FCC TEST REPORT (WLAN/DTS-15.247)

REPORT NO.:	RF120625E05 R1
MODEL NO.:	QCSWB282
FCC ID:	PPD-QCSWB282
IC:	4104A-QCSWB282
RECEIVED:	June 25, 2012
TESTED:	Aug. 22 to Oct. 25, 2012
ISSUED:	Dec. 03, 2012

APPLICANT:	Qualcomm Atheros, Inc.
ADDRESS:	1700 Technology Drive, San Jose, CA 95110

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.

Table of Contents

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120625E05	Original release	Nov. 06, 2012
RF120625E05 R1	Add channel 2 & 10 of OFDM(2.4GHz) mode for “OUTPUT POWER” & “RADIATED EMISSION” measurement.	Dec. 03, 2012

1. CERTIFICATION

PRODUCT:	Low Power 2x2 802.11 a/b/g/n + BT SDIO-WLAN/UART-BT Card
BRAND NAME:	Qualcomm Atheros
MODEL NO.:	QCSWB282
TEST SAMPLE:	R&D SAMPLE
APPLICANT:	Qualcomm Atheros, Inc.
TESTED:	Aug. 22 to Oct. 25, 2012
STANDARDS:	FCC Part 15, Subpart C (Section 15.247) ANSI C63.10-2009 Canada RSS-210 Issue 8 (2010-12) Canada RSS-Gen Issue 3 (2010-12)

The above equipment (Model: QCSWB282) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and was in 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:** *Dec. 03, 2012*
(Midoli Peng, Specialist)

APPROVED BY : _____, **DATE:** *Dec. 03, 2012*
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz(WLAN), 2412~2462MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) ; RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-Gen			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -16.08dB at 0.16562MHz
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 2483.5MHz & 2390.00MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement
15.203	-	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

For 2.4GHz(BT-LE(GFSK)), 2402~2480MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) ; RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-Gen			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -15.74dB at 0.16562MHz
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.0dB at 324.99MHz & 349.98MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement
15.203	-	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247) ; RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	RSS-210; RSS-Gen			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -16.14dB at 0.16172MHz
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -3.3dB at 11570.00MHz & 11650MHz
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.2 (4)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	-	Meet the requirement.
15.203	-	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

NOTE: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz 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(WLAN / DTS)

PRODUCT	Low Power 2x2 802.11 a/b/g/n + BT SDIO-WLAN/UART-BT Card
MODEL NO.	QCSWB282
POWER SUPPLY	DC 3.3V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM GFSK(BT <LE> mode) for DTS
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n (HT20, 800ns GI): up to 130Mbps 802.11n (HT20, 400ns GI): up to 144.4Mbps 802.11n (HT40, 800ns GI) : up to 270Mbps(5GHz only) 802.11n (HT40, 400ns GI) : up to 300Mbps(5GHz only) BT-LE(GFSK): 1Mbps
OPERATING FREQUENCY	**For 15.407** 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.58GHz & 5.66~5.7GHz
	For 15.247 2.4GHz: 2.412 ~ 2.462GHz 5GHz: 5.745 ~ 5.825GHz BT-LE(GFSK): 2.402 ~ 2.480GHz
NUMBER OF CHANNEL	**For 15.407** 16 for 802.11a, 802.11n (HT20) 7 for 802.11n (HT40)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20) 40 for BT-LE(GFSK) **For 15.247(5GHz)** 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 43.767mW 802.11n (HT20): 44.500mW 802.11n (HT40): 29.292mW **For 15.247(2.4GHz)** 802.11b: 158.908mW 802.11g: 209.481mW 802.11n (HT20): 221.967mW BT-LE(GFSK): 10.889 mW **For 15.247(5GHz)** 802.11a: 105.658mW 802.11n (HT20): 106.747mW 802.11n (HT40): 87.512mW
ANTENNA TYPE	See item 3.2
ANTENNA CONNECTOR	See item 3.2
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. There are Bluetooth technology and WLAN technology used for the EUT. And the report number corresponds with EUT functions are listed as below:

Function	Report No.
WLAN / BT(LE MODE)	RF120625E05 (15.247) RF120625E05-1(15.407) RF120625E05-3(DFS)
Bluetooth	RF120625E05-2

2. The device has below configurations

Working mode	chain 0	chain 1	Note
1X1+BT	11a/b/g/n (MCS0~7)	BT	WLAN/BT concurrent
2X2+BT	11a/n (MCS0~15)	11a/n (MCS0~15)+ BT	WLAN/BT concurrent only when WLAN is 802.11an.
2x2 WLAN only	11a/b/g/n (MCS0~15)	11a/b/g/n (MCS0~15)	-

3. Spurious Emission (radiated emission) of the simultaneous operation (WiFi & Bluetooth) have been evaluated and no non-compliance found. The detail combinations of transmitters / frequencies / modes as below table

Mode	Available Channel	Tested Channel	Modulation Technology
2.4 GHz (802.11n (HT20)) + Bluetooth	1 to 11	6	OFDM
	0 to 78	78	FHSS
5 GHz (802.11n (HT20)) + Bluetooth	149 to 165	149	OFDM
	0 to 78	78	FHSS

4. The EUT is 2 * 2 MIMO with 802.11n beam forming function.

MODULATION MODE	Tx/Rx FUNCTION
802.11b	1Tx/1Rx or 2Tx/2Rx
802.11g	1Tx/1Rx or 2Tx/2Rx
802.11a	1Tx/1Rx or 2Tx/2Rx
802.11n (HT20)	2Tx/2Rx
802.11n (HT40) <5GHz only>	2Tx/2Rx

The maximum compliance powers listed on the report are compliance with both Beam Forming and non-Beam Forming configurations.

5. The EUT was pre-tested under the following modes:

Test Mode	Data rate
Mode A	400ns GI
Mode B	**800ns GI**

From the above modes, the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

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

3.2 DESCRIPTION OF ANTENNA

The antenna provided to the EUT, please refer to the following table:

Brand	Model	Antenna Type	Peak gain with cable loss 2.4G(dBi)	Peak gain with cable loss 5G(dBi)	Cable Loss 2.4G(dB)	Cable Loss 5G(dB)	Connector Type	Cable Length (mm)
WNC	81.EBJ15.005	PIFA	3.62	Band 1&2: 3.08 Band 3: 4.76 Band 4: 4.76	1.15	Band1&2: 1.70 Band 3: 1.74 Band 4: 1.79	IPEX	300

Note: Above antenna gains of antenna are Total (H+V).

3.3 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		

Forty channels are provided for Bluetooth LE mode:

CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)	CHANNEL	FREQ. (MHZ)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

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

3.3.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

RE ³ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

OB: Conducted Out-Band Emission Measurement

NOTE: The EUT's antenna had been pre-tested on the positioned of each 3 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	DATA RATE (Mbps)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	6
BT-LE	0 to 39	39	DTS	1
For 5 GHz 802.11n (HT20)	149 to 165	149	OFDM	6.5

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	DATA RATE (Mbps)
For 2.4 GHz 802.11n (HT20)	1 to 11	6	OFDM	6
BT-LE	0 to 39	39	DTS	1
For 5 GHz 802.11n (HT20)	149 to 165	149	OFDM	6.5

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1
802.11g	1 to 11	1, 6, 11	OFDM	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	6.5
BT-LE	0 to 39	0, 19, 39	DTS	1
802.11a	149 to 165	149, 157, 165	OFDM	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	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	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1
802.11g	1 to 11	1, 2, 6, 10, 11	OFDM	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 2, 6, 10, 11	OFDM	6.5
BT-LE	0 to 39	0, 19, 39	DTS	1
802.11a	149 to 165	149, 157, 165	OFDM	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	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	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	1
802.11g	1 to 11	1, 6, 11	OFDM	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	6.5
BT-LE	0 to 39	0, 39	DTS	1
802.11a	149 to 165	149, 157, 165	OFDM	6
For 5 GHz 802.11n (HT20)	149 to 165	149, 157, 165	OFDM	6.5
For 5 GHz 802.11n (HT40)	151 to 159	151, 159	OFDM	13.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	25deg. C, 65%RH	120Vac, 60Hz	Kyle Huang
RE<1G	25deg. C, 74%RH / 25deg. C, 65%RH	120Vac, 60Hz	Frank Liu
RE≥1G	25deg. C, 65%RH / 25deg. C, 69%RH	120Vac, 60Hz	Nelson Teng / Frank Liu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang / Amos Chuang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang

3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (Section 15.247)
558074 D01 DTS Meas Guidance v01
ANSI C63.10-2009
Canada RSS-210 Issue 8 (2010-12)
Canada RSS-Gen Issue 3 (2010-12)

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

3.5 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.

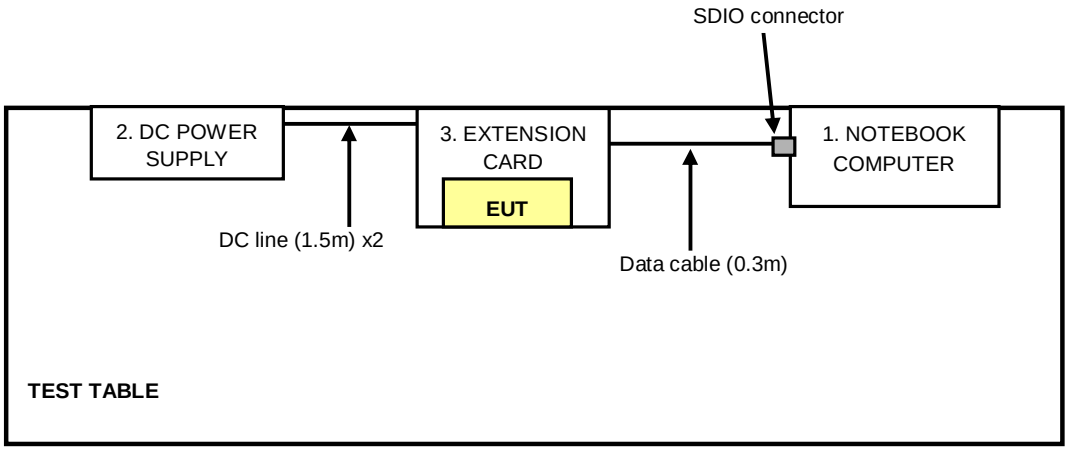
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
2	DC POWER SUPPLY	Topward	6603D	795558	NA
3	EXTENSION CARD	Qualcomm Atheros	NA	NA	NA

No.	Signal cable description
1	NA
2	DC line(1.5m)
3	Data cable(0.3m)

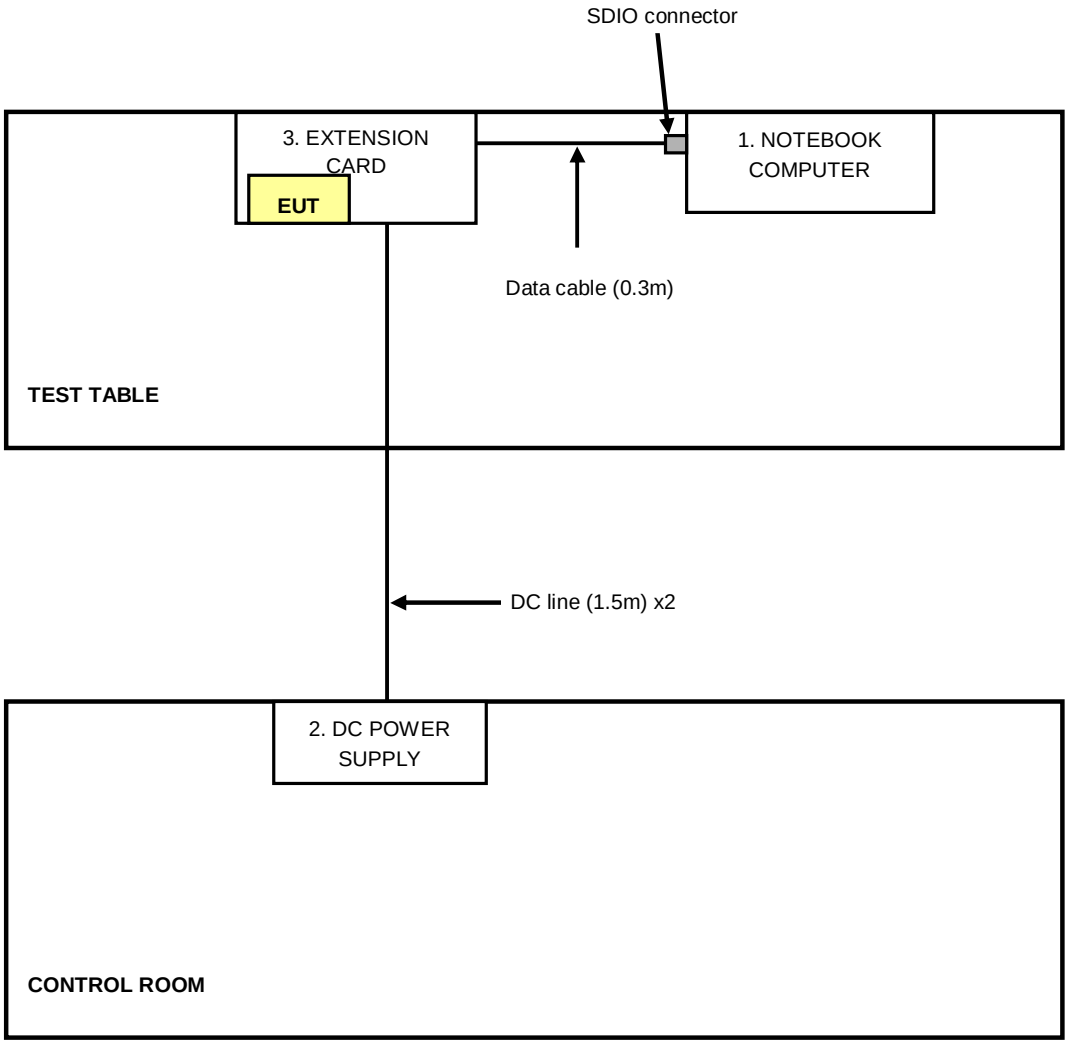
Note: The power cords of the above support units were unshielded (1.8m).

3.6 CONFIGURATION OF SYSTEM UNDER TEST

For conducted emission test



For other test items



4. TEST TYPES AND RESULTS (FOR 2.4GHz, 2400 ~ 2483.5MHz Band)

4.1 CONDUCTED OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

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

4.1.2 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 : Aug. 22 to Oct. 25, 2012

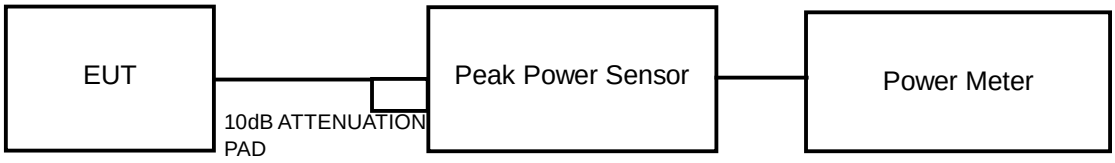
4.1.3 TEST PROCEDURES

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.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



4.1.6 EUT OPERATING CONDITIONS

The software(EMI_ART2_AR6K_2299Eng) provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.1.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	18.9	18.2	143.694	21.57	29.37	PASS
6	2437	18.9	19.1	158.908	22.01	29.37	PASS
11	2462	17.9	17.6	119.204	20.76	29.37	PASS

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi)=6.63
The effective legacy gain is 6.63dBi, therefore the limit needs to reduce.

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	17.9	17.4	116.614	20.67	29.37	PASS
2	2417	19.3	18.7	159.245	22.02	29.37	PASS
6	2437	20.3	20.1	209.481	23.21	29.37	PASS
10	2457	18.5	18.1	135.360	21.31	29.37	PASS
11	2462	16.7	16.5	91.442	19.61	29.37	PASS

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi)= 6.63
The effective legacy gain is 6.63dBi, therefore the limit needs to reduce.

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	18.1	17.6	122.109	20.87	29.37	PASS
2	2417	19.2	18.3	150.784	21.78	29.37	PASS
6	2437	20.6	20.3	221.967	23.46	29.37	PASS
10	2457	18.3	17.9	129.268	21.11	29.37	PASS
11	2462	17.3	16.9	102.681	20.11	29.37	PASS

Directional gain = gain of antenna element + 10 log (# of TX antenna elements)
Effective Legacy Gain (dBi)= 6.63
The effective legacy gain is 6.63dBi, therefore the limit needs to reduce.

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
0	2402	9.120	9.60	30	PASS
19	2440	9.204	9.64	30	PASS
39	2480	10.889	10.37	30	PASS

4.2 AVERAGE OUTPUT POWER

4.2.1 FOR REFERENCE.

4.2.2 TEST INSTRUMENTS

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

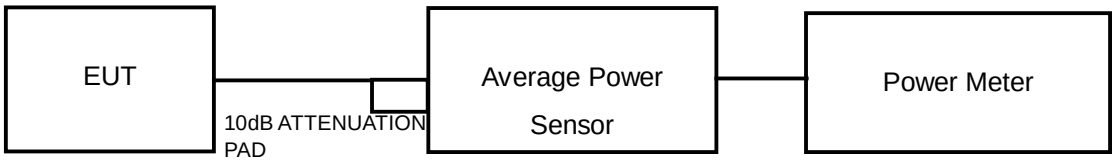
Note:

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 : Aug. 22 to Oct. 25, 2012

4.2.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

4.2.4 TEST SETUP



4.2.5 EUT OPERATING CONDITIONS

Same as Item 4.1.6

4.2.6 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		AVERAGE POWER OUTPUT (dBm)
		Chain(0)	Chain(1)	
1	2412	16.6	16.0	19.32
6	2437	16.7	16.9	19.81
11	2462	15.5	15.3	18.41

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		AVERAGE POWER OUTPUT (dBm)
		Chain(0)	Chain(1)	
1	2412	11.1	11.4	14.26
2	2417	13.4	13.6	16.51
6	2437	16.1	15.9	19.01
10	2457	12.9	12.7	15.81
11	2462	9.7	9.8	12.76

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		AVERAGE POWER OUTPUT (dBm)
		Chain(0)	Chain(1)	
1	2412	10.7	11.1	13.91
2	2417	13.2	13.0	16.11
6	2437	16.4	15.8	19.12
10	2457	12.3	12.3	15.31
11	2462	9.8	9.1	12.47

BT_LE-GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)
0	2402	10.50
19	2440	10.80
39	2480	11.00

4.3 POWER SPECTRAL DENSITY MEASUREMENT

4.3.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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 : Aug. 22 to Oct. 25, 2012

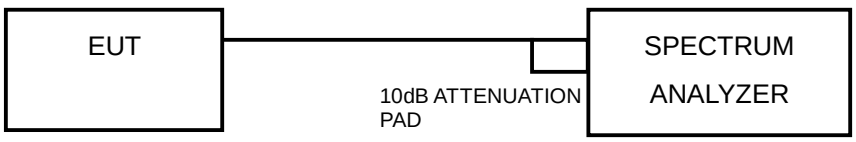
4.3.3 TEST PROCEDURE

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 = 10log(3 kHz/100kHz)

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITION

Same as Item 4.1.6

4.3.7 TEST RESULTS

802.11b

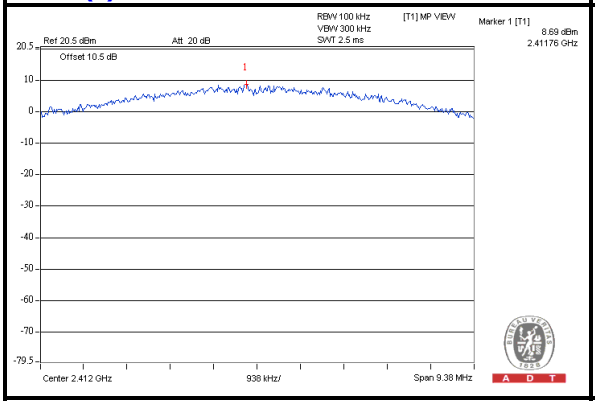
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	8.69	-6.54	3.01	-3.53	7.37	PASS
	6	2437	9.35	-5.88	3.01	-2.87	7.37	PASS
	11	2462	7.52	-7.71	3.01	-4.70	7.37	PASS
1	1	2412	8.07	-7.16	3.01	-4.15	7.37	PASS
	6	2437	9.12	-6.11	3.01	-3.10	7.37	PASS
	11	2462	7.89	-7.34	3.01	-4.33	7.37	PASS

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

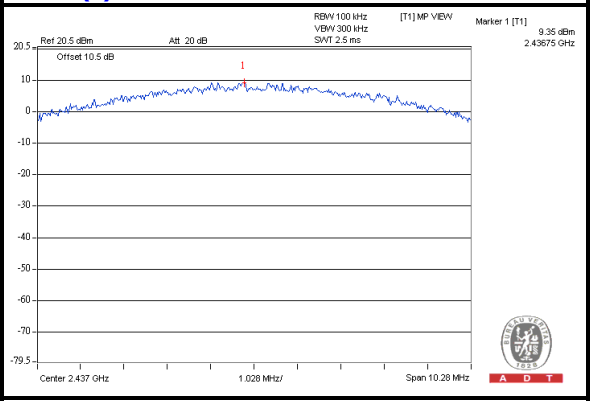
Effective Legacy Gain (dBi)=6.63

The effective legacy gain is 6.63dBi, therefore the limit needs to reduce.

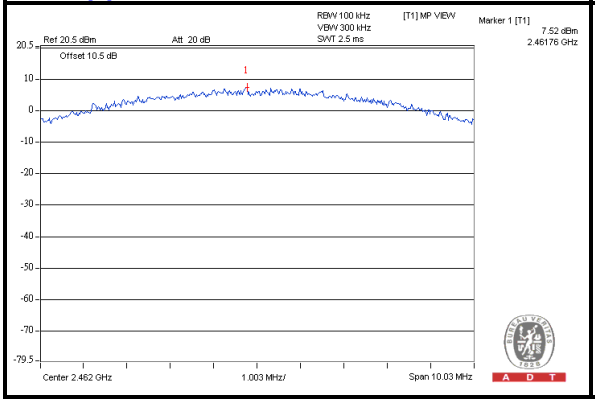
Chain(0) : CH1



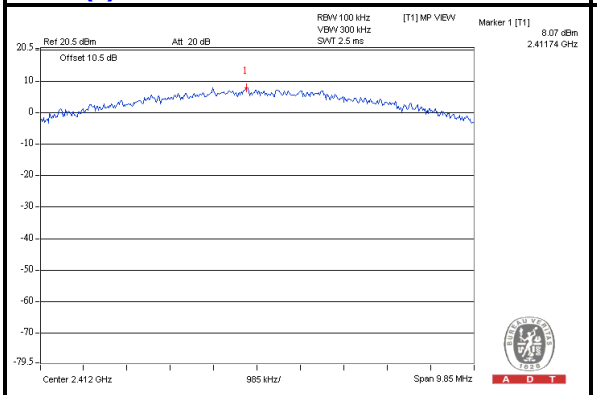
Chain(0) : CH6



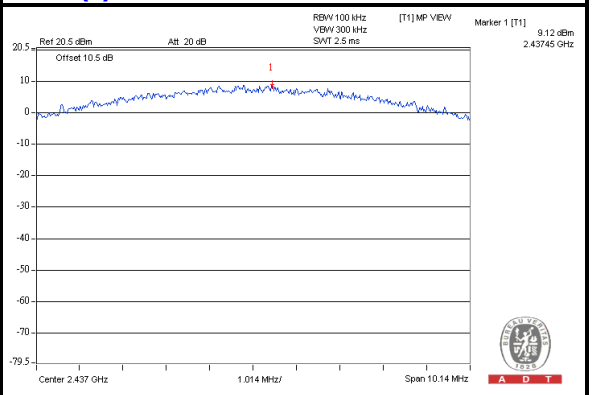
Chain(0) : CH11



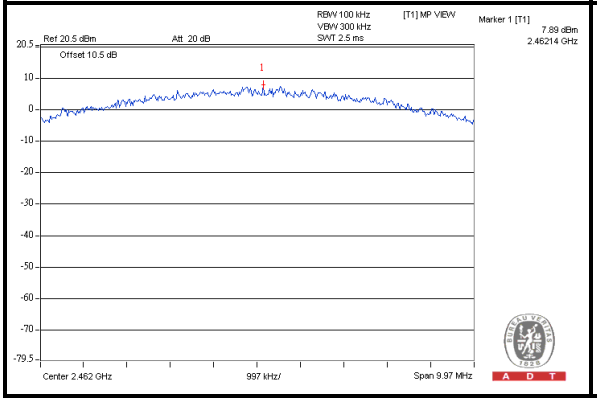
Chain(1) : CH1



Chain(1) : CH6



Chain(1) : CH11



802.11g

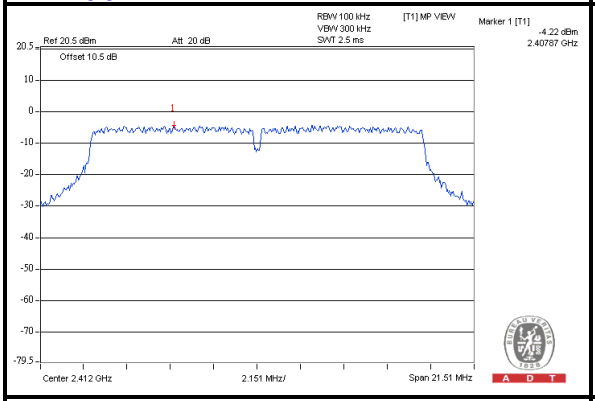
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-4.22	-19.45	3.01	-16.44	7.37	PASS
	6	2437	1.94	-13.29	3.01	-10.28	7.37	PASS
	11	2462	-5.15	-20.38	3.01	-17.37	7.37	PASS
1	1	2412	-3.33	-18.56	3.01	-15.55	7.37	PASS
	6	2437	2.46	-12.77	3.01	-9.76	7.37	PASS
	11	2462	-4.30	-19.53	3.01	-16.52	7.37	PASS

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

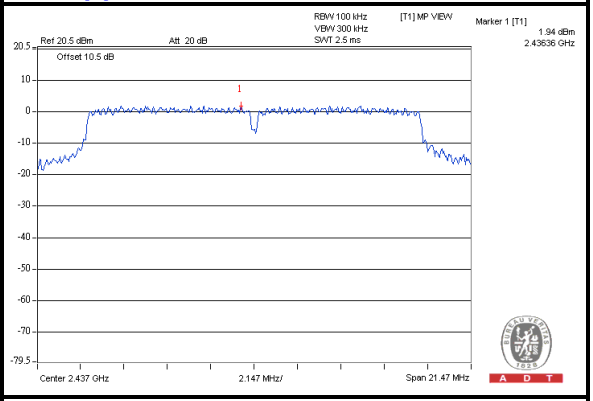
Effective Legacy Gain (dBi)=6.63

The effective legacy gain is 6.63dBi, therefore the limit needs to reduce.

