FCC TEST REPORT (15.247)

REPORT NO.:	RF120517E03
MODEL NO.:	WS-AP3705i
FCC ID:	QXO-WSAP3705I
RECEIVED:	May 17, 2012
TESTED:	May 25 to June 21, 2012
ISSUED:	July 04, 2012

APPLICANT:	Enterasys Networks, Inc.
ADDRESS:	50 Minuterman Road Andover, MA 01810

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.
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TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120517E03	Original release	July 04, 2012

1. CERTIFICATION

PRODUCT:	Wireless Access Point
BRAND NAME:	Enterasys Networks
MODEL NO.:	WS-AP3705i
TEST SAMPLE:	MASS-PRODUCTION
APPLICANT:	Enterasys Networks, Inc.
TESTED:	May 25 to June 21, 2012
STANDARDS:	FCC Part 15, Subpart C (Section 15.247) ANSI C63.10-2009

The above equipment (Model: WS-AP3705i) 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 : Phoenix Huang , **DATE:** July 04, 2012
(Phoenix Huang, Specialist)

APPROVED BY : , **DATE:** July 04, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.94dB at 0.16162MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2485.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

For 5GHz, 5745~5825MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.55dB at 0.15000MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.0dB at 5399.94MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. For the 5.15~5.25GHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.98 dB
Radiated emissions (30MHz-1GHz)	4.89 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT(WLAN)

PRODUCT	Wireless Access Point
MODEL NO.	WS-AP3705i
POWER SUPPLY	DC 48V from POE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11g / a: up to 54Mbps 802.11n (20MHz, 800ns GI): up to 130Mbps 802.11n (20MHz, 400ns GI): up to 144.444Mbps 802.11n (40MHz, 800ns GI): up to 270Mbps 802.11n (40MHz, 400ns GI): up to 300Mbps
OPERATING FREQUENCY	**For 15.407** 5.18 ~ 5.24GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	**For 15.407** 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) **For 15.247 (5GHz)** 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 30.086mW 802.11n (20MHz): 29.942mW 802.11n (40MHz): 44.289mW **For 15.247(2.4GHz)** 802.11b: 368.764mW 802.11g: 626.252mW 802.11n (20MHz): 611.997mW 802.11n (40MHz): 300.855mW **For 15.247(5GHz)** 802.11a: 499.576mW 802.11n (20MHz): 538.306mW 802.11n (40MHz): 496.923mW

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

NOTE:

1. There are 2.4GHz and 5GHz WLAN technology used for the EUT. The test report of EUT listed as below table:

Function	Report No.
WLAN	RF120517E03 (15.247) RF120517E03-1(15.407)

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

For 2.4GHz					
Transmitter Circuit	Manufacture	Model name	Antenna Gain Gain (dBi)	Antenna Type	Connector
Chain (0)	WHA YU GROUP	C037-511135-A (SSR-13314)	3.97	PIFA	I-PEX
Chain (1)	WHA YU GROUP	C037-511135-A (SSR-13314)	3.91	PIFA	I-PEX
For 5GHz					
Transmitter Circuit	Manufacture	Model name	Antenna Gain Gain (dBi)	Antenna Type	Connector
Chain (0)	WHA YU GROUP	C037-511135-A (SSR-13314)	5G Band1: 3.74 5G Band2: 3.92 5G Band3: 3.95 5G Band4: 3.87	PIFA	I-PEX
Chain (1)	WHA YU GROUP	C037-511135-A (SSR-13314)	5G Band1: 3.87 5G Band2: 3.84 5G Band3: 3.72 5G Band4: 3.98	PIFA	I-PEX

3. The EUT must be supplied with a POE as following table:

POE (only for test, not for sale)		
Brand	Model No.	Spec.
Base-Unit	EBU-101G-T2 LF	Output: 48V
Adapter (for POE use)		
Brand	Model No.	Spec.
Bothhand	SA06-20S48-V	Input: 100-240V, 0.6A, 50-60Hz Output: 48V, 0.4A DC output cable (Unshielded, 1.8m, with one core)

4. The EUT incorporates a MIMO function.

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

5. Radiated and Conducted emission of the simultaneous operation (2.4GHz and 5GHz WLAN technology) has been evaluated and no non-compliance was found.

6. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.

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:

11 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		

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

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

Operated in 5725 ~ 5850MHz band:

5 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		

2 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: 1. The EUT had been pre-tested on the positioned of each 2 axis. The radiated emission worst case was found when positioned on **Y-plane**

2. "-"means no effect.

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
For 2.4 GHz 802.11g	1 to 13	6	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	157	OFDM	BPSK	6.5

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATIO N TYPE	DATA RATE (Mbps)
For 2.4 GHz 802.11g	1 to 13	6	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 165	157	OFDM	BPSK	6.5

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 161	149, 157, 161	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 161	149, 157, 161	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 161	149, 157, 161	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 161	149, 157, 161	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 161	149, 157, 161	OFDM	BPSK	6
For 5 GHz 802.11n (20MHz)	149 to 161	149, 157, 161	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	26deg. C, 63%RH	120Vac, 60Hz	Jyunchun Lin
RE<1G	27deg. C, 67%RH	120Vac, 60Hz	Nelson Teng
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng
OB	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)

558074 D01 DTS Meas Guidance v01

ANSI C63.10-2009

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

Note: The EUT 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.

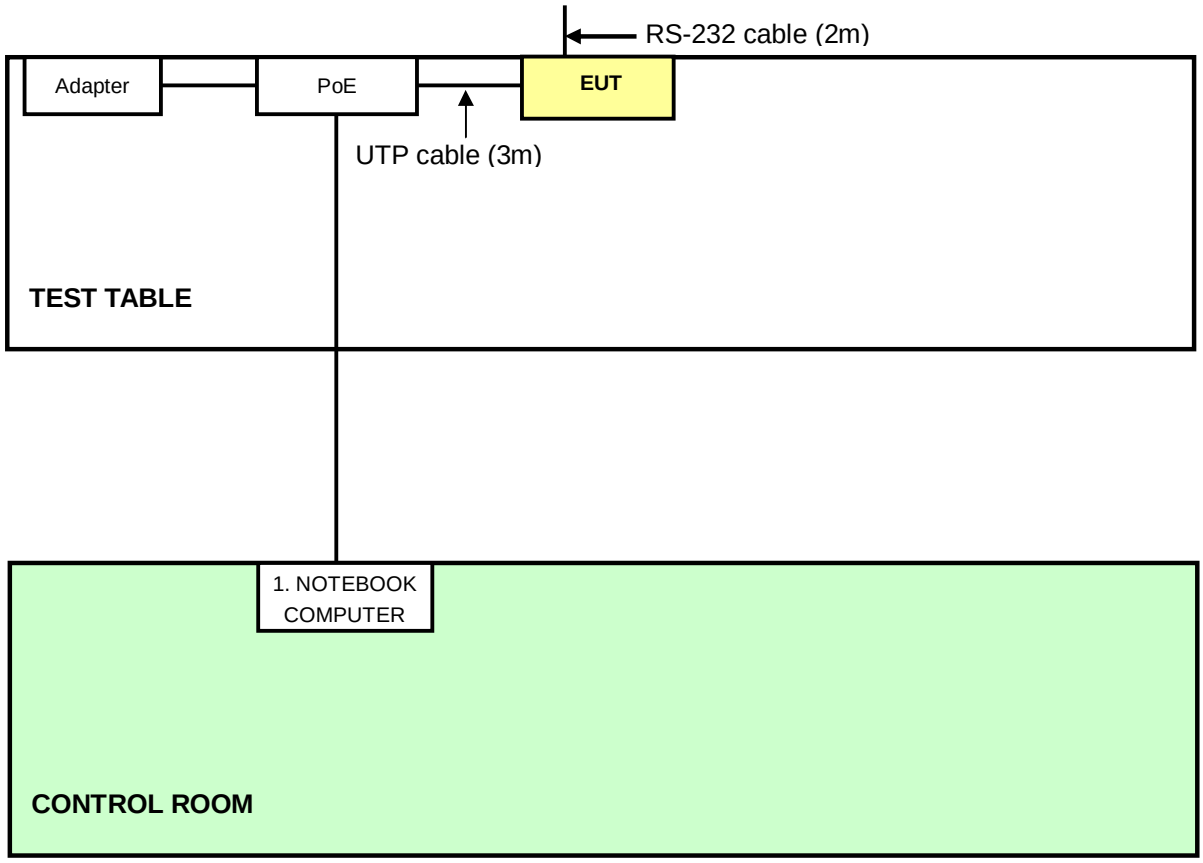
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable, 3m

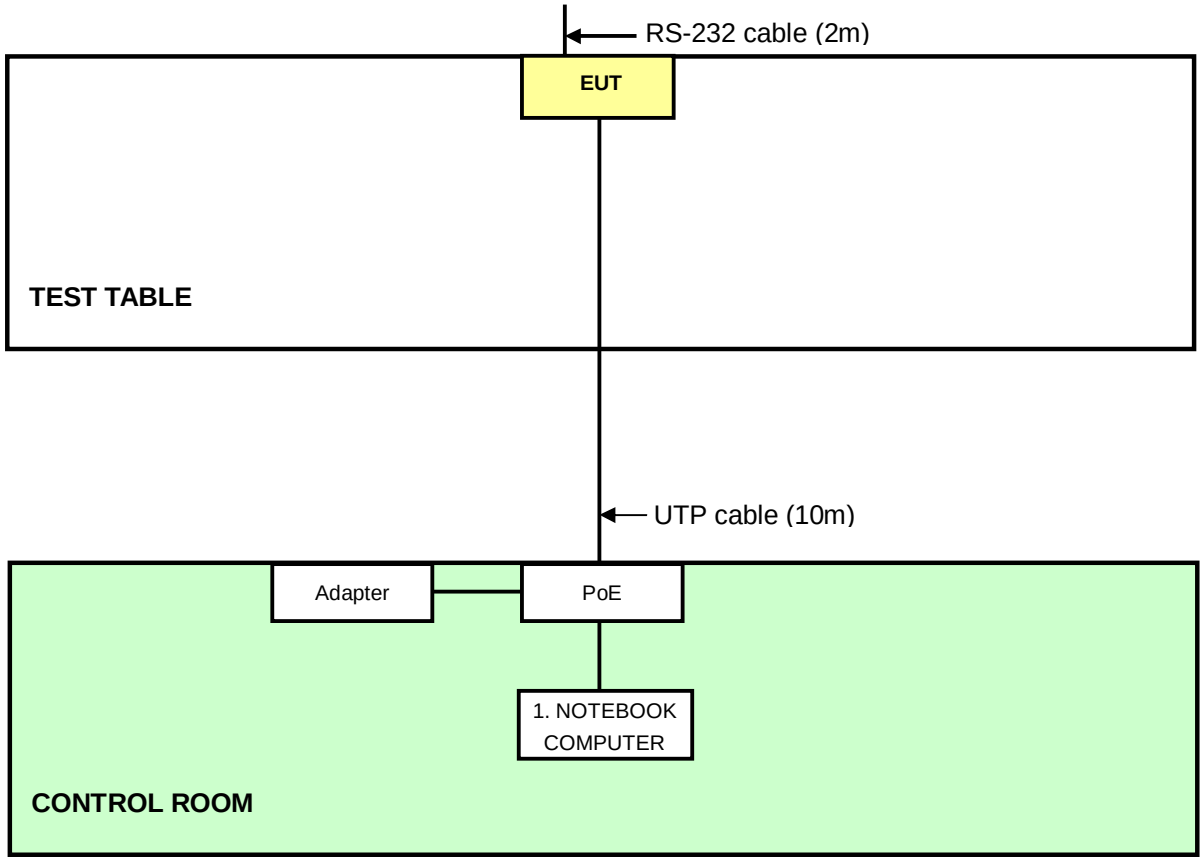
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted emission test:



For Other test items:



4.TEST TYPES AND RESULTS (FOR 2.4GHz, 2412 ~ 2462MHz 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) SCHWARZBECK	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 ADT	BV ADT_Cond_V7.3.7 .3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: June 08, 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.

