



# FCC TEST REPORT (WLAN 15.407)

**REPORT NO.:** RF131203E01-1

**MODEL NO.:** RTL8821AU

**FCC ID:** TX2-RTL8821AU

**RECEIVED:** Dec. 02, 2013

**TESTED:** Dec. 24, 2013 to Feb. 24, 2014

**ISSUED:** Mar. 04, 2014

**APPLICANT:** Realtek Semiconductor Corp.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF131203E01-1	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. 24, 2014  
**STANDARDS:** **FCC Part 15, Subpart E (Section 15.407)**  
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 :** May Chen , **DATE:** Mar. 04, 2014  
( May Chen, Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.98dB at 0.20469MHz
15.407(b/1/2/3) (b)(6)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 5150.00MHz & 5470.00MHz.
15.407(a/1/2)	Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

**NOTE:** 1. For WLAN: The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz. For the 2400 ~ 2483.5MHz and 5.725~5.850GHz RF parameters was recorded in another test report.

2. The DFS report was recorded in another test report.



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## 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)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB



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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT(WLAN)

<b>PRODUCT</b>	802.11a/b/g/n/ac RTL8821AU Combo module
<b>MODEL NO.</b>	RTL8821AU
<b>POWER SUPPLY</b>	DC 3.3V from host equipment
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM BT-LE (GFSK) for DTS 256QAM for OFDM in 11ac mode only
<b>MODULATION TECHNOLOGY</b>	DSSS,OFDM, DTS
<b>TRANSFER RATE</b>	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
<b>OPERATING FREQUENCY</b>	<b>For 15.407</b> <b>5GHz:</b> 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66GHz ~ 5.70GHz
	<b>For 15.247</b> <b>2.4GHz:</b> 2.412 ~ 2.462GHz <b>5GHz:</b> 5.745 ~ 5.825GHz <b>BT-LE(GFSK):</b> 2.402 ~ 2.480GHz
<b>NUMBER OF CHANNEL</b>	<b>For 15.407</b> 16 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 7 for 802.11n (HT40), 802.11ac (VHT40) 3 for 802.11ac (VHT80)
	<b>For 15.247 (2.4GHz)</b> 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) <b>For 15.247 (5GHz)</b> 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)





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



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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



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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



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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)

- When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 7.
- When the EUT operating in 802.11ac, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.
- 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 5150 ~ 5350MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	52	5260 MHz
40	5200 MHz	56	5280 MHz
44	5220 MHz	60	5300 MHz
48	5240 MHz	64	5320 MHz

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

CHANNEL	FREQUENCY
38	5190 MHz
46	5230 MHz
54	5270 MHz
62	5310 MHz

2 channels are provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
42	5210 MHz
58	5290 MHz

#### Operated in 5470MHz ~ 5600MHz & 5650MHz ~ 5725MHz bands:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	116	5580 MHz
104	5520 MHz	132	5660 MHz
108	5540 MHz	136	5680 MHz
112	5560 MHz	140	5700 MHz

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

CHANNEL	FREQUENCY
102	5510 MHz
110	5550 MHz
134	5670 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
106	5530 MHz



### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **PLC**: Power Line Conducted Emission                      **RE < 1G**: Radiated Emission below 1GHz  
**RE ≥ 1G**: Radiated Emission above 1GHz                      **APCM**: Antenna Port Conducted Measurement

**NOTE:** 1. 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)
802.11ac (VHT40)	38 to 134	110	OFDM	BPSK	13.5

#### **RADIATED EMISSION TEST (BELOW 1 GHz):**

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	38 to 134	110	OFDM	BPSK	13.5



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**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	MODULATI ON TYPE	DATA RATE (Mbps)
802.11a	36 to 140	36, 40, 48, 52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6
802.11ac (VHT20)	36 to 140	36, 40, 48, 52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6.5
802.11ac (VHT40)	38 to 134	38, 46, 54, 62, 102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)	42 to 106	42, 58, 106	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	MODULATI ON TYPE	DATA RATE (Mbps)
802.11a	36 to 140	36, 40, 48, 52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6
802.11ac (VHT20)	36 to 140	36, 40, 48, 52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6.5
802.11ac (VHT40)	38 to 134	38, 46, 54, 62, 102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)	42 to 106	42, 58, 106	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 <sup>3</sup> 1G	23deg. C, 67%RH	120Vac, 60Hz	Tim Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nelson Teng

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC Part 15, Subpart C. (15.247)**

**558074 D01 DTS Meas Guidance 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.



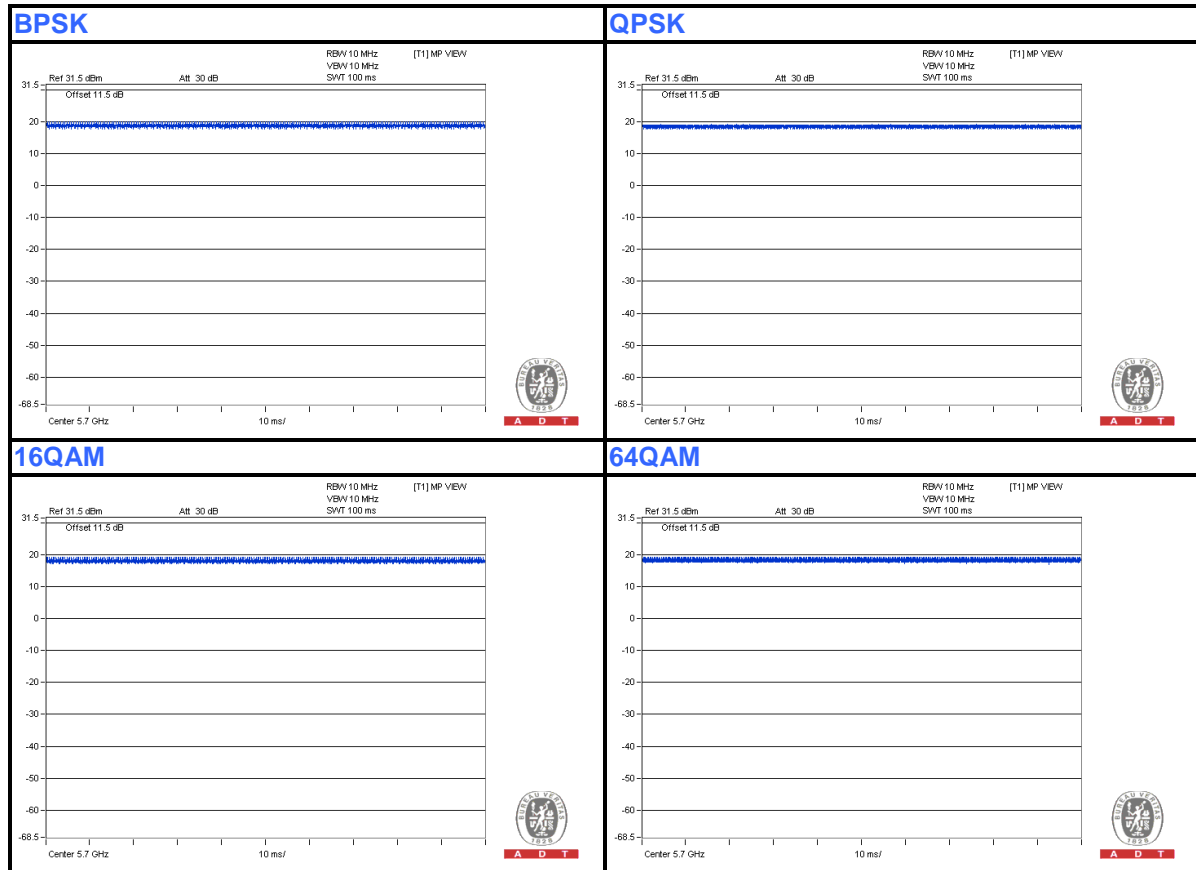


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### 3.4 DUTY CYCLE OF TEST SIGNAL

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

802.11a

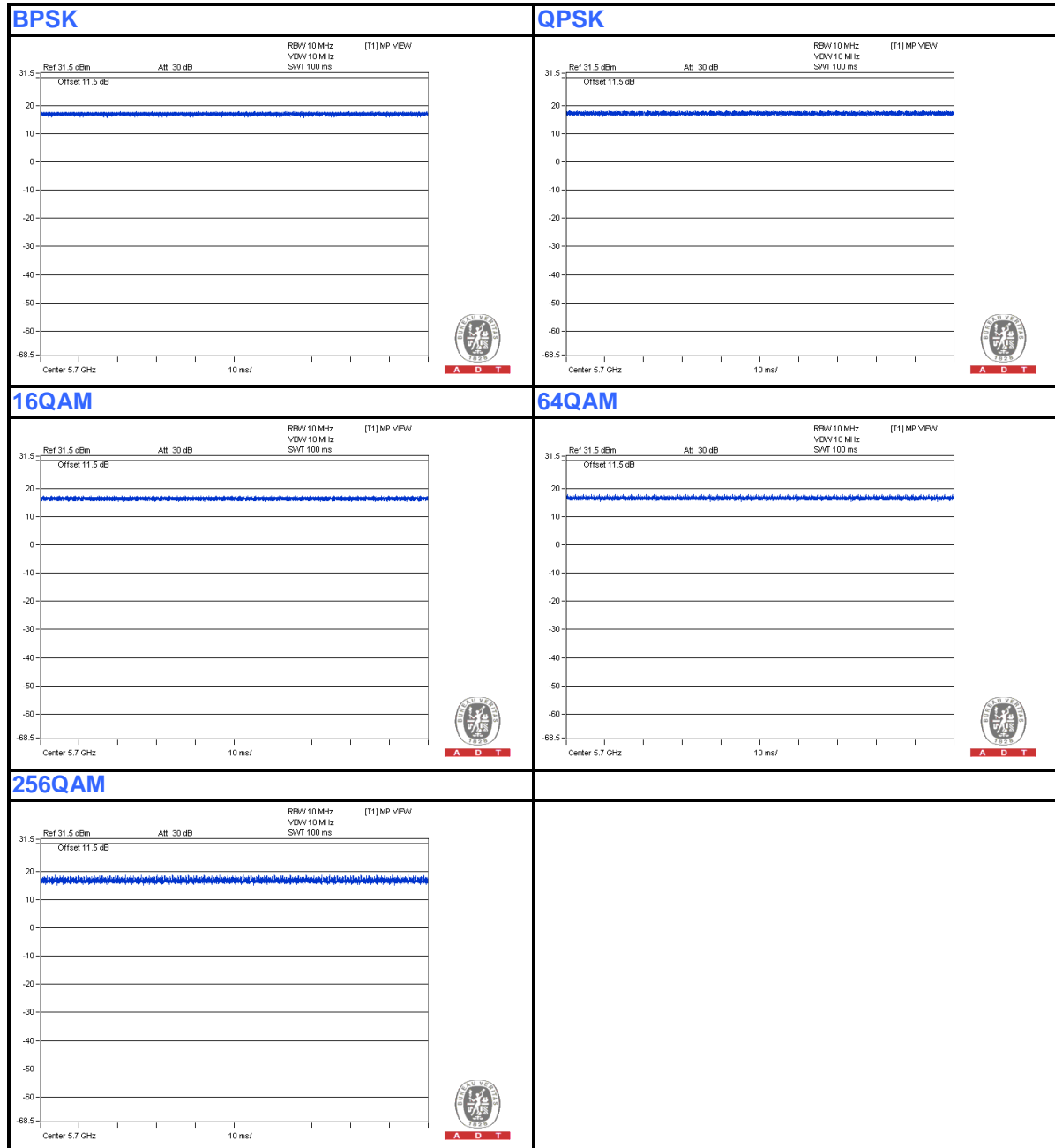




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Duty cycle of test signal is 100 %, duty factor is not required.

