



FCC TEST REPORT (15.407)

REPORT NO.: RF140718E03-1

MODEL NO.: ECW5320, ECW5320-L, ECW5320-C,
SS-AC1200-US

FCC ID: HEDSSAC1200

RECEIVED: July 18, 2014

TESTED: July 29 to Aug. 19, 2014

ISSUED: Aug. 28, 2014

APPLICANT: Accton Technology Corporation

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140718E03-1	Original release	



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1. CERTIFICATION

PRODUCT: 802.11ac Dual-Band Wireless Access Point,
Dualband Ceiling/Wall/Desktop Enterprise AP (802.11ac)

BRAND NAME: Edge-corE, IgniteNet

MODEL NO.: ECW5320, ECW5320-L, ECW5320-C, SS-AC1200-US

TEST SAMPLE: ENGINEERING SAMPLE

APPLICANT: Accton Technology Corporation

TESTED: July 29 to Aug. 19, 2014

STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.10-2009

The above equipment (Model: SS-AC1200-US) 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 : Midoli Peng , **DATE:** Aug. 28, 2014
(Midoli Peng, Specialist)

APPROVED BY : May Chen , **DATE:** Aug. 28, 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 -7.94dB at 17.09766MHz
15.407 (b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5715.00MHz, 5150.00MHz, 11650.00MHz, 10480.00MHz, 11490.00MHz, 11570.00MHz & 11650.00MHz.
15.407(a/1/2/3)	Transmit Power	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is MMCS not a standard connector.

NOTE: 1. The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.25GHz and 5.725~5.850GHz. For the 2.400 ~ 2.4835GHz RF parameters was recorded in another test report.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.43 dB
Radiated emissions (1GHz -6GHz)	3.72 dB
Radiated emissions (6GHz -18GHz)	4.00 dB
Radiated emissions (18GHz -40GHz)	4.11 dB



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11ac Dual-Band Wireless Access Point, Dualband Ceiling/Wall/Desktop Enterprise AP (802.11ac)
MODEL NO.	ECW5320, ECW5320-L, ECW5320-C, SS-AC1200-US
POWER SUPPLY	DC 12V from Adapter or DC 48V from PoE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n : up to 300Mbps 802.11ac: up to 866.7Mbps
OPERATING FREQUENCY	For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
NUMBER OF CHANNEL	For 15.407 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
MAXIMUM OUTPUT POWER	For 15.407 802.11a: 312.608mW 802.11ac (VHT20): 381.551mW 802.11ac (VHT40): 630.536mW 802.11ac (VHT80): 166.267mW For 15.247 802.11b: 416.869mW 802.11g: 519.996mW 802.11n (HT20): 982.948mW 802.11n (HT40): 363.576mW
ANTENNA TYPE	Please see NOTE



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DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x1

Note:

- 2.4GHz and 5GHz technology can transmit at same time.
- The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
- The EUT has two brand names, two product names and four model names, which are identical to each other in all aspects except for the following:

Brand	Product Name	Model Name	Software
Edge-corE	802.11ac Dual-Band Wireless Access Point	ECW5320	Fat
		ECW5320-L	Fit
		ECW5320-C	Fit
IgniteNet	Dualband Ceiling/Wall/Desktop Enterprise AP (802.11ac)	SS-AC1200-US	Fat

From the above models, model: **SS-AC1200-US** was selected as representative model for the test and its data were recorded in this report.

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

For 2.4G WLAN used						
Set	Transmitter Circuit	Antenna Gain(dBi) <including cable loss>	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain (0)	3.16	2400~2500	PCB Dipole	IPEX	255 (Gray)
	Chain (1)	4.04				150 (Blue)
For 5G WLAN used						
Set	Transmitter Circuit	Antenna Gain(dBi) <including cable loss>	Frequency range (MHz ~ MHz)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain (0)	5.07	5150~5850	PCB Dipole	MMCS	65 (White)
	Chain (1)	3.97				140 (Black)

- The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
APD	WA-24Q12FU	Input: 100-240V, 0.6A, 50-60Hz Output: 12V, 2A DC power cable: 1.83m, unshielded