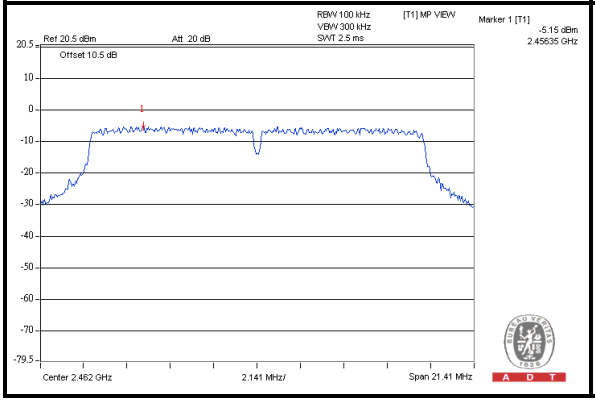
Chain(0) : CH1



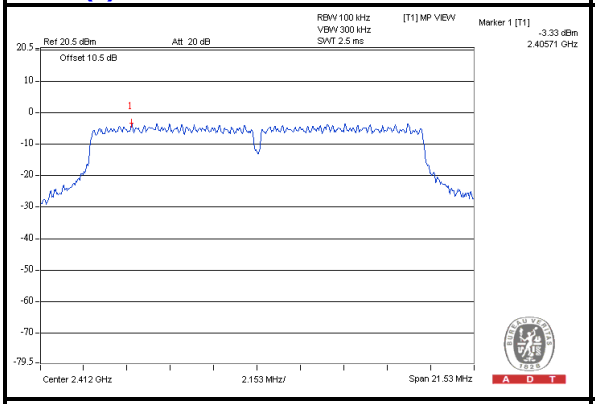
Chain(0) : CH6



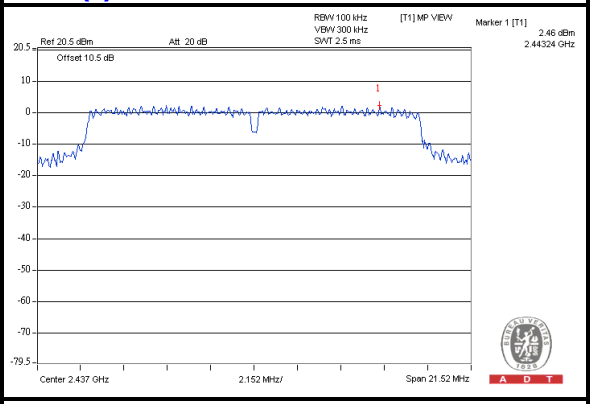
Chain(0) : CH11



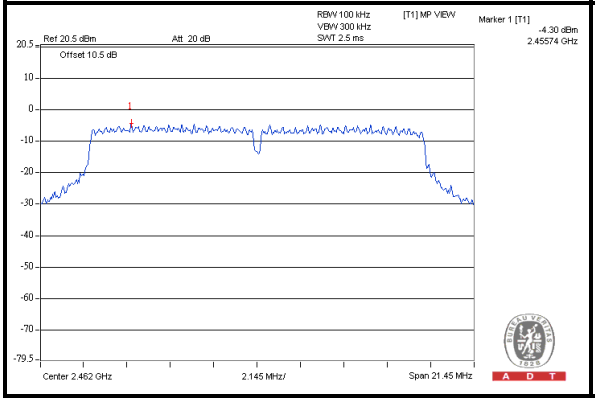
Chain(1) : CH1



Chain(1) : CH6



Chain(1) : CH11



802.11n (HT20)

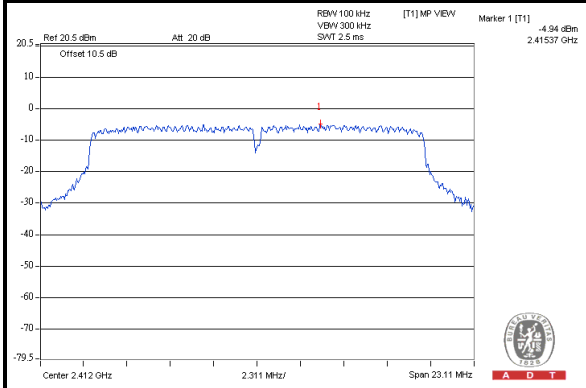
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-4.94	-20.17	3.01	-17.16	7.37	PASS
	6	2437	1.80	-13.43	3.01	-10.42	7.37	PASS
	11	2462	-6.41	-21.64	3.01	-18.63	7.37	PASS
1	1	2412	-4.96	-20.19	3.01	-17.18	7.37	PASS
	6	2437	1.67	-13.56	3.01	-10.55	7.37	PASS
	11	2462	-5.66	-20.89	3.01	-17.88	7.37	PASS

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

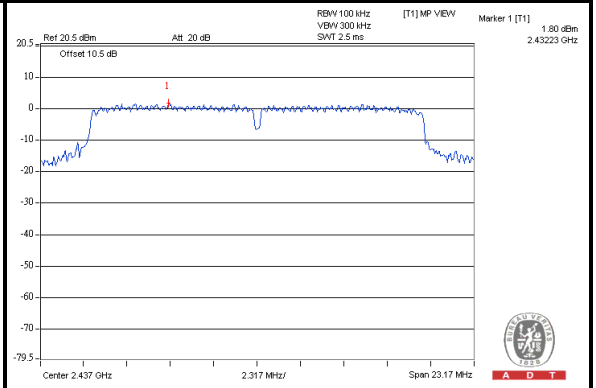
Effective Legacy Gain (dBi)= 6.63

The effective legacy gain is 6.63dBi, therefore the limit needs to reduce.

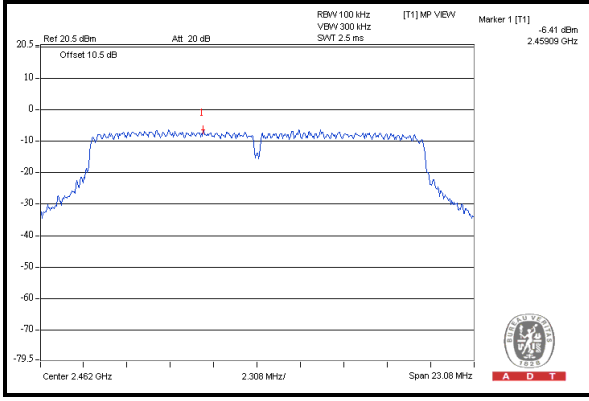
Chain(0) : CH1



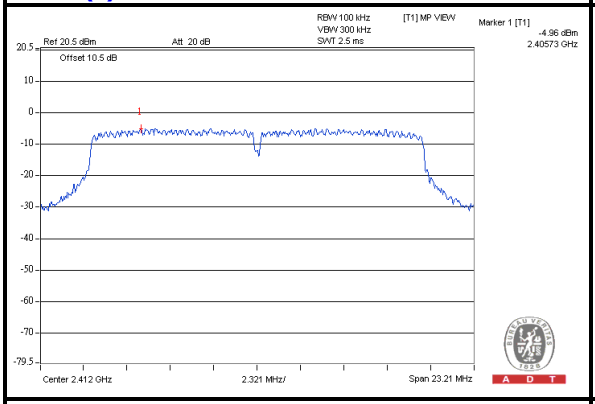
Chain(0) : CH6



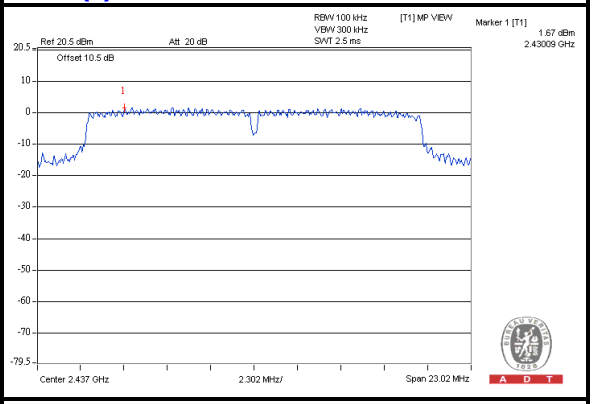
Chain(0) : CH11



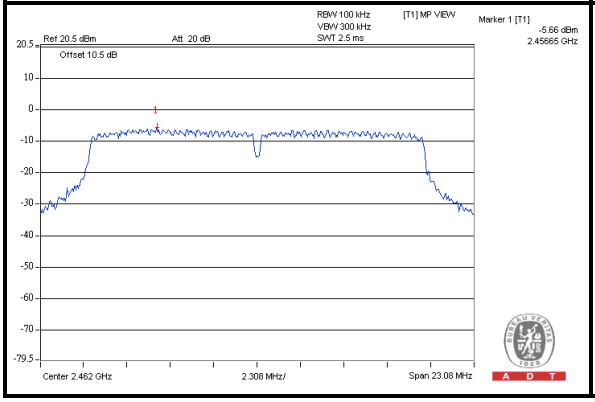
Chain(1) : CH1



Chain(1) : CH6



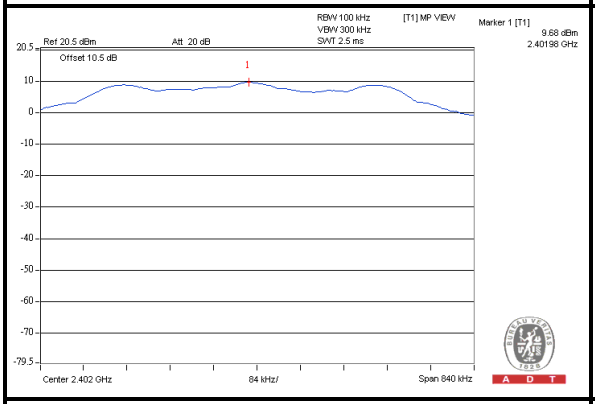
Chain(1) : CH11



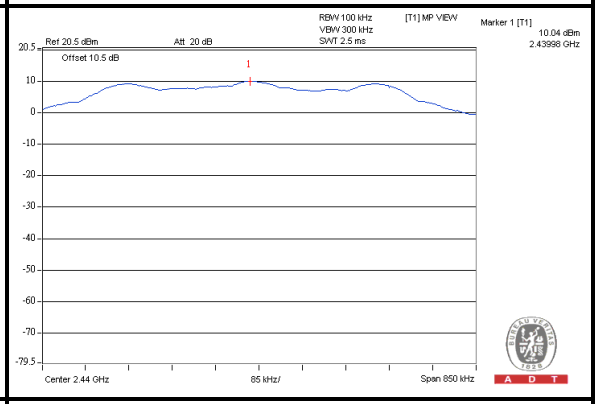
BT_LE-GFSK

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	2402	9.68	-5.55	8	PASS
19	2440	10.04	-4.83	8	PASS
39	2480	10.45	-4.78	8	PASS

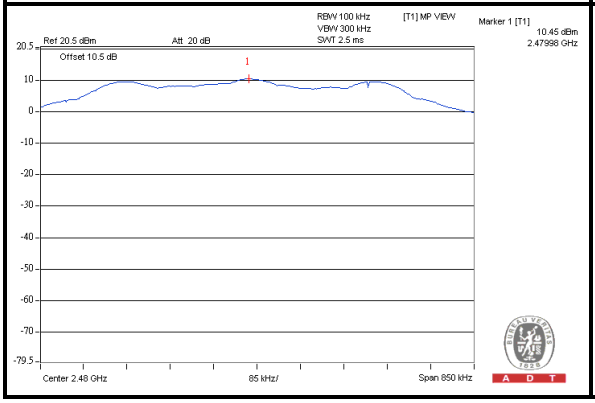
CH0



CH19



CH39



4.4 6dB BANDWIDTH MEASUREMENT

4.4.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	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 : Aug. 22 to Oct. 25, 2012

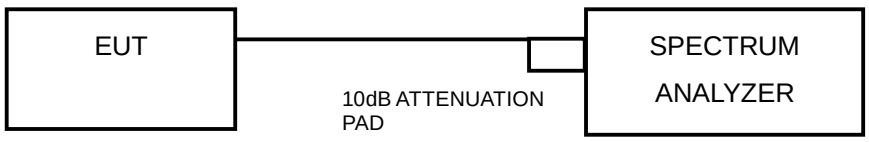
4.4.3 TEST PROCEDURE

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

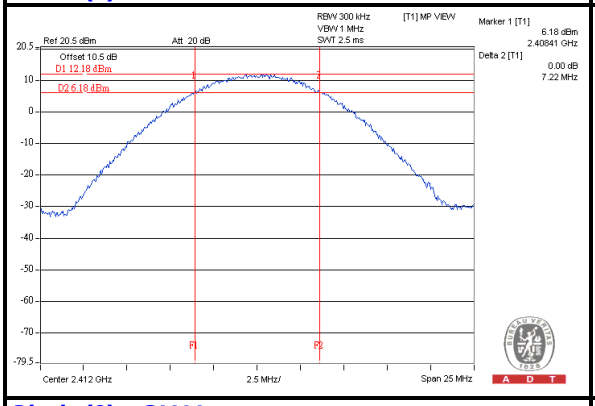
Same as Item 4.1.6

4.4.7 TEST RESULTS

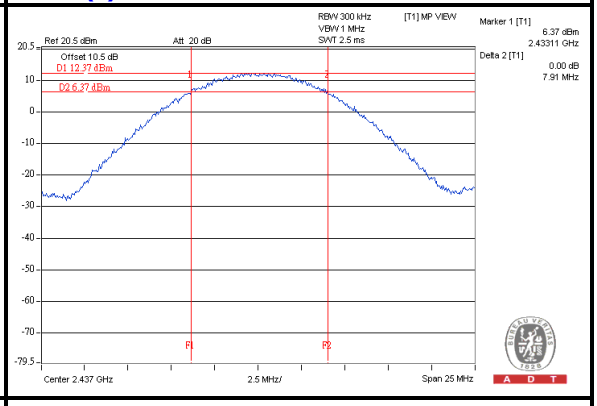
802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	7.22	7.58	0.5	PASS
6	2437	7.91	7.80	0.5	PASS
11	2462	7.72	7.67	0.5	PASS

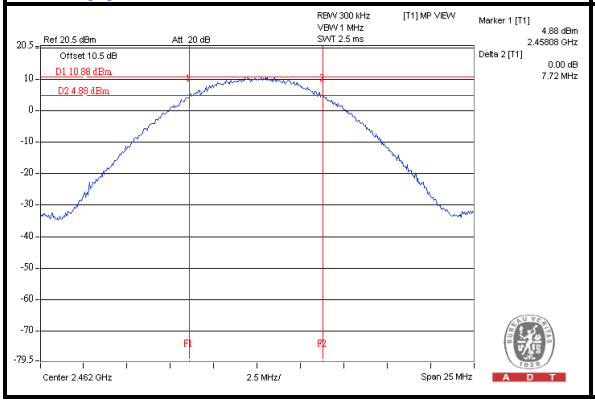
Chain(0) : CH1



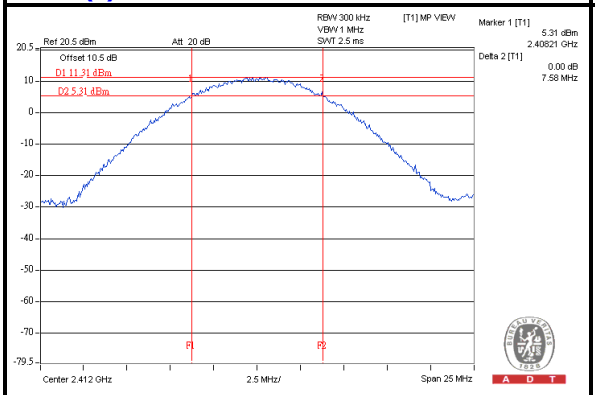
Chain(0) : CH6



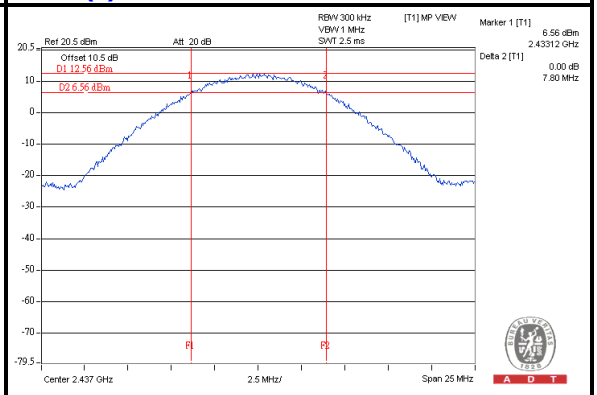
Chain(0) : CH11



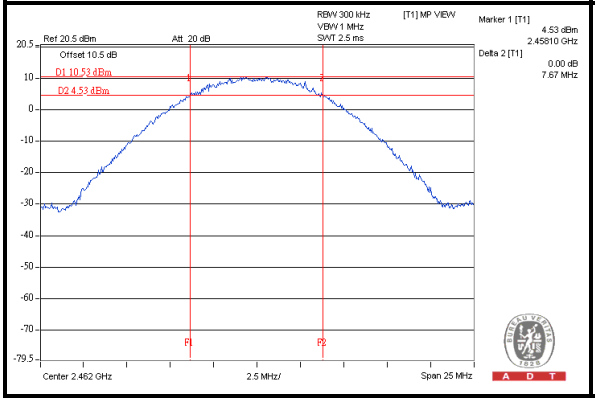
Chain(1) : CH1



Chain(1) : CH6



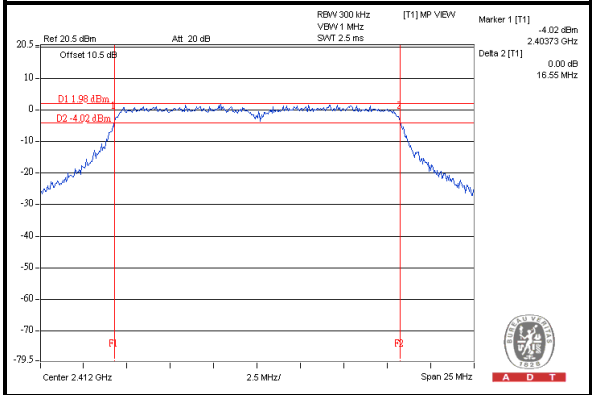
Chain(1) : CH11



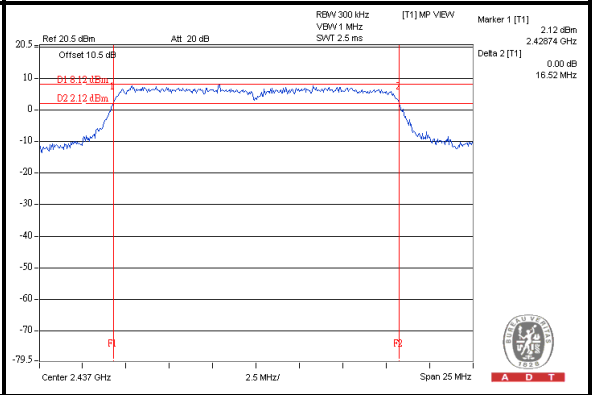
802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	16.55	16.57	0.5	PASS
6	2437	16.52	16.56	0.5	PASS
11	2462	16.48	16.51	0.5	PASS

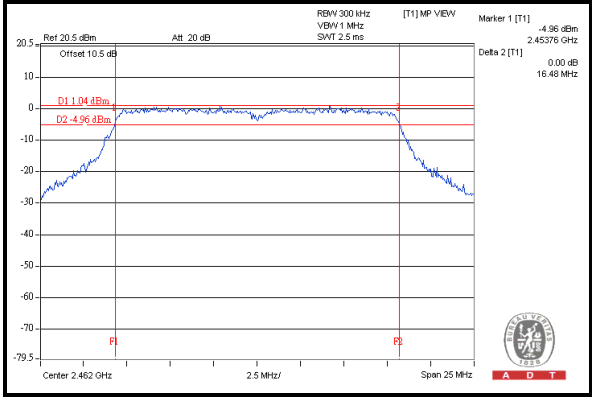
Chain(0) : CH1



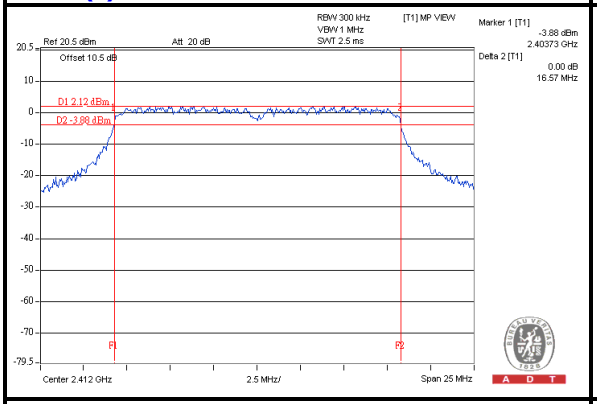
Chain(0) : CH6



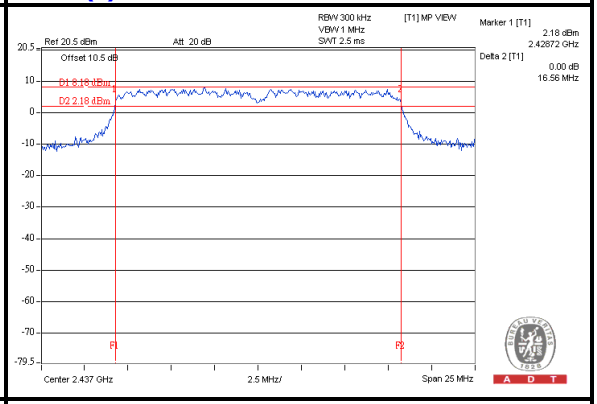
Chain(0) : CH11



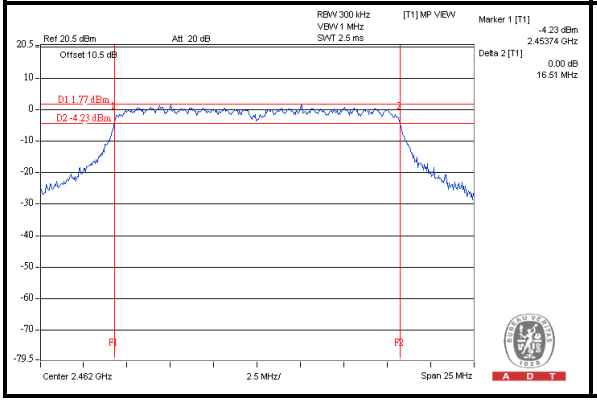
Chain(1) : CH1



Chain(1) : CH6



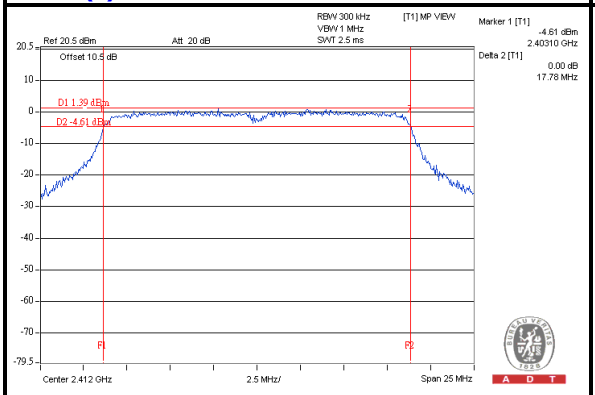
Chain(1) : CH11



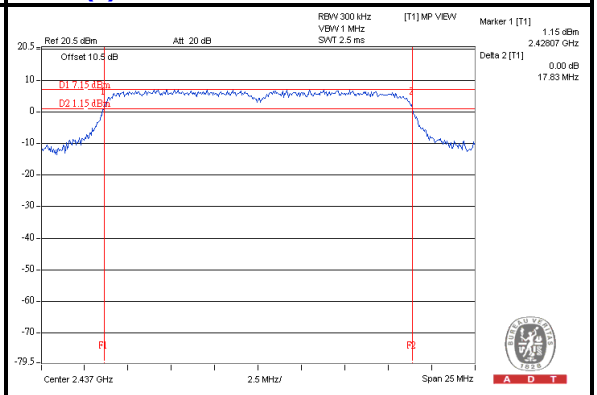
802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	17.78	17.86	0.5	PASS
6	2437	17.83	17.71	0.5	PASS
11	2462	17.76	17.76	0.5	PASS

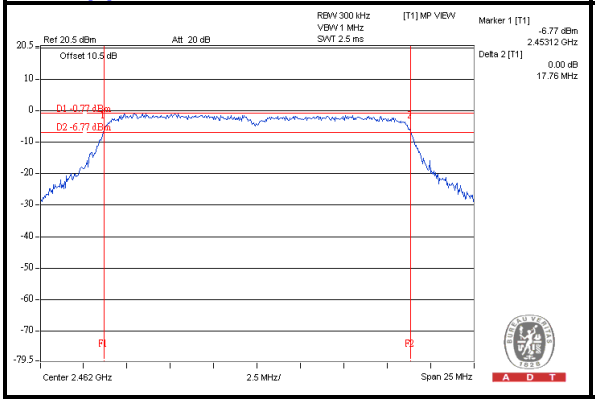
Chain(0) : CH1



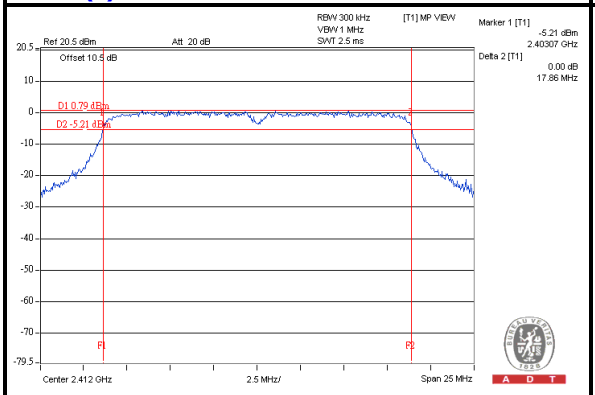
Chain(0) : CH6



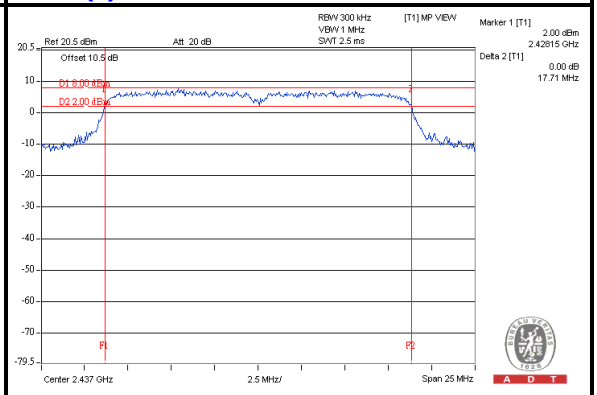
Chain(0) : CH11



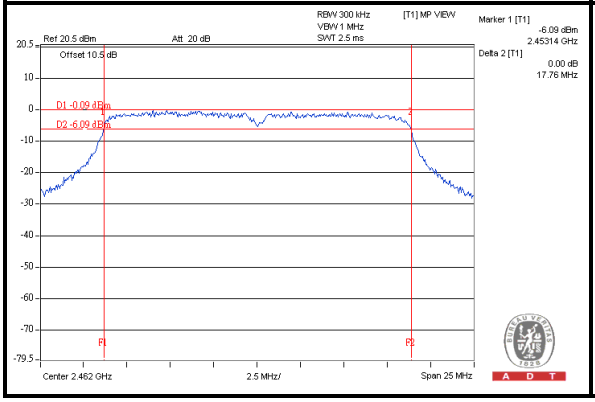
Chain(1) : CH1



Chain(1) : CH6



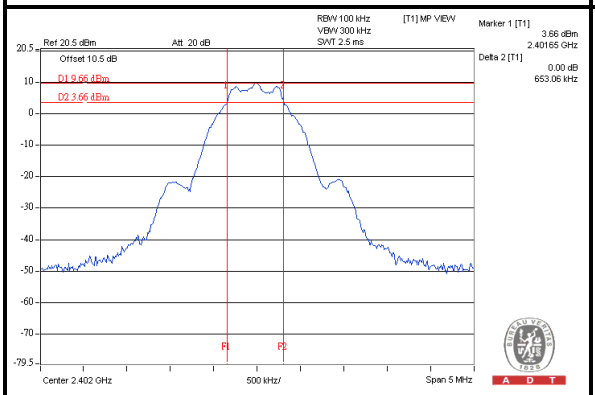
Chain(1) : CH11



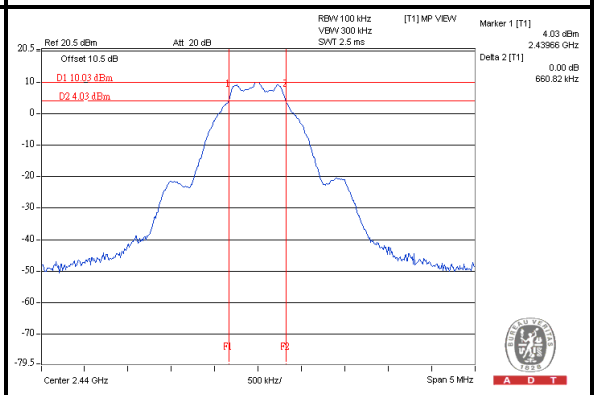
BT_LE-GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)
0	2402	0.653
19	2440	0.660
39	2480	0.661

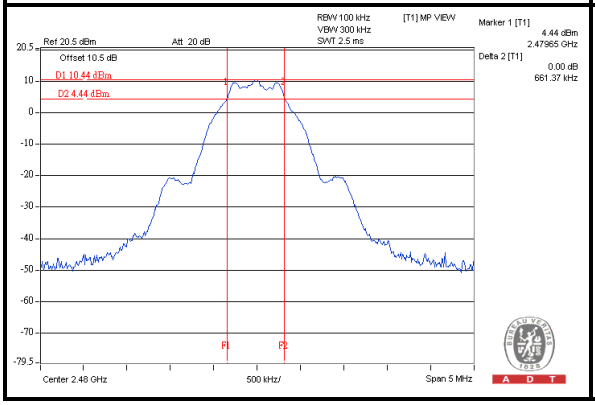
CH0



CH19



CH39



4.5 OCCUPIED BANDWIDTH MEASUREMENT

4.5.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100036	Dec. 14, 2011	Dec. 13, 2012

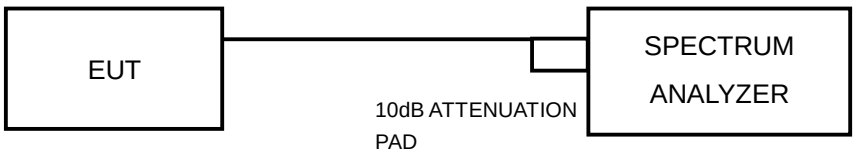
Note:

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 : Aug. 22 to Oct. 25, 2012

4.5.2 TEST PROCEDURE

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

4.5.3 TEST SETUP



4.5.4 EUT OPERATING CONDITIONS

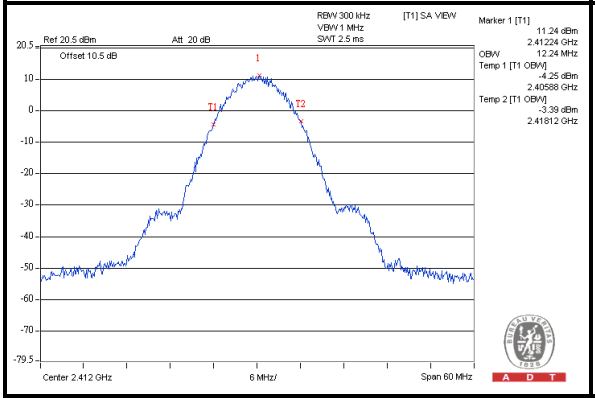
Same as Item 4.1.6

4.5.5 TEST RESULTS

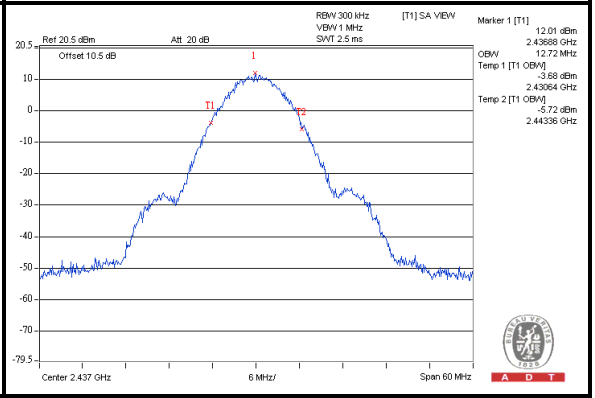
802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN(0)	CHAIN(1)
1	2412	12.24	12.48
6	2437	12.72	13.20
11	2462	12.36	12.48