802.11ac (VHT20)

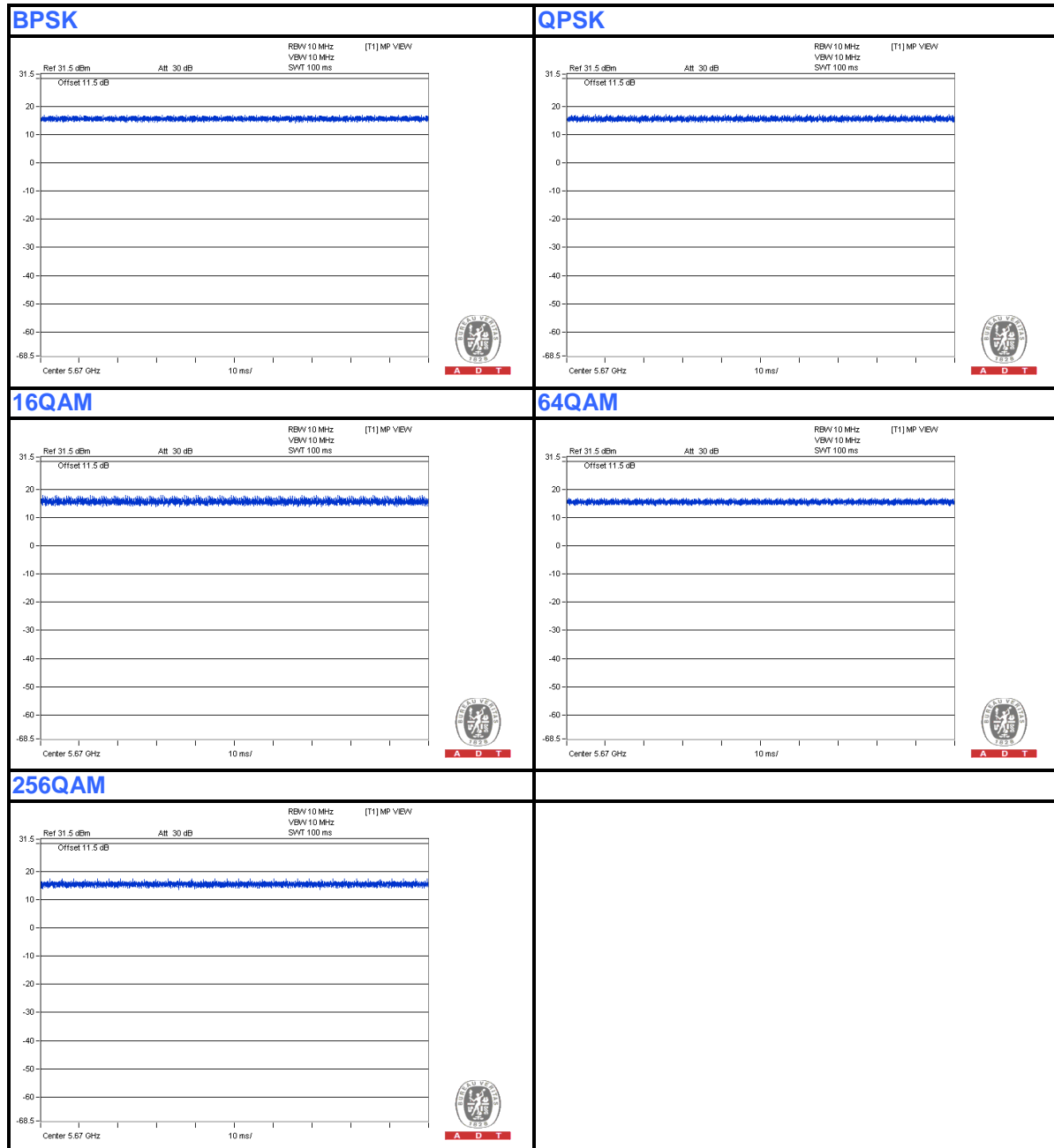




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Duty cycle of test signal is 100 %, duty factor is not required.

802.11ac (VHT40)





A D T

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

802.11ac (VHT80)





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### 3.5 DESCRIPTION OF SUPPORT UNITS

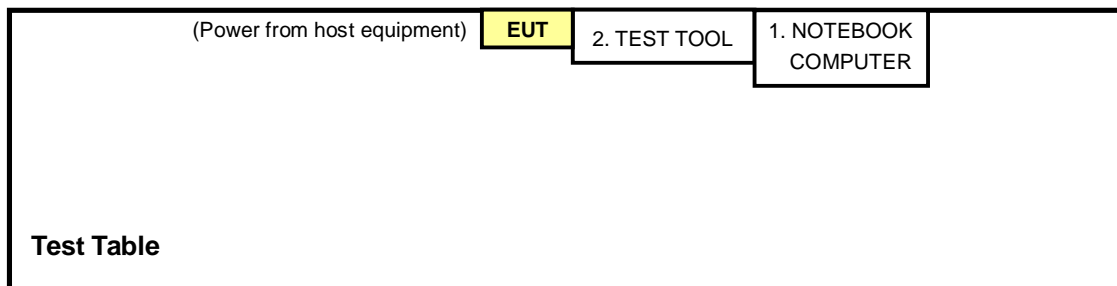
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

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





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## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	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 (JYBAO)	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 level under (Limit – 20dB) was not recorded.

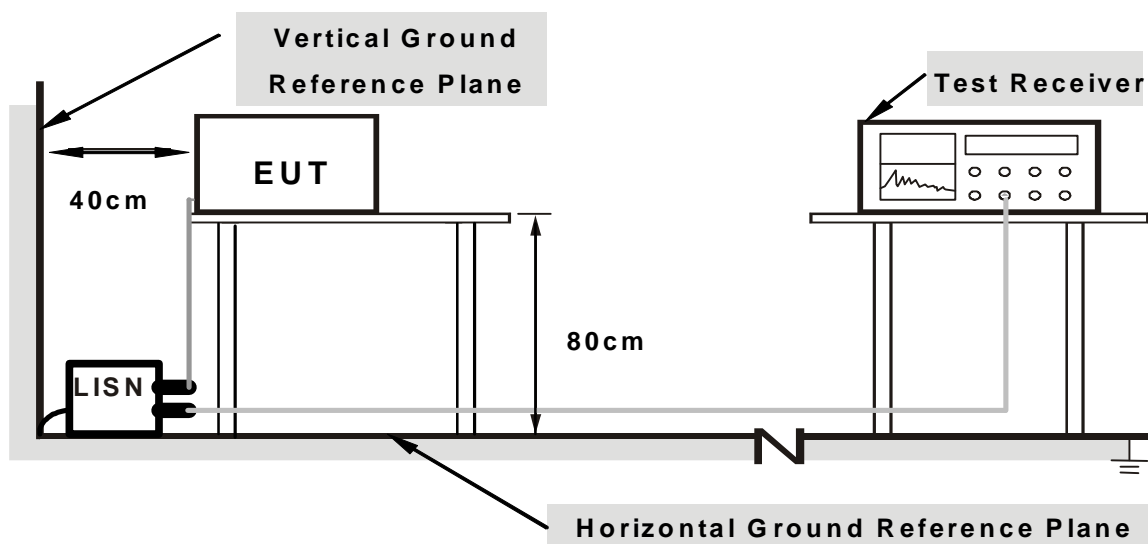
**NOTE:**

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.



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#### 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.



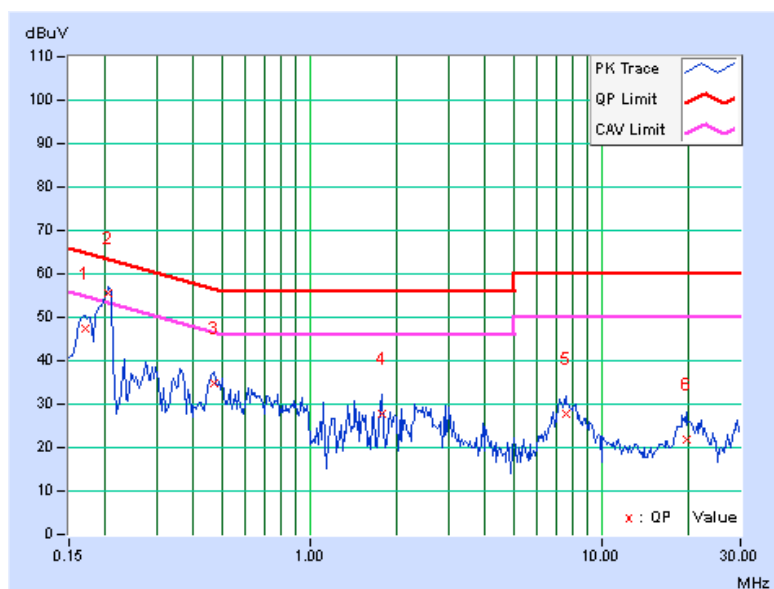
### 4.1.7 TEST RESULTS

<b>PHASE</b>	Line (L)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16953	0.09	47.42	35.92	47.51	36.01	64.98	54.98	-17.48	-18.98
<b>2</b>	<b>0.20469</b>	<b>0.10</b>	<b>55.34</b>	<b>37.39</b>	<b>55.44</b>	<b>37.49</b>	<b>63.42</b>	<b>53.42</b>	<b>-7.98</b>	<b>-15.93</b>
3	0.47031	0.14	34.68	24.81	34.82	24.95	56.51	46.51	-21.68	-21.55
4	1.76172	0.20	27.54	16.94	27.74	17.14	56.00	46.00	-28.26	-28.86
5	7.53906	0.39	27.43	21.12	27.82	21.51	60.00	50.00	-32.18	-28.49
6	19.55078	0.70	20.98	15.43	21.68	16.13	60.00	50.00	-38.32	-33.87

#### 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

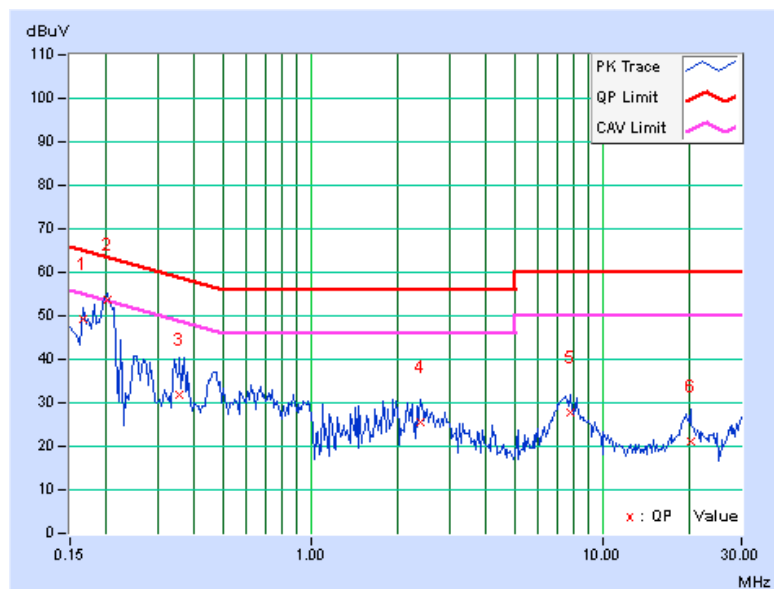


<b>PHASE</b>	Neutral (N)	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP) / Average (AV)
--------------	-------------	--------------------------	--------------------------------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. (dB)	AV. (dB)
1	0.16562	0.09	49.22	36.34	49.31	36.43	65.18	55.18	-15.86	-18.74
2	0.20078	0.10	53.78	36.83	53.88	36.93	63.58	53.58	-9.70	-16.65
3	0.35703	0.13	31.68	17.12	31.81	17.25	58.80	48.80	-26.99	-31.55
4	2.38672	0.23	25.47	18.50	25.70	18.73	56.00	46.00	-30.30	-27.27
5	7.76172	0.40	27.28	21.37	27.68	21.77	60.00	50.00	-32.32	-28.23
6	20.07813	0.70	20.44	15.15	21.14	15.85	60.00	50.00	-38.86	-34.15

