FCC TEST REPORT (WLAN/DTS 15.247)

REPORT NO.:	RF131203E01
MODEL NO.:	RTL8821AU
FCC ID:	TX2-RTL8821AU
RECEIVED:	Dec. 02, 2013
TESTED:	Dec. 24, 2013 to Feb. 26, 2014
ISSUED:	Mar. 04, 2014

APPLICANT:	Realtek Semiconductor Corp.
ADDRESS:	No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

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
RF131203E01	Original release	Mar. 04, 2014

1. CERTIFICATION

PRODUCT:	802.11a/b/g/n/ac RTL8821AU Combo module
BRAND NAME:	Realtek
MODEL NO.:	RTL8821AU
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Realtek Semiconductor Corp.
TESTED:	Dec. 24, 2013 to Feb. 26, 2014
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.10-2009

The above equipment (Model: RTL8821AU) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Phoenix Huang , **DATE:** *Mar. 04, 2014*
(Phoenix Huang, Specialist)

APPROVED BY : , **DATE:** *Mar. 04, 2014*
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz (WLAN), 2400~2483.5MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.58dB at 0.18516MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 2390.00MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

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

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.55dB at 0.20469MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.4dB at 2390.00MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

For 5GHz, 5725~5850MHz Band

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -13.10dB at 0.21250MHz
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -5.4dB at 134.35MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted Output power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

NOTE: The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2.400 ~ 2.4835GHz and 5.725~5.850GHz. For the 5.15~5.35GHz, 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)	5.37 dB
Radiated emissions (1GHz -6GHz) for Chamber G	3.65 dB
Radiated emissions (1GHz -6GHz) for Chamber H	3.72 dB
Radiated emissions (6GHz -18GHz) for Chamber G	3.88 dB
Radiated emissions (6GHz -18GHz) for Chamber H	4.00 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT (WLAN/DTS)

PRODUCT	802.11a/b/g/n/ac RTL8821AU Combo module
MODEL NO.	RTL8821AU
POWER SUPPLY	DC 3.3V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM BT-LE (GFSK) for DTS 256QAM for OFDM in 11ac mode only
MODULATION TECHNOLOGY	DSSS,OFDM, DTS
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 150Mbps 802.11ac: up to 433.4Mbps BT-LE (GFSK): 1Mbps
OPERATING FREQUENCY	**For 15.407** **5GHz:** 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66GHz ~ 5.70GHz
	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), 802.11ac (VHT20) 7 for 802.11n (HT40), 802.11ac (VHT40) 3 for 802.11ac (VHT80)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) **For 15.247 (5GHz)** 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 69.823mW 802.11ac (VHT20): 69.343mW 802.11ac (VHT40): 71.285mW 802.11ac (VHT80): 20.701mW **For 15.247 (2.4GHz)** 802.11b: 123.310mW 802.11g: 293.765mW 802.11n (HT20): 264.850mW 802.11n (HT40): 213.304mW BT-LE(GFSK): 3.048mW **For 15.247 (5GHz)** 802.11a: 205.116mW 802.11ac (VHT20): 224.905mW 802.11ac (VHT40): 201.372mW 802.11ac (VHT80): 301.301mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. There are Bluetooth technology and WLAN technology used for the EUT.
2. For WLAN: 2.4GHz and 5GHz technology cannot transmit at same time.
3. The antennas provided to the EUT, please refer to the following table:

No.	Brand	Model	Antenna Type	Peak gain with cable loss (dBi) (2.4GHz)	Peak gain with cable loss(dBi) (5GHz)	Cable Loss (dB) (2.4GHz)	Cable Loss (dB) (5GHz)	Connector Type
1	LYNwave	ALA110-222050-300010 (Main) ALA110-222050-300010 (Aux)	PIFA	3.5 3.5	5 5	NA	NA	IPEX
2	WGT	SKA91WMPB02+A (Tx1) SKA91WMPB01+A (Tx2)	PIFA	0.82 -2.23	0.94 2.18	-1.32 -0.75	-2.04 -1.17	IPEX
3	JEM	1510-0122-0027 (Tx1) 1510-0122-0027 (Tx2)	PIFA	3.23 2.31	4.89 1.89	NA	NA	RF
4	FVC	K05007014501(6-23-7W25H-010) (Tx1) K05007014501(6-23-7W25H-010) (Tx2)	PIFA	2.85 1.59	2.46 2.91	NA	NA	IPEX

No.	Brand	Model	Antenna Type	Peak gain with cable loss (dBi) (2.4GHz)	Peak gain with cable loss(dBi) (5GHz)	Cable Loss (dB) (2.4GHz)	Cable Loss (dB) (5GHz)	Connector Type
5	JEM	1510-0122-0022(IA-120073) (Tx1) 1510-0122-0022(IA-120073) (Tx2)	PIFA	2.23 2.21	1.69 1.84	NA	NA	RF
6	WGT	SK81WMPB01+A (Tx1) SK81WMPB02+A (Tx2)	PIFA	1.79 0.66	1.49 -0.40	-1.88 -2.95	-3.17 -4.96	IPEX
7	WGT	SKW2UWMPB01+A (Tx1) SKW2UWMPB01+A (Tx2)	PIFA	1.36 2.88	1.92 3.16	NA	NA	IPEX
8	WGT	SKW25WMPB01+A (Tx1) SKW25WMPB01+A (Tx2)	PIFA	0.72 0.49	-0.72 -0.71	-1.41 -1.39	-2.18 -2.15	IPEX
9	WGT	SK549WMPB01+A (Tx1) SK549WMPB02+A (Tx2)	PIFA	-0.17 -2.24	-0.13 0.03	-1.04 -0.88	-1.94 -1.64	IPEX
10	WGT	SK110WMPB01+A (Tx1) SK110WMPB02+A (Tx2)	PIFA	1.05 -0.41	1.08 2.32	-0.98 -0.99	-1.52 -1.54	IPEX
11	WGT	SKW31WMPB01+A (Tx1) SKW31WMPB01+A (Tx2)	PIFA	1.85 3.14	1.74 2.10	NA	NA	IPEX
12	FVC	6-23-7B51M-031 (Tx1) 6-23-7B51M-031 (Tx2)	PIFA	1.58 1.75	2.54 2.24	NA	NA	IPEX
13	FVC	6-23-7E51Q-011 (Tx1) 6-23-7E51Q-011 (Tx2)	PIFA	2.70 2.19	1.57 2.94	NA	NA	IPEX
14	FVC	6-23-7B710-022 (WM1) 6-23-7B710-022 (WM2)	PIFA	1.51 2.04	2.99 3.02	NA	NA	IPEX
15	WGT	SKM11WMPB03+A (Tx1) SKM11WMPB02+D (Tx2)	PIFA	-1.84 -2.93	0.44 1.35	1.17 0.89	2.02 1.54	IPEX
16	WGT	SKW23WMPB01+A (Tx1) SKW23WMPB02+A (Tx2)	PIFA	-1.61 -2.84	-0.14 -0.96	-2.10 -2.07	-3.25 -3.20	IPEX
17	WGT	SKW24WMPB01+B (WM1) SKW24WMPB01+B (WM2)	PIFA	1.25 3.17	1.95 2.42	NA	NA	IPEX
18	FVC	K05007015501(6-23-7W244-020-1) (Tx1) K05007015501(6-23-7W244-020-1) (Tx2)	PIFA	2.53 2.28	2.86 2.97	NA	NA	IPEX
19	FVC	K05007014201(6-23-7W25P-020) (Tx1) K05007014201(6-23-7W25P-020) (Tx2)	PIFA	3.00 1.52	2.82 2.21	NA	NA	IPEX
20	WGT	SKW10WMPB01+A (Tx1) SKW10WMPB02+A (Tx2)	PIFA	0.85 0.44	0.75 1.24	-1.56 -1.53	-2.42 -2.36	IPEX

No.	Brand	Model	Antenna Type	Peak gain with cable loss (dBi) (2.4GHz)	Peak gain with cable loss(dBi) (5GHz)	Cable Loss (dB) (2.4GHz)	Cable Loss (dB) (5GHz)	Connector Type
21	WGT	SKCZTWMPB01+A (Tx1) SKCZTWMPB02+A (Tx2)	PIFA	0.46 -0.79	2.80 1.03	-1.56 -1.53	-2.42 -2.36	IPEX
22	JEM	IA-120266 (Tx1) IA-120267 (Tx2)	PIFA	2.60 0.53	2.61 2.60	2.12 1.76	3.48 2.87	IPEX
23	WGT	SK547WMPB01+A (Tx1) SK549WMPB02+A (Tx2)	PIFA	-0.66 0.78	-0.19 2.06	-1.42 -1.43	-2.20 -2.21	IPEX
24	WGT	SK555WMPB01+B (Tx1) SK555WMPB02+B (Tx2)	PIFA	0.76 0.09	1.97 0.56	-1.83 -1.80	-2.83 -2.78	IPEX
25	WGT	SK65EWMPB01+A (Tx1) SK650WMPB02+A (Tx2)	PIFA	0.42 -0.13	0.11 1.27	-1.56 -0.61	-2.41 -0.94	IPEX
26	WGT	SK670WMPB01+A (Tx1) SK670WMPB02+A (Tx2)	PIFA	1.48 1.15	-0.44 0.42	-2.47 -1.93	-3.82 -2.99	IPEX
27	WGT	SK740WMPB01+A (Tx1) SK740WMPB02+A (Tx2)	PIFA	-0.93 0.20	0.96 0.86	-1.39 -1.26	-2.16 -1.95	IPEX
28	WGT	SK840WMPB01+B_SN (Tx1) SK840WMPB01+B_SN (Tx2)	PIFA	3.03 0.55	4.16 0.90	-1.12 -1.20	-1.74 -1.86	IPEX
29	WGT	SK94SWMPB01+B (TX1) SK94SWMPB01+B (TX2)	PIFA	0.76 0.46	1.12 1.44	-0.32 -0.44	-0.50 -0.68	IPEX
30	WGT	SK94TWMPB01+B (TX1) SK94TWMPB01+B (TX2)	PIFA	1.32 1.86	2.59 1.57	-0.59 -0.71	-0.91 -1.10	IPEX
31	WGT	SK50SWMPB01+A (TX1) SK50SWMPB02+A (TX2)	PIFA	-0.03 -0.13	1.25 2.13	-0.86 -0.72	-1.32 -1.12	IPEX
32	WGT	SK94TWMPB01+D (TX1) SK94TWMPB01+D (TX2)	PIFA	1.32 1.86	2.59 1.57	-0.59 -0.71	-0.91 -1.10	IPEX
33	WGT	SKC45WMPB03+B (WM1) SKC45WMPB03+B (WM2)	PIFA	2.46 2.91	2.90 2.67	NA	NA	IPEX
34	FVC	K05007015801 (WM1) K05007015901 (WM2)	PIFA	3.12 1.01	3.51 1.93	NA	NA	RF
35	WGT	SK345WMPB01+A (WM1) SK345WMPB02+A (WM2)	PIFA	0.86 2.51	2.94 3.25	NA	NA	IPEX
36	FVC	K05007014901 (WM1) K05007015001 (WM2)	PIFA	1.85 1.94	1.35 1.99	NA	NA	IPEX
37	WGT	SKX51WMPB01+C (WM1) SKX51WMPB02+C (WM2)	PIFA	3.2 2.76	2.28 2.51	NA	NA	IPEX
38	INPAQ	WA-P-LB-02-122 (Main) WA-P-LB-01-072 (Aux)	PIFA	-1.41 -0.33	-2.44 -3.87	1.23 1.86	2.06 3.12	IPEX
39	Smart Approach	SE-ECZ50-001 (Tx1) SE-ECZ50-002 (Tx2)	PIFA	-1.37 -2.17	1.83 1.86	0.96 1.45	1.73 2.62	IPEX
40	INPAQ	WA-P-LB-02-121 (Main) WA-P-LB-01-071 (Aux)	PIFA	-2.26 -4.63	-2.87 -2.49	1.32 1.95	2.22 3.28	IPEX

No.	Brand	Model	Antenna Type	Peak gain with cable loss (dBi) (2.4GHz)	Peak gain with cable loss(dBi) (5GHz)	Cable Loss (dB) (2.4GHz)	Cable Loss (dB) (5GHz)	Connector Type
41	Smart Approach	SE-ECZ70-001 (Tx1) SE-ECZ70-002 (Tx2)	PIFA	-0.65 -2.39	1.52 0.58	1.03 1.52	1.87 2.76	IPEX

Note: The **Antenna 1** was chosen for final test. The worst case was found in Aux. Therefore only the test data of the mode was recorded in this report.

4. The EUT incorporates a SISO function.

MODULATION MODE	Tx/Rx FUNCTION
802.11a	1Tx (Diversity) /1Rx (Diversity)
802.11b	1Tx (Diversity) /1Rx (Diversity)
802.11g	1Tx (Diversity) /1Rx (Diversity)
802.11n (HT20)	1Tx (Diversity) /1Rx (Diversity)
802.11n (HT40)	1Tx (Diversity) /1Rx (Diversity)
802.11ac (VHT20)	1Tx (Diversity) /1Rx (Diversity)
802.11ac (VHT40)	1Tx (Diversity) /1Rx (Diversity)
802.11ac (VHT80)	1Tx (Diversity) /1Rx (Diversity)

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

5. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 7.
6. When the EUT operating in 802.11ac, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.
7. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

11 channels are provided for 802.11b, 802.11g, 802.11n (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		

7 channels are provided for 802.11n (HT40):

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

40 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:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

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

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

OB: Conducted Out-Band Emission Measurement

1. **For 2.4GHz:** The EUT's antenna (PIFA) had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane** (for below 1GHz) and **X-plane** (for above 1GHz)**.**
2. **For 5GHz:** The EUT's antenna (PIFA) 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	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
BT-LE	0 to 39	19	DTS	GFSK	1
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

RADIATED EMISSION TEST (BELOW 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 11	6	OFDM	BPSK	6
BT-LE	0 to 39	19	DTS	GFSK	1
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
BT-LE	0 to 39	0, 19, 39	DTS	GFSK	1
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
BT-LE	0 to 39	0, 19, 39	DTS	GFSK	1
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

CONDUCTED OUT-BAND EMISSION MEASUREMENT:

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
For 2.4 GHz 802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
For 2.4 GHz 802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5
BT-LE	0 to 39	0, 19, 39	DTS	GFSK	1
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6
For 5 GHz 802.11ac (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
For 5 GHz 802.11ac (VHT40)	151 to 159	151, 159	OFDM	BPSK	13.5
For 5 GHz 802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	24deg. 53C,%RH	120Vac, 60Hz	Bear Lee
RE<1G	23deg. C, 74%RH	120Vac, 60Hz	Jason Huang
RE≥1G	21deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
	22deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
	23deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Chilin Lee

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)

558074 D01 DTS Meas Guidance v03r01

ANSI C63.10-2009

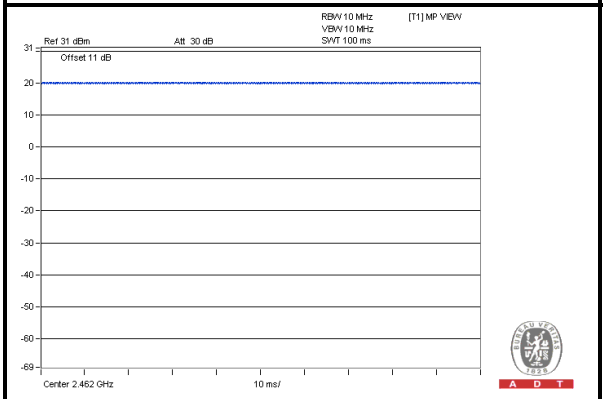
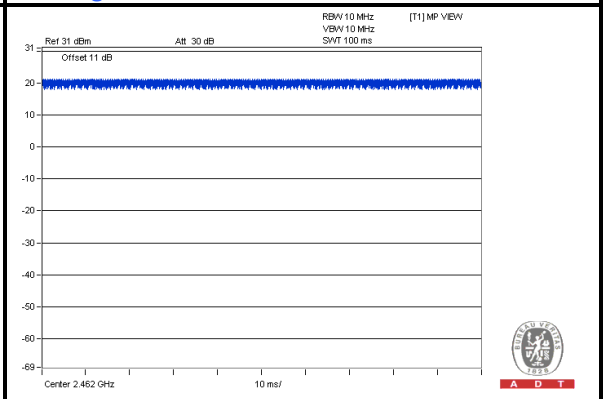
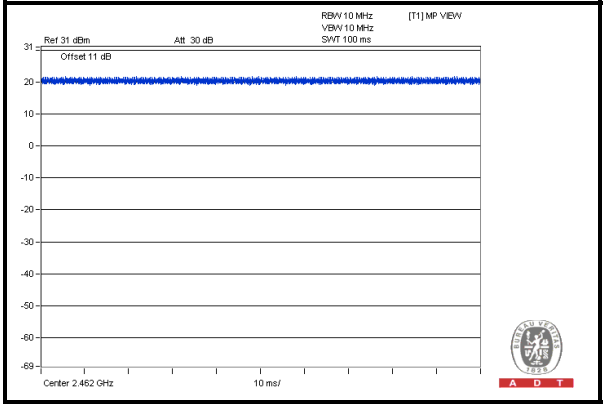
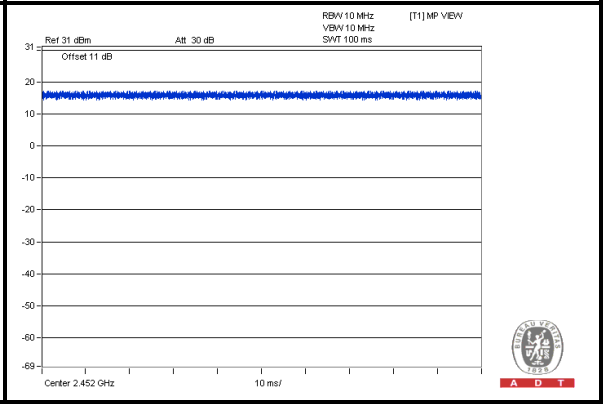
All test items have been performed and recorded as per the above standards.

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DUTY CYCLE OF TEST SIGNAL

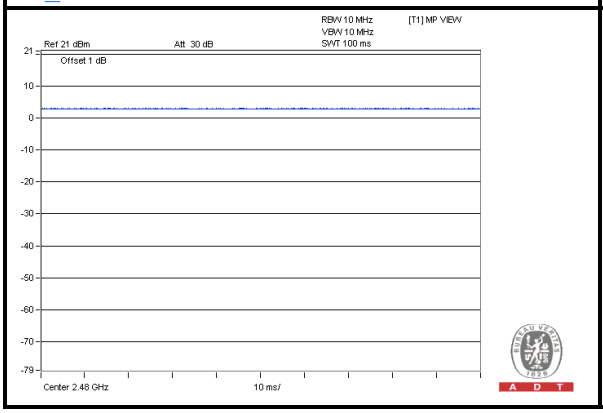
For 2.4GHz

Duty cycle of test signal is 100 %, duty factor is not required.

