

FCC TEST REPORT (15.247)

REPORT NO.: RF120725E01

MODEL NO.: WNDAP660

FCC ID: PY312200203

RECEIVED: July 19, 2012

TESTED: July 19 to Aug. 04, 2012

ISSUED: Aug. 15, 2012

APPLICANT: Netgear Incorporated.

ADDRESS: 350 East Plumeria Drive San Jose
California United States 95134

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

LAB ADDRESS : No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan,
R.O.C.

TEST LOCATION (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan,
R.O.C.

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

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



A D T

Table of Contents

RELEASE CONTROL RECORD	5
1. CERTIFICATION	6
2. SUMMARY OF TEST RESULTS	7
2.1 MEASUREMENT UNCERTAINTY	9
3. GENERAL INFORMATION	10
3.1 GENERAL DESCRIPTION OF EUT	10
3.2 DESCRIPTION OF TEST MODES	13
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	14
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	17
3.4 DESCRIPTION OF SUPPORT UNITS	18
3.5 CONFIGURATION OF SYSTEM UNDER TEST	19
4. TEST TYPES AND RESULTS (for 2.4GHz, 2.400 ~ 2.4835GHz Band)	21
4.1 CONDUCTED EMISSION MEASUREMENT	21
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	21
4.1.2 TEST INSTRUMENTS	21
4.1.3 TEST PROCEDURES	22
4.1.4 DEVIATION FROM TEST STANDARD	22
4.1.5 TEST SETUP	23
4.1.6 EUT OPERATING CONDITIONS	23
4.1.7 TEST RESULTS (MODE 1)	24
4.1.8 TEST RESULTS (MODE 2)	26
4.1.9 TEST RESULTS (MODE 3)	28
4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT	30
4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	30
4.2.2 TEST INSTRUMENTS	31
4.2.3 TEST PROCEDURES	32
4.2.4 DEVIATION FROM TEST STANDARD	32
4.2.5 TEST SETUP	33
4.2.6 EUT OPERATING CONDITIONS	33
4.2.7 TEST RESULTS	34
4.3 6dB BANDWIDTH MEASUREMENT	47
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	47
4.3.2 TEST INSTRUMENTS	47
4.3.3 TEST PROCEDURE	47
4.3.4 DEVIATION FROM TEST STANDARD	47
4.3.5 TEST SETUP	47
4.3.6 EUT OPERATING CONDITIONS	47
4.3.7 TEST RESULTS	48
4.4 CONDUCTED OUTPUT POWER MEASUREMENT	49
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	49
4.4.2 INSTRUMENTS	49
4.4.3 TEST PROCEDURES	49
4.4.4 DEVIATION FROM TEST STANDARD	49
4.4.5 TEST SETUP	50
4.4.6 EUT OPERATING CONDITIONS	50
4.4.7 TEST RESULTS	51
4.5 POWER SPECTRAL DENSITY MEASUREMENT	52
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	52
4.5.2 TEST INSTRUMENTS	52
4.5.3 TEST PROCEDURE	52



4.5.4	DEVIATION FROM TEST STANDARD	52
4.5.5	TEST SETUP	52
4.5.6	EUT OPERATING CONDITION	52
4.5.7	TEST RESULTS	53
4.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT	55
4.6.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT	55
4.6.2	TEST INSTRUMENTS	55
4.6.3	TEST PROCEDURE	55
4.6.4	DEVIATION FROM TEST STANDARD	56
4.6.5	TEST SETUP	56
4.6.6	EUT OPERATING CONDITION	56
4.6.7	TEST RESULTS	56
5.	TEST TYPES AND RESULTS (FOR 5gHz, 5.725~5.850GHz Band)	61
5.1	CONDUCTED EMISSION MEASUREMENT	61
5.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	61
5.1.2	TEST INSTRUMENTS	61
5.1.3	TEST PROCEDURES	62
5.1.4	DEVIATION FROM TEST STANDARD	62
5.1.5	TEST SETUP	63
5.1.6	EUT OPERATING CONDITIONS	63
5.1.7	TEST RESULTS (MODE 1)	64
5.1.8	TEST RESULTS (MODE 2)	66
5.1.9	TEST RESULTS (MODE 3)	68
5.2	RADIATED AND BANDEDGE EMISSION MEASUREMENT	70
5.2.1	LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT	70
5.2.2	TEST INSTRUMENTS	71
5.2.3	TEST PROCEDURES	72
5.2.4	DEVIATION FROM TEST STANDARD	72
5.2.5	TEST SETUP	73
5.2.6	EUT OPERATING CONDITIONS	73
5.2.7	TEST RESULTS	74
5.3	6dB BANDWIDTH MEASUREMENT	83
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	83
5.3.2	TEST INSTRUMENTS	83
5.3.3	TEST PROCEDURE	83
5.3.4	DEVIATION FROM TEST STANDARD	83
5.3.5	TEST SETUP	83
5.3.6	EUT OPERATING CONDITIONS	83
5.3.7	TEST RESULTS	84
5.4	CONDUCTED OUTPUT POWER MEASUREMENT	85
5.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT	85
5.4.2	INSTRUMENTS	85
5.4.3	TEST PROCEDURES	85
5.4.4	DEVIATION FROM TEST STANDARD	85
5.4.5	TEST SETUP	86
5.4.6	EUT OPERATING CONDITIONS	86
5.4.7	TEST RESULTS	87
5.5	POWER SPECTRAL DENSITY MEASUREMENT	88
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	88
5.5.2	TEST INSTRUMENTS	88
5.5.3	TEST PROCEDURE	88
5.5.4	DEVIATION FROM TEST STANDARD	88



A D T

5.5.5	TEST SETUP	88
5.5.6	EUT OPERATING CONDITION.....	89
5.5.7	TEST RESULTS	90
5.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT.....	92
5.6.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT.....	92
5.6.2	TEST INSTRUMENTS.....	92
5.6.3	TEST PROCEDURE.....	92
5.6.4	DEVIATION FROM TEST STANDARD.....	93
5.6.5	TEST SETUP	93
5.6.6	EUT OPERATING CONDITION.....	93
5.6.7	TEST RESULTS	93
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	97
7.	INFORMATION ON THE TESTING LABORATORIES	98
8.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	99



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120725E01	Original release	Aug. 15, 2012

1. CERTIFICATION

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

BRAND NAME: Netgear

MODEL NO.: WNDAP660

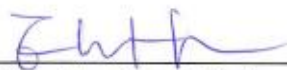
TEST SAMPLE: ENGINEERING SAMPLE

APPLICANT: Netgear Incorporated.

TESTED: July 19 to Aug. 04, 2012

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

The above equipment (Model: WNDAP660) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , **DATE:** Aug. 15, 2012
(Elsie Hsu, Specialist)

APPROVED BY :  , **DATE:** Aug. 15, 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 -4.13dB at 22.44922MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2483.50MHz & 4924.00 MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -4.04dB at 22.19447MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 5400.00MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

NOTE:

1. The EUT was operating in 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)	5.69 dB
Radiated emissions (1GHz -6GHz)	3.84 dB
Radiated emissions (6GHz -18GHz)	4.09 dB
Radiated emissions (18GHz -40GHz)	4.24 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	ProSafe 3x3 Dual Radio, Dual Band Wireless Access Point
MODEL NO.	WNDAP660
POWER SUPPLY	DC 12V from power adapter or DC 56V from POE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps
OPERATING FREQUENCY	For 15.407 802.11a: 5.18 ~ 5.24GHz
	For 15.247 802.11b/g/n: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) For 15.247 (5GHz) 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)

MAXIMUM OUTPUT POWER	For 15.407 802.11a: 14.377mW 802.11n (HT20): 32.486mW 802.11n (HT40): 45.134mW For 15.247 (2.4GHz) 802.11b: 250.352mW 802.11g: 575.666 mW 802.11n (HT20): 547.711mW 802.11n (HT40): 341.814mW For 15.247 (5GHz) 802.11a: 360.869mW 802.11n (HT20): 355.585mW 802.11n (HT40): 347.243mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	Console cable (unshielded, 1.5m) × 1
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1

NOTE:

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

Adapter			
No	Brand	Model No.	Spec.
1	NETGEAR	MT18-9120150-A1	Input: 120V, 0.5A, 60Hz Output: 12V, 1.5A DC output cable (Unshielded, 1.8m)
2	NETGEAR	SAL018F1 NA	Input: 100-120V, 0.6A, 47-63Hz Output: 12V, 1.5A DC output cable (Unshielded, 1.8m)
POE			
Brand		Model No.	Spec.
PHIHONG		POE30U-560(G)	Input: 100-240V, 0.95A, 50-60Hz Output: 56V, 0.55A
From the above two adapters and POE were pre-tested in chamber, the radiated emission worse case was found in Adapter 2 . Therefore only the test data of the adapter was recorded in this report.			

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

Internal Antenna (For 2.4GHz / 5GHz)					
Transmitter Circuit	Antenna Type	Peak Gain (dBi)			
		2.4GHz	5GHz Band 1	5GHz Band 4	
Chain (0)	Dipole	2.44	4.36	5.95	
Chain (1)	Dipole	2.44	5.31	5.02	
Chain (2)	Dipole	2.44	3.87	3.96	
External Antenna (For 2.4GHz)					
Model	Antenna Type	Gain (dBi) (Exclude cable loss)	Cable Loss (dB)	Net Gain (dBi) (Include cable loss)	Connector Type
ANT-32405	Dipole	5	3.68	1.32	SMA Plug Reverse
From the above antennas, internal antenna was selected for testing.					

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

MODULATION MODE	TX/RX FUNCTION
802.11b	3Tx (Diversity)/ 3Rx
802.11g	3Tx(Diversity)/ 3Rx
802.11a	3Tx(Diversity)/ 3Rx
802.11n (HT20)	3Tx/3Rx
802.11n (HT40)	3Tx/3Rx

- Radiated spurious emissions of the simultaneous operation(2.4GHz and 5GHz) has been evaluated and no non-compliance was found
- When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.
- The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

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

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

Seven channels are provided for 802.11n (HT40):

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

Operated in 5725 ~ 5850MHz band:

Five channels are provided for 802.11a, 802.11n (HT20):

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

Two channels are provided for 802.11n (HT40):

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz
RE ³ 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement
OB: Conducted Out-Band Emission Measurement

Note: For 2.4GHz, the EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane** (for below 1GHz) and **X-plane** (for above 1GHz).
For 5GHz, the EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**.

POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
802.11a	149 to 165	149	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
802.11a	149 to 165	149	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHZ):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT40)	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT40)	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 (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	25deg. C, 70%RH 27deg. C, 63%RH	120Vac, 60Hz	Mike Hsieh Scott Chen
RE<1G	21deg. C, 64%RH	120Vac, 60Hz	Evan Huang
RE ³ 1G	25deg. C, 65%RH	120Vac, 60Hz	Nelson Teng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang



A D T

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v01

ANSI C63.10-2009

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

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



A D T

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.

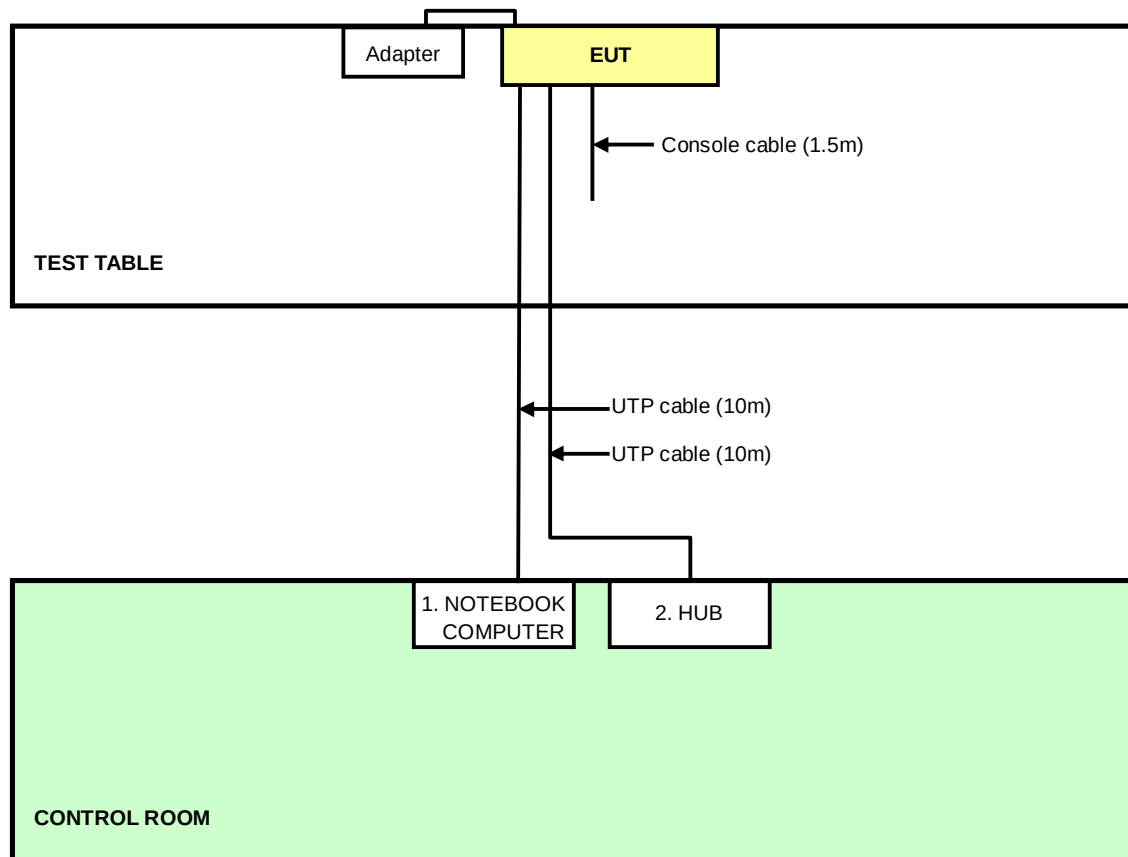
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable, 10m
2	UTP cable, 10m

