.6	1.35 V	82	25.13	27.27
3	*2412.00	112.1 PK			1.17 V	174	84.83	27.27
4	*2412.00	101.4 AV			1.17 V	174	74.13	27.27
5	4824.00	51.2 PK	74.0	-22.8	1.06 V	249	23.93	27.27
6	4824.00	39.3 AV	54.0	-14.7	1.06 V	249	12.03	27.27

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	2389.00	62.2 PK	74.0	-11.8	1.09 H	20	34.93	27.27
2	2389.00	48.5 AV	54.0	-5.5	1.09 H	20	21.23	27.27
3	*2437.00	111.2 PK			1.10 H	22	83.93	27.27
4	*2437.00	99.2 AV			1.10 H	22	71.93	27.27
5	2483.50	59.6 PK	74.0	-14.4	1.11 H	19	32.33	27.27
6	2483.50	46.2 AV	54.0	-7.8	1.11 H	19	18.93	27.27
7	4874.00	48.3 PK	74.0	-25.7	1.15 H	155	21.03	27.27
8	4874.00	36.9 AV	54.0	-17.1	1.15 H	155	9.63	27.27
9	7311.00	65.9 PK	74.0	-8.1	1.63 H	21	38.63	27.27
10	**7311.00**	**53.3 AV**	**54.0**	**-0.7**	**1.63 H**	**21**	**26.03**	**27.27**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.00	69.5 PK	74.0	-4.5	1.20 V	173	42.23	27.27
2	2389.00	53.1 AV	54.0	-0.9	1.20 V	173	25.83	27.27
3	*2437.00	121.2 PK			1.18 V	176	93.93	27.27
4	*2437.00	109.5 AV			1.18 V	176	82.23	27.27
5	2483.50	57.3 PK	74.0	-16.7	1.17 V	135	30.03	27.27
6	2483.50	50.4 AV	54.0	-3.6	1.17 V	135	23.13	27.27
7	4874.00	50.3 PK	74.0	-23.7	1.15 V	233	23.03	27.27
8	4874.00	38.8 AV	54.0	-15.2	1.15 V	233	11.53	27.27
9	7311.00	54.6 PK	74.0	-19.4	1.16 V	151	27.33	27.27
10	7311.00	43.2 AV	54.0	-10.8	1.16 V	151	15.93	27.27

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	102.5 PK			1.00 H	24	75.23	27.27
2	*2462.00	91.7 AV			1.00 H	24	64.43	27.27
3	2483.50	59.6 PK	74.0	-14.4	1.00 H	23	32.33	27.27
4	2483.50	45.9 AV	54.0	-8.1	1.00 H	23	18.63	27.27
5	4924.00	48.7 PK	74.0	-25.3	1.22 H	156	21.43	27.27
6	4924.00	37.2 AV	54.0	-16.8	1.22 H	156	9.93	27.27
7	7386.00	54.3 PK	74.0	-19.7	1.26 H	34	27.03	27.27
8	7386.00	42.7 AV	54.0	-11.3	1.26 H	34	15.43	27.27
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.3 PK			1.17 V	167	84.03	27.27
2	*2462.00	100.3 AV			1.17 V	167	73.03	27.27
3	2483.50	68.4 PK	74.0	-5.6	1.14 V	156	41.13	27.27
4	2483.50	53.0 AV	54.0	-1.0	1.14 V	156	25.73	27.27
5	4924.00	51.3 PK	74.0	-22.7	1.09 V	231	24.03	27.27
6	4924.00	39.8 AV	54.0	-14.2	1.09 V	231	12.53	27.27
7	7386.00	53.9 PK	74.0	-20.1	1.18 V	160	26.63	27.27
8	7386.00	42.6 AV	54.0	-11.4	1.18 V	160	15.33	27.27

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	66.2 PK	74.0	-7.8	1.00 H	20	38.93	27.27
2	2390.00	49.4 AV	54.0	-4.6	1.00 H	20	22.13	27.27
3	*2412.00	103.2 PK			1.10 H	21	75.93	27.27
4	*2412.00	92.6 AV			1.10 H	21	65.33	27.27
5	4824.00	48.6 PK	74.0	-25.4	1.12 H	149	21.33	27.27
6	4824.00	36.8 AV	54.0	-17.2	1.12 H	149	9.53	27.27
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	67.3 PK	74.0	-6.7	1.19 V	191	40.03	27.27
2	2390.00	53.0 AV	54.0	-1.0	1.19 V	191	25.73	27.27
3	*2412.00	111.8 PK			1.02 V	176	84.53	27.27
4	*2412.00	100.4 AV			1.02 V	176	73.13	27.27
5	4824.00	52.2 PK	74.0	-21.8	1.15 V	265	24.93	27.27
6	4824.00	39.9 AV	54.0	-14.1	1.15 V	265	12.63	27.27

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	61.9 PK	74.0	-12.1	1.10 H	19	34.63	27.27
2	2390.00	47.9 AV	54.0	-6.1	1.10 H	19	20.63	27.27
3	*2437.00	109.4 PK			1.10 H	20	82.13	27.27
4	*2437.00	98.4 AV			1.10 H	20	71.13	27.27
5	2483.50	60.2 PK	74.0	-13.8	1.11 H	22	32.93	27.27
6	2483.50	46.2 AV	54.0	-7.8	1.11 H	22	18.93	27.27
7	4874.00	55.9 PK	74.0	-18.1	1.18 H	152	28.63	27.27
8	4874.00	42.9 AV	54.0	-11.1	1.18 H	152	15.63	27.27
9	7311.00	64.7 PK	74.0	-9.3	1.62 H	26	37.43	27.27
10	7311.00	51.6 AV	54.0	-2.4	1.62 H	26	24.33	27.27
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	70.5 PK	74.0	-3.5	1.18 V	165	43.23	27.27
2	2390.00	53.1 AV	54.0	-0.9	1.18 V	165	25.83	27.27
3	*2437.00	117.8 PK			1.19 V	172	90.53	27.27
4	*2437.00	106.4 AV			1.19 V	172	79.13	27.27
5	2483.50	68.3 PK	74.0	-5.7	1.16 V	161	41.03	27.27
6	2483.50	52.4 AV	54.0	-1.6	1.16 V	161	25.13	27.27
7	4874.00	51.3 PK	74.0	-22.7	1.13 V	242	24.03	27.27
8	4874.00	39.6 AV	54.0	-14.4	1.13 V	242	12.33	27.27
9	7311.00	55.0 PK	74.0	-19.0	1.20 V	163	27.73	27.27
10	7311.00	43.1 AV	54.0	-10.9	1.20 V	163	15.83	27.27

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			1.10 H	19	74.83	27.27
2	*2462.00	90.5 AV			1.10 H	19	63.23	27.27
3	2483.50	59.9 PK	74.0	-14.1	1.10 H	20	32.63	27.27
4	2483.50	46.9 AV	54.0	-7.1	1.10 H	20	19.63	27.27
5	4924.00	48.9 PK	74.0	-25.1	1.18 H	153	21.63	27.27
6	4924.00	37.2 AV	54.0	-16.8	1.18 H	153	9.93	27.27
7	7386.00	54.6 PK	74.0	-19.4	1.31 H	32	27.33	27.27
8	7386.00	42.9 AV	54.0	-11.1	1.31 H	32	15.63	27.27
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	110.9 PK			1.17 V	173	83.63	27.27
2	*2462.00	100.1 AV			1.17 V	173	72.83	27.27
3	2483.50	71.7 PK	74.0	-2.3	1.14 V	158	44.43	27.27
4	2483.50	53.2 AV	54.0	-0.8	1.14 V	158	25.93	27.27
5	4924.00	52.4 PK	74.0	-21.6	1.16 V	249	25.13	27.27
6	4924.00	40.0 AV	54.0	-14.0	1.16 V	249	12.73	27.27
7	7386.00	54.9 PK	74.0	-19.1	1.32 V	150	27.63	27.27
8	7386.00	43.1 AV	54.0	-10.9	1.32 V	150	15.83	27.27