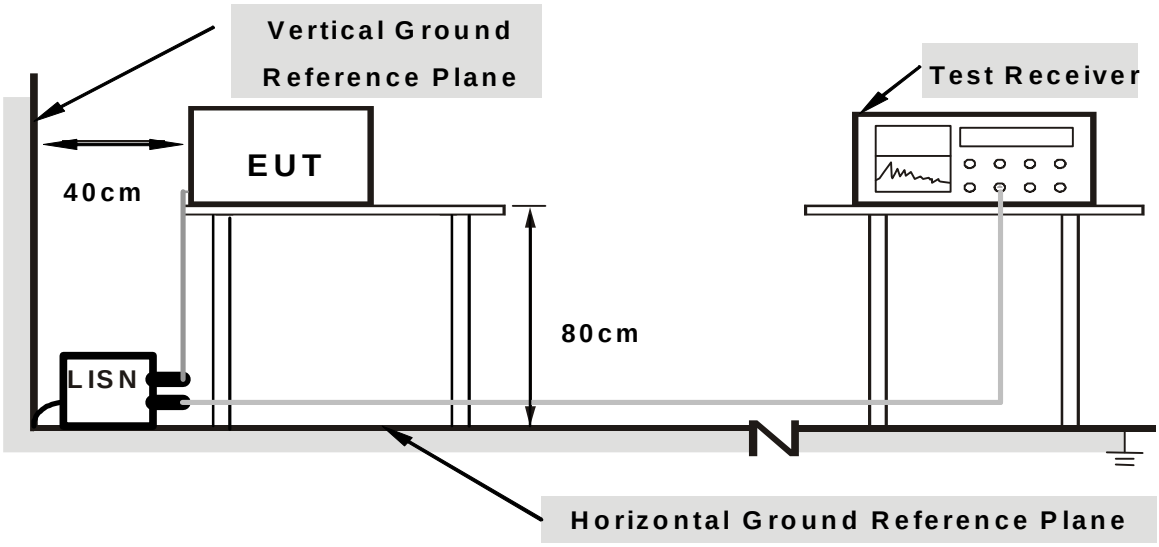
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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. Turn on the power of EUT.
2. The communication partner run test program “artgui.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

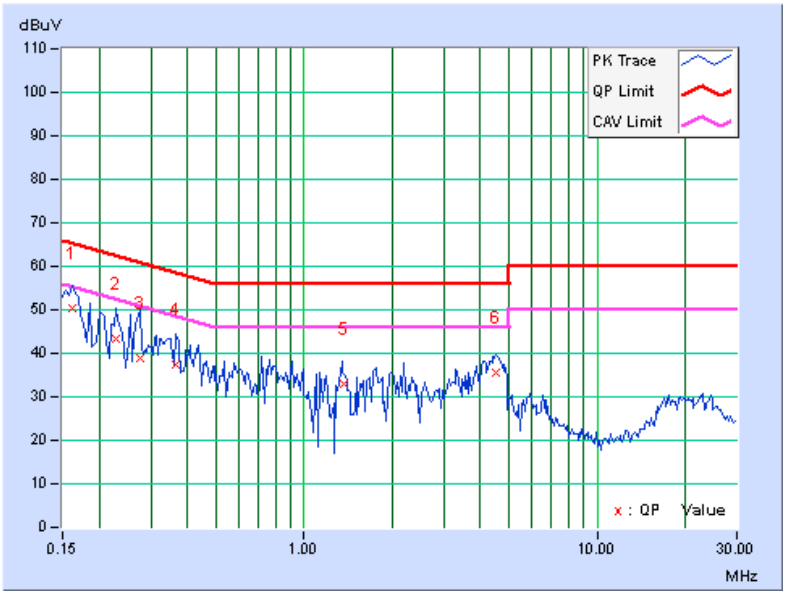
4.1.7 TEST RESULTS

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	0.16172	0.07	50.33	39.69	50.40	39.76	65.38	55.38	-14.98	-15.62
2	0.22812	0.07	43.25	31.06	43.32	31.13	62.52	52.52	-19.20	-21.39
3	0.27500	0.07	38.91	26.94	38.98	27.01	60.97	50.97	-21.98	-23.95
4	0.36484	0.08	37.48	26.45	37.56	26.53	58.62	48.62	-21.06	-22.09
5	1.36194	0.14	32.82	22.53	32.96	22.67	56.00	46.00	-23.04	-23.33
6	4.54297	0.34	35.04	26.53	35.38	26.87	56.00	46.00	-20.62	-19.13

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.

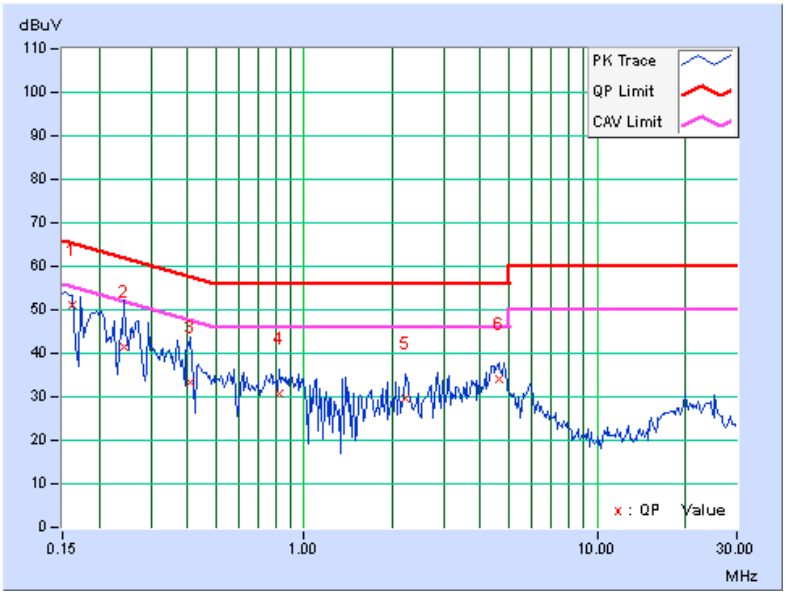


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.16162**	**0.06**	**50.92**	**42.38**	**50.98**	**42.44**	**65.38**	**55.38**	**-14.40**	**-12.94**
2	0.24375	0.06	41.55	31.28	41.61	31.34	61.97	51.97	-20.35	-20.62
3	0.41172	0.08	33.36	25.06	33.44	25.14	57.61	47.61	-24.17	-22.47
4	0.82188	0.09	30.81	23.23	30.90	23.32	56.00	46.00	-25.10	-22.68
5	2.21484	0.18	29.41	20.86	29.59	21.04	56.00	46.00	-26.41	-24.96
6	4.61719	0.26	33.95	26.98	34.21	27.24	56.00	46.00	-21.79	-18.76

REMARKS:

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



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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012
Spectrum Analyzer Agilent PSA	E4446A	MY48250113	Nov. 30 , 2011	Nov. 29 , 2012
Pre_Amplifier HP	8449B	300801923	Oct. 31, 2011	Oct. 30, 2012
Test Receiver ROHDE & SCHWARZ	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
TRILOG Broadband Antenna SCHWARZBECK	VULB 9168	138	Apr. 02, 2012	Apr. 01, 2013
Horn_Antenna SCHWARZBECK	BBHA9120	D124	Dec. 16, 2011	Dec. 15, 2012
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170153	Jan. 17, 2012	Jan. 16, 2013
*Loop Antenna R&S	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
RF Switches	EMH-011	1001	Sep. 24, 2011	Sep. 23, 2012
RF Cable (Chaintek)	Sucoflex 106	RF106-102	Jan. 19, 2012	Jan. 18, 2013
RF Cable	8DFB	STCCAB-30M -1GHz	Sep. 24, 2011	Sep. 23, 2012
Software	ADT_Radiated _V7.6.15.9.2	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3 The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in Open Site No. C.
5 The FCC Site Registration No. is 656396.
6 The VCCI Site Registration No. is R-1626.
7 The CANADA Site Registration No. is IC 7450G-3.
8 Tested Date: May 25 to June 08, 2012

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters open field site. 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.

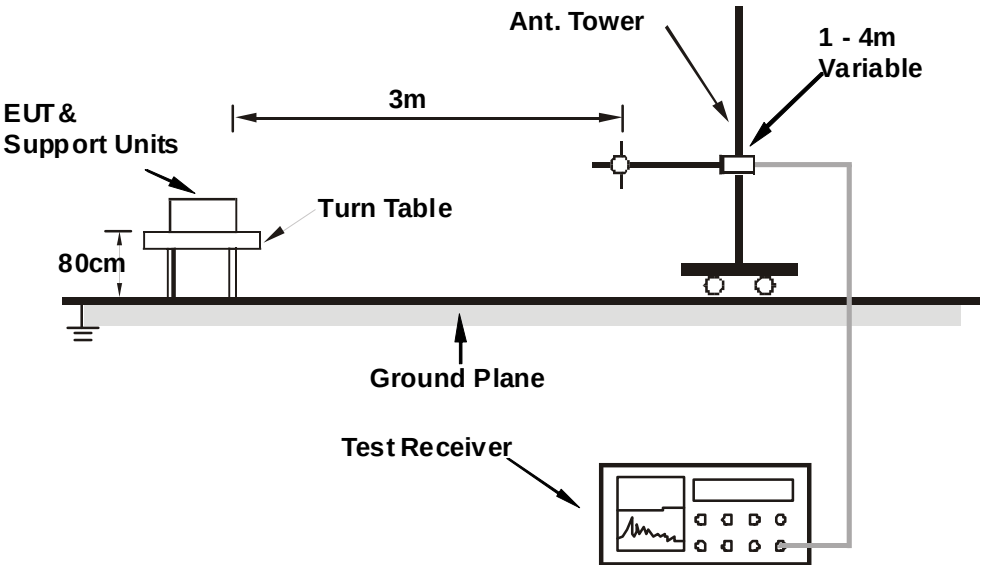
NOTE:

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	125.00	22.9 QP	43.5	-20.6	1.68 H	326	9.71	13.16
2	216.03	26.4 QP	46.0	-19.6	1.00 H	169	13.75	12.68
3	250.00	40.1 QP	46.0	-5.9	1.00 H	308	25.71	14.38
4	375.01	33.4 QP	46.0	-12.6	1.23 H	58	14.92	18.50
5	479.97	41.9 QP	46.0	-4.2	1.60 H	332	20.33	21.52
6	1000.00	25.8 QP	54.0	-28.2	1.01 H	311	-4.66	30.45
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	125.00	23.8 QP	43.5	-19.7	1.00 V	286	10.66	13.16
2	217.12	27.2 QP	46.0	-18.8	1.09 V	203	14.49	12.74
3	250.01	33.6 QP	46.0	-12.4	1.00 V	187	19.19	14.38
4	375.01	29.4 QP	46.0	-16.6	1.60 V	351	10.92	18.50
5	479.99	42.0 QP	46.0	-4.0	1.00 V	121	20.46	21.52
6	500.01	30.5 QP	46.0	-15.6	1.62 V	10	8.34	22.11
7	996.36	45.1 QP	54.0	-8.9	1.56 V	248	14.72	30.41

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	2386.31	57.1 PK	74.0	-16.9	1.86 H	208	26.72	30.38
2	2386.31	48.4 AV	54.0	-5.6	1.86 H	208	18.02	30.38
3	*2412.00	109.2 PK			1.73 H	219	78.73	30.47
4	*2412.00	107.1 AV			1.73 H	219	76.63	30.47
5	4824.00	50.4 PK	74.0	-23.6	1.16 H	84	14.49	35.91
6	4824.00	46.9 AV	54.0	-7.1	1.16 H	84	10.99	35.91
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	61.3 PK	74.0	-12.7	1.66 V	170	30.91	30.39
2	2390.00	52.9 AV	54.0	-1.1	1.66 V	170	22.51	30.39
3	*2412.00	112.9 PK			1.36 V	190	82.43	30.47
4	*2412.00	110.9 AV			1.36 V	190	80.43	30.47
5	4824.00	48.4 PK	74.0	-25.6	1.40 V	229	12.49	35.91
6	4824.00	44.8 AV	54.0	-9.2	1.40 V	229	8.89	35.91

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	114.0 PK			1.61 H	110	83.43	30.57
2	*2437.00	111.9 AV			1.61 H	110	81.33	30.57
3	4874.00	53.7 PK	74.0	-20.3	1.21 H	86	17.74	35.96
4	4874.00	51.0 AV	54.0	-3.0	1.21 H	86	15.04	35.96
5	7311.00	50.2 PK	74.0	-23.8	1.24 H	215	8.04	42.16
6	7311.00	39.2 AV	54.0	-14.8	1.24 H	215	-2.96	42.16
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	116.6 PK			1.41 V	220	86.03	30.57
2	*2437.00	114.5 AV			1.41 V	220	83.93	30.57
3	4874.00	53.7 PK	74.0	-20.3	1.51 V	212	17.74	35.96
4	4874.00	50.2 AV	54.0	-3.8	1.51 V	212	14.24	35.96
5	7311.00	49.2 PK	74.0	-24.8	1.17 V	37	7.04	42.16
6	7311.00	39.6 AV	54.0	-14.4	1.17 V	37	-2.56	42.16