**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 BANDEGE MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION AND BANDEGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
√	FIELD STRENGTH AT 3m (dBµV/m)	
	PK	AV
	74	54
	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBµV/m)
	PK	PK
	-27	68.3

**NOTE:**

1. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).$$



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### 4.2.3 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

#### 4.2.4 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:**

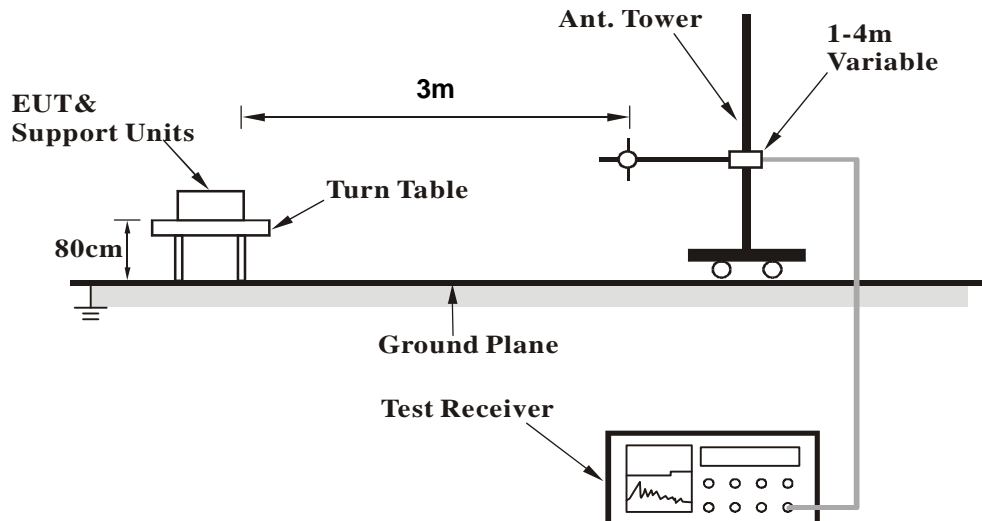
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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 ( $10 \log(1/\text{duty cycle})$ ).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.5 DEVIATION FROM TEST STANDARD

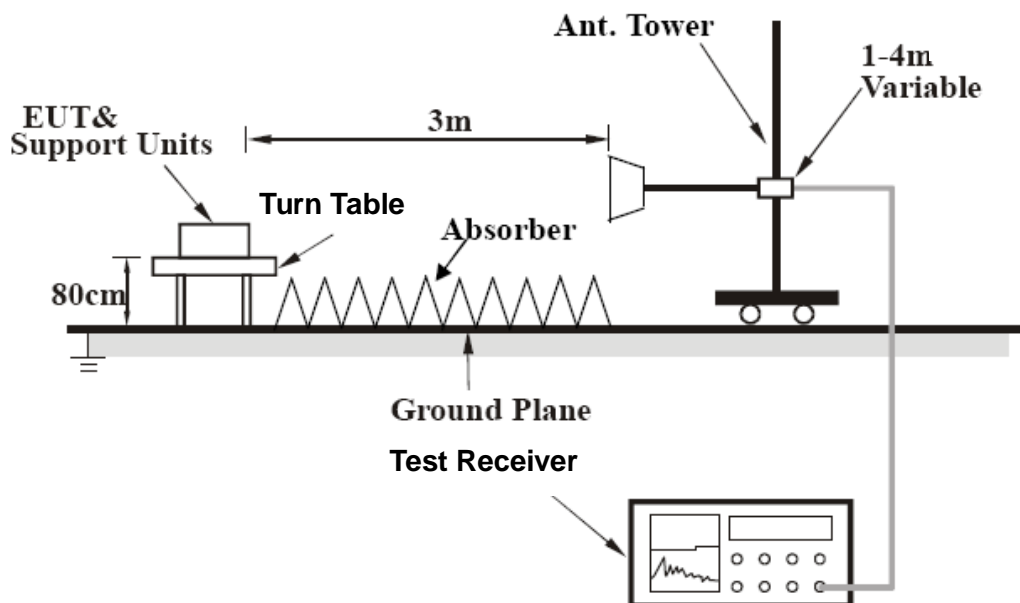
No deviation

#### 4.2.6 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.

#### 4.2.7 EUT OPERATING CONDITION

Same as 4.1.6



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### 4.2.8 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA

#### 802.11ac (VHT40)

<b>CHANNEL</b>	TX Channel 110	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	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	134.61	39.2 QP	43.5	-4.3	2.00 H	148	53.14	-13.94
2	168.23	37.4 QP	43.5	-6.1	1.50 H	0	51.20	-13.76
3	250.09	39.5 QP	46.0	-6.5	1.50 H	354	53.83	-14.31
4	263.77	35.7 QP	46.0	-10.3	1.50 H	180	49.54	-13.81
5	322.61	34.9 QP	46.0	-11.1	1.50 H	0	46.67	-11.73
6	400.28	27.0 QP	46.0	-19.0	2.00 H	50	36.94	-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	117.93	35.7 QP	43.5	-7.8	1.00 V	132	50.99	-15.32
2	134.61	30.5 QP	43.5	-13.0	1.00 V	95	44.43	-13.94
3	168.08	31.2 QP	43.5	-12.3	1.00 V	286	45.00	-13.78
4	250.09	36.7 QP	46.0	-9.3	1.50 V	121	50.99	-14.31
5	267.36	36.1 QP	46.0	-9.9	1.50 V	93	49.87	-13.76
6	400.01	29.5 QP	46.0	-16.5	1.00 V	104	39.44	-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



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ABOVE 1GHz DATA

802.11a

<b>CHANNEL</b>	TX Channel 36	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	64.7 PK	74.0	-9.3	1.26 H	285	56.47	8.23
2	5150.00	52.1 AV	54.0	-1.9	1.26 H	285	43.87	8.23
3	*5180.00	109.1 PK			1.26 H	285	100.87	8.23
4	*5180.00	101.4 AV			1.26 H	285	93.17	8.23
5	#10360.00	56.5 PK	74.0	-17.5	1.10 H	292	41.62	14.88
6	#10360.00	46.2 AV	54.0	-7.8	1.10 H	292	31.32	14.88
7	15540.00	59.7 PK	74.0	-14.3	1.01 H	309	38.85	20.85
8	15540.00	47.1 AV	54.0	-6.9	1.01 H	309	26.25	20.85

**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	5150.00	61.2 PK	74.0	-12.8	1.00 V	60	52.97	8.23
2	5150.00	47.2 AV	54.0	-6.8	1.00 V	60	38.97	8.23
3	*5180.00	106.1 PK			1.00 V	60	97.87	8.23
4	*5180.00	96.8 AV			1.00 V	60	88.57	8.23
5	#10360.00	54.5 PK	74.0	-19.5	1.15 V	268	39.62	14.88
6	#10360.00	44.5 AV	54.0	-9.5	1.15 V	268	29.62	14.88
7	15540.00	59.2 PK	74.0	-14.8	1.36 V	290	38.35	20.85
8	15540.00	47.3 AV	54.0	-6.7	1.36 V	290	26.45	20.85

**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.
6. " # ": The radiated frequency is out of the restricted band.



<b>CHANNEL</b>	TX Channel 40	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	55.9 PK	74.0	-18.1	1.25 H	286	47.67	8.23
2	5150.00	42.7 AV	54.0	-11.3	1.25 H	286	34.47	8.23
3	*5200.00	109.8 PK			1.25 H	286	101.56	8.24
4	*5200.00	101.1 AV			1.25 H	286	92.86	8.24
5	#10400.00	56.3 PK	74.0	-17.7	1.04 H	298	41.07	15.23
6	#10400.00	46.5 AV	54.0	-7.5	1.04 H	298	31.27	15.23
7	15600.00	59.5 PK	74.0	-14.5	1.04 H	288	38.62	20.88
8	15600.00	47.3 AV	54.0	-6.7	1.04 H	288	26.42	20.88

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	5123.00	53.4 PK	74.0	-20.6	1.00 V	40	45.17	8.23
2	5123.00	38.0 AV	54.0	-16.0	1.00 V	40	29.77	8.23
3	*5200.00	105.3 PK			1.00 V	40	97.06	8.24
4	*5200.00	96.1 AV			1.00 V	40	87.86	8.24
5	#10400.00	55.5 PK	74.0	-18.5	1.10 V	240	40.27	15.23
6	#10400.00	45.0 AV	54.0	-9.0	1.10 V	240	29.77	15.23
7	15600.00	59.5 PK	74.0	-14.5	1.26 V	286	38.62	20.88
8	15600.00	47.4 AV	54.0	-6.6	1.26 V	286	26.52	20.88

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 48	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5240.00	112.5 PK			1.26 H	284	104.10	8.40
2	*5240.00	102.6 AV			1.26 H	284	94.20	8.40
3	#10480.00	56.0 PK	74.0	-18.0	1.05 H	270	40.79	15.21
4	#10480.00	46.5 AV	54.0	-7.5	1.05 H	270	31.29	15.21
5	15720.00	58.8 PK	74.0	-15.2	1.01 H	304	37.93	20.87
6	15720.00	46.9 AV	54.0	-7.1	1.01 H	304	26.03	20.87

**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	*5240.00	107.2 PK			1.00 V	31	98.80	8.40
2	*5240.00	97.1 AV			1.00 V	31	88.70	8.40
3	#10480.00	55.3 PK	74.0	-18.7	1.16 V	259	40.09	15.21
4	#10480.00	45.1 AV	54.0	-8.9	1.16 V	259	29.89	15.21
5	15720.00	58.7 PK	74.0	-15.3	1.28 V	283	37.83	20.87
6	15720.00	47.2 AV	54.0	-6.8	1.28 V	283	26.33	20.87

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 52	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5260.00	114.3 PK			1.23 H	285	105.84	8.46
2	*5260.00	104.5 AV			1.23 H	285	96.04	8.46
3	#10520.00	55.5 PK	74.0	-18.5	1.00 H	291	40.24	15.26
4	#10520.00	45.7 AV	54.0	-8.3	1.00 H	291	30.44	15.26
5	15780.00	59.9 PK	74.0	-14.1	1.08 H	283	39.15	20.75
6	15780.00	47.7 AV	54.0	-6.3	1.08 H	283	26.95	20.75

**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	*5260.00	108.9 PK			1.02 V	37	100.44	8.46
2	*5260.00	98.9 AV			1.02 V	37	90.44	8.46
3	#10520.00	54.9 PK	74.0	-19.1	1.14 V	245	39.64	15.26
4	#10520.00	45.0 AV	54.0	-9.0	1.14 V	245	29.74	15.26
5	15780.00	58.6 PK	74.0	-15.4	1.33 V	307	37.85	20.75
6	15780.00	47.0 AV	54.0	-7.0	1.33 V	307	26.25	20.75

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 60	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5300.00	113.7 PK			1.24 H	287	105.08	8.62
2	*5300.00	103.7 AV			1.24 H	287	95.08	8.62
3	10600.00	56.2 PK	74.0	-17.8	1.00 H	311	40.67	15.53
4	10600.00	46.7 AV	54.0	-7.3	1.00 H	311	31.17	15.53
5	15900.00	59.8 PK	74.0	-14.2	1.09 H	260	38.50	21.30
6	15900.00	47.7 AV	54.0	-6.3	1.09 H	260	26.40	21.30

**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	*5300.00	108.1 PK			1.00 V	49	99.48	8.62
2	*5300.00	98.2 AV			1.00 V	49	89.58	8.62
3	10600.00	55.3 PK	74.0	-18.7	1.05 V	262	39.77	15.53
4	10600.00	44.8 AV	54.0	-9.2	1.05 V	262	29.27	15.53
5	15900.00	59.2 PK	74.0	-14.8	1.27 V	285	37.90	21.30
6	15900.00	47.3 AV	54.0	-6.7	1.27 V	285	26.00	21.30