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	2390.00	61.5 PK	74.0	-12.5	1.10 H	19	34.23	27.27
2	2390.00	48.9 AV	54.0	-5.1	1.10 H	19	21.63	27.27
3	*2422.00	96.6 PK			1.09 H	22	69.33	27.27
4	*2422.00	85.6 AV			1.09 H	22	58.33	27.27
5	4844.00	46.8 PK	74.0	-27.2	1.18 H	141	19.53	27.27
6	4844.00	35.8 AV	54.0	-18.2	1.18 H	141	8.53	27.27
7	7266.00	55.4 PK	74.0	-18.6	1.30 H	28	28.13	27.27
8	7266.00	43.7 AV	54.0	-10.3	1.30 H	28	16.43	27.27
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	68.1 PK	74.0	-5.9	1.20 V	175	40.83	27.27
2	2390.00	52.9 AV	54.0	-1.1	1.20 V	175	25.63	27.27
3	*2422.00	104.5 PK			1.18 V	174	77.23	27.27
4	*2422.00	93.3 AV			1.18 V	174	66.03	27.27
5	4844.00	49.1 PK	74.0	-24.9	1.15 V	230	21.83	27.27
6	4844.00	37.0 AV	54.0	-17.0	1.15 V	230	9.73	27.27
7	7266.00	55.8 PK	74.0	-18.2	1.35 V	151	28.53	27.27
8	7266.00	43.2 AV	54.0	-10.8	1.35 V	151	15.93	27.27

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	61.2 PK	74.0	-12.8	1.11 H	18	33.93	27.27
2	2390.00	48.2 AV	54.0	-5.8	1.11 H	18	20.93	27.27
3	*2437.00	100.6 PK			1.09 H	18	73.33	27.27
4	*2437.00	89.2 AV			1.09 H	18	61.93	27.27
5	2483.50	59.9 PK	74.0	-14.1	1.10 H	21	32.63	27.27
6	2483.50	45.7 AV	54.0	-8.3	1.10 H	21	18.43	27.27
7	4874.00	47.3 PK	74.0	-26.7	1.21 H	156	20.03	27.27
8	4874.00	36.3 AV	54.0	-17.7	1.21 H	156	9.03	27.27
9	7311.00	55.1 PK	74.0	-18.9	1.36 H	38	27.83	27.27
10	7311.00	43.3 AV	54.0	-10.7	1.36 H	38	16.03	27.27
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	68.7 PK	74.0	-5.3	1.02 V	166	41.43	27.27
2	2390.00	53.1 AV	54.0	-0.9	1.02 V	166	25.83	27.27
3	*2437.00	107.9 PK			1.01 V	177	80.63	27.27
4	*2437.00	97.4 AV			1.01 V	177	70.13	27.27
5	2483.50	67.6 PK	74.0	-6.4	1.00 V	165	40.33	27.27
6	2483.50	49.6 AV	54.0	-4.4	1.00 V	165	22.33	27.27
7	4874.00	49.9 PK	74.0	-24.1	1.15 V	244	22.63	27.27
8	4874.00	37.7 AV	54.0	-16.3	1.15 V	244	10.43	27.27
9	7311.00	55.7 PK	74.0	-18.3	1.41 V	153	28.43	27.27
10	7311.00	43.1 AV	54.0	-10.9	1.41 V	153	15.83	27.27

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	96.5 PK			1.09 H	20	69.23	27.27
2	*2452.00	85.8 AV			1.09 H	20	58.53	27.27
3	2483.50	65.2 PK	74.0	-8.8	1.07 H	19	37.93	27.27
4	2483.50	47.6 AV	54.0	-6.4	1.07 H	19	20.33	27.27
5	4904.00	46.3 PK	74.0	-27.7	1.21 H	144	19.03	27.27
6	4904.00	35.5 AV	54.0	-18.5	1.21 H	144	8.23	27.27
7	7356.00	54.3 PK	74.0	-19.7	1.37 H	40	27.03	27.27
8	7356.00	42.7 AV	54.0	-11.3	1.37 H	40	15.43	27.27
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	106.4 PK			1.00 V	171	79.13	27.27
2	*2452.00	94.0 AV			1.00 V	171	66.73	27.27
3	2483.50	71.5 PK	74.0	-2.5	1.16 V	174	44.23	27.27
4	2483.50	53.1 AV	54.0	-0.9	1.16 V	174	25.83	27.27
5	4904.00	50.0 PK	74.0	-24.0	1.08 V	228	22.73	27.27
6	4904.00	37.8 AV	54.0	-16.2	1.08 V	228	10.53	27.27
7	7356.00	56.0 PK	74.0	-18.0	1.44 V	149	28.73	27.27
8	7356.00	43.5 AV	54.0	-10.5	1.44 V	149	16.23	27.27

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 : Apr. 14, 2012

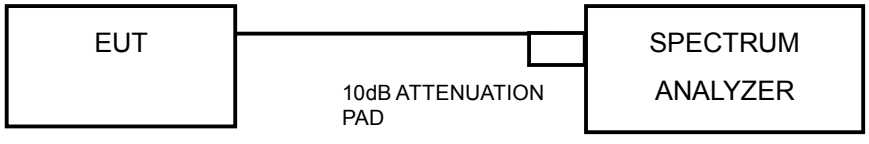
4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) ≥ 3 x 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
		CHAIN 0	CHAIN 1		
1	2412	10.63	10.60	0.5	PASS
6	2437	10.63	10.60	0.5	PASS
11	2462	10.65	10.65	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.56	16.56	0.5	PASS
6	2437	16.58	16.51	0.5	PASS
11	2462	16.58	16.59	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.79	17.76	0.5	PASS
6	2437	17.78	17.77	0.5	PASS
11	2462	17.85	17.76	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.87	37.39	0.5	PASS
6	2437	36.75	37.61	0.5	PASS
9	2452	37.13	37.36	0.5	PASS

4.4 OCCUPIED BANDWIDTH MEASUREMENT

4.4.1 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 : Apr. 14, 2012

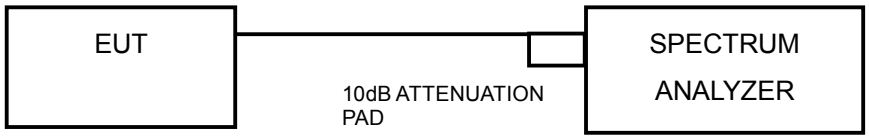
4.4.2 TEST PROCEDURE

1) Set RBW ≥ 1% of the emission bandwidth.
2) Set the VBW ≥ 3 x RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) Record the 99% emission bandwidth.

4.4.3 DEVIATION FROM TEST STANDARD

No deviation

4.4.4 TEST SETUP



4.4.5 EUT OPERATING CONDITIONS

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

4.4.6 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
1	2412	13.80	13.70
6	2437	13.70	13.80
11	2462	13.80	13.80

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
1	2412	16.90	17.00
6	2437	17.10	17.30
11	2462	16.90	17.00

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
1	2412	18.00	18.10
6	2437	18.10	18.20
11	2462	18.00	18.10

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
3	2422	36.60	36.60
6	2437	36.60	36.80
9	2452	36.60	36.80

4.5 CONDUCTED OUTPUT POWER MEASUREMENT

4.5.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz band: 1 Watt (30dBm)

4.5.2 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 : Apr. 14, 2012

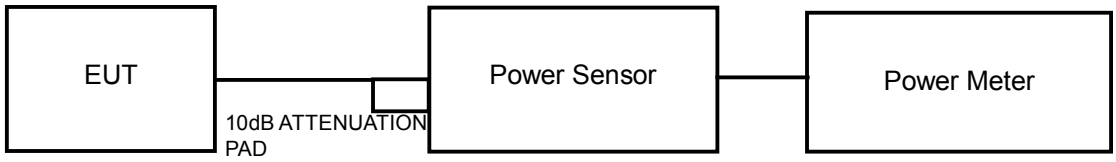
4.5.3 TEST PROCEDURES

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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	18.40	17.70	128.067	21.07	30	PASS
6	2437	18.40	18.20	135.252	21.31	30	PASS
11	2462	17.70	18.00	121.980	20.86	30	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

802.11g

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	24.10	23.50	480.912	26.82	30	PASS
6	2437	26.00	25.40	744.844	28.72	30	PASS
11	2462	23.20	23.10	413.104	26.16	30	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

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	23.70	22.30	404.247	26.07	30	PASS
6	2437	25.90	25.40	735.782	28.67	30	PASS
11	2462	23.40	23.50	442.648	26.46	30	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

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	20.30	19.70	200.477	23.02	30	PASS
6	2437	23.00	22.70	385.735	25.86	30	PASS
9	2452	22.00	23.60	387.576	25.88	30	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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 : Apr. 14, 2012

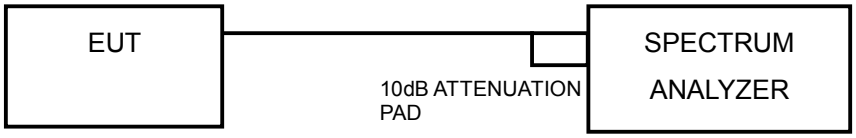
4.6.3 TEST PROCEDURE

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 = 10log(3 kHz/100kHz)