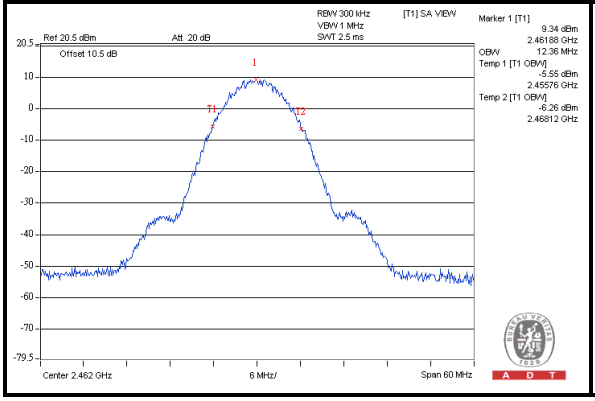
Chain(0) : CH1



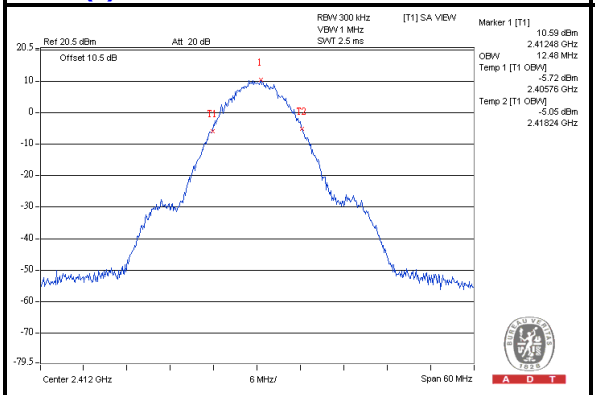
Chain(0) : CH6



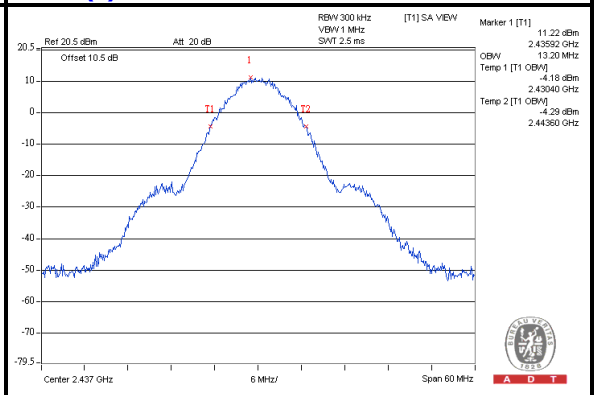
Chain(0) : CH11



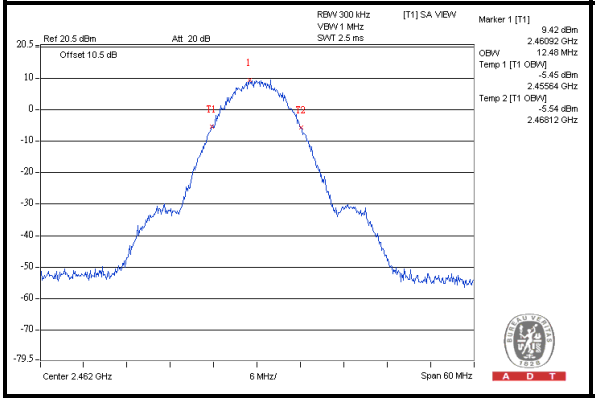
Chain(1) : CH1



Chain(1) : CH6



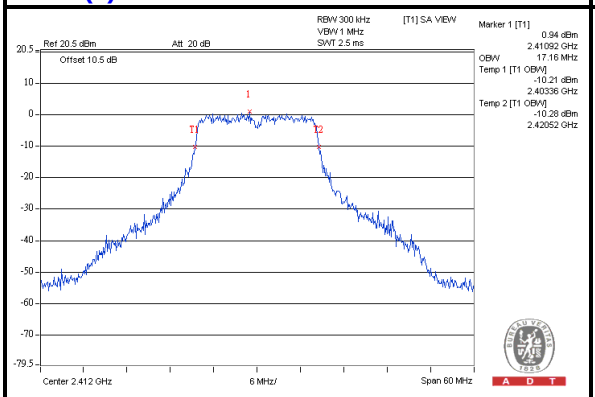
Chain(1) : CH11



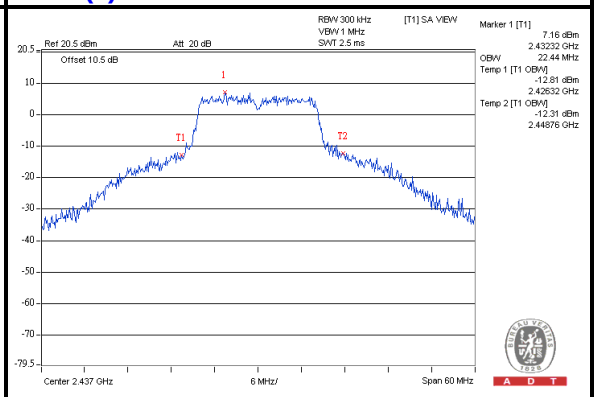
802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN(0)	CHAIN(1)
1	2412	17.16	16.92
6	2437	22.44	25.68
11	2462	17.04	16.92

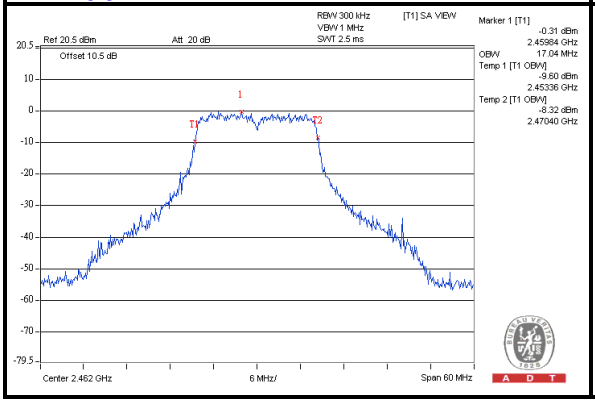
Chain(0) : CH1



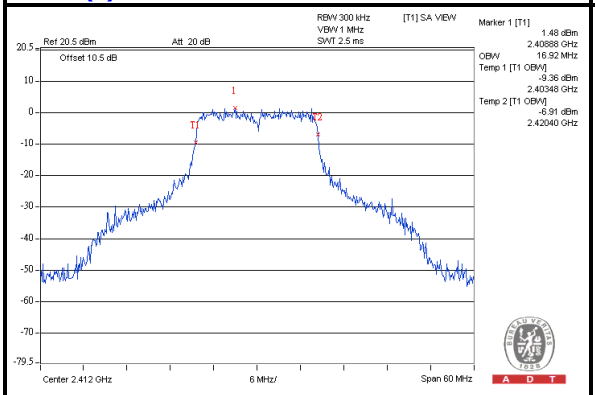
Chain(0) : CH6



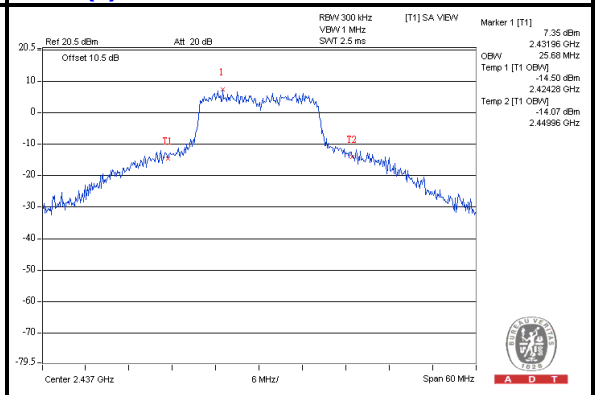
Chain(0) : CH11



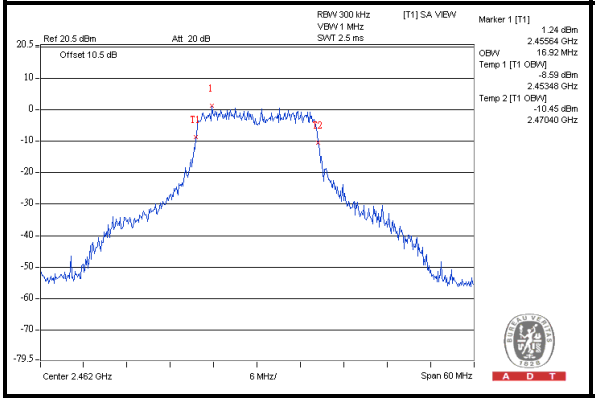
Chain(1) : CH1



Chain(1) : CH6



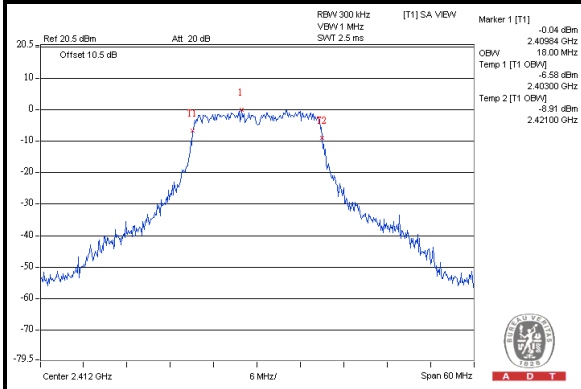
Chain(1) : CH11



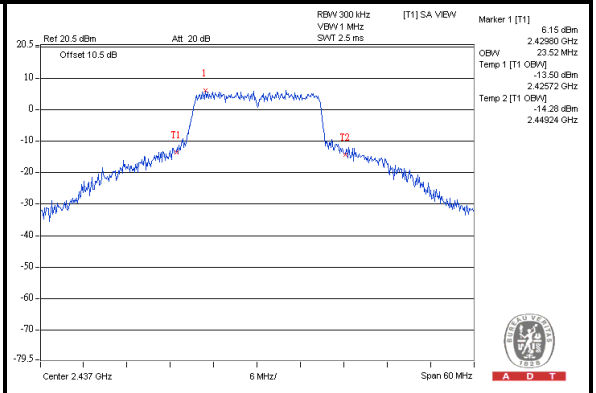
802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN(0)	CHAIN(1)
1	2412	18.00	18.12
6	2437	23.52	26.40
11	2462	18.12	18.12

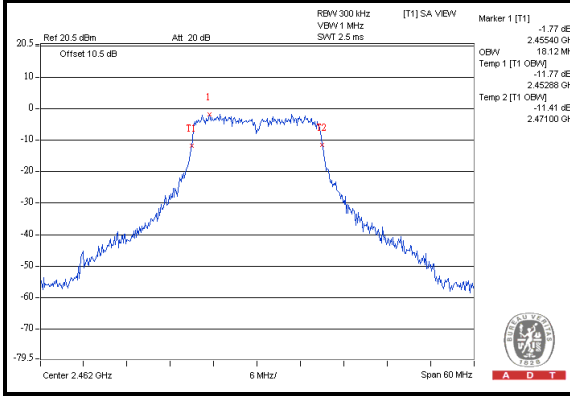
Chain(0) : CH1



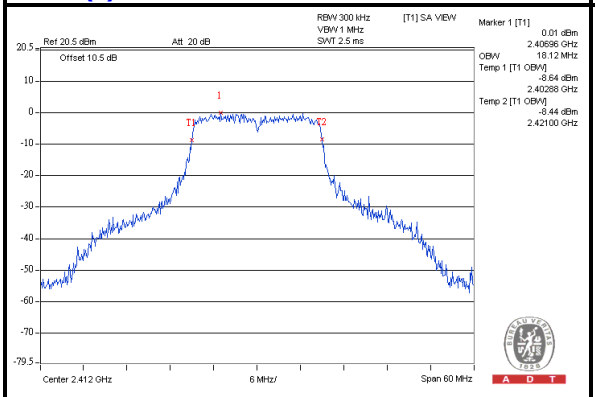
Chain(0) : CH6



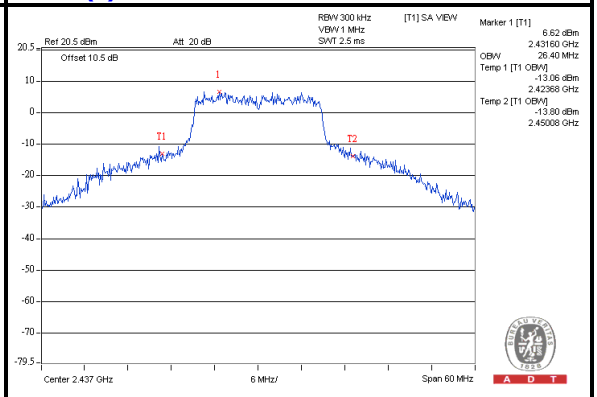
Chain(0) : CH11



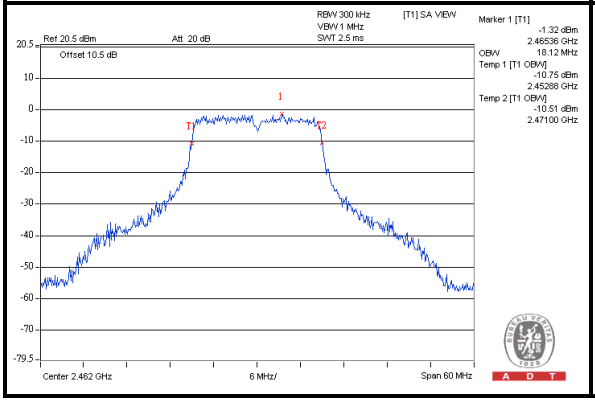
Chain(1) : CH1



Chain(1) : CH6



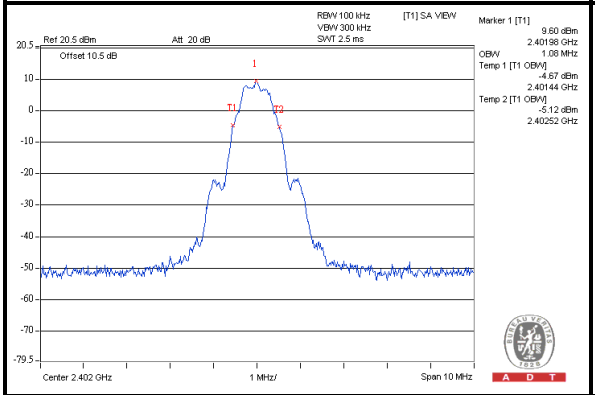
Chain(1) : CH11



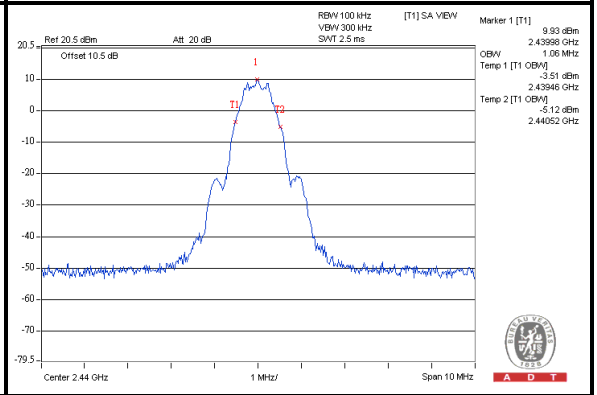
BT_LE-GFSK

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)
0	2402	1.08
19	2440	1.06
39	2480	1.06

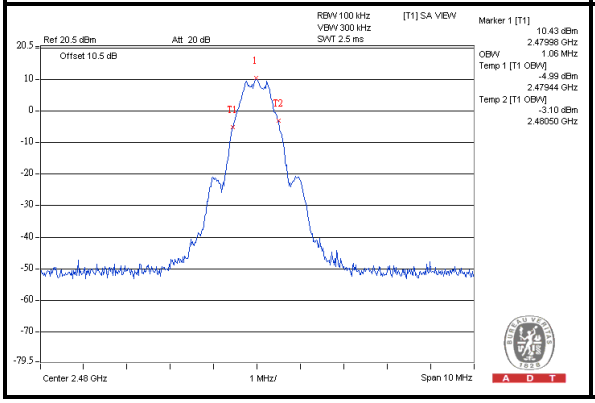
CH0



CH19



CH39



4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	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 : Aug. 22 to Oct. 25, 2012

4.6.3 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

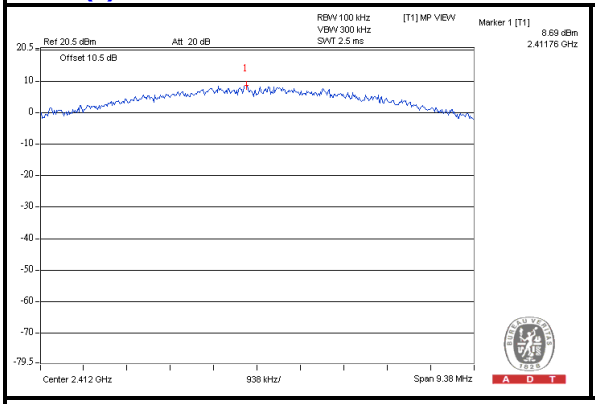
Same as Item 4.1.6

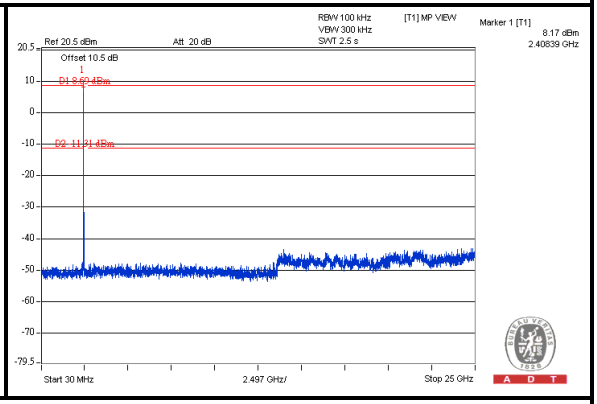
4.6.6 TEST RESULTS

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.