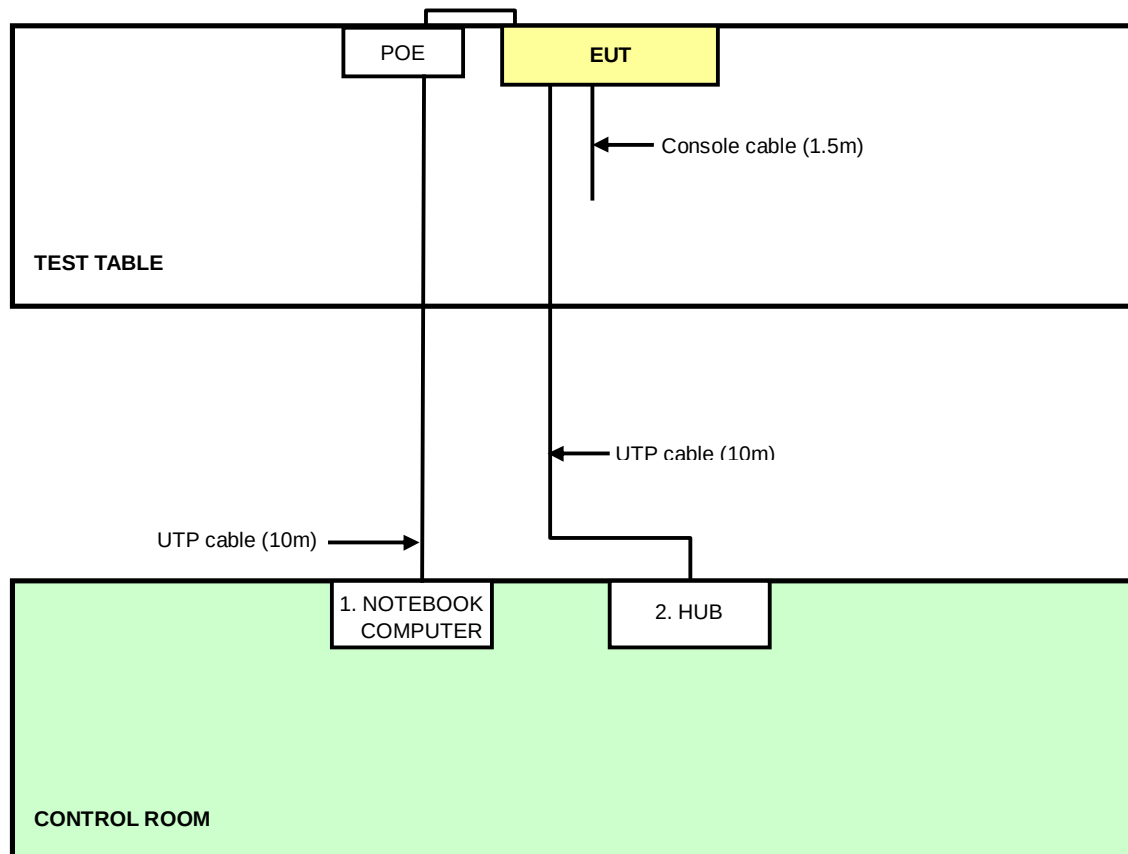
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Adapter Mode:



For POE Mode:



4. TEST TYPES AND RESULTS (FOR 2.4GHz, 2.400 ~ 2.4835GHz 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. 12, 2012	Mar.11, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08,2012	June 07,2013
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	EMC-3	Sep. 26, 2011	Sep. 25, 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: July 19 to Aug. 04, 2012

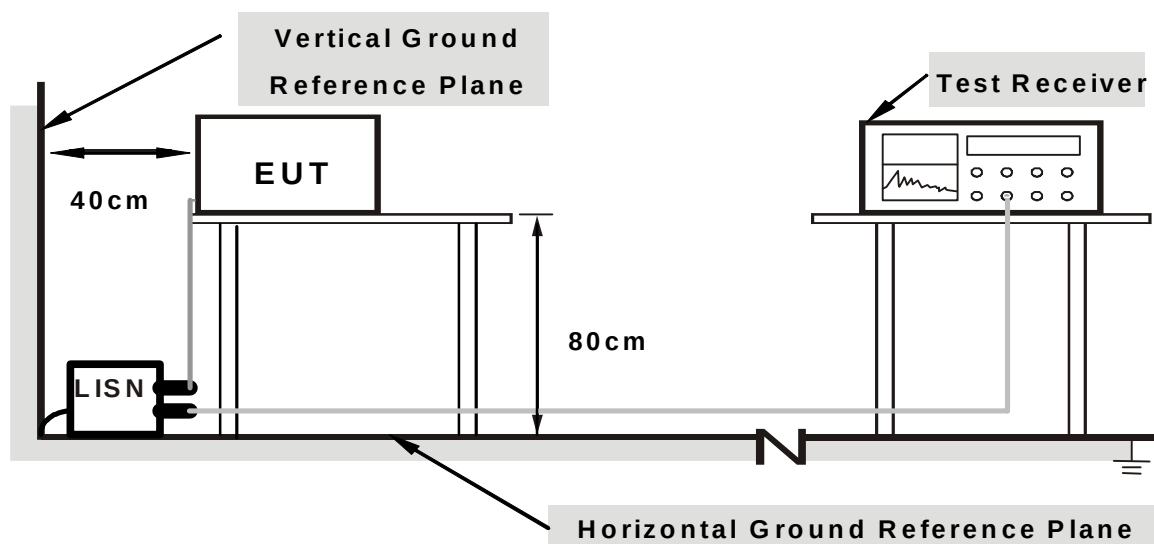
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

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

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared other computer system (support unit 1) to act as communication partner and placed them outside of testing area.
3. The communication partner ran test program “artgui.exe [art2 ver 2 25BIN]” to enable EUT under transmission/receiving condition continuously via one UTP cable transmission.

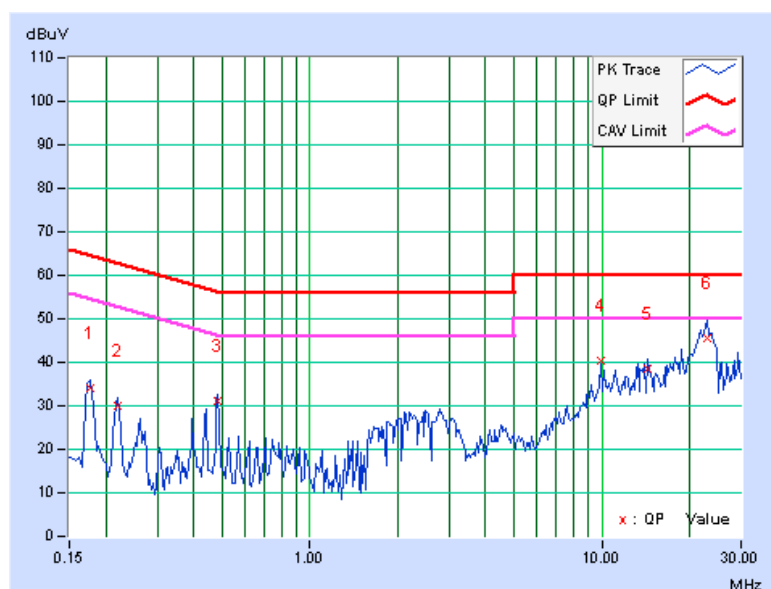
4.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.07	34.03	32.68	34.10	32.75	64.61	54.61	-30.51	-21.86
2	0.22031	0.07	30.10	29.01	30.17	29.08	62.81	52.81	-32.64	-23.73
3	0.48203	0.08	31.15	30.95	31.23	31.03	56.30	46.30	-25.07	-15.27
4	9.90234	0.53	39.99	36.17	40.52	36.70	60.00	50.00	-19.48	-13.30
5	14.30078	0.67	37.86	36.83	38.53	37.50	60.00	50.00	-21.47	-12.50
6	22.93103	0.86	44.62	43.28	45.48	44.14	60.00	50.00	-14.52	-5.86

REMARKS:

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

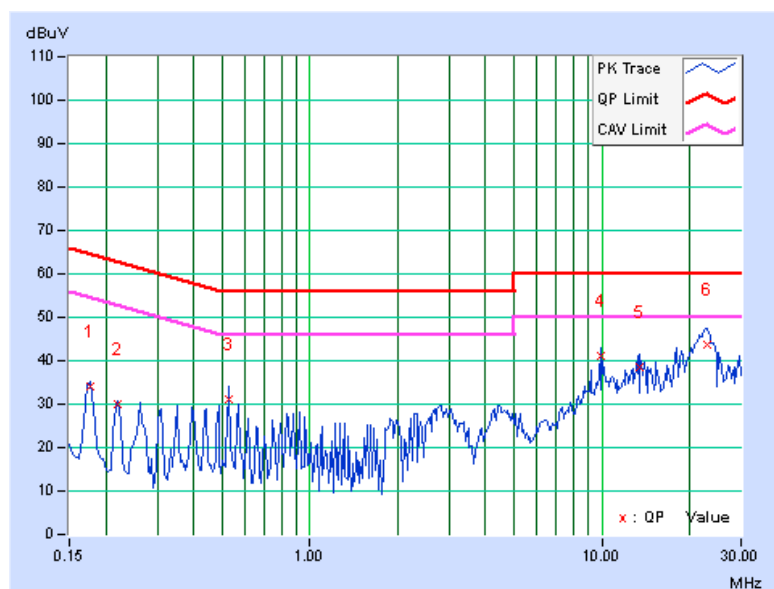


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.06	33.96	33.04	34.02	33.10	64.61	54.61	-30.59	-21.51
2	0.22031	0.06	29.91	29.07	29.97	29.13	62.81	52.81	-32.84	-23.68
3	0.52891	0.08	31.02	30.11	31.10	30.19	56.00	46.00	-24.90	-15.81
4	9.90234	0.39	40.55	36.86	40.94	37.25	60.00	50.00	-19.06	-12.75
5	13.55859	0.51	37.90	36.36	38.41	36.87	60.00	50.00	-21.59	-13.13
6	22.93359	0.75	42.89	38.80	43.64	39.55	60.00	50.00	-16.36	-10.45

REMARKS:

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



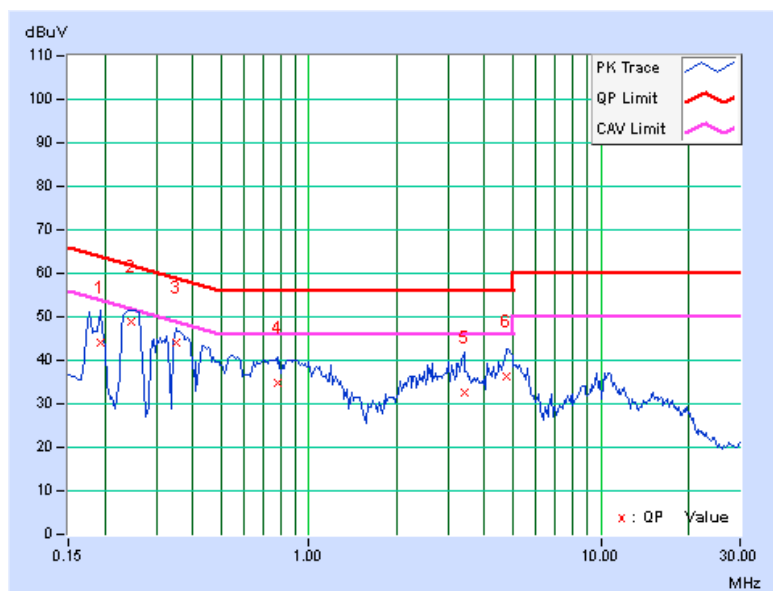
4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19297	0.08	44.07	33.03	44.15	33.11	63.91	53.91	-19.76	-20.80
2	0.24766	0.08	48.69	40.21	48.77	40.29	61.84	51.84	-13.06	-11.54
3	0.35313	0.10	44.11	32.18	44.21	32.28	58.89	48.89	-14.68	-16.61
4	0.78672	0.13	34.78	21.34	34.91	21.47	56.00	46.00	-21.09	-24.53
5	3.40625	0.35	32.35	23.68	32.70	24.03	56.00	46.00	-23.30	-21.97
6	4.75000	0.43	36.01	27.46	36.44	27.89	56.00	46.00	-19.56	-18.11

REMARKS:

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

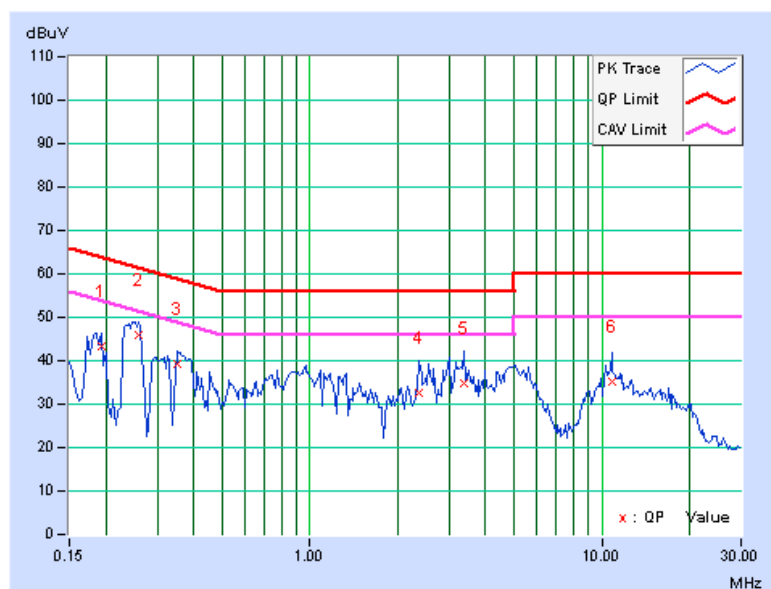


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19297	0.08	43.40	30.68	43.48	30.76	63.91	53.91	-20.43	-23.15
2	0.25938	0.09	45.90	33.53	45.99	33.62	61.45	51.45	-15.47	-17.84
3	0.35313	0.10	39.17	27.22	39.27	27.32	58.89	48.89	-19.62	-21.57
4	2.37500	0.24	32.45	22.82	32.69	23.06	56.00	46.00	-23.31	-22.94
5	3.39063	0.31	34.42	24.74	34.73	25.05	56.00	46.00	-21.27	-20.95
6	10.80859	0.67	34.62	28.38	35.29	29.05	60.00	50.00	-24.71	-20.95

REMARKS:

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



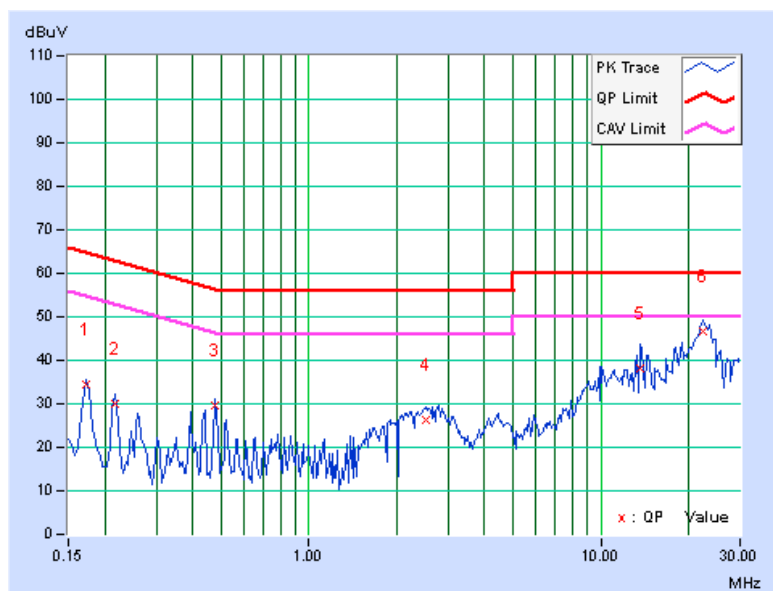
4.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.07	34.21	32.51	34.28	32.58	64.79	54.79	-30.51	-22.21
2	0.21641	0.07	29.78	28.49	29.85	28.56	62.96	52.96	-33.10	-24.39
3	0.47813	0.08	29.59	29.46	29.67	29.54	56.37	46.37	-26.70	-16.83
4	2.51172	0.23	26.20	22.89	26.43	23.12	56.00	46.00	-29.57	-22.88
5	13.57031	0.65	37.51	36.22	38.16	36.87	60.00	50.00	-21.84	-13.13
6	22.44922	0.85	45.74	45.02	46.59	45.87	60.00	50.00	-13.41	-4.13