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

802.11b

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	7.08	-8.15	3.01	-5.14	8	PASS
	6	2437	7.31	-7.92	3.01	-4.91	8	PASS
	11	2462	6.51	-8.72	3.01	-5.71	8	PASS
1	1	2412	5.96	-9.27	3.01	-6.26	8	PASS
	6	2437	6.72	-8.51	3.01	-5.50	8	PASS
	11	2462	6.42	-8.81	3.01	-5.80	8	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

802.11g

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	2.64	-12.59	3.01	-9.58	8	PASS
	6	2437	6.26	-8.97	3.01	-5.96	8	PASS
	11	2462	2.10	-13.13	3.01	-10.12	8	PASS
1	1	2412	2.27	-12.96	3.01	-9.95	8	PASS
	6	2437	5.61	-9.62	3.01	-6.61	8	PASS
	11	2462	1.87	-13.36	3.01	-10.35	8	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

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	2.29	-12.94	3.01	-9.93	8	PASS
	6	2437	4.49	-10.74	3.01	-7.73	8	PASS
	11	2462	2.48	-12.75	3.01	-9.74	8	PASS
1	1	2412	1.49	-13.74	3.01	-10.73	8	PASS
	6	2437	4.33	-10.90	3.01	-7.89	8	PASS
	11	2462	2.56	-12.67	3.01	-9.66	8	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

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	-4.22	-19.45	3.01	-16.44	8	PASS
	6	2437	0.09	-15.14	3.01	-12.13	8	PASS
	9	2452	-2.70	-17.93	3.01	-14.92	8	PASS
1	3	2422	-5.13	-20.36	3.01	-17.35	8	PASS
	6	2437	-0.06	-15.29	3.01	-12.28	8	PASS
	9	2452	-2.98	-18.21	3.01	-15.20	8	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 5.01
The effective legacy gain is 5.01dBi, therefore the limit doesn't reduce.

4.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.7.2 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 : Apr. 14, 2012

4.7.3 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 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.

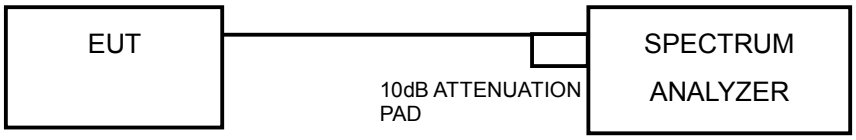
MEASUREMENT PROCEDURE OOBE

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

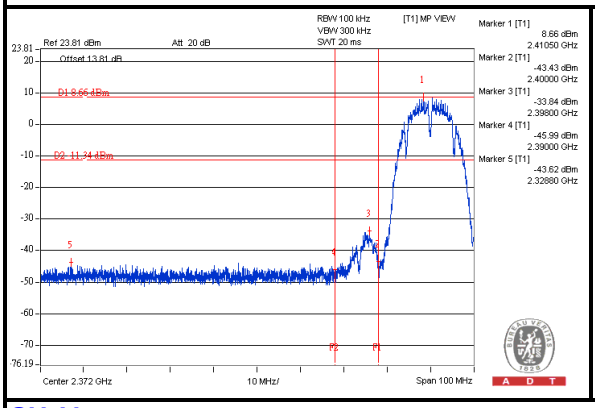
4.7.7 TEST RESULTS

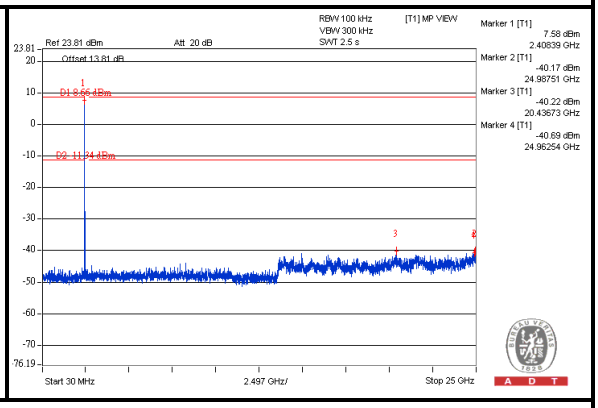
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

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.