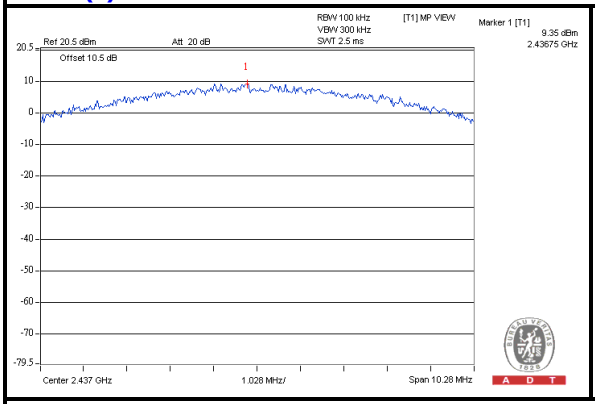
802.11b

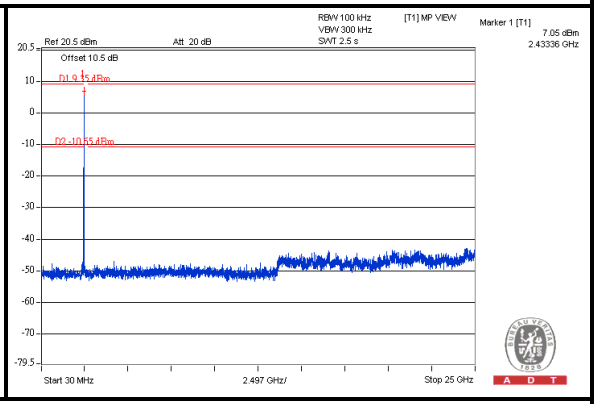
Chain(0) : CH 1



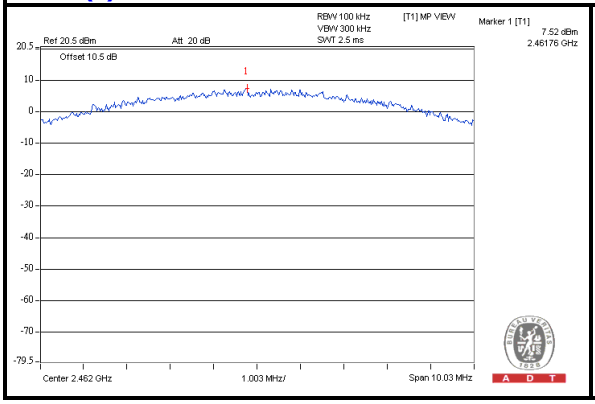


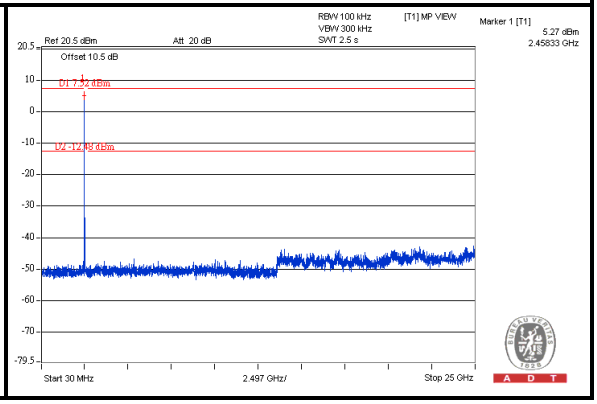
Chain(0) : CH 6





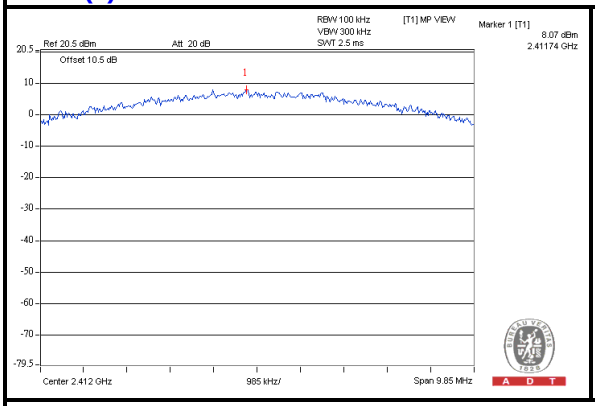
Chain(0) : CH 11

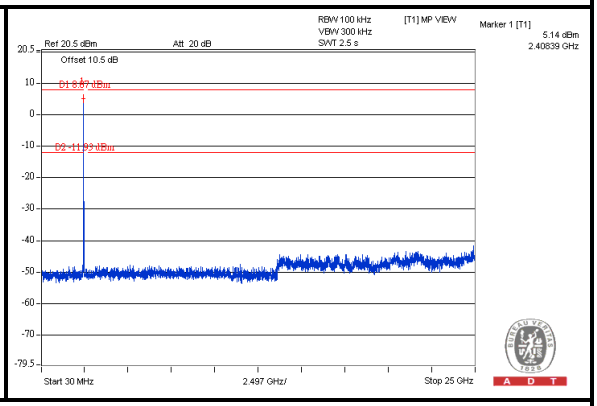




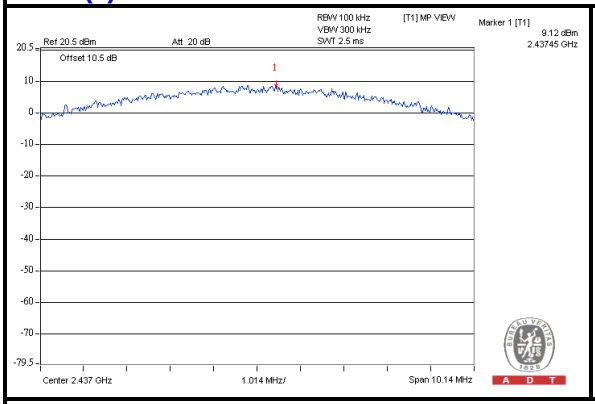
802.11b

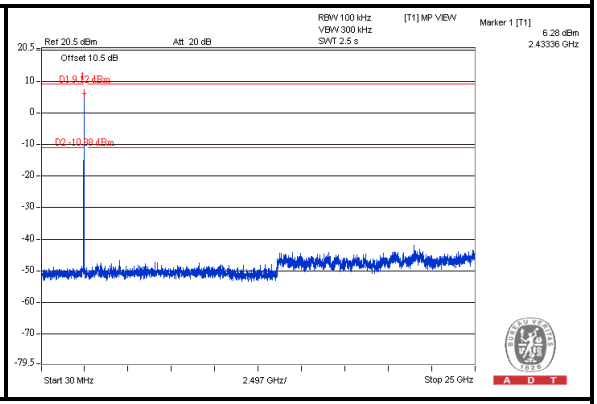
Chain(1) : CH 1



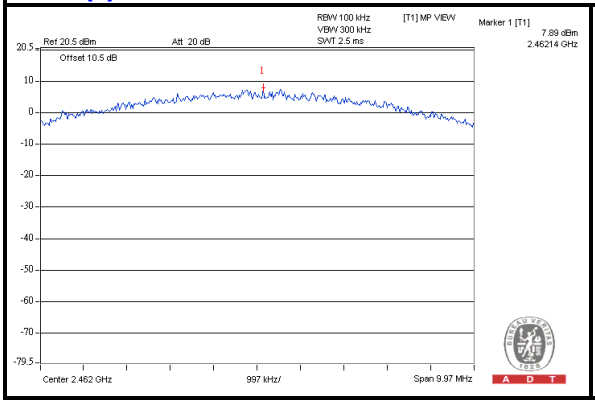


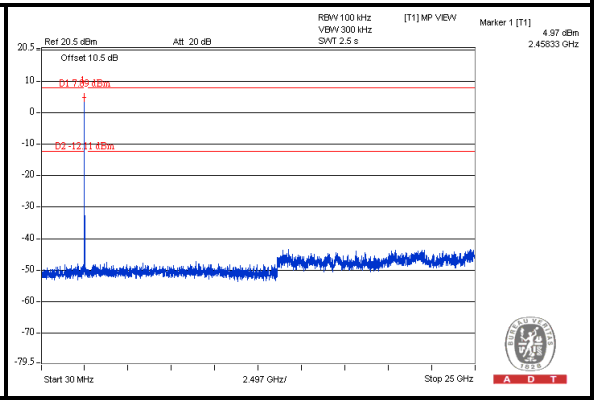
Chain(1) : CH 6





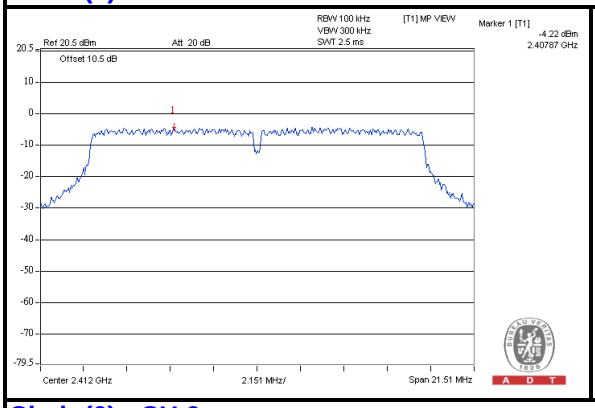
Chain(1) : CH 11

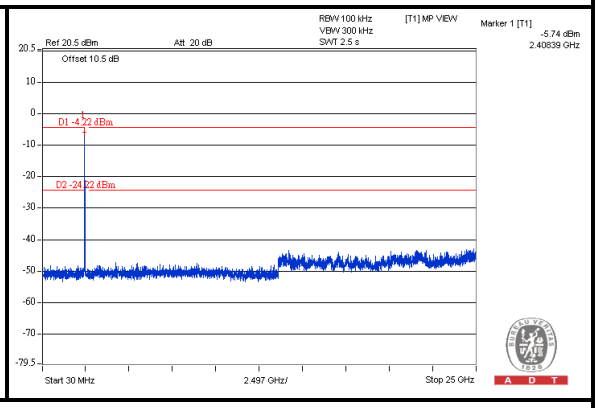




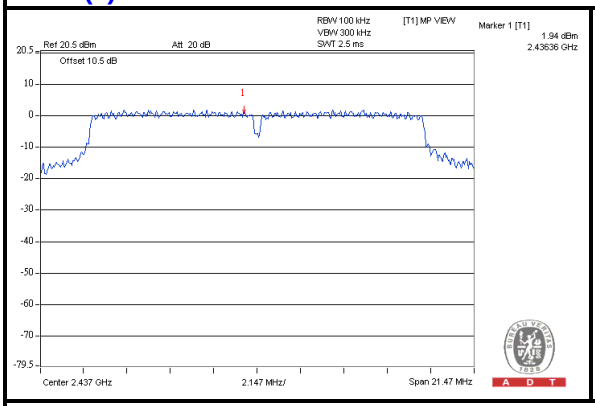
802.11g

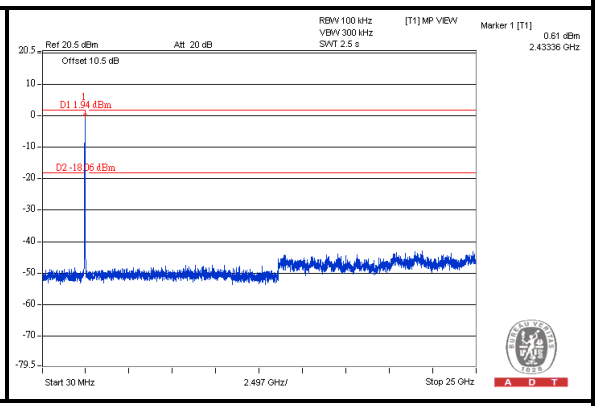
Chain(0) : CH 1



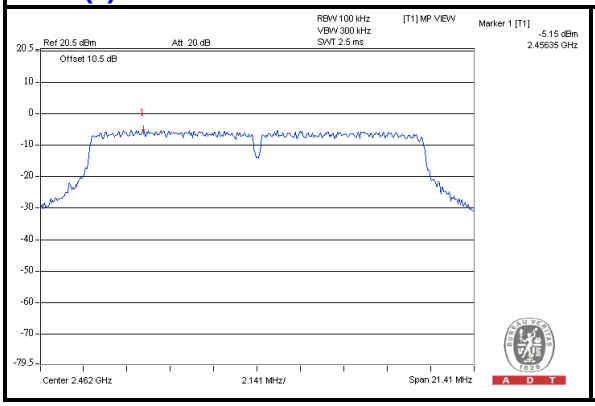


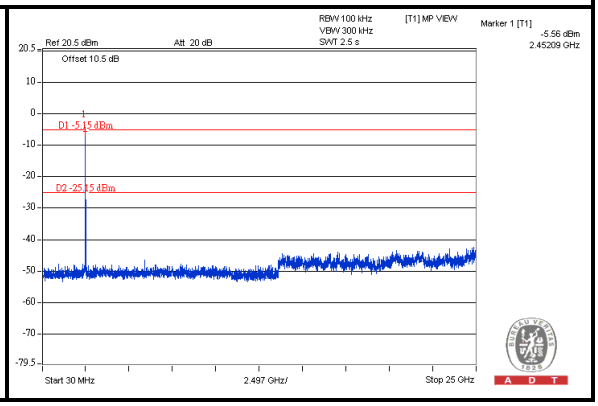
Chain(0) : CH 6





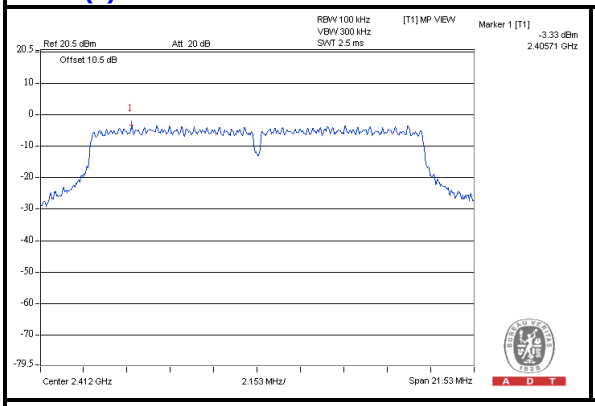
Chain(0) : CH 11

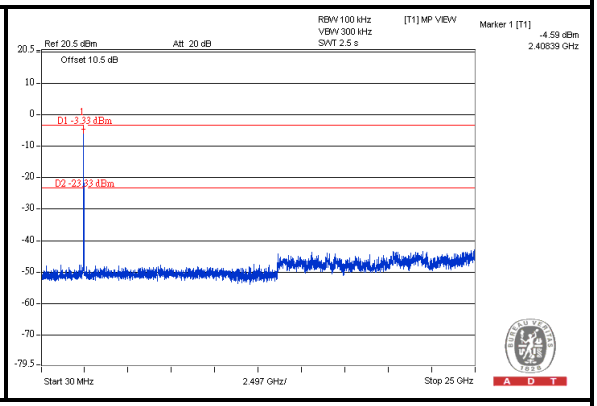




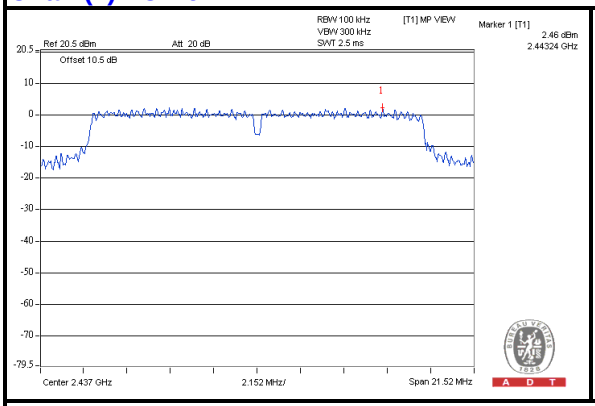
802.11g

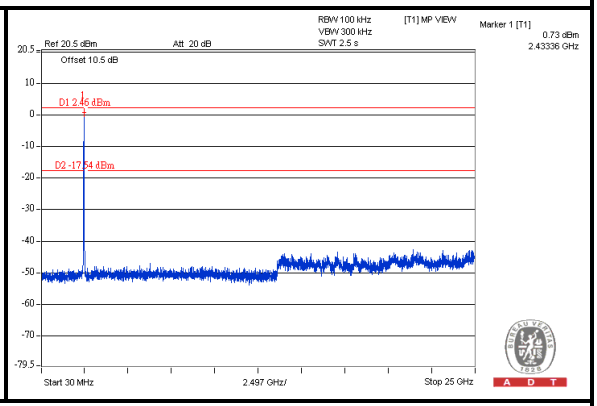
Chain(1) : CH 1



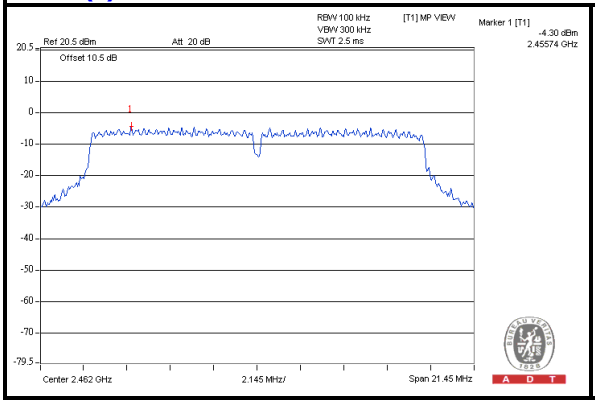


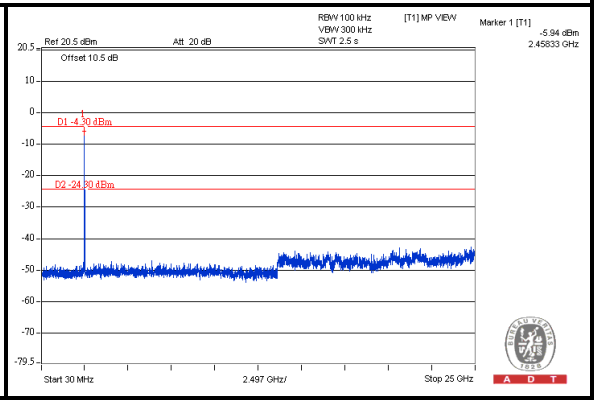
Chain(1) : CH 6





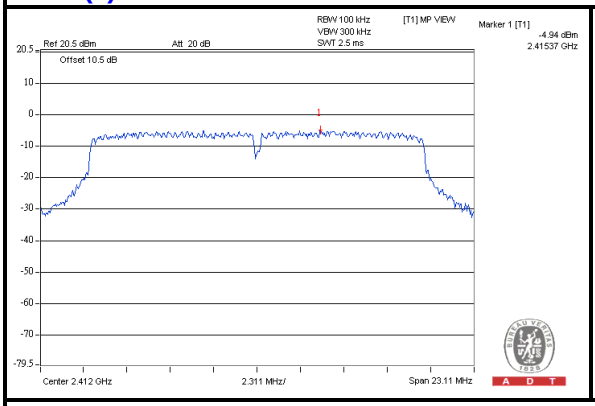
Chain(1) : CH 11

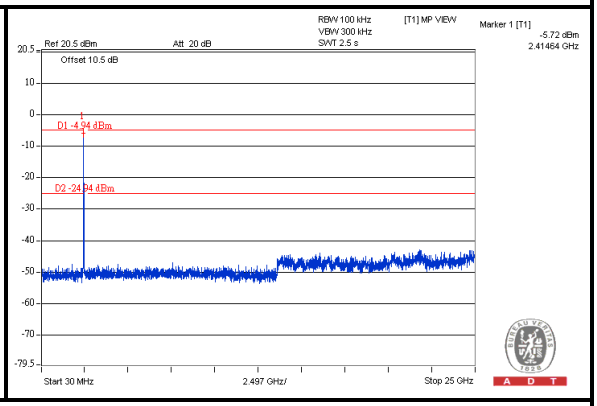




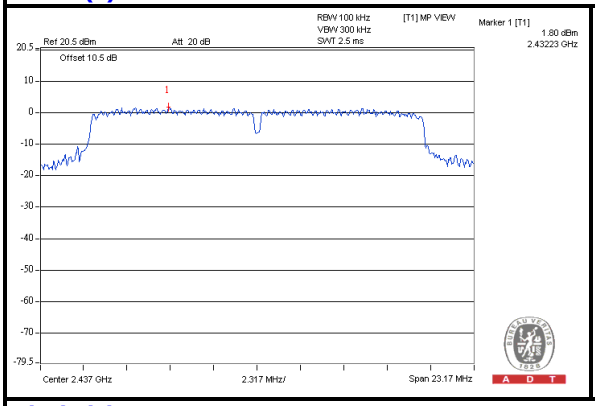
802.11n (HT20)

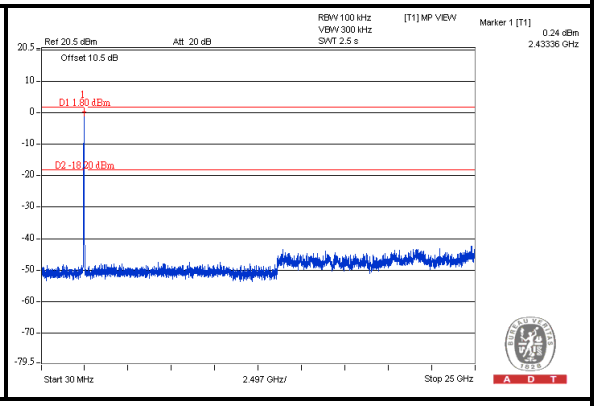
Chain(0) : CH 1



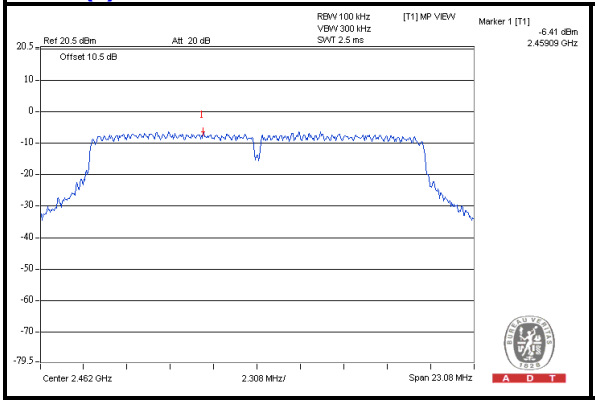


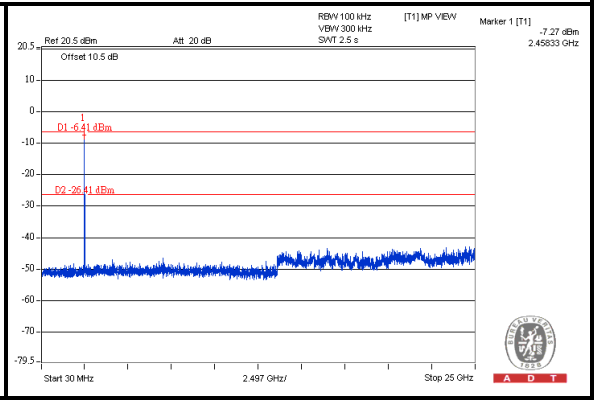
Chain(0) : CH 6





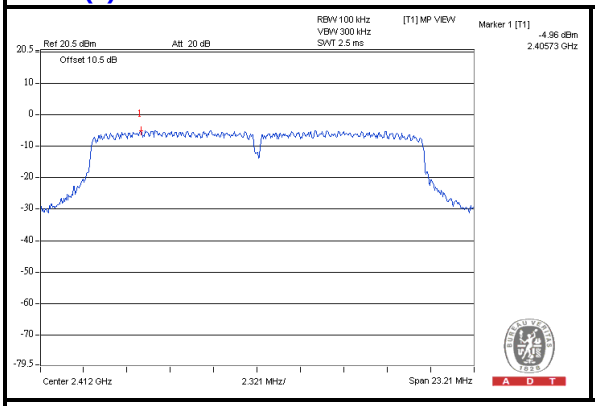
Chain(0) : CH 11

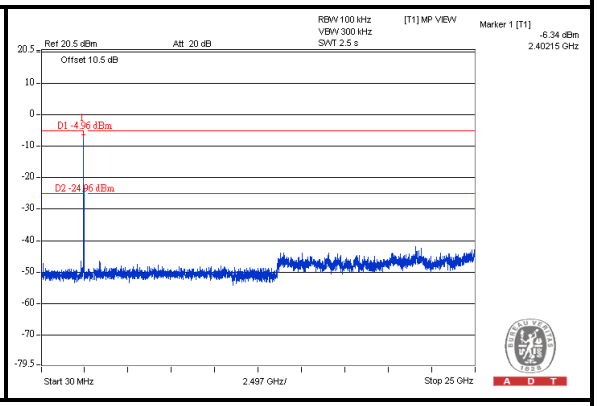




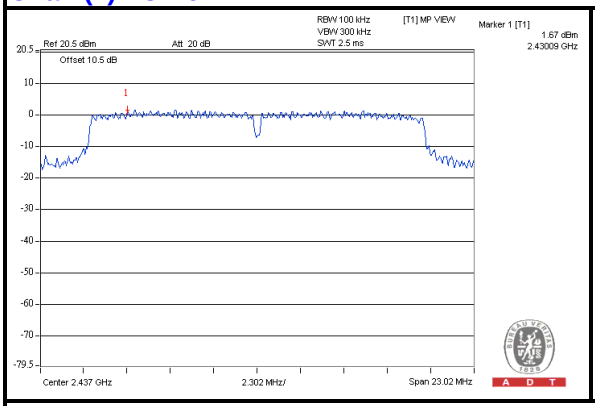
802.11n (HT20)

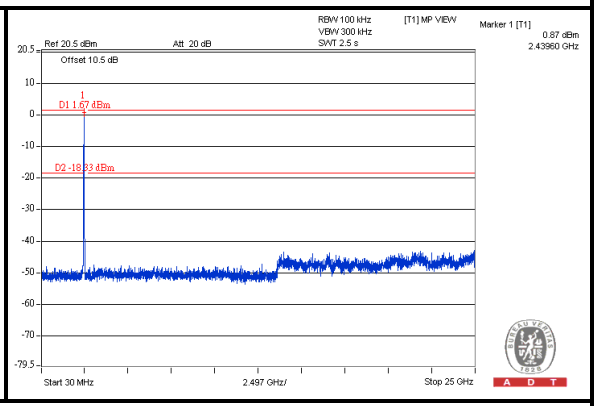
Chain(1) : CH 1



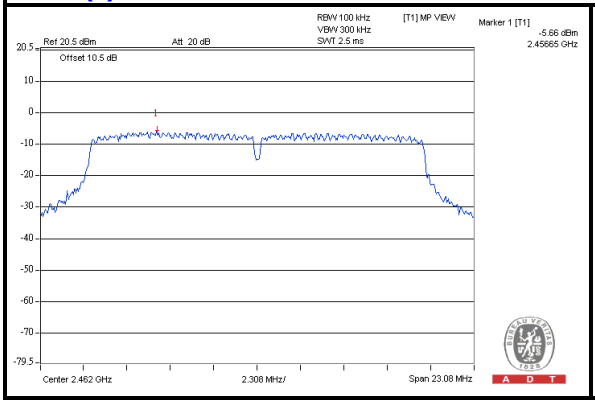


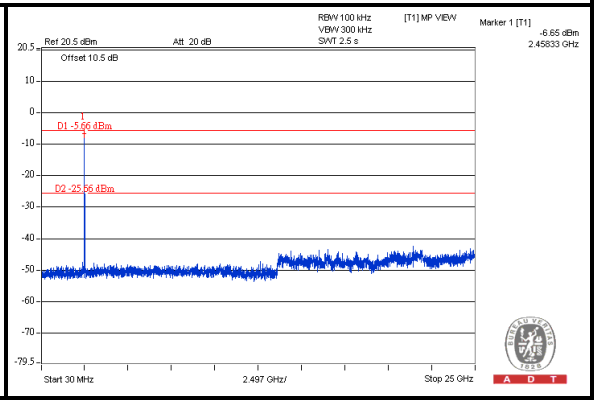
Chain(1) : CH 6





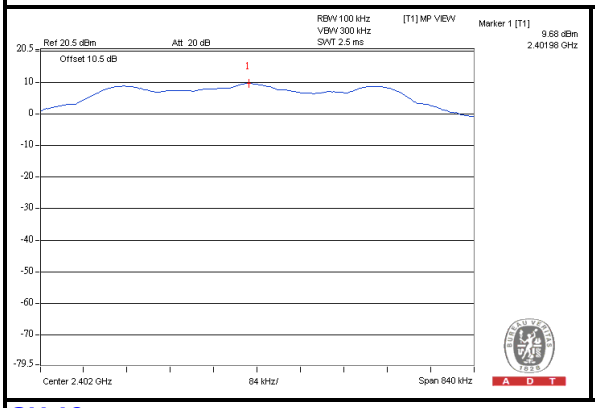
Chain(1) : CH 11

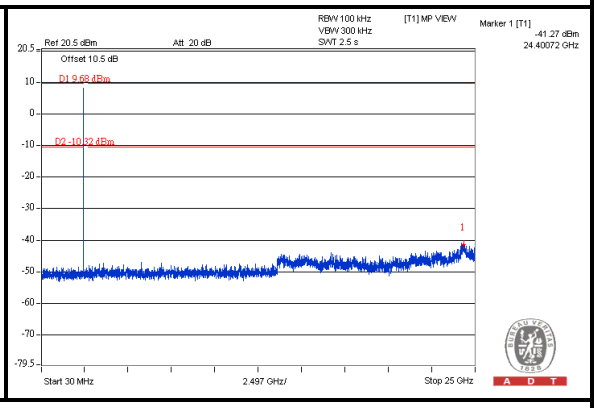




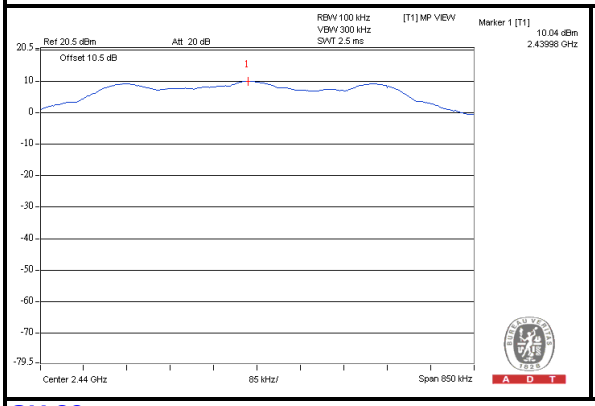
BT_LE-GFSK

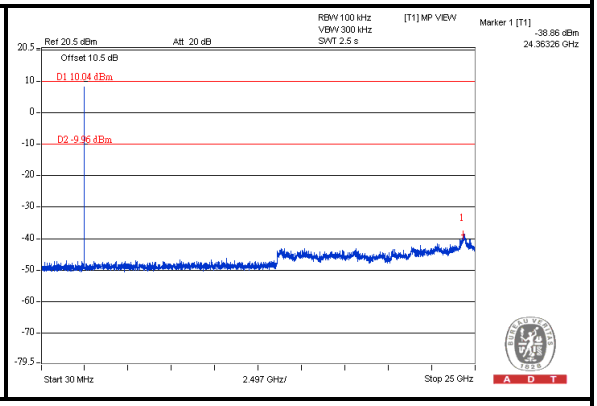
CH 0



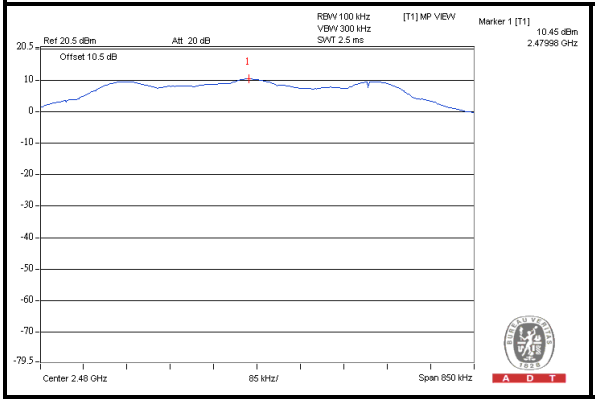


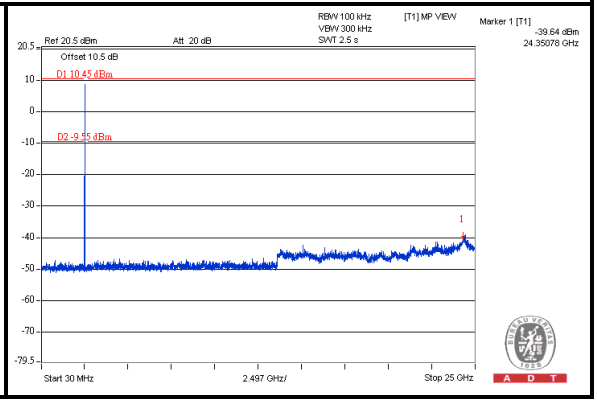
CH 19





CH 39





4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

4.7.2 TEST INSTRUMENTS

For WLAN mode test

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 24, 2012	July 23, 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: Aug. 16 to 20, 2012

For BT <LE> mode test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250253	Sep. 03, 2012	Sep. 02, 2013
Pre-Selector Agilent	N9039A	MY46520310	Sep. 03, 2012	Sep. 02, 2013
Signal Generator Agilent	N5181A	MY49060347	July 24, 2012	July 23, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	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. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 27, 2011	Dec. 26, 2012
RF Cable	NA	CHHCAB_001	Oct. 06, 2012	Oct. 05, 2013
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: Oct. 25, 2012

4.7.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

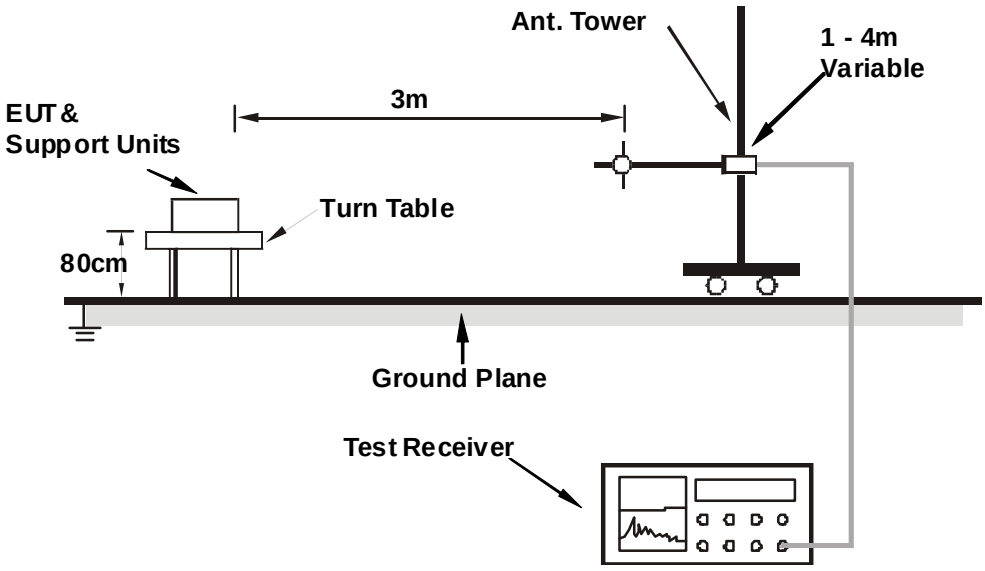
NOTE:

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



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

4.7.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “EMI_ART2_AR6K_2299Eng” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.7.7 TEST RESULTS (WLAN MODE)

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

CHANNEL	TX Channel 6	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	50.01	27.3 QP	40.0	-12.7	1.50 H	360	13.39	13.94
2	650.06	40.0 QP	46.0	-6.0	1.50 H	334	17.11	22.87
3	700.04	39.0 QP	46.0	-7.0	1.50 H	330	15.33	23.67
4	750.01	36.9 QP	46.0	-9.1	1.00 H	322	12.37	24.56
5	775.00	39.8 QP	46.0	-6.2	1.00 H	323	14.72	25.09
6	824.97	34.9 QP	46.0	-11.1	1.00 H	231	8.98	25.95
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	132.67	39.7 QP	43.5	-3.8	2.00 V	149	26.21	13.50
2	324.99	42.3 QP	46.0	-3.8	1.50 V	141	26.37	15.88
3	349.98	42.0 QP	46.0	-4.1	1.00 V	303	25.49	16.46
4	399.95	40.7 QP	46.0	-5.3	2.00 V	276	22.96	17.70
5	650.06	38.3 QP	46.0	-7.7	1.00 V	124	15.39	22.87
6	725.02	42.0 QP	46.0	-4.0	1.00 V	119	17.91	24.12

REMARKS:

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

ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2389.07	59.9 PK	74.0	-14.1	1.41 H	86	27.52	32.38
2	2389.07	52.7 AV	54.0	-1.3	1.41 H	86	20.32	32.38
3	*2412.00	107.7 PK			1.41 H	86	75.26	32.44
4	*2412.00	105.3 AV			1.41 H	86	72.86	32.44
5	4824.00	53.7 PK	74.0	-20.3	1.02 H	324	11.76	41.94
6	4824.00	45.1 AV	54.0	-8.9	1.02 H	324	3.16	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	59.4 PK	74.0	-14.6	1.00 V	247	27.02	32.38
2	2390.00	50.3 AV	54.0	-3.7	1.00 V	247	17.92	32.38
3	*2412.00	108.9 PK			1.00 V	247	76.46	32.44
4	*2412.00	106.7 AV			1.00 V	247	74.26	32.44
5	4824.00	54.4 PK	74.0	-19.6	1.03 V	295	12.46	41.94
6	4824.00	48.2 AV	54.0	-5.8	1.03 V	295	6.26	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	108.4 PK			1.39 H	92	75.89	32.51
2	*2437.00	105.7 AV			1.39 H	92	73.19	32.51
3	4874.00	52.7 PK	74.0	-21.3	1.01 H	304	10.71	41.99
4	4874.00	44.5 AV	54.0	-9.5	1.01 H	304	2.51	41.99
5	7311.00	54.3 PK	74.0	-19.7	1.62 H	341	7.77	46.53
6	7311.00	43.2 AV	54.0	-10.8	1.62 H	341	-3.33	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	108.9 PK			1.00 V	259	76.39	32.51
2	*2437.00	106.8 AV			1.00 V	259	74.29	32.51
3	4874.00	54.2 PK	74.0	-19.8	1.00 V	258	12.21	41.99
4	4874.00	48.0 AV	54.0	-6.0	1.00 V	258	6.01	41.99
5	7311.00	54.7 PK	74.0	-19.3	1.64 V	313	8.17	46.53
6	7311.00	44.8 AV	54.0	-9.2	1.64 V	313	-1.73	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	107.5 PK			1.42 H	249	74.93	32.57
2	*2462.00	105.2 AV			1.42 H	249	72.63	32.57
3	2483.50	60.1 PK	74.0	-13.9	1.42 H	249	27.47	32.63
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.42 H**	**249**	**20.37**	**32.63**
5	4924.00	52.5 PK	74.0	-21.5	1.00 H	317	10.49	42.01
6	4924.00	44.4 AV	54.0	-9.6	1.00 H	317	2.39	42.01
7	7386.00	54.1 PK	74.0	-19.9	1.62 H	339	7.37	46.73
8	7386.00	42.9 AV	54.0	-11.1	1.62 H	339	-3.83	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	106.7 PK			1.00 V	139	74.13	32.57
2	*2462.00	104.3 AV			1.00 V	139	71.73	32.57
3	2483.50	60.6 PK	74.0	-13.4	1.00 V	137	27.97	32.63
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.00 V**	**137**	**20.37**	**32.63**
5	4924.00	53.8 PK	74.0	-20.2	1.01 V	268	11.79	42.01
6	4924.00	47.6 AV	54.0	-6.4	1.01 V	268	5.59	42.01
7	7386.00	54.7 PK	74.0	-19.3	1.58 V	329	7.97	46.73
8	7386.00	44.7 AV	54.0	-9.3	1.58 V	329	-2.03	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	72.5 PK	74.0	-1.5	1.33 H	115	40.12	32.38
2	2390.00	51.3 AV	54.0	-2.7	1.33 H	115	18.92	32.38
3	*2412.00	104.9 PK			1.33 H	115	72.46	32.44
4	*2412.00	92.8 AV			1.33 H	115	60.36	32.44
5	4824.00	52.6 PK	74.0	-21.4	1.27 H	225	10.66	41.94
6	4824.00	41.2 AV	54.0	-12.8	1.27 H	225	-0.74	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**	**73.0 PK**	**74.0**	**-1.0**	**1.00 V**	**248**	**40.62**	**32.38**
2	2390.00	51.9 AV	54.0	-2.1	1.00 V	248	19.52	32.38
3	*2412.00	104.2 PK			1.00 V	248	71.76	32.44
4	*2412.00	92.1 AV			1.00 V	248	59.66	32.44
5	4824.00	52.8 PK	74.0	-21.2	1.00 V	97	10.86	41.94
6	4824.00	40.9 AV	54.0	-13.1	1.00 V	97	-1.04	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 2	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	72.8 PK	74.0	-1.2	1.44 H	266	40.82	31.98
2	2390.00	52.9 AV	54.0	-1.1	1.44 H	266	20.92	31.98
3	*2417.00	108.1 PK			1.34 H	264	76.04	32.06
4	*2417.00	95.7 AV			1.34 H	264	63.64	32.06
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	72.9 PK	74.0	-1.1	1.33 V	5	40.92	31.98
2	2390.00	52.5 AV	54.0	-1.5	1.33 V	5	20.52	31.98
3	*2417.00	107.9 PK			1.00 V	60	75.84	32.06
4	*2417.00	95.4 AV			1.00 V	60	63.34	32.06