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6. The EUT incorporates a MIMO function without beamforming.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1TX (Diversity)	2RX
802.11b	1 ~ 11Mbps	1TX (Diversity)	2RX
802.11g	6 ~ 54Mbps	1TX (Diversity)	2RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	1TX (Diversity)	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 (256QAM) Nss= 1	1TX (Diversity)	2RX
	MCS0~8 (256QAM) Nss= 2	2TX	2RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 (256QAM) Nss= 1	1TX (Diversity)	2RX
	MCS0~9 (256QAM) Nss= 2	2TX	2RX

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 3.3)

7. Test modes are presented in the report as below.

Pre-test Mode	Power Source
A	With Adapter
B	With PoE (PoE only test not sale)

From the above pre-test modes, the worse spurious emission was found in Mode A. Therefore only the test data of the mode was recorded in this report.

8. 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 ~ 5250MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
42	5210 MHz

Operated in 5725 ~ 5850MHz band:

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

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

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	
1	√	√	√	√	With Adapter
2	√	-	-	-	With PoE

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

NOTE: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **X-plane**(below 1GHz) & **Y-plane**(above 1GHz)

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	MODULATI ON TYPE	DATA RATE (MBPS)
802.11ac (VHT40)	38 to 46 & 151 to 159	46	OFDM	BPSK	13

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	MODULATI ON TYPE	DATA RATE (MBPS)
802.11ac (VHT40)	38 to 46 & 151 to 159	46	OFDM	BPSK	13



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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 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	13
802.11ac (VHT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	27
802.11ac (VHT80)	42 & 155	42, 155	OFDM	BPSK	58.5

ANTENNA PORT CONDUCTED MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATI ON TYPE	DATA RATE (MBPS)
802.11a	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	13
802.11ac (VHT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	27
802.11ac (VHT80)	42 & 155	42, 155	OFDM	BPSK	58.5



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	30deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Tim Ho
RE ³ 1G	22deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

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 E (15.407)

789033 D02 General UNII Test Procedures New Rules v01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

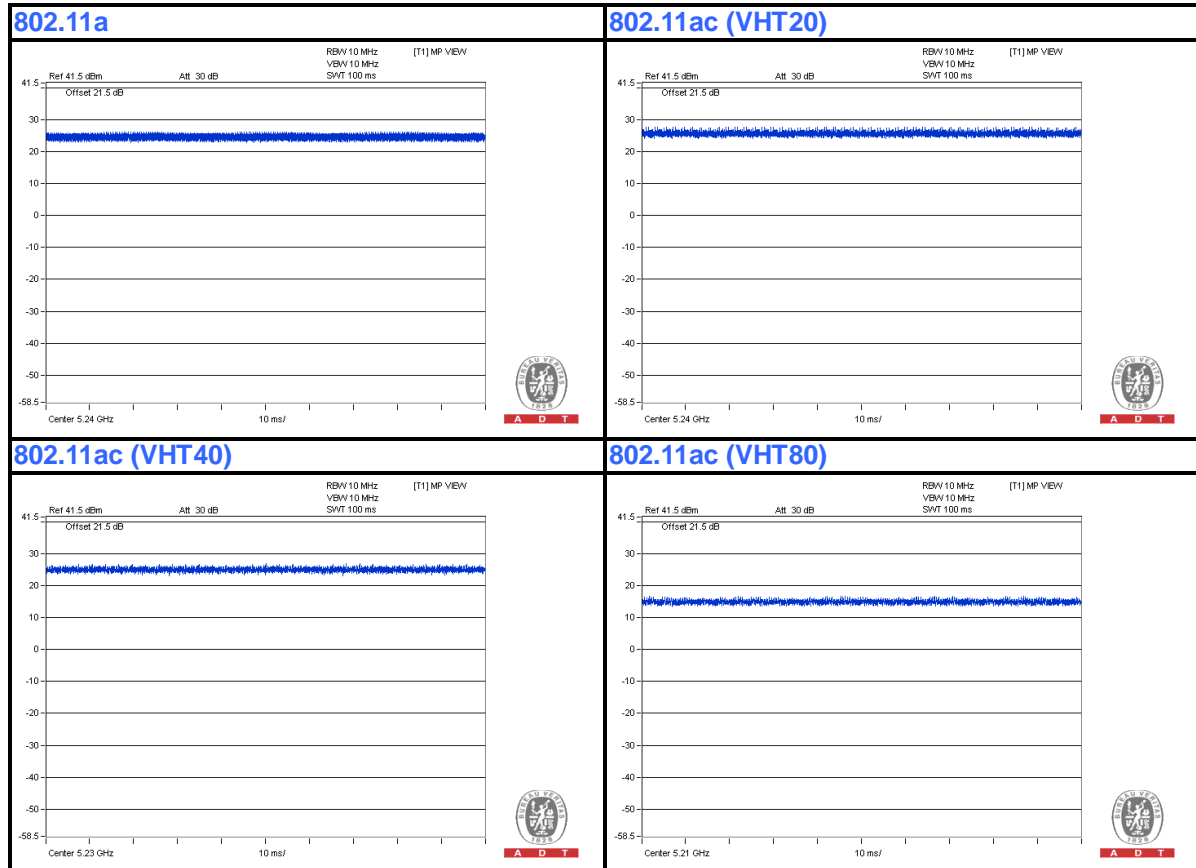
Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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3.4 DUTY CYCLE OF TEST SIGNAL