802.11b	802.11g
	
802.11n (HT20)	**802.11n (HT40)**
	

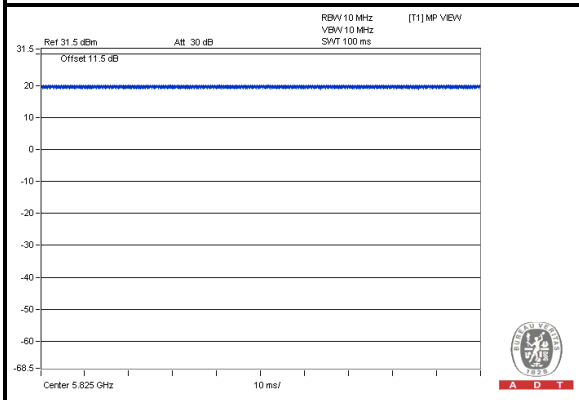
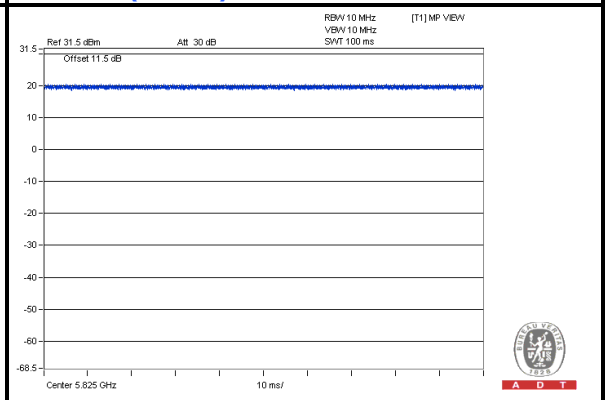
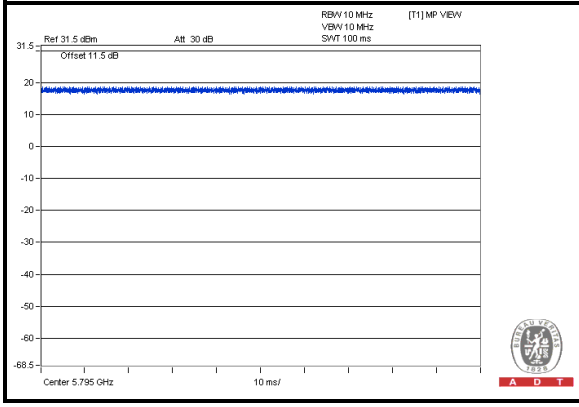
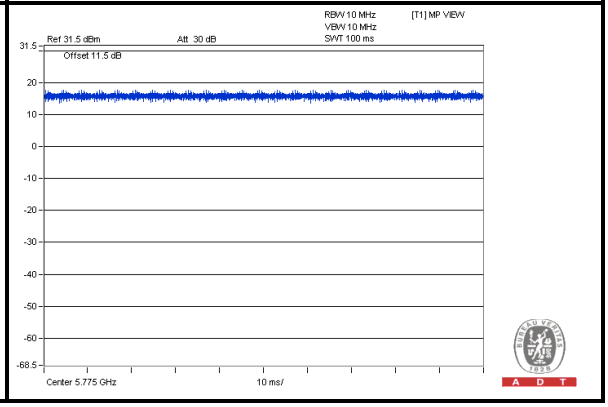
For BT_LE-GFSK:

Duty cycle of test signal is 100 %, duty factor is not required.

BT_LE-GFSK	
	

For 5GHz

Duty cycle of test signal is 100 %, duty factor is not required.

802.11a	802.11ac (VHT20)
	
802.11ac (VHT40)	**802.11ac (VHT80)**
	

3.5 DESCRIPTION OF SUPPORT UNITS

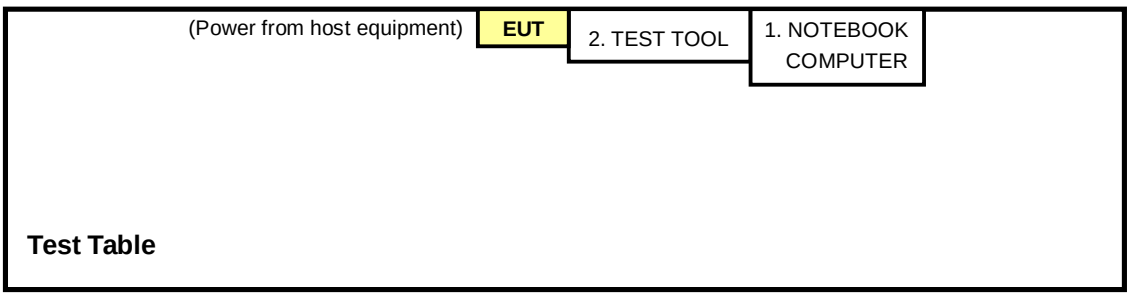
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	HSLB32S	FCC DoC
2	TEST TOOL	Realtek	NA	NA	NA

No.	Signal cable description
1	NA
2	NA

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

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS (FOR 2.4GHz, 2.400 ~ 2.4835GHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Mar. 08, 2013	Mar. 07, 2014
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 05, 2013	Sep. 04, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 06, 2013	June 05, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 11, 2013	Mar. 10, 2014
50 ohms Terminator	50	EMC-03	Sep. 24, 2013	Sep. 23, 2014
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Dec. 24, 2013

4.1.3 TEST PROCEDURES

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

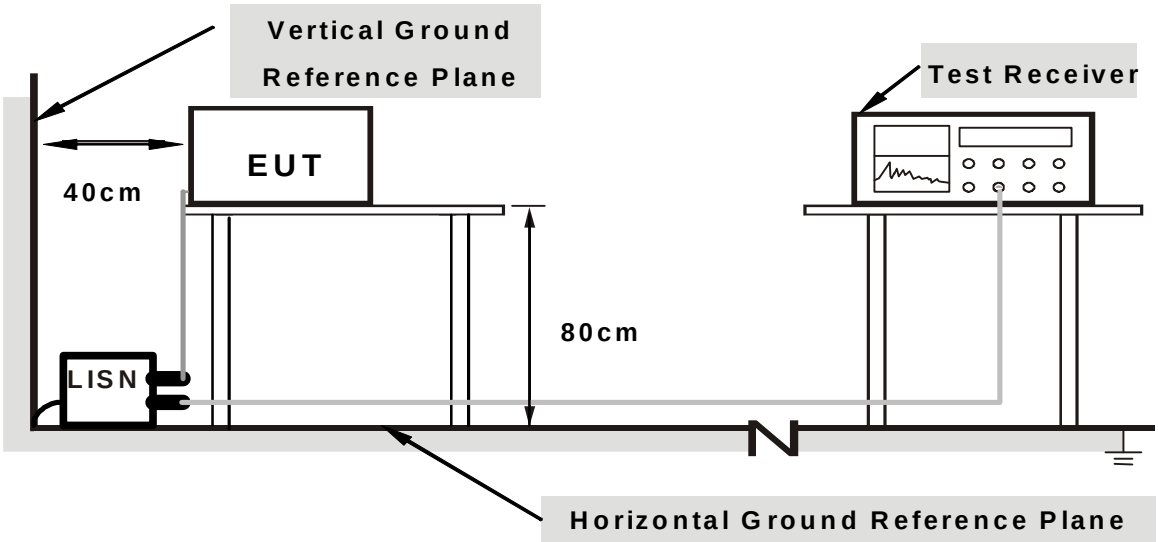
NOTE:

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 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 “REALTEK 11ac 8821AU USB WLAN NIC Massproduction Kit” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

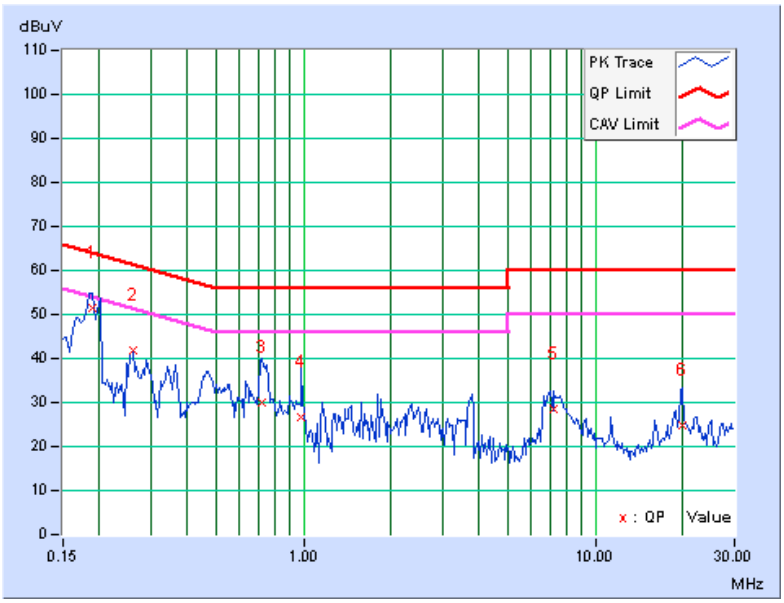
4.1.7 TEST RESULTS (WLAN)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.18906	0.10	51.20	29.26	51.30	29.36	64.08	54.08	-12.78	-24.72
2	0.25938	0.11	41.67	27.25	41.78	27.36	61.45	51.45	-19.67	-24.09
3	0.72422	0.16	29.99	15.25	30.15	15.41	56.00	46.00	-25.85	-30.59
4	0.98594	0.17	26.65	16.09	26.82	16.26	56.00	46.00	-29.18	-29.74
5	7.22656	0.38	28.00	20.61	28.38	20.99	60.00	50.00	-31.62	-29.01
6	19.95313	0.71	23.92	18.51	24.63	19.22	60.00	50.00	-35.37	-30.78

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

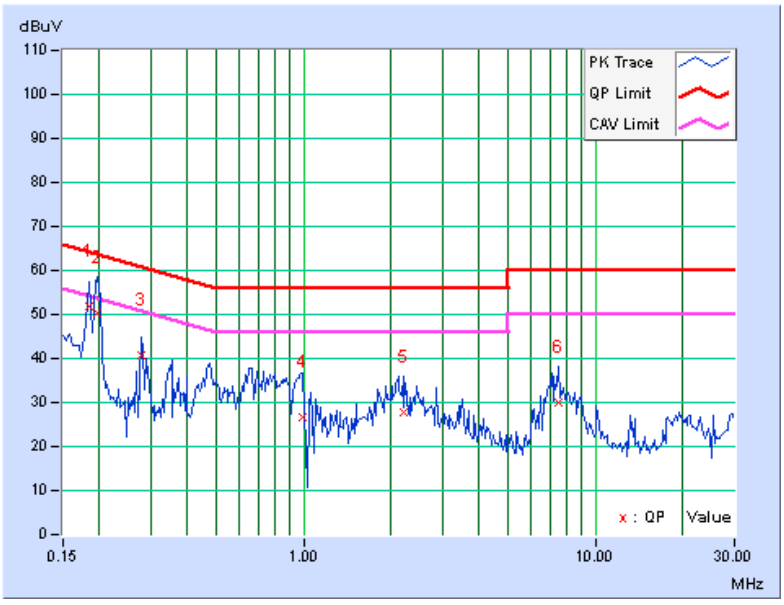


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	**0.18516**	**0.10**	**51.57**	**35.55**	**51.67**	**35.65**	**64.25**	**54.25**	**-12.58**	**-18.60**
2	0.19687	0.10	50.10	30.33	50.20	30.43	63.74	53.74	-13.54	-23.31
3	0.27891	0.12	40.70	19.76	40.82	19.88	60.85	50.85	-20.03	-30.97
4	0.99766	0.17	26.37	15.67	26.54	15.84	56.00	46.00	-29.46	-30.16
5	2.19531	0.23	27.56	18.94	27.79	19.17	56.00	46.00	-28.21	-26.83
6	7.49609	0.39	29.76	22.72	30.15	23.11	60.00	50.00	-29.85	-26.89

REMARKS:

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



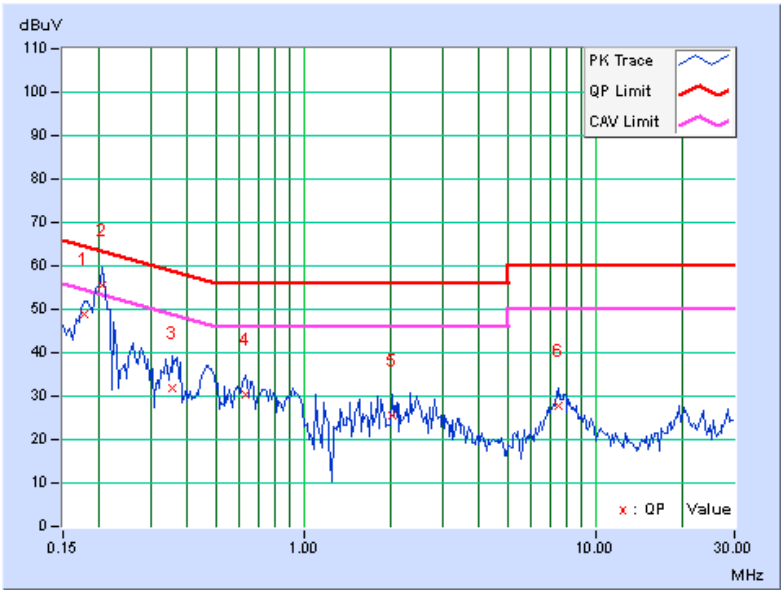
4.1.8 TEST RESULTS (BT-LE)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.17734	0.09	48.79	35.25	48.88	35.34	64.61	54.61	-15.73	-19.27
2	0.20469	0.10	55.44	37.60	55.54	37.70	63.42	53.42	-7.88	-15.72
3	0.35703	0.13	31.60	16.90	31.73	17.03	58.80	48.80	-27.07	-31.77
4	0.63438	0.15	30.20	21.32	30.35	21.47	56.00	46.00	-25.65	-24.53
5	2.01953	0.21	25.33	17.26	25.54	17.47	56.00	46.00	-30.46	-28.53
6	7.47656	0.39	27.45	21.34	27.84	21.73	60.00	50.00	-32.16	-28.27

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

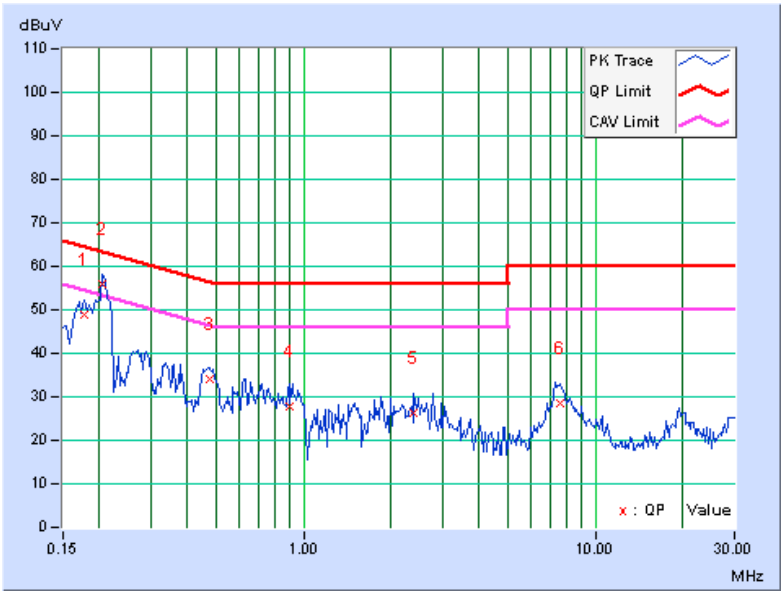


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.17734	0.10	48.67	35.89	48.77	35.99	64.61	54.61	-15.84	-18.62
2	**0.20469**	**0.10**	**55.77**	**37.86**	**55.87**	**37.96**	**63.42**	**53.42**	**-7.55**	**-15.46**
3	0.47422	0.14	33.96	23.28	34.10	23.42	56.44	46.44	-22.34	-23.02
4	0.89219	0.16	27.54	17.74	27.70	17.90	56.00	46.00	-28.30	-28.10
5	2.39063	0.23	26.10	18.90	26.33	19.13	56.00	46.00	-29.67	-26.87
6	7.59766	0.39	28.18	22.22	28.57	22.61	60.00	50.00	-31.43	-27.39

REMARKS:

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



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

For BT-LE test: (above 1GHz)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Jan. 15, 2014	Jan. 14, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Mar. 25, 2013	Mar. 24, 2014
RF Cable	NA	CHHCAB_001	Oct. 06, 2013	Oct. 05, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISI	AIH.8018	0000220091110	Dec. 06, 2013	Dec. 05, 2014
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	RF104-205 RF104-207 RF104-202	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	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: Feb. 14 to 26, 2014

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	Jan. 21,2014	Jan. 20,2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Mar. 19, 2013	Mar. 18, 2014
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A02578	June 25, 2013	June 24, 2014
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	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. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: Jan. 21 to Feb. 20, 2014

4.2.3 TEST PROCEDURES

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

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

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

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

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

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

Note:

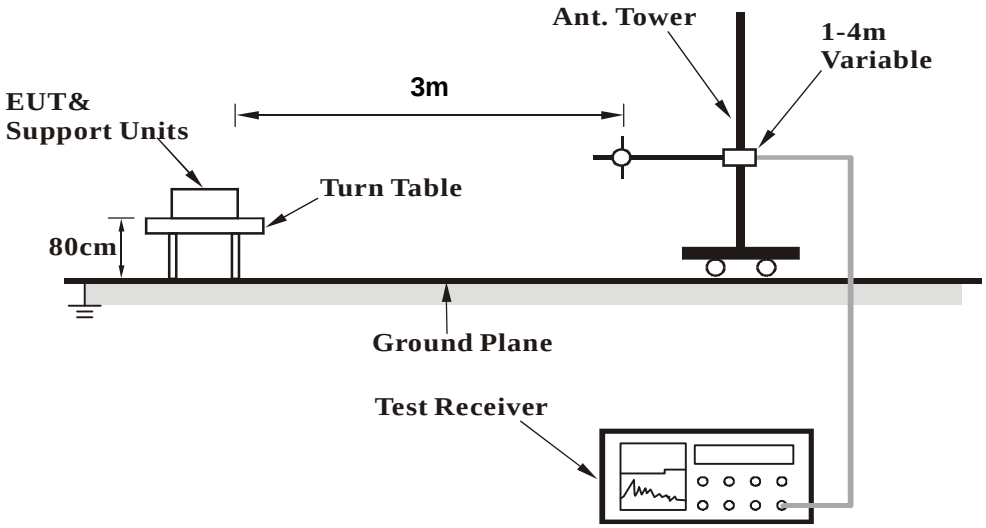
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

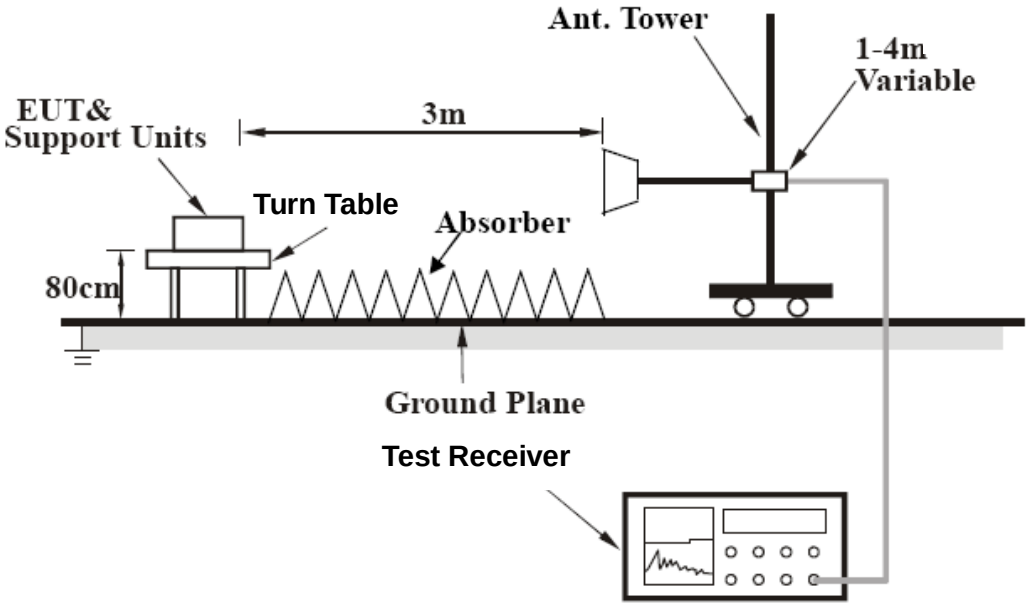
No deviation

4.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS (WLAN)

BELOW 1GHz WORST-CASE DATA

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	117.93	30.4 QP	43.5	-13.1	1.50 H	99	45.70	-15.32
2	132.00	32.8 QP	43.5	-10.7	1.50 H	141	47.26	-14.46
3	149.07	30.6 QP	43.5	-12.9	1.50 H	67	44.06	-13.49
4	173.12	37.5 QP	43.5	-6.0	1.50 H	124	51.70	-14.23
5	252.71	38.4 QP	46.0	-7.6	1.00 H	148	52.69	-14.33
6	330.70	32.6 QP	46.0	-13.4	1.00 H	60	44.07	-11.46
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	117.93	36.8 QP	43.5	-6.7	1.00 V	137	52.13	-15.32
2	137.19	31.1 QP	43.5	-12.4	1.00 V	82	45.06	-13.93
3	175.21	34.2 QP	43.5	-9.4	1.50 V	107	48.70	-14.55
4	252.52	32.2 QP	46.0	-13.8	1.50 V	52	46.53	-14.33
5	399.43	29.9 QP	46.0	-16.1	1.50 V	165	39.81	-9.91
6	960.00	34.0 QP	46.0	-12.0	1.00 V	115	32.93	1.03