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	68.3 PK	74.0	-5.7	1.33 H	115	35.92	32.38
2	2390.00	51.4 AV	54.0	-2.6	1.33 H	115	19.02	32.38
3	*2437.00	111.5 PK			1.33 H	115	78.99	32.51
4	*2437.00	98.3 AV			1.33 H	115	65.79	32.51
5	2483.50	72.6 PK	74.0	-1.4	1.33 H	115	39.97	32.63
6	2483.50	50.5 AV	54.0	-3.5	1.33 H	115	17.87	32.63
7	4874.00	52.4 PK	74.0	-21.6	1.28 H	235	10.41	41.99
8	4874.00	41.1 AV	54.0	-12.9	1.28 H	235	-0.89	41.99
9	7311.00	62.7 PK	74.0	-11.3	1.08 H	288	16.17	46.53
10	7311.00	41.4 AV	54.0	-12.6	1.08 H	288	-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	70.1 PK	74.0	-3.9	1.33 V	91	37.72	32.38
2	2390.00	50.7 AV	54.0	-3.3	1.33 V	91	18.32	32.38
3	*2437.00	112.6 PK			1.33 V	91	80.09	32.51
4	*2437.00	100.3 AV			1.33 V	91	67.79	32.51
5	2483.50	69.9 PK	74.0	-4.1	1.35 V	134	37.27	32.63
6	2483.50	49.9 AV	54.0	-4.1	1.35 V	134	17.27	32.63
7	4874.00	52.7 PK	74.0	-21.3	1.03 V	89	10.71	41.99
8	4874.00	41.1 AV	54.0	-12.9	1.03 V	89	-0.89	41.99
9	7311.00	53.3 PK	74.0	-20.7	1.02 V	295	6.77	46.53
10	7311.00	41.6 AV	54.0	-12.4	1.02 V	295	-4.93	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 10	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	*2457.00	108.5 PK			1.35 H	266	76.33	32.17
2	*2457.00	95.8 AV			1.35 H	266	63.63	32.17
3	2483.50	73.4 PK	74.0	-0.6	1.34 H	266	41.16	32.24
4	2483.50	52.9 AV	54.0	-1.1	1.34 H	266	20.66	32.24
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	*2457.00	106.5 PK			1.00 V	19	74.33	32.17
2	*2457.00	94.3 AV			1.00 V	19	62.13	32.17
3	2483.50	73.2 PK	74.0	-0.8	1.26 V	20	40.96	32.24
4	2483.50	51.4 AV	54.0	-2.6	1.26 V	20	19.16	32.24

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	104.8 PK			1.32 H	87	72.23	32.57
2	*2462.00	93.5 AV			1.32 H	87	60.93	32.57
3	**2483.50**	**73.0 PK**	**74.0**	**-1.0**	**1.32 H**	**87**	**40.37**	**32.63**
4	2483.50	52.8 AV	54.0	-1.2	1.32 H	87	20.17	32.63
5	4924.00	52.2 PK	74.0	-21.8	1.24 H	249	10.19	42.01
6	4924.00	40.8 AV	54.0	-13.2	1.24 H	249	-1.21	42.01
7	7386.00	62.6 PK	74.0	-11.4	1.13 H	273	15.87	46.73
8	7386.00	41.4 AV	54.0	-12.6	1.13 H	273	-5.33	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	105.9 PK			1.32 V	122	73.33	32.57
2	*2462.00	93.8 AV			1.32 V	122	61.23	32.57
3	2483.50	72.5 PK	74.0	-1.5	1.32 V	122	39.87	32.63
4	2483.50	52.9 AV	54.0	-1.1	1.32 V	122	20.27	32.63
5	4924.00	52.5 PK	74.0	-21.5	1.01 V	79	10.49	42.01
6	4924.00	41.1 AV	54.0	-12.9	1.01 V	79	-0.91	42.01
7	7386.00	53.3 PK	74.0	-20.7	1.01 V	303	6.57	46.73
8	7386.00	41.4 AV	54.0	-12.6	1.01 V	303	-5.33	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) Average (AV)
FREQUENCY RANGE	1GHz ~ 25GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.6 PK	74.0	-6.4	1.35 H	87	35.22	32.38
2	2390.00	52.8 AV	54.0	-1.2	1.35 H	87	20.42	32.38
3	*2412.00	105.4 PK			1.35 H	87	72.96	32.44
4	*2412.00	92.6 AV			1.35 H	87	60.16	32.44
5	4824.00	52.5 PK	74.0	-21.5	1.21 H	248	10.56	41.94
6	4824.00	41.1 AV	54.0	-12.9	1.21 H	248	-0.84	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	69.1 PK	74.0	-4.9	1.00 V	145	36.72	32.38
2	2390.00	52.2 AV	54.0	-1.8	1.00 V	145	19.82	32.38
3	*2412.00	104.2 PK			1.00 V	145	71.76	32.44
4	*2412.00	91.4 AV			1.00 V	145	58.96	32.44
5	4824.00	52.7 PK	74.0	-21.3	1.01 V	95	10.76	41.94
6	4824.00	41.5 AV	54.0	-12.5	1.01 V	95	-0.44	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 2	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	73.1 PK	74.0	-0.9	1.38 H	258	41.12	31.98
2	2390.00	52.6 AV	54.0	-1.4	1.38 H	258	20.62	31.98
3	*2417.00	108.0 PK			1.38 H	263	75.94	32.06
4	*2417.00	95.1 AV			1.38 H	263	63.04	32.06
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	72.8 PK	74.0	-1.2	1.25 V	350	40.82	31.98
2	2390.00	52.4 AV	54.0	-1.6	1.25 V	350	20.42	31.98
3	*2417.00	106.7 PK			1.00 V	55	74.64	32.06
4	*2417.00	94.6 AV			1.00 V	55	62.54	32.06

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.8 PK	74.0	-10.2	1.00 H	211	31.42	32.38
2	2390.00	49.0 AV	54.0	-5.0	1.00 H	211	16.62	32.38
3	*2437.00	109.3 PK			1.00 H	211	76.79	32.51
4	*2437.00	97.2 AV			1.00 H	211	64.69	32.51
5	2483.50	70.6 PK	74.0	-3.4	1.00 H	213	37.97	32.63
6	2483.50	47.4 AV	54.0	-6.6	1.00 H	213	14.77	32.63
7	4874.00	52.7 PK	74.0	-21.3	1.33 H	237	10.71	41.99
8	4874.00	41.4 AV	54.0	-12.6	1.33 H	237	-0.59	41.99
9	7311.00	62.5 PK	74.0	-11.5	1.09 H	284	15.97	46.53
10	7311.00	41.0 AV	54.0	-13.0	1.09 H	284	-5.53	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	68.2 PK	74.0	-5.8	1.00 V	147	35.82	32.38
2	2390.00	50.2 AV	54.0	-3.8	1.00 V	147	17.82	32.38
3	*2437.00	110.4 PK			1.00 V	147	77.89	32.51
4	*2437.00	96.9 AV			1.00 V	147	64.39	32.51
5	2483.50	70.1 PK	74.0	-3.9	1.00 V	147	37.47	32.63
6	2483.50	49.7 AV	54.0	-4.3	1.00 V	147	17.07	32.63
7	4874.00	52.7 PK	74.0	-21.3	1.00 V	97	10.71	41.99
8	4874.00	41.0 AV	54.0	-13.0	1.00 V	97	-0.99	41.99
9	7311.00	53.4 PK	74.0	-20.6	1.05 V	303	6.87	46.53
10	7311.00	41.7 AV	54.0	-12.3	1.05 V	303	-4.83	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 10	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	*2457.00	107.6 PK			1.36 H	264	75.43	32.17
2	*2457.00	94.1 AV			1.36 H	264	61.93	32.17
3	2483.50	72.2 PK	74.0	-1.8	1.35 H	264	39.96	32.24
4	2483.50	51.5 AV	54.0	-2.5	1.35 H	264	19.26	32.24
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	*2457.00	105.7 PK			1.00 V	26	73.53	32.17
2	*2457.00	93.8 AV			1.00 V	26	61.63	32.17
3	2483.50	71.3 PK	74.0	-2.7	1.00 V	31	39.06	32.24
4	2483.50	51.0 AV	54.0	-3.0	1.00 V	31	18.76	32.24

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	102.7 PK			1.33 H	123	70.13	32.57
2	*2462.00	92.0 AV			1.33 H	123	59.43	32.57
3	**2483.50**	**73.0 PK**	**74.0**	**-1.0**	**1.33 H**	**123**	**40.37**	**32.63**
4	**2483.50**	**53.0 AV**	**54.0**	**-1.0**	**1.33 H**	**123**	**20.37**	**32.63**
5	4924.00	52.4 PK	74.0	-21.6	1.30 H	221	10.39	42.01
6	4924.00	41.2 AV	54.0	-12.8	1.30 H	221	-0.81	42.01
7	7386.00	62.2 PK	74.0	-11.8	1.04 H	282	15.47	46.73
8	7386.00	40.9 AV	54.0	-13.1	1.04 H	282	-5.83	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	102.5 PK			1.00 V	167	69.93	32.57
2	*2462.00	90.8 AV			1.00 V	167	58.23	32.57
3	2483.50	71.6 PK	74.0	-2.4	1.00 V	167	38.97	32.63
4	2483.50	52.3 AV	54.0	-1.7	1.00 V	167	19.67	32.63
5	4924.00	52.3 PK	74.0	-21.7	1.00 V	85	10.29	42.01
6	4924.00	40.8 AV	54.0	-13.2	1.00 V	85	-1.21	42.01
7	7386.00	53.7 PK	74.0	-20.3	1.02 V	293	6.97	46.73
8	7386.00	41.9 AV	54.0	-12.1	1.02 V	293	-4.83	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.

4.7.8 TEST RESULTS (BT <LE> MODE)

BELOW 1GHz WORST-CASE DATA

CHANNEL	TX Channel 39	**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	50.01	29.4 QP	40.0	-10.6	1.00 H	111	15.07	14.36
2	650.06	41.1 QP	46.0	-4.9	1.00 H	155	18.51	22.60
3	700.04	42.5 QP	46.0	-3.5	1.00 H	125	19.41	23.10
4	750.01	38.3 QP	46.0	-7.7	1.00 H	172	14.01	24.25
5	775.00	41.1 QP	46.0	-4.9	1.00 H	168	16.22	24.91
6	824.97	35.3 QP	46.0	-10.7	1.00 H	134	9.37	25.89
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	132.67	39.8 QP	43.5	-3.7	1.00 V	25	26.19	13.62
2	**324.99**	**43.0 QP**	**46.0**	**-3.0**	**1.00 V**	**121**	**27.04**	**15.95**
3	**349.98**	**43.0 QP**	**46.0**	**-3.0**	**1.00 V**	**142**	**26.46**	**16.51**
4	399.95	41.9 QP	46.0	-4.1	1.00 V	166	24.20	17.70
5	650.06	40.8 QP	46.0	-5.2	1.00 V	257	18.24	22.60
6	725.02	42.8 QP	46.0	-3.2	1.00 V	123	19.10	23.68

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

CHANNEL	TX Channel 0	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	57.3 PK	74.0	-16.7	1.42 H	269	24.92	32.38
2	2390.00	44.3 AV	54.0	-9.7	1.42 H	269	11.92	32.38
3	*2402.00	106.6 PK			1.42 H	269	74.18	32.42
4	*2402.00	91.3 AV			1.42 H	269	58.88	32.42
5	4804.00	52.2 PK	74.0	-21.8	1.16 H	51	10.29	41.91
6	4804.00	41.6 AV	54.0	-12.4	1.16 H	51	-0.31	41.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.5 PK	74.0	-16.5	1.00 V	86	25.12	32.38
2	2390.00	44.7 AV	54.0	-9.3	1.00 V	86	12.32	32.38
3	*2402.00	104.2 PK			1.00 V	86	71.78	32.42
4	*2402.00	89.7 AV			1.00 V	86	57.28	32.42
5	4804.00	55.7 PK	74.0	-18.3	1.00 V	112	13.79	41.91
6	4804.00	46.0 AV	54.0	-8.0	1.00 V	112	4.09	41.91

REMARKS:

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

CHANNEL	TX Channel 19	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	*2440.00	107.3 PK			1.42 H	269	74.79	32.51
2	*2440.00	91.7 AV			1.42 H	269	59.19	32.51
3	4880.00	51.4 PK	74.0	-22.6	1.02 H	44	9.40	42.00
4	4880.00	40.8 AV	54.0	-13.2	1.02 H	44	-1.20	42.00
5	7320.00	53.8 PK	74.0	-20.2	1.17 H	312	7.25	46.55
6	7320.00	41.2 AV	54.0	-12.8	1.17 H	312	-5.35	46.55
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	*2440.00	105.2 PK			1.00 V	95	72.69	32.51
2	*2440.00	90.3 AV			1.00 V	95	57.79	32.51
3	4880.00	54.7 PK	74.0	-19.3	1.05 V	113	12.70	42.00
4	4880.00	45.6 AV	54.0	-8.4	1.05 V	113	3.60	42.00
5	7320.00	55.4 PK	74.0	-18.6	1.06 V	43	8.85	46.55
6	7320.00	42.9 AV	54.0	-11.1	1.06 V	43	-3.65	46.55

REMARKS:

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

CHANNEL	TX Channel 39	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	*2480.00	107.8 PK			1.42 H	269	75.18	32.62
2	*2480.00	92.0 AV			1.42 H	269	59.38	32.62
3	2483.50	56.8 PK	74.0	-17.2	1.42 H	269	24.17	32.63
4	2483.50	44.2 AV	54.0	-9.8	1.42 H	269	11.57	32.63
5	4960.00	52.2 PK	74.0	-21.8	1.18 H	48	10.21	41.99
6	4960.00	41.4 AV	54.0	-12.6	1.18 H	48	-0.59	41.99
7	7440.00	55.2 PK	74.0	-18.8	1.02 H	130	8.39	46.81
8	7440.00	41.6 AV	54.0	-12.4	1.02 H	130	-5.21	46.81
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	*2480.00	104.7 PK			1.00 V	95	72.08	32.62
2	*2480.00	89.9 AV			1.00 V	95	57.28	32.62
3	2483.50	56.7 PK	74.0	-17.3	1.03 V	95	24.07	32.63
4	2483.50	44.4 AV	54.0	-9.6	1.03 V	95	11.77	32.63
5	4960.00	56.0 PK	74.0	-18.0	1.02 V	124	14.01	41.99
6	4960.00	46.1 AV	54.0	-7.9	1.02 V	124	4.11	41.99
7	7440.00	54.3 PK	74.0	-19.7	1.14 V	41	7.49	46.81
8	7440.00	41.9 AV	54.0	-12.1	1.14 V	41	-4.91	46.81

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.

4.8 CONDUCTED EMISSION MEASUREMENT

4.8.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100287	Feb. 29, 2012	Feb. 28, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK 8127	8127-523	Sep. 20, 2011	Sep. 19, 2012
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ESH3-Z5	848773/004	Nov. 01, 2011	Oct. 31, 2012
RF Cable (JYEBAO)	5DFB	COACAB-002	Aug. 05, 2012	Aug. 04, 2013
50 ohms Terminator	50	4	Nov. 12, 2011	Nov. 11, 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. A.
3 The VCCI Con A Registration No. is C-817.
4. Tested Date: Aug. 28, 2012

4.8.3 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.

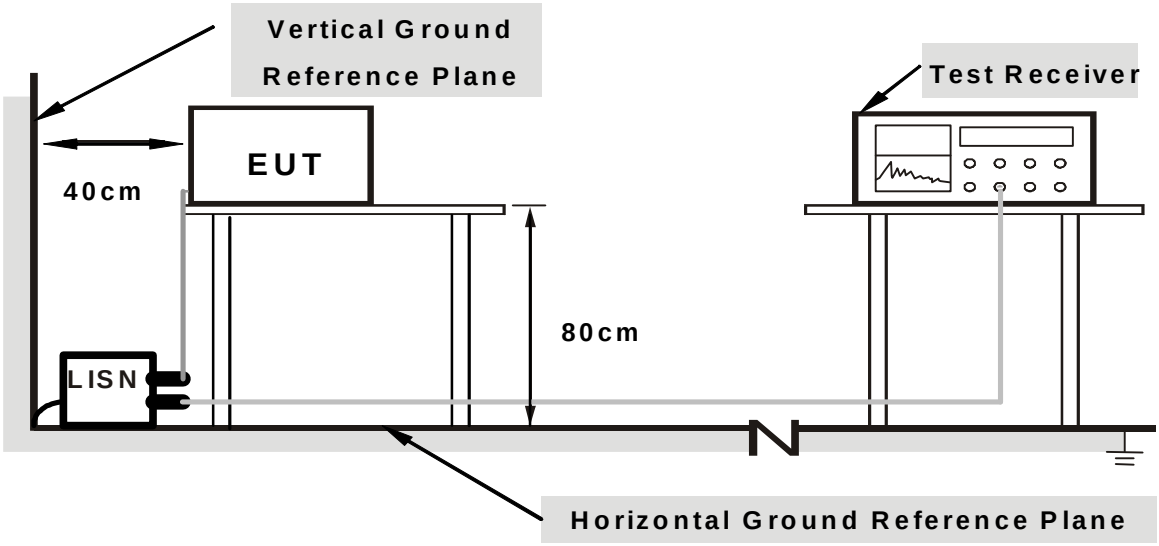
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 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.

4.8.6 EUT OPERATING CONDITIONS

Same as Item 4.7.6

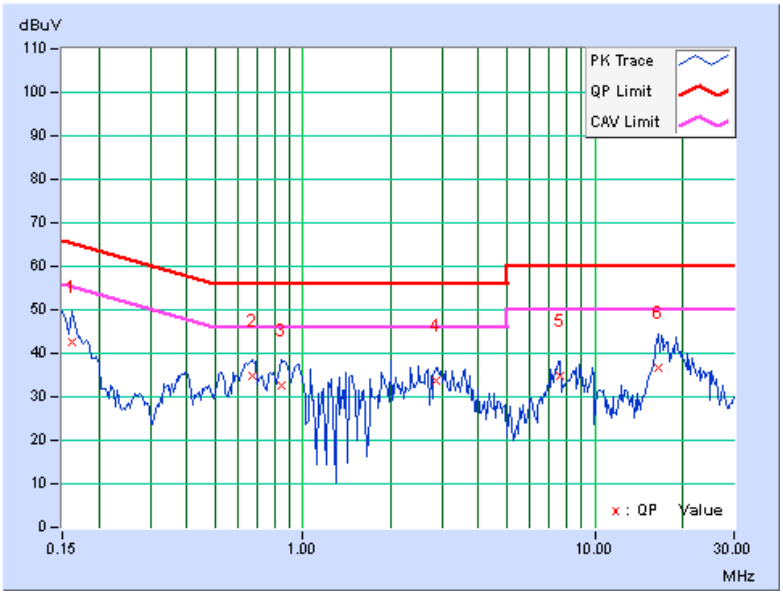
4.8.7 TEST RESULTS (WLAN mode)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.06	42.53	38.83	42.59	38.89	65.38	55.38	-22.79	-16.49
2	0.67344	0.09	34.79	18.32	34.88	18.41	56.00	46.00	-21.12	-27.59
3	0.84141	0.11	32.52	17.17	32.63	17.28	56.00	46.00	-23.37	-28.72
4	2.85156	0.22	33.49	21.91	33.71	22.13	56.00	46.00	-22.29	-23.87
5	7.60547	0.35	34.28	22.91	34.63	23.26	60.00	50.00	-25.37	-26.74
6	16.44141	0.55	36.13	28.97	36.68	29.52	60.00	50.00	-23.32	-20.48

REMARKS:

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

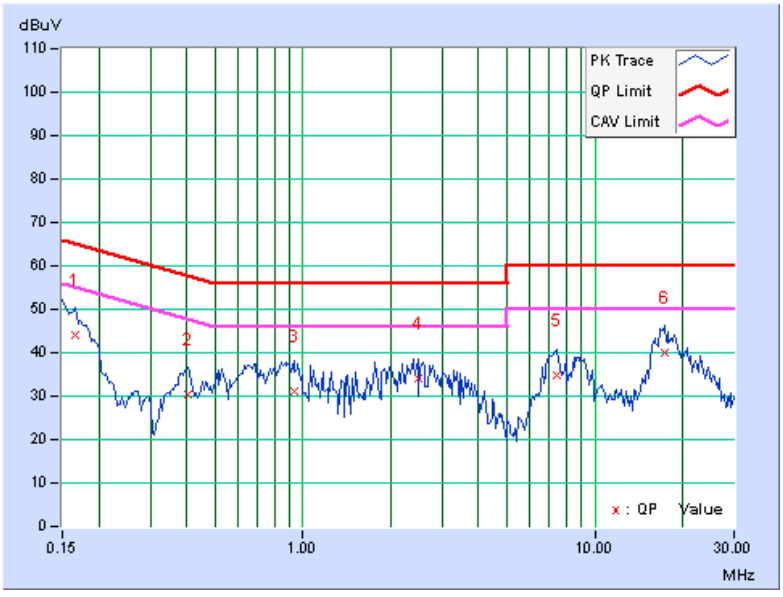


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.16562**	**0.07**	**43.91**	**39.03**	**43.98**	**39.10**	**65.18**	**55.18**	**-21.20**	**-16.08**
2	0.40391	0.08	30.13	14.55	30.21	14.63	57.77	47.77	-27.56	-33.14
3	0.93125	0.12	31.13	18.06	31.25	18.18	56.00	46.00	-24.75	-27.82
4	2.48438	0.20	33.78	22.48	33.98	22.68	56.00	46.00	-22.02	-23.32
5	7.44922	0.32	34.32	22.93	34.64	23.25	60.00	50.00	-25.36	-26.75
6	17.39844	0.55	39.39	32.07	39.94	32.62	60.00	50.00	-20.06	-17.38

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.



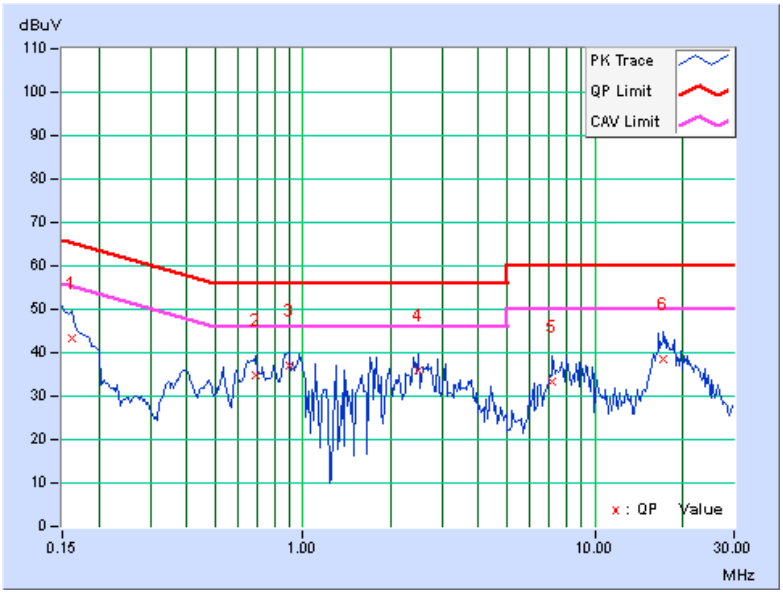
4.8.8 TEST RESULTS (BT<LE> mode)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.06	43.35	39.13	43.41	39.19	65.38	55.38	-21.97	-16.19
2	0.68516	0.09	34.80	16.54	34.89	16.63	56.00	46.00	-21.11	-29.37
3	0.89609	0.11	37.01	24.07	37.12	24.18	56.00	46.00	-18.88	-21.82
4	2.49219	0.21	35.59	22.46	35.80	22.67	56.00	46.00	-20.20	-23.33
5	7.17969	0.34	33.06	22.26	33.40	22.60	60.00	50.00	-26.60	-27.40
6	17.21875	0.56	38.12	30.98	38.68	31.54	60.00	50.00	-21.32	-18.46

REMARKS:

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

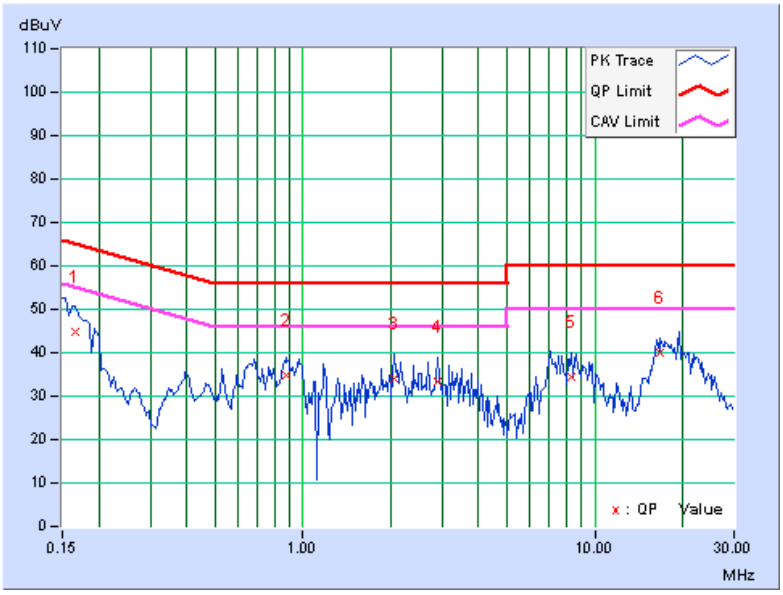


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.07	44.56	39.37	44.63	39.44	65.18	55.18	-20.55	-15.74
2	0.87266	0.11	34.61	19.20	34.72	19.31	56.00	46.00	-21.28	-26.69
3	2.04688	0.18	33.94	21.56	34.12	21.74	56.00	46.00	-21.88	-24.26
4	2.90625	0.21	33.06	22.20	33.27	22.41	56.00	46.00	-22.73	-23.59
5	8.35547	0.34	34.05	23.63	34.39	23.97	60.00	50.00	-25.61	-26.03
6	16.78906	0.54	39.60	31.92	40.14	32.46	60.00	50.00	-19.86	-17.54

REMARKS:

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



5. TEST TYPES AND RESULTS (FOR 5GHz, 5725~5850MHz Band)

5.1 CONDUCTED OUTPUT POWER MEASUREMENT

5.1.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

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

5.1.2 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 : Aug. 22, 2012

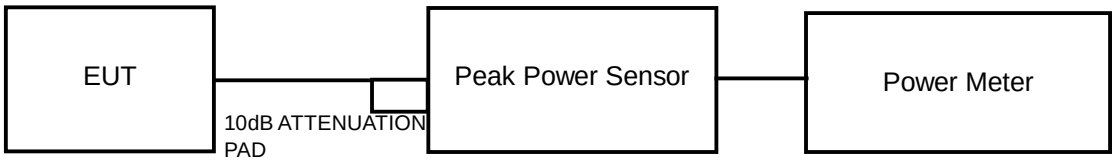
5.1.3 TEST PROCEDURES

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.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



5.1.6 EUT OPERATING CONDITIONS

Same as Item 4.1.6

5.1.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
149	5745	16.7	17.7	105.658	20.24	28.23	PASS
157	5785	16.4	17.6	101.196	20.05	28.23	PASS
165	5825	16.4	17.4	98.606	19.94	28.23	PASS

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

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
149	5745	16.8	17.7	106.747	20.28	28.23	PASS
157	5785	16.6	17.7	104.593	20.20	28.23	PASS
165	5825	16.4	17.8	103.908	20.17	28.23	PASS

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

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
151	5755	16.2	16.5	86.355	19.36	28.23	PASS
159	5795	16.1	16.7	87.512	19.42	28.23	PASS

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

5.2 AVERAGE OUTPUT POWER

5.2.1 For reference.

5.2.2 TEST INSTRUMENTS

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

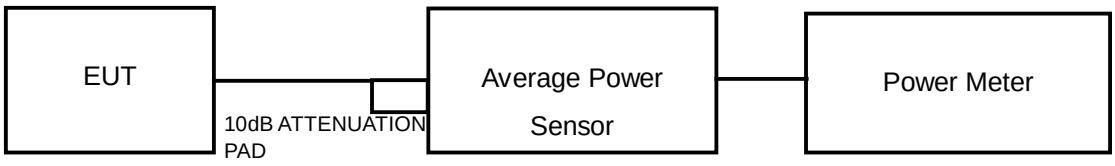
Note:

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 : Aug. 22, 2012

5.2.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator, the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the average power level.