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





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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	Remark
A	iPod shuffle (For adapter mode)	Apple	MC749TA/A	CC4DN29UDFDM	NA	Provided by Lab
	iPod shuffle (For POE mode)	Apple	MD778TA/A	CC4JMCMXF4T1	NA	Provided by Lab
B	HUB	Linksys	SD208	NA	NA	Provided by Lab
C	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	NA	Provided by Lab
D	NOTEBOOK COMPUTER	DELL	PP32LA	HSLB32S	FCC DoC	Provided by Lab
E	POE	Motorola	PD3501G/AC	C11426552000008 35	FCC DoC	Supplied by client

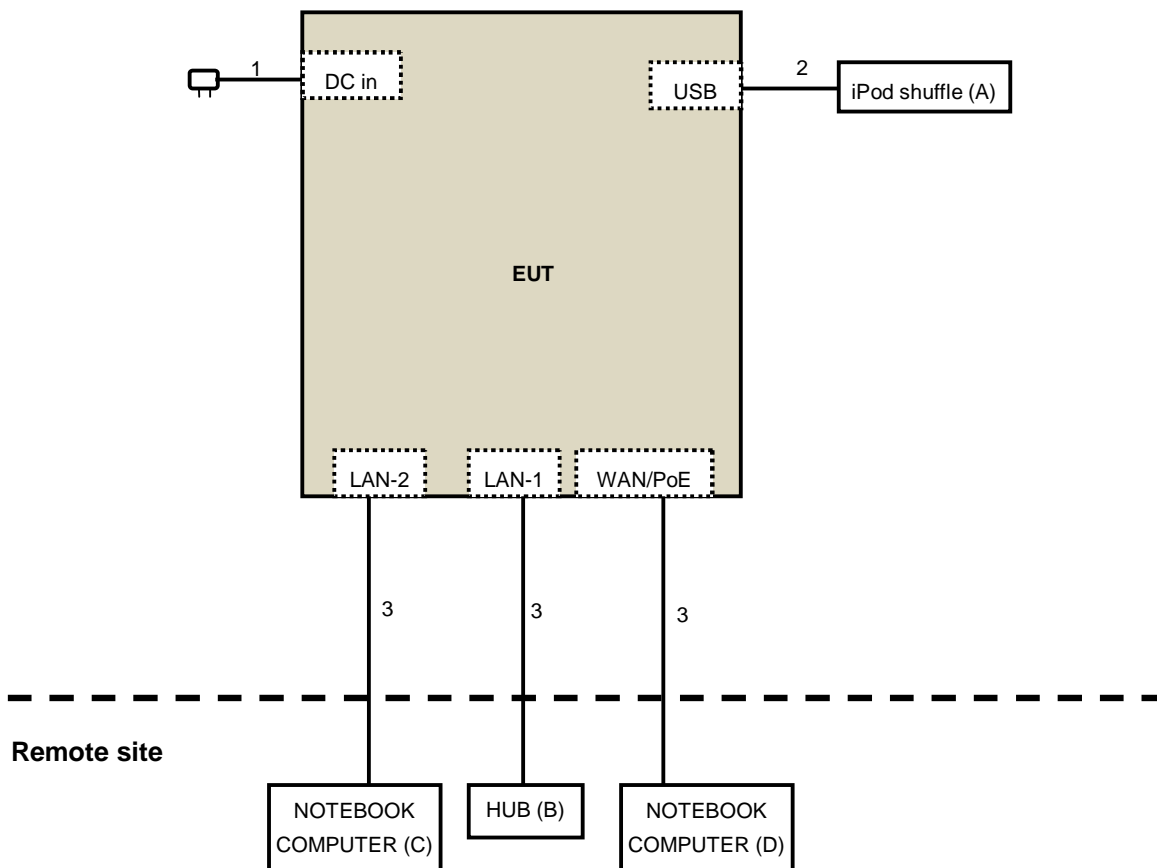
NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1.	DC	1	1.5	No	0	Supplied by client
2.	USB	1	0.1	Yes	0	Provided by Lab
3.	RJ-45	1	10	No	0	Provided by Lab
4.	RJ-45	1	3	No	0	Provided by Lab