REMARKS:

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

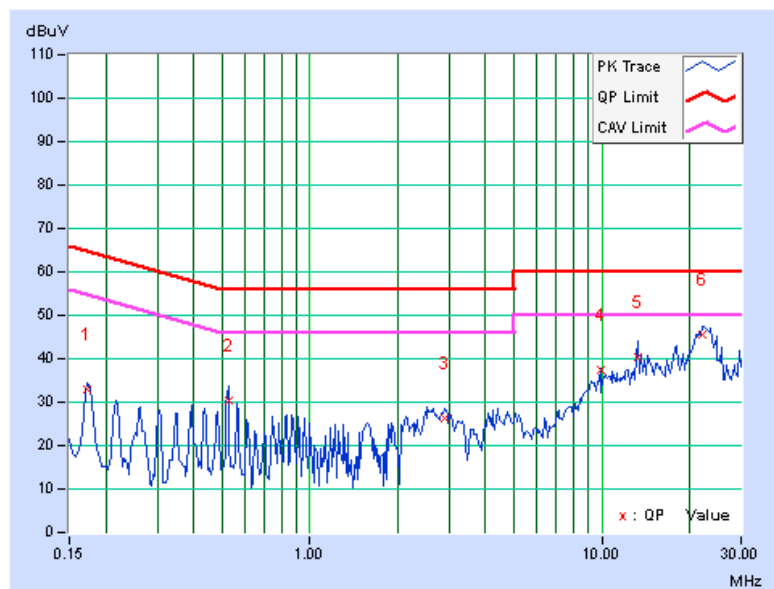


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.06	33.00	32.53	33.06	32.59	64.79	54.79	-31.73	-22.20
2	0.52500	0.08	30.27	29.27	30.35	29.35	56.00	46.00	-25.65	-16.65
3	2.91406	0.20	26.24	25.36	26.44	25.56	56.00	46.00	-29.56	-20.44
4	9.90234	0.39	36.96	32.97	37.35	33.36	60.00	50.00	-22.65	-16.64
5	13.32031	0.51	39.73	39.09	40.24	39.60	60.00	50.00	-19.76	-10.40
6	22.19922	0.74	44.95	44.75	45.69	45.49	60.00	50.00	-14.31	-4.51

REMARKS:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Pre-Selector Agilent	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Signal Generator Agilent	N5181A	MY49060347	July 25, 2012	July 24, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 15, 2011	Nov. 14, 2012
Pre-Amplifier Agilent	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 23, 2011	Nov. 22, 2012
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated _V8.7.05	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
- 5 The CANADA Site Registration No. is IC 7450H-3.
- 6 Tested Date: July 26 to 31, 2012

4.2.3 TEST PROCEDURES

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

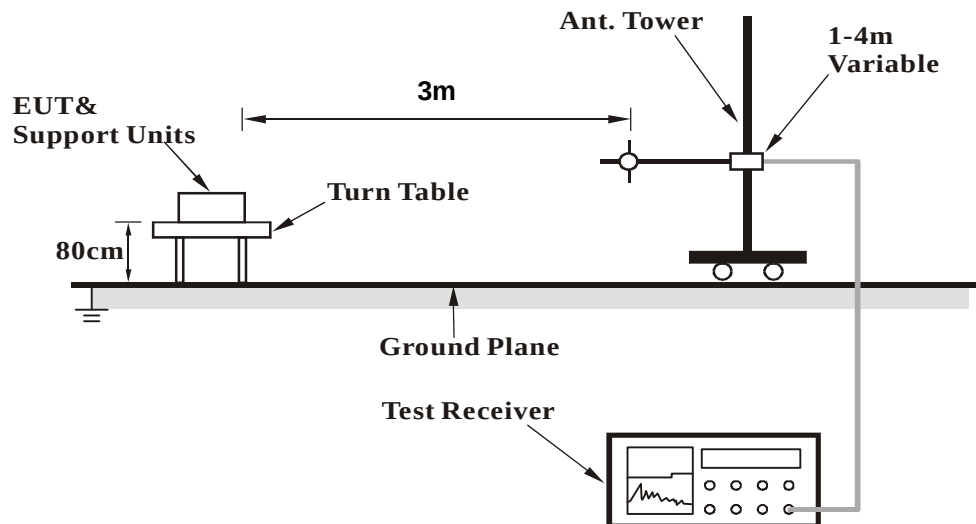
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	94.66	32.1 QP	43.5	-11.4	1.75 H	261	23.06	9.05
2	176.02	36.5 QP	43.5	-7.0	1.75 H	59	23.21	13.31
3	374.97	37.1 QP	46.0	-8.9	1.00 H	54	19.99	17.08
4	500.02	39.6 QP	46.0	-6.4	1.50 H	174	19.57	20.04
5	666.64	40.7 QP	46.0	-5.3	1.00 H	148	17.59	23.13
6	750.01	41.9 QP	46.0	-4.2	1.50 H	2	17.29	24.56
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	374.97	38.6 QP	46.0	-7.4	1.25 V	167	21.50	17.08
2	416.65	34.4 QP	46.0	-11.6	1.00 V	271	16.29	18.08
3	426.95	33.4 QP	46.0	-12.6	1.00 V	280	15.12	18.32
4	583.39	36.3 QP	46.0	-9.7	1.75 V	46	14.46	21.86
5	624.96	41.8 QP	46.0	-4.2	1.50 V	183	19.29	22.54
6	750.01	40.9 QP	46.0	-5.1	1.00 V	109	16.33	24.56

REMARKS:

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

ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.1 PK	74.0	-15.9	1.00 H	194	25.72	32.38
2	2390.00	45.9 AV	54.0	-8.1	1.00 H	194	13.52	32.38
3	*2412.00	103.9 PK			1.00 H	194	71.46	32.44
4	*2412.00	102.1 AV			1.00 H	194	69.66	32.44
5	4824.00	52.7 PK	74.0	-21.3	1.01 H	115	10.76	41.94
6	4824.00	46.1 AV	54.0	-7.9	1.01 H	115	4.16	41.94
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.5 PK	74.0	-14.5	1.08 V	23	27.12	32.38
2	2390.00	49.1 AV	54.0	-4.9	1.08 V	23	16.72	32.38
3	*2412.00	112.9 PK			1.08 V	23	80.46	32.44
4	*2412.00	110.3 AV			1.08 V	23	77.86	32.44
5	4824.00	56.5 PK	74.0	-17.5	1.00 V	150	14.56	41.94
6	4824.00	53.4 AV	54.0	-0.6	1.00 V	150	11.46	41.94

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	103.6 PK			1.00 H	192	71.09	32.51
2	*2437.00	101.9 AV			1.00 H	192	69.39	32.51
3	4874.00	51.4 PK	74.0	-22.6	1.01 H	118	9.41	41.99
4	4874.00	42.7 AV	54.0	-11.3	1.01 H	118	0.71	41.99
5	7311.00	55.8 PK	74.0	-18.2	1.19 H	295	9.27	46.53
6	7311.00	46.7 AV	54.0	-7.3	1.19 H	295	0.17	46.53
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	112.9 PK			1.20 V	23	80.39	32.51
2	*2437.00	110.2 AV			1.20 V	23	77.69	32.51
3	4874.00	56.7 PK	74.0	-17.3	1.36 V	134	14.71	41.99
4	4874.00	52.5 AV	54.0	-1.5	1.36 V	134	10.51	41.99
5	7311.00	56.6 PK	74.0	-17.4	1.23 V	162	10.07	46.53
6	7311.00	49.4 AV	54.0	-4.6	1.23 V	162	2.87	46.53

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	104.1 PK			1.00 H	192	71.53	32.57
2	*2462.00	102.2 AV			1.00 H	192	69.63	32.57
3	2483.50	59.3 PK	74.0	-14.7	1.00 H	192	26.67	32.63
4	2483.50	49.8 AV	54.0	-4.2	1.00 H	192	17.17	32.63
5	4924.00	53.2 PK	74.0	-20.8	1.00 H	94	11.19	42.01
6	4924.00	46.8 AV	54.0	-7.2	1.00 H	94	4.79	42.01
7	7386.00	56.8 PK	74.0	-17.2	1.17 H	272	10.07	46.73
8	7386.00	47.3 AV	54.0	-6.7	1.17 H	272	0.57	46.73
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			1.07 V	27	80.33	32.57
2	*2462.00	110.4 AV			1.07 V	27	77.83	32.57
3	2483.50	63.3 PK	74.0	-10.7	1.12 V	18	30.67	32.63
4	2483.50	52.2 AV	54.0	-1.8	1.12 V	18	19.57	32.63
5	4924.00	56.2 PK	74.0	-17.8	1.00 V	142	14.19	42.01
6	4924.00	53.5 AV	54.0	-0.5	1.00 V	142	11.49	42.01
7	7386.00	57.9 PK	74.0	-16.1	1.20 V	191	11.17	46.73
8	7386.00	50.8 AV	54.0	-3.2	1.20 V	191	4.07	46.73

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	66.5 PK	74.0	-7.5	1.00 H	161	34.12	32.38
2	2390.00	47.4 AV	54.0	-6.6	1.00 H	161	15.02	32.38
3	*2412.00	103.3 PK			1.00 H	161	70.86	32.44
4	*2412.00	92.9 AV			1.00 H	161	60.46	32.44
5	4824.00	47.8 PK	74.0	-26.2	1.03 H	103	5.86	41.94
6	4824.00	35.2 AV	54.0	-18.8	1.03 H	103	-6.74	41.94
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.1 PK	74.0	-0.9	1.11 V	326	40.72	32.38
2	2390.00	52.8 AV	54.0	-1.2	1.11 V	326	20.42	32.38
3	*2412.00	111.8 PK			1.11 V	23	79.36	32.44
4	*2412.00	100.3 AV			1.11 V	23	67.86	32.44
5	4824.00	49.5 PK	74.0	-24.5	1.16 V	125	7.56	41.94
6	4824.00	36.9 AV	54.0	-17.1	1.16 V	125	-5.04	41.94

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	108.8 PK			1.00 H	157	76.29	32.51
2	*2437.00	98.2 AV			1.00 H	157	65.69	32.51
3	4874.00	55.6 PK	74.0	-18.4	1.01 H	120	13.61	41.99
4	4874.00	41.7 AV	54.0	-12.3	1.01 H	120	-0.29	41.99
5	7311.00	61.7 PK	74.0	-12.3	1.19 H	283	15.17	46.53
6	7311.00	46.7 AV	54.0	-7.3	1.19 H	283	0.17	46.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.4 PK	74.0	-7.6	1.00 V	0	34.02	32.38
2	2390.00	52.8 AV	54.0	-1.2	1.00 V	0	20.42	32.38
3	*2437.00	116.7 PK			1.22 V	23	84.19	32.51
4	*2437.00	105.6 AV			1.22 V	23	73.09	32.51
5	2483.60	69.7 PK	74.0	-4.3	1.16 V	200	37.07	32.63
6	2483.60	53.1 AV	54.0	-0.9	1.16 V	200	20.47	32.63
7	4874.00	62.4 PK	74.0	-11.6	1.14 V	130	20.41	41.99
8	4874.00	49.8 AV	54.0	-4.2	1.14 V	130	7.81	41.99
9	7311.00	58.3 PK	74.0	-15.7	1.19 V	185	11.77	46.53
10	7311.00	47.6 AV	54.0	-6.4	1.19 V	185	1.07	46.53

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	102.3 PK			1.00 H	194	69.73	32.57
2	*2462.00	91.8 AV			1.00 H	194	59.23	32.57
3	2483.50	63.1 PK	74.0	-10.9	1.00 H	194	30.47	32.63
4	2483.50	46.3 AV	54.0	-7.7	1.00 H	194	13.67	32.63
5	4924.00	48.1 PK	74.0	-25.9	1.01 H	88	6.09	42.01
6	4924.00	35.6 AV	54.0	-18.4	1.01 H	88	-6.41	42.01
7	7386.00	53.8 PK	74.0	-20.2	1.13 H	268	7.07	46.73
8	7386.00	41.2 AV	54.0	-12.8	1.13 H	268	-5.53	46.73
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.0 PK			1.07 V	27	78.43	32.57
2	*2462.00	99.9 AV			1.07 V	27	67.33	32.57
3	2483.50	73.5 PK	74.0	-0.5	1.04 V	303	40.87	32.63
4	2483.50	51.3 AV	54.0	-2.7	1.04 V	303	18.67	32.63
5	4924.00	49.5 PK	74.0	-24.5	1.11 V	137	7.49	42.01
6	4924.00	36.8 AV	54.0	-17.2	1.11 V	137	-5.21	42.01
7	7386.00	54.6 PK	74.0	-19.4	1.25 V	178	7.87	46.73
8	7386.00	41.6 AV	54.0	-12.4	1.25 V	178	-5.13	46.73

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 (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	66.3 PK	74.0	-7.7	1.00 H	194	33.92	32.38
2	2390.00	47.2 AV	54.0	-6.8	1.00 H	194	14.82	32.38
3	*2412.00	102.3 PK			1.00 H	194	69.86	32.44
4	*2412.00	91.9 AV			1.00 H	194	59.46	32.44
5	4824.00	48.4 PK	74.0	-25.6	1.02 H	95	6.46	41.94
6	4824.00	35.9 AV	54.0	-18.1	1.02 H	95	-6.04	41.94
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	72.6 PK	74.0	-1.4	1.11 V	326	40.22	32.38
2	2390.00	52.4 AV	54.0	-1.6	1.11 V	326	20.02	32.38
3	*2412.00	111.5 PK			1.08 V	20	79.06	32.44
4	*2412.00	99.6 AV			1.08 V	20	67.16	32.44
5	4824.00	49.4 PK	74.0	-24.6	1.11 V	133	7.46	41.94
6	4824.00	36.7 AV	54.0	-17.3	1.11 V	133	-5.24	41.94