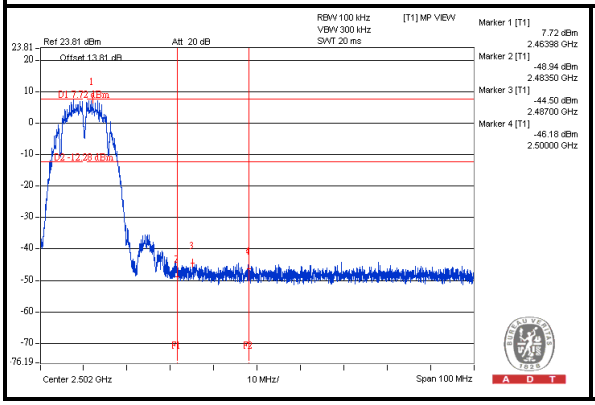
802.11b

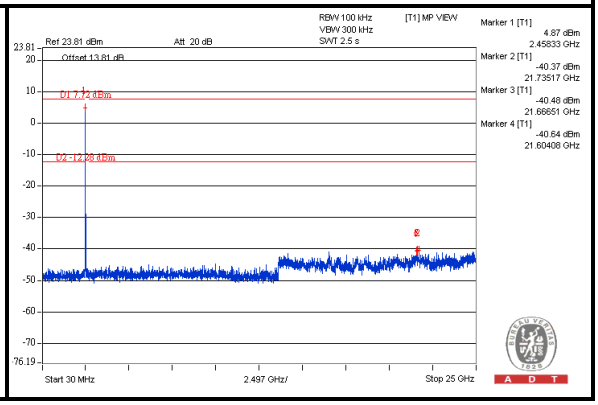
CH 1





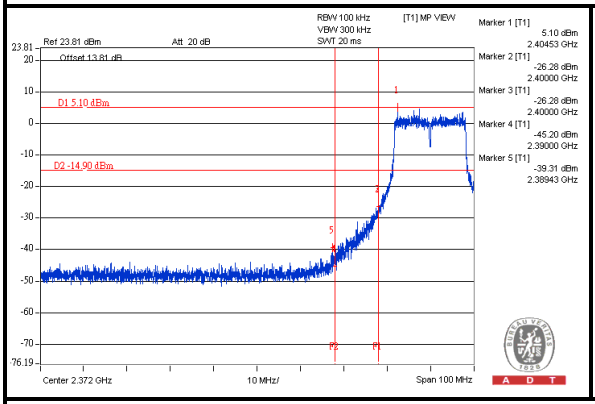
CH 11

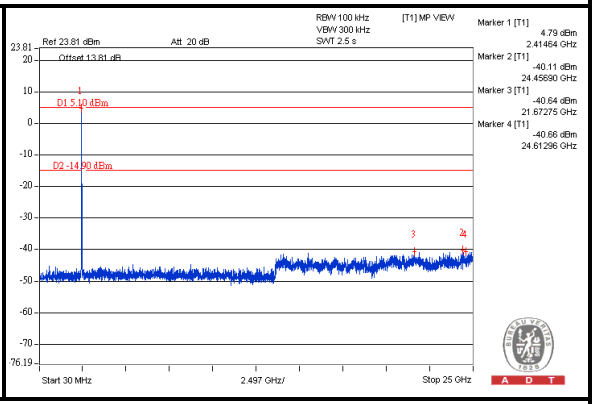




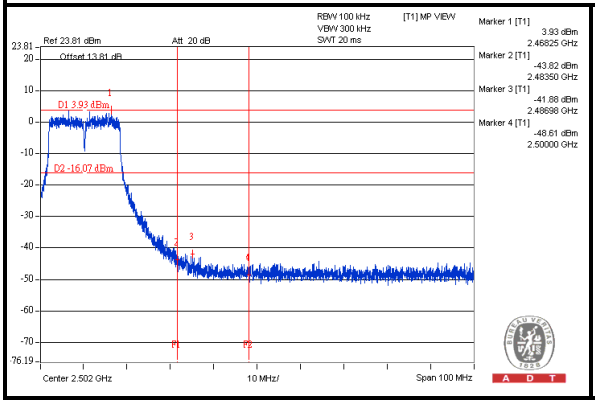
802.11g

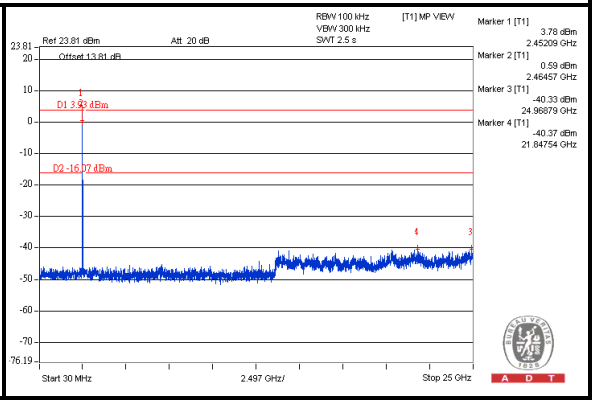
CH 1





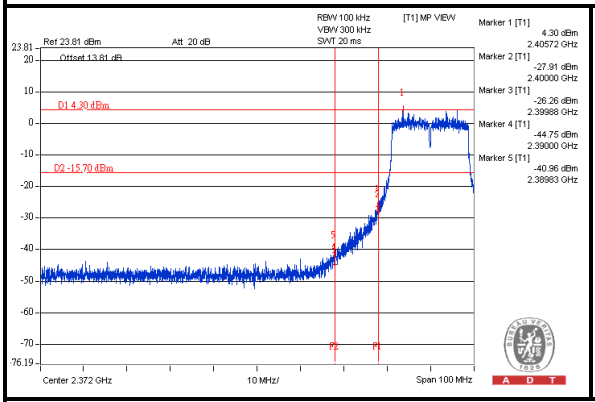
CH 11

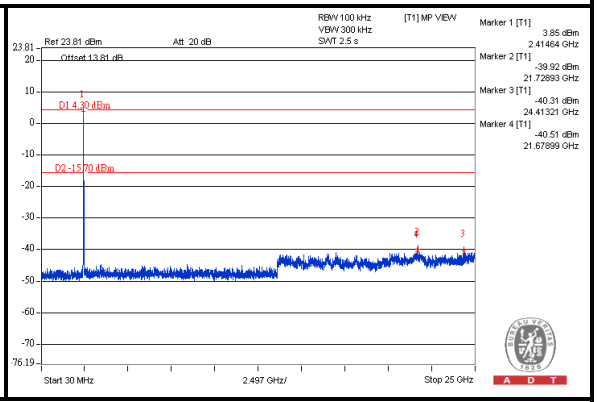




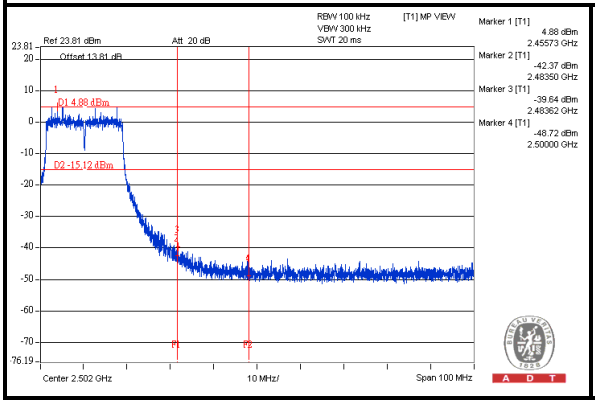
802.11n (20MHz)

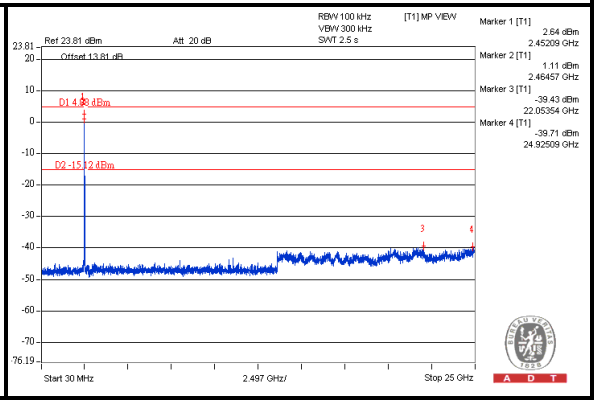
CH 1





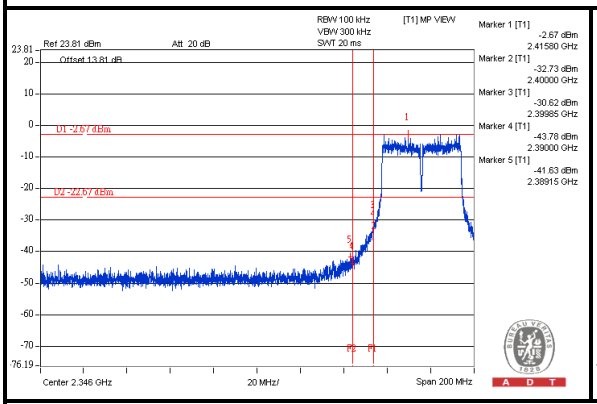
CH 11

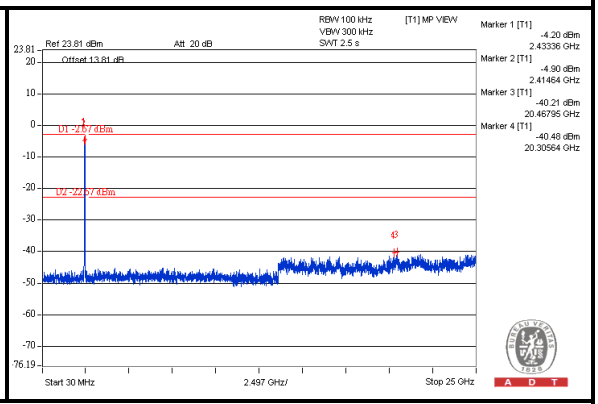




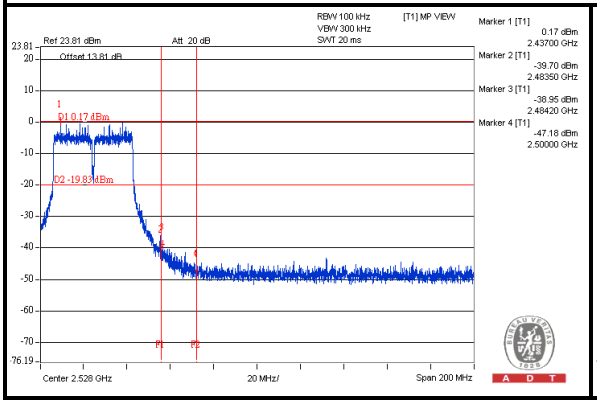
802.11n (40MHz)

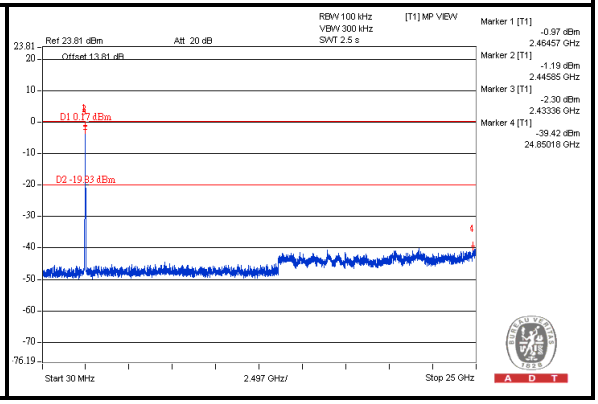
CH 3





CH 9





5. TEST TYPES AND RESULTS (802.11a, 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 0.5-5 5-30	66 to 56 56 60	56 to 46 46 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: Apr. 06, 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.

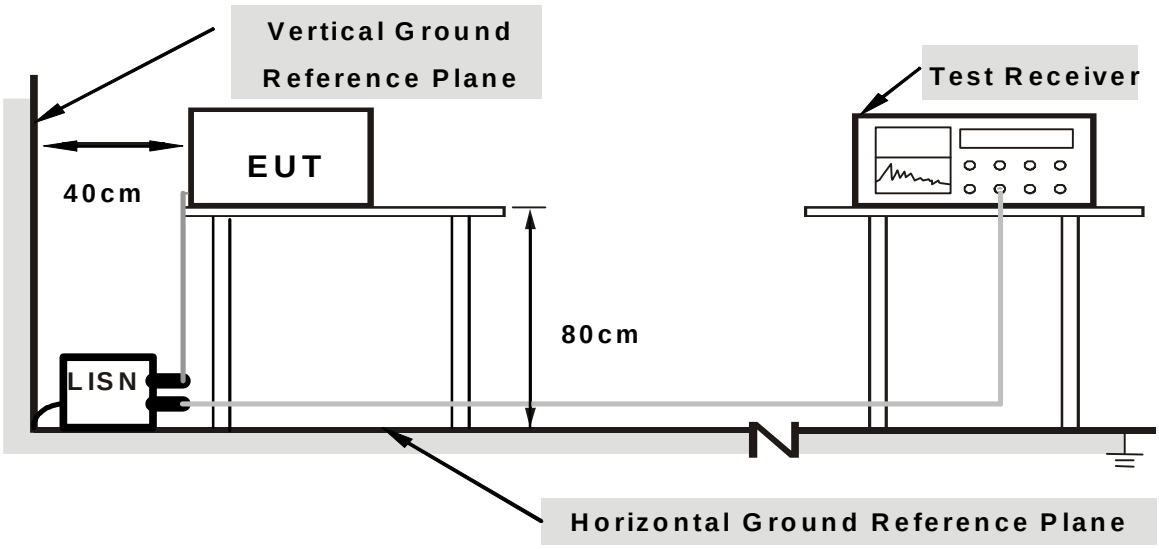
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