**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.

<b>CHANNEL</b>	TX Channel 64	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5320.00	110.5 PK			1.47 H	287	101.81	8.69
2	*5320.00	100.9 AV			1.47 H	287	92.21	8.69
3	5350.00	69.7 PK	74.0	-4.3	1.47 H	287	60.90	8.80
4	5350.00	52.4 AV	54.0	-1.6	1.47 H	287	43.60	8.80
5	10640.00	56.4 PK	74.0	-17.6	1.08 H	310	40.86	15.54
6	10640.00	46.4 AV	54.0	-7.6	1.08 H	310	30.86	15.54
7	15960.00	59.4 PK	74.0	-14.6	1.09 H	273	38.58	20.82
8	15960.00	47.5 AV	54.0	-6.5	1.09 H	273	26.68	20.82

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	*5320.00	105.1 PK			1.00 V	58	96.41	8.69
2	*5320.00	95.1 AV			1.00 V	58	86.41	8.69
3	5350.00	66.2 PK	74.0	-7.8	1.00 V	58	57.40	8.80
4	5350.00	47.1 AV	54.0	-6.9	1.00 V	58	38.30	8.80
5	10640.00	54.7 PK	74.0	-19.3	1.09 V	241	39.16	15.54
6	10640.00	44.7 AV	54.0	-9.3	1.09 V	241	29.16	15.54
7	15960.00	59.4 PK	74.0	-14.6	1.37 V	313	38.58	20.82
8	15960.00	47.5 AV	54.0	-6.5	1.37 V	313	26.68	20.82

**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.



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<b>CHANNEL</b>	TX Channel 100	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	71.4 PK	74.0	-2.6	1.49 H	87	62.21	9.19
2	5460.00	51.4 AV	54.0	-2.6	1.49 H	87	42.21	9.19
3	#5470.00	69.4 PK	74.0	-4.6	1.49 H	87	60.18	9.22
4	#5470.00	49.3 AV	54.0	-4.7	1.49 H	87	40.08	9.22
5	*5500.00	112.4 PK			1.44 H	96	103.07	9.33
6	*5500.00	102.8 AV			1.44 H	96	93.47	9.33
7	11000.00	56.1 PK	74.0	-17.9	1.06 H	306	39.15	16.95
8	11000.00	46.5 AV	54.0	-7.5	1.06 H	306	29.55	16.95
9	#16500.00	59.5 PK	74.0	-14.5	1.00 H	304	36.46	23.04
10	#16500.00	47.2 AV	54.0	-6.8	1.00 H	304	24.16	23.04

**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	68.0 PK	74.0	-6.0	1.01 V	64	58.81	9.19
2	5460.00	46.0 AV	54.0	-8.0	1.01 V	64	36.81	9.19
3	#5470.00	66.3 PK	74.0	-7.7	1.01 V	64	57.08	9.22
4	#5470.00	44.4 AV	54.0	-9.6	1.01 V	64	35.18	9.22
5	*5500.00	107.6 PK			1.01 V	64	98.27	9.33
6	*5500.00	96.9 AV			1.01 V	64	87.57	9.33
7	11000.00	55.3 PK	74.0	-18.7	1.15 V	255	38.35	16.95
8	11000.00	45.1 AV	54.0	-8.9	1.15 V	255	28.15	16.95
9	#16500.00	59.1 PK	74.0	-14.9	1.37 V	310	36.06	23.04
10	#16500.00	47.2 AV	54.0	-6.8	1.37 V	310	24.16	23.04

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 116	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5580.00	111.6 PK			1.27 H	271	102.13	9.47
2	*5580.00	101.7 AV			1.27 H	271	92.23	9.47
3	11160.00	56.1 PK	74.0	-17.9	1.08 H	293	39.89	16.21
4	11160.00	46.3 AV	54.0	-7.7	1.08 H	293	30.09	16.21
5	#16740.00	60.0 PK	74.0	-14.0	1.04 H	270	36.32	23.68
6	#16740.00	47.5 AV	54.0	-6.5	1.04 H	270	23.82	23.68

**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	*5580.00	106.0 PK			1.02 V	61	96.53	9.47
2	*5580.00	96.9 AV			1.02 V	61	87.43	9.47
3	11160.00	54.8 PK	74.0	-19.2	1.07 V	239	38.59	16.21
4	11160.00	44.6 AV	54.0	-9.4	1.07 V	239	28.39	16.21
5	#16740.00	58.8 PK	74.0	-15.2	1.27 V	292	35.12	23.68
6	#16740.00	47.3 AV	54.0	-6.7	1.27 V	292	23.62	23.68

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 132	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5660.00	112.6 PK			1.22 H	270	102.87	9.73
2	*5660.00	103.0 AV			1.22 H	270	93.27	9.73
3	11320.00	56.6 PK	74.0	-17.4	1.08 H	277	39.68	16.92
4	11320.00	46.6 AV	54.0	-7.4	1.08 H	277	29.68	16.92
5	#16980.00	59.3 PK	74.0	-14.7	1.00 H	298	35.10	24.20
6	#16980.00	47.7 AV	54.0	-6.3	1.00 H	298	23.50	24.20

**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	*5660.00	107.6 PK			1.00 V	59	97.87	9.73
2	*5660.00	97.9 AV			1.00 V	59	88.17	9.73
3	11320.00	55.0 PK	74.0	-19.0	1.13 V	250	38.08	16.92
4	11320.00	44.7 AV	54.0	-9.3	1.13 V	250	27.78	16.92
5	#16980.00	58.7 PK	74.0	-15.3	1.32 V	283	34.50	24.20
6	#16980.00	47.0 AV	54.0	-7.0	1.32 V	283	22.80	24.20

**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.
6. " # ": The radiated frequency is out of the restricted band.





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<b>CHANNEL</b>	TX Channel 140	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5700.00	111.6 PK			1.29 H	108	101.72	9.88
2	*5700.00	101.6 AV			1.29 H	108	91.72	9.88
3	#5725.00	69.2 PK	74.0	-4.8	1.29 H	108	59.29	9.91
4	#5725.00	52.5 AV	54.0	-1.5	1.29 H	108	42.59	9.91
5	11400.00	55.3 PK	74.0	-18.7	1.00 H	295	38.55	16.75
6	11400.00	45.6 AV	54.0	-8.4	1.00 H	295	28.85	16.75
7	#17100.00	59.1 PK	74.0	-14.9	1.00 H	302	34.04	25.06
8	#17100.00	47.2 AV	54.0	-6.8	1.00 H	302	22.14	25.06

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	106.3 PK			1.00 V	70	96.42	9.88
2	*5700.00	96.5 AV			1.00 V	70	86.62	9.88
3	#5725.00	65.9 PK	74.0	-8.1	1.00 V	70	55.99	9.91
4	#5725.00	47.1 AV	54.0	-6.9	1.00 V	70	37.19	9.91
5	11400.00	54.3 PK	74.0	-19.7	1.09 V	258	37.55	16.75
6	11400.00	44.3 AV	54.0	-9.7	1.09 V	258	27.55	16.75
7	#17100.00	58.7 PK	74.0	-15.3	1.33 V	283	33.64	25.06
8	#17100.00	46.9 AV	54.0	-7.1	1.33 V	283	21.84	25.06

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.



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802.11ac (VHT20)

<b>CHANNEL</b>	TX Channel 36	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	67.5 PK	74.0	-6.5	1.26 H	286	59.27	8.23
2	5150.00	52.2 AV	54.0	-1.8	1.26 H	286	43.97	8.23
3	*5180.00	110.4 PK			1.26 H	286	102.17	8.23
4	*5180.00	100.8 AV			1.26 H	286	92.57	8.23
5	#10360.00	56.7 PK	74.0	-17.3	1.08 H	302	41.82	14.88
6	#10360.00	46.9 AV	54.0	-7.1	1.08 H	302	32.02	14.88
7	15540.00	59.6 PK	74.0	-14.4	1.06 H	289	38.75	20.85
8	15540.00	47.4 AV	54.0	-6.6	1.06 H	289	26.55	20.85

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	5150.00	65.0 PK	74.0	-9.0	1.00 V	55	56.77	8.23
2	5150.00	47.6 AV	54.0	-6.4	1.00 V	55	39.37	8.23
3	*5180.00	105.4 PK			1.00 V	55	97.17	8.23
4	*5180.00	95.1 AV			1.00 V	55	86.87	8.23
5	#10360.00	54.8 PK	74.0	-19.2	1.11 V	241	39.92	14.88
6	#10360.00	44.7 AV	54.0	-9.3	1.11 V	241	29.82	14.88
7	15540.00	59.5 PK	74.0	-14.5	1.35 V	287	38.65	20.85
8	15540.00	47.4 AV	54.0	-6.6	1.35 V	287	26.55	20.85

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 40	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5200.00	112.3 PK			1.25 H	286	104.06	8.24
2	*5200.00	102.7 AV			1.25 H	286	94.46	8.24
3	#10400.00	56.1 PK	74.0	-17.9	1.00 H	284	40.87	15.23
4	#10400.00	46.4 AV	54.0	-7.6	1.00 H	284	31.17	15.23
5	15600.00	59.0 PK	74.0	-15.0	1.03 H	299	38.12	20.88
6	15600.00	47.0 AV	54.0	-7.0	1.03 H	299	26.12	20.88

**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	*5200.00	107.2 PK			1.03 V	69	98.96	8.24
2	*5200.00	97.3 AV			1.03 V	69	89.06	8.24
3	#10400.00	55.1 PK	74.0	-18.9	1.08 V	266	39.87	15.23
4	#10400.00	44.8 AV	54.0	-9.2	1.08 V	266	29.57	15.23
5	15600.00	58.4 PK	74.0	-15.6	1.37 V	291	37.52	20.88
6	15600.00	46.8 AV	54.0	-7.2	1.37 V	291	25.92	20.88

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 48	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5240.00	112.8 PK			1.24 H	285	104.40	8.40
2	*5240.00	103.1 AV			1.24 H	285	94.70	8.40
3	#10480.00	56.4 PK	74.0	-17.6	1.00 H	294	41.19	15.21
4	#10480.00	46.4 AV	54.0	-7.6	1.00 H	294	31.19	15.21
5	15720.00	59.3 PK	74.0	-14.7	1.00 H	291	38.43	20.87
6	15720.00	47.0 AV	54.0	-7.0	1.00 H	291	26.13	20.87

**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	*5240.00	107.6 PK			1.00 V	39	99.20	8.40
2	*5240.00	97.9 AV			1.00 V	39	89.50	8.40
3	#10480.00	54.3 PK	74.0	-19.7	1.14 V	251	39.09	15.21
4	#10480.00	44.3 AV	54.0	-9.7	1.14 V	251	29.09	15.21
5	15720.00	59.2 PK	74.0	-14.8	1.28 V	310	38.33	20.87
6	15720.00	47.5 AV	54.0	-6.5	1.28 V	310	26.63	20.87

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 52	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5260.00	114.2 PK			1.24 H	285	105.74	8.46
2	*5260.00	104.3 AV			1.24 H	285	95.84	8.46
3	#10520.00	55.3 PK	74.0	-18.7	1.06 H	295	40.04	15.26
4	#10520.00	45.3 AV	54.0	-8.7	1.06 H	295	30.04	15.26
5	15780.00	59.1 PK	74.0	-14.9	1.00 H	289	38.35	20.75
6	15780.00	46.9 AV	54.0	-7.1	1.00 H	289	26.15	20.75

**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	*5260.00	108.9 PK			1.01 V	75	100.44	8.46
2	*5260.00	98.6 AV			1.01 V	75	90.14	8.46
3	#10520.00	55.0 PK	74.0	-19.0	1.16 V	242	39.74	15.26
4	#10520.00	45.0 AV	54.0	-9.0	1.16 V	242	29.74	15.26
5	15780.00	58.9 PK	74.0	-15.1	1.34 V	298	38.15	20.75
6	15780.00	47.2 AV	54.0	-6.8	1.34 V	298	26.45	20.75