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	109.9 PK			1.57 H	212	79.24	30.66
2	*2462.00	107.3 AV			1.57 H	212	76.64	30.66
3	2483.50	60.7 PK	74.0	-13.3	1.75 H	216	29.96	30.74
4	2483.50	51.5 AV	54.0	-2.5	1.75 H	216	20.76	30.74
5	4924.00	50.0 PK	74.0	-24.0	1.21 H	155	13.97	36.03
6	4924.00	46.3 AV	54.0	-7.7	1.21 H	155	10.27	36.03
7	7386.00	49.9 PK	74.0	-24.1	1.28 H	227	7.48	42.42
8	7386.00	38.9 AV	54.0	-15.1	1.28 H	227	-3.52	42.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.7 PK			1.67 V	165	82.04	30.66
2	*2462.00	110.3 AV			1.67 V	165	79.64	30.66
3	2487.79	61.8 PK	74.0	-12.2	1.87 V	187	31.05	30.75
4	2487.79	52.5 AV	54.0	-1.5	1.87 V	187	21.75	30.75
5	4924.00	51.2 PK	74.0	-22.8	1.02 V	243	15.17	36.03
6	4924.00	47.9 AV	54.0	-6.1	1.02 V	243	11.87	36.03
7	7386.00	49.2 PK	74.0	-24.8	1.20 V	31	6.78	42.42
8	7386.00	39.9 AV	54.0	-14.1	1.20 V	31	-2.52	42.42

REMARKS:

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

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	64.0 PK	74.0	-10.0	1.56 H	201	33.61	30.39
2	2390.00	50.3 AV	54.0	-3.7	1.56 H	201	19.91	30.39
3	*2412.00	111.9 PK			1.57 H	107	81.43	30.47
4	*2412.00	103.3 AV			1.57 H	107	72.83	30.47
5	4824.00	44.2 PK	74.0	-29.8	1.22 H	223	8.29	35.91
6	4824.00	33.1 AV	54.0	-20.9	1.22 H	223	-2.81	35.91
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	70.4 PK	74.0	-3.6	1.67 V	166	40.01	30.39
2	2390.00	53.1 AV	54.0	-0.9	1.67 V	166	22.71	30.39
3	*2412.00	115.5 PK			1.63 V	137	85.03	30.47
4	*2412.00	107.2 AV			1.63 V	137	76.73	30.47
5	4824.00	45.3 PK	74.0	-28.7	1.06 V	132	9.39	35.91
6	4824.00	33.6 AV	54.0	-20.4	1.06 V	132	-2.31	35.91

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	115.5 PK			1.59 H	107	84.93	30.57
2	*2437.00	106.9 AV			1.59 H	107	76.33	30.57
3	4874.00	47.9 PK	74.0	-26.1	1.27 H	233	11.94	35.96
4	4874.00	36.8 AV	54.0	-17.2	1.27 H	233	0.84	35.96
5	7311.00	48.2 PK	74.0	-25.8	1.17 H	222	6.04	42.16
6	7311.00	36.7 AV	54.0	-17.3	1.17 H	222	-5.46	42.16
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	70.1 PK	74.0	-3.9	1.37 V	168	39.71	30.39
2	2390.00	52.9 AV	54.0	-1.1	1.37 V	168	22.51	30.39
3	*2437.00	117.3 PK			1.34 V	221	86.73	30.57
4	*2437.00	107.8 AV			1.34 V	221	77.23	30.57
5	2483.50	69.6 PK	74.0	-4.4	1.30 V	197	38.86	30.74
6	2483.50	51.5 AV	54.0	-2.5	1.30 V	197	20.76	30.74
7	4874.00	48.8 PK	74.0	-25.2	1.09 V	129	12.84	35.96
8	4874.00	37.9 AV	54.0	-16.1	1.09 V	129	1.94	35.96
9	7311.00	48.8 PK	74.0	-25.2	1.19 V	57	6.64	42.16
10	7311.00	36.9 AV	54.0	-17.1	1.19 V	57	-5.26	42.16

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	111.3 PK			1.58 H	213	80.64	30.66
2	*2462.00	102.2 AV			1.58 H	213	71.54	30.66
3	2484.87	66.1 PK	74.0	-7.9	1.75 H	222	35.36	30.74
4	2484.87	52.2 AV	54.0	-1.8	1.75 H	222	21.46	30.74
5	4924.00	44.1 PK	74.0	-29.9	1.27 H	214	8.07	36.03
6	4924.00	33.3 AV	54.0	-20.7	1.27 H	214	-2.73	36.03
7	7386.00	48.2 PK	74.0	-25.8	1.22 H	225	5.78	42.42
8	7386.00	36.4 AV	54.0	-17.6	1.22 H	225	-6.02	42.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.1 PK			1.69 V	190	83.44	30.66
2	*2462.00	104.8 AV			1.69 V	190	74.14	30.66
3	2483.50	68.1 PK	74.0	-5.9	1.69 V	203	37.36	30.74
4	2483.50	53.1 AV	54.0	-0.9	1.69 V	203	22.36	30.74
5	4924.00	45.3 PK	74.0	-28.7	1.07 V	117	9.27	36.03
6	4924.00	33.8 AV	54.0	-20.2	1.07 V	117	-2.23	36.03
7	7386.00	49.1 PK	74.0	-24.9	1.17 V	54	6.68	42.42
8	7386.00	36.9 AV	54.0	-17.1	1.17 V	54	-5.52	42.42

REMARKS:

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

802.11n (20MHz)

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	63.2 PK	74.0	-10.8	1.55 H	206	32.81	30.39
2	2390.00	50.0 AV	54.0	-4.0	1.55 H	206	19.61	30.39
3	*2412.00	110.7 PK			1.59 H	107	80.23	30.47
4	*2412.00	101.7 AV			1.59 H	107	71.23	30.47
5	4824.00	43.7 PK	74.0	-30.3	1.22 H	216	7.79	35.91
6	4824.00	32.9 AV	54.0	-21.1	1.22 H	216	-3.01	35.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.0 PK	74.0	-8.0	1.44 V	192	35.61	30.39
2	2390.00	53.2 AV	54.0	-0.8	1.44 V	192	22.81	30.39
3	*2412.00	114.5 PK			1.66 V	136	84.03	30.47
4	*2412.00	105.6 AV			1.66 V	136	75.13	30.47
5	4824.00	45.5 PK	74.0	-28.5	1.03 V	122	9.59	35.91
6	4824.00	33.7 AV	54.0	-20.3	1.03 V	122	-2.21	35.91

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	115.2 PK			1.60 H	107	84.63	30.57
2	*2437.00	105.9 AV			1.60 H	107	75.33	30.57
3	4874.00	47.9 PK	74.0	-26.1	1.31 H	218	11.94	35.96
4	4874.00	36.5 AV	54.0	-17.5	1.31 H	218	0.54	35.96
5	7311.00	48.4 PK	74.0	-25.6	1.11 H	229	6.24	42.16
6	7311.00	36.8 AV	54.0	-17.2	1.11 H	229	-5.36	42.16
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	70.1 PK	74.0	-3.9	1.34 V	171	39.71	30.39
2	2390.00	52.7 AV	54.0	-1.3	1.34 V	171	22.31	30.39
3	*2437.00	117.2 PK			1.35 V	221	86.63	30.57
4	*2437.00	107.5 AV			1.35 V	221	76.93	30.57
5	2485.31	69.1 PK	74.0	-4.9	1.32 V	200	38.35	30.75
6	2485.31	51.2 AV	54.0	-2.8	1.32 V	200	20.45	30.75
7	4874.00	48.6 PK	74.0	-25.4	1.09 V	128	12.64	35.96
8	4874.00	37.5 AV	54.0	-16.5	1.09 V	128	1.54	35.96
9	7311.00	48.7 PK	74.0	-25.3	1.21 V	55	6.54	42.16
10	7311.00	37.1 AV	54.0	-16.9	1.21 V	55	-5.06	42.16

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	109.6 PK			1.58 H	215	78.94	30.66
2	*2462.00	101.1 AV			1.58 H	215	70.44	30.66
3	2483.50	67.5 PK	74.0	-6.5	1.85 H	218	36.76	30.74
4	2483.50	53.3 AV	54.0	-0.7	1.85 H	218	22.56	30.74
5	4924.00	44.1 PK	74.0	-29.9	1.28 H	212	8.07	36.03
6	4924.00	33.6 AV	54.0	-20.4	1.28 H	212	-2.43	36.03
7	7386.00	48.2 PK	74.0	-25.8	1.24 H	237	5.78	42.42
8	7386.00	36.2 AV	54.0	-17.8	1.24 H	237	-6.22	42.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.9 PK			1.62 V	191	82.24	30.66
2	*2462.00	103.4 AV			1.62 V	191	72.74	30.66
3	2483.50	67.6 PK	74.0	-6.4	1.63 V	217	36.86	30.74
4	2483.50	53.4 AV	54.0	-0.6	1.63 V	217	22.66	30.74
5	4924.00	45.3 PK	74.0	-28.7	1.05 V	120	9.27	36.03
6	4924.00	33.6 AV	54.0	-20.4	1.05 V	120	-2.43	36.03
7	7386.00	48.7 PK	74.0	-25.3	1.14 V	40	6.28	42.42
8	7386.00	36.5 AV	54.0	-17.5	1.14 V	40	-5.92	42.42

REMARKS:

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

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	66.4 PK	74.0	-7.6	1.55 H	208	36.01	30.39
2	2390.00	51.2 AV	54.0	-2.8	1.55 H	208	20.81	30.39
3	*2422.00	106.9 PK			1.54 H	110	76.39	30.51
4	*2422.00	96.7 AV			1.54 H	110	66.19	30.51
5	4844.00	41.8 PK	74.0	-32.2	1.34 H	230	5.87	35.93
6	4844.00	30.7 AV	54.0	-23.3	1.34 H	230	-5.23	35.93
7	7266.00	48.2 PK	74.0	-25.8	1.12 H	222	6.11	42.09
8	7266.00	36.7 AV	54.0	-17.3	1.12 H	222	-5.39	42.09
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.9 PK	74.0	-7.1	1.45 V	192	36.51	30.39
2	2390.00	52.9 AV	54.0	-1.1	1.45 V	192	22.51	30.39
3	*2422.00	109.0 PK			1.67 V	192	78.49	30.51
4	*2422.00	100.2 AV			1.67 V	192	69.69	30.51
5	4844.00	42.3 PK	74.0	-31.7	1.31 V	228	6.37	35.93
6	4844.00	31.2 AV	54.0	-22.8	1.31 V	228	-4.73	35.93
7	7266.00	48.6 PK	74.0	-25.4	1.20 V	87	6.51	42.09
8	7266.00	36.9 AV	54.0	-17.1	1.20 V	87	-5.19	42.09

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	67.0 PK	74.0	-7.0	1.77 H	210	36.61	30.39
2	2390.00	50.1 AV	54.0	-3.9	1.77 H	210	19.71	30.39
3	*2437.00	108.6 PK			1.68 H	217	78.03	30.57
4	*2437.00	99.6 AV			1.68 H	217	69.03	30.57
5	2483.50	71.4 PK	74.0	-2.6	1.66 H	219	40.66	30.74
6	2483.50	50.9 AV	54.0	-3.1	1.66 H	219	20.16	30.74
7	4874.00	42.1 PK	74.0	-31.9	1.35 H	226	6.14	35.96
8	4874.00	30.9 AV	54.0	-23.1	1.35 H	226	-5.06	35.96
9	7311.00	48.8 PK	74.0	-25.2	1.16 H	232	6.64	42.16
10	7311.00	37.1 AV	54.0	-16.9	1.16 H	232	-5.06	42.16
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	70.9 PK	74.0	-3.1	1.60 V	213	40.51	30.39
2	2390.00	52.9 AV	54.0	-1.1	1.60 V	213	22.51	30.39
3	*2437.00	109.8 PK			1.55 V	211	79.23	30.57
4	*2437.00	100.9 AV			1.55 V	211	70.33	30.57
5	2483.50	70.6 PK	74.0	-3.4	1.58 V	210	39.86	30.74
6	2483.50	51.9 AV	54.0	-2.1	1.58 V	210	21.16	30.74
7	4874.00	42.6 PK	74.0	-31.4	1.33 V	226	6.64	35.96
8	4874.00	31.5 AV	54.0	-22.5	1.33 V	226	-4.46	35.96
9	7311.00	48.2 PK	74.0	-25.8	1.23 V	95	6.04	42.16
10	7311.00	36.8 AV	54.0	-17.2	1.23 V	95	-5.36	42.16