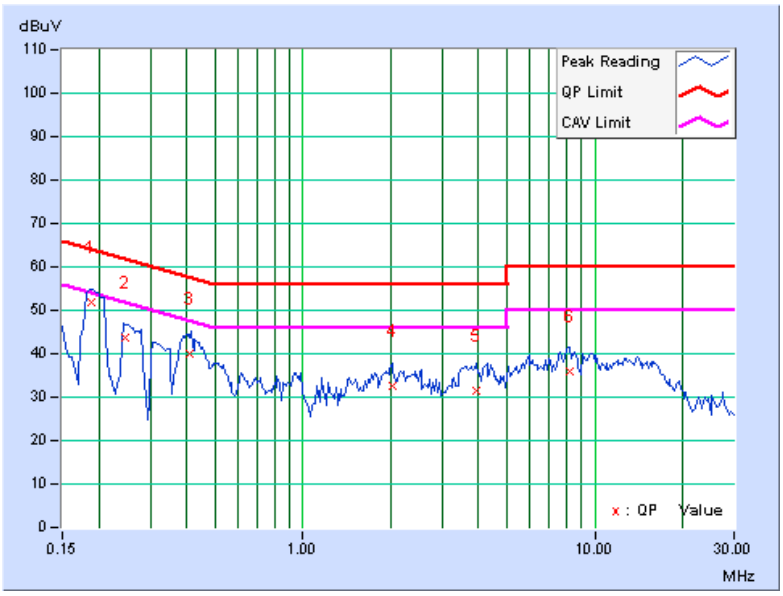
Same as the 4.1.6

5.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.18906**	**0.10**	**51.68**	**38.33**	**51.78**	**38.43**	**64.08**	**54.08**	**-12.30**	**-15.65**
2	0.24638	0.11	43.42	27.34	43.53	27.45	61.88	51.88	-18.35	-24.43
3	0.40950	0.13	39.86	28.88	39.99	29.01	57.66	47.66	-17.67	-18.65
4	2.01953	0.29	32.23	25.21	32.52	25.50	56.00	46.00	-23.48	-20.50
5	3.91406	0.43	31.16	23.92	31.59	24.35	56.00	46.00	-24.41	-21.65
6	8.23828	0.67	35.12	27.30	35.79	27.97	60.00	50.00	-24.21	-22.03

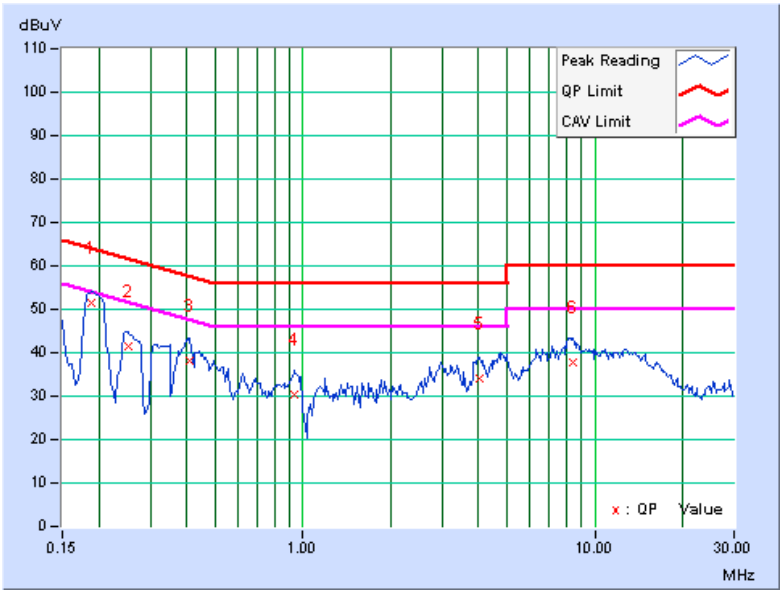
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18906	0.09	51.21	37.37	51.30	37.46	64.08	54.08	-12.78	-16.62
2	0.25156	0.10	41.51	28.14	41.61	28.24	61.71	51.71	-20.10	-23.47
3	0.40797	0.12	37.86	27.60	37.98	27.72	57.69	47.69	-19.71	-19.97
4	0.93516	0.15	30.28	21.08	30.43	21.23	56.00	46.00	-25.57	-24.77
5	4.03516	0.35	33.78	26.46	34.13	26.81	56.00	46.00	-21.87	-19.19
6	8.41797	0.56	37.04	29.50	37.60	30.06	60.00	50.00	-22.40	-19.94

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.



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

For below 1GHz test:

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. 09, 2012	Apr. 08, 2013
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: Apr. 11, 2012

For above 1GHz test:

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
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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: Apr. 13, 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 a 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.

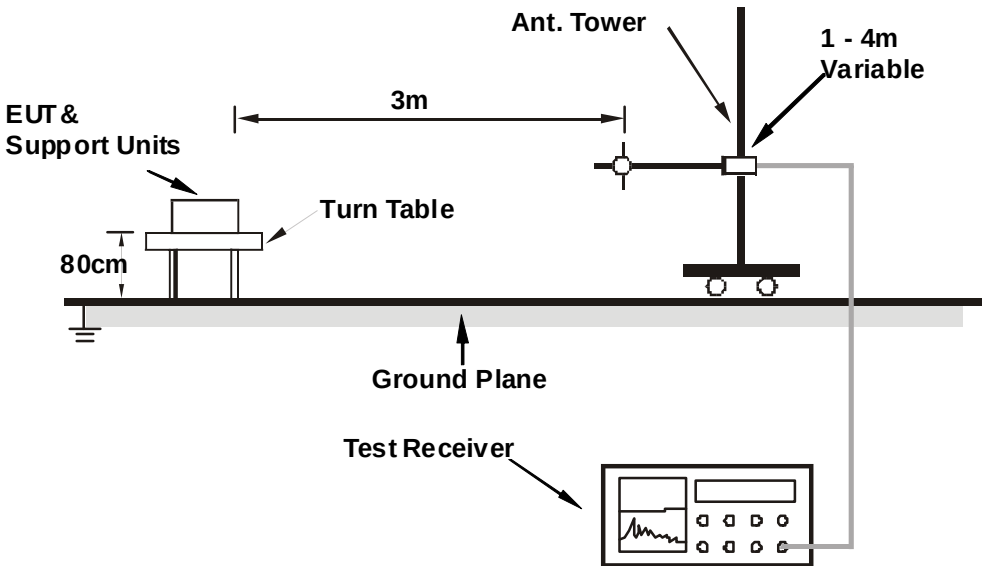
NOTE:

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.

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 4.2.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

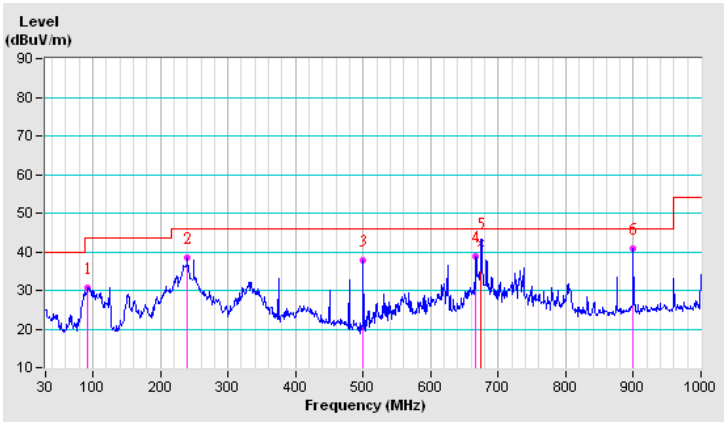
802.11a

CHANNEL	TX Channel 149	**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	92.17	30.8 QP	43.5	-12.7	2.00 H	336	19.35	11.48
2	239.96	38.6 QP	46.0	-7.4	1.25 H	344	25.18	13.44
3	500.02	37.8 QP	46.0	-8.2	1.50 H	358	17.21	20.63
4	667.23	39.0 QP	46.0	-7.0	1.25 H	189	15.60	23.36
5	674.99	42.3 QP	46.0	-3.7	1.10 H	183	18.84	23.45
6	900.05	40.8 QP	46.0	-5.2	1.00 H	171	13.36	27.46

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.