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 60	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5300.00	113.8 PK			1.22 H	285	105.18	8.62
2	*5300.00	104.0 AV			1.22 H	285	95.38	8.62
3	10600.00	56.0 PK	74.0	-18.0	1.04 H	303	40.47	15.53
4	10600.00	46.3 AV	54.0	-7.7	1.04 H	303	30.77	15.53
5	15900.00	58.6 PK	74.0	-15.4	1.04 H	287	37.30	21.30
6	15900.00	46.3 AV	54.0	-7.7	1.04 H	287	25.00	21.30

**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	*5300.00	108.7 PK			1.00 V	53	100.08	8.62
2	*5300.00	97.8 AV			1.00 V	53	89.18	8.62
3	10600.00	54.9 PK	74.0	-19.1	1.15 V	239	39.37	15.53
4	10600.00	44.6 AV	54.0	-9.4	1.15 V	239	29.07	15.53
5	15900.00	58.4 PK	74.0	-15.6	1.28 V	305	37.10	21.30
6	15900.00	46.7 AV	54.0	-7.3	1.28 V	305	25.40	21.30

**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.



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<b>CHANNEL</b>	TX Channel 64	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5320.00	111.3 PK			1.49 H	286	102.61	8.69
2	*5320.00	101.4 AV			1.49 H	286	92.71	8.69
3	5350.00	67.5 PK	74.0	-6.5	1.49 H	286	58.70	8.80
4	5350.00	52.1 AV	54.0	-1.9	1.49 H	286	43.30	8.80
5	10640.00	56.3 PK	74.0	-17.7	1.00 H	293	40.76	15.54
6	10640.00	46.4 AV	54.0	-7.6	1.00 H	293	30.86	15.54
7	15960.00	59.5 PK	74.0	-14.5	1.09 H	289	38.68	20.82
8	15960.00	47.1 AV	54.0	-6.9	1.09 H	289	26.28	20.82

**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	*5320.00	106.7 PK			1.00 V	72	98.01	8.69
2	*5320.00	96.3 AV			1.00 V	72	87.61	8.69
3	5350.00	64.2 PK	74.0	-9.8	1.00 V	72	55.40	8.80
4	5350.00	46.9 AV	54.0	-7.1	1.00 V	72	38.10	8.80
5	10640.00	55.1 PK	74.0	-18.9	1.12 V	253	39.56	15.54
6	10640.00	44.6 AV	54.0	-9.4	1.12 V	253	29.06	15.54
7	15960.00	58.3 PK	74.0	-15.7	1.31 V	304	37.48	20.82
8	15960.00	46.7 AV	54.0	-7.3	1.31 V	304	25.88	20.82

**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.



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<b>CHANNEL</b>	TX Channel 100	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	69.4 PK	74.0	-4.6	1.44 H	96	60.21	9.19
2	5460.00	49.3 AV	54.0	-4.7	1.44 H	96	40.11	9.19
3	#5470.00	71.5 PK	74.0	-2.5	1.44 H	96	62.28	9.22
4	#5470.00	51.7 AV	54.0	-2.3	1.44 H	96	42.48	9.22
5	*5500.00	114.3 PK			1.44 H	96	104.97	9.33
6	*5500.00	104.3 AV			1.44 H	96	94.97	9.33
7	11160.00	56.2 PK	74.0	-17.8	1.00 H	306	39.99	16.21
8	11160.00	46.5 AV	54.0	-7.5	1.00 H	306	30.29	16.21
9	#16740.00	60.1 PK	74.0	-13.9	1.00 H	260	36.42	23.68
10	#16740.00	47.8 AV	54.0	-6.2	1.00 H	260	24.12	23.68

**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	66.2 PK	74.0	-7.8	1.06 V	69	57.01	9.19
2	5460.00	44.1 AV	54.0	-9.9	1.06 V	69	34.91	9.19
3	#5470.00	69.0 PK	74.0	-5.0	1.06 V	69	59.78	9.22
4	#5470.00	47.0 AV	54.0	-7.0	1.06 V	69	37.78	9.22
5	*5500.00	108.6 PK			1.06 V	69	99.27	9.33
6	*5500.00	98.0 AV			1.06 V	69	88.67	9.33
7	11000.00	54.9 PK	74.0	-19.1	1.11 V	253	37.95	16.95
8	11000.00	44.7 AV	54.0	-9.3	1.11 V	253	27.75	16.95
9	#16500.00	58.9 PK	74.0	-15.1	1.32 V	299	35.86	23.04
10	#16500.00	47.1 AV	54.0	-6.9	1.32 V	299	24.06	23.04

**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.
6. " # ": The radiated frequency is out of the restricted band.





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<b>CHANNEL</b>	TX Channel 116	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5580.00	112.6 PK			1.24 H	280	103.13	9.47
2	*5580.00	102.9 AV			1.24 H	280	93.43	9.47
3	11160.00	55.9 PK	74.0	-18.1	1.00 H	292	39.69	16.21
4	11160.00	46.3 AV	54.0	-7.7	1.00 H	292	30.09	16.21
5	#16740.00	59.2 PK	74.0	-14.8	1.00 H	299	35.52	23.68
6	#16740.00	46.8 AV	54.0	-7.2	1.00 H	299	23.12	23.68

**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	*5580.00	107.2 PK			1.00 V	47	97.73	9.47
2	*5580.00	97.6 AV			1.00 V	47	88.13	9.47
3	11160.00	54.6 PK	74.0	-19.4	1.08 V	240	38.39	16.21
4	11160.00	44.7 AV	54.0	-9.3	1.08 V	240	28.49	16.21
5	#16740.00	58.7 PK	74.0	-15.3	1.33 V	283	35.02	23.68
6	#16740.00	47.0 AV	54.0	-7.0	1.33 V	283	23.32	23.68

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 132	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5660.00	113.2 PK			1.24 H	270	103.47	9.73
2	*5660.00	103.4 AV			1.24 H	270	93.67	9.73
3	11320.00	55.8 PK	74.0	-18.2	1.00 H	308	38.88	16.92
4	11320.00	46.1 AV	54.0	-7.9	1.00 H	308	29.18	16.92
5	#16980.00	59.2 PK	74.0	-14.8	1.00 H	282	35.00	24.20
6	#16980.00	46.8 AV	54.0	-7.2	1.00 H	282	22.60	24.20

**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	*5660.00	108.1 PK			1.05 V	38	98.37	9.73
2	*5660.00	98.1 AV			1.05 V	38	88.37	9.73
3	11320.00	54.7 PK	74.0	-19.3	1.13 V	253	37.78	16.92
4	11320.00	44.6 AV	54.0	-9.4	1.13 V	253	27.68	16.92
5	#16980.00	58.7 PK	74.0	-15.3	1.28 V	306	34.50	24.20
6	#16980.00	46.8 AV	54.0	-7.2	1.28 V	306	22.60	24.20

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 140	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5700.00	110.4 PK			1.40 H	94	100.52	9.88
2	*5700.00	100.8 AV			1.40 H	94	90.92	9.88
3	#5725.00	71.0 PK	74.0	-3.0	1.40 H	94	61.09	9.91
4	#5725.00	52.1 AV	54.0	-1.9	1.40 H	94	42.19	9.91
5	11400.00	56.5 PK	74.0	-17.5	1.00 H	298	39.75	16.75
6	11400.00	46.8 AV	54.0	-7.2	1.00 H	298	30.05	16.75
7	#17100.00	58.8 PK	74.0	-15.2	1.00 H	265	33.74	25.06
8	#17100.00	46.5 AV	54.0	-7.5	1.00 H	265	21.44	25.06

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	105.4 PK			1.04 V	58	95.52	9.88
2	*5700.00	95.1 AV			1.04 V	58	85.22	9.88
3	#5725.00	68.3 PK	74.0	-5.7	1.04 V	58	58.39	9.91
4	#5725.00	47.5 AV	54.0	-6.5	1.04 V	58	37.59	9.91
5	11400.00	54.8 PK	74.0	-19.2	1.10 V	249	38.05	16.75
6	11400.00	44.3 AV	54.0	-9.7	1.10 V	249	27.55	16.75
7	#17100.00	58.7 PK	74.0	-15.3	1.38 V	300	33.64	25.06
8	#17100.00	47.0 AV	54.0	-7.0	1.38 V	300	21.94	25.06

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.



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### 802.11ac (VHT40)

<b>CHANNEL</b>	TX Channel 38	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	70.3 PK	74.0	-3.7	1.22 H	264	62.07	8.23
2	5150.00	53.5 AV	54.0	-0.5	1.22 H	264	45.27	8.23
3	*5190.00	104.0 PK			1.22 H	268	95.76	8.24
4	*5190.00	94.4 AV			1.22 H	268	86.16	8.24
5	#10380.00	56.2 PK	74.0	-17.8	1.00 H	292	41.14	15.06
6	#10380.00	46.4 AV	54.0	-7.6	1.00 H	292	31.34	15.06
7	15570.00	58.8 PK	74.0	-15.2	1.00 H	298	37.94	20.86
8	15570.00	47.0 AV	54.0	-7.0	1.00 H	298	26.14	20.86

#### 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	5150.00	62.4 PK	74.0	-11.6	1.05 V	56	54.17	8.23
2	5150.00	48.4 AV	54.0	-5.6	1.05 V	56	40.17	8.23
3	*5190.00	98.9 PK			1.05 V	56	90.66	8.24
4	*5190.00	89.1 AV			1.05 V	56	80.86	8.24
5	#10380.00	54.8 PK	74.0	-19.2	1.15 V	263	39.74	15.06
6	#10380.00	44.8 AV	54.0	-9.2	1.15 V	263	29.74	15.06
7	15570.00	58.5 PK	74.0	-15.5	1.26 V	296	37.64	20.86
8	15570.00	46.9 AV	54.0	-7.1	1.26 V	296	26.04	20.86

#### 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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 46	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	65.6 PK	74.0	-8.4	1.23 H	286	57.37	8.23
2	5150.00	50.2 AV	54.0	-3.8	1.23 H	286	41.97	8.23
3	*5230.00	110.4 PK			1.23 H	286	102.04	8.36
4	*5230.00	100.1 AV			1.23 H	286	91.74	8.36
5	#10460.00	55.4 PK	74.0	-18.6	1.00 H	295	40.19	15.21
6	#10460.00	45.9 AV	54.0	-8.1	1.00 H	295	30.69	15.21
7	15690.00	59.0 PK	74.0	-15.0	1.09 H	297	38.09	20.91
8	15690.00	46.7 AV	54.0	-7.3	1.09 H	297	25.79	20.91

**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	5150.00	54.9 PK	74.0	-19.1	1.05 V	65	46.67	8.23
2	5150.00	45.6 AV	54.0	-8.4	1.05 V	65	37.37	8.23
3	*5230.00	105.1 PK			1.05 V	65	96.74	8.36
4	*5230.00	94.9 AV			1.05 V	65	86.54	8.36
5	#10460.00	54.9 PK	74.0	-19.1	1.07 V	265	39.69	15.21
6	#10460.00	44.4 AV	54.0	-9.6	1.07 V	265	29.19	15.21
7	15690.00	59.2 PK	74.0	-14.8	1.27 V	313	38.29	20.91
8	15690.00	47.2 AV	54.0	-6.8	1.27 V	313	26.29	20.91

**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
5. " \* ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 54	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5270.00	110.5 PK			1.24 H	286	102.00	8.50
2	*5270.00	100.5 AV			1.24 H	286	92.00	8.50
3	5350.00	68.7 PK	74.0	-5.3	1.24 H	286	59.90	8.80
4	5350.00	52.4 AV	54.0	-1.6	1.24 H	286	43.60	8.80
5	#10540.00	56.4 PK	74.0	-17.6	1.11 H	285	41.07	15.33
6	#10540.00	46.3 AV	54.0	-7.7	1.11 H	285	30.97	15.33
7	15810.00	59.6 PK	74.0	-14.4	1.02 H	318	38.84	20.76
8	15810.00	47.3 AV	54.0	-6.7	1.02 H	318	26.54	20.76