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	105.7 PK			1.60 H	109	75.08	30.62
2	*2452.00	97.1 AV			1.60 H	109	66.48	30.62
3	2483.50	69.1 PK	74.0	-4.9	1.48 H	215	38.36	30.74
4	2483.50	53.1 AV	54.0	-0.9	1.48 H	215	22.36	30.74
5	4904.00	42.1 PK	74.0	-31.9	1.31 H	229	6.11	35.99
6	4904.00	30.8 AV	54.0	-23.2	1.31 H	229	-5.19	35.99
7	7356.00	48.1 PK	74.0	-25.9	1.06 H	211	5.78	42.32
8	7356.00	36.5 AV	54.0	-17.5	1.06 H	211	-5.82	42.32
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	107.2 PK			1.55 V	213	76.58	30.62
2	*2452.00	98.1 AV			1.55 V	213	67.48	30.62
3	2483.50	67.7 PK	74.0	-6.3	1.61 V	226	36.96	30.74
4	**2483.50**	**53.5 AV**	**54.0**	**-0.5**	**1.61 V**	**226**	**22.76**	**30.74**
5	4904.00	42.0 PK	74.0	-32.0	1.31 V	211	6.01	35.99
6	4904.00	31.2 AV	54.0	-22.8	1.31 V	211	-4.79	35.99
7	7356.00	48.5 PK	74.0	-25.5	1.24 V	99	6.18	42.32
8	7356.00	36.9 AV	54.0	-17.1	1.24 V	99	-5.42	42.32

REMARKS:

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 21, 2012

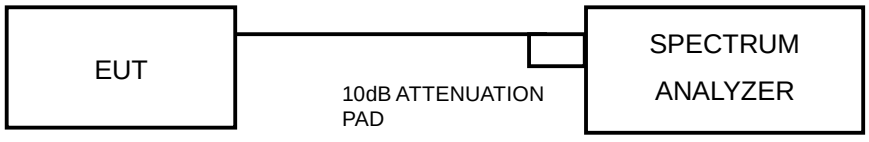
4.3.3 TEST PROCEDURE

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	10.54	10.59	0.5	PASS
6	2437	10.63	10.54	0.5	PASS
11	2462	10.61	11.00	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.54	16.60	0.5	PASS
6	2437	16.51	16.46	0.5	PASS
11	2462	16.52	16.56	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.66	17.80	0.5	PASS
6	2437	17.73	17.76	0.5	PASS
11	2462	17.78	17.81	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.64	35.66	0.5	PASS
6	2437	36.70	36.21	0.5	PASS
9	2452	37.14	36.10	0.5	PASS

4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

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

4.4.2 INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 21, 2012

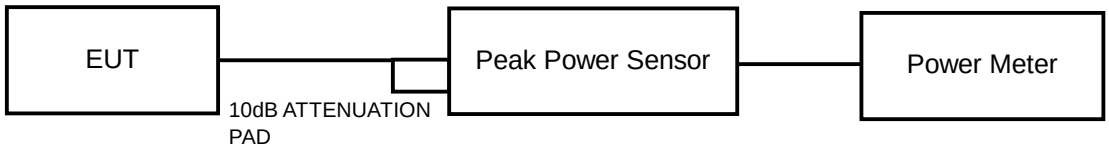
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	19.90	20.00	197.724	22.96	29.05	PASS
6	2437	22.90	22.40	368.764	25.67	29.05	PASS
11	2462	19.80	19.80	190.998	22.81	29.05	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 6.95

The effective legacy gain is 6.95dBi, therefore the limit needs to 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	23.30	23.20	422.726	26.26	29.05	PASS
6	2437	24.70	25.20	626.252	27.97	29.05	PASS
11	2462	22.10	22.40	335.961	25.26	29.05	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 6.95

The effective legacy gain is 6.95dBi, 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				
1	2412	21.70	21.90	302.793	24.81	30	PASS
6	2437	24.60	25.10	611.997	27.87	30	PASS
11	2462	21.20	21.50	273.080	24.36	30	PASS

802.11n (40MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	19.90	20.30	204.876	23.11	30	PASS
6	2437	21.30	22.20	300.855	24.78	30	PASS
9	2452	19.40	19.90	184.820	22.67	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 21, 2012

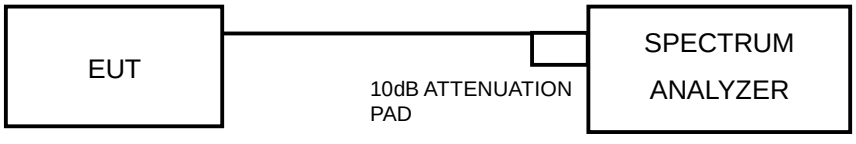
4.5.3 TEST PROCEDURE

1. Set the RBW = 100 kHz, VBW =300 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(3 kHz/100kHz)

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	9.00	-6.23	3.01	-3.22	7.05	PASS
	6	2437	11.93	-3.30	3.01	-0.29	7.05	PASS
	11	2462	8.15	-7.08	3.01	-4.07	7.05	PASS
1	1	2412	8.98	-6.25	3.01	-3.24	7.05	PASS
	6	2437	11.63	-3.60	3.01	-0.59	7.05	PASS
	11	2462	8.51	-6.72	3.01	-3.71	7.05	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 6.95

The effective legacy gain is 6.95dBi, therefore the limit needs to 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	3.67	-11.56	3.01	-8.55	7.05	PASS
	6	2437	6.44	-8.79	3.01	-5.78	7.05	PASS
	11	2462	0.57	-14.66	3.01	-11.65	7.05	PASS
1	1	2412	3.37	-11.86	3.01	-8.85	7.05	PASS
	6	2437	6.96	-8.27	3.01	-5.26	7.05	PASS
	11	2462	2.30	-12.93	3.01	-9.92	7.05	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 6.95

The effective legacy gain is 6.95dBi, therefore the limit needs to 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	0.63	-14.60	3.01	-11.59	8	PASS
	6	2437	4.90	-10.33	3.01	-7.32	8	PASS
	11	2462	-0.12	-15.35	3.01	-12.34	8	PASS
1	1	2412	1.90	-13.33	3.01	-10.32	8	PASS
	6	2437	6.36	-8.87	3.01	-5.86	8	PASS
	11	2462	1.56	-13.67	3.01	-10.66	8	PASS

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-4.02	-19.25	3.01	-16.24	8	PASS
	6	2437	-1.92	-17.15	3.01	-14.14	8	PASS
	9	2452	-4.35	-19.58	3.01	-16.57	8	PASS
1	3	2422	-1.31	-16.54	3.01	-13.53	8	PASS
	6	2437	-0.06	-15.29	3.01	-12.28	8	PASS
	9	2452	-3.06	-18.29	3.01	-15.28	8	PASS

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 21, 2012

4.6.3 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.

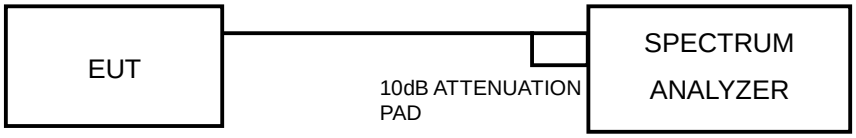
MEASUREMENT PROCEDURE OOBE

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.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

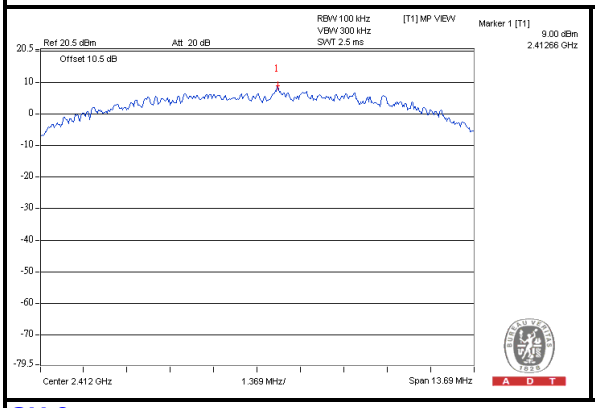
4.6.7 TEST RESULTS

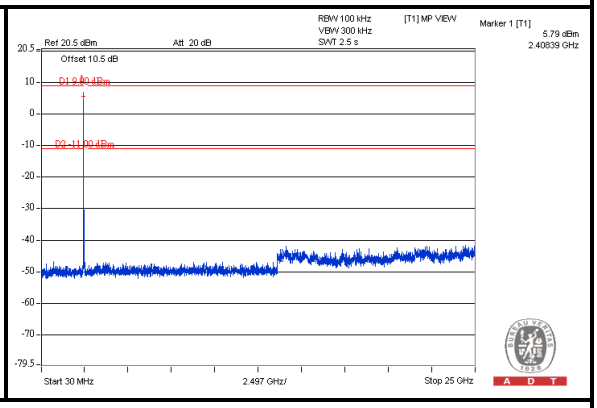
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

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.