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

ABOVE 1GHz DATA

802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	2386.00	60.3 PK	74.0	-13.7	1.39 H	295	62.06	-1.76
2	**2386.00**	**53.4 AV**	**54.0**	**-0.6**	**1.39 H**	**295**	**55.16**	**-1.76**
3	*2412.00	109.1 PK			1.39 H	295	110.75	-1.65
4	*2412.00	106.8 AV			1.39 H	295	108.45	-1.65
5	4824.00	54.6 PK	74.0	-19.4	1.10 H	29	47.59	7.01
6	4824.00	49.2 AV	54.0	-4.8	1.10 H	29	42.19	7.01
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	50.4 PK	74.0	-23.6	1.03 V	81	52.14	-1.74
2	2390.00	41.3 AV	54.0	-12.7	1.03 V	81	43.04	-1.74
3	*2412.00	100.4 PK			1.03 V	81	102.05	-1.65
4	*2412.00	96.6 AV			1.03 V	81	98.25	-1.65
5	4824.00	51.1 PK	74.0	-22.9	1.11 V	263	44.09	7.01
6	4824.00	44.9 AV	54.0	-9.1	1.11 V	263	37.89	7.01

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) – Pre-Amplifier 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	110.8 PK			1.39 H	296	112.35	-1.55
2	*2437.00	107.2 AV			1.39 H	296	108.75	-1.55
3	4874.00	57.3 PK	74.0	-16.7	1.08 H	29	50.14	7.16
4	4874.00	52.7 AV	54.0	-1.3	1.08 H	29	45.54	7.16
5	7311.00	57.4 PK	74.0	-16.6	1.04 H	175	42.64	14.76
6	7311.00	44.0 AV	54.0	-10.0	1.04 H	175	29.24	14.76
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	100.7 PK			1.04 V	73	102.25	-1.55
2	*2437.00	96.9 AV			1.04 V	73	98.45	-1.55
3	4874.00	52.1 PK	74.0	-21.9	1.02 V	231	44.94	7.16
4	4874.00	45.8 AV	54.0	-8.2	1.02 V	231	38.64	7.16
5	7311.00	57.0 PK	74.0	-17.0	1.00 V	346	42.24	14.76
6	7311.00	43.6 AV	54.0	-10.4	1.00 V	346	28.84	14.76

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) – Pre-Amplifier 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	110.3 PK			1.35 H	295	111.74	-1.44
2	*2462.00	106.6 AV			1.35 H	295	108.04	-1.44
3	2483.50	57.8 PK	74.0	-16.2	1.35 H	295	59.15	-1.35
4	2483.50	48.0 AV	54.0	-6.0	1.35 H	295	49.35	-1.35
5	4924.00	57.0 PK	74.0	-17.0	1.06 H	28	49.70	7.30
6	4924.00	52.7 AV	54.0	-1.3	1.06 H	28	45.40	7.30
7	7386.00	57.2 PK	74.0	-16.8	1.01 H	182	42.58	14.62
8	7386.00	44.0 AV	54.0	-10.0	1.01 H	182	29.38	14.62
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	100.1 PK			1.00 V	74	101.54	-1.44
2	*2462.00	96.5 AV			1.00 V	74	97.94	-1.44
3	2483.50	50.3 PK	74.0	-23.7	1.02 V	74	51.65	-1.35
4	2483.50	41.0 AV	54.0	-13.0	1.02 V	74	42.35	-1.35
5	4924.00	52.9 PK	74.0	-21.1	1.09 V	249	45.60	7.30
6	4924.00	46.4 AV	54.0	-7.6	1.09 V	249	39.10	7.30
7	7386.00	57.4 PK	74.0	-16.6	1.00 V	339	42.78	14.62
8	7386.00	43.9 AV	54.0	-10.1	1.00 V	339	29.28	14.62

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) – Pre-Amplifier 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) 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	68.2 PK	74.0	-5.8	1.41 H	290	69.94	-1.74
2	2390.00	52.4 AV	54.0	-1.6	1.41 H	290	54.14	-1.74
3	*2412.00	108.4 PK			1.41 H	290	110.05	-1.65
4	*2412.00	99.1 AV			1.41 H	290	100.75	-1.65
5	4824.00	48.5 PK	74.0	-25.5	1.00 H	328	41.49	7.01
6	4824.00	37.2 AV	54.0	-16.8	1.00 H	328	30.19	7.01
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	57.8 PK	74.0	-16.2	1.00 V	72	59.54	-1.74
2	2390.00	42.8 AV	54.0	-11.2	1.00 V	72	44.54	-1.74
3	*2412.00	97.9 PK			1.00 V	72	99.55	-1.65
4	*2412.00	89.8 AV			1.00 V	72	91.45	-1.65
5	4824.00	47.5 PK	74.0	-26.5	1.26 V	129	40.49	7.01
6	4824.00	37.5 AV	54.0	-16.5	1.26 V	129	30.49	7.01

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) – Pre-Amplifier 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	2356.00	58.4 PK	74.0	-15.6	1.39 H	295	60.29	-1.89
2	2356.00	40.9 AV	54.0	-13.1	1.39 H	295	42.79	-1.89
3	*2437.00	109.3 PK			1.39 H	295	110.85	-1.55
4	*2437.00	99.8 AV			1.39 H	295	101.35	-1.55
5	2483.50	53.5 PK	74.0	-20.5	1.39 H	295	54.85	-1.35
6	2483.50	37.4 AV	54.0	-16.6	1.39 H	295	38.75	-1.35
7	4874.00	47.9 PK	74.0	-26.1	1.00 H	340	40.74	7.16
8	4874.00	36.9 AV	54.0	-17.1	1.00 H	340	29.74	7.16
9	7311.00	52.0 PK	74.0	-22.0	1.05 H	338	37.24	14.76
10	7311.00	42.0 AV	54.0	-12.0	1.05 H	338	27.24	14.76
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	50.4 PK	74.0	-23.6	1.04 V	87	52.14	-1.74
2	2390.00	39.2 AV	54.0	-14.8	1.04 V	87	40.94	-1.74
3	*2437.00	99.4 PK			1.04 V	87	100.95	-1.55
4	*2437.00	89.7 AV			1.04 V	87	91.25	-1.55
5	2483.50	49.9 PK	74.0	-24.1	1.04 V	87	51.25	-1.35
6	2483.50	36.1 AV	54.0	-17.9	1.04 V	87	37.45	-1.35
7	4874.00	47.2 PK	74.0	-26.8	1.25 V	118	40.04	7.16
8	4874.00	36.9 AV	54.0	-17.1	1.25 V	118	29.74	7.16
9	7311.00	54.2 PK	74.0	-19.8	1.07 V	184	39.44	14.76
10	7311.00	43.1 AV	54.0	-10.9	1.07 V	184	28.34	14.76

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) – Pre-Amplifier 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	107.8 PK			1.34 H	295	109.24	-1.44
2	*2462.00	98.6 AV			1.34 H	295	100.04	-1.44
3	2483.50	70.1 PK	74.0	-3.9	1.34 H	295	71.45	-1.35
4	2483.50	52.2 AV	54.0	-1.8	1.34 H	295	53.55	-1.35
5	4924.00	48.3 PK	74.0	-25.7	1.00 H	336	41.00	7.30
6	4924.00	37.0 AV	54.0	-17.0	1.00 H	336	29.70	7.30
7	7386.00	52.6 PK	74.0	-21.4	1.05 H	353	37.98	14.62
8	7386.00	42.3 AV	54.0	-11.7	1.05 H	353	27.68	14.62
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	97.2 PK			1.00 V	91	98.64	-1.44
2	*2462.00	88.7 AV			1.00 V	91	90.14	-1.44
3	2483.50	56.9 PK	74.0	-17.1	1.00 V	91	58.25	-1.35
4	2483.50	42.1 AV	54.0	-11.9	1.00 V	91	43.45	-1.35
5	4924.00	47.9 PK	74.0	-26.1	1.32 V	122	40.60	7.30
6	4924.00	37.6 AV	54.0	-16.4	1.32 V	122	30.30	7.30
7	7386.00	53.3 PK	74.0	-20.7	1.06 V	189	38.68	14.62
8	7386.00	42.6 AV	54.0	-11.4	1.06 V	189	27.98	14.62

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) – Pre-Amplifier 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	66.9 PK	74.0	-7.1	1.40 H	289	68.64	-1.74
2	2390.00	53.2 AV	54.0	-0.8	1.40 H	289	54.94	-1.74
3	*2412.00	108.3 PK			1.40 H	289	109.95	-1.65
4	*2412.00	98.6 AV			1.40 H	289	100.25	-1.65
5	4824.00	47.3 PK	74.0	-26.7	1.00 H	344	40.29	7.01
6	4824.00	36.3 AV	54.0	-17.7	1.00 H	344	29.29	7.01
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	57.9 PK	74.0	-16.1	1.00 V	67	59.64	-1.74
2	2390.00	42.9 AV	54.0	-11.1	1.00 V	67	44.64	-1.74
3	*2412.00	97.8 PK			1.00 V	67	99.45	-1.65
4	*2412.00	88.4 AV			1.00 V	67	90.05	-1.65
5	4824.00	47.8 PK	74.0	-26.2	1.23 V	133	40.79	7.01
6	4824.00	37.2 AV	54.0	-16.8	1.23 V	133	30.19	7.01

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) – Pre-Amplifier 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	57.7 PK	74.0	-16.3	1.38 H	291	59.44	-1.74
2	2390.00	40.6 AV	54.0	-13.4	1.38 H	291	42.34	-1.74
3	*2437.00	109.3 PK			1.38 H	291	110.85	-1.55
4	*2437.00	99.8 AV			1.38 H	291	101.35	-1.55
5	2483.50	53.2 PK	74.0	-20.8	1.38 H	291	54.55	-1.35
6	2483.50	37.9 AV	54.0	-16.1	1.38 H	291	39.25	-1.35
7	4874.00	47.8 PK	74.0	-26.2	1.00 H	338	40.64	7.16
8	4874.00	37.2 AV	54.0	-16.8	1.00 H	338	30.04	7.16
9	7311.00	52.0 PK	74.0	-22.0	1.02 H	327	37.24	14.76
10	7311.00	41.9 AV	54.0	-12.1	1.02 H	327	27.14	14.76
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	50.3 PK	74.0	-23.7	1.00 V	81	52.04	-1.74
2	2390.00	39.4 AV	54.0	-14.6	1.00 V	81	41.14	-1.74
3	*2437.00	99.2 PK			1.00 V	81	100.75	-1.55
4	*2437.00	89.7 AV			1.00 V	81	91.25	-1.55
5	2483.50	49.9 PK	74.0	-24.1	1.00 V	81	51.25	-1.35
6	2483.50	36.1 AV	54.0	-17.9	1.00 V	81	37.45	-1.35
7	4874.00	47.7 PK	74.0	-26.3	1.13 V	131	40.54	7.16
8	4874.00	37.6 AV	54.0	-16.4	1.13 V	131	30.44	7.16
9	7311.00	53.7 PK	74.0	-20.3	1.04 V	194	38.94	14.76
10	7311.00	42.4 AV	54.0	-11.6	1.04 V	194	27.64	14.76

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) – Pre-Amplifier 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	107.9 PK			1.37 H	294	109.34	-1.44
2	*2462.00	98.2 AV			1.37 H	294	99.64	-1.44
3	**2483.50**	**73.4 PK**	**74.0**	**-0.6**	**1.33 H**	**295**	**74.75**	**-1.35**
4	2483.50	53.2 AV	54.0	-0.8	1.33 H	295	54.55	-1.35
5	4924.00	47.9 PK	74.0	-26.1	1.00 H	318	40.60	7.30
6	4924.00	36.7 AV	54.0	-17.3	1.00 H	318	29.40	7.30
7	7386.00	51.5 PK	74.0	-22.5	1.08 H	350	36.88	14.62
8	7386.00	41.4 AV	54.0	-12.6	1.08 H	350	26.78	14.62
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	97.2 PK			1.06 V	79	98.64	-1.44
2	*2462.00	88.1 AV			1.06 V	79	89.54	-1.44
3	2483.50	57.6 PK	74.0	-16.4	1.06 V	79	58.95	-1.35
4	2483.50	42.1 AV	54.0	-11.9	1.06 V	79	43.45	-1.35
5	4924.00	47.3 PK	74.0	-26.7	1.28 V	139	40.00	7.30
6	4924.00	37.0 AV	54.0	-17.0	1.28 V	139	29.70	7.30
7	7386.00	53.1 PK	74.0	-20.9	1.08 V	183	38.48	14.62
8	7386.00	42.2 AV	54.0	-11.8	1.08 V	183	27.58	14.62

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11n (HT40)

CHANNEL	TX Channel 3	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.2 PK	74.0	-6.8	1.39 H	297	68.94	-1.74
2	**2390.00**	**53.6 AV**	**54.0**	**-0.4**	**1.39 H**	**297**	**55.34**	**-1.74**
3	*2422.00	105.0 PK			1.39 H	297	106.61	-1.61
4	*2422.00	95.8 AV			1.39 H	297	97.41	-1.61
5	4844.00	48.0 PK	74.0	-26.0	1.06 H	343	40.94	7.06
6	4844.00	37.1 AV	54.0	-16.9	1.06 H	343	30.04	7.06
7	7266.00	52.1 PK	74.0	-21.9	1.01 H	338	37.26	14.84
8	7266.00	42.2 AV	54.0	-11.8	1.01 H	338	27.36	14.84
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	2390.00	59.1 PK	74.0	-14.9	1.01 V	75	60.84	-1.74
2	2390.00	43.8 AV	54.0	-10.2	1.01 V	75	45.54	-1.74
3	*2422.00	95.1 PK			1.01 V	75	96.71	-1.61
4	*2422.00	85.7 AV			1.01 V	75	87.31	-1.61
5	4844.00	47.7 PK	74.0	-26.3	1.20 V	114	40.64	7.06
6	4844.00	37.4 AV	54.0	-16.6	1.20 V	114	30.34	7.06
7	7266.00	52.6 PK	74.0	-21.4	1.08 V	207	37.76	14.84
8	7266.00	41.7 AV	54.0	-12.3	1.08 V	207	26.86	14.84

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) – Pre-Amplifier 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	63.4 PK	74.0	-10.6	1.43 H	292	65.14	-1.74
2	2390.00	49.3 AV	54.0	-4.7	1.43 H	292	51.04	-1.74
3	*2437.00	106.7 PK			1.35 H	291	108.25	-1.55
4	*2437.00	96.8 AV			1.35 H	291	98.35	-1.55
5	2483.50	67.0 PK	74.0	-7.0	1.34 H	296	68.35	-1.35
6	2483.50	52.4 AV	54.0	-1.6	1.34 H	296	53.75	-1.35
7	4874.00	47.9 PK	74.0	-26.1	1.03 H	349	40.74	7.16
8	4874.00	37.3 AV	54.0	-16.7	1.03 H	349	30.14	7.16
9	7311.00	52.7 PK	74.0	-21.3	1.00 H	357	37.94	14.76
10	7311.00	42.2 AV	54.0	-11.8	1.00 H	357	27.44	14.76
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	56.1 PK	74.0	-17.9	1.04 V	74	57.84	-1.74
2	2390.00	40.1 AV	54.0	-13.9	1.04 V	74	41.84	-1.74
3	*2437.00	96.5 PK			1.04 V	74	98.05	-1.55
4	*2437.00	86.7 AV			1.04 V	74	88.25	-1.55
5	2483.50	57.8 PK	74.0	-16.2	1.04 V	74	59.15	-1.35
6	2483.50	41.5 AV	54.0	-12.5	1.04 V	74	42.85	-1.35
7	4874.00	48.1 PK	74.0	-25.9	1.23 V	120	40.94	7.16
8	4874.00	37.7 AV	54.0	-16.3	1.23 V	120	30.54	7.16
9	7311.00	52.6 PK	74.0	-21.4	1.04 V	211	37.84	14.76
10	7311.00	41.3 AV	54.0	-12.7	1.04 V	211	26.54	14.76

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 9	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	104.5 PK			1.32 H	292	105.99	-1.49
2	*2452.00	94.3 AV			1.32 H	292	95.79	-1.49
3	2483.50	65.7 PK	74.0	-8.3	1.32 H	292	67.05	-1.35
4	2483.50	50.3 AV	54.0	-3.7	1.32 H	292	51.65	-1.35
5	4904.00	48.2 PK	74.0	-25.8	1.01 H	359	40.95	7.25
6	4904.00	37.5 AV	54.0	-16.5	1.01 H	359	30.25	7.25
7	7356.00	52.1 PK	74.0	-21.9	1.05 H	341	37.43	14.67
8	7356.00	42.1 AV	54.0	-11.9	1.05 H	341	27.43	14.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	94.1 PK			1.00 V	81	95.59	-1.49
2	*2452.00	84.2 AV			1.00 V	81	85.69	-1.49
3	2483.50	57.5 PK	74.0	-16.5	1.00 V	81	58.85	-1.35
4	2483.50	41.5 AV	54.0	-12.5	1.00 V	81	42.85	-1.35
5	4904.00	47.1 PK	74.0	-26.9	1.35 V	123	39.85	7.25
6	4904.00	37.2 AV	54.0	-16.8	1.35 V	123	29.95	7.25
7	7356.00	52.7 PK	74.0	-21.3	1.00 V	207	38.03	14.67
8	7356.00	41.9 AV	54.0	-12.1	1.00 V	207	27.23	14.67

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

4.2.8 TEST RESULTS (BT-LE)

BELOW 1GHz WORST-CASE DATA

BT_LE-GFSK

CHANNEL	TX Channel 19	**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	117.24	30.5 QP	43.5	-13.0	1.50 H	327	45.89	-15.38
2	171.42	36.2 QP	43.5	-7.3	2.00 H	251	50.01	-13.81
3	224.10	34.1 QP	46.0	-11.9	1.50 H	172	50.43	-16.31
4	256.51	35.2 QP	46.0	-10.8	1.50 H	182	49.45	-14.22
5	330.31	35.2 QP	46.0	-10.8	1.00 H	240	46.68	-11.45
6	400.02	29.0 QP	46.0	-17.0	1.50 H	73	38.89	-9.91
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	117.95	36.5 QP	43.5	-7.0	1.00 V	28	51.82	-15.31
2	137.38	32.1 QP	43.5	-11.4	1.00 V	81	46.06	-13.94
3	170.58	31.5 QP	43.5	-12.0	2.00 V	171	45.18	-13.67
4	250.35	36.8 QP	46.0	-9.2	1.50 V	53	51.13	-14.32
5	326.52	31.9 QP	46.0	-14.1	2.00 V	207	43.56	-11.64
6	400.12	30.0 QP	46.0	-16.0	1.50 V	202	39.93	-9.91

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

ABOVE 1GHz DATA

BT_LE-GFSK

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	49.9 PK	74.0	-24.1	1.13 H	30	53.35	-3.45
2	2390.00	37.0 AV	54.0	-17.0	1.13 H	30	40.45	-3.45
3	*2402.00	99.3 PK			1.13 H	30	102.72	-3.42
4	*2402.00	97.8 AV			1.13 H	30	101.22	-3.42
5	4804.00	50.3 PK	74.0	-23.7	1.00 H	160	43.82	6.48
6	4804.00	37.0 AV	54.0	-17.0	1.00 H	160	30.52	6.48
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	50.1 PK	74.0	-23.9	1.12 V	73	53.55	-3.45
2	2390.00	35.4 AV	54.0	-18.6	1.12 V	73	38.85	-3.45
3	*2402.00	92.5 PK			1.12 V	73	95.92	-3.42
4	*2402.00	90.0 AV			1.12 V	73	93.42	-3.42
5	4804.00	51.4 PK	74.0	-22.6	1.00 V	266	44.92	6.48
6	4804.00	38.3 AV	54.0	-15.7	1.00 V	266	31.82	6.48

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) – Pre-Amplifier 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	99.6 PK			1.07 H	19	102.90	-3.30
2	*2440.00	98.7 AV			1.07 H	19	102.00	-3.30
3	4880.00	50.3 PK	74.0	-23.7	1.05 H	161	43.77	6.53
4	4880.00	36.9 AV	54.0	-17.1	1.05 H	161	30.37	6.53
5	7320.00	59.4 PK	74.0	-14.6	1.10 H	348	48.27	11.13
6	7320.00	45.9 AV	54.0	-8.1	1.10 H	348	34.77	11.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	92.6 PK			1.07 V	90	95.90	-3.30
2	*2440.00	90.1 AV			1.07 V	90	93.40	-3.30
3	4880.00	49.8 PK	74.0	-24.2	1.05 V	244	43.27	6.53
4	4880.00	37.0 AV	54.0	-17.0	1.05 V	244	30.47	6.53
5	7320.00	58.7 PK	74.0	-15.3	1.00 V	288	47.57	11.13
6	7320.00	28.6 AV	54.0	-25.4	1.00 V	288	17.47	11.13