**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	*5270.00	105.1 PK			1.00 V	66	96.60	8.50
2	*5270.00	95.1 AV			1.00 V	66	86.60	8.50
3	5350.00	66.3 PK	74.0	-7.7	1.00 V	66	57.50	8.80
4	5350.00	47.7 AV	54.0	-6.3	1.00 V	66	38.90	8.80
5	#10540.00	55.4 PK	74.0	-18.6	1.15 V	268	40.07	15.33
6	#10540.00	45.1 AV	54.0	-8.9	1.15 V	268	29.77	15.33
7	15810.00	59.5 PK	74.0	-14.5	1.34 V	285	38.74	20.76
8	15810.00	47.6 AV	54.0	-6.4	1.34 V	285	26.84	20.76

**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.
6. " # ": The radiated frequency is out of the restricted band.

<b>CHANNEL</b>	TX Channel 62	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5310.00	104.7 PK			1.49 H	287	96.05	8.65
2	*5310.00	94.5 AV			1.49 H	287	85.85	8.65
3	5350.00	65.1 PK	74.0	-8.9	1.49 H	287	56.30	8.80
4	5350.00	51.9 AV	54.0	-2.1	1.49 H	287	43.10	8.80
5	10620.00	55.9 PK	74.0	-18.1	1.16 H	285	40.37	15.53
6	10620.00	45.8 AV	54.0	-8.2	1.16 H	285	30.27	15.53
7	15930.00	60.1 PK	74.0	-13.9	1.00 H	306	39.03	21.07
8	15930.00	47.2 AV	54.0	-6.8	1.00 H	306	26.13	21.07

**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	*5310.00	98.2 PK			1.00 V	49	89.55	8.65
2	*5310.00	89.1 AV			1.00 V	49	80.45	8.65
3	5350.00	62.1 PK	74.0	-11.9	1.00 V	49	53.30	8.80
4	5350.00	47.0 AV	54.0	-7.0	1.00 V	49	38.20	8.80
5	10620.00	55.2 PK	74.0	-18.8	1.11 V	246	39.67	15.53
6	10620.00	45.2 AV	54.0	-8.8	1.11 V	246	29.67	15.53
7	15930.00	58.3 PK	74.0	-15.7	1.27 V	301	37.23	21.07
8	15930.00	46.7 AV	54.0	-7.3	1.27 V	301	25.63	21.07

**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.



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<b>CHANNEL</b>	TX Channel 102	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	60.3 PK	74.0	-13.7	1.43 H	90	51.11	9.19
2	5460.00	47.4 AV	54.0	-6.6	1.43 H	90	38.21	9.19
3	#5470.00	68.1 PK	74.0	-5.9	1.43 H	90	58.88	9.22
4	#5470.00	53.5 AV	54.0	-0.5	1.43 H	90	44.28	9.22
5	*5510.00	106.8 PK			1.43 H	90	97.45	9.35
6	*5510.00	96.6 AV			1.43 H	90	87.25	9.35
7	11020.00	56.0 PK	74.0	-18.0	1.12 H	293	39.19	16.81
8	11020.00	45.7 AV	54.0	-8.3	1.12 H	293	28.89	16.81
9	#16530.00	59.1 PK	74.0	-14.9	1.00 H	298	35.94	23.16
10	#16530.00	46.6 AV	54.0	-7.4	1.00 H	298	23.44	23.16

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	56.8 PK	74.0	-17.2	1.00 V	58	47.61	9.19
2	5460.00	42.0 AV	54.0	-12.0	1.00 V	58	32.81	9.19
3	#5470.00	65.3 PK	74.0	-8.7	1.00 V	58	56.08	9.22
4	#5470.00	48.7 AV	54.0	-5.3	1.00 V	58	39.48	9.22
5	*5510.00	101.8 PK			1.00 V	58	92.45	9.35
6	*5510.00	91.4 AV			1.00 V	58	82.05	9.35
7	11020.00	55.4 PK	74.0	-18.6	1.10 V	260	38.59	16.81
8	11020.00	45.2 AV	54.0	-8.8	1.10 V	260	28.39	16.81
9	#16530.00	58.4 PK	74.0	-15.6	1.31 V	312	35.24	23.16
10	#16530.00	46.9 AV	54.0	-7.1	1.31 V	312	23.74	23.16

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.





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<b>CHANNEL</b>	TX Channel 110	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	#5470.00	60.1 PK	74.0	-13.9	1.43 H	90	50.88	9.22
2	#5470.00	47.2 AV	54.0	-6.8	1.43 H	90	37.98	9.22
3	*5550.00	110.5 PK			1.43 H	90	101.08	9.42
4	*5550.00	100.3 AV			1.43 H	90	90.88	9.42
5	#5725.00	56.9 PK	74.0	-17.1	1.43 H	90	46.99	9.91
6	#5725.00	44.5 AV	54.0	-9.5	1.43 H	90	34.59	9.91
7	11100.00	56.2 PK	74.0	-17.8	1.12 H	278	39.88	16.32
8	11100.00	46.0 AV	54.0	-8.0	1.12 H	278	29.68	16.32
9	#16650.00	58.9 PK	74.0	-15.1	1.00 H	289	35.45	23.45
10	#16650.00	46.4 AV	54.0	-7.6	1.00 H	289	22.95	23.45

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	56.8 PK	74.0	-17.2	1.02 V	45	47.58	9.22
2	#5470.00	41.9 AV	54.0	-12.1	1.02 V	45	32.68	9.22
3	*5550.00	105.2 PK			1.02 V	45	95.78	9.42
4	*5550.00	94.6 AV			1.02 V	45	85.18	9.42
5	#5725.00	54.4 PK	74.0	-19.6	1.02 V	45	44.49	9.91
6	#5725.00	39.8 AV	54.0	-14.2	1.02 V	45	29.89	9.91
7	11100.00	54.8 PK	74.0	-19.2	1.12 V	238	38.48	16.32
8	11100.00	44.3 AV	54.0	-9.7	1.12 V	238	27.98	16.32
9	#16650.00	59.0 PK	74.0	-15.0	1.34 V	296	35.55	23.45
10	#16650.00	46.9 AV	54.0	-7.1	1.34 V	296	23.45	23.45

**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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 134	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	*5670.00	109.3 PK			1.38 H	95	99.53	9.77
2	*5670.00	99.1 AV			1.38 H	95	89.33	9.77
3	#5725.00	65.3 PK	74.0	-8.7	1.38 H	95	55.39	9.91
4	#5725.00	51.6 AV	54.0	-2.4	1.38 H	95	41.69	9.91
5	11340.00	56.7 PK	74.0	-17.3	1.09 H	277	39.82	16.88
6	11340.00	46.4 AV	54.0	-7.6	1.09 H	277	29.52	16.88
7	#17010.00	58.9 PK	74.0	-15.1	1.04 H	293	34.65	24.25
8	#17010.00	46.4 AV	54.0	-7.6	1.04 H	293	22.15	24.25

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	*5670.00	104.2 PK			1.02 V	46	94.43	9.77
2	*5670.00	93.8 AV			1.02 V	46	84.03	9.77
3	#5725.00	62.4 PK	74.0	-11.6	1.02 V	46	52.49	9.91
4	#5725.00	46.8 AV	54.0	-7.2	1.02 V	46	36.89	9.91
5	11340.00	54.7 PK	74.0	-19.3	1.14 V	242	37.82	16.88
6	11340.00	44.3 AV	54.0	-9.7	1.14 V	242	27.42	16.88
7	#17010.00	59.7 PK	74.0	-14.3	1.34 V	310	35.45	24.25
8	#17010.00	47.3 AV	54.0	-6.7	1.34 V	310	23.05	24.25

**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.
6. " # ": The radiated frequency is out of the restricted band.



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802.11ac (VHT80)

<b>CHANNEL</b>	TX Channel 42	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	66.8 PK	74.0	-7.2	1.24 H	264	58.57	8.23
2	5150.00	53.0 AV	54.0	-1.0	1.24 H	264	44.77	8.23
3	*5210.00	101.6 PK			1.24 H	264	93.33	8.27
4	*5210.00	91.6 AV			1.24 H	264	83.33	8.27
5	#10420.00	56.3 PK	74.0	-17.7	1.10 H	280	41.09	15.21
6	#10420.00	46.1 AV	54.0	-7.9	1.10 H	280	30.89	15.21
7	15630.00	59.4 PK	74.0	-14.6	1.02 H	313	38.51	20.89
8	15630.00	47.1 AV	54.0	-6.9	1.02 H	313	26.21	20.89

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.9 PK	74.0	-12.1	1.02 V	7	53.67	8.23
2	5150.00	48.4 AV	54.0	-5.6	1.02 V	7	40.17	8.23
3	*5210.00	106.2 PK			1.00 V	44	97.93	8.27
4	*5210.00	86.4 AV			1.00 V	44	78.13	8.27
5	#10420.00	54.4 PK	74.0	-19.6	1.16 V	240	39.19	15.21
6	#10420.00	43.9 AV	54.0	-10.1	1.16 V	240	28.69	15.21
7	15630.00	59.3 PK	74.0	-14.7	1.39 V	311	38.41	20.89
8	15630.00	47.2 AV	54.0	-6.8	1.39 V	311	26.31	20.89

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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 58	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	5150.00	56.2 PK	74.0	-17.8	1.22 H	286	47.97	8.23
2	5150.00	42.6 AV	54.0	-11.4	1.22 H	286	34.37	8.23
3	*5290.00	111.2 PK			1.22 H	286	102.61	8.59
4	*5290.00	91.1 AV			1.22 H	286	82.51	8.59
5	5350.00	65.8 PK	74.0	-8.2	1.22 H	286	57.00	8.80
6	5350.00	51.5 AV	54.0	-2.5	1.22 H	286	42.70	8.80
7	#10580.00	56.5 PK	74.0	-17.5	1.00 H	272	41.04	15.46
8	#10580.00	46.4 AV	54.0	-7.6	1.00 H	272	30.94	15.46
9	15870.00	58.9 PK	74.0	-15.1	1.00 H	322	37.79	21.11
10	15870.00	46.2 AV	54.0	-7.8	1.00 H	322	25.09	21.11

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.3 PK	74.0	-20.7	1.04 V	17	45.07	8.23
2	5150.00	37.7 AV	54.0	-16.3	1.04 V	17	29.47	8.23
3	*5290.00	106.1 PK			1.04 V	17	97.51	8.59
4	*5290.00	85.9 AV			1.04 V	17	77.31	8.59
5	5350.00	63.0 PK	74.0	-11.0	1.04 V	17	54.20	8.80
6	5350.00	46.7 AV	54.0	-7.3	1.04 V	17	37.90	8.80
7	#10580.00	54.5 PK	74.0	-19.5	1.17 V	245	39.04	15.46
8	#10580.00	43.9 AV	54.0	-10.1	1.17 V	245	28.44	15.46
9	15870.00	58.8 PK	74.0	-15.2	1.38 V	289	37.69	21.11
10	15870.00	46.9 AV	54.0	-7.1	1.38 V	289	25.79	21.11

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.



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<b>CHANNEL</b>	TX Channel 106	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	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	#5470.00	64.2 PK	74.0	-9.8	1.26 H	280	54.98	9.22
2	#5470.00	52.3 AV	54.0	-1.7	1.26 H	280	43.08	9.22
3	*5530.00	102.8 PK			1.26 H	280	93.41	9.39
4	*5530.00	92.7 AV			1.26 H	280	83.31	9.39
5	#5725.00	57.9 PK	74.0	-16.1	1.26 H	280	47.99	9.91
6	#5725.00	45.0 AV	54.0	-9.0	1.26 H	280	35.09	9.91
7	11060.00	56.0 PK	74.0	-18.0	1.07 H	291	39.43	16.57
8	11060.00	46.0 AV	54.0	-8.0	1.07 H	291	29.43	16.57
9	#16590.00	60.2 PK	74.0	-13.8	1.00 H	302	36.79	23.41
10	#16590.00	47.4 AV	54.0	-6.6	1.00 H	302	23.99	23.41

**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	#5470.00	61.1 PK	74.0	-12.9	1.00 V	60	51.88	9.22
2	#5470.00	47.4 AV	54.0	-6.6	1.00 V	60	38.18	9.22
3	*5530.00	97.2 PK			1.00 V	60	87.81	9.39
4	*5530.00	87.2 AV			1.00 V	60	77.81	9.39
5	#5725.00	54.8 PK	74.0	-19.2	1.00 V	60	44.89	9.91
6	#5725.00	39.8 AV	54.0	-14.2	1.00 V	60	29.89	9.91
7	11060.00	54.1 PK	74.0	-19.9	1.14 V	236	37.53	16.57
8	11060.00	43.9 AV	54.0	-10.1	1.14 V	236	27.33	16.57
9	#16590.00	58.8 PK	74.0	-15.2	1.35 V	304	35.39	23.41
10	#16590.00	46.6 AV	54.0	-7.4	1.35 V	304	23.19	23.41

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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.
6. " # ": The radiated frequency is out of the restricted band.