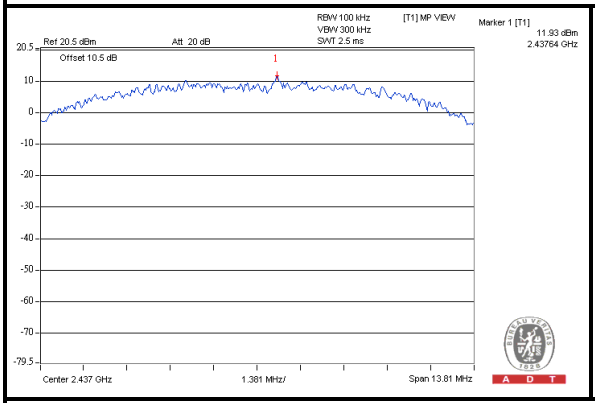
802.11b

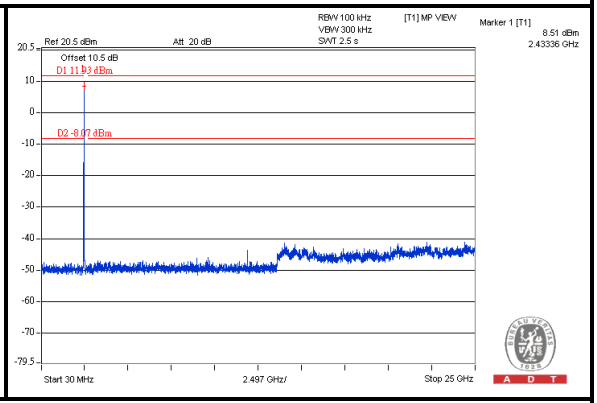
CH 1



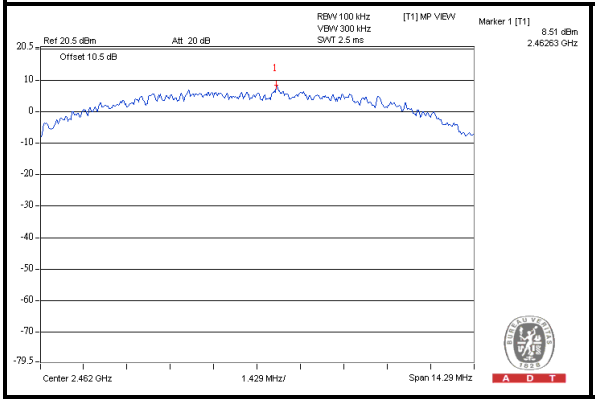


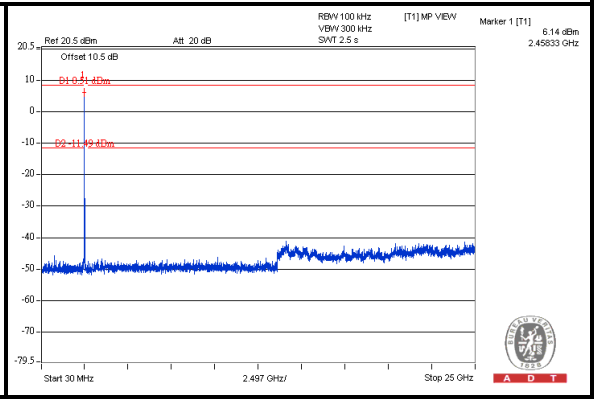
CH 6





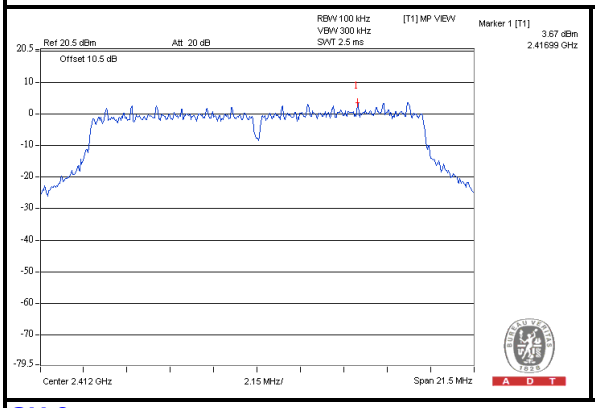
CH 11

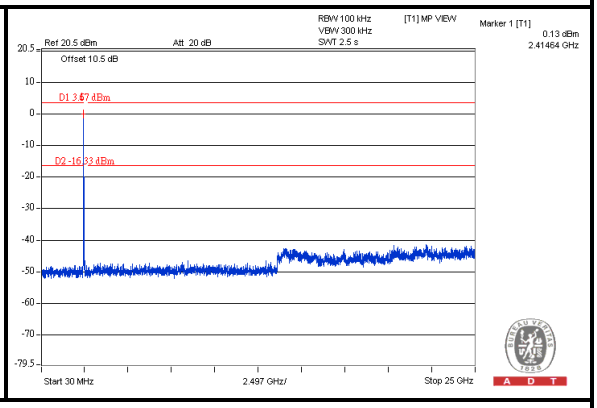




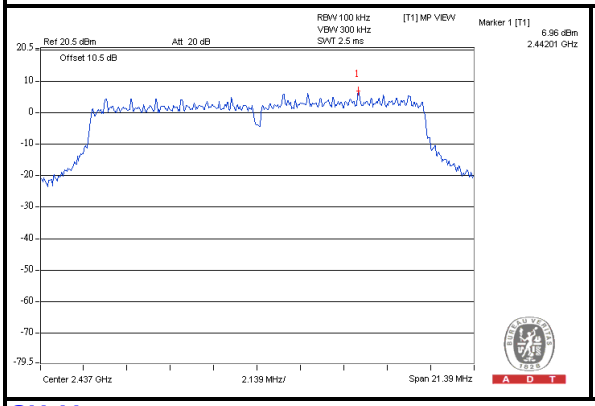
802.11g

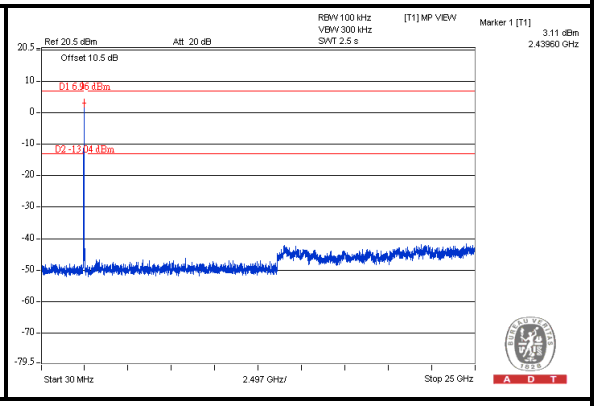
CH 1



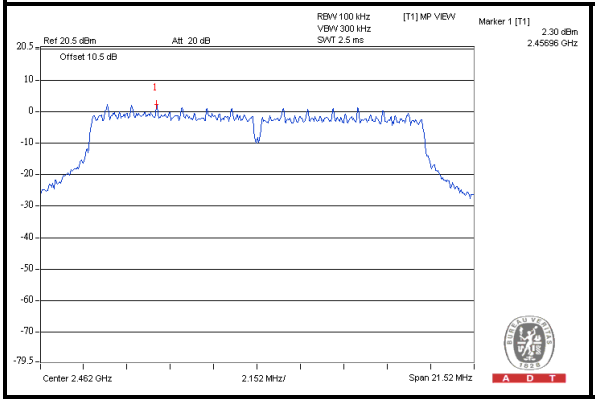


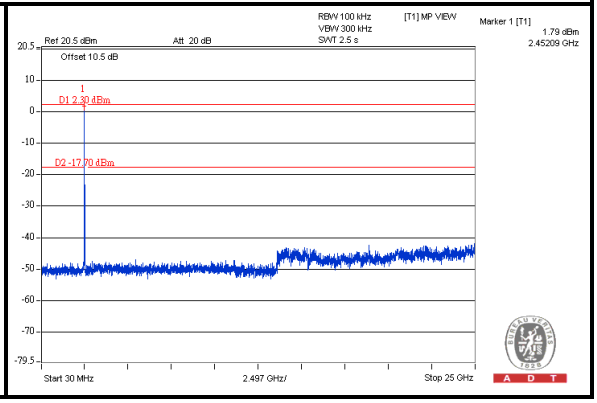
CH 6





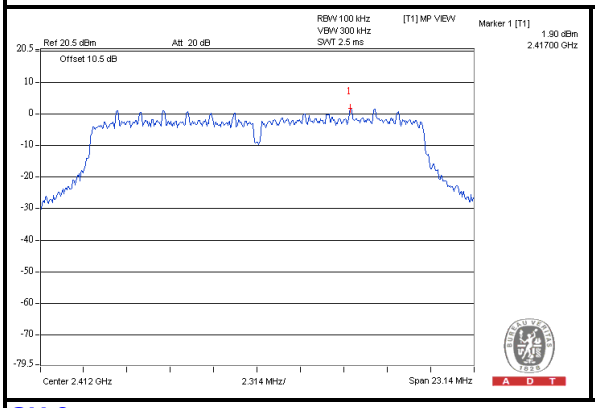
CH 11

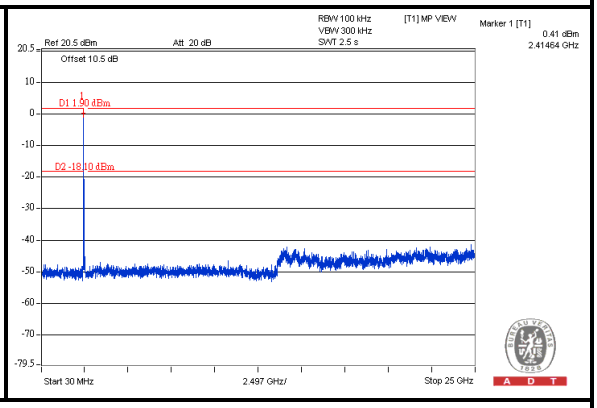




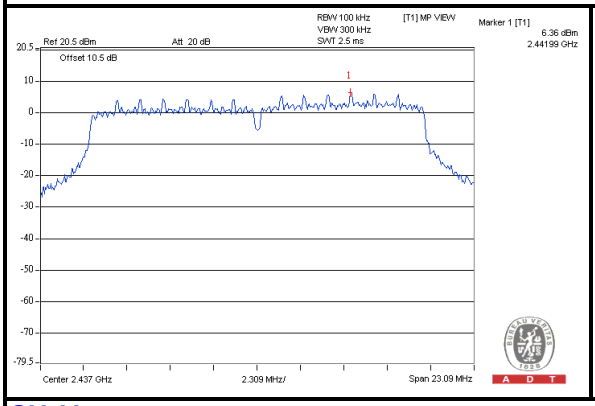
802.11n (20MHz)

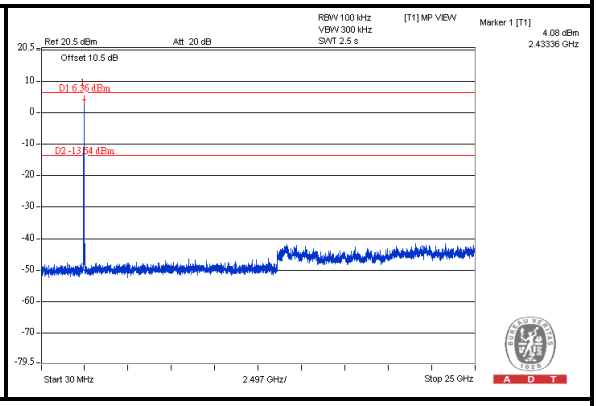
CH 1



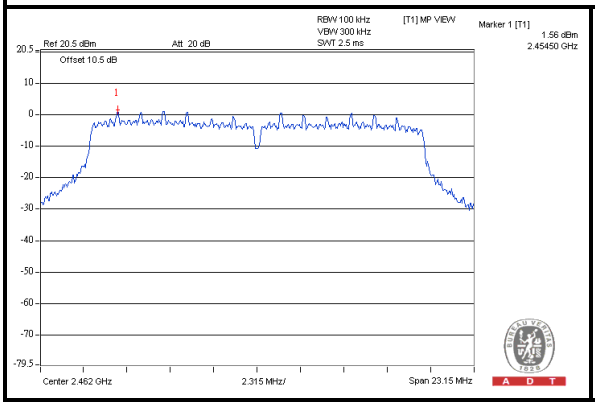


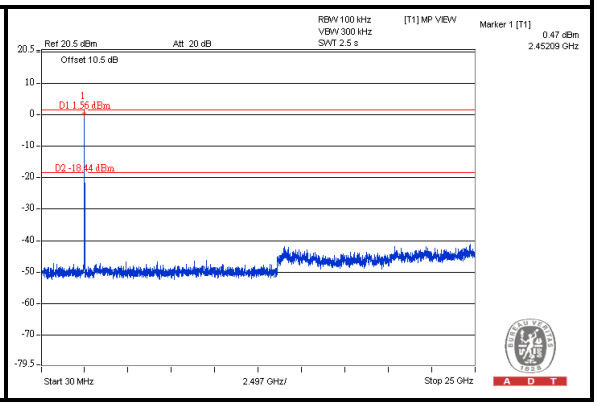
CH 6





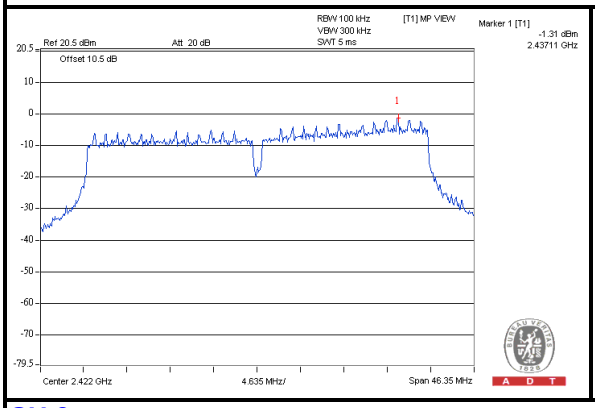
CH 11

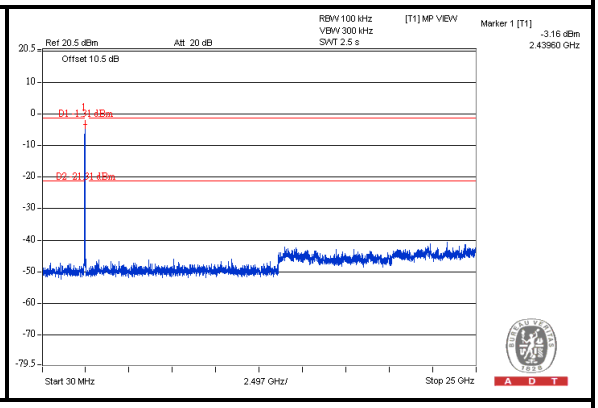




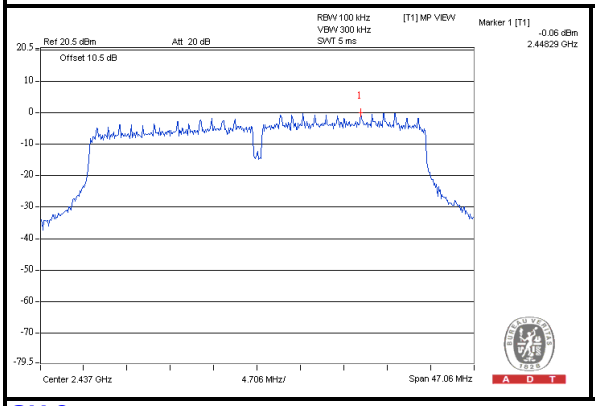
802.11n (40MHz)

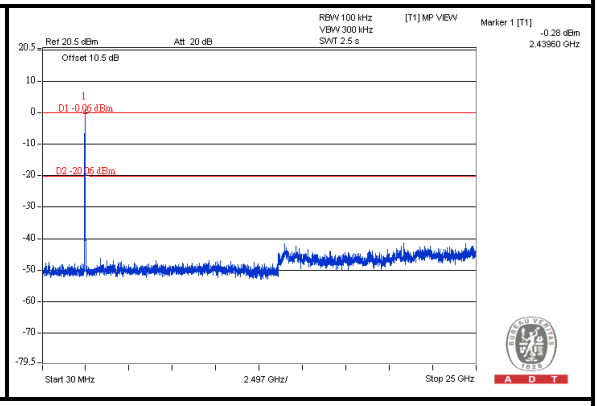
CH 3



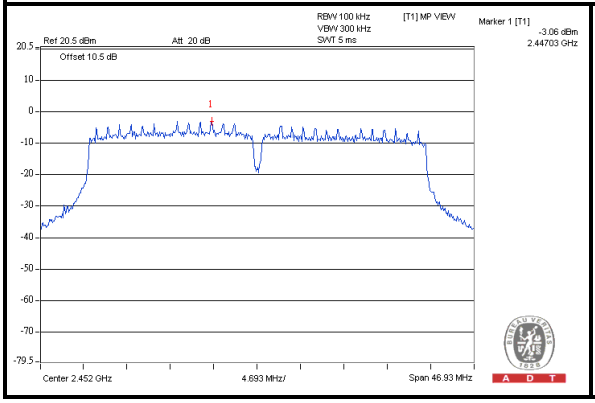


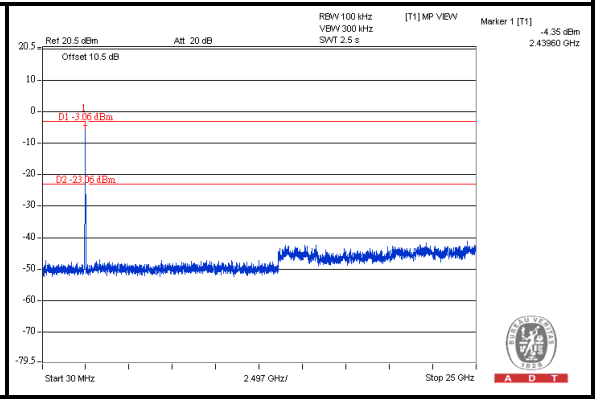
CH 6





CH 9





5. TEST TYPES AND RESULTS (FOR 5GHz, 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) SCHWARZBECK	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 ADT	BV ADT_Cond_V7.3.7 .3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: June 08, 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.