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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	100.1 PK			1.10 H	26	103.27	-3.17
2	*2480.00	98.9 AV			1.10 H	26	102.07	-3.17
3	2483.50	51.1 PK	74.0	-22.9	1.10 H	26	54.26	-3.16
4	2483.50	37.9 AV	54.0	-16.1	1.10 H	26	41.06	-3.16
5	4960.00	50.9 PK	74.0	-23.1	1.14 H	162	44.36	6.54
6	4960.00	37.2 AV	54.0	-16.8	1.14 H	162	30.66	6.54
7	7440.00	59.6 PK	74.0	-14.4	1.08 H	339	48.09	11.51
8	**7440.00**	**46.0 AV**	**54.0**	**-8.0**	**1.08 H**	**339**	**34.49**	**11.51**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	93.0 PK			1.08 V	87	96.17	-3.17
2	*2480.00	90.5 AV			1.08 V	87	93.67	-3.17
3	2483.50	50.1 PK	74.0	-23.9	1.08 V	87	53.26	-3.16
4	2483.50	36.9 AV	54.0	-17.1	1.08 V	87	40.06	-3.16
5	4960.00	50.2 PK	74.0	-23.8	1.08 V	243	43.66	6.54
6	4960.00	37.2 AV	54.0	-16.8	1.08 V	243	30.66	6.54
7	7440.00	59.2 PK	74.0	-14.8	1.00 V	304	47.69	11.51
8	7440.00	29.2 AV	54.0	-24.8	1.00 V	304	17.69	11.51

REMARKS:

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

4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 14 to 24, 2014

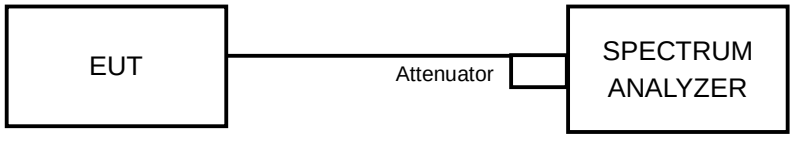
4.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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

4.3.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.15	0.5	PASS
6	2437	10.16	0.5	PASS
11	2462	10.15	0.5	PASS

802.11g

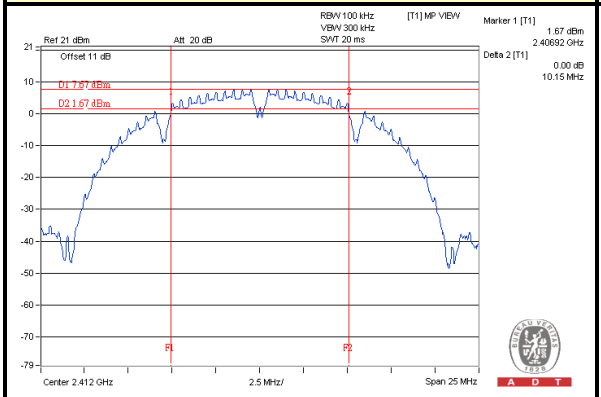
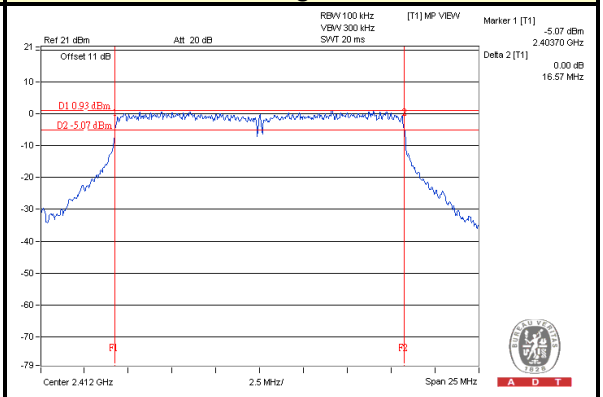
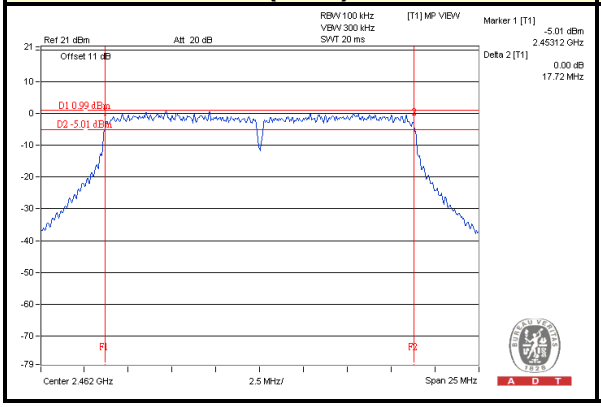
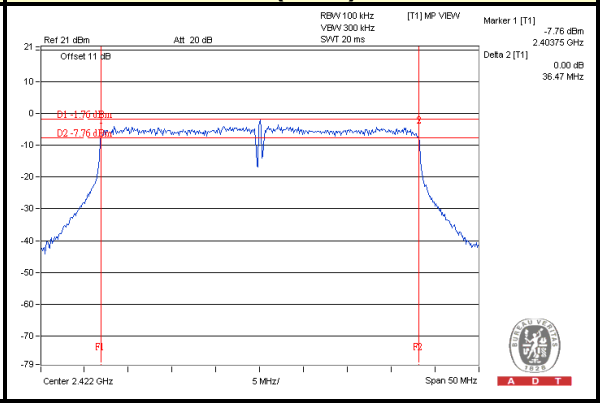
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.57	0.5	PASS
6	2437	16.60	0.5	PASS
11	2462	16.61	0.5	PASS

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.82	0.5	PASS
6	2437	17.81	0.5	PASS
11	2462	17.72	0.5	PASS

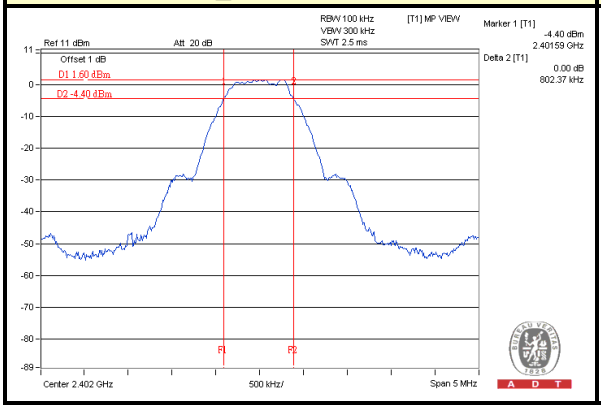
802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	36.47	0.5	PASS
6	2437	36.61	0.5	PASS
9	2452	36.62	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b / CH1	**802.11g / CH1**
	
802.11n (HT20) / CH11	**802.11n (HT40) / CH3**
	

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
0	2402	0.80	0.5	PASS
19	2440	0.80	0.5	PASS
39	2480	0.81	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
BT_LE-GFSK / CH0	
	

4.4 CONDUCTED OUTPUT POWER MEASUREMENT

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	0824006	May 20, 2013	May 19, 2014
Power sensor Anritsu	MA2411B	0738172	May 20, 2013	May 19, 2014

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 : Feb. 14 to 24, 2014

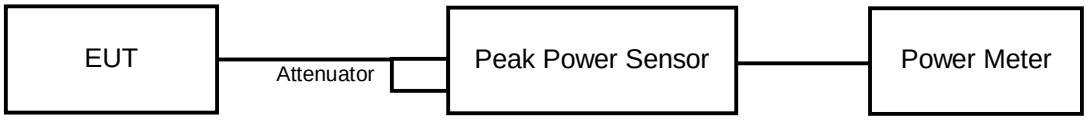
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	123.310	20.91	30	PASS
6	2437	95.280	19.79	30	PASS
11	2462	79.799	19.02	30	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	194.984	22.90	30	PASS
6	2437	293.765	24.68	30	PASS
11	2462	263.027	24.20	30	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	206.063	23.14	30	PASS
6	2437	264.850	24.23	30	PASS
11	2462	226.464	23.55	30	PASS

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
3	2422	171.396	22.34	30	PASS
6	2437	213.304	23.29	30	PASS
9	2452	130.617	21.16	30	PASS

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
0	2402	2.780	4.44	30	PASS
19	2440	3.048	4.84	30	PASS
39	2480	2.979	4.74	30	PASS

4.5 AVERAGE OUTPUT POWER

4.5.1 FOR REFERENCE

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	0824006	May 20, 2013	May 19, 2014
Power sensor Anritsu	MA2411B	0738172	May 20, 2013	May 19, 2014

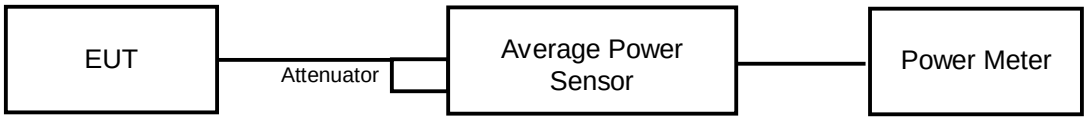
Note:

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 : Feb. 14 to 24, 2014

4.5.3 TEST PROCEDURES

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.5.4 TEST SETUP



4.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.5.6 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	65.313	18.15
6	2437	55.208	17.42
11	2462	47.424	16.76

802.11g

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	30.690	14.87
6	2437	45.920	16.62
11	2462	40.179	16.04

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
1	2412	32.810	15.16
6	2437	59.979	17.78
11	2462	34.995	15.44

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
3	2422	29.242	14.66
6	2437	43.752	16.41
9	2452	23.067	13.63

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
0	2402	2.366	3.74
19	2440	2.594	4.14
39	2480	2.535	4.04

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 14 to 24, 2014

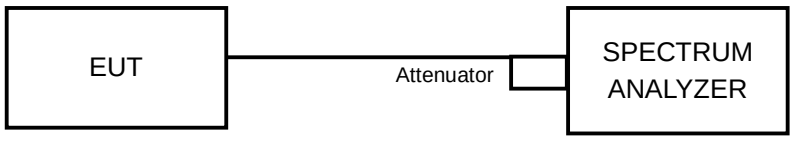
4.6.3 TEST PROCEDURE

1. Set the RBW = 3 kHz, VBW =10 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 amplitude level.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	-3.72	8	PASS
6	2437	-3.69	8	PASS
11	2462	-3.90	8	PASS

802.11g

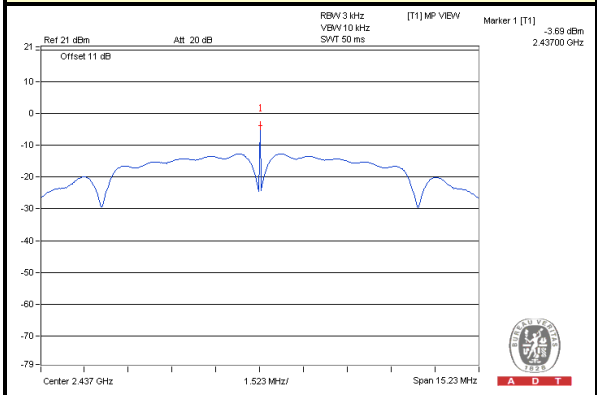
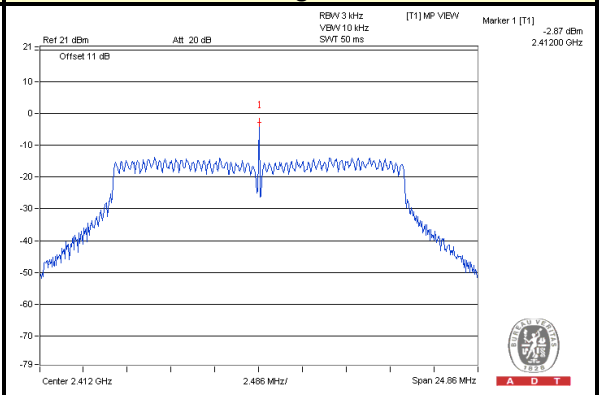
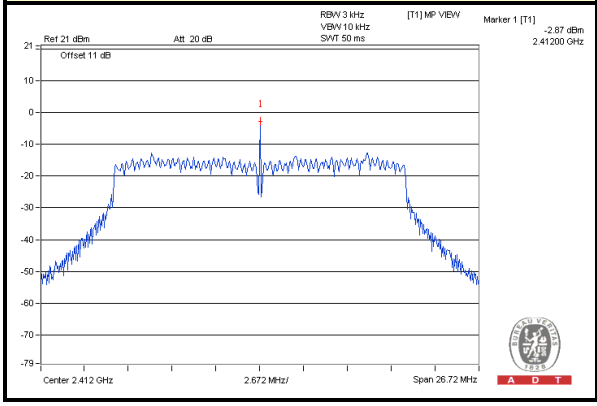
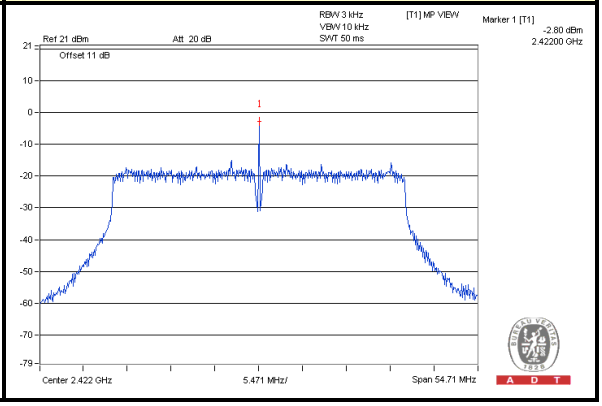
CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	-2.87	8	PASS
6	2437	-3.29	8	PASS
11	2462	-3.50	8	PASS

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
1	2412	-2.87	8	PASS
6	2437	-3.13	8	PASS
11	2462	-3.16	8	PASS

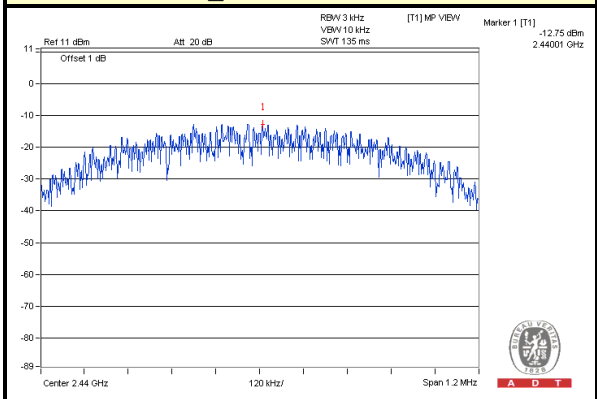
802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
3	2422	-2.80	8	PASS
6	2437	-3.10	8	PASS
9	2452	-3.11	8	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11b / CH6	**802.11g / CH1**
	
802.11n (HT20) / CH1	**802.11n (HT40) / CH3**
	

BT_LE-GFSK

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
0	2402	-13.00	8	PASS
19	2440	-12.75	8	PASS
39	2480	-13.20	8	PASS

SPECTRUM PLOT OF WORST VALUE	
BT_LE-GFSK / CH39	
	

4.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 14 to 24, 2014

4.7.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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.

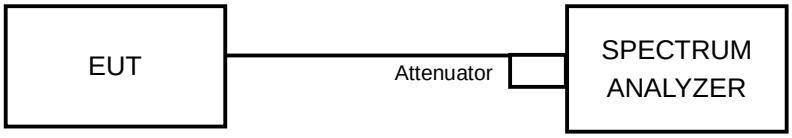
Measurement Procedure –Unwanted Emission Level