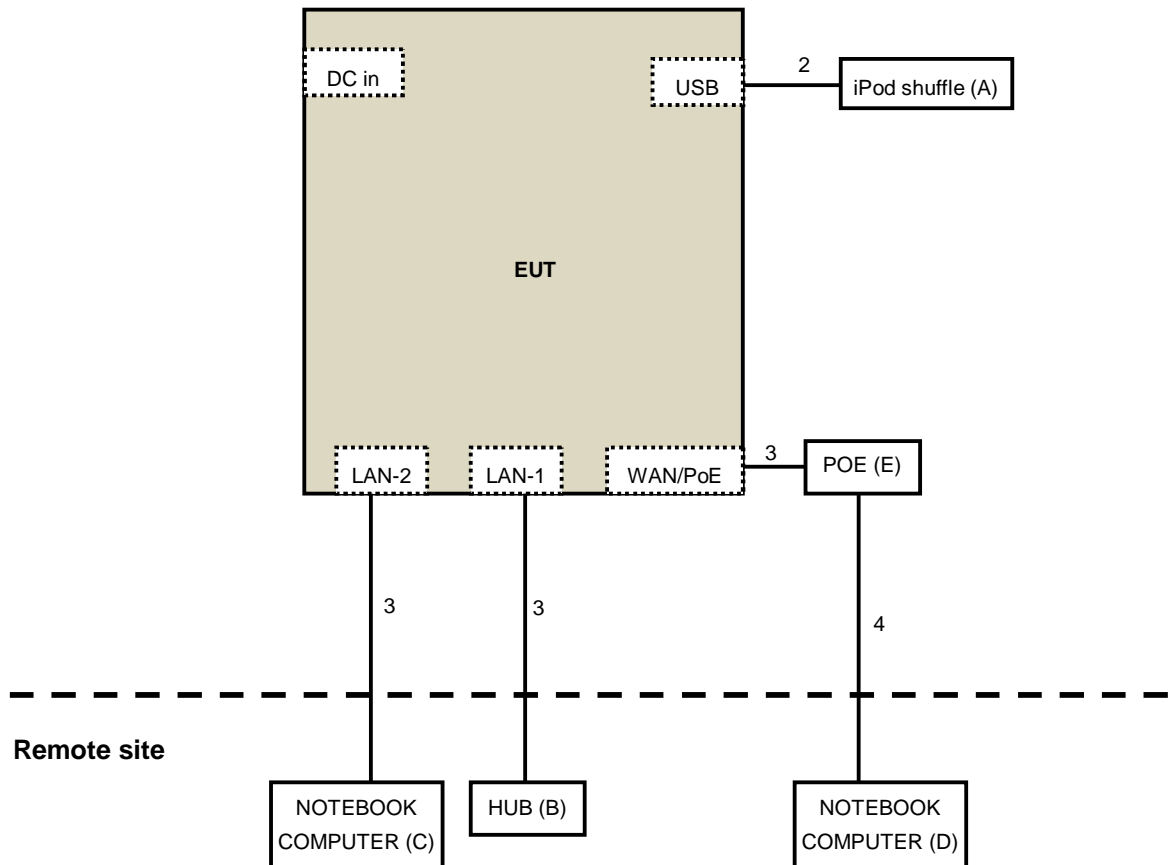
3.6 CONFIGURATION OF SYSTEM UNDER TEST

For Adapter Mode:





For POE Mode:





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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 (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 12, 2013	Sep. 11, 2014
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10, 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 24, 2013	Sep. 23, 2014
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2013	Sep. 30, 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: July 29, 2014

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.