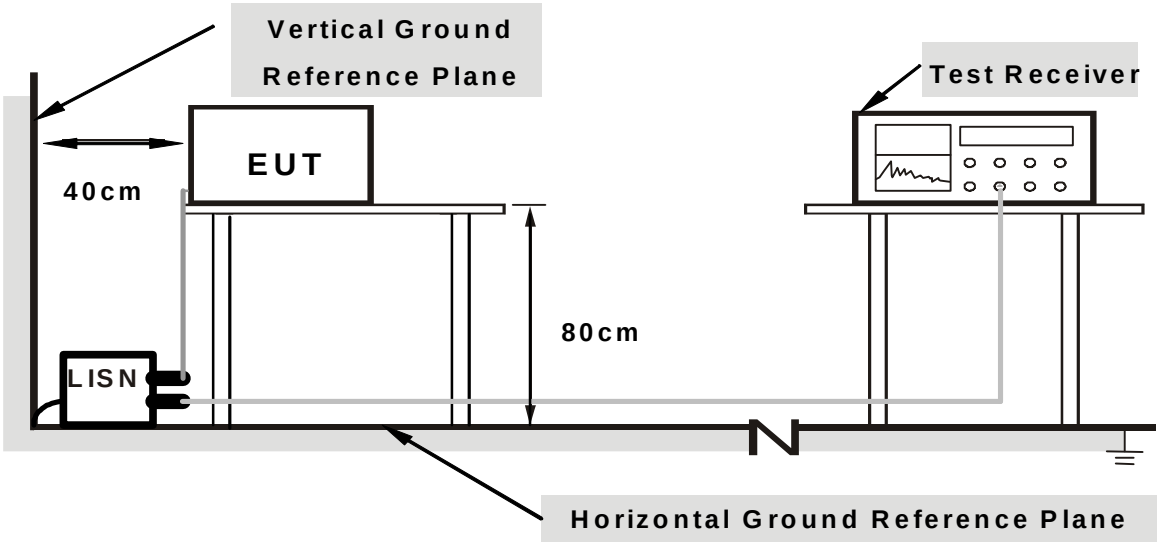
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

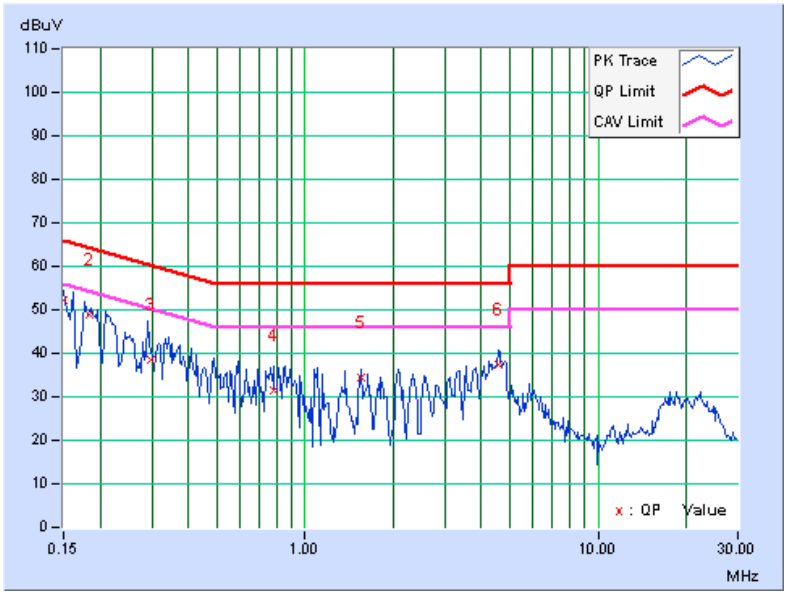
5.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.07	52.30	43.32	52.37	43.39	66.00	56.00	-13.63	-12.61
2	0.18422	0.07	48.64	38.24	48.71	38.31	64.29	54.29	-15.58	-15.98
3	0.29663	0.07	38.62	34.13	38.69	34.20	60.34	50.34	-21.64	-16.13
4	0.77769	0.10	31.43	27.00	31.53	27.10	56.00	46.00	-24.47	-18.90
5	1.55859	0.16	34.24	27.01	34.40	27.17	56.00	46.00	-21.60	-18.83
6	4.55469	0.34	37.11	29.63	37.45	29.97	56.00	46.00	-18.55	-16.03

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.

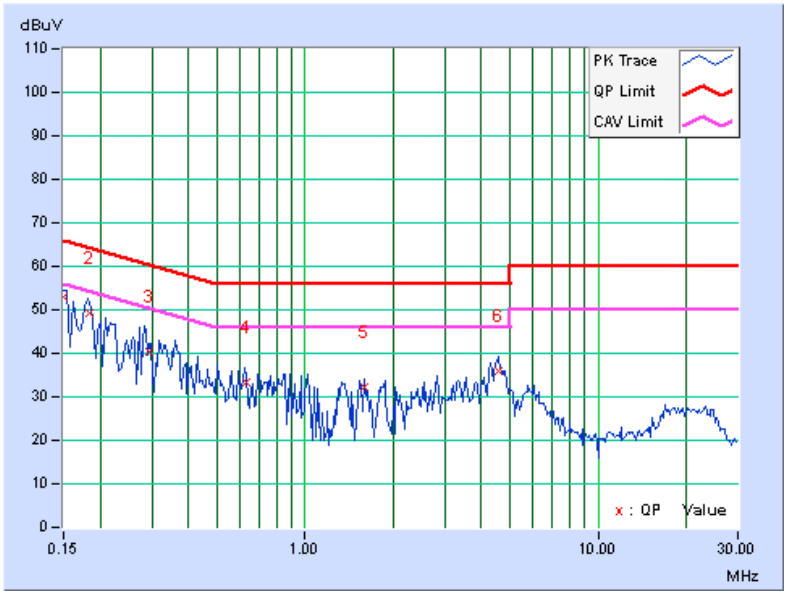


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**0.06**	**53.08**	**44.39**	**53.14**	**44.45**	**66.00**	**56.00**	**-12.86**	**-11.55**
2	0.18488	0.06	49.03	38.77	49.09	38.83	64.26	54.26	-15.17	-15.43
3	0.29569	0.07	40.34	33.07	40.41	33.14	60.36	50.36	-19.95	-17.22
4	0.62875	0.08	33.09	29.36	33.17	29.44	56.00	46.00	-22.83	-16.56
5	1.58984	0.14	32.11	27.40	32.25	27.54	56.00	46.00	-23.75	-18.46
6	4.54688	0.25	35.61	29.59	35.86	29.84	56.00	46.00	-20.14	-16.16

REMARKS:

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012
Spectrum Analyzer Agilent PSA	E4446A	MY48250113	Nov. 30 , 2011	Nov. 29 , 2012
Pre_Amplifier HP	8449B	300801923	Oct. 31, 2011	Oct. 30, 2012
Test Receiver ROHDE & SCHWARZ	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
TRILOG Broadband Antenna SCHWARZBECK	VULB 9168	138	Apr. 02, 2012	Apr. 01, 2013
Horn_Antenna SCHWARZBECK	BBHA9120	D124	Dec. 16, 2011	Dec. 15, 2012
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170153	Jan. 17, 2012	Jan. 16, 2013
*Loop Antenna R&S	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
RF Switches	EMH-011	1001	Sep. 24, 2011	Sep. 23, 2012
RF Cable (Chaintek)	Sucoflex 106	RF106-102	Jan. 19, 2012	Jan. 18, 2013
RF Cable	8DFB	STCCAB-30M -1GHz	Sep. 24, 2011	Sep. 23, 2012
Software	ADT_Radiated _V7.6.15.9.2	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3 The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in Open Site No. C.
5 The FCC Site Registration No. is 656396.
6 The VCCI Site Registration No. is R-1626.
7 The CANADA Site Registration No. is IC 7450G-3.
8 Tested Date: May 25 to June 08, 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 10 meters open field site. 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.

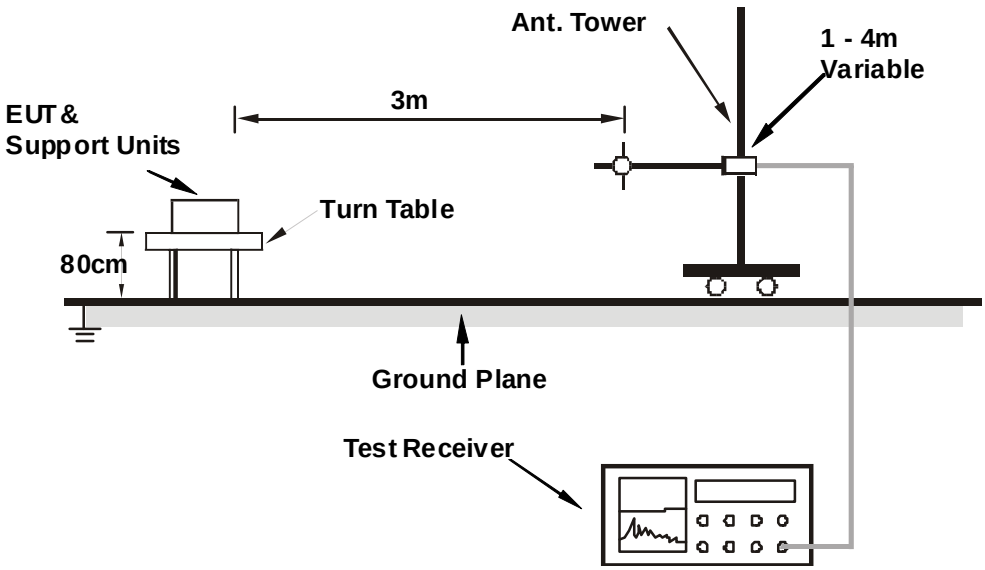
NOTE:

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

802.11n (20MHz)

CHANNEL	TX Channel 157	**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	126.31	25.6 QP	43.5	-17.9	1.75 H	298	12.36	13.26
2	217.21	27.6 QP	46.0	-18.5	1.25 H	205	14.81	12.74
3	250.37	41.4 QP	46.0	-4.6	1.10 H	125	26.99	14.39
4	375.94	35.1 QP	46.0	-10.9	1.00 H	0	16.61	18.52
5	482.16	41.8 QP	46.0	-4.2	1.50 H	0	20.18	21.59
6	999.17	26.3 QP	54.0	-27.7	1.00 H	222	-4.11	30.44
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	221.03	28.3 QP	46.0	-17.7	1.25 V	246	15.33	12.93
2	250.62	34.9 QP	46.0	-11.1	1.10 V	173	20.53	14.40
3	375.52	31.6 QP	46.0	-14.4	1.25 V	360	13.12	18.51
4	477.33	41.9 QP	46.0	-4.1	1.00 V	360	20.43	21.45
5	502.64	36.9 QP	46.0	-9.1	1.25 V	275	14.67	22.20
6	999.42	48.5 QP	54.0	-5.5	1.50 V	225	18.09	30.44

REMARKS:

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

ABOVE 1GHz DATA

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5399.95	56.5 PK	74.0	-17.5	1.15 H	122	19.51	36.99
2	5399.95	45.5 AV	54.0	-8.5	1.15 H	122	8.51	36.99
3	*5745.00	118.4 PK			1.06 H	190	80.54	37.86
4	*5745.00	109.5 AV			1.06 H	190	71.64	37.86
5	11490.00	56.3 PK	74.0	-17.7	1.31 H	129	8.69	47.61
6	11490.00	44.4 AV	54.0	-9.6	1.31 H	129	-3.21	47.61
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	116.6 PK			1.07 V	150	78.74	37.86
2	*5745.00	107.7 AV			1.07 V	150	69.84	37.86
3	11490.00	56.2 PK	74.0	-17.8	1.67 V	183	8.59	47.61
4	11490.00	44.7 AV	54.0	-9.3	1.67 V	183	-2.91	47.61