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

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 EUT OPERATING CONDITION

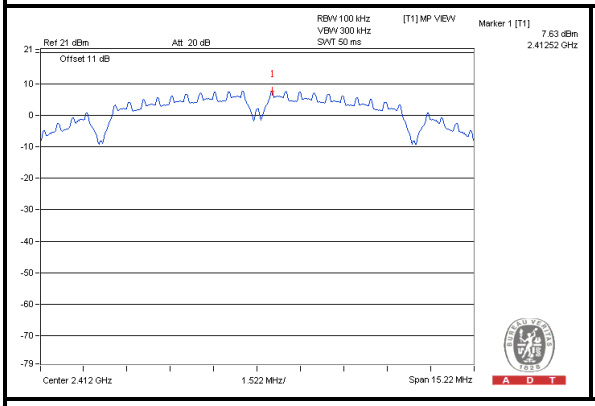
Same as Item 4.3.6

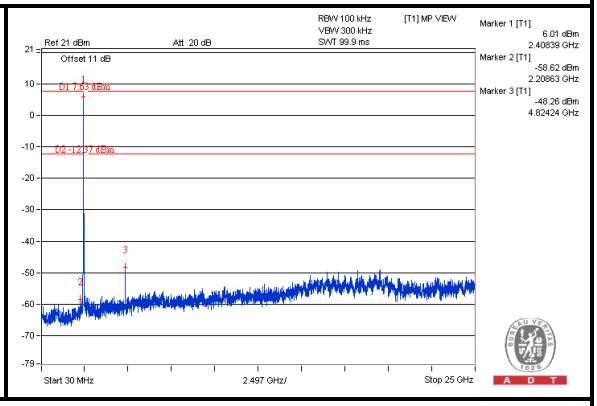
4.7.7 TEST RESULTS

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

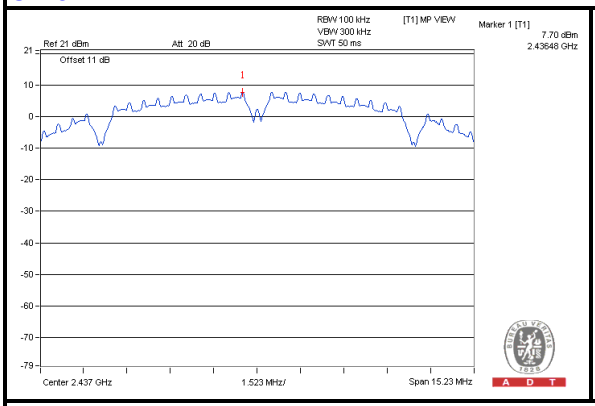
802.11b

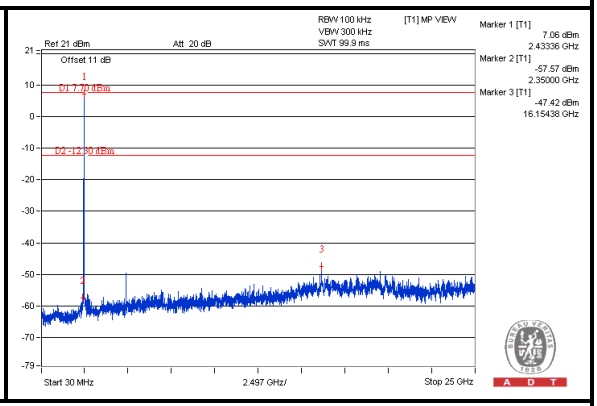
CH 1



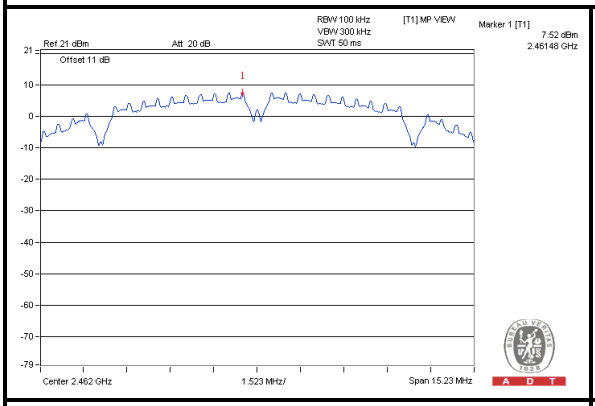


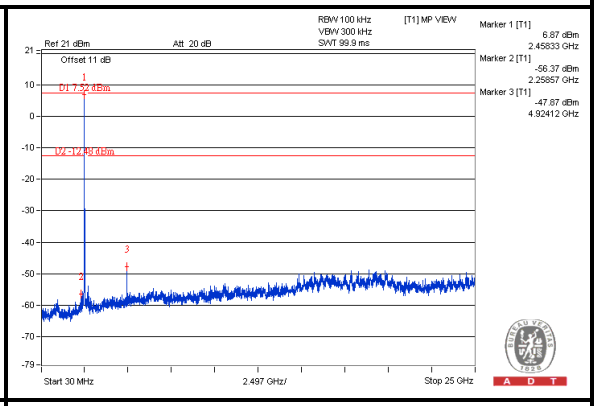
CH 6



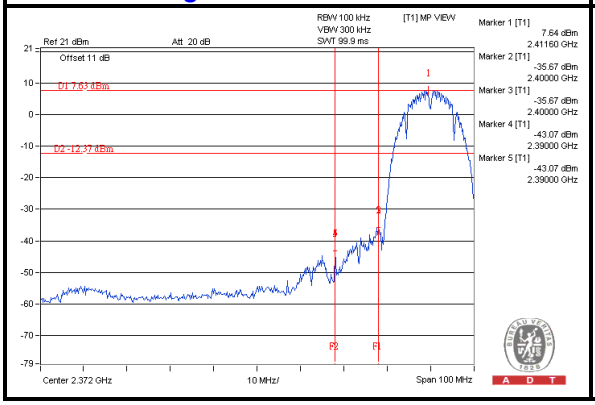


CH 11

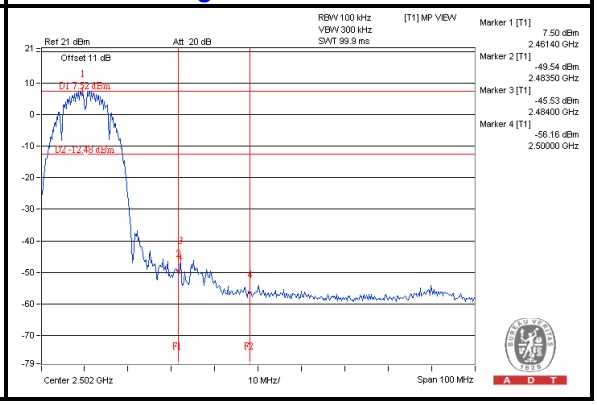




CH 1 Band edge

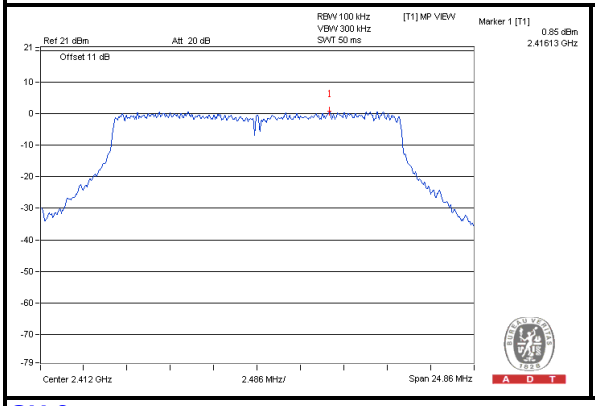


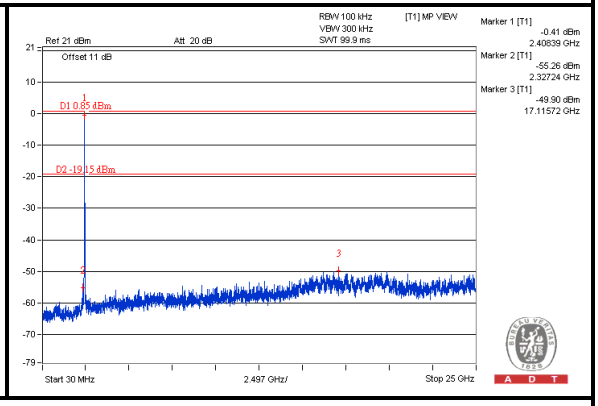
CH 11 Band edge



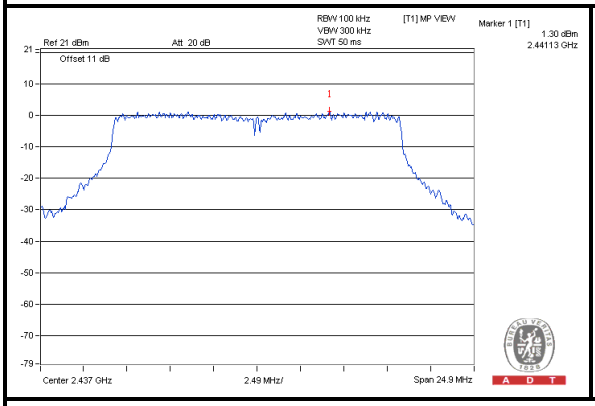
802.11g

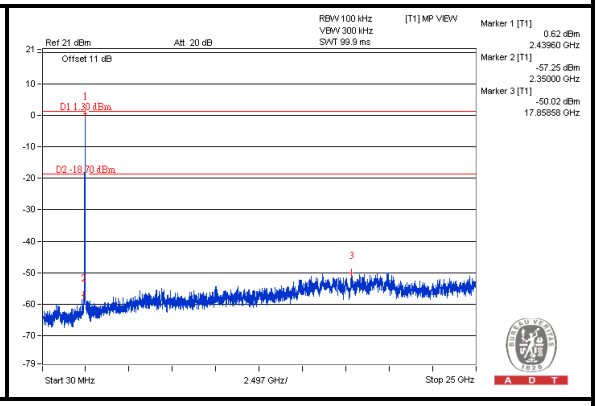
CH 1



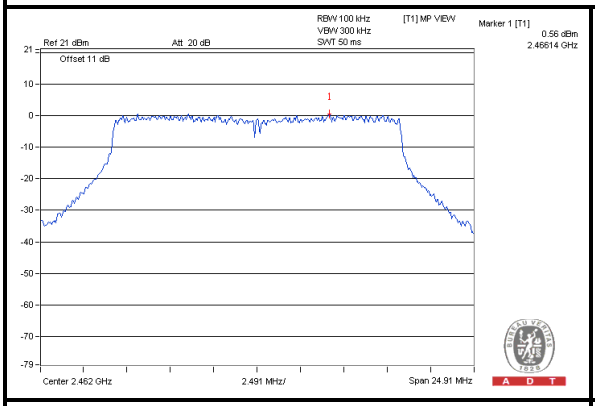


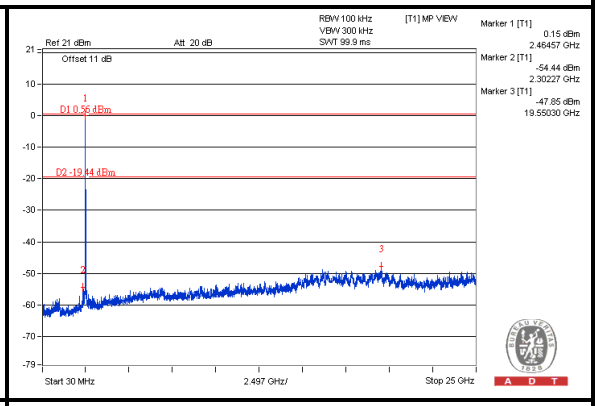
CH 6



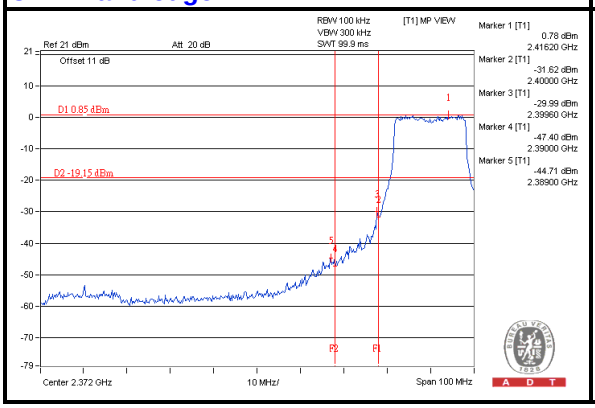


CH 11

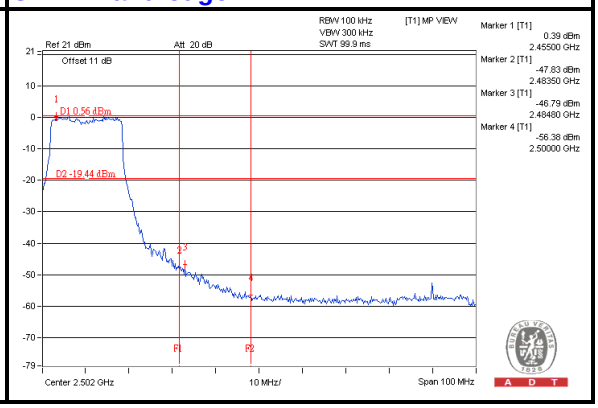




CH 1 Band edge

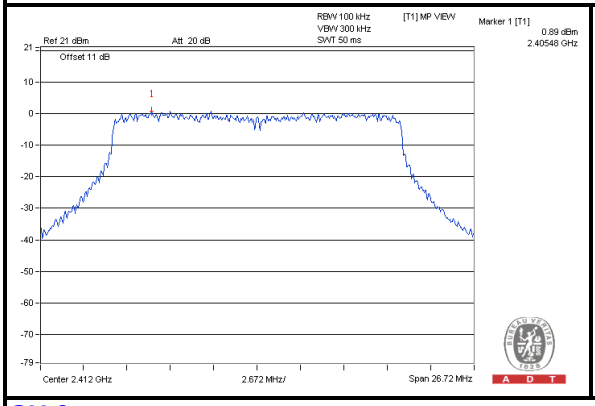


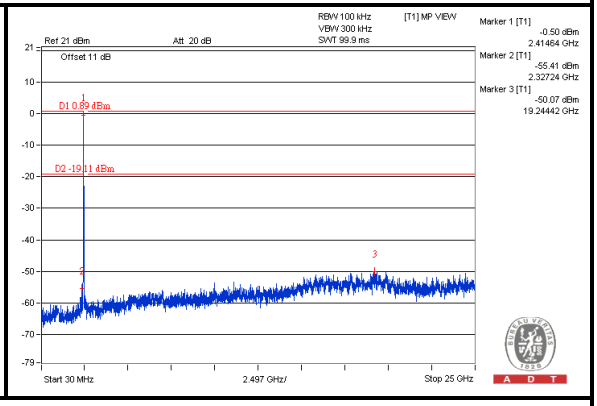
CH 11 Band edge



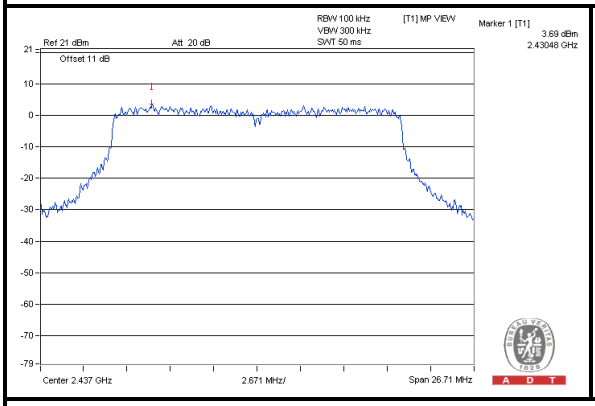
802.11n (HT20)

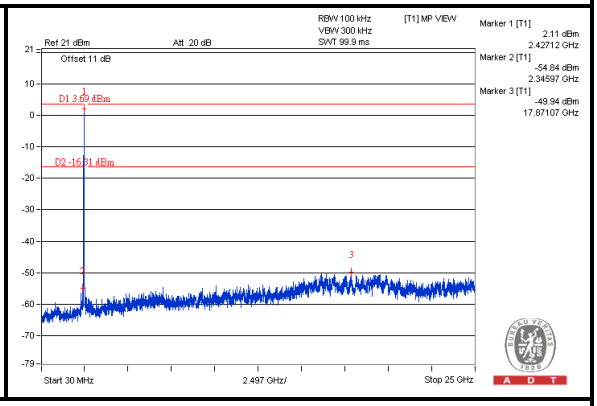
CH 1



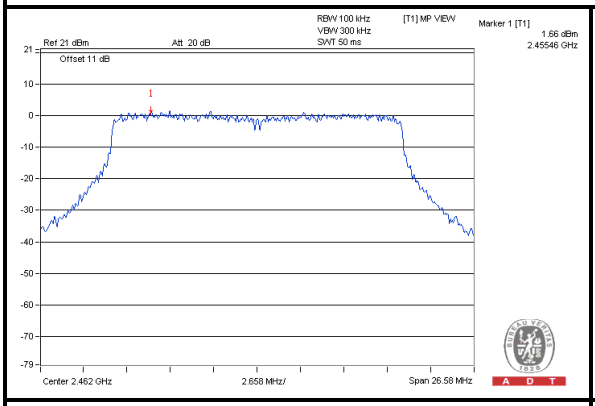


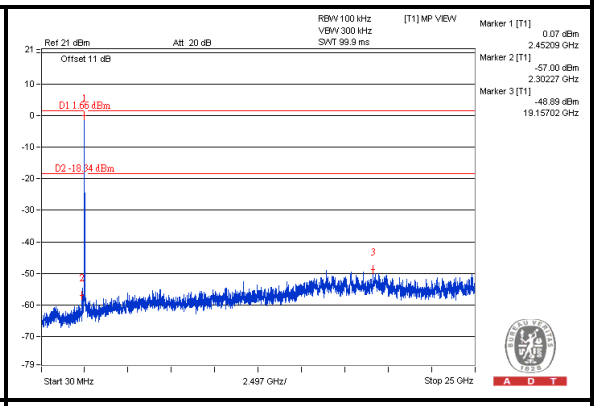
CH 6



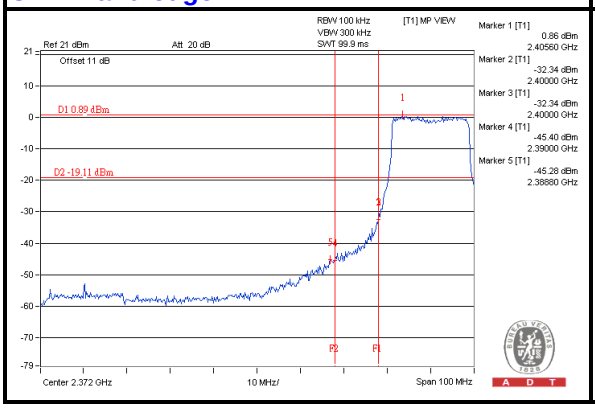


CH 11

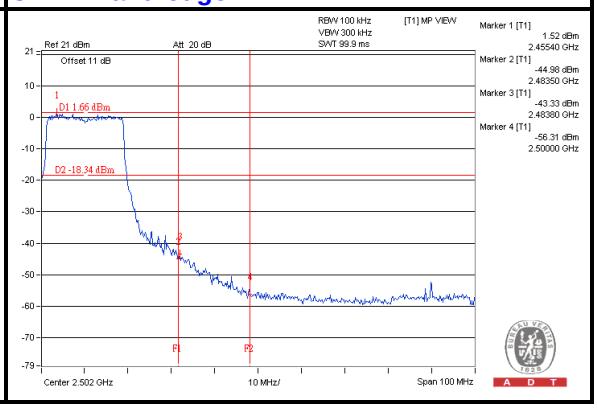




CH 1 Band edge

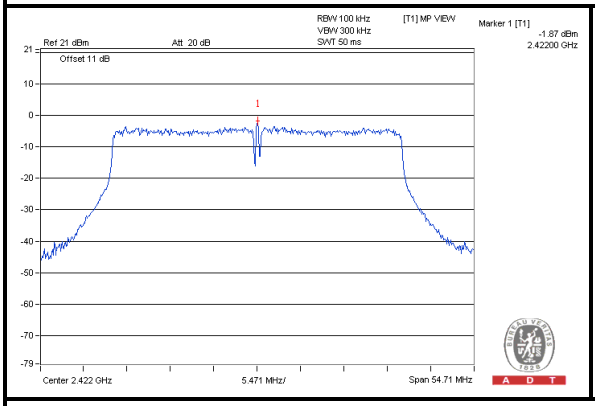


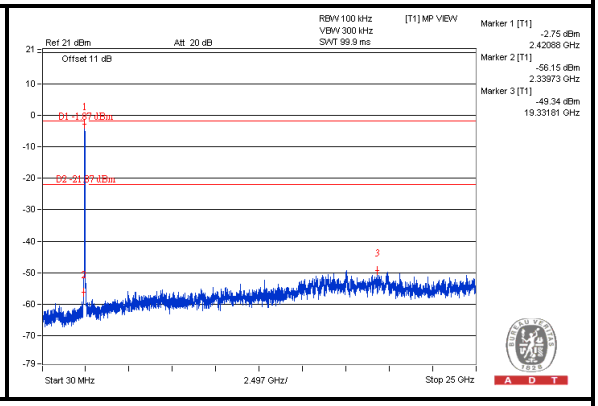
CH 11 Band edge



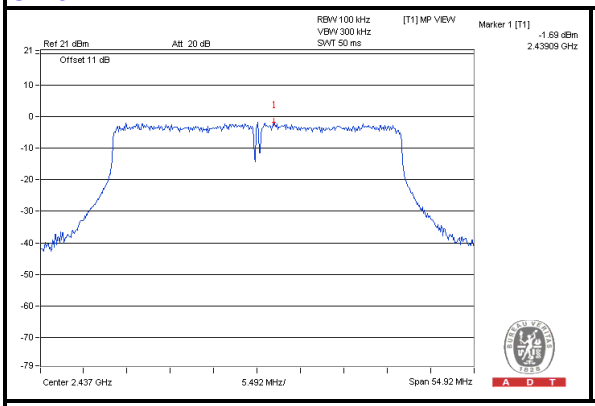
802.11n (HT40)