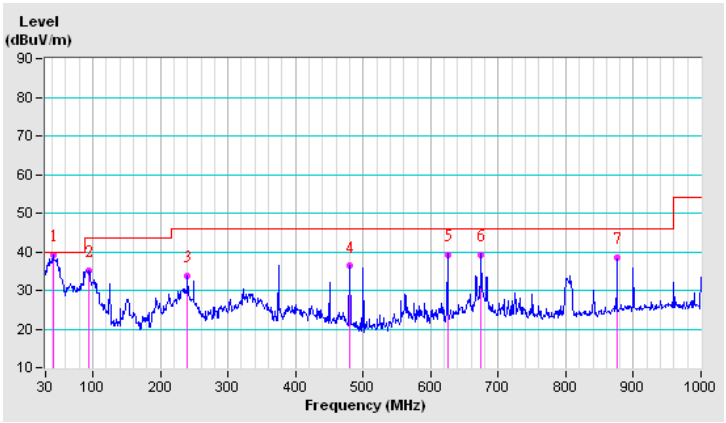


CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

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	41.49	39.3 QP	40.0	-0.7	1.25 V	360	23.72	15.55
2	93.36	35.0 QP	43.5	-8.5	1.25 V	303	23.43	11.59
3	240.08	33.8 QP	46.0	-12.2	1.74 V	27	20.32	13.45
4	480.01	36.3 QP	46.0	-9.7	1.01 V	305	16.16	20.16
5	624.96	39.1 QP	46.0	-6.9	1.75 V	175	16.22	22.89
6	675.05	39.1 QP	46.0	-6.9	1.75 V	125	15.66	23.45
7	875.06	38.5 QP	46.0	-7.5	1.25 V	190	11.39	27.08

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

802.11n (20MHz)

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

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	*5745.00	104.8 PK			1.00 H	289	77.53	27.27
2	*5745.00	94.4 AV			1.00 H	289	67.13	27.27
3	11490.00	65.8 PK	74.0	-8.2	1.19 H	221	38.53	27.27
4	11490.00	53.2 AV	54.0	-0.8	1.19 H	221	25.93	27.27
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	60.9 PK	74.0	-13.1	1.00 V	77	33.63	27.27
2	5400.00	50.1 AV	54.0	-3.9	1.00 V	77	22.83	27.27
3	*5745.00	118.8 PK			1.16 V	181	91.53	27.27
4	*5745.00	107.7 AV			1.16 V	181	80.43	27.27
5	11490.00	60.5 PK	74.0	-13.5	1.18 V	227	33.23	27.27
6	11490.00	50.1 AV	54.0	-3.9	1.18 V	227	22.83	27.27

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.

802.11a

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	*5785.00	106.2 PK			1.00 H	282	78.93	27.27
2	*5785.00	96.0 AV			1.00 H	282	68.73	27.27
3	11570.00	64.6 PK	74.0	-9.4	1.17 H	223	37.33	27.27
4	11570.00	53.0 AV	54.0	-1.0	1.17 H	223	25.73	27.27
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	63.6 PK	74.0	-10.4	1.00 V	73	36.33	27.27
2	**5400.00**	**53.4 AV**	**54.0**	**-0.6**	**1.00 V**	**73**	**26.13**	**27.27**
3	*5785.00	119.8 PK			1.16 V	179	92.53	27.27
4	*5785.00	109.1 AV			1.16 V	179	81.83	27.27
5	11570.00	59.8 PK	74.0	-14.2	1.17 V	220	32.53	27.27
6	11570.00	49.6 AV	54.0	-4.4	1.17 V	220	22.33	27.27

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	*5825.00	103.5 PK			1.00 H	282	76.23	27.27
2	*5825.00	92.3 AV			1.00 H	282	65.03	27.27
3	11650.00	62.5 PK	74.0	-11.5	1.18 H	222	35.23	27.27
4	11650.00	50.2 AV	54.0	-3.8	1.18 H	222	22.93	27.27
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	62.1 PK	74.0	-11.9	1.00 V	71	34.83	27.27
2	5400.00	51.1 AV	54.0	-2.9	1.00 V	71	23.83	27.27
3	*5825.00	116.8 PK			1.15 V	169	89.53	27.27
4	*5825.00	106.4 AV			1.15 V	169	79.13	27.27
5	11650.00	59.8 PK	74.0	-14.2	1.21 V	205	32.53	27.27
6	11650.00	49.8 AV	54.0	-4.2	1.21 V	205	22.53	27.27

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	*5745.00	104.2 PK			1.02 H	290	76.93	27.27
2	*5745.00	94.1 AV			1.02 H	290	66.83	27.27
3	11490.00	65.2 PK	74.0	-8.8	1.19 H	222	37.93	27.27
4	11490.00	53.3 AV	54.0	-0.7	1.19 H	222	26.03	27.27
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	61.6 PK	74.0	-12.4	1.00 V	76	34.33	27.27
2	5400.00	50.2 AV	54.0	-3.8	1.00 V	76	22.93	27.27
3	*5745.00	118.7 PK			1.10 V	192	91.43	27.27
4	*5745.00	107.4 AV			1.10 V	192	80.13	27.27
5	11490.00	59.8 PK	74.0	-14.2	1.25 V	203	32.53	27.27
6	11490.00	49.8 AV	54.0	-4.2	1.25 V	203	22.53	27.27

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	*5785.00	105.2 PK			1.00 H	284	77.93	27.27
2	*5785.00	95.1 AV			1.00 H	284	67.83	27.27
3	11570.00	65.1 PK	74.0	-8.9	1.21 H	244	37.83	27.27
4	11570.00	53.2 AV	54.0	-0.8	1.21 H	244	25.93	27.27
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	63.4 PK	74.0	-10.6	1.00 V	70	36.13	27.27
2	5400.00	53.2 AV	54.0	-0.8	1.00 V	70	25.93	27.27
3	*5785.00	119.5 PK			1.10 V	190	92.23	27.27
4	*5785.00	108.8 AV			1.10 V	190	81.53	27.27
5	11570.00	60.2 PK	74.0	-13.8	1.21 V	218	32.93	27.27
6	11570.00	49.9 AV	54.0	-4.1	1.21 V	218	22.63	27.27

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	*5825.00	103.2 PK			1.00 H	275	75.93	27.27
2	*5825.00	92.1 AV			1.00 H	275	64.83	27.27
3	11650.00	61.2 PK	74.0	-12.8	1.18 H	111	33.93	27.27
4	11650.00	50.5 AV	54.0	-3.5	1.18 H	111	23.23	27.27
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	62.3 PK	74.0	-11.7	1.00 V	71	35.03	27.27
2	5400.00	51.6 AV	54.0	-2.4	1.00 V	71	24.33	27.27
3	*5825.00	116.4 PK			1.09 V	188	89.13	27.27
4	*5825.00	106.1 AV			1.09 V	188	78.83	27.27
5	11650.00	60.3 PK	74.0	-13.7	1.25 V	210	33.03	27.27
6	11650.00	50.0 AV	54.0	-4.0	1.25 V	210	22.73	27.27

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	*5755.00	100.6 PK			1.00 H	300	73.33	27.27
2	*5755.00	90.2 AV			1.00 H	300	62.93	27.27
3	11510.00	62.1 PK	74.0	-11.9	1.19 H	221	34.83	27.27
4	11510.00	50.5 AV	54.0	-3.5	1.19 H	221	23.23	27.27
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	60.7 PK	74.0	-13.3	1.00 V	80	33.43	27.27
2	5400.00	52.7 AV	54.0	-1.3	1.00 V	80	25.43	27.27
3	*5755.00	114.3 PK			1.13 V	193	87.03	27.27
4	*5755.00	103.7 AV			1.13 V	193	76.43	27.27
5	11510.00	60.3 PK	74.0	-13.7	1.30 V	206	33.03	27.27
6	11510.00	49.9 AV	54.0	-4.1	1.30 V	206	22.63	27.27