5.2.4 TEST SETUP



5.2.5 EUT OPERATING CONDITIONS

Same as Item 4.1.6

5.2.6 TEST RESULTS

802.11a :

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		AVERAGE POWER OUTPUT (dBm)
		Chain(0)	Chain(1)	
149	5745	13.1	13.8	16.47
157	5785	13.0	13.4	16.21
165	5825	13.2	13.6	16.41

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		AVERAGE POWER OUTPUT (dBm)
		Chain(0)	Chain(1)	
149	5745	13.0	13.7	16.37
157	5785	13.2	13.9	16.57
165	5825	13.0	13.5	16.27

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER OUTPUT (dBm)		AVERAGE POWER OUTPUT (dBm)
		Chain(0)	Chain(1)	
151	5755	11.2	11.6	14.41
159	5795	11.1	11.8	14.47

5.3 POWER SPECTRAL DENSITY MEASUREMENT

5.3.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	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 : Aug. 22, 2012

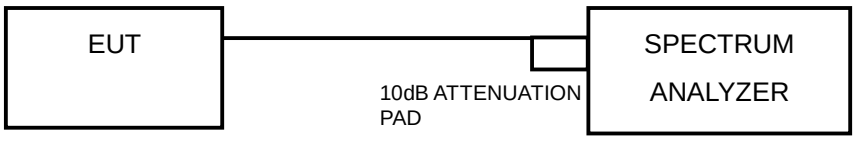
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITION

Same as Item 4.1.6

5.3.7 TEST RESULTS

802.11a

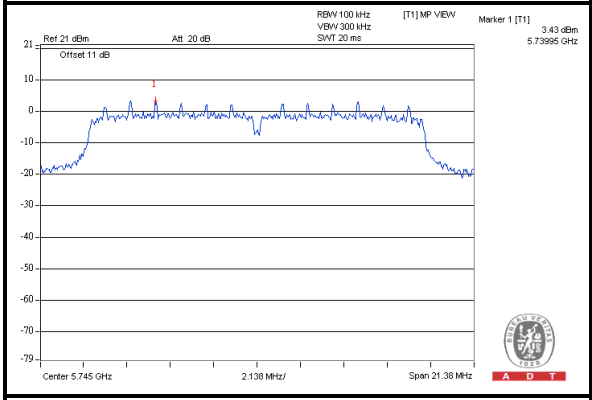
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	3.43	-11.80	3.01	-8.79	6.23	PASS
	157	5785	3.29	-11.94	3.01	-8.93	6.23	PASS
	165	5825	3.30	-11.93	3.01	-8.92	6.23	PASS
1	149	5745	3.58	-11.65	3.01	-8.64	6.23	PASS
	157	5785	3.56	-11.67	3.01	-8.66	6.23	PASS
	165	5825	3.21	-12.02	3.01	-9.01	6.23	PASS

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

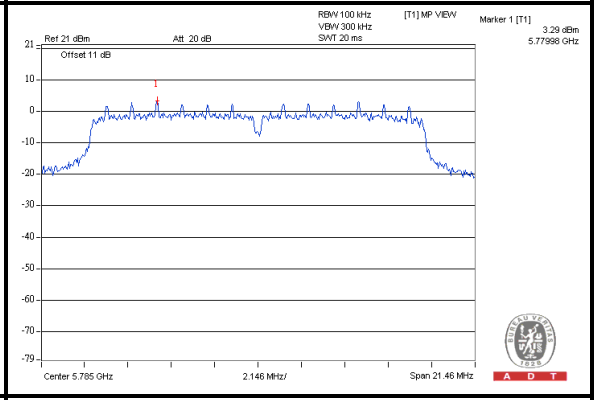
Effective Legacy Gain (dBi)=7.77

The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

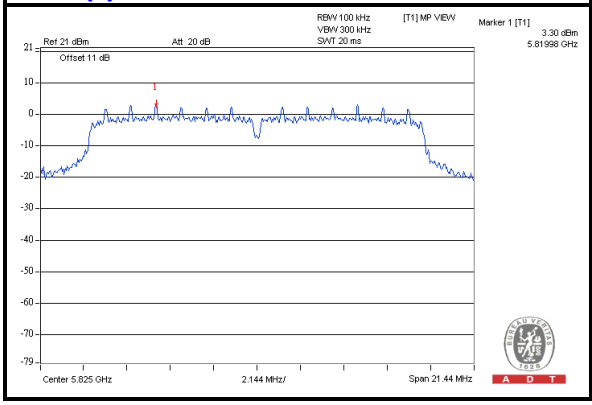
Chain(0) : CH149



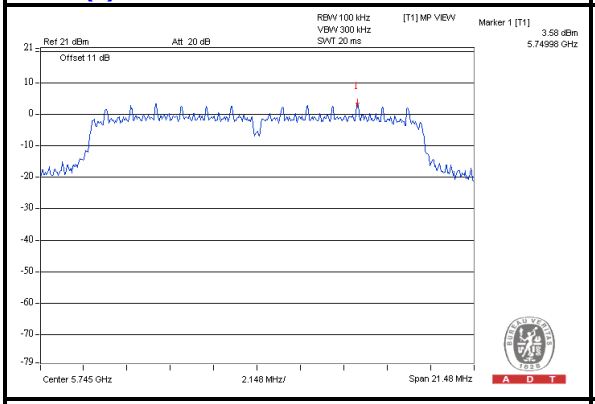
Chain(0) : CH157



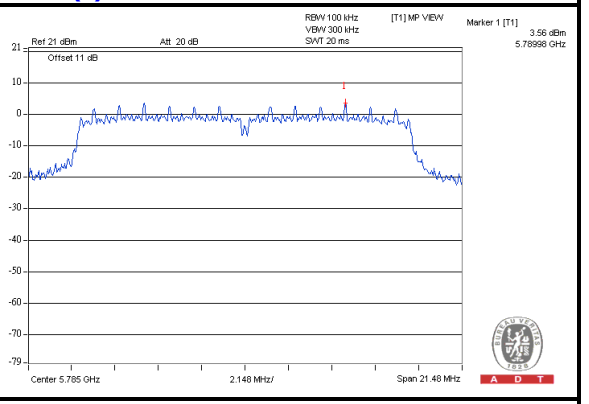
Chain(0) : CH165



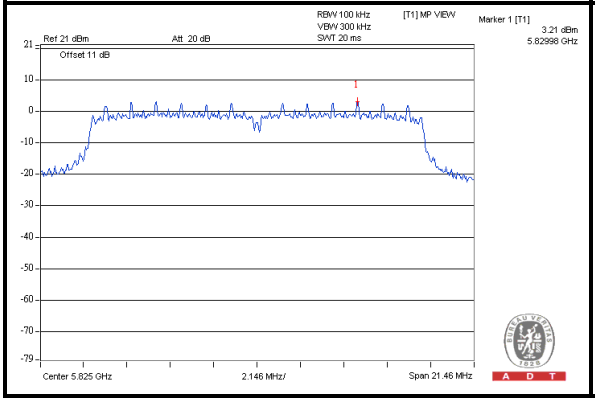
Chain(1) : CH149



Chain(1) : CH157



Chain(1) : CH165

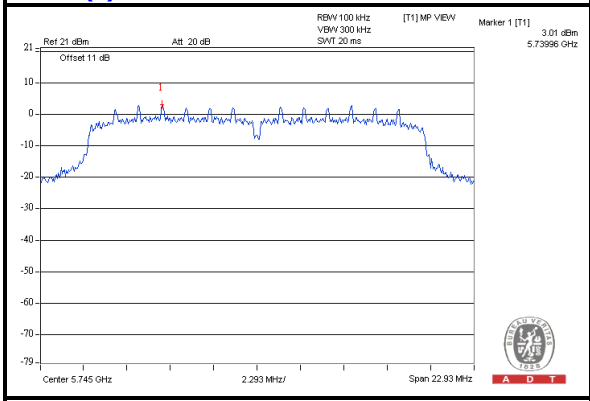


802.11n (HT20) OFDM MODULATION:

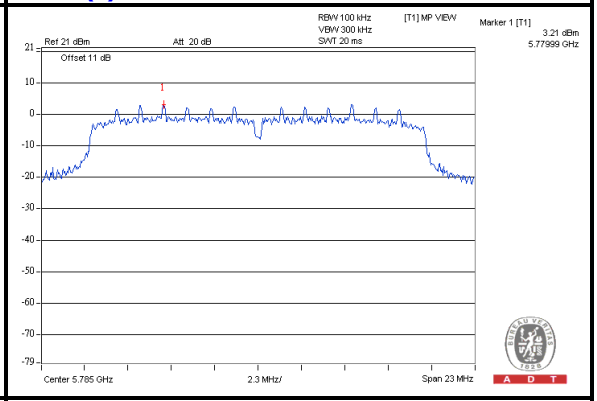
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	3.01	-12.22	3.01	-9.21	6.23	PASS
	157	5785	3.21	-12.02	3.01	-9.01	6.23	PASS
	165	5825	3.30	-11.93	3.01	-8.92	6.23	PASS
1	149	5745	4.38	-10.85	3.01	-7.84	6.23	PASS
	157	5785	4.02	-11.21	3.01	-8.20	6.23	PASS
	165	5825	3.90	-11.33	3.01	-8.32	6.23	PASS

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

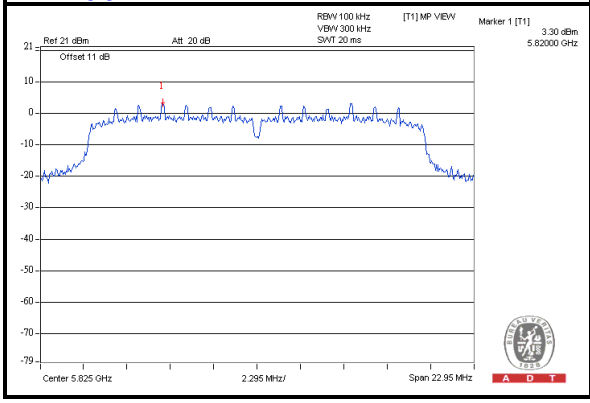
Chain(0) : CH149



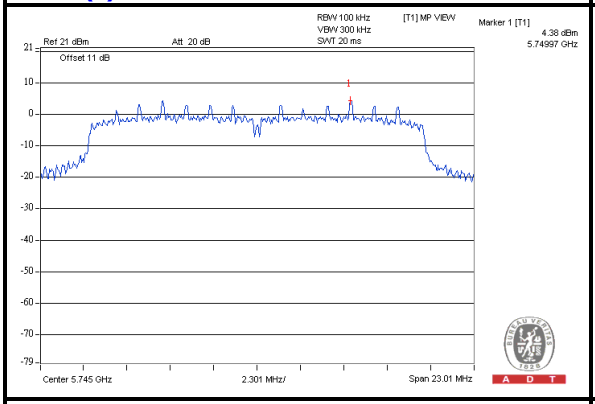
Chain(0) : CH157



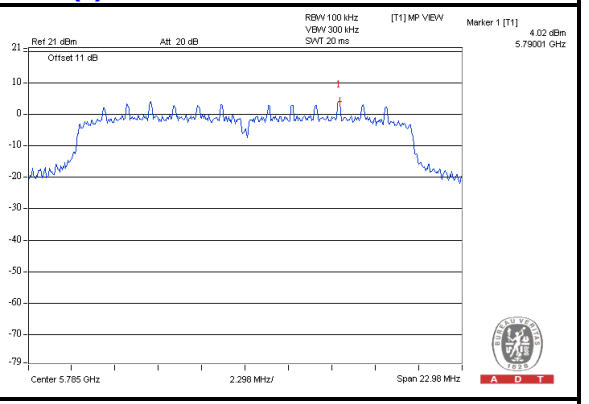
Chain(0) : CH165



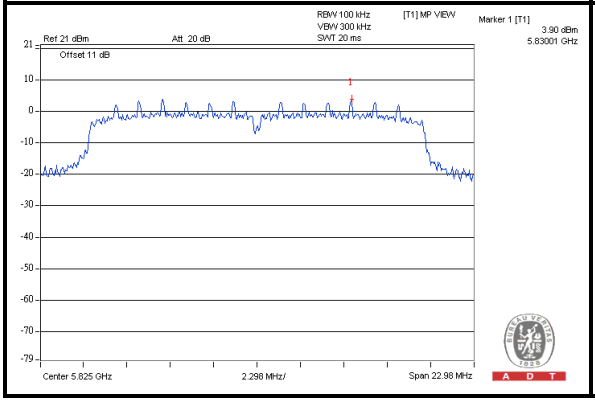
Chain(1) : CH149



Chain(1) : CH157



Chain(1) : CH165



802.11n (HT40)

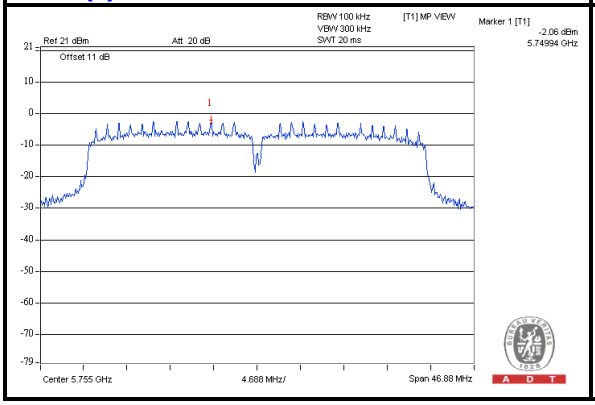
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-2.06	-17.29	3.01	-14.28	6.23	PASS
	159	5795	-1.69	-16.92	3.01	-13.91	6.23	PASS
1	151	5755	-1.43	-16.66	3.01	-13.65	6.23	PASS
	159	5795	-1.42	-16.65	3.01	-13.64	6.23	PASS

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

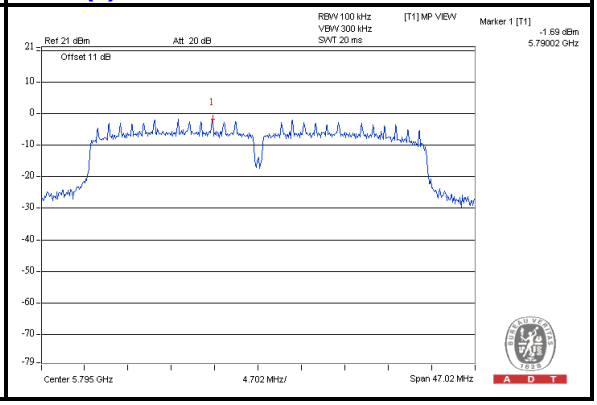
Effective Legacy Gain (dBi)=7.77

The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

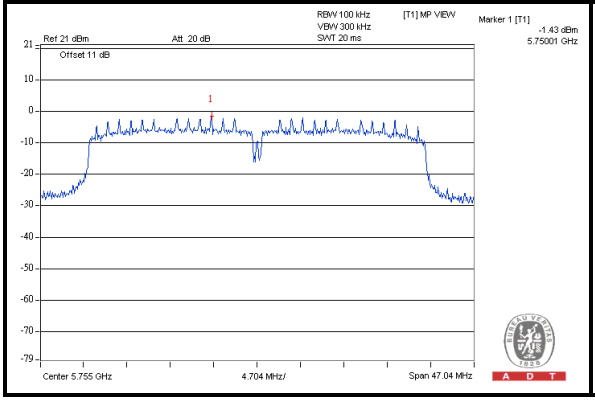
Chain(0) : CH151



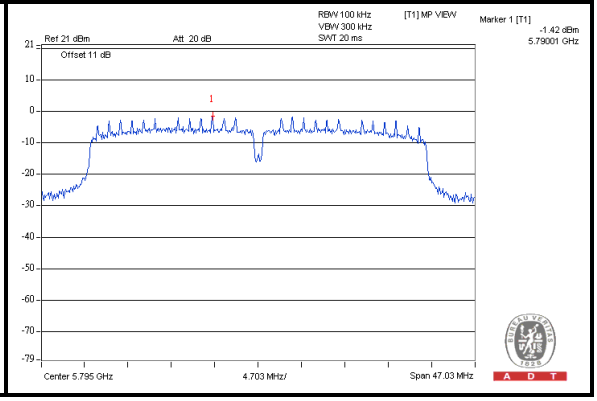
Chain(0) : CH159



Chain(1) : CH151



Chain(1) : CH159



5.4 6dB BANDWIDTH MEASUREMENT

5.4.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	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 : Aug. 22, 2012

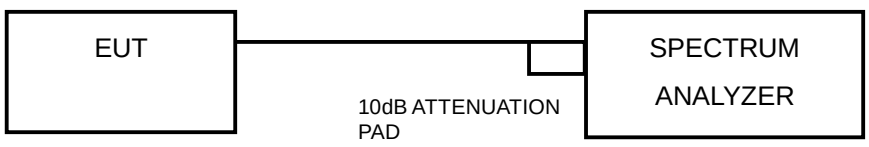
5.4.3 TEST PROCEDURE

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

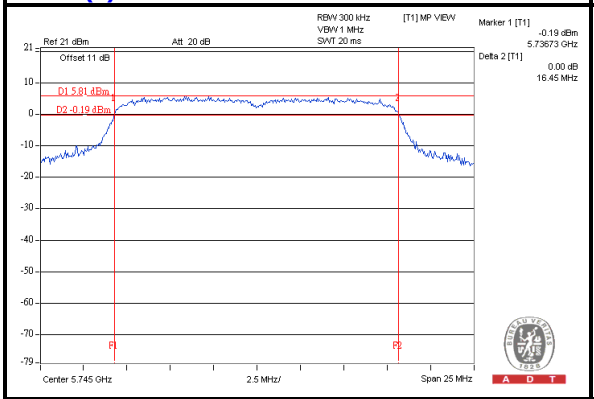
Same as the 4.1.6

5.4.7 TEST RESULTS

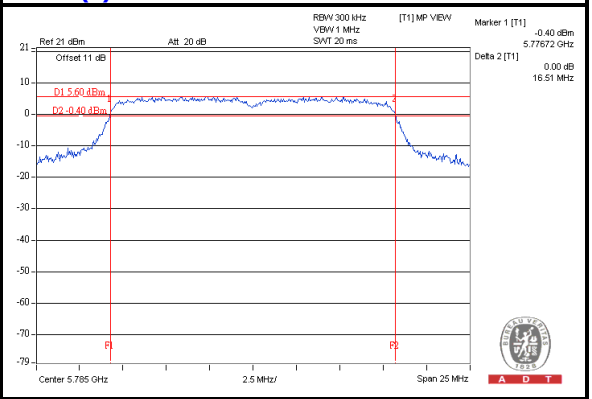
802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
149	5745	16.45	16.52	0.5	PASS
157	5785	16.51	16.53	0.5	PASS
165	5825	16.50	16.51	0.5	PASS

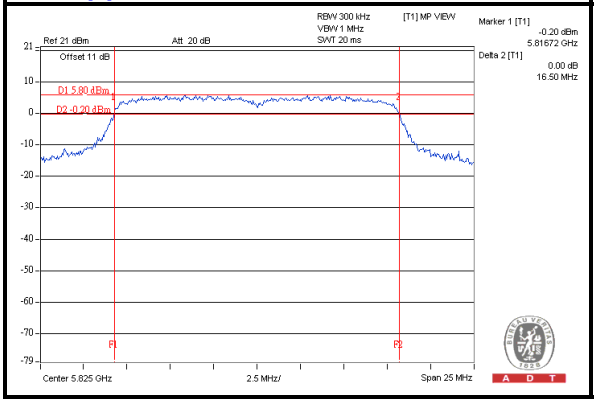
Chain(0) : CH149



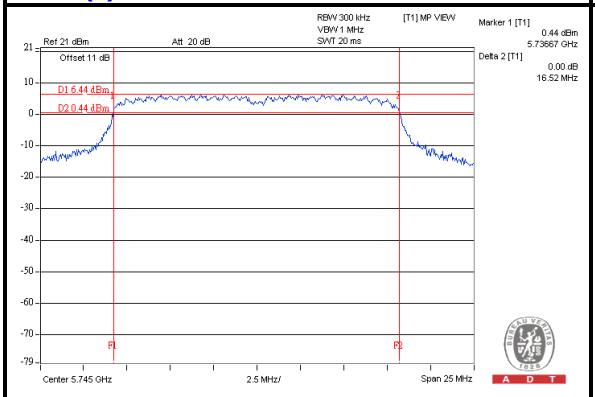
Chain(0) : CH157



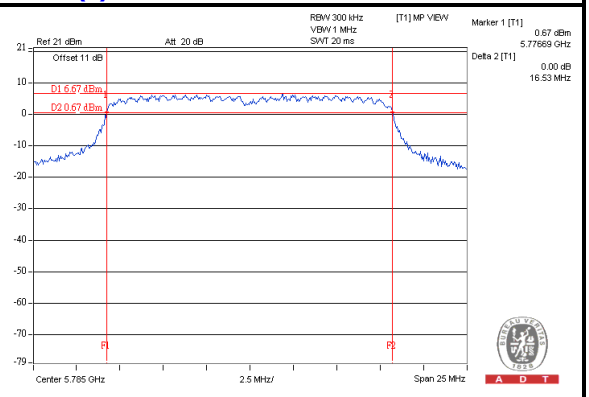
Chain(0) : CH165



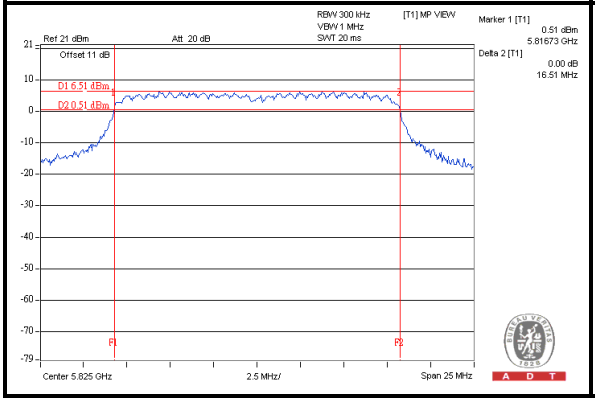
Chain(1) : CH149



Chain(1) : CH157



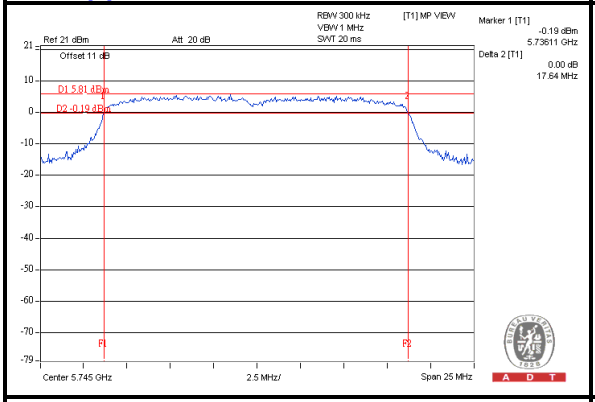
Chain(1) : CH165



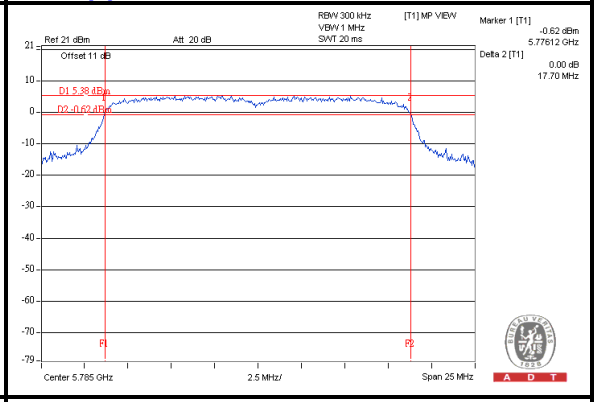
802.11n (HT20):

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
149	5745	17.64	17.70	0.5	PASS
157	5785	17.70	17.68	0.5	PASS
165	5825	17.65	17.68	0.5	PASS

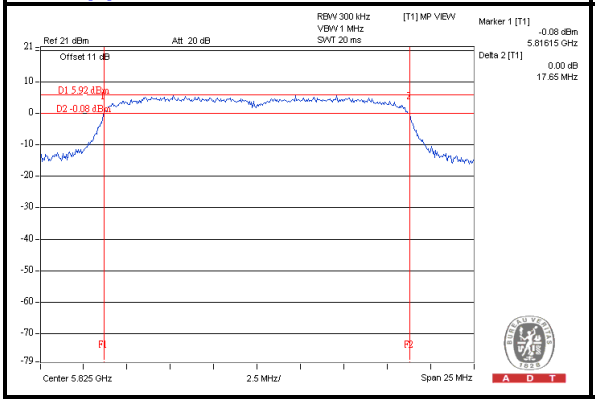
Chain(0) : CH149



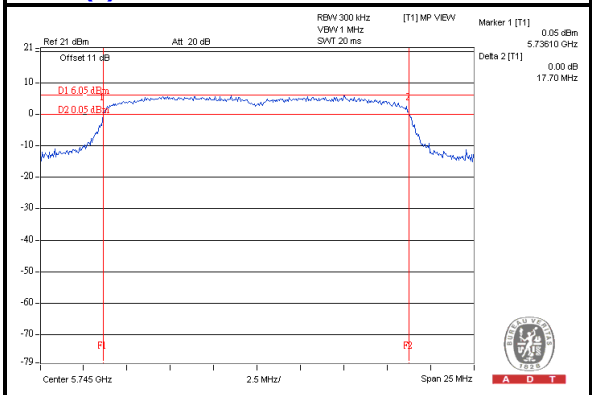
Chain(0) : CH157



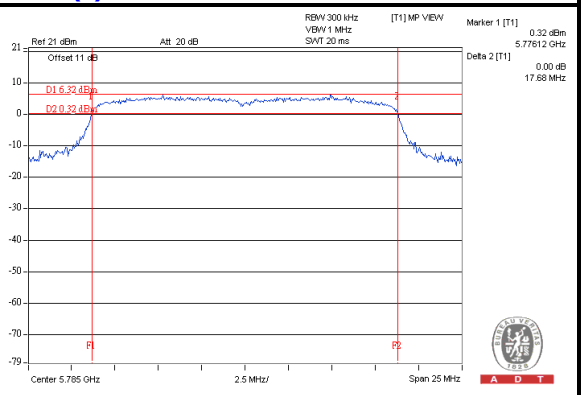
Chain(0) : CH165



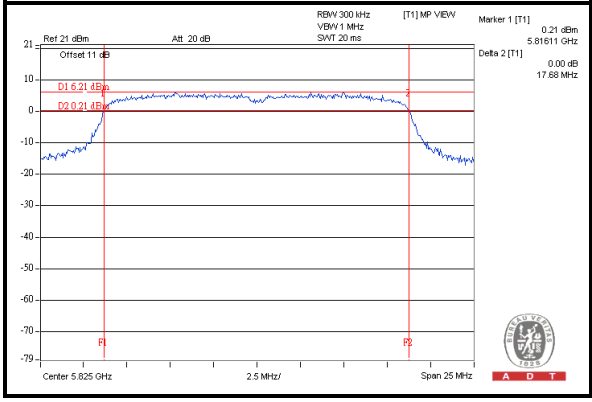
Chain(1) : CH149



Chain(1) : CH157



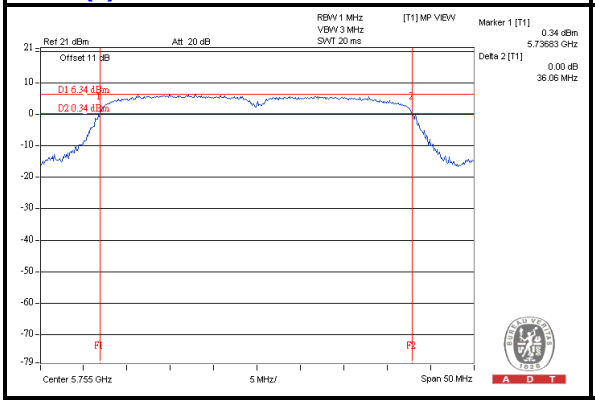
Chain(1) : CH165



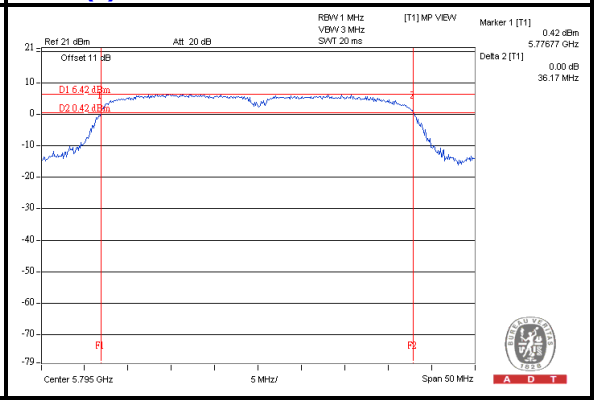
802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
151	5755	36.06	36.19	0.5	PASS
159	5795	36.17	36.18	0.5	PASS