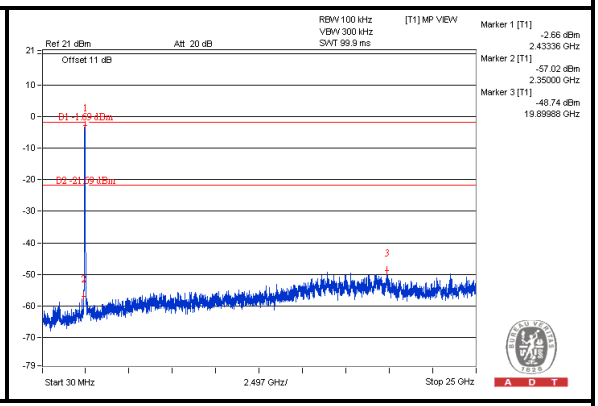
CH 3



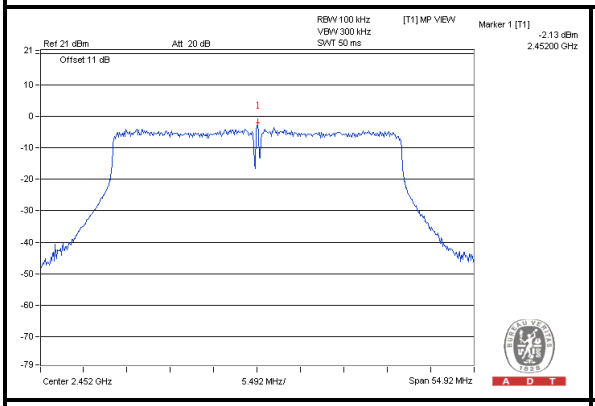


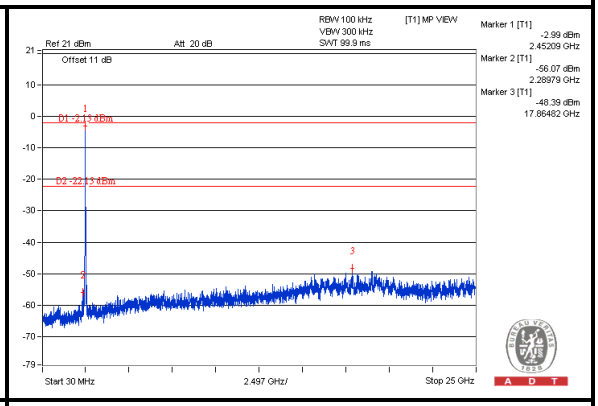
CH 6



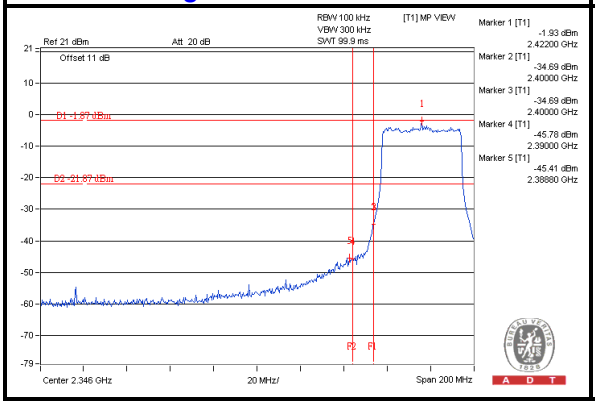


CH 9

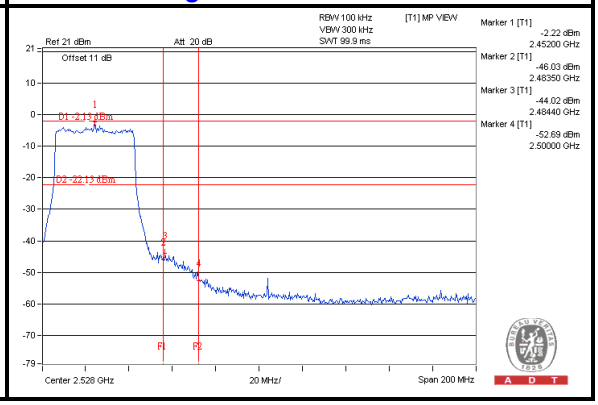




CH 3 Band edge

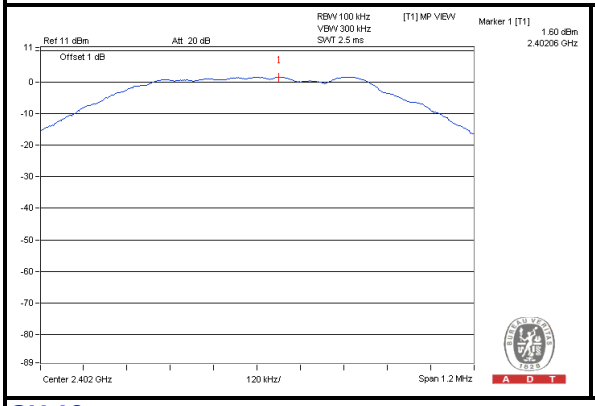


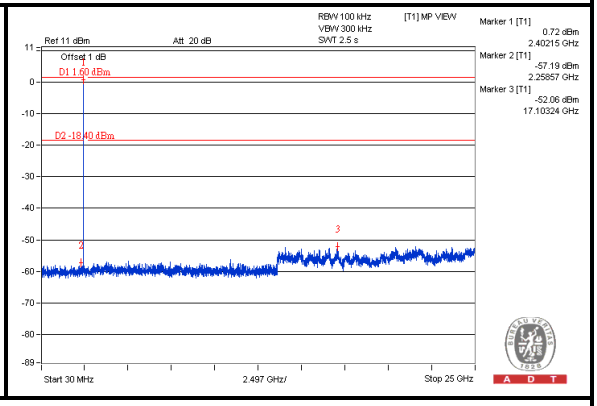
CH 9 Band edge



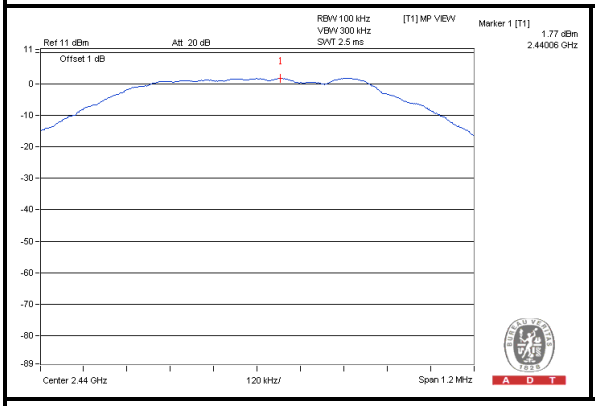
BT_LE-GFSK

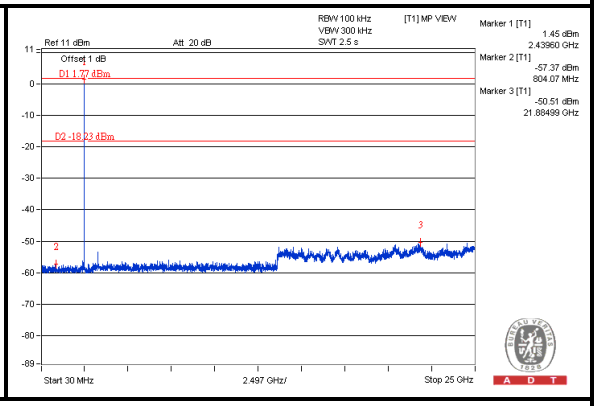
CH 0



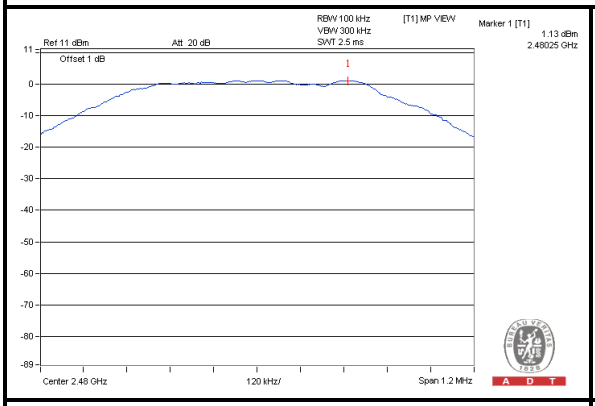


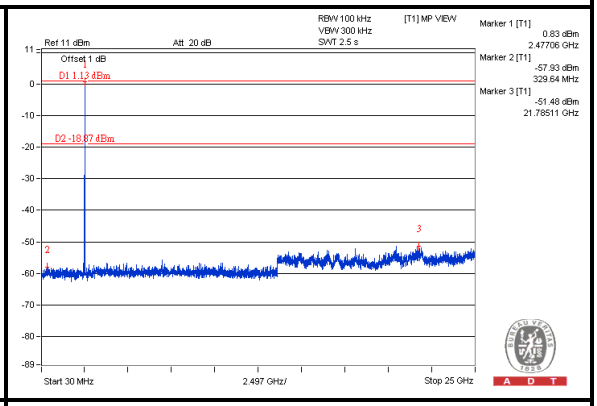
CH 19



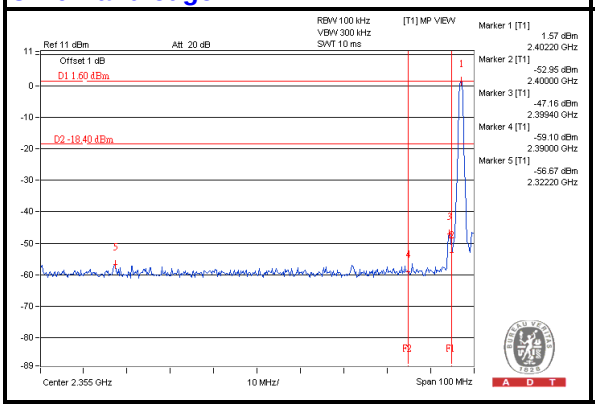


CH 39

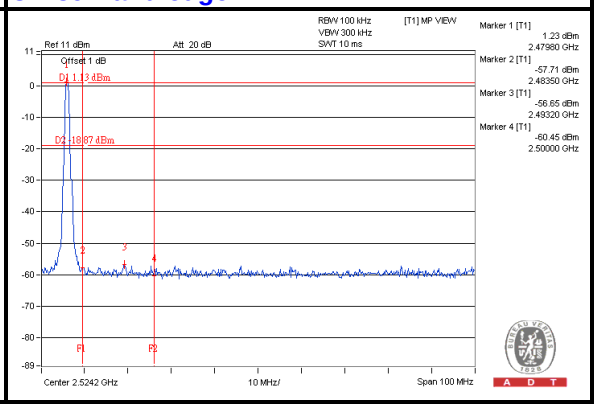




CH 0 Band edge



CH 39 Band edge



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

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Mar. 08, 2013	Mar. 07, 2014
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 05, 2013	Sep. 04, 2014
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 06, 2013	June 05, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 11, 2013	Mar. 10, 2014
50 ohms Terminator	50	EMC-03	Sep. 24, 2013	Sep. 23, 2014
Software ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Dec. 24, 2013

5.1.3 TEST PROCEDURES

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

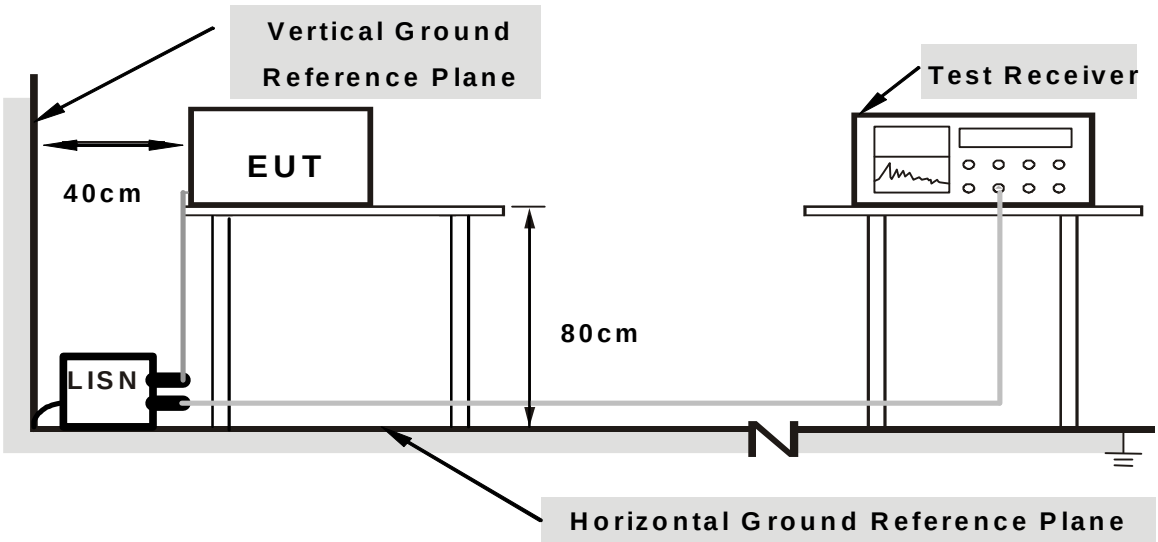
NOTE:

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

5.1.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

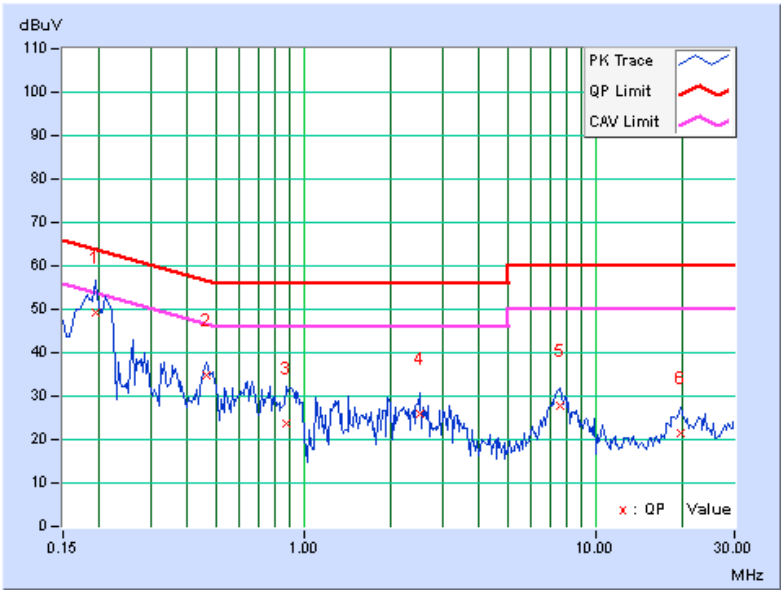
5.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.19297	0.10	49.21	27.94	49.31	28.04	63.91	53.91	-14.60	-25.87
2	0.46641	0.14	34.65	25.58	34.79	25.72	56.58	46.58	-21.78	-20.85
3	0.87656	0.16	23.70	15.02	23.86	15.18	56.00	46.00	-32.14	-30.82
4	2.51172	0.23	25.76	18.97	25.99	19.20	56.00	46.00	-30.01	-26.80
5	7.58203	0.39	27.37	21.26	27.76	21.65	60.00	50.00	-32.24	-28.35
6	19.50000	0.70	20.95	15.48	21.65	16.18	60.00	50.00	-38.35	-33.82

REMARKS:

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

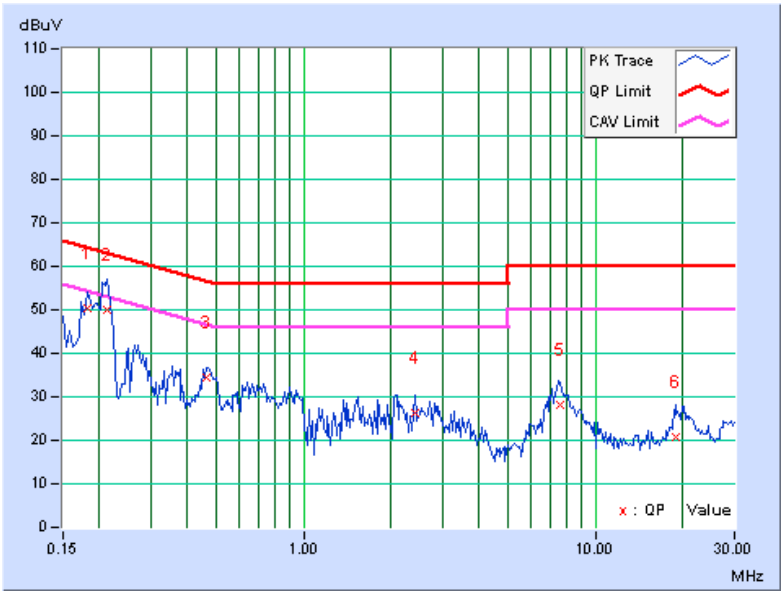


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	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	0.18125	0.10	50.41	34.91	50.51	35.01	64.43	54.43	-13.92	-19.42
2	**0.21250**	**0.10**	**49.90**	**33.88**	**50.00**	**33.98**	**63.11**	**53.11**	**-13.10**	**-19.12**
3	0.46641	0.14	34.35	25.26	34.49	25.40	56.58	46.58	-22.08	-21.17
4	2.41797	0.23	25.94	18.90	26.17	19.13	56.00	46.00	-29.83	-26.87
5	7.56641	0.39	27.76	21.95	28.15	22.34	60.00	50.00	-31.85	-27.66
6	18.86719	0.68	20.17	14.64	20.85	15.32	60.00	50.00	-39.15	-34.68

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

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

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

NOTE:

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

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	Jan. 21, 2014	Jan. 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Mar. 19, 2013	Mar. 18, 2014
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 15, 2013	July 14, 2014
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A02578	June 25, 2013	June 24, 2014
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
Software	ADT_Radiated _V8.7.07	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. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: Jan. 21 to Feb. 20, 2014

5.2.3 TEST PROCEDURES

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

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

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

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

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

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

Note:

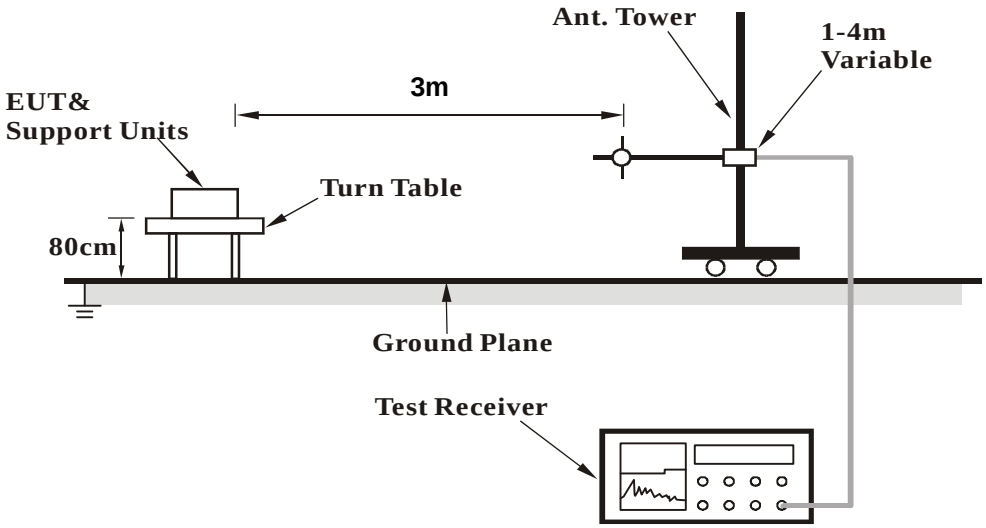
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

5.2.4 DEVIATION FROM TEST STANDARD

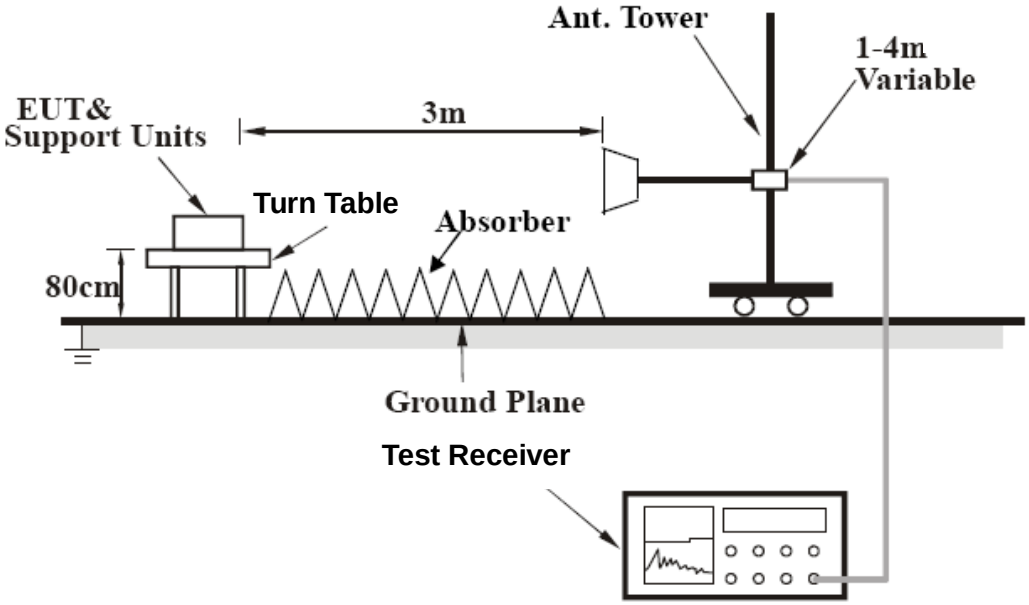
No deviation

5.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.1.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11ac (VHT80)

CHANNEL	TX Channel 155	**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	**134.35**	**38.1 QP**	**43.5**	**-5.4**	**2.00 H**	**212**	**52.10**	**-13.97**
2	168.51	37.4 QP	43.5	-6.1	1.00 H	35	51.11	-13.73
3	250.13	40.5 QP	46.0	-5.5	1.50 H	21	54.84	-14.31
4	263.32	35.7 QP	46.0	-10.3	1.50 H	248	49.54	-13.82
5	322.62	34.8 QP	46.0	-11.2	1.50 H	32	46.57	-11.73
6	400.01	27.5 QP	46.0	-18.5	2.00 H	38	37.45	-9.91
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	117.89	34.5 QP	43.5	-9.1	1.00 V	134	49.77	-15.32
2	134.81	31.5 QP	43.5	-12.1	1.00 V	248	45.38	-13.93
3	168.02	31.3 QP	43.5	-12.2	1.50 V	254	45.07	-13.79
4	250.09	36.0 QP	46.0	-10.0	2.00 V	239	50.29	-14.31
5	267.25	35.3 QP	46.0	-10.8	1.50 V	114	49.02	-13.77
6	332.21	32.2 QP	46.0	-13.8	1.00 V	203	43.73	-11.51

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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	5460.00	56.1 PK	74.0	-17.9	1.24 H	269	46.91	9.19
2	5460.00	43.5 AV	54.0	-10.5	1.24 H	269	34.31	9.19
3	*5745.00	111.9 PK			1.24 H	269	101.96	9.94
4	*5745.00	102.2 AV			1.24 H	269	92.26	9.94
5	11160.00	55.2 PK	74.0	-18.8	1.08 H	295	38.99	16.21
6	11160.00	45.1 AV	54.0	-8.9	1.08 H	295	28.89	16.21
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	5460.00	56.4 PK	74.0	-17.6	1.06 V	34	47.21	9.19
2	5460.00	43.6 AV	54.0	-10.4	1.06 V	34	34.41	9.19
3	*5745.00	106.1 PK			1.06 V	34	96.16	9.94
4	*5745.00	96.7 AV			1.06 V	34	86.76	9.94
5	11490.00	55.2 PK	74.0	-18.8	1.12 V	258	38.62	16.58
6	11490.00	45.1 AV	54.0	-8.9	1.12 V	258	28.52	16.58