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
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	117.6 PK			1.06 H	187	79.62	37.98
2	*5785.00	108.9 AV			1.06 H	187	70.92	37.98
3	11570.00	56.9 PK	74.0	-17.1	1.27 H	133	9.33	47.57
4	11570.00	45.2 AV	54.0	-8.8	1.27 H	133	-2.37	47.57
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	115.3 PK			1.14 V	148	77.32	37.98
2	*5785.00	106.3 AV			1.14 V	148	68.32	37.98
3	11570.00	56.3 PK	74.0	-17.7	1.62 V	191	8.73	47.57
4	11570.00	45.0 AV	54.0	-9.0	1.62 V	191	-2.57	47.57

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
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	4999.85	54.1 PK	74.0	-19.9	1.20 H	191	17.91	36.19
2	4999.85	48.3 AV	54.0	-5.7	1.20 H	191	12.11	36.19
3	5399.94	58.1 PK	74.0	-15.9	1.15 H	119	21.11	36.99
4	5399.94	47.4 AV	54.0	-6.6	1.15 H	119	10.41	36.99
5	*5825.00	117.9 PK			1.02 H	196	79.83	38.07
6	*5825.00	109.0 AV			1.02 H	196	70.93	38.07
7	11650.00	56.7 PK	74.0	-17.3	1.30 H	118	9.16	47.54
8	11650.00	45.5 AV	54.0	-8.5	1.30 H	118	-2.04	47.54
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	4999.85	54.2 PK	74.0	-19.8	1.30 V	193	18.01	36.19
2	4999.85	48.7 AV	54.0	-5.3	1.30 V	193	12.51	36.19
3	5399.94	55.2 PK	74.0	-18.8	1.45 V	134	18.21	36.99
4	5399.94	44.9 AV	54.0	-9.1	1.45 V	134	7.91	36.99
5	*5825.00	115.8 PK			1.09 V	141	77.73	38.07
6	*5825.00	106.7 AV			1.09 V	141	68.63	38.07
7	11650.00	56.6 PK	74.0	-17.4	1.61 V	189	9.06	47.54
8	11650.00	45.2 AV	54.0	-8.8	1.61 V	189	-2.34	47.54

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	4999.85	54.4 PK	74.0	-19.6	1.25 H	183	18.21	36.19
2	4999.85	46.2 AV	54.0	-7.8	1.25 H	183	10.01	36.19
3	5399.94	61.5 PK	74.0	-12.5	1.22 H	121	24.51	36.99
4	5399.94	50.6 AV	54.0	-3.4	1.22 H	121	13.61	36.99
5	*5745.00	117.7 PK			1.07 H	183	79.84	37.86
6	*5745.00	109.4 AV			1.07 H	183	71.54	37.86
7	11490.00	56.4 PK	74.0	-17.6	1.38 H	124	8.79	47.61
8	11490.00	44.7 AV	54.0	-9.3	1.38 H	124	-2.91	47.61
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4919.90	53.9 PK	74.0	-20.1	1.00 V	136	17.88	36.02
2	4919.90	47.6 AV	54.0	-6.4	1.00 V	136	11.58	36.02
3	5399.94	60.3 PK	74.0	-13.7	1.32 V	159	23.31	36.99
4	5399.94	49.7 AV	54.0	-4.3	1.32 V	159	12.71	36.99
5	*5745.00	116.0 PK			1.07 V	147	78.14	37.86
6	*5745.00	107.5 AV			1.07 V	147	69.64	37.86
7	11490.00	56.1 PK	74.0	-17.9	1.67 V	180	8.49	47.61
8	11490.00	44.1 AV	54.0	-9.9	1.67 V	180	-3.51	47.61

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
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	116.1 PK			1.05 H	188	78.12	37.98
2	*5785.00	107.6 AV			1.05 H	188	69.62	37.98
3	11570.00	57.9 PK	74.0	-16.1	1.39 H	128	10.33	47.57
4	11570.00	45.7 AV	54.0	-8.3	1.39 H	128	-1.87	47.57
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	115.9 PK			1.06 V	145	77.92	37.98
2	*5785.00	106.9 AV			1.06 V	145	68.92	37.98
3	11570.00	55.9 PK	74.0	-18.1	1.62 V	198	8.33	47.57
4	11570.00	44.9 AV	54.0	-9.1	1.62 V	198	-2.67	47.57

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
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	5120.10	55.2 PK	74.0	-18.8	1.32 H	173	18.70	36.50
2	5120.10	50.6 AV	54.0	-3.4	1.32 H	173	14.10	36.50
3	5400.00	59.9 PK	74.0	-14.1	1.25 H	164	22.91	36.99
4	5400.00	50.6 AV	54.0	-3.4	1.25 H	164	13.61	36.99
5	*5825.00	116.1 PK			1.03 H	187	78.03	38.07
6	*5825.00	107.4 AV			1.03 H	187	69.33	38.07
7	11650.00	56.3 PK	74.0	-17.7	1.21 H	105	8.76	47.54
8	11650.00	45.5 AV	54.0	-8.5	1.21 H	105	-2.04	47.54
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	4920.01	56.3 PK	74.0	-17.7	1.00 V	135	20.28	36.02
2	4920.01	47.9 AV	54.0	-6.1	1.00 V	135	11.88	36.02
3	5399.94	58.7 PK	74.0	-15.3	1.30 V	159	21.71	36.99
4	**5399.94**	**51.0 AV**	**54.0**	**-3.0**	**1.30 V**	**159**	**14.01**	**36.99**
5	*5825.00	115.3 PK			1.05 V	132	77.23	38.07
6	*5825.00	106.4 AV			1.05 V	132	68.33	38.07
7	11650.00	56.5 PK	74.0	-17.5	1.72 V	199	8.96	47.54
8	11650.00	44.9 AV	54.0	-9.1	1.72 V	199	-2.64	47.54

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) 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	*5755.00	114.4 PK			1.07 H	183	76.51	37.89
2	*5755.00	106.1 AV			1.07 H	183	68.21	37.89
3	11510.00	55.5 PK	74.0	-18.5	1.34 H	92	7.89	47.61
4	11510.00	44.1 AV	54.0	-9.9	1.34 H	92	-3.51	47.61
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	113.1 PK			1.12 V	137	75.21	37.89
2	*5755.00	105.6 AV			1.12 V	137	67.71	37.89
3	11510.00	56.3 PK	74.0	-17.7	1.59 V	195	8.69	47.61
4	11510.00	44.9 AV	54.0	-9.1	1.59 V	195	-2.71	47.61

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
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	4999.85	58.8 PK	74.0	-15.2	1.22 H	177	22.61	36.19
2	4999.85	50.3 AV	54.0	-3.7	1.22 H	177	14.11	36.19
3	5399.94	62.7 PK	74.0	-11.3	1.21 H	120	25.71	36.99
4	**5399.94**	**51.0 AV**	**54.0**	**-3.0**	**1.21 H**	**120**	**14.01**	**36.99**
5	*5795.00	115.1 PK			1.05 H	181	77.09	38.01
6	*5795.00	106.3 AV			1.05 H	181	68.29	38.01
7	11590.00	56.2 PK	74.0	-17.8	1.23 H	111	8.64	47.56
8	11590.00	44.5 AV	54.0	-9.5	1.23 H	111	-3.06	47.56
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	1000.00	53.5 PK	74.0	-20.5	1.32 V	150	26.91	26.59
2	1000.00	46.8 AV	54.0	-7.2	1.32 V	150	20.21	26.59
3	5399.94	60.9 PK	74.0	-13.1	1.33 V	153	23.91	36.99
4	5399.94	50.2 AV	54.0	-3.8	1.33 V	153	13.21	36.99
5	*5795.00	112.8 PK			1.08 V	137	74.79	38.01
6	*5795.00	105.2 AV			1.08 V	137	67.19	38.01
7	11590.00	55.5 PK	74.0	-18.5	1.65 V	197	7.94	47.56
8	11590.00	44.7 AV	54.0	-9.3	1.65 V	197	-2.86	47.56

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. The limit value is defined as per 15.247.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 16, 2012

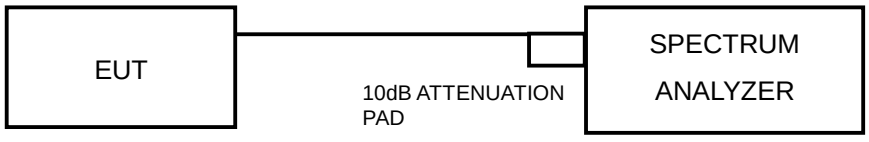
5.3.3 TEST PROCEDURE

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	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.63	16.52	0.5	PASS
157	5785	16.59	16.61	0.5	PASS
165	5825	16.53	16.60	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.78	17.77	0.5	PASS
157	5785	17.67	17.77	0.5	PASS
165	5825	17.75	17.79	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.41	36.99	0.5	PASS
159	5795	36.99	37.14	0.5	PASS

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

5.4.2 INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 16, 2012

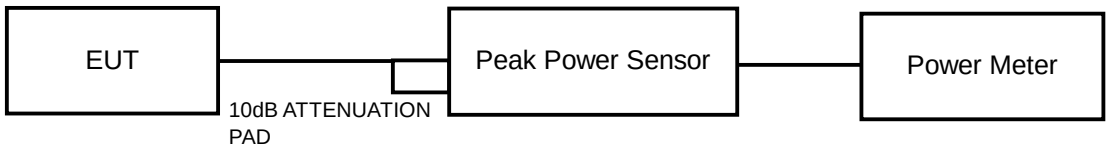
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.4.7 TEST RESULTS

802.11a

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	24.10	23.10	461.214	26.64	29.06	PASS
157	5785	24.60	22.80	478.949	26.80	29.06	PASS
165	5825	24.90	22.80	499.576	26.99	29.06	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 6.94

The effective legacy gain is 6.94dBi, 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				
149	5745	23.90	24.20	508.498	27.06	30	PASS
157	5785	24.30	24.30	538.306	27.31	30	PASS
165	5825	24.70	22.70	481.330	26.82	30	PASS

802.11n (40MHz)

CHAN.	FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	23.80	24.10	496.923	26.96	30	PASS
159	5795	24.10	22.80	447.586	26.51	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 16, 2012

5.5.3 TEST PROCEDURE

1. Set the RBW = 100 kHz, VBW =300 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(3 kHz/100kHz)

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP

5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	7.28	-7.95	3.01	-4.94	7.06	PASS
	157	5785	8.43	-6.80	3.01	-3.79	7.06	PASS
	165	5825	9.47	-5.76	3.01	-2.75	7.06	PASS
1	149	5745	8.95	-6.28	3.01	-3.27	7.06	PASS
	157	5785	7.42	-7.81	3.01	-4.80	7.06	PASS
	165	5825	5.72	-9.51	3.01	-6.50	7.06	PASS

Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2]

Effective Legacy Gain (dBi) = 6.94

The effective legacy gain is 6.94dBi, therefore the limit needs to 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	149	5745	7.13	-8.10	3.01	-5.09	8	PASS
	157	5785	7.77	-7.46	3.01	-4.45	8	PASS
	165	5825	7.42	-7.81	3.01	-4.80	8	PASS
1	149	5745	8.64	-6.59	3.01	-3.58	8	PASS
	157	5785	7.13	-8.10	3.01	-5.09	8	PASS
	165	5825	5.62	-9.61	3.01	-6.60	8	PASS

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	3.91	-11.32	3.01	-8.31	8	PASS
	159	5795	4.15	-11.08	3.01	-8.07	8	PASS
1	151	5755	6.35	-8.88	3.01	-5.87	8	PASS
	159	5795	4.08	-11.15	3.01	-8.14	8	PASS

5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. Tested date : June 16, 2012

5.6.3 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.