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	108.9 PK			1.01 H	198	76.39	32.51
2	*2437.00	98.1 AV			1.01 H	198	65.59	32.51
3	4874.00	55.1 PK	74.0	-18.9	1.00 H	115	13.11	41.99
4	4874.00	41.4 AV	54.0	-12.6	1.00 H	115	-0.59	41.99
5	7311.00	61.7 PK	74.0	-12.3	1.19 H	280	15.17	46.53
6	7311.00	46.4 AV	54.0	-7.6	1.19 H	280	-0.13	46.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.0 PK	74.0	-6.0	1.21 V	312	35.62	32.38
2	2390.00	53.3 AV	54.0	-0.7	1.21 V	312	20.92	32.38
3	*2437.00	114.6 PK			1.23 V	16	82.09	32.51
4	*2437.00	103.6 AV			1.23 V	16	71.09	32.51
5	2483.50	63.7 PK	74.0	-10.3	1.17 V	37	31.07	32.63
6	2483.50	49.1 AV	54.0	-4.9	1.17 V	37	16.47	32.63
7	4874.00	62.4 PK	74.0	-11.6	1.15 V	145	20.41	41.99
8	4874.00	49.6 AV	54.0	-4.4	1.15 V	145	7.61	41.99
9	7311.00	57.8 PK	74.0	-16.2	1.15 V	180	11.27	46.53
10	7311.00	47.3 AV	54.0	-6.7	1.15 V	180	0.77	46.53

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	101.1 PK			1.00 H	195	68.53	32.57
2	*2462.00	90.4 AV			1.00 H	195	57.83	32.57
3	2483.50	62.8 PK	74.0	-11.2	1.00 H	195	30.17	32.63
4	2483.50	46.0 AV	54.0	-8.0	1.00 H	195	13.37	32.63
5	4924.00	47.5 PK	74.0	-26.5	1.01 H	80	5.49	42.01
6	4924.00	35.3 AV	54.0	-18.7	1.01 H	80	-6.71	42.01
7	7386.00	53.9 PK	74.0	-20.1	1.18 H	256	7.17	46.73
8	7386.00	41.0 AV	54.0	-13.0	1.18 H	256	-5.73	46.73
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.1 PK			1.17 V	34	77.53	32.57
2	*2462.00	98.4 AV			1.17 V	34	65.83	32.57
3	2483.50	73.5 PK	74.0	-0.5	1.19 V	38	40.87	32.63
4	2483.50	50.1 AV	54.0	-3.9	1.19 V	38	17.47	32.63
5	4924.00	49.0 PK	74.0	-25.0	1.14 V	129	6.99	42.01
6	4924.00	36.4 AV	54.0	-17.6	1.14 V	129	-5.61	42.01
7	7386.00	55.1 PK	74.0	-18.9	1.25 V	186	8.37	46.73
8	7386.00	42.0 AV	54.0	-12.0	1.25 V	186	-4.73	46.73

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 (HT40)

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	63.8 PK	74.0	-10.2	1.05 H	184	31.42	32.38
2	2390.00	46.8 AV	54.0	-7.2	1.05 H	184	14.42	32.38
3	*2422.00	99.1 PK			1.05 H	184	66.63	32.47
4	*2422.00	88.2 AV			1.05 H	184	55.73	32.47
5	4844.00	47.8 PK	74.0	-26.2	1.02 H	68	5.84	41.96
6	4844.00	35.4 AV	54.0	-18.6	1.02 H	68	-6.56	41.96
7	7266.00	53.9 PK	74.0	-20.1	1.14 H	267	7.50	46.40
8	7266.00	41.0 AV	54.0	-13.0	1.14 H	267	-5.40	46.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.9 PK	74.0	-2.1	1.10 V	0	39.52	32.38
2	2390.00	52.5 AV	54.0	-1.5	1.10 V	0	20.12	32.38
3	*2422.00	108.3 PK			1.10 V	12	75.83	32.47
4	*2422.00	95.2 AV			1.10 V	12	62.73	32.47
5	4844.00	49.3 PK	74.0	-24.7	1.15 V	131	7.34	41.96
6	4844.00	36.9 AV	54.0	-17.1	1.15 V	131	-5.06	41.96
7	7266.00	55.3 PK	74.0	-18.7	1.22 V	186	8.90	46.40
8	7266.00	42.3 AV	54.0	-11.7	1.22 V	186	-4.10	46.40

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.3 PK			1.45 H	144	67.79	32.51
2	*2437.00	89.5 AV			1.45 H	144	56.99	32.51
3	4874.00	47.2 PK	74.0	-26.8	1.06 H	73	5.21	41.99
4	4874.00	35.0 AV	54.0	-19.0	1.06 H	73	-6.99	41.99
5	7311.00	54.1 PK	74.0	-19.9	1.18 H	246	7.57	46.53
6	7311.00	41.4 AV	54.0	-12.6	1.18 H	246	-5.13	46.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	59.2 PK	74.0	-14.8	1.25 V	188	26.82	32.38
2	2390.00	50.1 AV	54.0	-3.9	1.25 V	188	17.72	32.38
3	*2437.00	107.9 PK			1.20 V	17	75.39	32.51
4	*2437.00	97.1 AV			1.20 V	17	64.59	32.51
5	2483.50	73.4 PK	74.0	-0.6	1.22 V	326	40.77	32.63
6	2483.50	52.7 AV	54.0	-1.3	1.22 V	326	20.07	32.63
7	4874.00	49.3 PK	74.0	-24.7	1.12 V	134	7.31	41.99
8	4874.00	36.6 AV	54.0	-17.4	1.12 V	134	-5.39	41.99
9	7311.00	54.5 PK	74.0	-19.5	1.27 V	201	7.97	46.53
10	7311.00	41.5 AV	54.0	-12.5	1.27 V	201	-5.03	46.53

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	99.3 PK			1.45 H	150	66.75	32.55
2	*2452.00	88.6 AV			1.45 H	150	56.05	32.55
3	2483.50	66.4 PK	74.0	-7.6	1.45 H	150	33.77	32.63
4	2483.50	46.4 AV	54.0	-7.6	1.45 H	150	13.77	32.63
5	4904.00	47.6 PK	74.0	-26.4	1.04 H	76	5.58	42.02
6	4904.00	35.4 AV	54.0	-18.6	1.04 H	76	-6.62	42.02
7	7356.00	53.5 PK	74.0	-20.5	1.23 H	252	6.85	46.65
8	7356.00	40.7 AV	54.0	-13.3	1.23 H	252	-5.95	46.65
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	104.7 PK			1.18 V	27	72.15	32.55
2	*2452.00	94.6 AV			1.18 V	27	62.05	32.55
3	2483.50	73.5 PK	74.0	-0.5	1.20 V	195	40.87	32.63
4	2483.50	52.6 AV	54.0	-1.4	1.20 V	195	19.97	32.63
5	4904.00	48.5 PK	74.0	-25.5	1.11 V	118	6.48	42.02
6	4904.00	36.2 AV	54.0	-17.8	1.11 V	118	-5.82	42.02
7	7356.00	55.1 PK	74.0	-18.9	1.21 V	172	8.45	46.65
8	7356.00	42.0 AV	54.0	-12.0	1.21 V	172	-4.65	46.65

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 : July 31, 2012

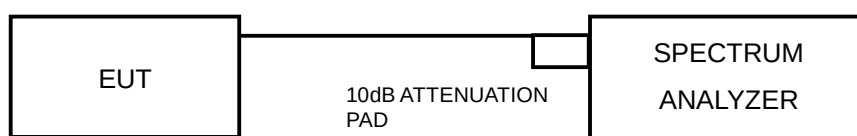
4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	10.77	10.71	10.82	0.5	PASS
6	2437	10.91	10.67	10.61	0.5	PASS
11	2462	10.57	11.01	10.97	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	16.55	16.58	16.60	0.5	PASS
6	2437	16.53	16.53	16.56	0.5	PASS
11	2462	16.57	16.59	16.55	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
1	2412	17.77	17.84	17.85	0.5	PASS
6	2437	17.83	17.78	17.80	0.5	PASS
11	2462	17.71	17.78	17.76	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
3	2422	37.15	36.99	36.97	0.5	PASS
6	2437	36.96	36.87	36.90	0.5	PASS
9	2452	37.20	36.97	37.09	0.5	PASS



A D T

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: July 31, 2012

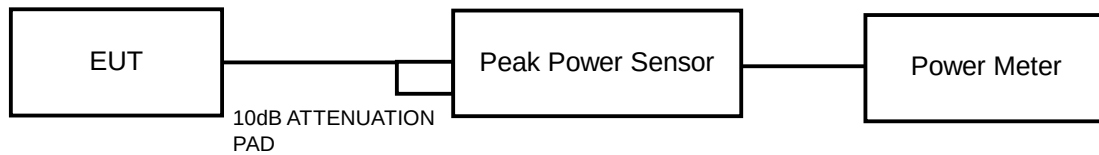
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	19.20	19.10	19.00	243.892	23.87	28.79	PASS
6	2437	19.40	19.30	18.90	249.835	23.98	28.79	PASS
11	2462	19.50	19.40	18.70	250.352	23.99	28.79	PASS

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

Effective Legacy Gain (dBi) = 7.21

The effective legacy gain is 7.21dBi, therefore the limit needs to reduce.

802.11g

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	21.10	20.70	20.50	358.517	25.55	28.79	PASS
6	2437	23.50	22.60	22.30	575.666	27.60	28.79	PASS
11	2462	20.90	20.70	20.20	345.230	25.38	28.79	PASS

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

Effective Legacy Gain (dBi) = 7.21

The effective legacy gain is 7.21dBi, therefore the limit needs to reduce.

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
1	2412	21.20	20.90	20.40	364.501	25.62	30	PASS
6	2437	22.90	22.80	22.10	547.711	27.39	30	PASS
11	2462	20.50	20.30	19.10	300.637	24.78	30	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
3	2422	20.70	20.10	19.50	308.944	24.90	30	PASS
6	2437	21.10	20.70	19.80	341.814	25.34	30	PASS
9	2452	19.10	20.10	19.10	264.895	24.23	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 : July 31, 2012

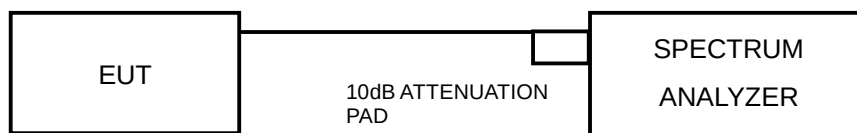
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	7.32	-7.91	4.77	-3.14	6.79	PASS
	6	2437	7.90	-7.33	4.77	-2.56	6.79	PASS
	11	2462	8.18	-7.05	4.77	-2.28	6.79	PASS
1	1	2412	6.91	-8.32	4.77	-3.55	6.79	PASS
	6	2437	7.08	-8.15	4.77	-3.38	6.79	PASS
	11	2462	7.03	-8.20	4.77	-3.43	6.79	PASS
2	1	2412	7.72	-7.51	4.77	-2.74	6.79	PASS
	6	2437	7.78	-7.45	4.77	-2.68	6.79	PASS
	11	2462	6.40	-8.83	4.77	-4.06	6.79	PASS

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

Effective Legacy Gain (dBi) = 7.21

The effective legacy gain is 7.21dBi, therefore the limit needs to reduce.

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-0.12	-15.35	4.77	-10.58	6.79	PASS
	6	2437	4.59	-10.64	4.77	-5.87	6.79	PASS
	11	2462	-0.01	-15.24	4.77	-10.47	6.79	PASS
1	1	2412	-1.18	-16.41	4.77	-11.64	6.79	PASS
	6	2437	4.73	-10.50	4.77	-5.73	6.79	PASS
	11	2462	-0.55	-15.78	4.77	-11.01	6.79	PASS
2	1	2412	-0.38	-15.61	4.77	-10.84	6.79	PASS
	6	2437	4.96	-10.27	4.77	-5.50	6.79	PASS
	11	2462	-0.69	-15.92	4.77	-11.15	6.79	PASS

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

Effective Legacy Gain (dBi) = 7.21

The effective legacy gain is 7.21dBi, therefore the limit needs to reduce.



A D T

802.11n (HT20)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-1.32	-16.55	4.77	-11.78	8	PASS
	6	2437	3.44	-11.79	4.77	-7.02	8	PASS
	11	2462	-2.37	-17.60	4.77	-12.83	8	PASS
1	1	2412	-2.24	-17.47	4.77	-12.70	8	PASS
	6	2437	3.05	-12.18	4.77	-7.41	8	PASS
	11	2462	-2.30	-17.53	4.77	-12.76	8	PASS
2	1	2412	-1.23	-16.46	4.77	-11.69	8	PASS
	6	2437	3.21	-12.02	4.77	-7.25	8	PASS
	11	2462	-3.64	-18.87	4.77	-14.10	8	PASS

802.11n (HT40)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-6.50	-21.73	4.77	-16.96	8	PASS
	6	2437	-4.19	-19.42	4.77	-14.65	8	PASS
	9	2452	-5.34	-20.57	4.77	-15.80	8	PASS
1	3	2422	-7.06	-22.29	4.77	-17.52	8	PASS
	6	2437	-4.74	-19.97	4.77	-15.20	8	PASS
	9	2452	-5.60	-20.83	4.77	-16.06	8	PASS
2	3	2422	-6.78	-22.01	4.77	-17.24	8	PASS
	6	2437	-4.31	-19.54	4.77	-14.77	8	PASS
	9	2452	-5.99	-21.22	4.77	-16.45	8	PASS



A D T

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 : July 31, 2012

4.6.3 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

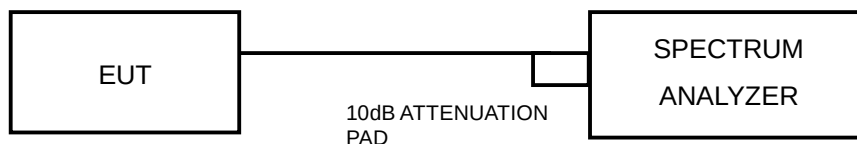
MEASUREMENT PROCEDURE OOB

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

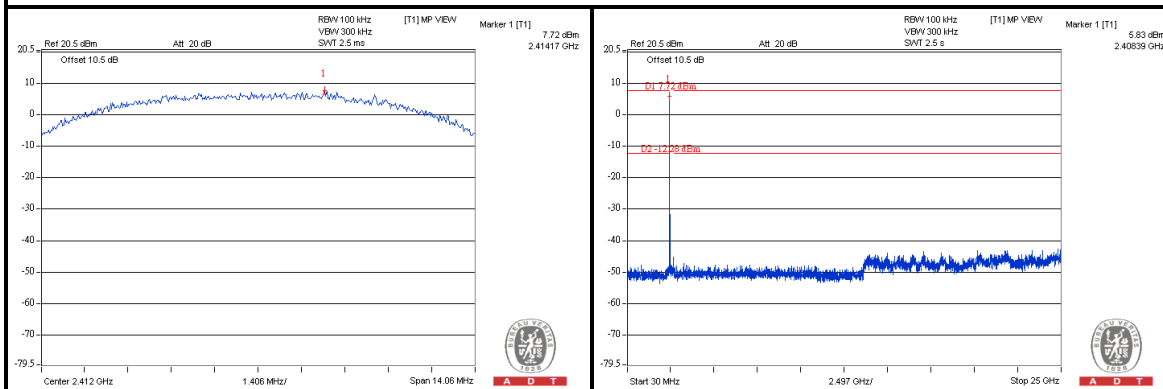
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