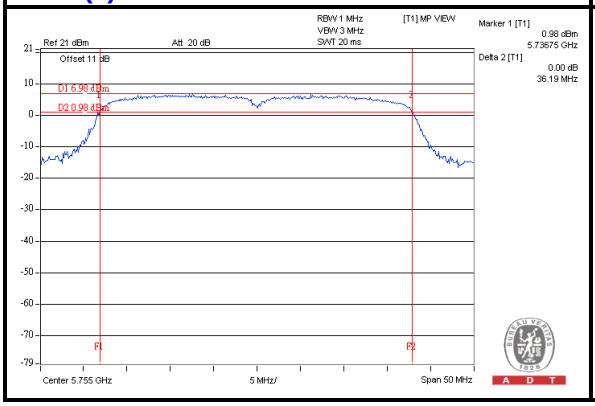
Chain(0) : CH151



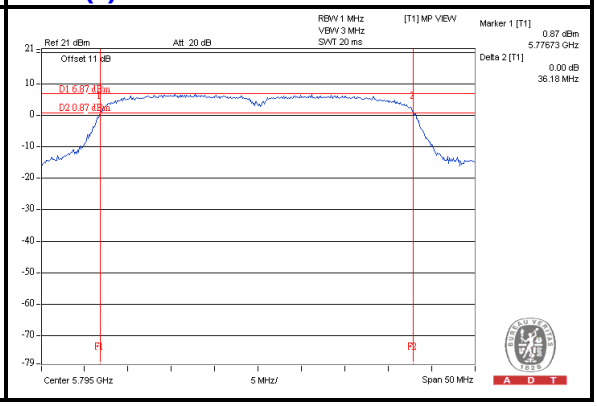
Chain(0) : CH159



Chain(1) : CH151



Chain(1) : CH159



5.5 OCCUPIED BANDWIDTH MEASUREMENT

5.5.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100036	Dec. 14, 2011	Dec. 13, 2012

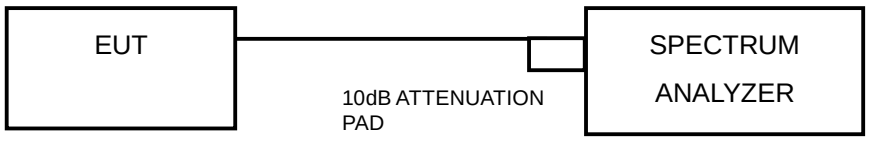
Note:

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 : Aug. 22, 2012

5.5.2 TEST PROCEDURE

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

5.5.3 TEST SETUP



5.5.4 EUT OPERATING CONDITIONS

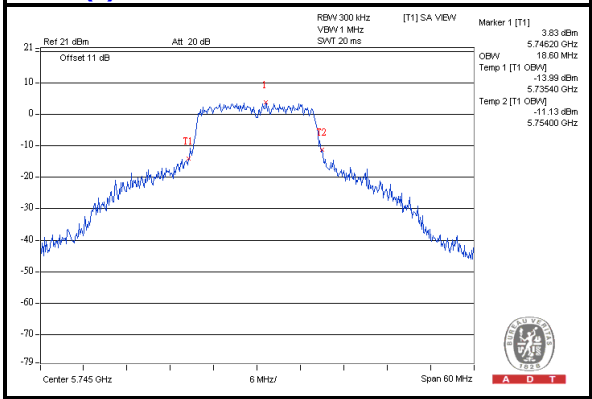
Same as the 4.1.6

5.5.5 TEST RESULTS

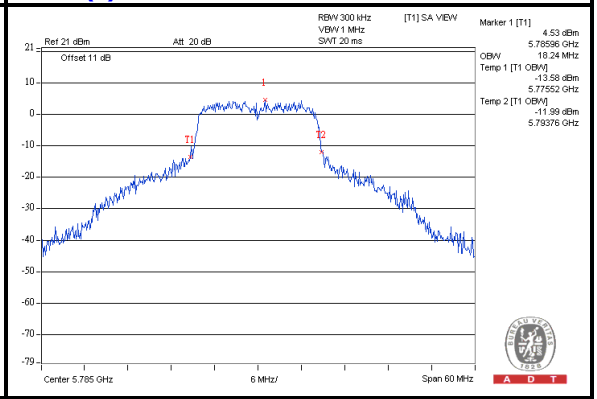
802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN(0)	CHAIN(1)
149	5745	18.60	18.36
157	5785	18.24	17.52
165	5825	18.36	17.40

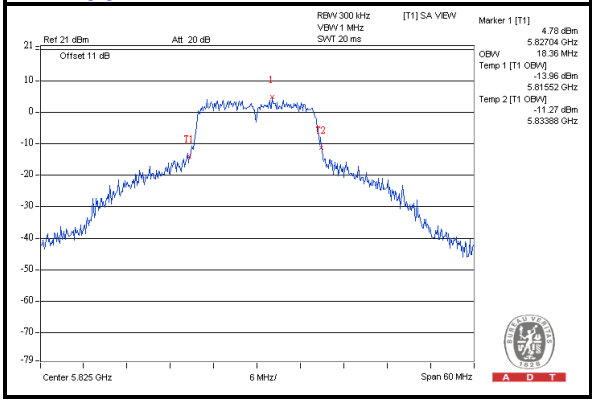
Chain(0) : CH149



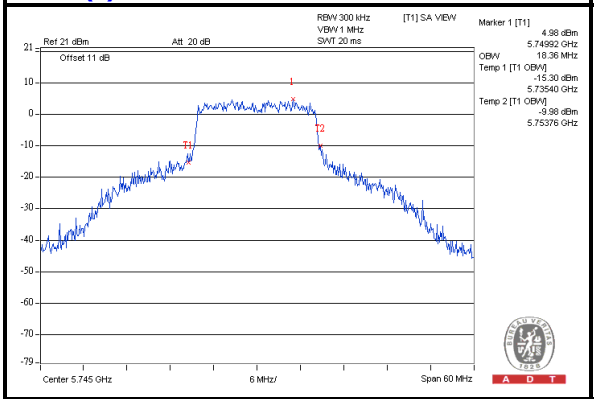
Chain(0) : CH157



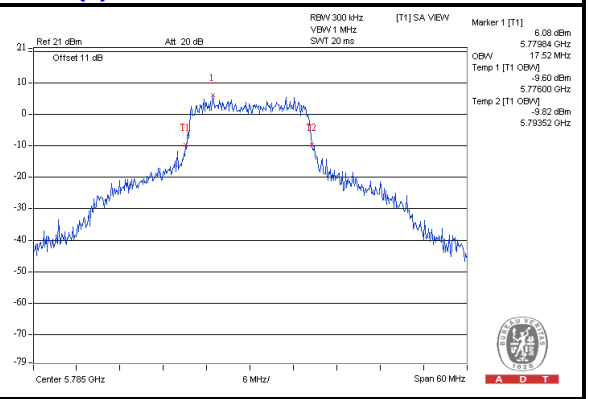
Chain(0) : CH165



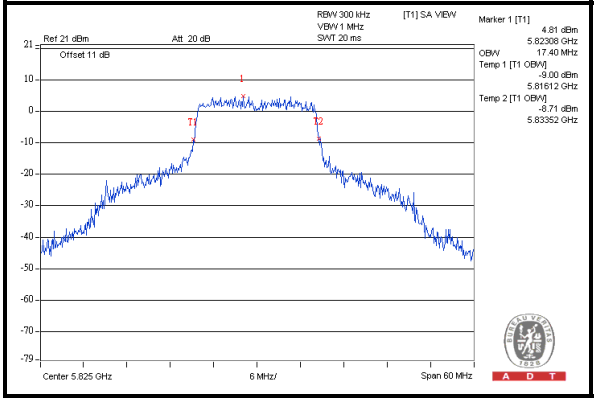
Chain(1) : CH149



Chain(1) : CH157



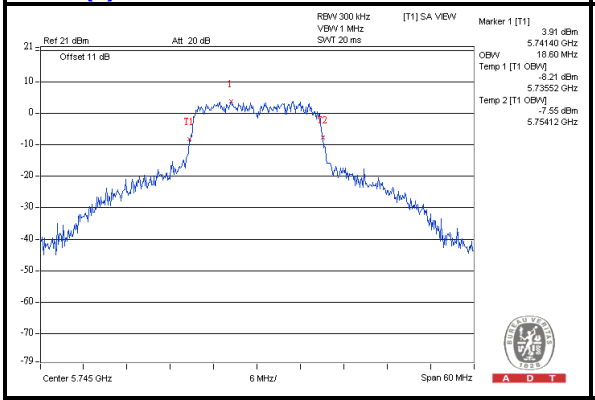
Chain(1) : CH165



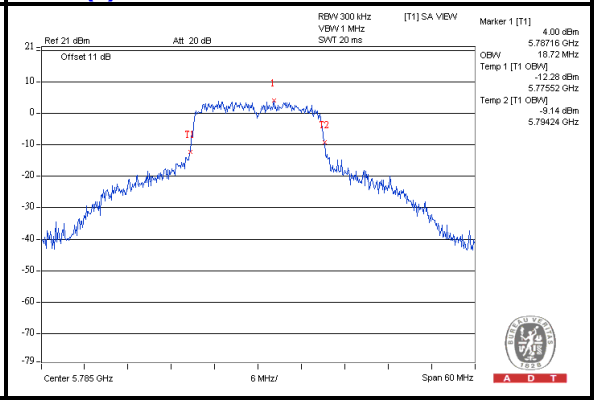
802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN(0)	CHAIN(1)
149	5745	18.60	19.92
157	5785	18.72	19.44
165	5825	18.96	18.60

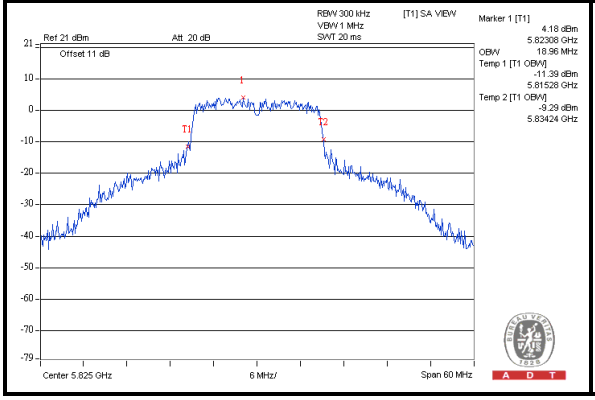
Chain(0) : CH149



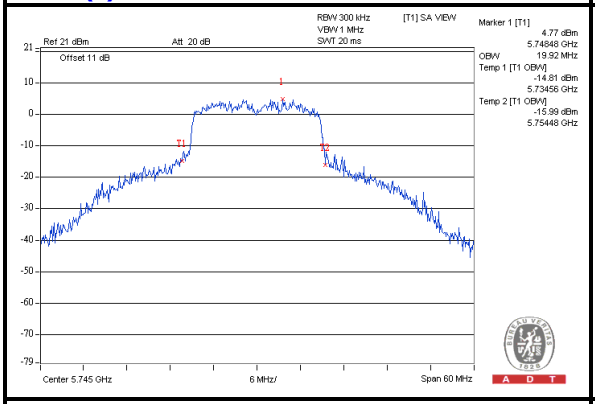
Chain(0) : CH157



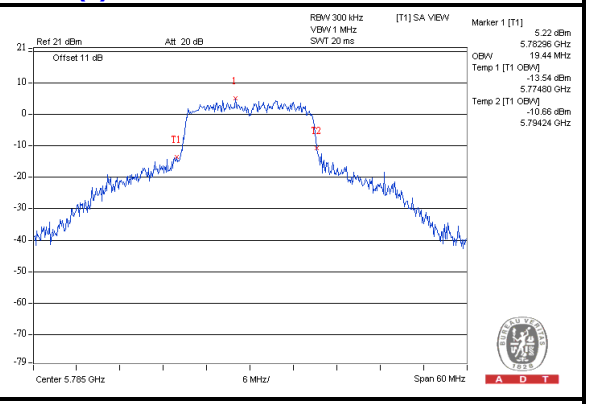
Chain(0) : CH165



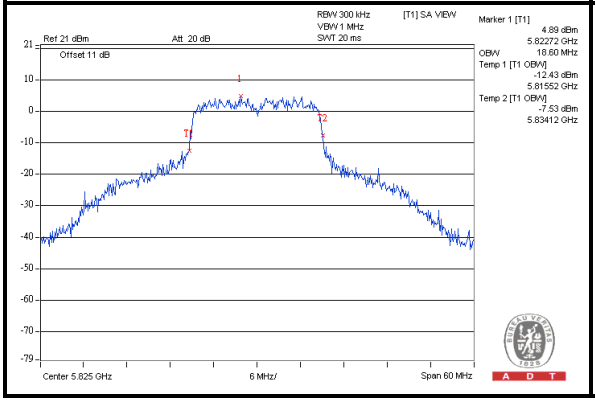
Chain(1) : CH149



Chain(1) : CH157



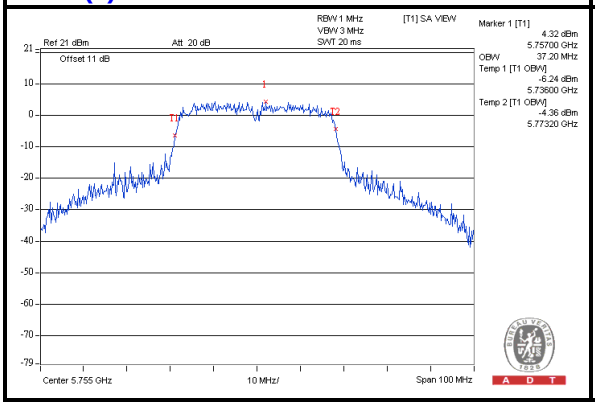
Chain(1) : CH165



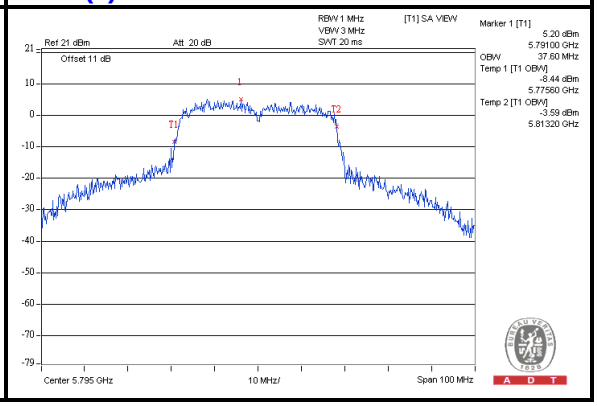
802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)	
		CHAIN(0)	CHAIN(1)
151	5755	37.20	37.00
159	5795	37.60	37.40

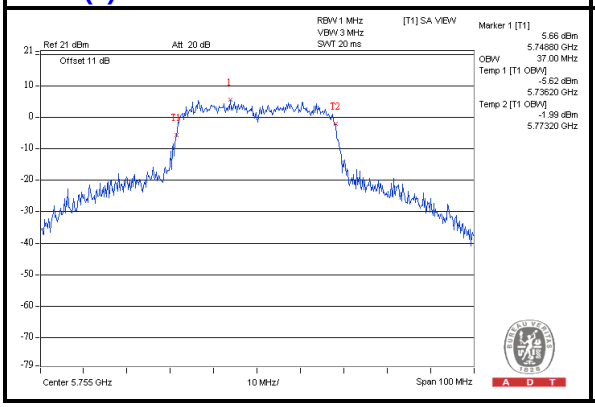
Chain(0) : CH151



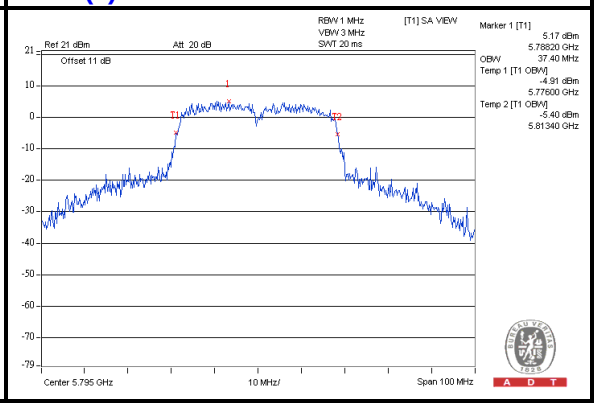
Chain(0) : CH159



Chain(1) : CH151



Chain(1) : CH159



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	FSP 40	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 : Aug. 22, 2012

5.6.3 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

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

MEASUREMENT PROCEDURE OOBE

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

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 EUT OPERATING CONDITION

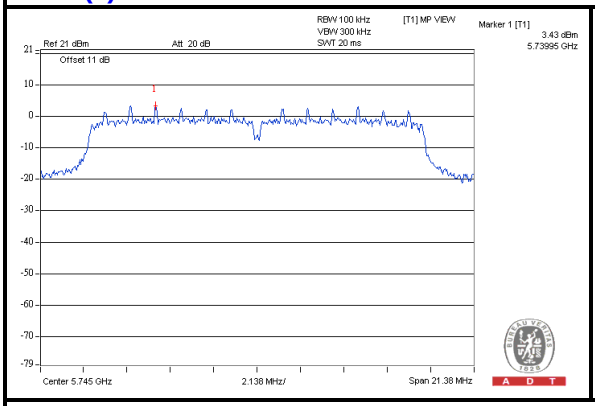
Same as Item 4.3.6

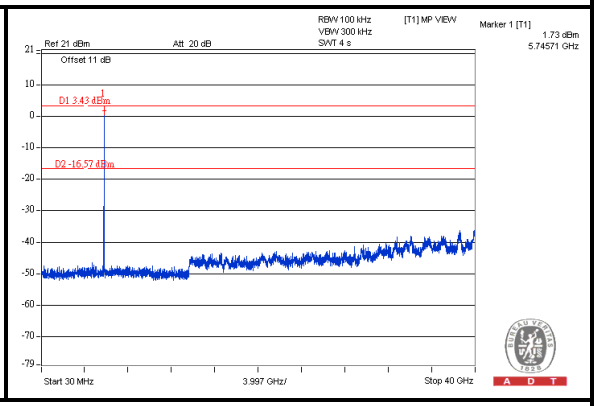
5.6.6 TEST RESULTS

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.

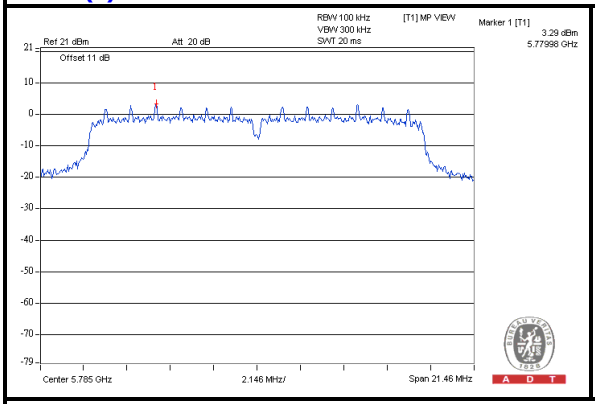
802.11a

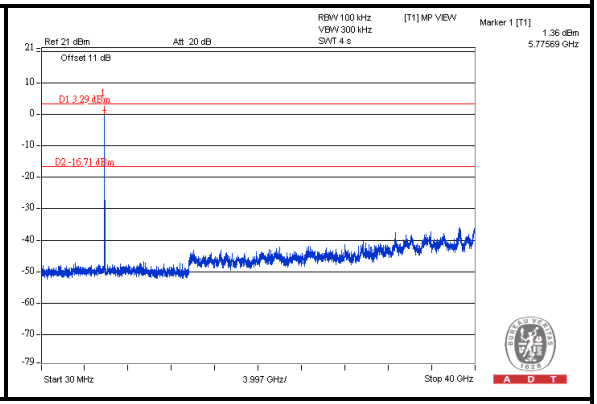
Chain(0) : CH149



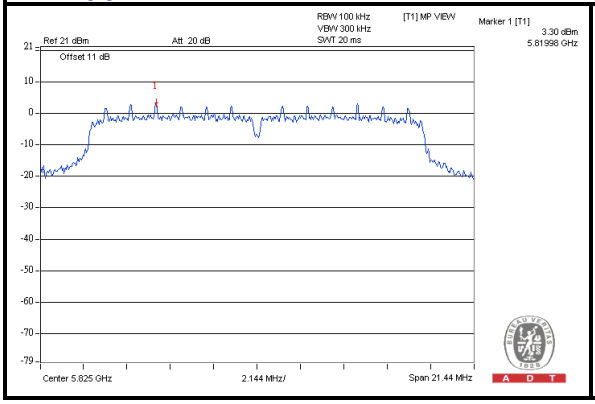


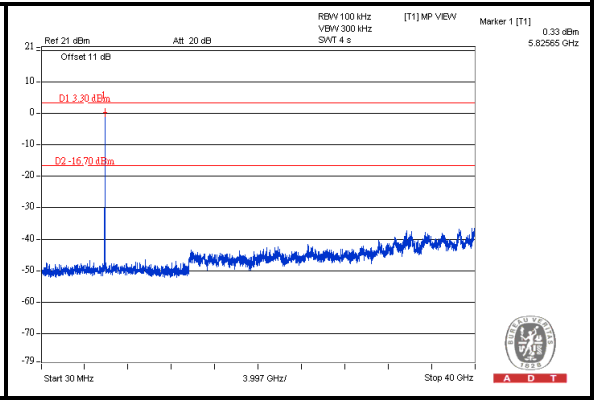
Chain(0) : CH 157





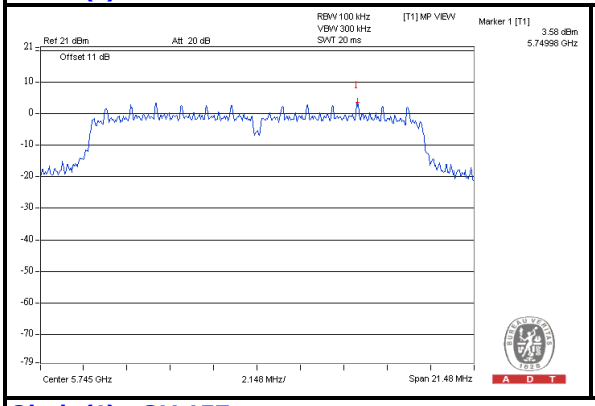
Chain(0) : CH 165

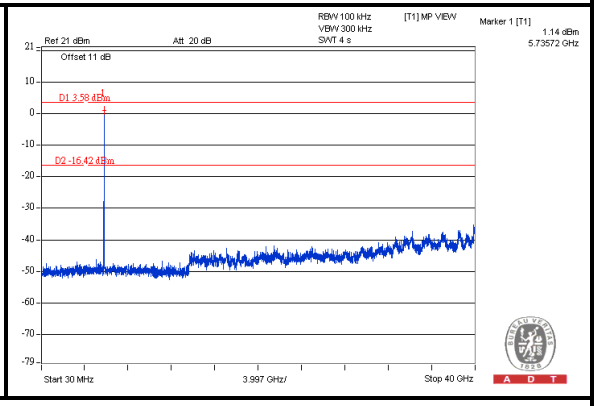




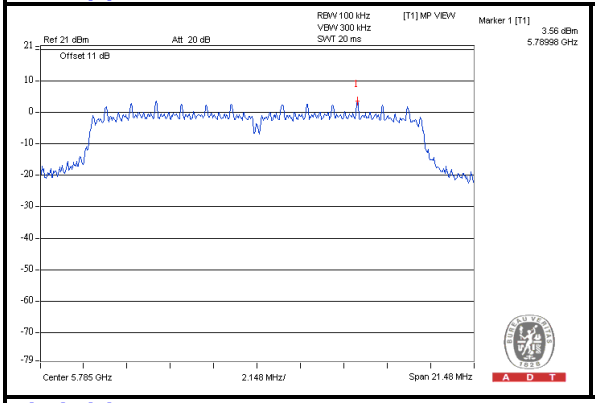
802.11a

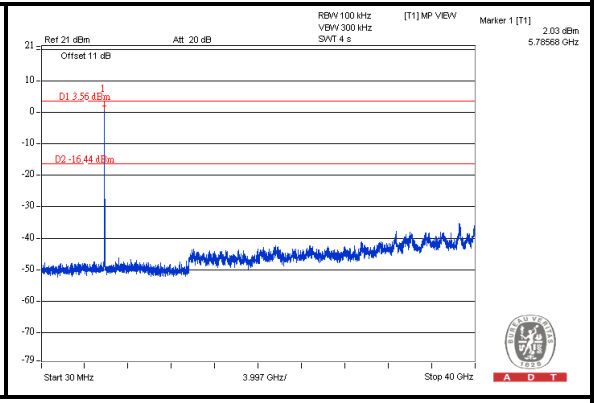
Chain(1) : CH149



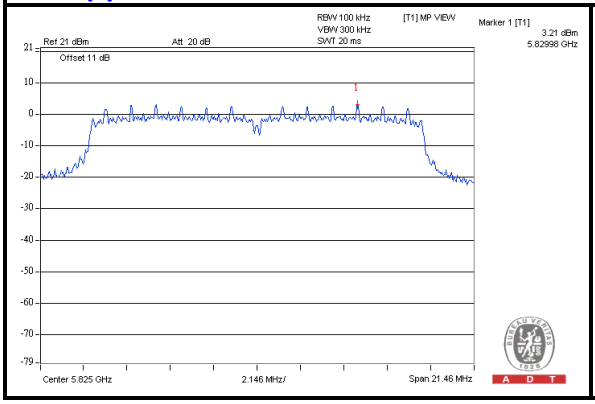


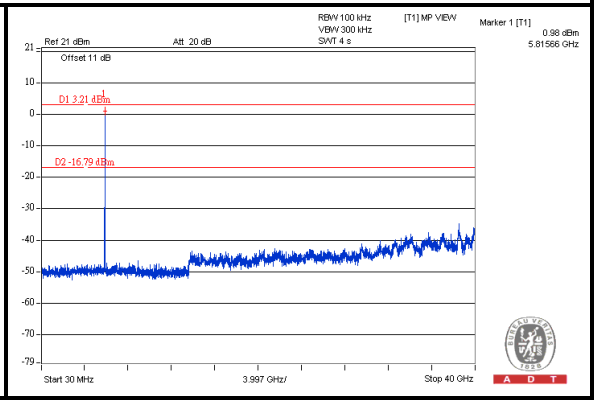
Chain(1) : CH 157





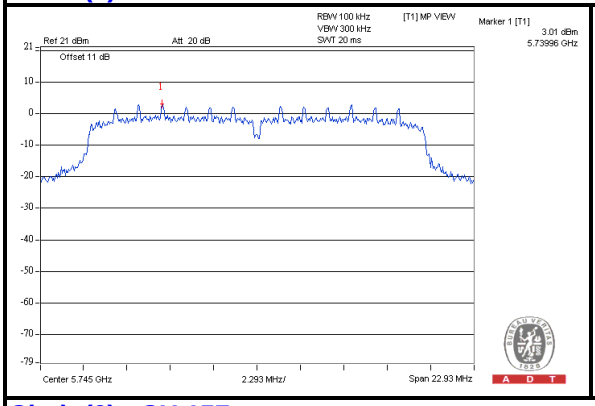
Chain(1) : CH 165

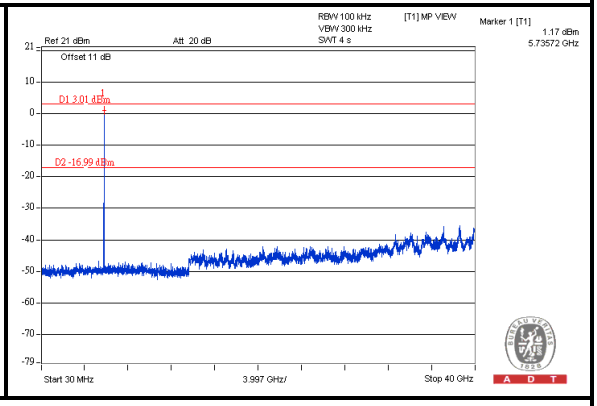




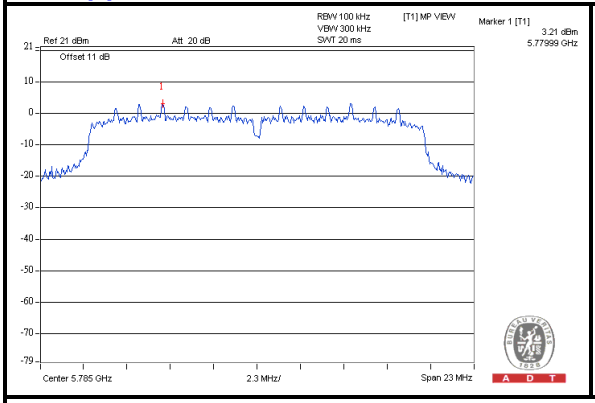
802.11n (HT20)