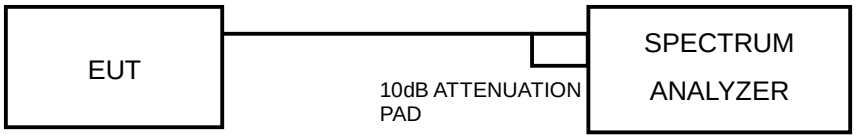
MEASUREMENT PROCEDURE OOBE

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.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

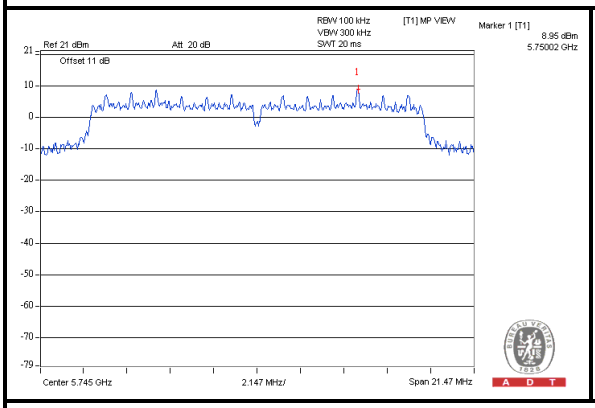
5.6.7 TEST RESULTS

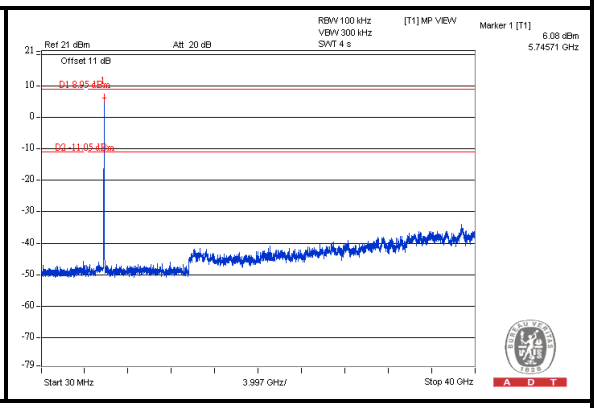
The conducted emission test is performed on each TX port of operating mode without summing or adding 10log (N) since the limit is relative emission limit. Only worst data of each operating mode is presented.

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.

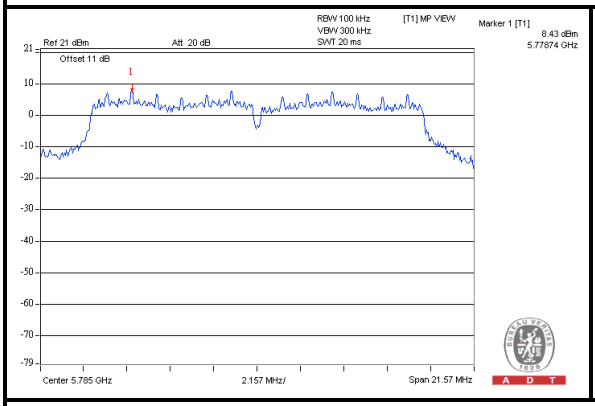
802.11a

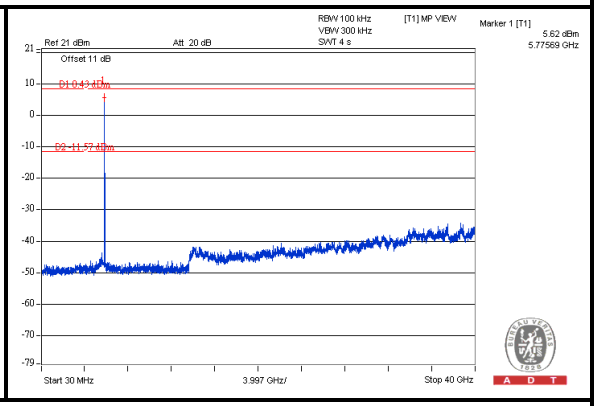
CH 149



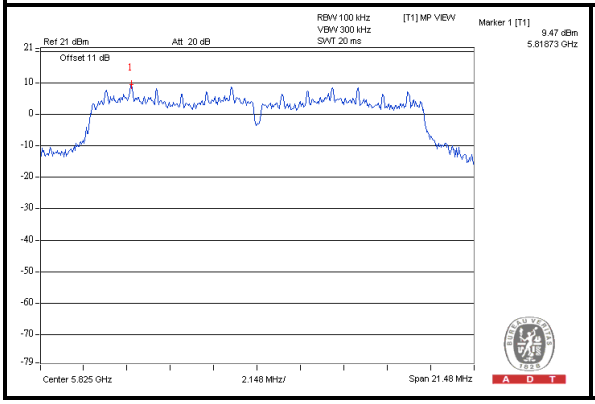


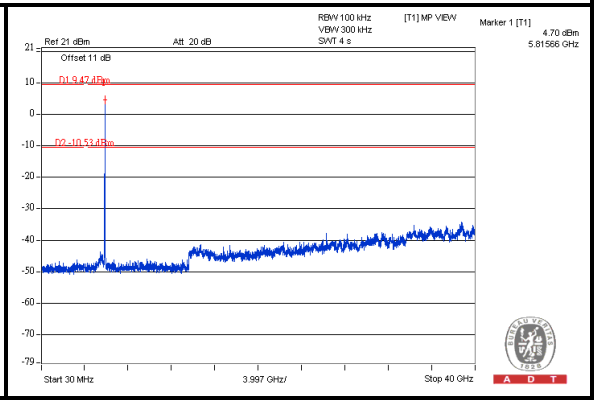
CH 157





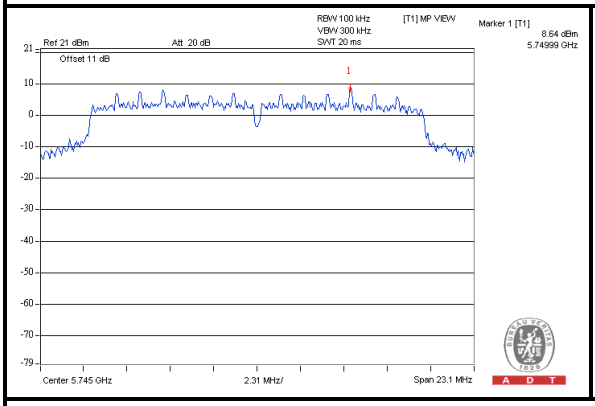
CH 165

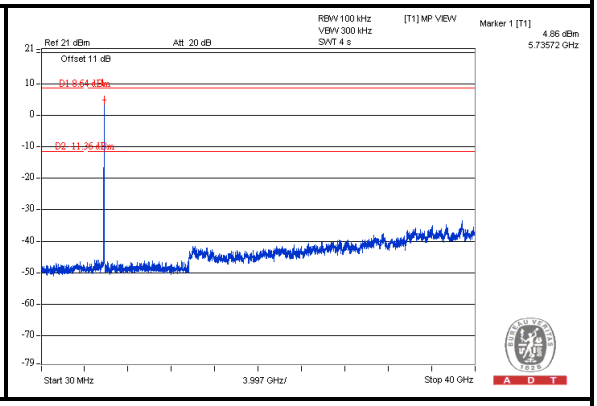




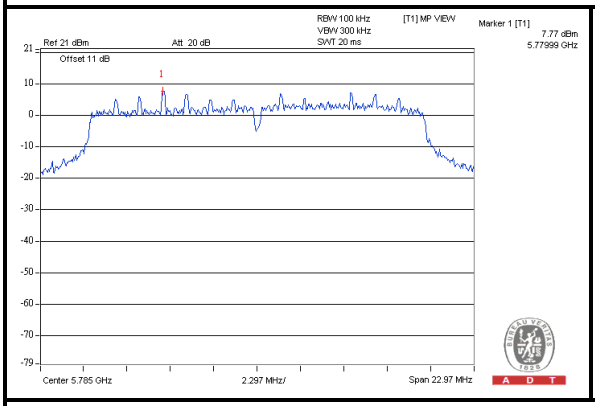
802.11n (20MHz)

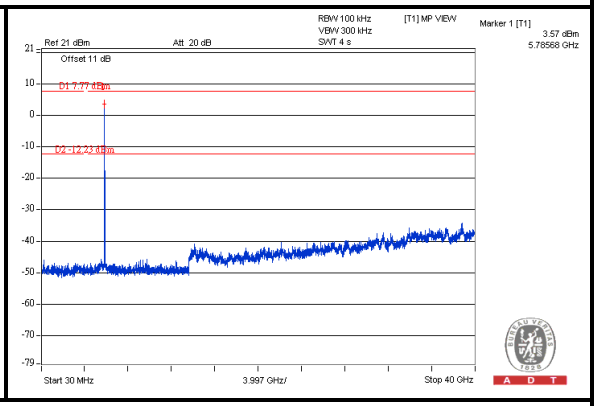
CH 149



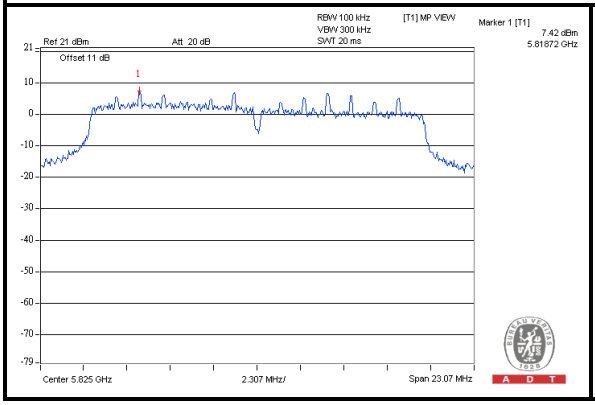


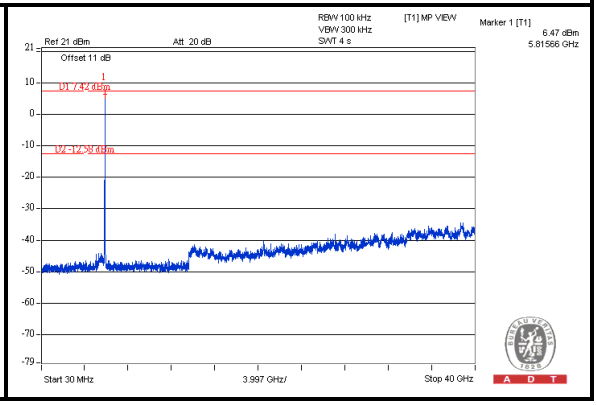
CH 157





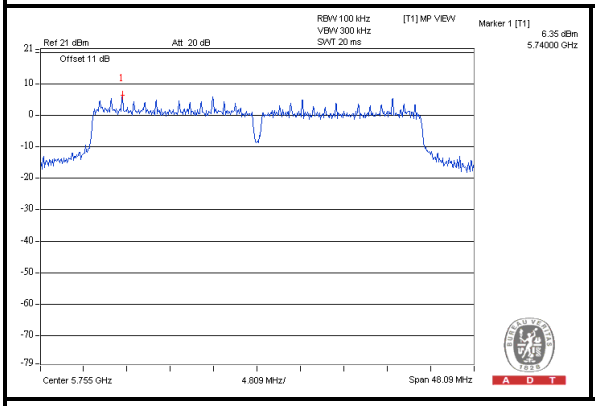
CH 165

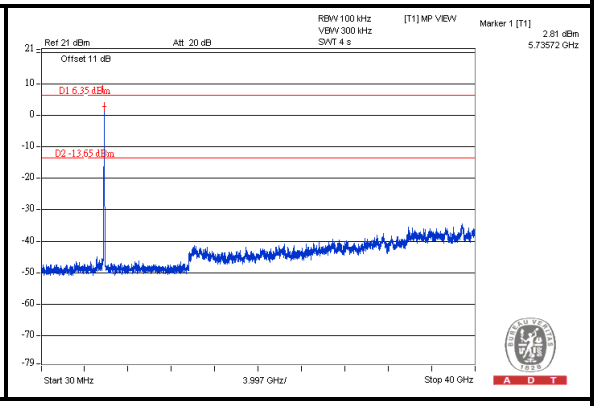




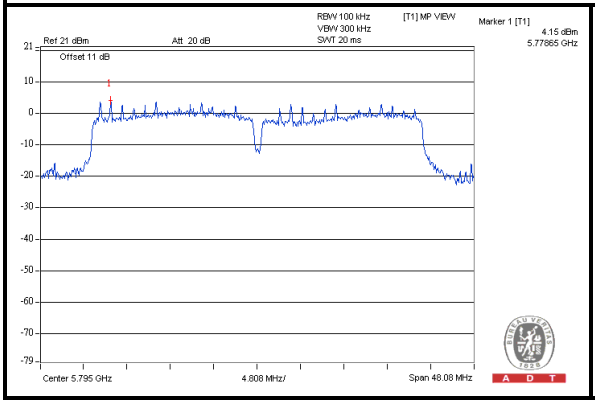
802.11n (40MHz)

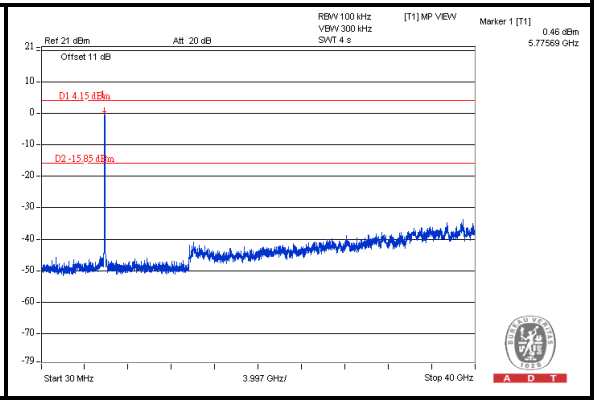
CH 151





CH 159





6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

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

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

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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 ---