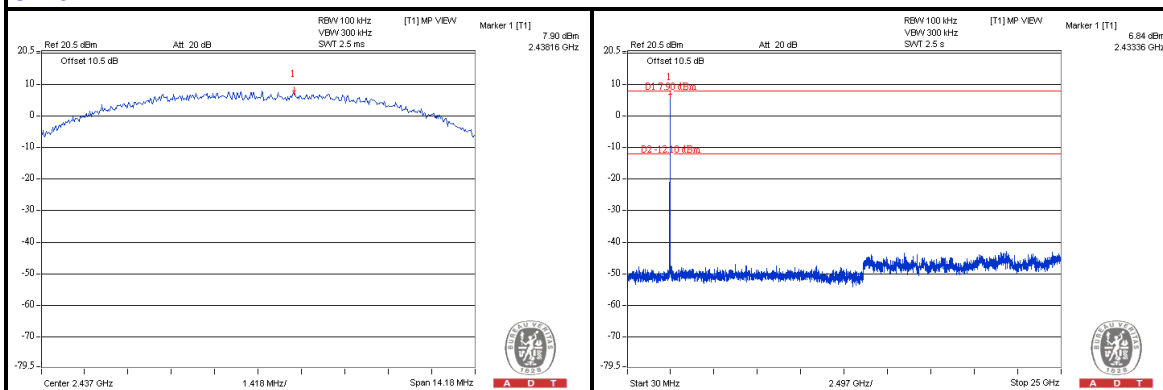
A D T

802.11b

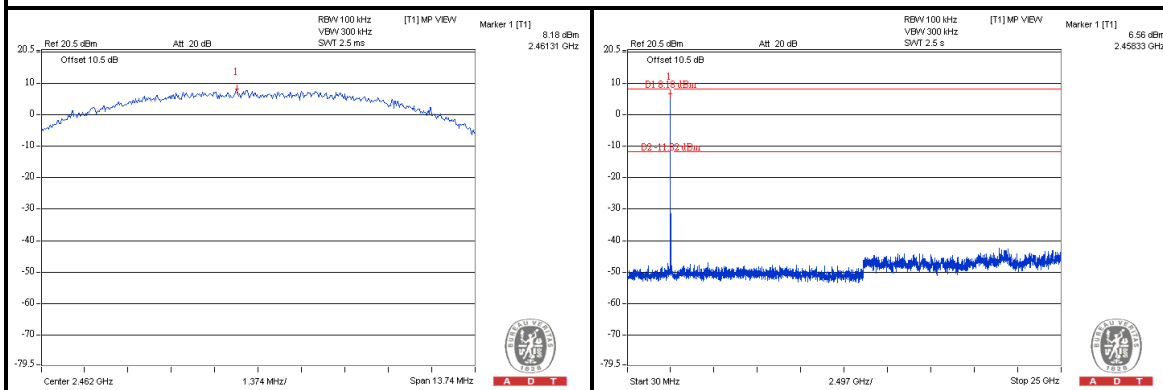
CH 1



CH 6

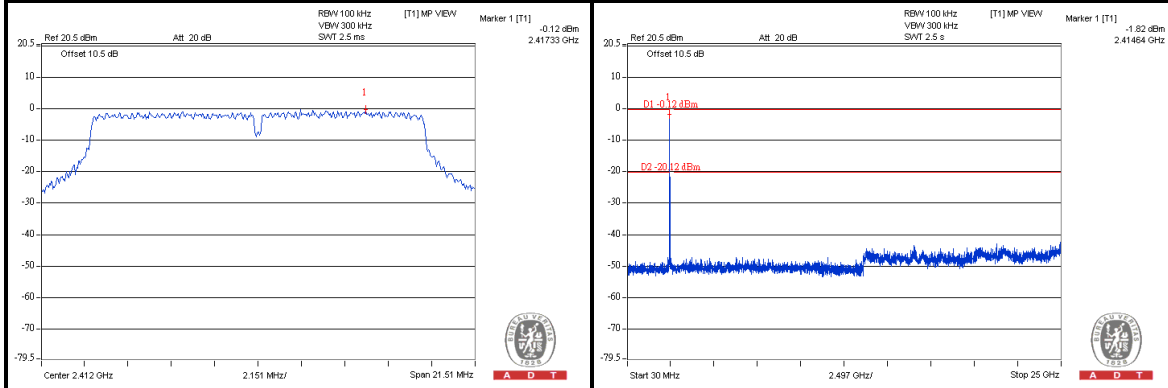


CH 11

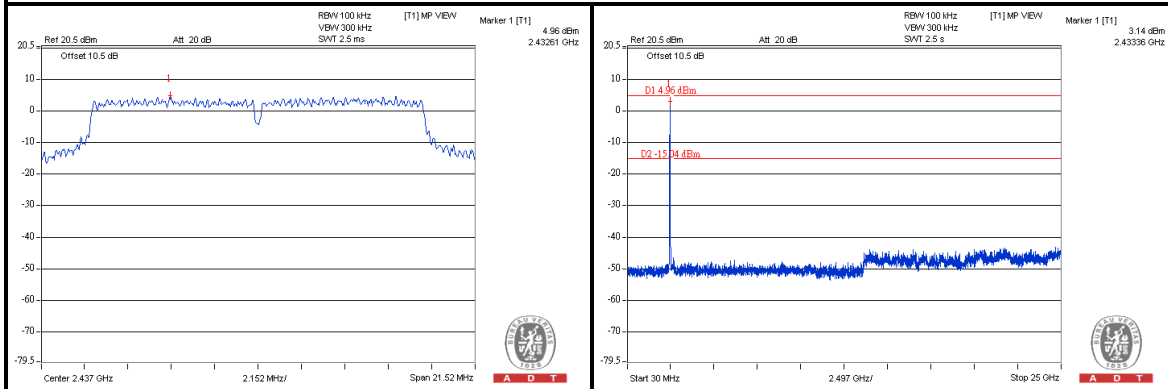


802.11g

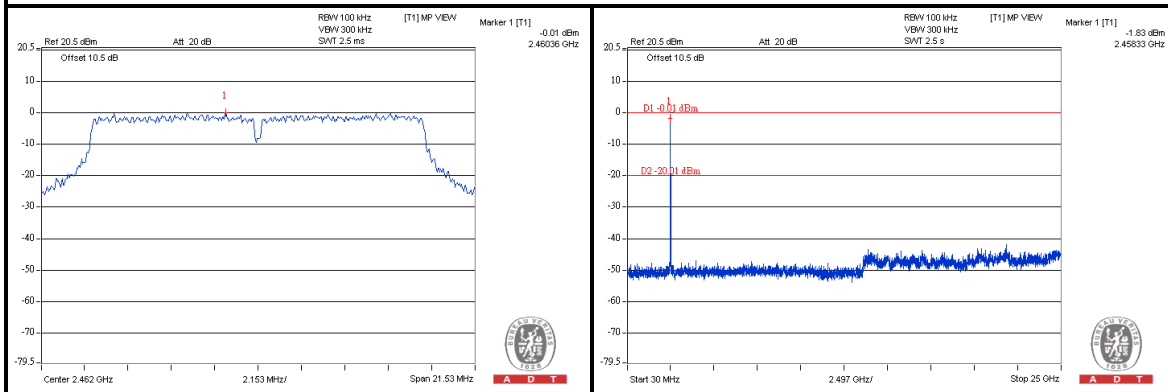
CH 1



CH 6



CH 11

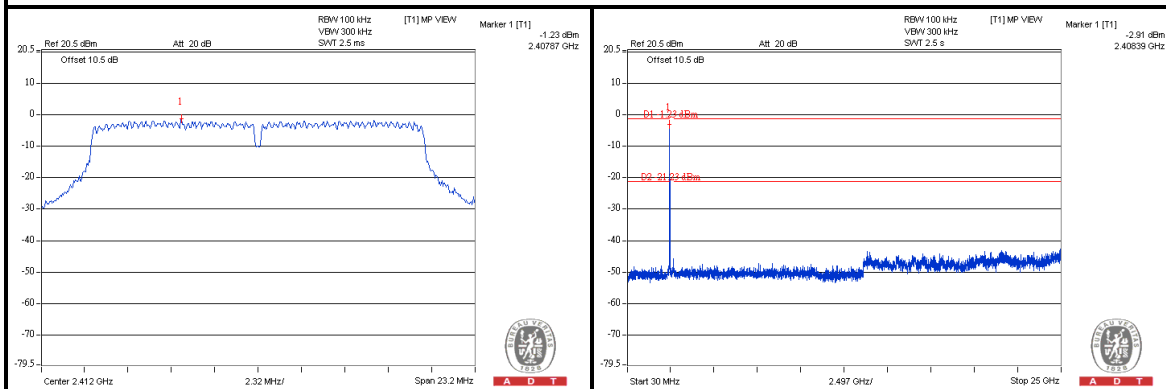




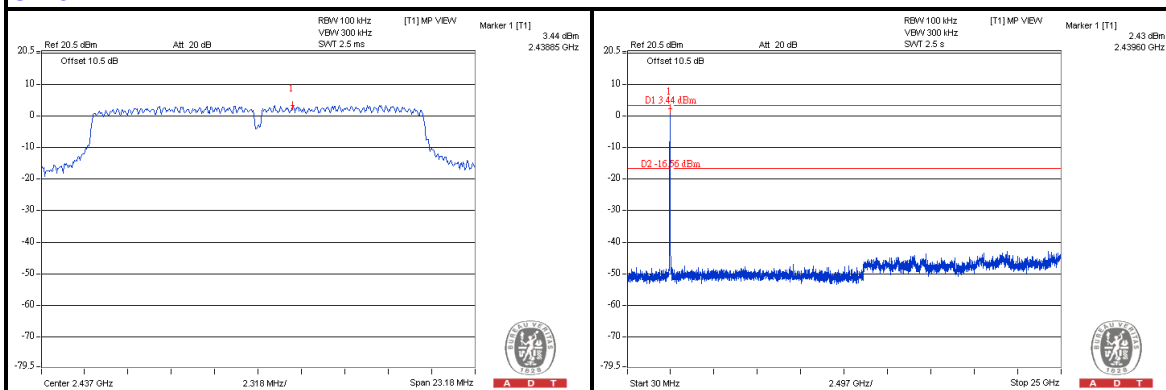
A D T

802.11n (HT20)

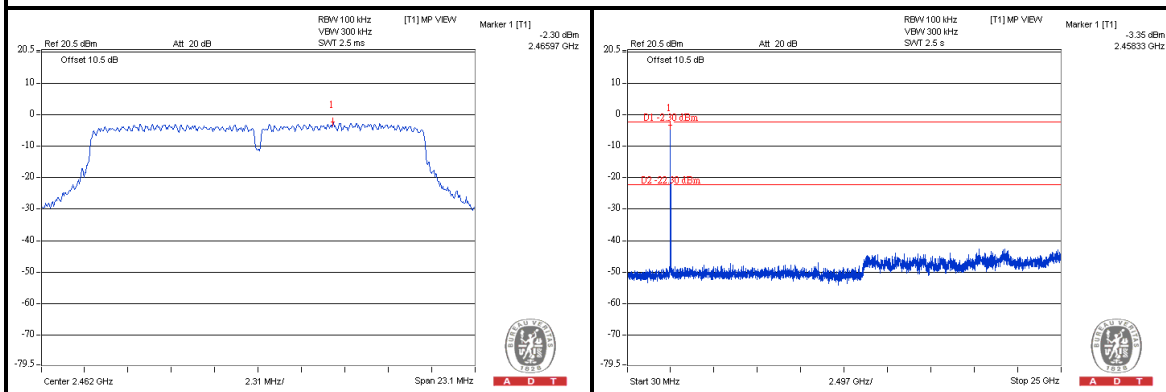
CH 1



CH 6



CH 11

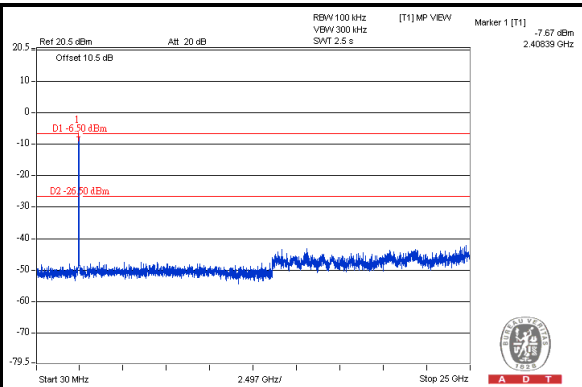
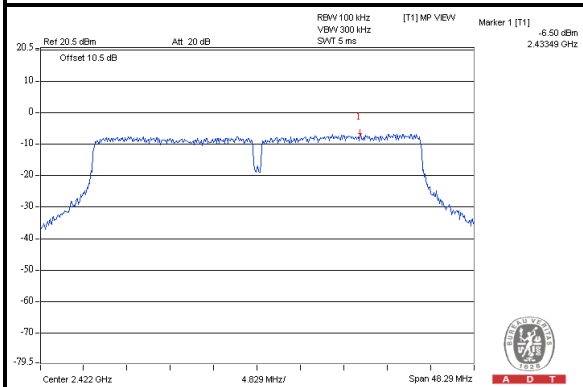




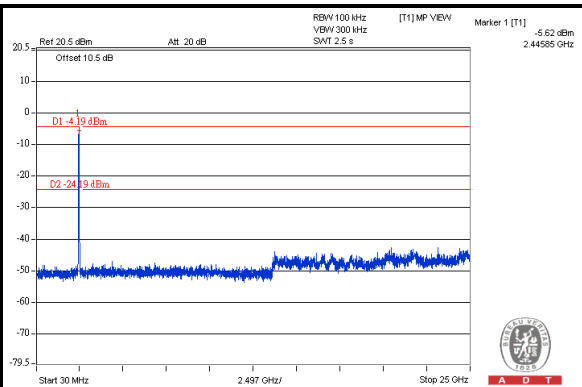
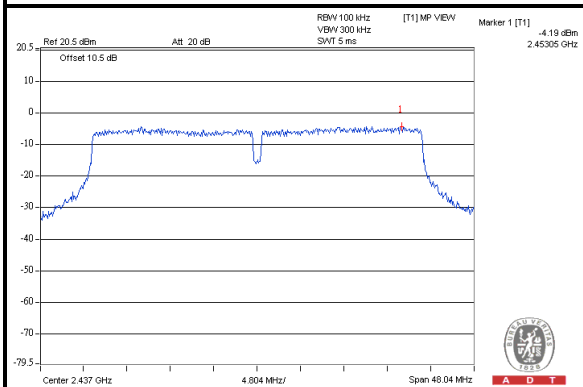
A D T

802.11n (HT40)