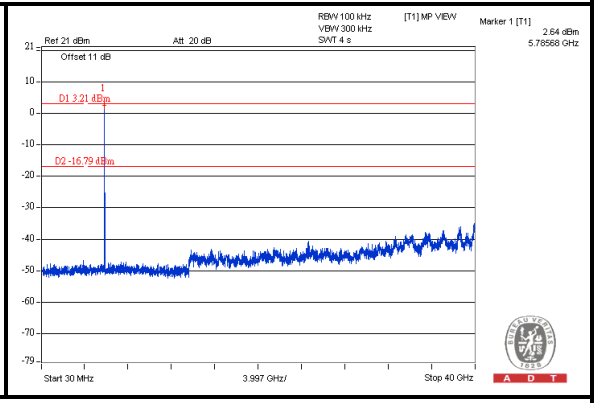
Chain(0) : CH149



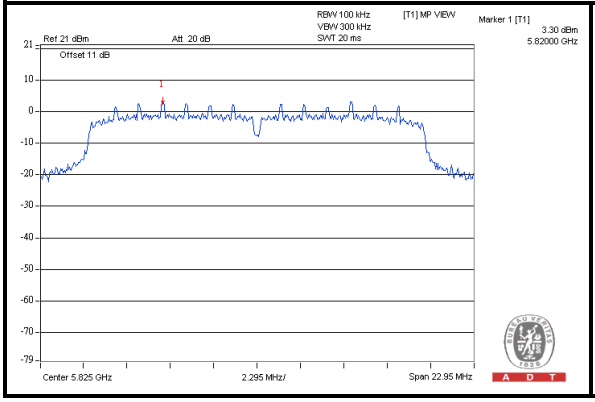


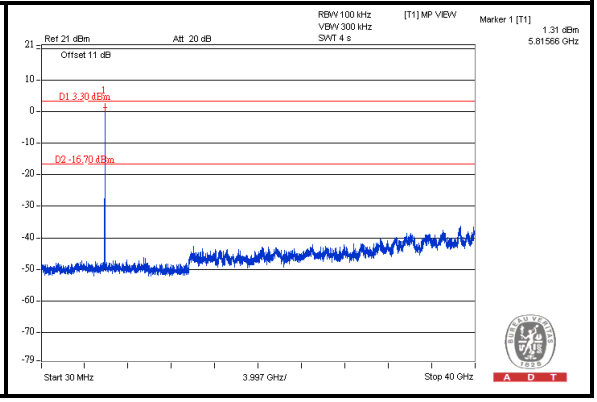
Chain(0) : CH 157





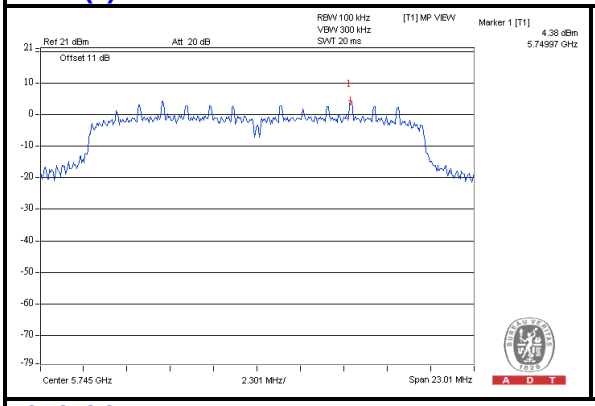
Chain(0) : CH 165

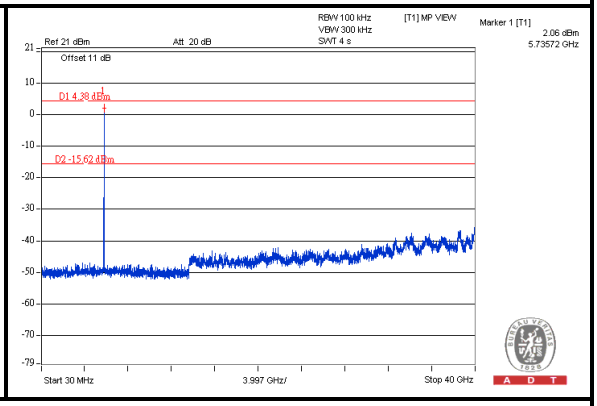




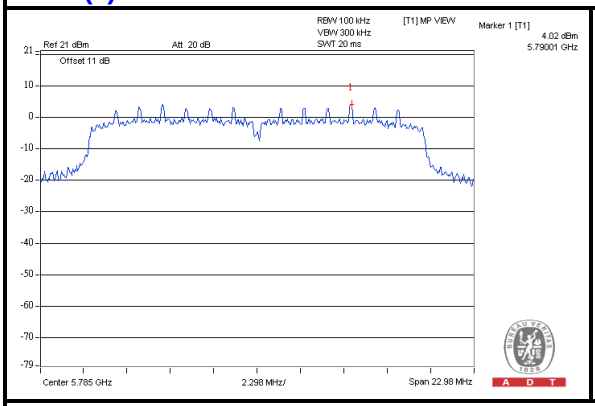
802.11n (HT20)

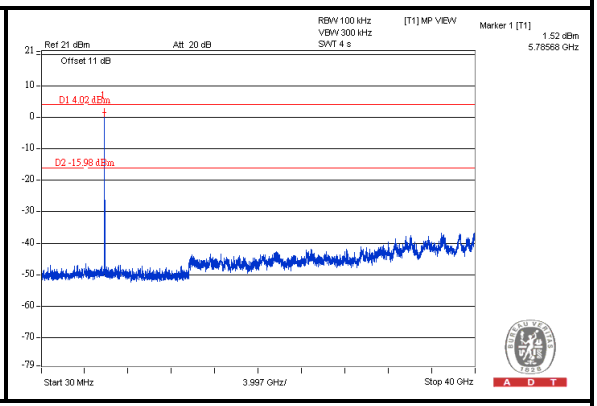
Chain(1) : CH149



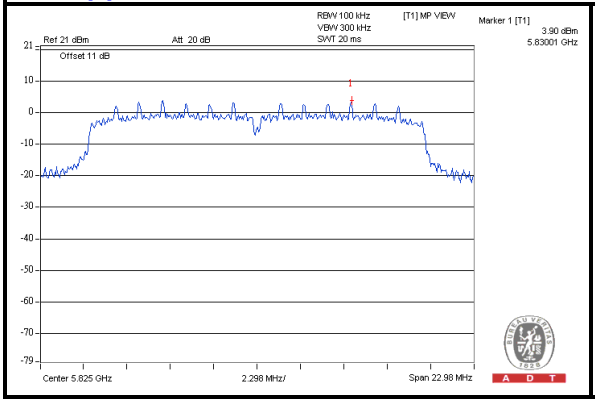


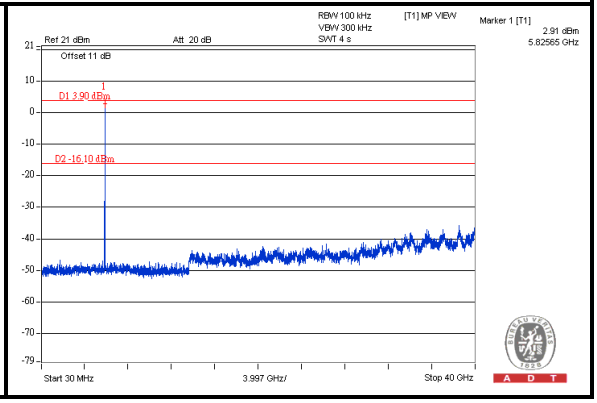
Chain(1) : CH 157





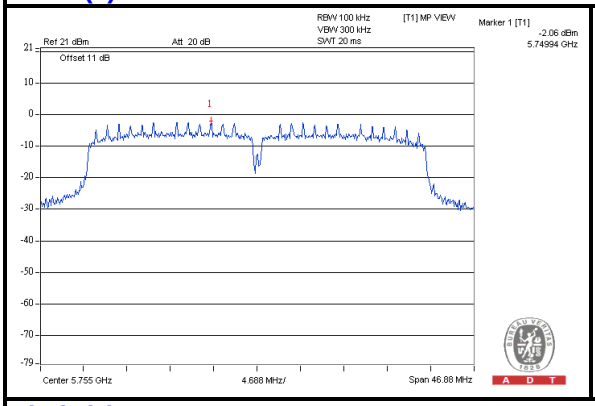
Chain(1) : CH 165

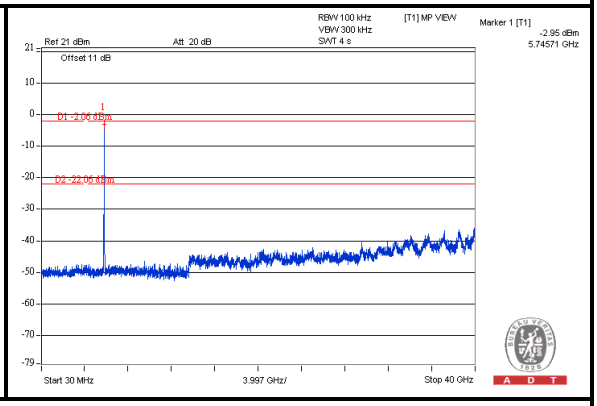




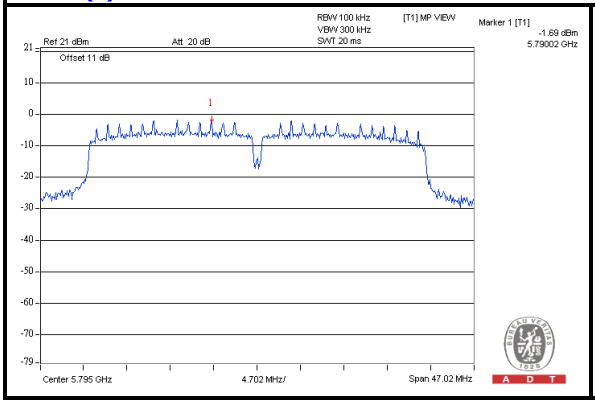
802.11n (HT40)

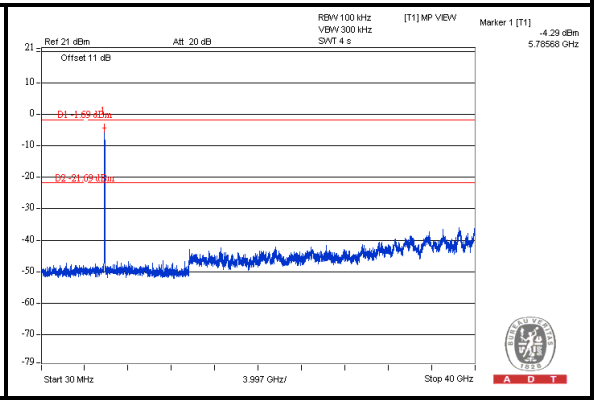
Chain(0) : CH 151





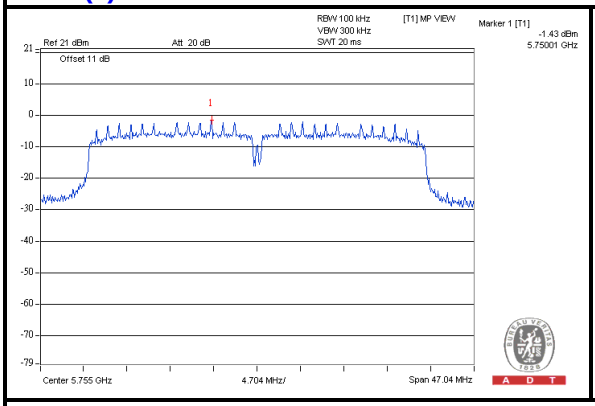
Chain(0) : CH 159

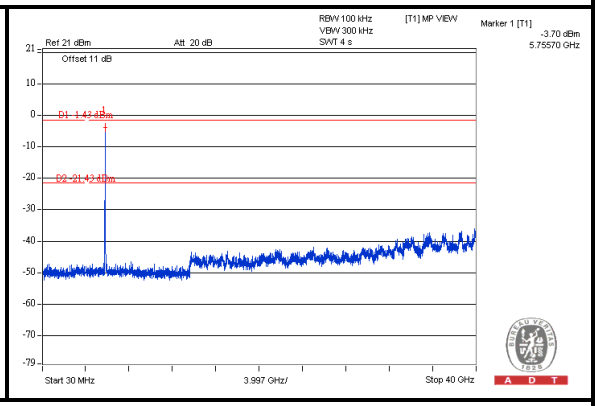




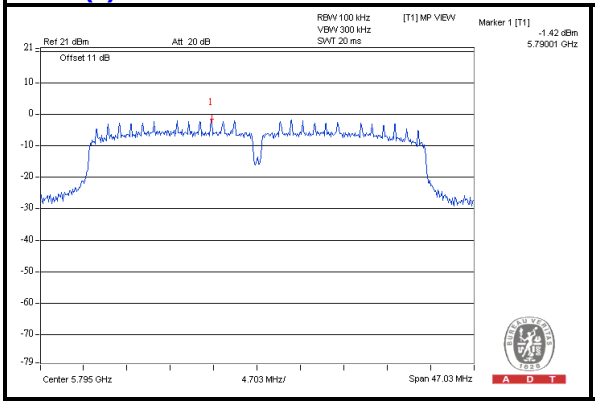
802.11n (HT40)

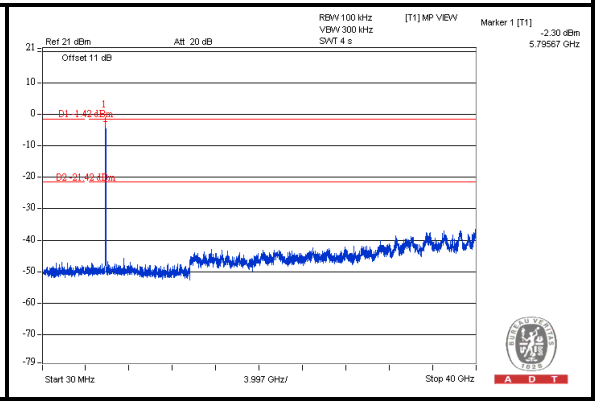
Chain(1) : CH 151





Chain(1) : CH 159





5.7 RADIATED EMISSION MEASUREMENT

5.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

5.7.2 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 24, 2012	July 23, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	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: Aug. 16 to 20, 2012

5.7.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

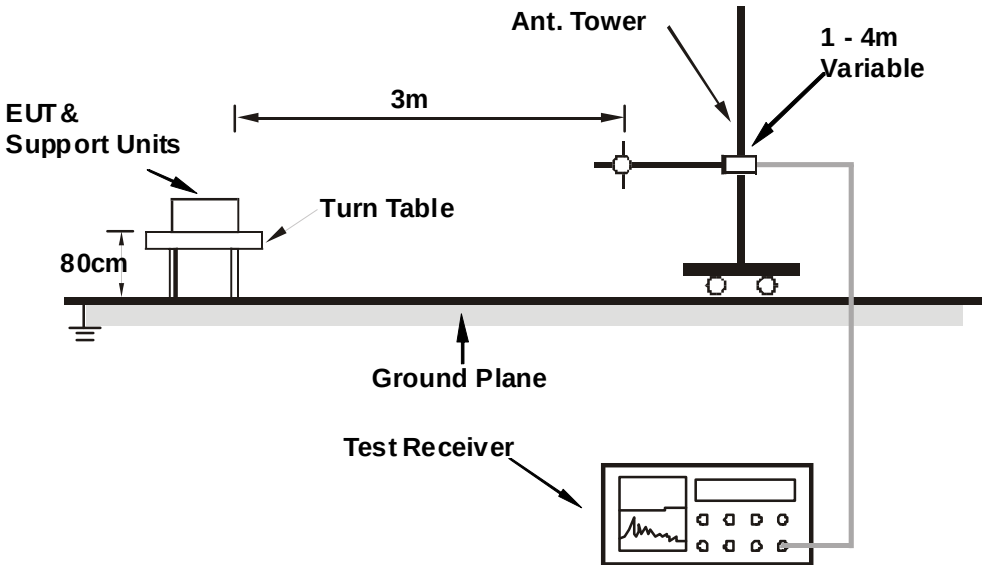
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 TEST SETUP



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

5.7.6 EUT OPERATING CONDITIONS

Same as the 4.7.6

5.7.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11n (HT20)

CHANNEL	TX Channel 149	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	50.01	27.4 QP	40.0	-12.7	1.00 H	183	13.41	13.94
2	650.06	39.8 QP	46.0	-6.2	1.00 H	127	16.96	22.87
3	700.04	39.2 QP	46.0	-6.8	1.00 H	144	15.53	23.67
4	750.01	36.6 QP	46.0	-9.4	1.00 H	124	12.08	24.56
5	775.00	39.2 QP	46.0	-6.8	1.00 H	122	14.15	25.09
6	824.97	34.6 QP	46.0	-11.5	1.00 H	165	8.60	25.95
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	132.67	39.2 QP	43.5	-4.3	1.00 V	84	25.71	13.50
2	324.99	42.5 QP	46.0	-3.5	1.00 V	123	26.58	15.88
3	349.98	41.6 QP	46.0	-4.4	1.00 V	311	25.11	16.46
4	399.95	40.8 QP	46.0	-5.2	1.00 V	156	23.14	17.70
5	650.06	38.1 QP	46.0	-7.9	1.00 V	143	15.25	22.87
6	725.02	42.7 QP	46.0	-3.3	1.00 V	257	18.54	24.12

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	106.1 PK			1.08 H	147	62.78	43.32
2	*5745.00	94.7 AV			1.08 H	147	51.38	43.32
3	11490.00	59.6 PK	74.0	-14.4	1.18 H	201	9.81	49.79
4	11490.00	48.1 AV	54.0	-5.9	1.18 H	201	-1.69	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	105.6 PK			1.09 V	269	62.28	43.32
2	*5745.00	94.6 AV			1.09 V	269	51.28	43.32
3	11490.00	62.3 PK	74.0	-11.7	1.34 V	114	12.51	49.79
4	11490.00	50.6 AV	54.0	-3.4	1.34 V	114	0.81	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	*5785.00	106.5 PK			1.07 H	161	63.13	43.37
2	*5785.00	95.1 AV			1.07 H	161	51.73	43.37
3	11570.00	59.5 PK	74.0	-14.5	1.24 H	189	9.67	49.83
4	11570.00	47.8 AV	54.0	-6.2	1.24 H	189	-2.03	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	105.9 PK			1.06 V	279	62.53	43.37
2	*5785.00	94.9 AV			1.06 V	279	51.53	43.37
3	11570.00	62.6 PK	74.0	-11.4	1.31 V	110	12.77	49.83
4	**11570.00**	**50.7 AV**	**54.0**	**-3.3**	**1.31 V**	**110**	**0.87**	**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	*5825.00	106.4 PK			1.05 H	163	62.93	43.47
2	*5825.00	94.9 AV			1.05 H	163	51.43	43.47
3	11650.00	59.3 PK	74.0	-14.7	1.24 H	191	9.19	50.11
4	11650.00	47.6 AV	54.0	-6.4	1.24 H	191	-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	105.8 PK			1.11 V	286	62.33	43.47
2	*5825.00	94.9 AV			1.11 V	286	51.43	43.47
3	11650.00	62.6 PK	74.0	-11.4	1.35 V	145	12.49	50.11
4	**11650.00**	**50.7 AV**	**54.0**	**-3.3**	**1.35 V**	**145**	**0.59**	**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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5745.00	106.0 PK			1.11 H	150	62.68	43.32
2	*5745.00	94.7 AV			1.11 H	150	51.38	43.32
3	11490.00	59.4 PK	74.0	-14.6	1.27 H	197	9.61	49.79
4	11490.00	47.9 AV	54.0	-6.1	1.27 H	197	-1.89	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	106.2 PK			1.06 V	275	62.88	43.32
2	*5745.00	95.0 AV			1.06 V	275	51.68	43.32
3	11490.00	61.6 PK	74.0	-12.4	1.31 V	146	11.81	49.79
4	11490.00	49.4 AV	54.0	-4.6	1.31 V	146	-0.39	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	*5785.00	106.3 PK			1.08 H	158	62.93	43.37
2	*5785.00	95.1 AV			1.08 H	158	51.73	43.37
3	11570.00	59.2 PK	74.0	-14.8	1.29 H	205	9.37	49.83
4	11570.00	47.7 AV	54.0	-6.3	1.29 H	205	-2.13	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	107.0 PK			1.02 V	276	63.63	43.37
2	*5785.00	95.5 AV			1.02 V	276	52.13	43.37
3	11570.00	61.4 PK	74.0	-12.6	1.34 V	153	11.57	49.83
4	11570.00	49.8 AV	54.0	-4.2	1.34 V	153	-0.03	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	*5825.00	106.7 PK			1.09 H	148	63.23	43.47
2	*5825.00	95.5 AV			1.09 H	148	52.03	43.47
3	11650.00	58.6 PK	74.0	-15.4	1.31 H	208	8.49	50.11
4	11650.00	47.3 AV	54.0	-6.7	1.31 H	208	-2.81	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	107.6 PK			1.01 V	263	64.13	43.47
2	*5825.00	95.9 AV			1.01 V	263	52.43	43.47
3	11650.00	61.7 PK	74.0	-12.3	1.31 V	166	11.59	50.11
4	11650.00	49.6 AV	54.0	-4.4	1.31 V	166	-0.51	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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5755.00	101.6 PK			1.45 H	97	58.26	43.34
2	*5755.00	90.4 AV			1.45 H	97	47.06	43.34
3	11510.00	59.4 PK	74.0	-14.6	1.28 H	201	9.62	49.78
4	11510.00	47.8 AV	54.0	-6.2	1.28 H	201	-1.98	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	101.9 PK			1.17 V	337	58.56	43.34
2	*5755.00	89.7 AV			1.17 V	337	46.36	43.34
3	11510.00	59.9 PK	74.0	-14.1	1.29 V	55	10.12	49.78
4	11510.00	47.8 AV	54.0	-6.2	1.29 V	55	-1.98	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	*5795.00	102.2 PK			1.39 H	99	58.82	43.38
2	*5795.00	90.8 AV			1.39 H	99	47.42	43.38
3	11590.00	59.5 PK	74.0	-14.5	1.28 H	203	9.66	49.84
4	11590.00	47.6 AV	54.0	-6.4	1.28 H	203	-2.24	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	*5795.00	102.3 PK			1.19 V	327	58.92	43.38
2	*5795.00	89.9 AV			1.19 V	327	46.52	43.38
3	11590.00	60.2 PK	74.0	-13.8	1.25 V	48	10.36	49.84
4	11590.00	48.0 AV	54.0	-6.0	1.25 V	48	-1.84	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.

5.8 CONDUCTED EMISSION MEASUREMENT

5.8.1 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.

5.8.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100287	Feb. 29, 2012	Feb. 28, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK 8127	8127-523	Sep. 20, 2011	Sep. 19, 2012
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ESH3-Z5	848773/004	Nov. 01, 2011	Oct. 31, 2012
RF Cable (JYEBAO)	5DFB	COACAB-002	Aug. 05, 2012	Aug. 04, 2013
50 ohms Terminator	50	4	Nov. 12, 2011	Nov. 11, 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. A.
3 The VCCI Con A Registration No. is C-817.
4. Tested Date: Aug. 28, 2012

5.8.3 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.

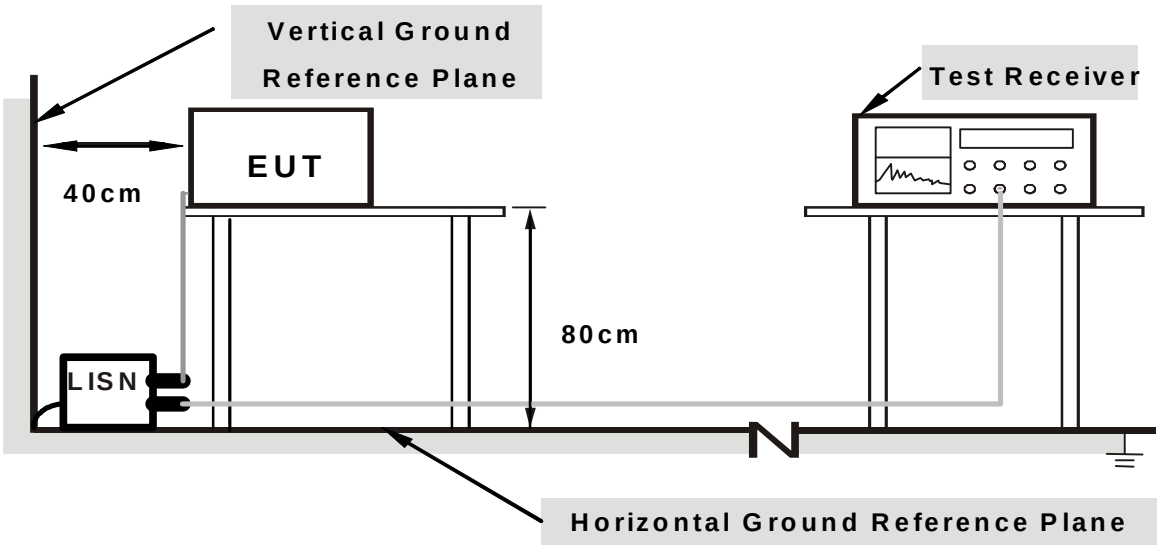
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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

5.8.4 DEVIATION FROM TEST STANDARD

No deviation

5.8.5 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.

5.8.6 EUT OPERATING CONDITIONS

Same as the 4.7.6

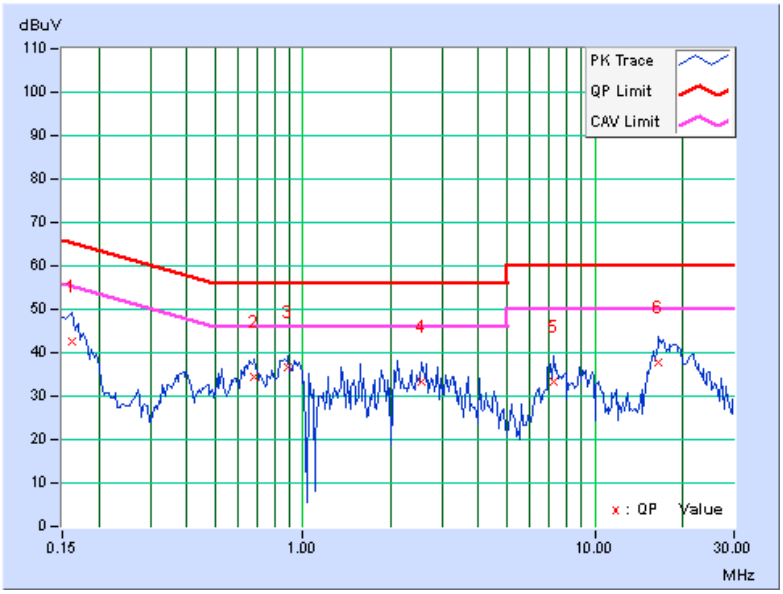
5.8.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.06	42.71	38.87	42.77	38.93	65.38	55.38	-22.61	-16.45
2	0.68125	0.09	34.31	16.18	34.40	16.27	56.00	46.00	-21.60	-29.73
3	0.88828	0.11	36.43	21.83	36.54	21.94	56.00	46.00	-19.46	-24.06
4	2.56641	0.21	33.13	21.47	33.34	21.68	56.00	46.00	-22.66	-24.32
5	7.21094	0.34	33.12	22.32	33.46	22.66	60.00	50.00	-26.54	-27.34
6	16.53906	0.55	37.14	29.42	37.69	29.97	60.00	50.00	-22.31	-20.03

REMARKS:

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

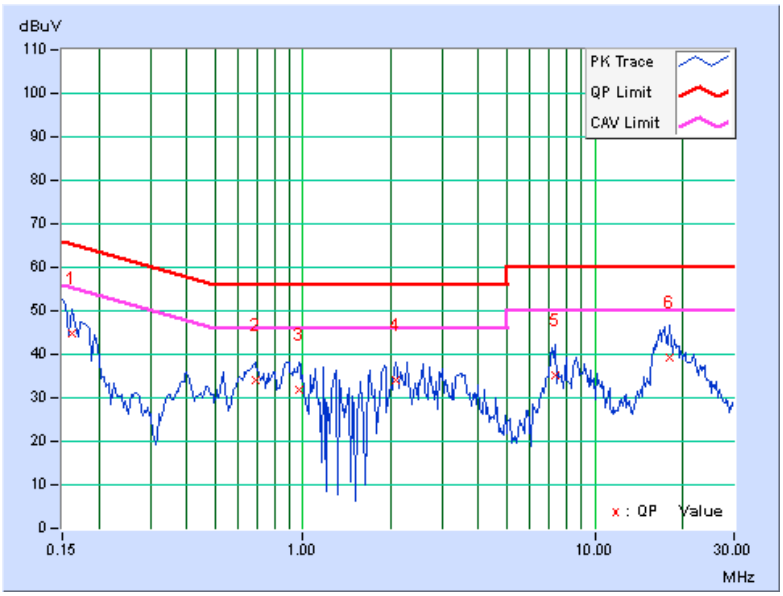


PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.16172**	**0.07**	**44.70**	**39.17**	**44.77**	**39.24**	**65.38**	**55.38**	**-20.61**	**-16.14**
2	0.68516	0.10	34.12	15.56	34.22	15.66	56.00	46.00	-21.78	-30.34
3	0.96641	0.12	31.56	14.87	31.68	14.99	56.00	46.00	-24.32	-31.01
4	2.07813	0.18	33.78	22.48	33.96	22.66	56.00	46.00	-22.04	-23.34
5	7.33984	0.32	34.75	23.28	35.07	23.60	60.00	50.00	-24.93	-26.40
6	18.01172	0.56	38.58	31.76	39.14	32.32	60.00	50.00	-20.86	-17.68

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.



6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

7. INFORMATION ON THE TESTING LABORATORIES

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

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

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.bureauveritas-adt.com

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

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

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

--- END ---