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 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	*5795.00	100.3 PK			1.00 H	259	73.03	27.27
2	*5795.00	89.9 AV			1.00 H	259	62.63	27.27
3	11590.00	63.7 PK	74.0	-10.3	1.19 H	222	36.43	27.27
4	11590.00	51.3 AV	54.0	-2.7	1.19 H	222	24.03	27.27
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	60.8 PK	74.0	-13.2	1.00 V	78	33.53	27.27
2	5400.00	51.2 AV	54.0	-2.8	1.00 V	78	23.93	27.27
3	*5795.00	112.8 PK			1.12 V	183	85.53	27.27
4	*5795.00	102.7 AV			1.12 V	183	75.43	27.27
5	11590.00	60.6 PK	74.0	-13.4	1.30 V	196	33.33	27.27
6	11590.00	50.0 AV	54.0	-4.0	1.30 V	196	22.73	27.27

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	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 : Apr. 14, 2012

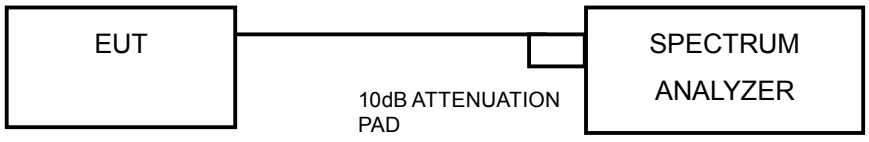
5.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) ≥ 3 x 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	16.43	16.54	16.53	0.5	PASS
157	5785	16.47	16.51	16.60	0.5	PASS
165	5825	16.50	16.53	16.53	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	17.64	17.81	17.77	0.5	PASS
157	5785	17.71	17.79	17.84	0.5	PASS
165	5825	17.68	17.76	17.82	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	36.85	36.28	36.28	0.5	PASS
159	5795	36.26	36.41	36.02	0.5	PASS

5.4 OCCUPIED BANDWIDTH MEASUREMENT

5.4.1 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 : Apr. 14, 2012

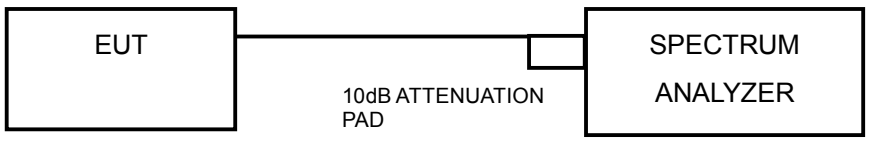
5.4.2 TEST PROCEDURE

1) Set RBW ≥ 1% of the emission bandwidth.
2) Set the VBW ≥ 3 x RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) Record the 99% emission bandwidth.

5.4.3 DEVIATION FROM TEST STANDARD

No deviation

5.4.4 TEST SETUP



5.4.5 EUT OPERATING CONDITIONS

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

5.4.6 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
149	5745	16.80	16.70	16.90
157	5785	16.90	16.80	16.70
165	5825	16.80	16.70	16.80

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
149	5745	17.80	17.90	17.90
157	5785	17.80	17.90	17.90
165	5825	17.90	18.00	17.90

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
151	5755	37.00	37.00	36.80
159	5795	37.00	37.00	36.80

5.5 CONDUCTED OUTPUT POWER MEASUREMENT

5.5.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

5.5.2 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 : Apr. 14, 2012

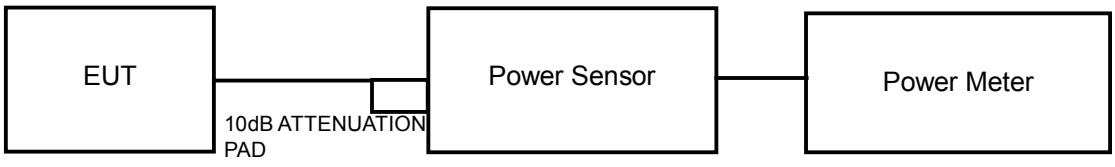
5.5.3 TEST PROCEDURES

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.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	21.50	21.00	22.20	433.106	26.37	28.23	PASS
157	5785	21.40	21.20	21.80	421.220	26.25	28.23	PASS
165	5825	21.70	21.20	21.30	414.633	26.18	28.23	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 7.77
The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

802.11n (20MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	21.40	20.80	21.80	409.620	26.12	28.23	PASS
157	5785	21.60	21.30	21.60	423.984	26.27	28.23	PASS
165	5825	21.50	21.40	21.50	420.546	26.24	28.23	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 7.77
The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

802.11n (40MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	21.20	21.10	22.10	422.832	26.26	28.23	PASS
159	5795	21.10	20.20	22.30	403.362	26.06	28.23	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 7.77
The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

5.6 POWER SPECTRAL DENSITY MEASUREMENT

5.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.6.2 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 : Apr. 14, 2012

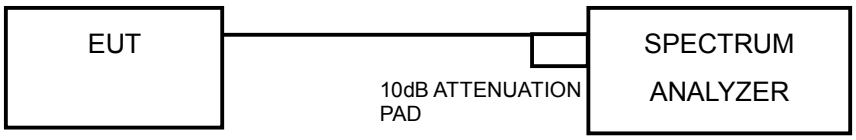
5.6.3 TEST PROCEDURE

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 = 10log(3 kHz/100kHz)

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

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	-0.99	-16.22	4.77	-11.45	6.23	PASS
	157	5785	-1.84	-17.07	4.77	-12.30	6.23	PASS
	165	5825	-1.63	-16.86	4.77	-12.09	6.23	PASS
1	149	5745	2.97	-12.26	4.77	-7.49	6.23	PASS
	157	5785	2.69	-12.54	4.77	-7.77	6.23	PASS
	165	5825	3.12	-12.11	4.77	-7.34	6.23	PASS
2	149	5745	2.27	-12.96	4.77	-8.19	6.23	PASS
	157	5785	2.92	-12.31	4.77	-7.54	6.23	PASS
	165	5825	3.08	-12.15	4.77	-7.38	6.23	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 7.77
The effective legacy gain is 7.77dBi, 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	4.14	-11.09	4.77	-6.32	6.23	PASS
	157	5785	3.79	-11.44	4.77	-6.67	6.23	PASS
	165	5825	3.96	-11.27	4.77	-6.50	6.23	PASS
1	149	5745	1.56	-13.67	4.77	-8.90	6.23	PASS
	157	5785	2.28	-12.95	4.77	-8.18	6.23	PASS
	165	5825	3.64	-11.59	4.77	-6.82	6.23	PASS
2	149	5745	4.15	-11.08	4.77	-6.31	6.23	PASS
	157	5785	3.99	-11.24	4.77	-6.47	6.23	PASS
	165	5825	3.77	-11.46	4.77	-6.69	6.23	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 7.77
The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

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	0.23	-15.00	4.77	-10.23	6.23	PASS
	159	5795	0.31	-14.92	4.77	-10.15	6.23	PASS
1	151	5755	-1.49	-16.72	4.77	-11.95	6.23	PASS
	159	5795	-0.53	-15.76	4.77	-10.99	6.23	PASS
2	151	5755	0.96	-14.27	4.77	-9.50	6.23	PASS
	159	5795	1.05	-14.18	4.77	-9.41	6.23	PASS

Note: Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi) = 7.77
The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

5.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.7.2 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 : Apr. 14, 2012

5.7.3 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW ≥ 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 OOBE

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

5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 EUT OPERATING CONDITION

Same as Item 4.3.6

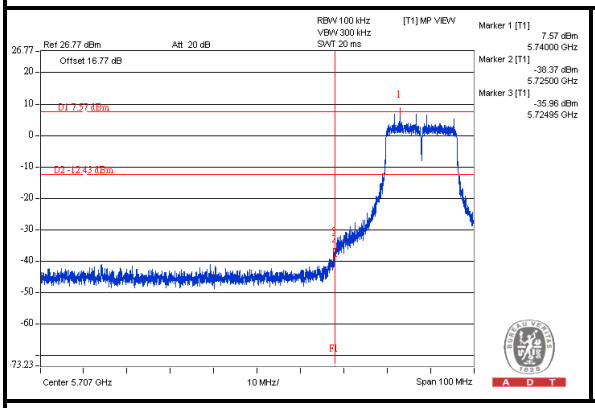
5.7.6 TEST RESULTS

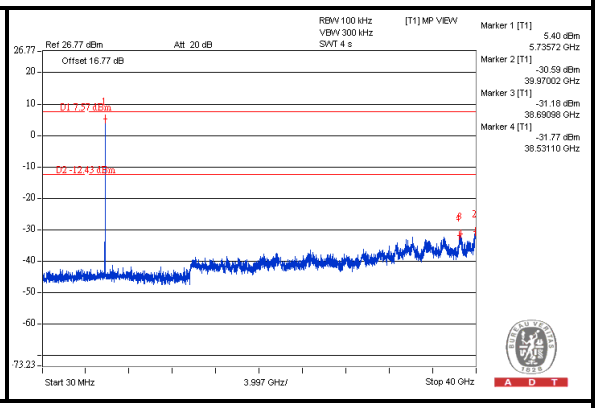
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

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.