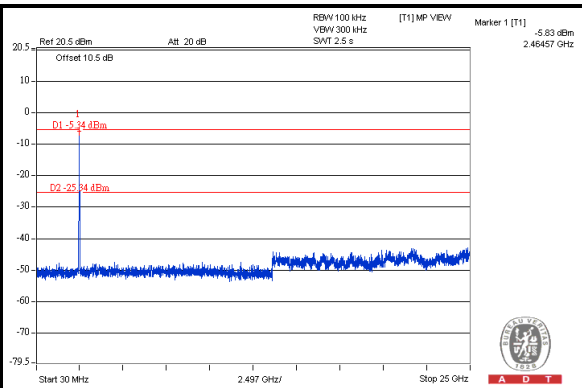
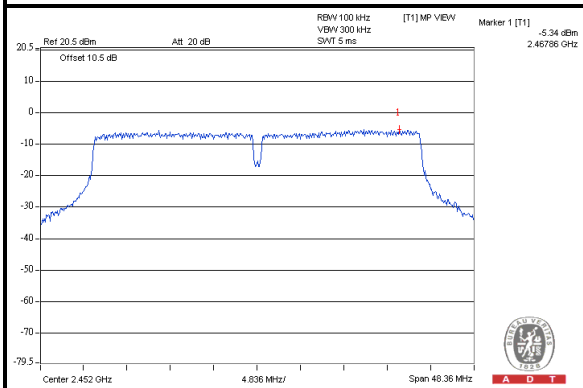
CH 3



CH 6



CH 9



5. TEST TYPES AND RESULTS (FOR 5GHz, 5.725~5.850GHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 12, 2012	Mar.11, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08,2012	June 07,2013
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	EMC-3	Sep. 26, 2011	Sep. 25, 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: July 19 to Aug. 04, 2012

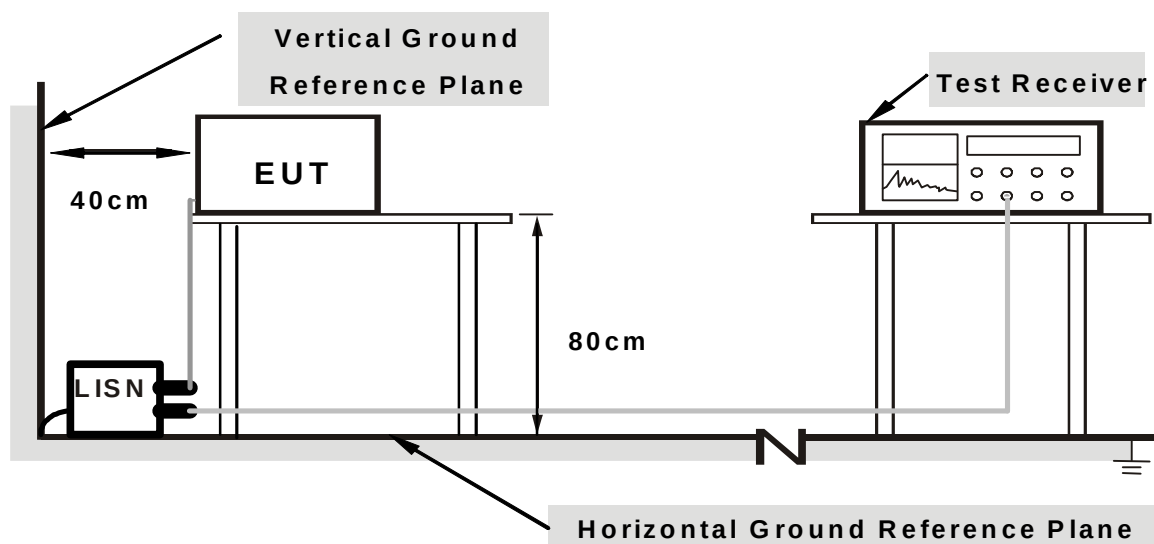
5.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

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

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

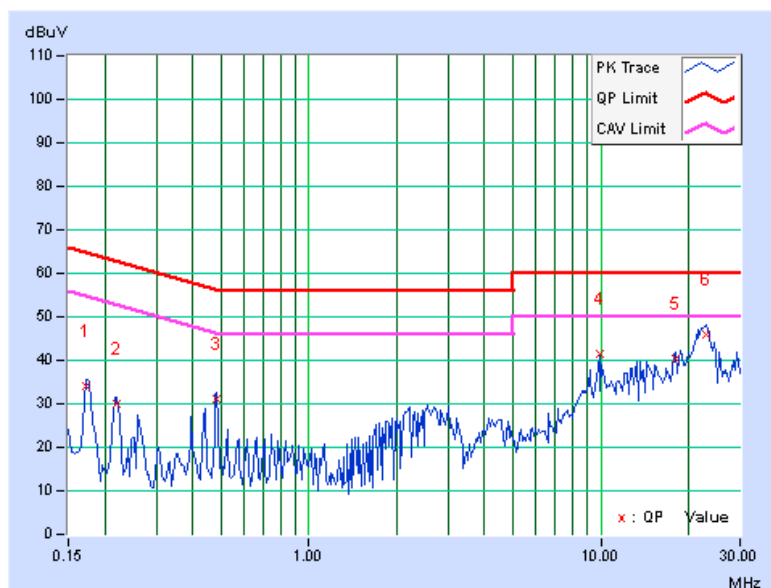
5.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.07	34.15	32.76	34.22	32.83	64.79	54.79	-30.57	-21.96
2	0.22031	0.07	30.06	28.95	30.13	29.02	62.81	52.81	-32.68	-23.79
3	0.48203	0.08	31.01	30.85	31.09	30.93	56.30	46.30	-25.21	-15.37
4	9.90234	0.53	40.93	37.30	41.46	37.83	60.00	50.00	-18.54	-12.17
5	18.00000	0.76	39.43	37.53	40.19	38.29	60.00	50.00	-19.81	-11.71
6	22.92969	0.86	44.99	44.47	45.85	45.33	60.00	50.00	-14.15	-4.67

REMARKS:

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

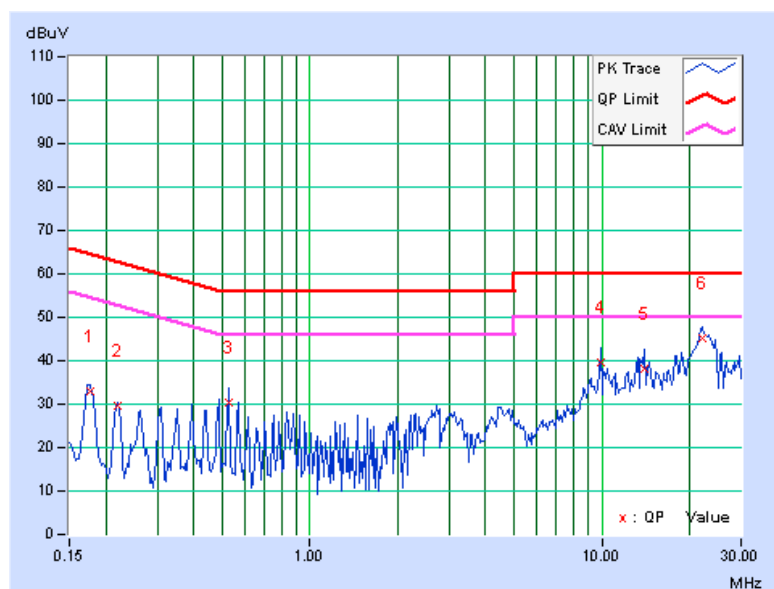


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.06	33.06	32.14	33.12	32.20	64.61	54.61	-31.49	-22.41
2	0.22031	0.06	29.72	28.88	29.78	28.94	62.81	52.81	-33.03	-23.87
3	0.52891	0.08	30.11	28.85	30.19	28.93	56.00	46.00	-25.81	-17.07
4	9.90234	0.39	39.36	35.83	39.75	36.22	60.00	50.00	-20.25	-13.78
5	14.05469	0.53	37.46	35.84	37.99	36.37	60.00	50.00	-22.01	-13.63
6	22.19141	0.74	44.42	44.03	45.16	44.77	60.00	50.00	-14.84	-5.23

REMARKS:

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



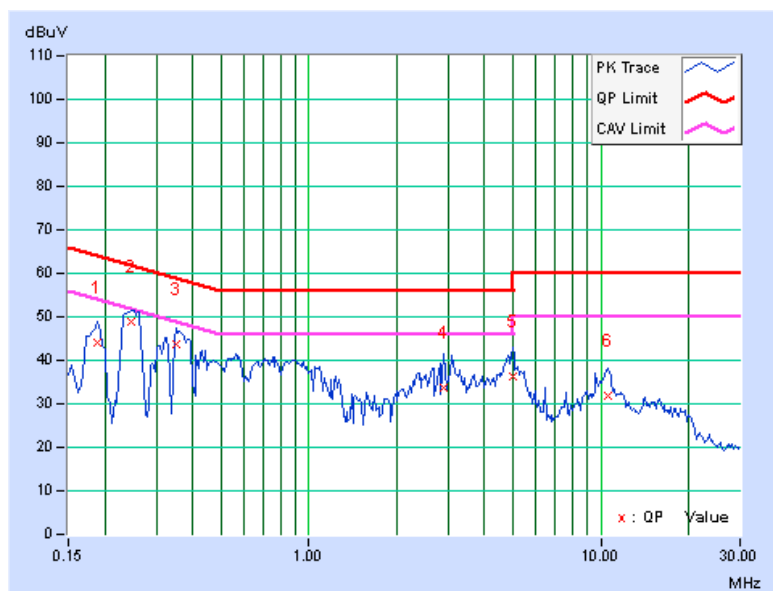
5.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18906	0.08	43.93	34.09	44.01	34.17	64.08	54.08	-20.07	-19.91
2	0.24766	0.08	48.63	40.17	48.71	40.25	61.84	51.84	-13.12	-11.58
3	0.34922	0.09	43.54	28.10	43.63	28.19	58.98	48.98	-15.35	-20.79
4	2.89453	0.31	33.54	22.99	33.85	23.30	56.00	46.00	-22.15	-22.70
5	4.98438	0.45	36.01	28.03	36.46	28.48	56.00	46.00	-19.54	-17.52
6	10.64453	0.76	30.95	24.03	31.71	24.79	60.00	50.00	-28.29	-25.21

REMARKS:

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

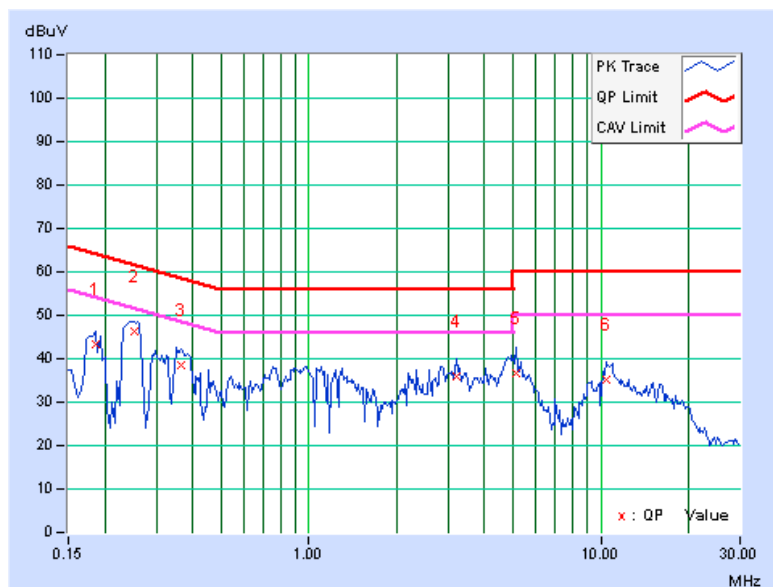


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.08	43.12	32.85	43.20	32.93	64.25	54.25	-21.05	-21.32
2	0.25156	0.09	46.08	36.87	46.17	36.96	61.71	51.71	-15.54	-14.75
3	0.36484	0.10	38.50	27.70	38.60	27.80	58.62	48.62	-20.02	-20.82
4	3.19531	0.30	35.52	24.45	35.82	24.75	56.00	46.00	-20.18	-21.25
5	5.15234	0.40	36.20	28.93	36.60	29.33	60.00	50.00	-23.40	-20.67
6	10.49219	0.65	34.40	27.85	35.05	28.50	60.00	50.00	-24.95	-21.50

REMARKS:

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



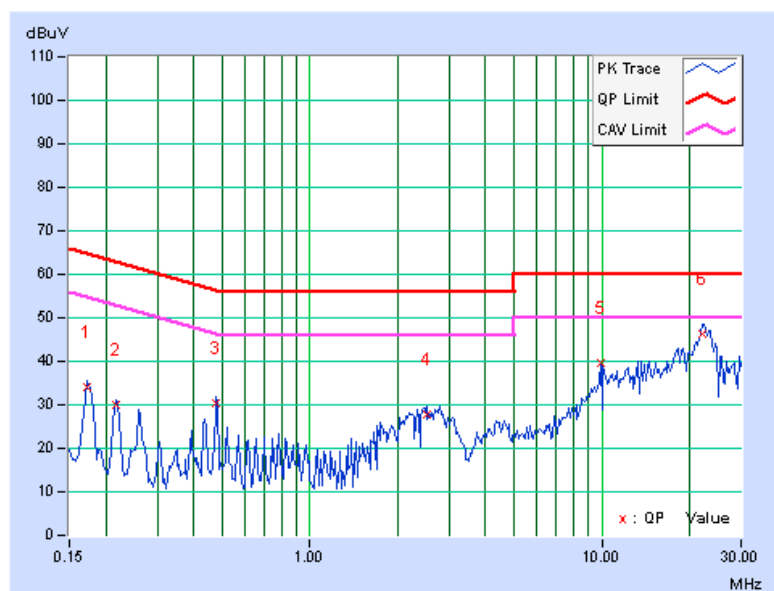
5.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17344	0.07	34.09	32.70	34.16	32.77	64.79	54.79	-30.63	-22.02
2	0.21641	0.07	29.77	28.59	29.84	28.66	62.96	52.96	-33.11	-24.29
3	0.47813	0.08	30.28	30.14	30.36	30.22	56.37	46.37	-26.01	-16.15
4	2.52344	0.23	27.58	26.09	27.81	26.32	56.00	46.00	-28.19	-19.68
5	9.90234	0.53	39.05	35.12	39.58	35.65	60.00	50.00	-20.42	-14.35
6	22.19447	0.85	45.33	45.11	46.18	45.96	60.00	50.00	-13.82	-4.04

REMARKS:

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

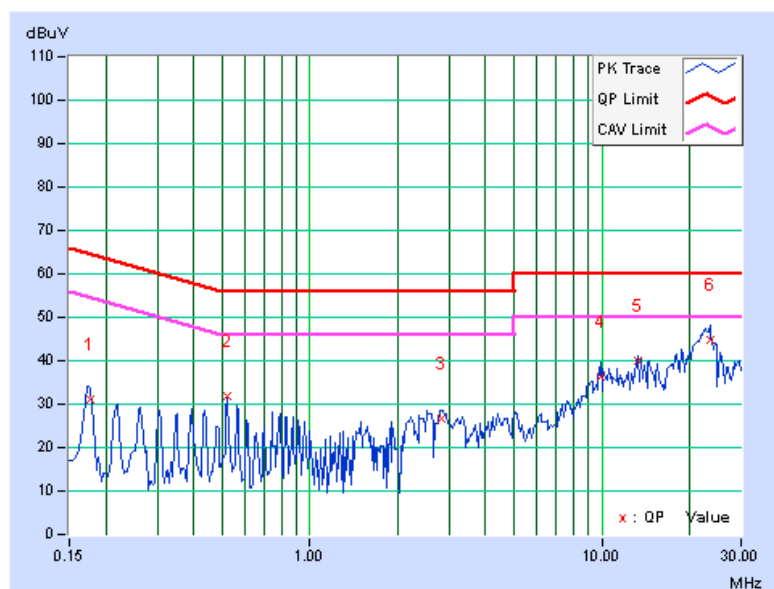


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17734	0.06	31.21	30.87	31.27	30.93	64.61	54.61	-33.34	-23.68
2	0.52109	0.08	31.68	30.74	31.76	30.82	56.00	46.00	-24.24	-15.18
3	2.83203	0.20	26.36	20.82	26.56	21.02	56.00	46.00	-29.44	-24.98
4	9.89453	0.39	35.95	31.84	36.34	32.23	60.00	50.00	-23.66	-17.77
5	13.31641	0.51	39.63	38.50	40.14	39.01	60.00	50.00	-19.86	-10.99
6	23.43359	0.76	44.20	42.92	44.96	43.68	60.00	50.00	-15.04	-6.32

REMARKS:

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



5.2 RADIATED AND BANDEGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEGE 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.