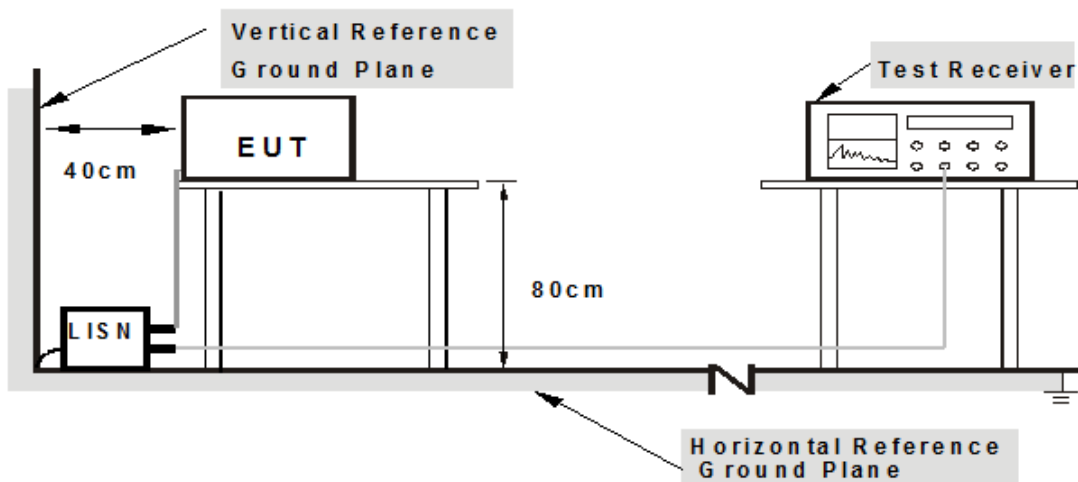
NOTE:

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.

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support units C & D) to act as communication partner.
3. The communication partner ran test program “MP_TEST.exe[Ver 1.3.8.0]” to enable EUT under transmission/receiving condition continuously.

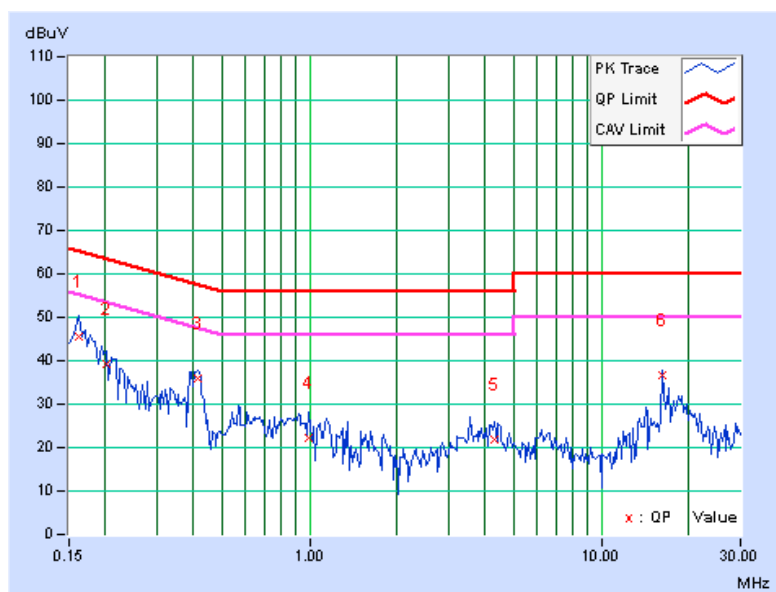
4.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	DETECTOR FUNCTION	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	0.16172	0.07	45.42	33.90	45.49	33.97	65.38	55.38	-19.89	-21.41
2	0.20078	0.07	39.09	26.75	39.16	26.82	63.58	53.58	-24.42	-26.76
3	0.41172	0.09	35.87	27.17	35.96	27.26	57.61	47.61	-21.65	-20.35
4	0.99766	0.13	21.92	14.18	22.05	14.31	56.00	46.00	-33.95	-31.69
5	4.31641	0.27	21.59	12.43	21.86	12.70	56.00	46.00	-34.14	-33.30
6	16.22656	0.62	35.88	30.17	36.50	30.79	60.00	50.00	-23.50	-19.21