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) – Pre-Amplifier 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 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	112.0 PK			1.25 H	267	101.99	10.01
2	*5785.00	102.1 AV			1.25 H	267	92.09	10.01
3	11570.00	55.1 PK	74.0	-18.9	1.10 H	291	38.46	16.64
4	11570.00	45.0 AV	54.0	-9.0	1.10 H	291	28.36	16.64
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			1.10 V	31	96.99	10.01
2	*5785.00	97.4 AV			1.10 V	31	87.39	10.01
3	11570.00	55.7 PK	74.0	-18.3	1.08 V	270	39.06	16.64
4	11570.00	45.5 AV	54.0	-8.5	1.08 V	270	28.86	16.64

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) – Pre-Amplifier 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 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	112.0 PK			1.29 H	257	101.90	10.10
2	*5825.00	102.5 AV			1.29 H	257	92.40	10.10
3	11650.00	55.7 PK	74.0	-18.3	1.06 H	307	38.85	16.85
4	11650.00	45.3 AV	54.0	-8.7	1.06 H	307	28.45	16.85
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	106.4 PK			1.01 V	40	96.30	10.10
2	*5825.00	96.9 AV			1.01 V	40	86.80	10.10
3	11650.00	55.4 PK	74.0	-18.6	1.14 V	254	38.55	16.85
4	11650.00	45.2 AV	54.0	-8.8	1.14 V	254	28.35	16.85

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	55.1 PK	74.0	-18.9	1.28 H	252	45.91	9.19
2	5460.00	42.6 AV	54.0	-11.4	1.28 H	252	33.41	9.19
3	*5745.00	112.4 PK			1.28 H	252	102.46	9.94
4	*5745.00	102.7 AV			1.28 H	252	92.76	9.94
5	11490.00	54.5 PK	74.0	-19.5	1.06 H	292	37.92	16.58
6	11490.00	44.7 AV	54.0	-9.3	1.06 H	292	28.12	16.58
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	5460.00	54.4 PK	74.0	-19.6	1.10 V	26	45.21	9.19
2	5460.00	42.1 AV	54.0	-11.9	1.10 V	26	32.91	9.19
3	*5745.00	107.8 PK			1.10 V	26	97.86	9.94
4	*5745.00	97.9 AV			1.10 V	26	87.96	9.94
5	11490.00	54.7 PK	74.0	-19.3	1.10 V	258	38.12	16.58
6	11490.00	44.7 AV	54.0	-9.3	1.10 V	258	28.12	16.58

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) – Pre-Amplifier 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 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	111.6 PK			1.25 H	241	101.59	10.01
2	*5785.00	102.1 AV			1.25 H	241	92.09	10.01
3	11570.00	55.5 PK	74.0	-18.5	1.11 H	284	38.86	16.64
4	11570.00	45.3 AV	54.0	-8.7	1.11 H	284	28.66	16.64
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	106.8 PK			1.02 V	20	96.79	10.01
2	*5785.00	97.4 AV			1.02 V	20	87.39	10.01
3	11570.00	54.9 PK	74.0	-19.1	1.16 V	249	38.26	16.64
4	11570.00	44.9 AV	54.0	-9.1	1.16 V	249	28.26	16.64

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) – Pre-Amplifier 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 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	111.5 PK			1.25 H	262	101.40	10.10
2	*5825.00	102.3 AV			1.25 H	262	92.20	10.10
3	11650.00	55.7 PK	74.0	-18.3	1.14 H	282	38.85	16.85
4	11650.00	45.5 AV	54.0	-8.5	1.14 H	282	28.65	16.85
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	106.6 PK			1.10 V	50	96.50	10.10
2	*5825.00	97.7 AV			1.10 V	50	87.60	10.10
3	11650.00	54.5 PK	74.0	-19.5	1.13 V	265	37.65	16.85
4	11650.00	44.6 AV	54.0	-9.4	1.13 V	265	27.75	16.85

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	56.5 PK	74.0	-17.5	1.22 H	271	47.31	9.19
2	5460.00	43.5 AV	54.0	-10.5	1.22 H	271	34.31	9.19
3	*5755.00	109.9 PK			1.22 H	271	99.94	9.96
4	*5755.00	99.5 AV			1.22 H	271	89.54	9.96
5	11510.00	55.4 PK	74.0	-18.6	1.16 H	278	38.84	16.56
6	11510.00	45.2 AV	54.0	-8.8	1.16 H	278	28.64	16.56
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	56.2 PK	74.0	-17.8	1.04 V	35	47.01	9.19
2	5460.00	43.2 AV	54.0	-10.8	1.04 V	35	34.01	9.19
3	*5755.00	105.2 PK			1.04 V	35	95.24	9.96
4	*5755.00	94.6 AV			1.04 V	35	84.64	9.96
5	11510.00	55.5 PK	74.0	-18.5	1.17 V	272	38.94	16.56
6	11510.00	45.3 AV	54.0	-8.7	1.17 V	272	28.74	16.56

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier 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 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	109.8 PK			1.20 H	287	99.79	10.01
2	*5795.00	99.4 AV			1.20 H	287	89.39	10.01
3	11590.00	55.5 PK	74.0	-18.5	1.09 H	277	38.83	16.67
4	11590.00	45.3 AV	54.0	-8.7	1.09 H	277	28.63	16.67
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	105.1 PK			1.06 V	25	95.09	10.01
2	*5795.00	94.4 AV			1.06 V	25	84.39	10.01
3	11590.00	54.6 PK	74.0	-19.4	1.10 V	265	37.93	16.67
4	11590.00	44.7 AV	54.0	-9.3	1.10 V	265	28.03	16.67

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

802.11ac (VHT80)

CHANNEL	TX Channel 155	**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	5460.00	55.6 PK	74.0	-18.4	1.22 H	270	46.41	9.19
2	5460.00	42.4 AV	54.0	-11.6	1.22 H	270	33.21	9.19
3	*5775.00	107.5 PK			1.22 H	270	97.51	9.99
4	*5775.00	97.0 AV			1.22 H	270	87.01	9.99
5	11550.00	55.8 PK	74.0	-18.2	1.15 H	279	39.18	16.62
6	11550.00	45.6 AV	54.0	-8.4	1.15 H	279	28.98	16.62
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	5460.00	55.8 PK	74.0	-18.2	1.05 V	42	46.61	9.19
2	5460.00	42.5 AV	54.0	-11.5	1.05 V	42	33.31	9.19
3	*5775.00	102.5 PK			1.05 V	42	92.51	9.99
4	*5775.00	91.7 AV			1.05 V	42	81.71	9.99
5	11550.00	54.7 PK	74.0	-19.3	1.06 V	254	38.08	16.62
6	11550.00	44.7 AV	54.0	-9.3	1.06 V	254	28.08	16.62

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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 24, 2014

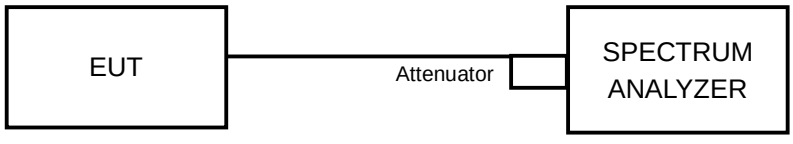
5.3.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.55	0.5	PASS
157	5785	16.57	0.5	PASS
165	5825	16.58	0.5	PASS

802.11ac (VHT20)

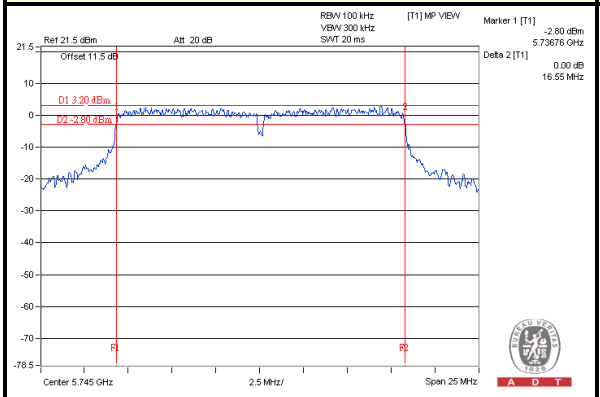
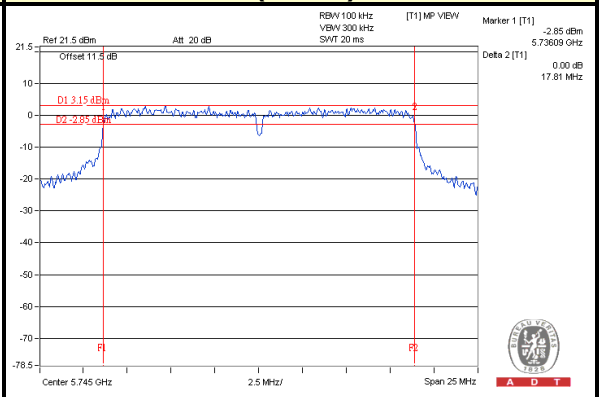
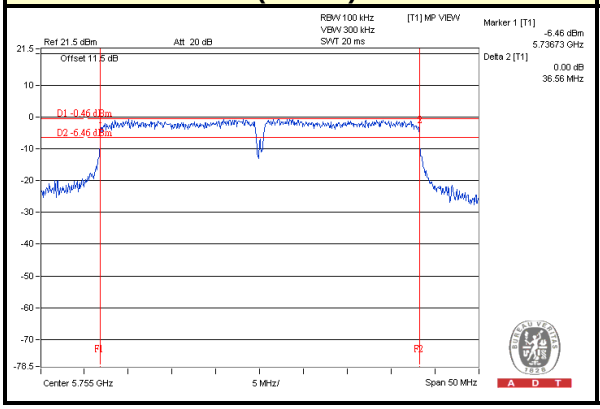
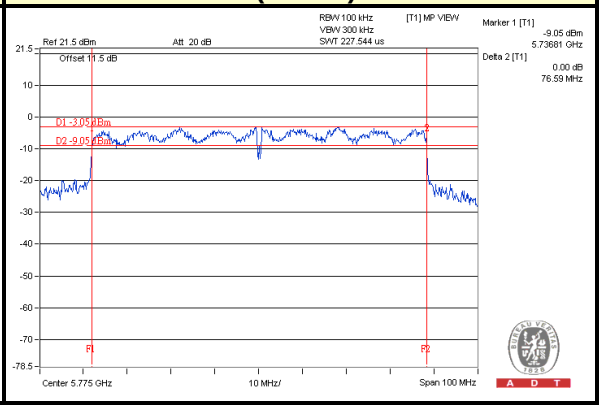
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	17.81	0.5	PASS
157	5785	17.82	0.5	PASS
165	5825	17.83	0.5	PASS

802.11ac (VHT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	36.56	0.5	PASS
159	5795	36.65	0.5	PASS

802.11ac (VHT80)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
155	5775	76.59	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a / CH149	**802.11ac (VHT20) / CH149**
	
802.11ac (VHT40) / CH151	**802.11ac (VHT80) / CH155**
	

5.4 CONDUCTED OUTPUT POWER MEASUREMENT

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

5.4.2 INSTRUMENTS

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	0824006	May 20, 2013	May 19, 2014
Power sensor Anritsu	MA2411B	0738172	May 20, 2013	May 19, 2014

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 : Feb. 24, 2014

For 802.11ac (VHT80)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 24, 2014

5.4.3 TEST PROCEDURES

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)

The 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.

For 802.11ac (VHT80)

Follow FCC KDB 558074 DTS test procedure:
Measurement Procedure Peak 2

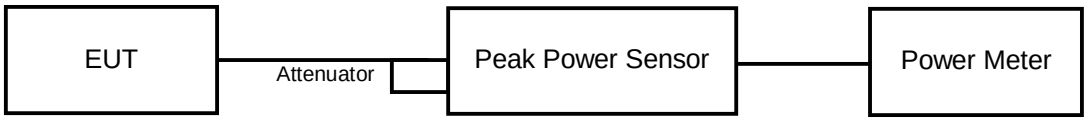
1. Set the RBW = 1 MHz.
2. Set the VBW ≥ 3 RBW.
3. Set the span ≥ 1.5 x DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the DTS bandwidth edges.

5.4.4 DEVIATION FROM TEST STANDARD

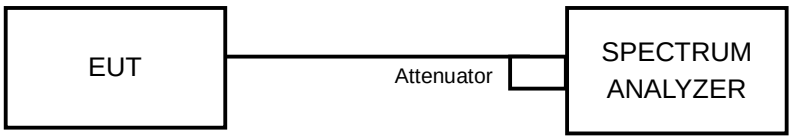
No deviation.

5.4.5 TEST SETUP

For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)



For 802.11ac (VHT80)



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6

5.4.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	202.768	23.07	30	PASS
157	5785	205.116	23.12	30	PASS
165	5825	195.884	22.92	30	PASS

802.11ac (VHT20)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	192.309	22.84	30	PASS
157	5785	224.905	23.52	30	PASS
165	5825	205.589	23.13	30	PASS

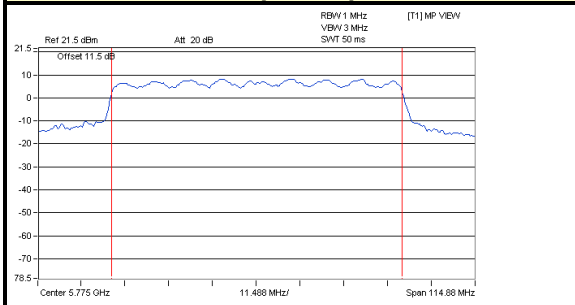
802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
151	5755	196.789	22.94	30	PASS
159	5795	201.372	23.04	30	PASS

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
155	5775	301.301	24.79	30	PASS

802.11ac (VHT80) / CH155



5.5 AVERAGE OUTPUT POWER

5.5.1 FOR REFERENCE

5.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	0824006	May 20, 2013	May 19, 2014
Power sensor Anritsu	MA2411B	0738172	May 20, 2013	May 19, 2014

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 : Feb. 24, 2014

5.5.3 TEST PROCEDURES

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

5.5.4 TEST SETUP

5.5.5 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.5.6 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
149	5745	63.826	18.05
157	5785	69.502	18.42
165	5825	68.549	18.36

802.11ac (VHT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
149	5745	63.241	18.01
157	5785	63.387	18.02
165	5825	64.269	18.08

802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
151	5755	70.469	18.48
159	5795	66.834	18.25

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)
155	5775	68.234	18.34

5.6 POWER SPECTRAL DENSITY MEASUREMENT

5.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 24, 2014

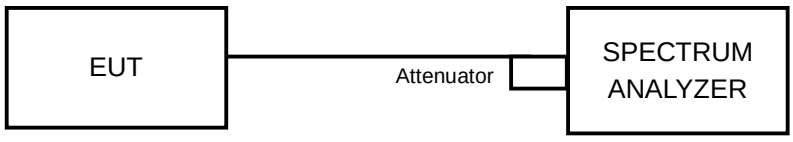
5.6.3 TEST PROCEDURE

1. Set the RBW = 3 kHz, VBW =10 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 amplitude level.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
149	5745	-11.66	8	PASS
157	5785	-12.28	8	PASS
165	5825	-12.07	8	PASS

802.11ac (VHT20)

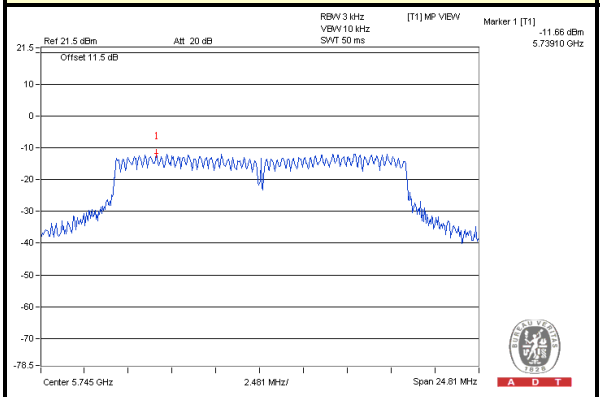
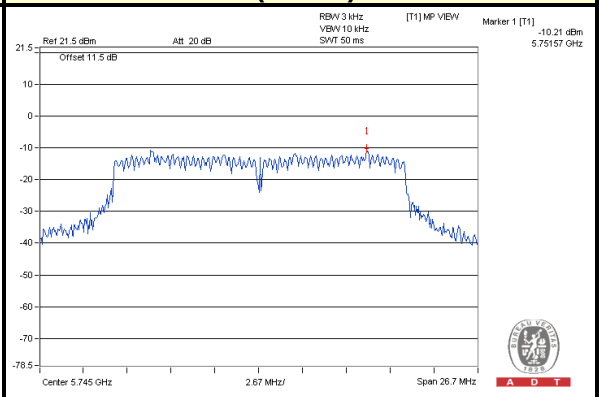
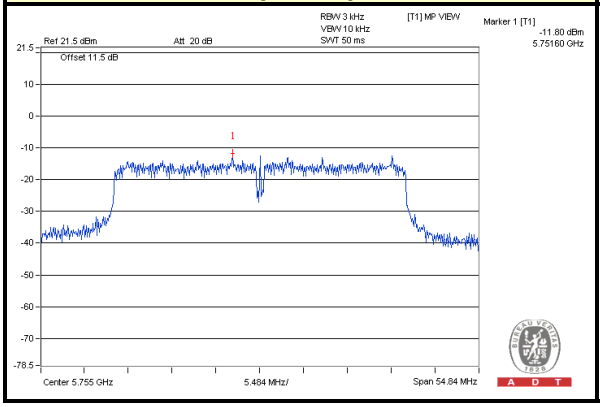
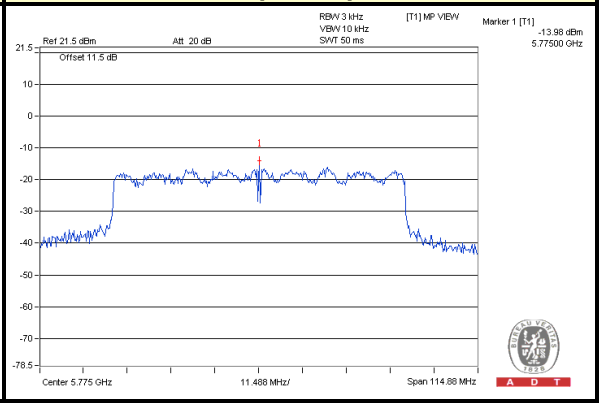
CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
149	5745	-10.21	8	PASS
157	5785	-10.43	8	PASS
165	5825	-10.49	8	PASS

802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
151	5755	-11.80	8	PASS
159	5795	-12.27	8	PASS

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	LIMIT (dBm)	PASS /FAIL
155	5775	-13.98	8	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a / CH149	802.11ac (VHT20) / CH149
	
802.11ac (VHT40) / CH151	802.11ac (VHT80) / CH155
	

5.7 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.7.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSP 40	100036	Jan. 21, 2014	Jan. 20, 2015

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 : Feb. 24, 2014

5.7.3 TEST PROCEDURE

Measurement Procedure - Reference Level

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.