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Pre-Selector Agilent	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Signal Generator Agilent	N5181A	MY49060347	July 25, 2012	July 24, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 15, 2011	Nov. 14, 2012
Pre-Amplifier Agilent	8449B	3008A02465	Feb. 27, 2012	Feb. 26, 2013
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Apr. 06, 2012	Apr. 05, 2013
Horn_Antenna AISI	AIH.8018	0000220091110	Nov. 23, 2011	Nov. 22, 2012
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
Software	ADT_Radiated _V8.7.05	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.
6. Tested Date: July 26 to 28, 2012

5.2.3 TEST PROCEDURES

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

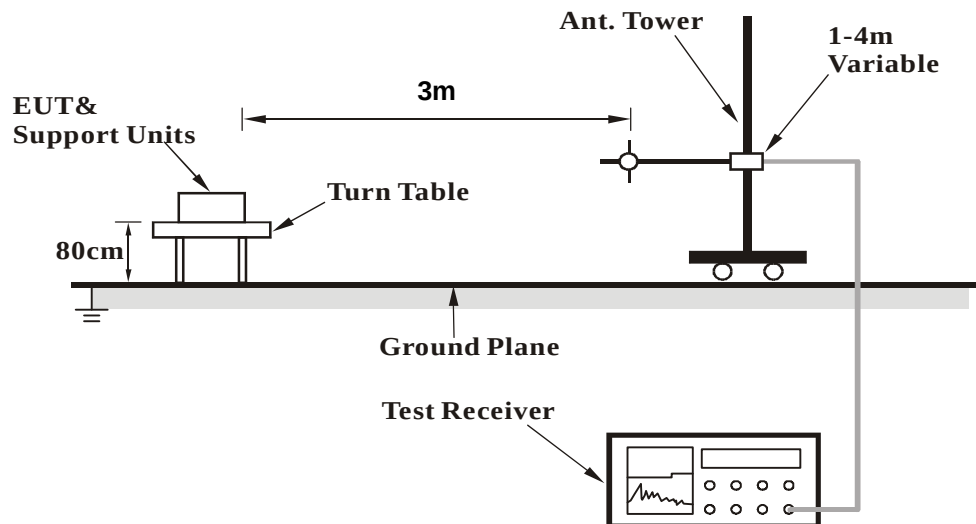
NOTE:

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

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	174.36	36.6 QP	43.5	-6.9	1.50 H	95	23.19	13.44
2	374.97	38.1 QP	46.0	-7.9	1.00 H	46	21.03	17.08
3	416.65	36.9 QP	46.0	-9.1	1.75 H	315	18.80	18.08
4	500.02	38.5 QP	46.0	-7.5	1.50 H	180	18.48	20.04
5	635.38	38.1 QP	46.0	-7.9	1.00 H	179	15.42	22.68
6	666.64	41.5 QP	46.0	-4.5	1.00 H	145	18.35	23.13
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	50.61	34.9 QP	40.0	-5.1	1.00 V	226	20.95	13.92
2	374.97	38.8 QP	46.0	-7.2	1.25 V	169	21.68	17.08
3	416.65	34.3 QP	46.0	-11.7	1.00 V	257	16.23	18.08
4	583.39	36.7 QP	46.0	-9.4	1.00 V	41	14.79	21.86
5	624.96	42.2 QP	46.0	-3.8	1.50 V	183	19.62	22.54
6	666.64	38.4 QP	46.0	-7.6	1.25 V	174	15.27	23.13

REMARKS:

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

ABOVE 1GHz DATA

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5440.00	63.3 PK	74.0	-10.7	1.41 H	86	20.55	42.75
2	5440.00	53.2 AV	54.0	-0.8	1.41 H	86	10.45	42.75
3	*5745.00	116.8 PK			1.30 H	81	73.48	43.32
4	*5745.00	105.8 AV			1.30 H	81	62.48	43.32
5	11490.00	66.2 PK	74.0	-7.8	1.30 H	75	16.41	49.79
6	11490.00	53.2 AV	54.0	-0.8	1.30 H	75	3.41	49.79
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	111.5 PK			1.00 V	39	68.18	43.32
2	*5745.00	100.2 AV			1.00 V	39	56.88	43.32
3	11490.00	66.4 PK	74.0	-7.6	1.13 V	36	16.61	49.79
4	11490.00	52.5 AV	54.0	-1.5	1.13 V	36	2.71	49.79

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	5400.00	62.7 PK	74.0	-11.3	1.39 H	81	20.09	42.61
2	5400.00	51.8 AV	54.0	-2.2	1.39 H	81	9.19	42.61
3	*5785.00	115.4 PK			1.30 H	84	72.03	43.37
4	*5785.00	104.4 AV			1.30 H	84	61.03	43.37
5	11570.00	66.6 PK	74.0	-7.4	1.28 H	86	16.77	49.83
6	11570.00	53.4 AV	54.0	-0.6	1.28 H	86	3.57	49.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.2 PK			1.00 V	34	66.83	43.37
2	*5785.00	99.4 AV			1.00 V	34	56.03	43.37
3	11570.00	64.9 PK	74.0	-9.1	1.18 V	30	15.07	49.83
4	11570.00	52.7 AV	54.0	-1.3	1.18 V	30	2.87	49.83

REMARKS:

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

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	5400.00	63.4 PK	74.0	-10.6	1.41 H	80	20.79	42.61
2	5400.00	53.3 AV	54.0	-0.7	1.41 H	80	10.69	42.61
3	*5825.00	115.6 PK			1.35 H	74	72.13	43.47
4	*5825.00	104.3 AV			1.35 H	74	60.83	43.47
5	11650.00	59.8 PK	74.0	-14.2	1.26 H	78	9.69	50.11
6	11650.00	48.0 AV	54.0	-6.0	1.26 H	78	-2.11	50.11
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	*5825.00	110.1 PK			1.03 V	32	66.63	43.47
2	*5825.00	99.2 AV			1.03 V	32	55.73	43.47
3	11650.00	60.2 PK	74.0	-13.8	1.60 V	7	10.09	50.11
4	11650.00	48.3 AV	54.0	-5.7	1.60 V	7	-1.81	50.11

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 (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5440.00	63.2 PK	74.0	-10.8	1.42 H	88	20.45	42.75
2	5440.00	53.2 AV	54.0	-0.8	1.42 H	88	10.45	42.75
3	*5745.00	116.9 PK			1.27 H	88	73.58	43.32
4	*5745.00	105.9 AV			1.27 H	88	62.58	43.32
5	11490.00	67.2 PK	74.0	-6.8	1.32 H	83	17.41	49.79
6	11490.00	52.9 AV	54.0	-1.1	1.32 H	83	3.11	49.79
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	111.9 PK			1.03 V	45	68.58	43.32
2	*5745.00	100.6 AV			1.03 V	45	57.28	43.32
3	11490.00	67.7 PK	74.0	-6.3	1.19 V	21	17.91	49.79
4	11490.00	53.1 AV	54.0	-0.9	1.19 V	21	3.31	49.79

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	5400.00	63.6 PK	74.0	-10.4	1.37 H	90	20.99	42.61
2	5400.00	53.5 AV	54.0	-0.5	1.37 H	90	10.89	42.61
3	*5785.00	115.5 PK			1.33 H	86	72.13	43.37
4	*5785.00	104.7 AV			1.33 H	86	61.33	43.37
5	11570.00	65.2 PK	74.0	-8.8	1.27 H	77	15.37	49.83
6	11570.00	53.0 AV	54.0	-1.0	1.27 H	77	3.17	49.83
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.3 PK			1.02 V	32	66.93	43.37
2	*5785.00	99.6 AV			1.02 V	32	56.23	43.37
3	11570.00	66.7 PK	74.0	-7.3	1.19 V	19	16.87	49.83
4	11570.00	53.1 AV	54.0	-0.9	1.19 V	19	3.27	49.83

REMARKS:

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

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	5400.00	63.2 PK	74.0	-10.8	1.39 H	83	20.59	42.61
2	5400.00	53.2 AV	54.0	-0.8	1.39 H	83	10.59	42.61
3	*5825.00	115.7 PK			1.32 H	65	72.23	43.47
4	*5825.00	104.4 AV			1.32 H	65	60.93	43.47
5	11650.00	58.9 PK	74.0	-15.1	1.24 H	80	8.79	50.11
6	11650.00	47.6 AV	54.0	-6.4	1.24 H	80	-2.51	50.11
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	*5825.00	110.4 PK			1.04 V	36	66.93	43.47
2	*5825.00	99.5 AV			1.04 V	36	56.03	43.47
3	11650.00	59.4 PK	74.0	-14.6	1.63 V	7	9.29	50.11
4	11650.00	47.9 AV	54.0	-6.1	1.63 V	7	-2.21	50.11

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 (HT40)

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5400.00	63.3 PK	74.0	-10.7	1.40 H	81	20.69	42.61
2	5400.00	53.2 AV	54.0	-0.8	1.40 H	81	10.59	42.61
3	*5755.00	104.2 PK			1.03 H	49	60.86	43.34
4	*5755.00	93.2 AV			1.03 H	49	49.86	43.34
5	11510.00	65.2 PK	74.0	-8.8	1.27 H	73	15.42	49.78
6	11510.00	53.0 AV	54.0	-1.0	1.27 H	73	3.22	49.78
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	108.4 PK			1.67 V	38	65.06	43.34
2	*5755.00	97.3 AV			1.67 V	38	53.96	43.34
3	11510.00	65.8 PK	74.0	-8.2	1.19 V	23	16.02	49.78
4	11510.00	53.3 AV	54.0	-0.7	1.19 V	23	3.52	49.78

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	5400.00	63.8 PK	74.0	-10.2	1.41 H	87	21.19	42.61
2	5400.00	53.2 AV	54.0	-0.8	1.41 H	87	10.59	42.61
3	*5795.00	103.7 PK			1.04 H	43	60.32	43.38
4	*5795.00	92.5 AV			1.04 H	43	49.12	43.38
5	11590.00	57.1 PK	74.0	-16.9	1.36 H	51	7.26	49.84
6	11590.00	46.4 AV	54.0	-7.6	1.36 H	51	-3.44	49.84
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5440.00	64.2 PK	74.0	-9.8	1.02 V	11	21.45	42.75
2	5440.00	53.0 AV	54.0	-1.0	1.02 V	11	10.25	42.75
3	*5795.00	107.8 PK			1.66 V	33	64.42	43.38
4	*5795.00	96.8 AV			1.66 V	33	53.42	43.38
5	11590.00	57.4 PK	74.0	-16.6	1.63 V	9	7.56	49.84
6	11590.00	46.8 AV	54.0	-7.2	1.63 V	9	-3.04	49.84

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 : July 31, 2012

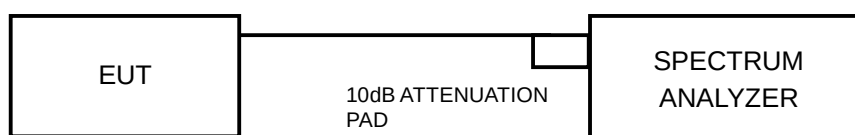
5.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.70	16.64	16.60	0.5	PASS
157	5785	16.59	16.61	16.61	0.5	PASS
165	5825	16.62	16.75	16.60	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.77	17.85	17.85	0.5	PASS
157	5785	17.80	17.81	17.83	0.5	PASS
165	5825	17.71	17.87	17.91	0.5	PASS

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	37.20	37.13	36.90	0.5	PASS
159	5795	36.96	37.21	37.01	0.5	PASS

5.4 CONDUCTED OUTPUT POWER MEASUREMENT

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: July 31, 2012

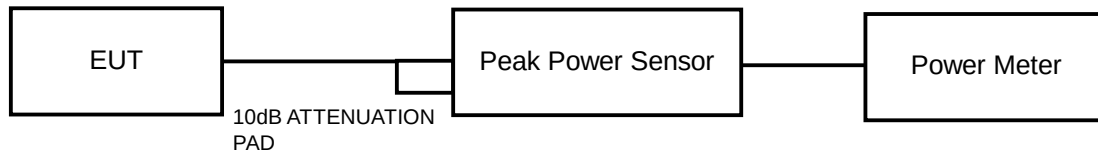
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6

5.4.7 TEST RESULTS

802.11a

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	20.90	20.90	20.60	360.869	25.57	26.21	PASS
157	5785	20.40	20.60	20.30	331.615	25.21	26.21	PASS
165	5825	20.20	20.50	20.20	321.628	25.07	26.21	PASS

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

Effective Legacy Gain (dBi) = 9.79

The effective legacy gain is 9.79dBi, therefore the limit needs to reduce.