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### 4.3 TRANSMIT POWER MEASUREMENT

#### 4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.47 – 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

**NOTE:** Where B is the 26dB emission bandwidth in MHz.

#### 4.3.2 TEST INSTRUMENTS

##### FOR POWER OUTPUT MEASUREMENT

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 26dB OCCUPIED BANDWIDTH

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

### 4.3.3 TEST PROCEDURE

#### FOR POWER OUTPUT MEASUREMENT

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.

#### FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

### 4.3.4 DEVIATION FROM TEST STANDARD

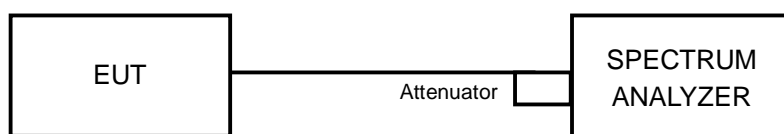
No deviation

### 4.3.5 TEST SETUP

#### FOR POWER OUTPUT MEASUREMENT



#### FOR 26dB OCCUPIED BANDWIDTH



#### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.





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### 4.3.7 TEST RESULTS

#### 802.11a

#### POWER OUTPUT:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	40.832	16.11	17	PASS
40	5200	44.978	16.53	17	PASS
48	5240	44.771	16.51	17	PASS
52	5260	64.714	18.11	24	PASS
60	5300	63.973	18.06	24	PASS
64	5320	52.966	17.24	24	PASS
100	5500	69.823	18.44	24	PASS
116	5580	63.533	18.03	24	PASS
132	5660	63.241	18.01	24	PASS
140	5700	35.156	15.46	24	PASS



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### 26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	27.47
40	5200	27.57
48	5240	25.73
52	5260	34.17
60	5300	34.31
64	5320	25.61
100	5500	34.75
116	5580	34.65
132	5660	34.10
140	5700	24.26

**Note: For output power limitation is determined based on 26dBc bandwidth.**

Power Limit = 4dBm + 10logB < UNII Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	27.47	18.38 > 17
40	5200	27.57	18.4 > 17
48	5240	25.73	18.1 > 17
Power Limit = 11dBm + 10logB < UNII Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	34.17	26.33 > 24
60	5300	34.31	26.35 > 24
64	5320	25.61	25.08 > 24
100	5500	34.75	26.4 > 24
116	5580	34.65	26.39 > 24
132	5660	34.10	26.32 > 24
140	5700	24.26	24.84 > 24



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### 802.11ac (VHT20)

#### POWER OUTPUT:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	43.954	16.43	17	PASS
40	5200	44.771	16.51	17	PASS
48	5240	44.978	16.53	17	PASS
52	5260	69.343	18.41	24	PASS
60	5300	66.527	18.23	24	PASS
64	5320	50.234	17.01	24	PASS
100	5500	63.680	18.04	24	PASS
116	5580	62.230	17.94	24	PASS
132	5660	67.764	18.31	24	PASS
140	5700	26.669	14.26	24	PASS



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**26dB OCCUPIED BANDWIDTH:**

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	36.48
40	5200	28.37
48	5240	26.97
52	5260	42.21
60	5300	40.57
64	5320	25.84
100	5500	34.79
116	5580	36.90
132	5660	37.88
140	5700	22.69

**Note: For output power limitation is determined based on 26dBc bandwidth.**

Power Limit = 4dBm + 10logB < UNII Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
36	5180	36.48	19.62 > 17
40	5200	28.37	18.52 > 17
48	5240	26.97	18.3 > 17
Power Limit = 11dBm + 10logB < UNII Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	42.21	27.25 > 24
60	5300	40.57	27.08 > 24
64	5320	25.84	25.12 > 24
100	5500	34.79	26.41 > 24
116	5580	36.90	26.67 > 24
132	5660	37.88	26.78 > 24
140	5700	22.69	24.55 > 24



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**802.11ac (VHT40)**

**POWER OUTPUT:**

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	21.827	13.39	17	PASS
46	5230	42.560	16.29	17	PASS
54	5270	45.290	16.56	24	PASS
62	5310	28.249	14.51	24	PASS
102	5510	22.439	13.51	24	PASS
110	5550	71.285	18.53	24	PASS
134	5670	35.810	15.54	24	PASS

**26dB OCCUPIED BANDWIDTH:**

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
38	5190	46.41
46	5230	56.31
54	5270	58.97
62	5310	46.42
102	5510	45.96
110	5550	73.96
134	5670	48.39

**Note: For output power limitation is determined based on 26dBc bandwidth.**

Power Limit = 4dBm + 10logB < UNII Band 1>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
38	5190	46.41	20.66 > 17
46	5230	56.31	21.5 > 17
Power Limit = 11dBm + 10logB < UNII Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	58.97	28.7 > 24
62	5310	46.42	27.66 > 24
102	5510	45.96	27.62 > 24
110	5550	73.96	29.68 > 24
134	5670	48.39	27.84 > 24



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### 802.11ac (VHT80)

#### POWER OUTPUT:

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
42	5210	16.482	12.17	17	PASS
58	5290	13.772	11.39	24	PASS
106	5530	20.701	13.16	24	PASS

#### 26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
42	5210	87.15
58	5290	87.20
106	5530	87.43

**Note: For output power limitation is determined based on 26dBc bandwidth.**

Power Limit = $4\text{dBm} + 10\log B$ < UNII Band 1 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
42	5210	87.15	23.4 > 17
Power Limit = $11\text{dBm} + 10\log B$ < UNII Band 2~3 >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	87.20	30.4 > 24
106	5530	87.43	30.41 > 24



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#### 4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

##### 4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	4dBm
5.25 ~ 5.35GHz	11dBm
5.47 ~ 5.725GHz	11dBm
5.725 ~ 5.825GHz	17dBm

##### 4.4.2 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

##### 4.4.3 TEST PROCEDURES

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW  $\geq$  3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

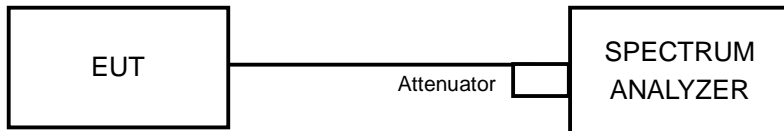
##### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation



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#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6





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#### 4.4.7 TEST RESULTS

##### 802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	2.54	4	PASS
40	5200	3.20	4	PASS
48	5240	2.89	4	PASS
52	5260	4.35	11	PASS
60	5300	4.79	11	PASS
64	5320	3.23	11	PASS
100	5500	4.76	11	PASS
116	5580	4.65	11	PASS
132	5660	3.66	11	PASS
140	5700	1.91	11	PASS

##### 802.11ac (VHT20)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	2.80	4	PASS
40	5200	2.69	4	PASS
48	5240	3.01	4	PASS
52	5260	4.01	11	PASS
60	5300	4.06	11	PASS
64	5320	2.82	11	PASS
100	5500	3.96	11	PASS
116	5580	4.14	11	PASS
132	5660	4.07	11	PASS
140	5700	-0.01	11	PASS



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### 802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
38	5190	-3.87	4	PASS
46	5230	-0.25	4	PASS
54	5270	-0.03	11	PASS
62	5310	-3.07	11	PASS
102	5510	-3.90	11	PASS
110	5550	1.27	11	PASS
134	5670	-1.88	11	PASS

### 802.11ac (VHT80)

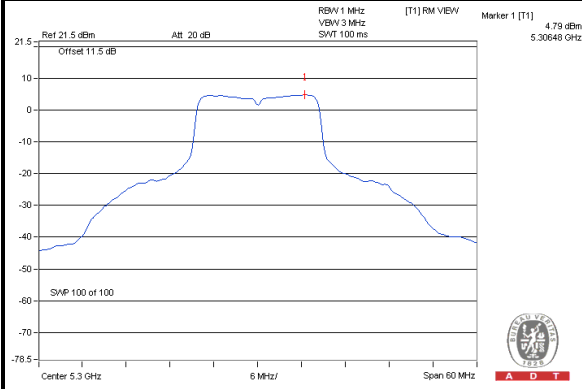
CHANNEL	FREQUENCY (MHz)	PSD (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
42	5210	-6.84	4	PASS
58	5290	-7.64	11	PASS
106	5530	-5.64	11	PASS



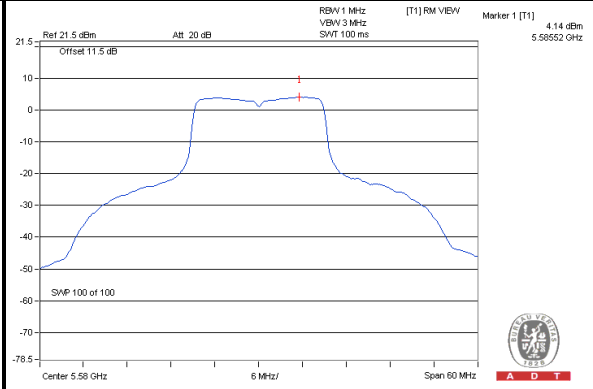
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### SPECTRUM PLOT OF WORST VALUE

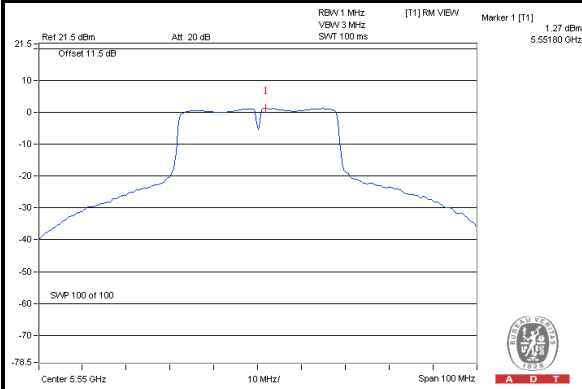
#### 802.11a / CH60



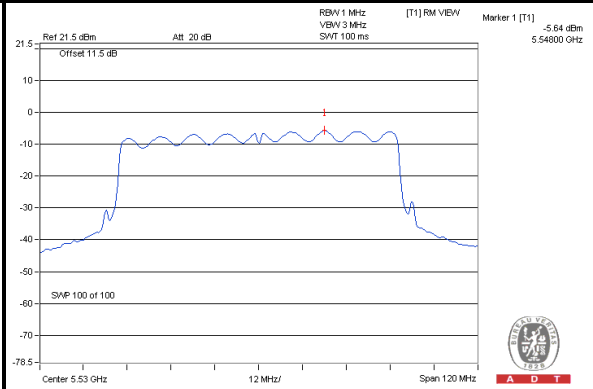
#### 802.11ac (VHT20) / CH116



#### 802.11ac (VHT40) / CH110



#### 802.11ac (VHT80) / CH106



## 4.5 PEAK POWER EXCURSION MEASUREMENT

### 4.5.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Shall not exceed 13 dB

### 4.5.2 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

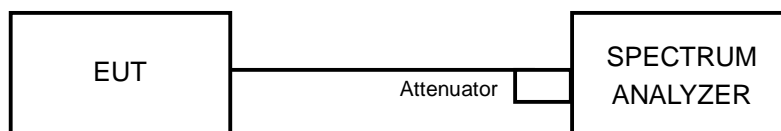
### 4.5.3 TEST PROCEDURE

1. Set RBW = 1 MHz, VBW  $\geq$  3 MHz, Detector = peak.
2. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak search function to find the peak of the spectrum.
4. Measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.5.5 TEST SETUP