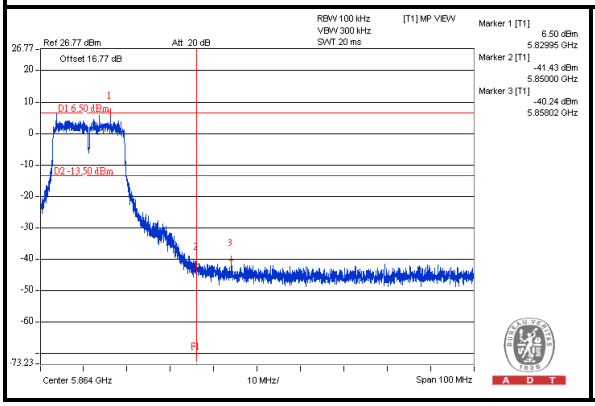
802.11a

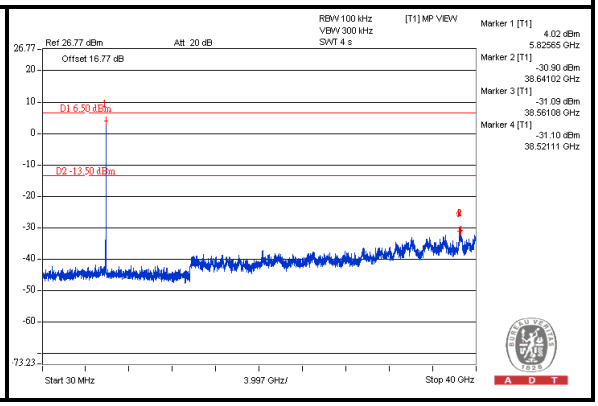
CH 149





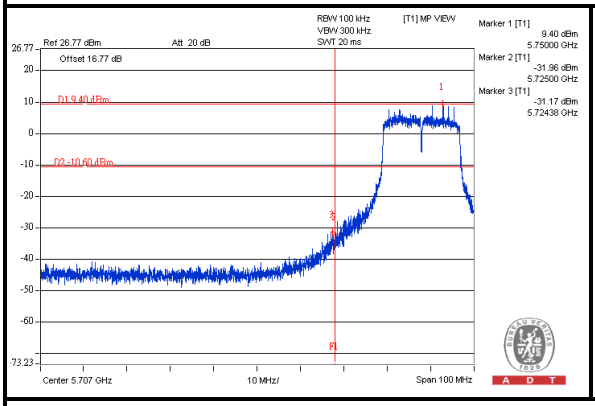
CH 165

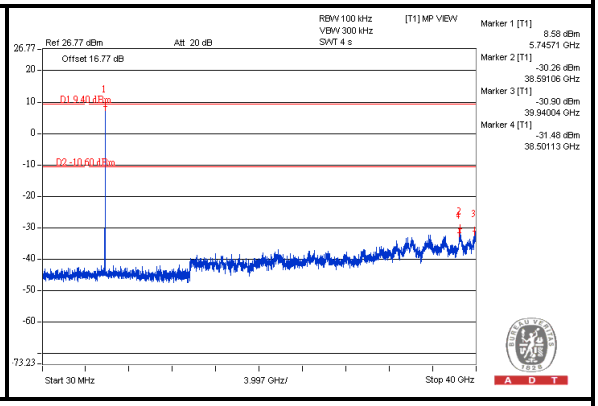




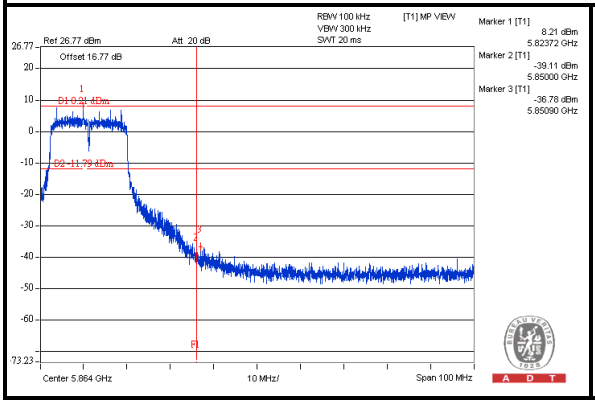
802.11n (20MHz)

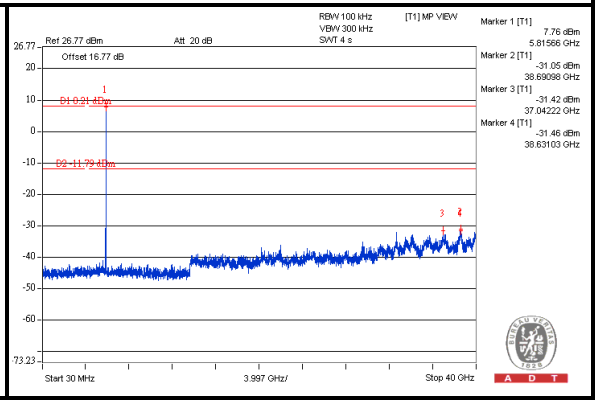
CH 149





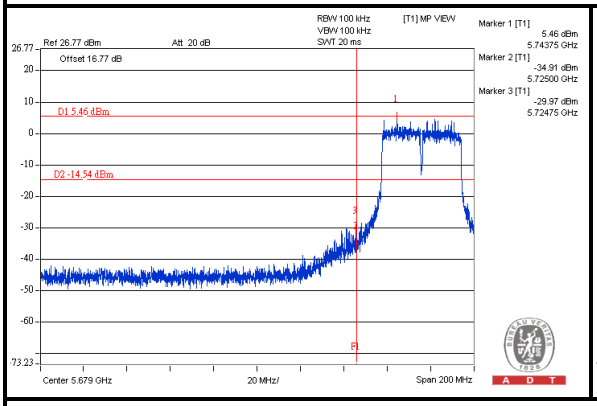
CH 165

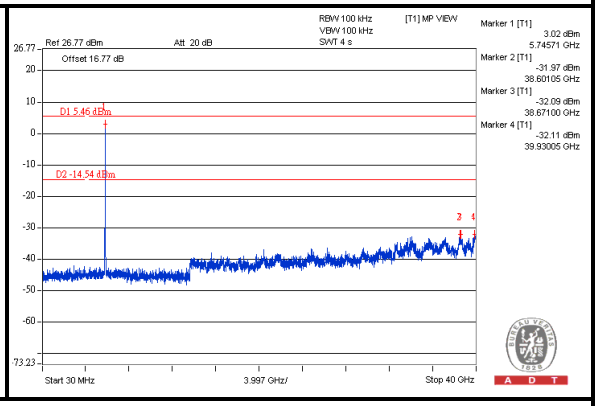




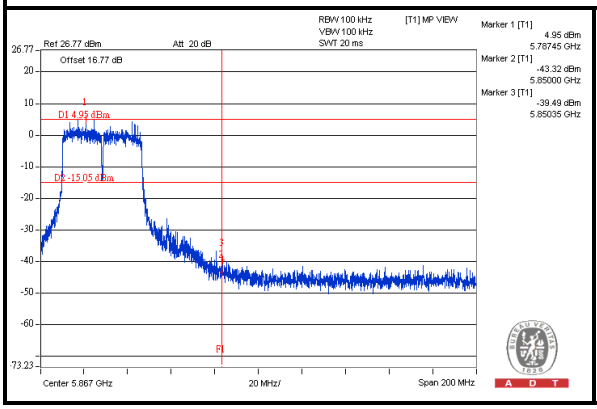
802.11n (40MHz)

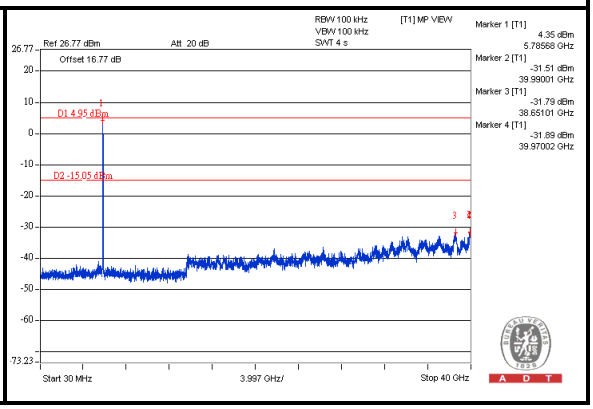
CH 151





CH 159





6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

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.

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:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

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

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.

--- END ---