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
149	5745	20.70	21.00	20.50	355.585	25.51	30	PASS
157	5785	20.40	20.70	20.30	334.290	25.24	30	PASS
165	5825	20.20	20.40	20.20	319.074	25.04	30	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	PEAK POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
151	5755	20.60	20.80	20.50	347.243	25.41	30	PASS
159	5795	20.30	20.60	20.30	329.119	25.17	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 : July 31, 2012

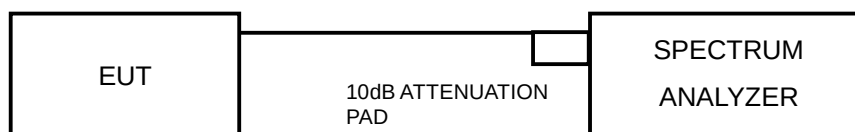
5.5.3 TEST PROCEDURE

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

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	3.29	-11.94	4.77	-7.17	4.21	PASS
	157	5785	3.70	-11.53	4.77	-6.76	4.21	PASS
	165	5825	3.43	-11.80	4.77	-7.03	4.21	PASS
1	149	5745	2.23	-13.00	4.77	-8.23	4.21	PASS
	157	5785	1.78	-13.45	4.77	-8.68	4.21	PASS
	165	5825	1.80	-13.43	4.77	-8.66	4.21	PASS
2	149	5745	2.83	-12.40	4.77	-7.63	4.21	PASS
	157	5785	3.24	-11.99	4.77	-7.22	4.21	PASS
	165	5825	3.54	-11.69	4.77	-6.92	4.21	PASS

Note: Directional gain = $10 \log[(10^{G_{1/20}} + 10^{G_{2/20}} + 10^{G_{3/20}}) / 3]$

Effective Legacy Gain (dBi) = 9.79

The effective legacy gain is 9.79dBi, therefore the limit needs to reduce.

802.11n (HT20)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	3.63	-11.60	4.77	-6.83	8	PASS
	157	5785	3.07	-12.16	4.77	-7.39	8	PASS
	165	5825	2.59	-12.64	4.77	-7.87	8	PASS
1	149	5745	1.37	-13.86	4.77	-9.09	8	PASS
	157	5785	1.68	-13.55	4.77	-8.78	8	PASS
	165	5825	1.26	-13.97	4.77	-9.20	8	PASS
2	149	5745	2.08	-13.15	4.77	-8.38	8	PASS
	157	5785	2.69	-12.54	4.77	-7.77	8	PASS
	165	5825	2.17	-13.06	4.77	-8.29	8	PASS



A D T

802.11n (HT40)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=3) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-0.38	-15.61	4.77	-10.84	8	PASS
	159	5795	0.19	-15.04	4.77	-10.27	8	PASS
1	151	5755	-1.34	-16.57	4.77	-11.80	8	PASS
	159	5795	-1.09	-16.32	4.77	-11.55	8	PASS
2	151	5755	0.41	-14.82	4.77	-10.05	8	PASS
	159	5795	-0.35	-15.58	4.77	-10.81	8	PASS



A D T

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 : July 31, 2012

5.6.3 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW $\geq$ 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

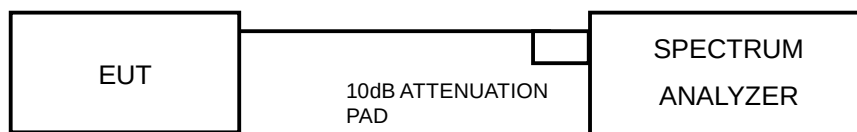
MEASUREMENT PROCEDURE OOB

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

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.7 TEST RESULTS

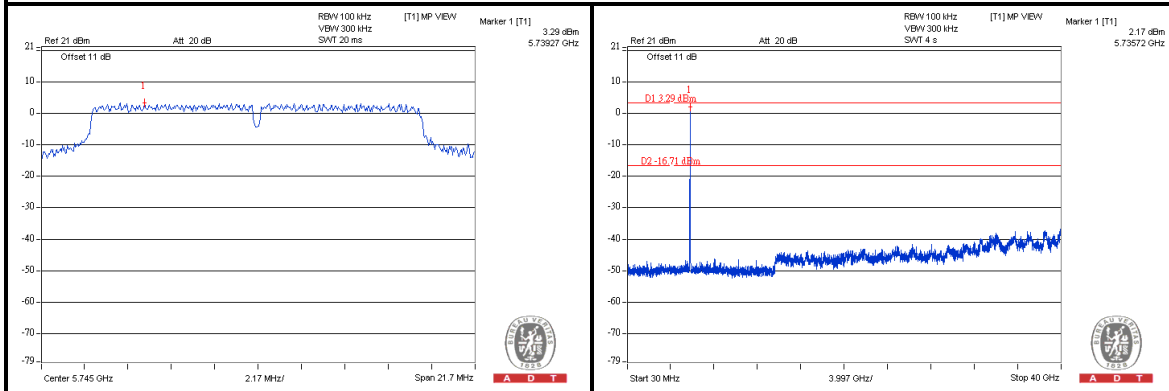
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



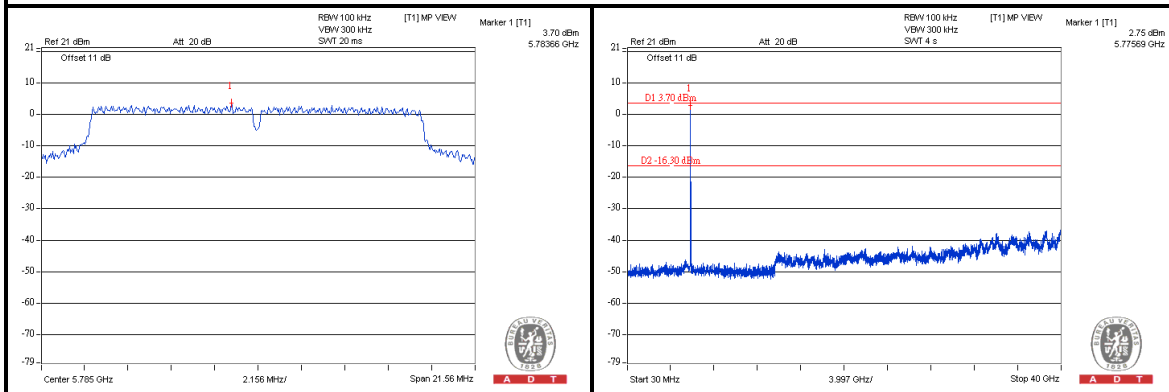
A D T

802.11a

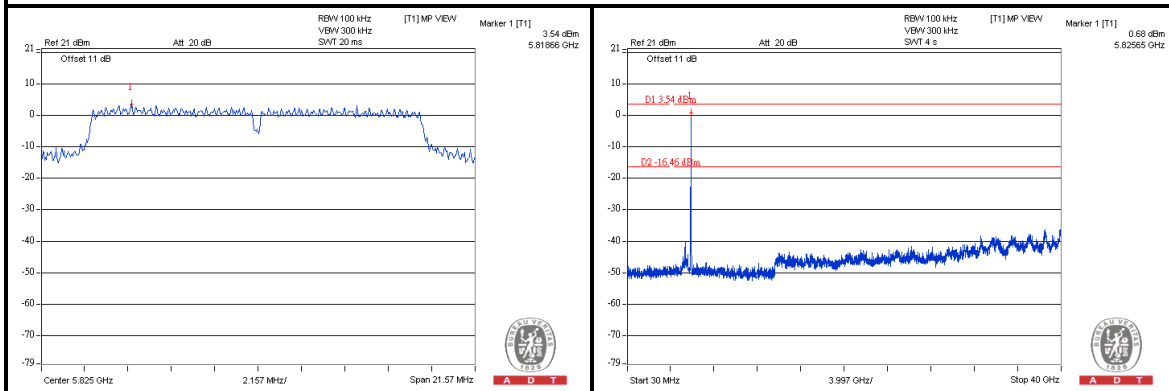
CH 149



CH 157



CH 165

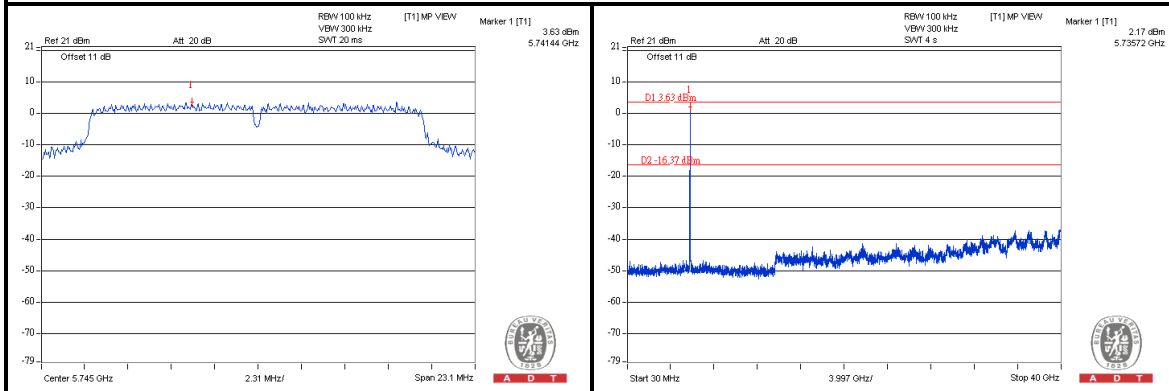




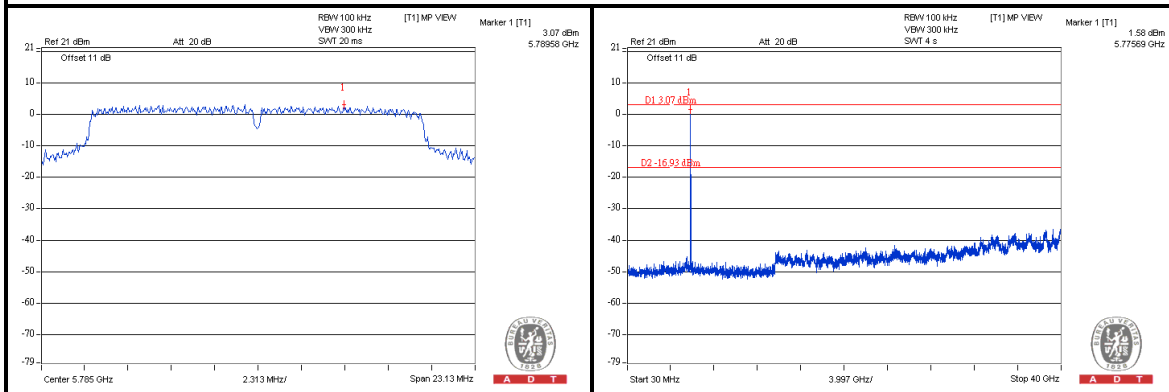
A D T

802.11n (HT20)

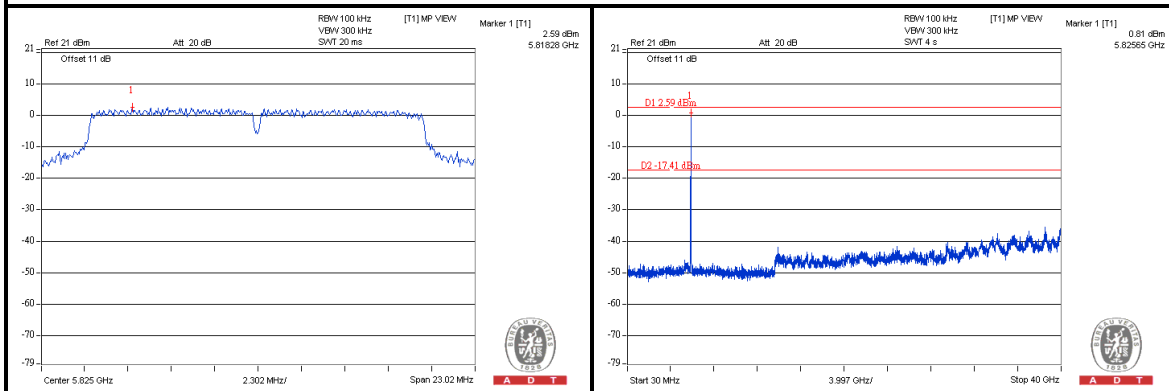
CH 149



CH 157

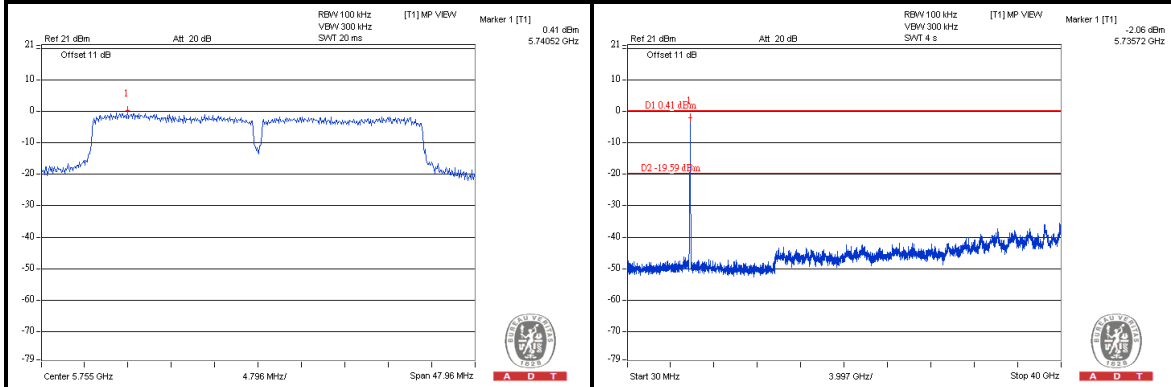


CH 165

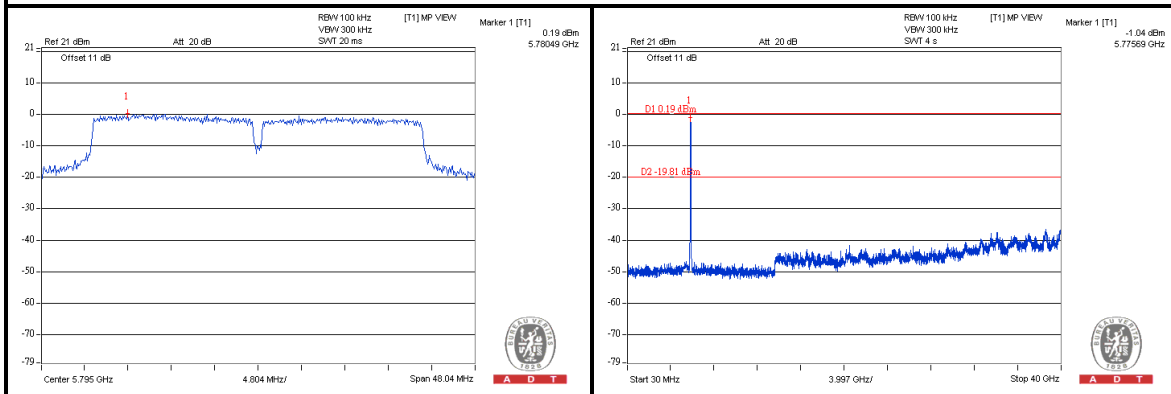


802.11n (HT40)

CH 151



CH 159



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



A D T

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:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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



A D T

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 ---