### 4.5.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

#### 4.5.7 TEST RESULTS

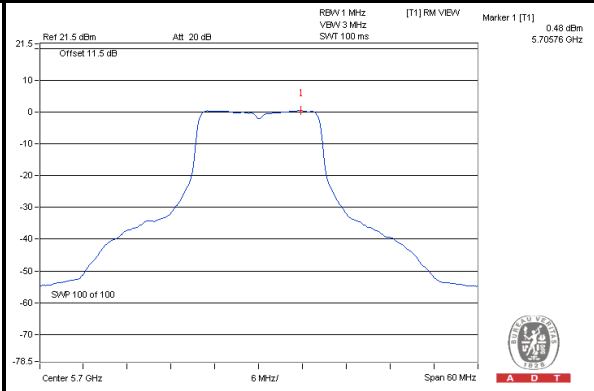
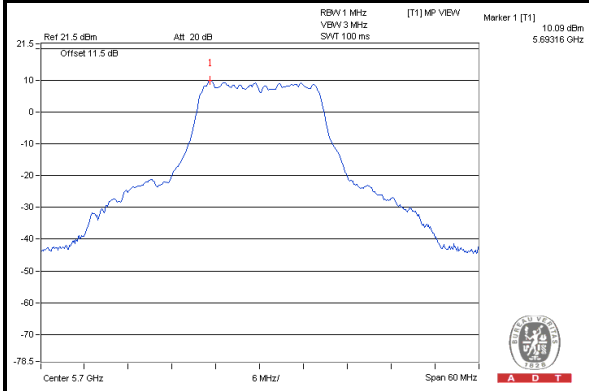
MODULATION MODE	MODULATION TYPE	CHANNEL FREQUENCY (MHz)	PEAK VALUE (dBm)	PPSD (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS/ FAIL
802.11a	BPSK	5700	9.25	1.91	7.34	13	PASS
	QPSK		10.14	1.09	9.05	13	PASS
	16QAM		8.82	0.21	8.61	13	PASS
	64QAM		10.09	0.48	9.61	13	PASS
802.11ac (VHT20)	BPSK	5700	7.52	-0.01	7.53	13	PASS
	QPSK		8.18	-0.42	8.6	13	PASS
	16QAM		6.54	-0.77	7.31	13	PASS
	64QAM		8.41	-0.73	9.14	13	PASS
	256QAM		9.05	-0.87	9.92	13	PASS
802.11ac (VHT40)	BPSK	5670	6.17	-1.88	8.05	13	PASS
	QPSK		6.47	-2.37	8.84	13	PASS
	16QAM		6.21	-2.69	8.9	13	PASS
	64QAM		6.3	-2.57	8.87	13	PASS
	256QAM		6.28	-3.33	9.61	13	PASS
802.11ac (VHT80)	BPSK	5530	2.59	-5.64	8.23	13	PASS
	QPSK		1.81	-6.76	8.57	13	PASS
	16QAM		1.57	-7.05	8.62	13	PASS
	64QAM		-0.33	-8.68	8.35	13	PASS
	256QAM		1.11	-8.35	9.46	13	PASS



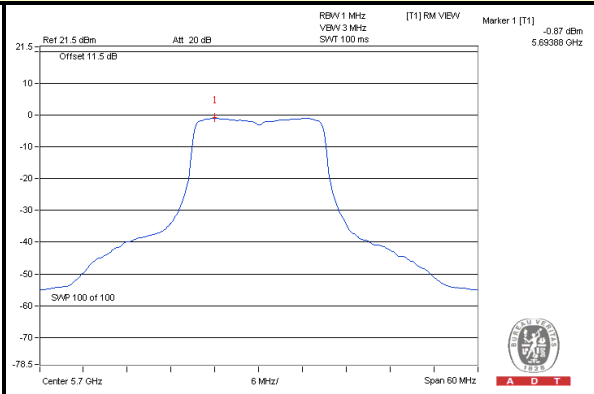
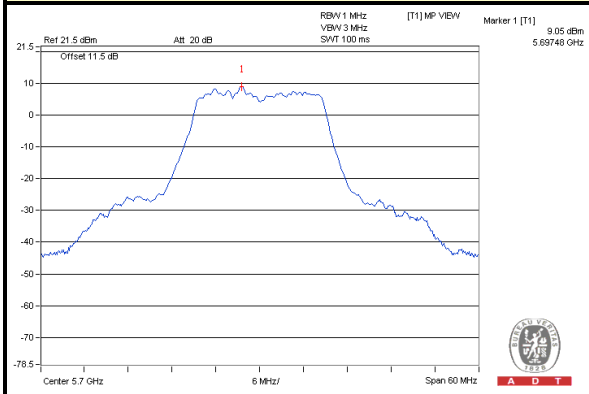
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### SPECTRUM PLOT OF WORST VALUE

#### 802.11a / 64QAM



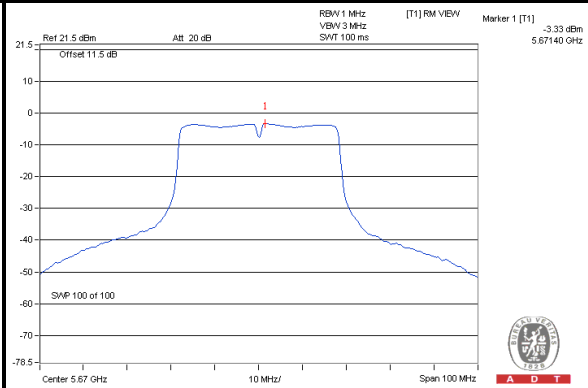
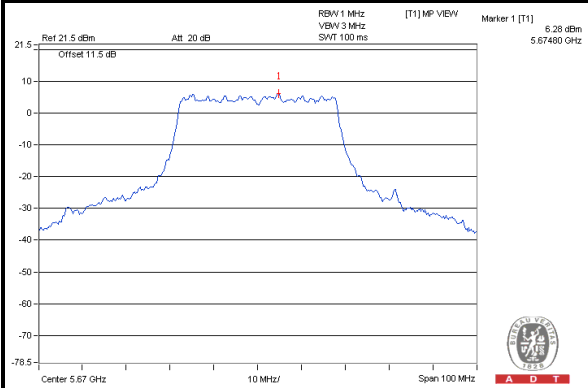
#### 802.11ac (VHT20) / 256QAM



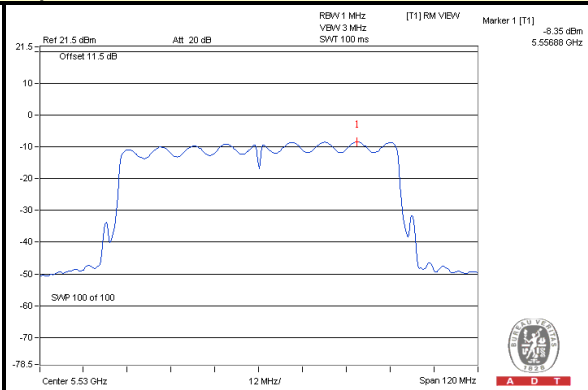
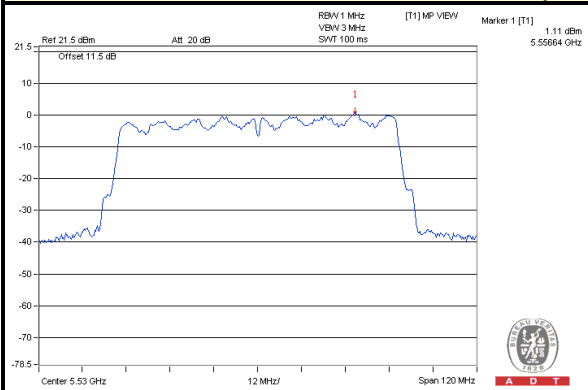


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### 802.11ac (VHT40) / 256QAM



### 802.11ac (VHT80) / 256QAM



## 4.6 FREQUENCY STABILITY

### 4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Jan. 21, 2014	Jan. 20, 2015
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-S P-AR	MAA0812-008	Jan. 13, 2014	Jan. 12, 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

### 4.6.3 TEST PROCEDURE

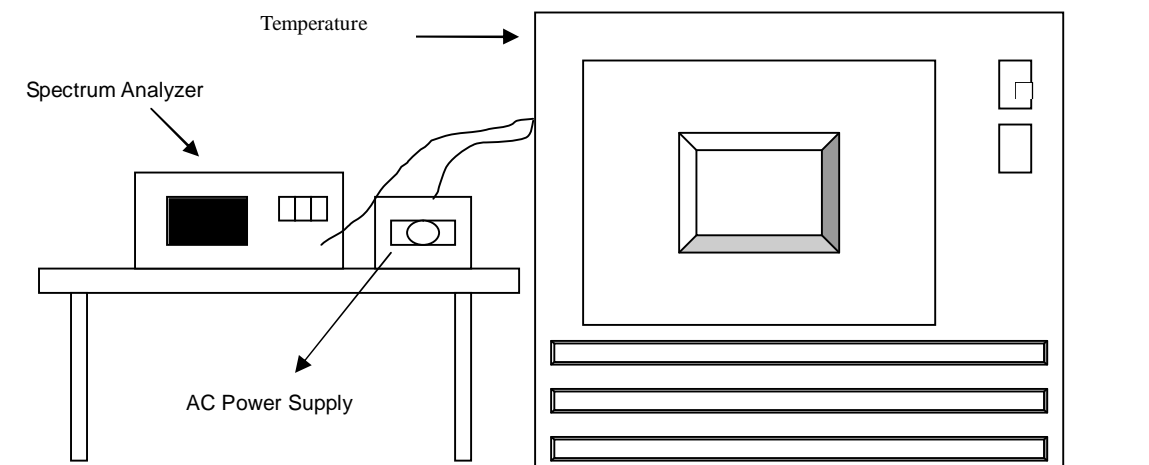
1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.



#### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.6.5 TEST SETUP



#### 4.6.6 EUT OPERATING CONDITION

Set the EUT transmit at un-modulation mode to test frequency stability.



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#### 4.6.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	5319.9876	-0.00023	5319.9844	-0.00029	5319.983	-0.00032	5319.9929	-0.00013
40	120	5319.97	-0.00056	5319.9701	-0.00056	5319.9762	-0.00045	5319.9796	-0.00038
30	120	5320.0169	0.00032	5320.0135	0.00025	5320.0164	0.00031	5320.015	0.00028
20	120	5320.0269	0.00051	5320.0217	0.00041	5320.0308	0.00058	5320.0224	0.00042
10	120	5319.9877	-0.00023	5319.9906	-0.00018	5319.9877	-0.00023	5319.9851	-0.00028
0	120	5320.014	0.00026	5320.0072	0.00014	5320.0096	0.00018	5320.0083	0.00016
-10	120	5319.994	-0.00011	5319.9953	-0.00009	5319.995	-0.00009	5319.9906	-0.00018
-20	120	5319.9925	-0.00014	5319.9934	-0.00012	5319.9932	-0.00013	5320.0015	0.00003
-30	120	5319.973	-0.00051	5319.9701	-0.00056	5319.9781	-0.00041	5319.9744	-0.00048

FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	5320.0279	0.00052	5320.0228	0.00043	5320.0304	0.00057	5320.022	0.00041
	120	5320.0269	0.00051	5320.0217	0.00041	5320.0308	0.00058	5320.0224	0.00042
	102	5320.0262	0.00049	5320.0224	0.00042	5320.0299	0.00056	5320.023	0.00043



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## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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





## 6. INFORMATION ON THE TESTING LABORATORIES

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

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

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



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## **7. 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 ---**