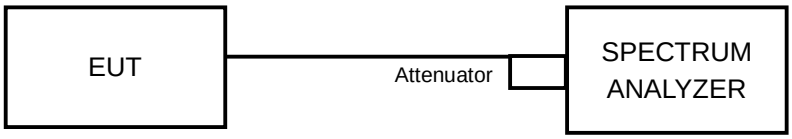
Measurement Procedure –Unwanted Emission Level

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

5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 TEST SETUP



5.7.6 EUT OPERATING CONDITION

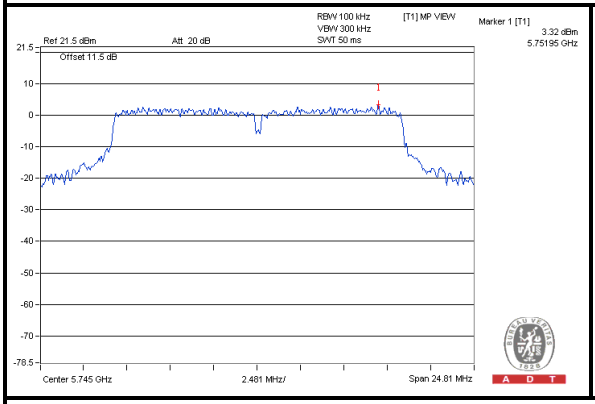
Same as Item 4.3.6

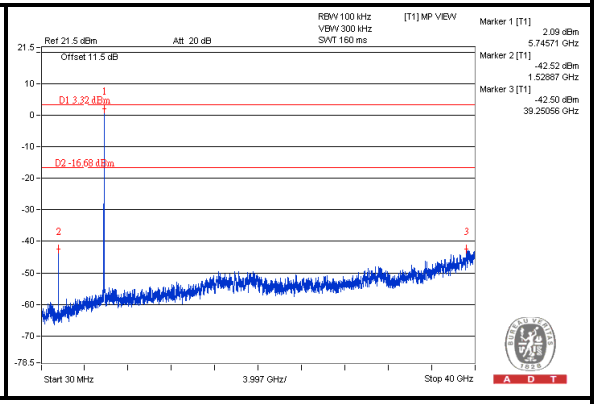
5.7.7 TEST RESULTS

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

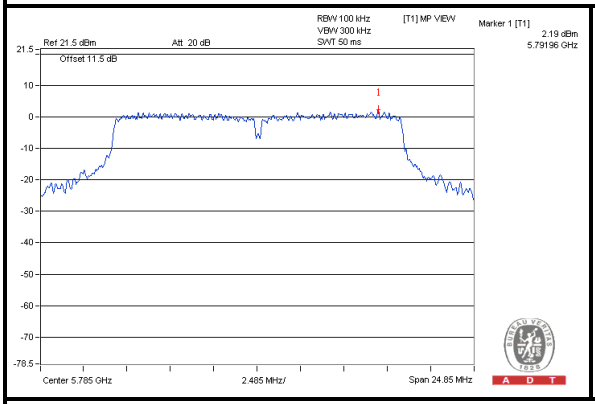
802.11a

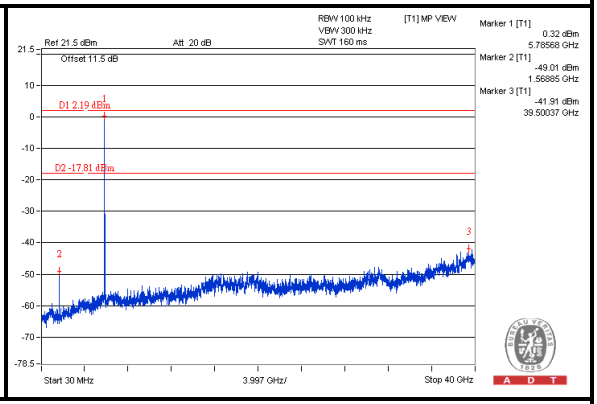
CH 149



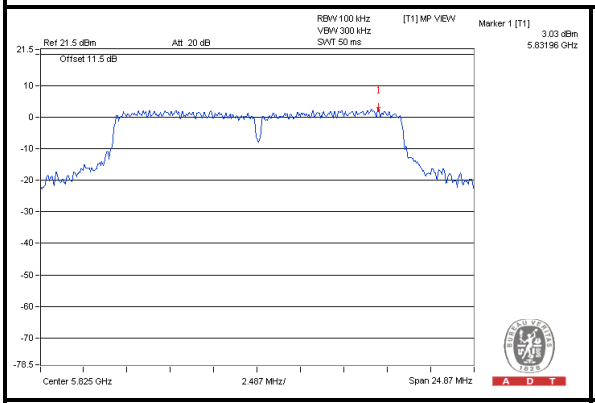


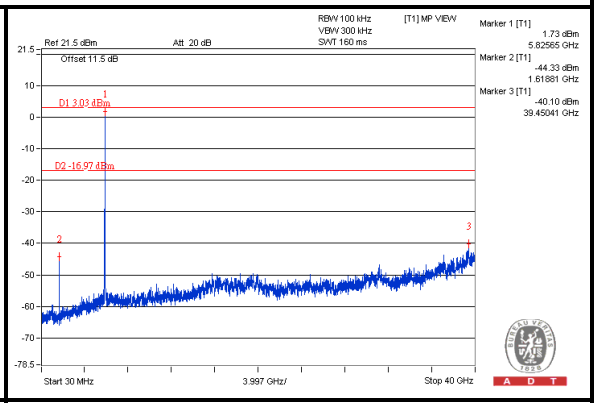
CH 157



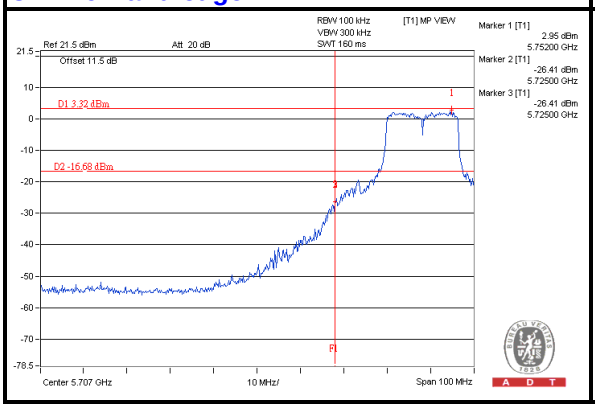


CH 165

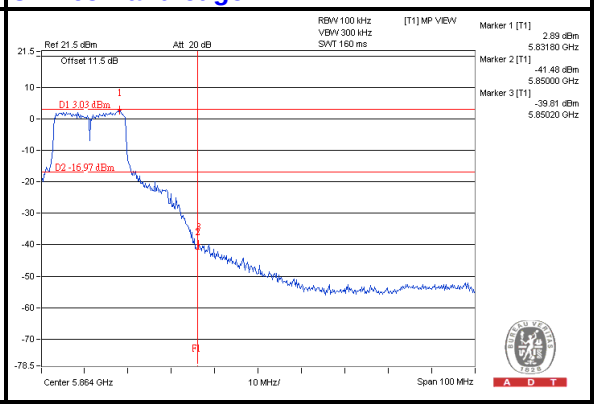




CH 149 Band edge

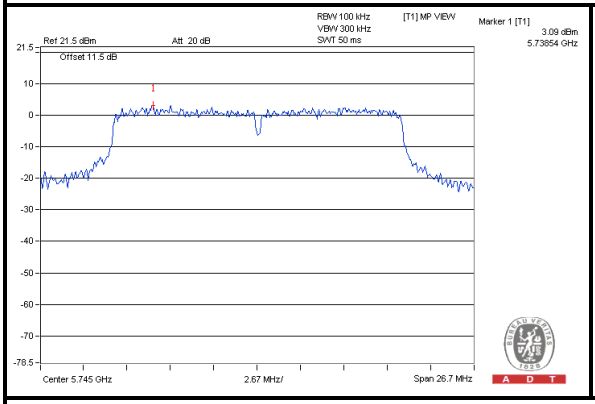


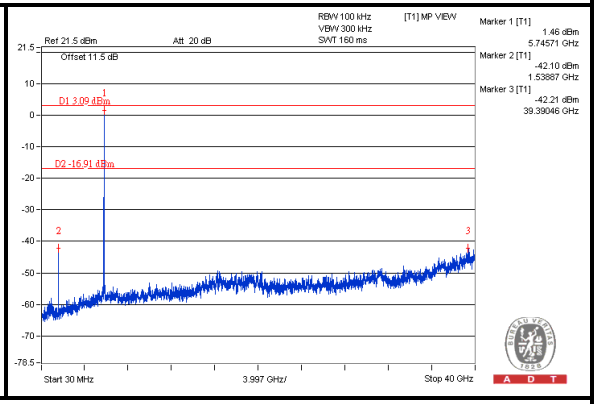
CH 165 Band edge



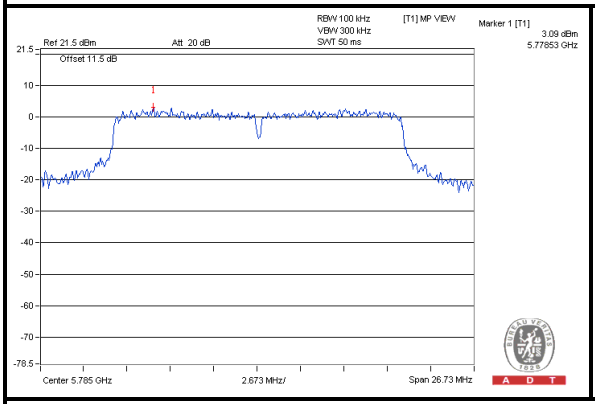
802.11ac (VHT20)

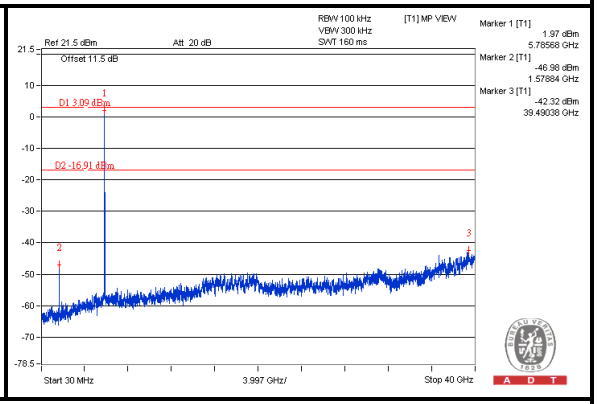
CH 149



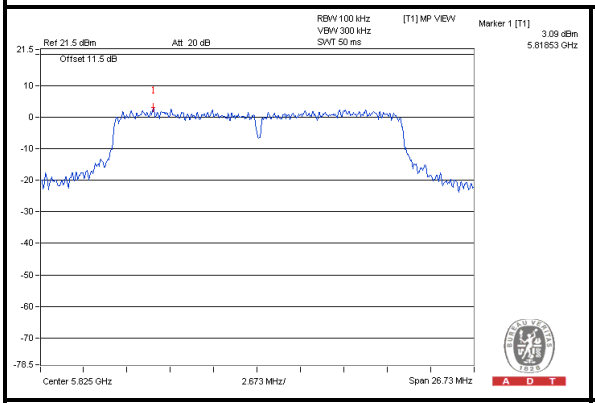


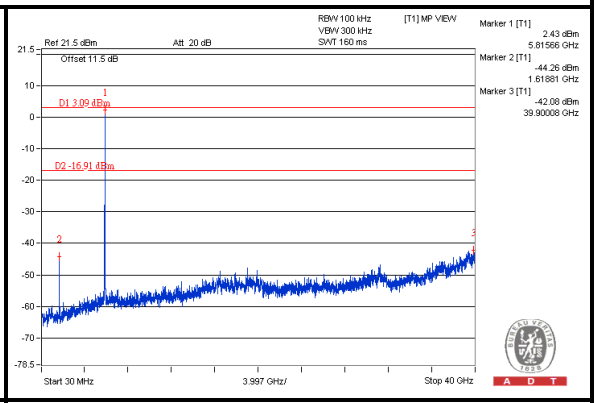
CH 157



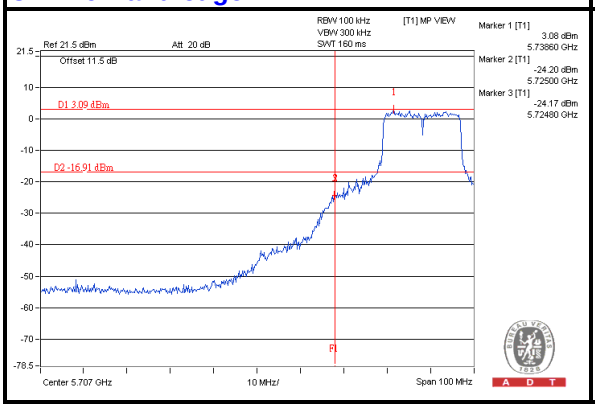


CH 165

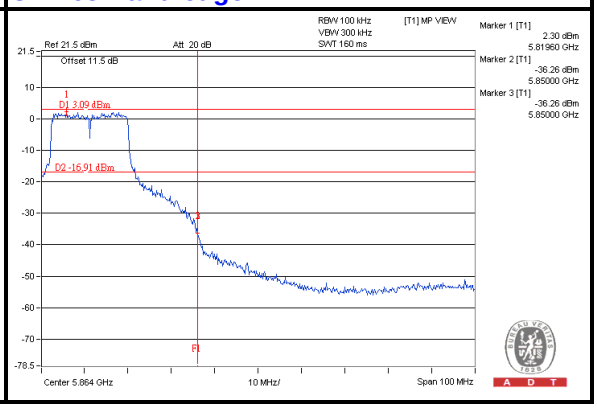




CH 149 Band edge

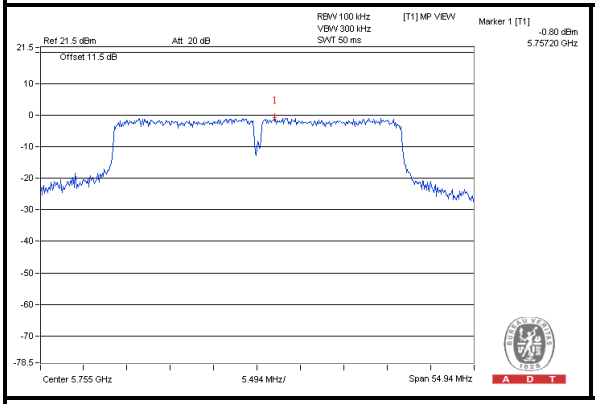


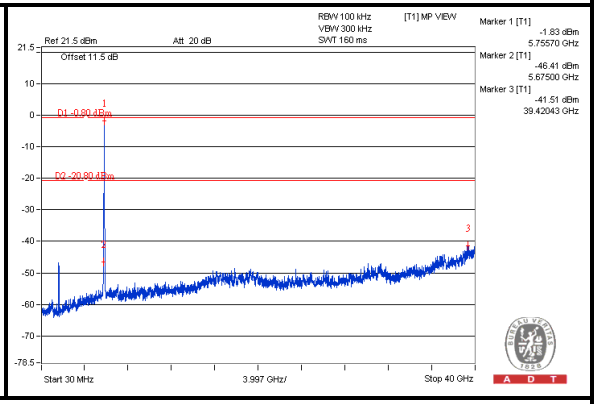
CH 165 Band edge



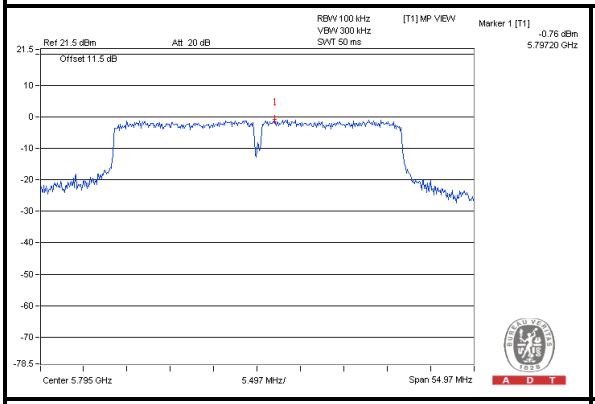
802.11ac (VHT40)

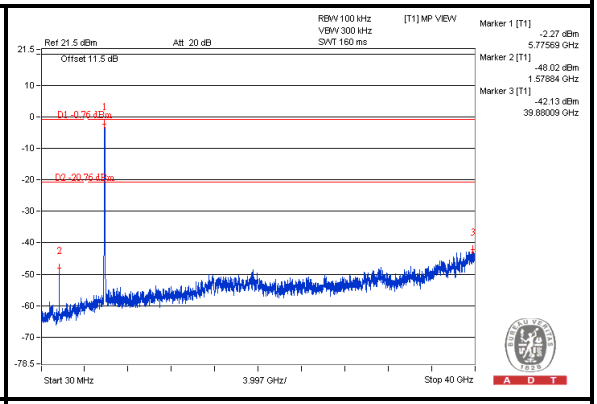
CH 151



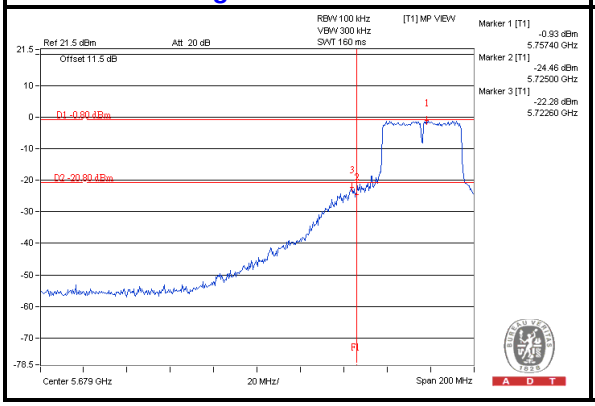


CH 159

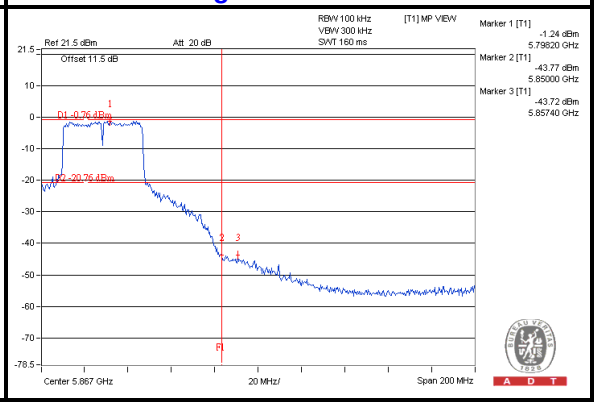




CH 151 Band edge

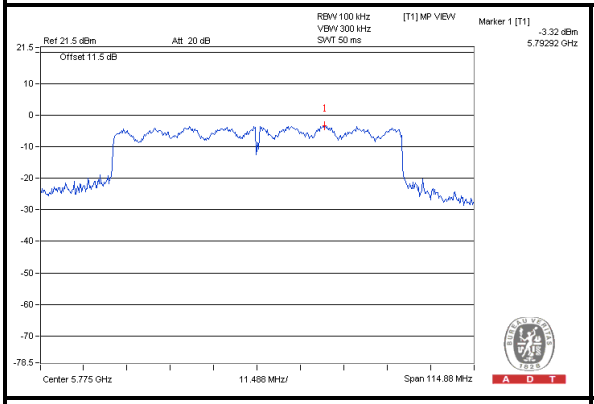


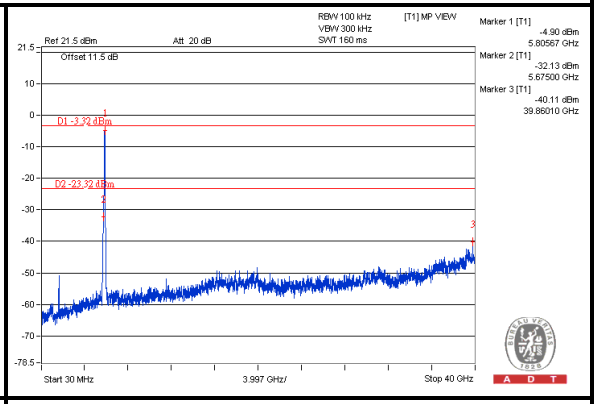
CH 159 Band edge



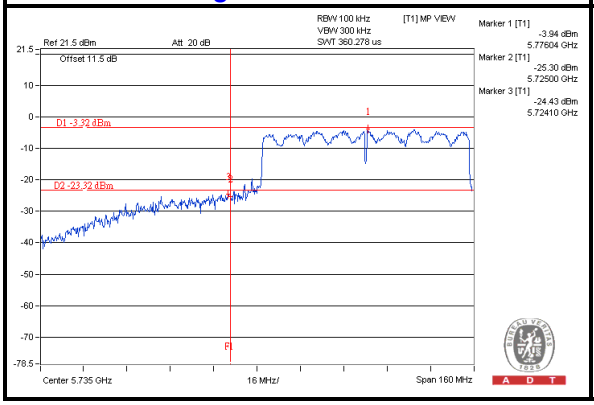
802.11ac (VHT80)

CH 155

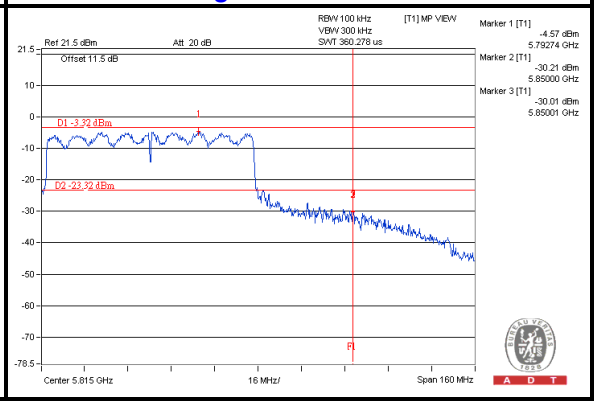




CH 155 Band edge



CH 155 Band edge



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 ---