REMARKS:

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

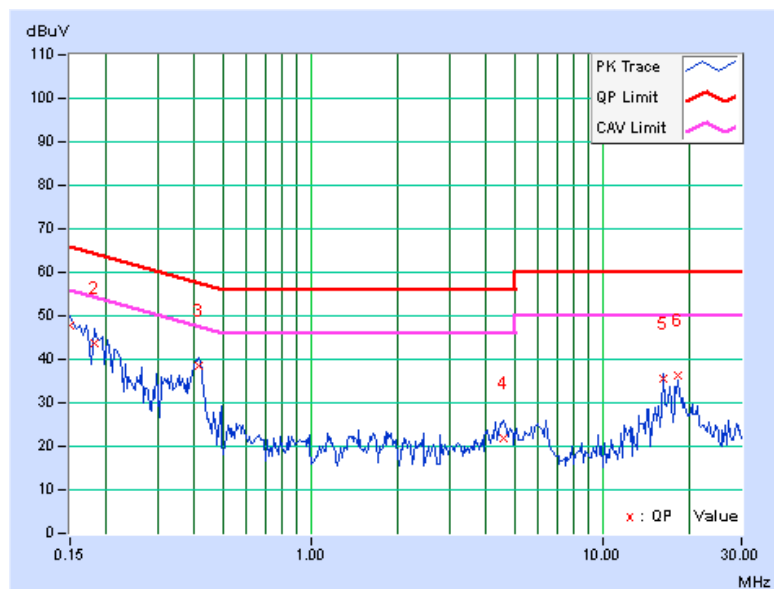


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	47.57	29.41	47.65	29.49	66.00	56.00	-18.35	-26.51
2	0.18125	0.07	43.68	31.32	43.75	31.39	64.43	54.43	-20.68	-23.04
3	0.41172	0.09	38.41	30.48	38.50	30.57	57.61	47.61	-19.11	-17.04
4	4.58203	0.28	21.64	10.35	21.92	10.63	56.00	46.00	-34.08	-35.37
5	16.23047	0.61	34.85	29.21	35.46	29.82	60.00	50.00	-24.54	-20.18
6	18.24219	0.66	35.55	29.12	36.21	29.78	60.00	50.00	-23.79	-20.22

REMARKS:

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



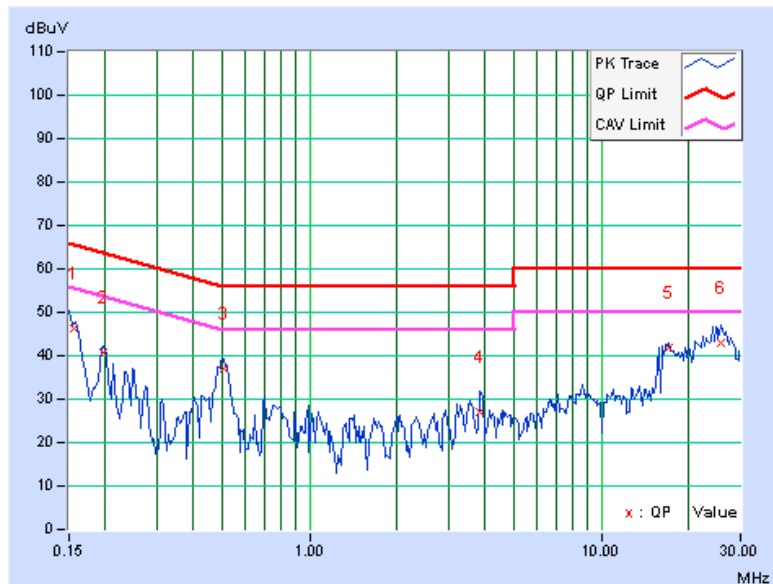
4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15675	0.07	46.30	37.20	46.37	37.27	65.63	55.63	-19.27	-18.37
2	0.19687	0.07	40.58	31.40	40.65	31.47	63.74	53.74	-23.09	-22.27
3	0.50938	0.10	37.06	36.01	37.16	36.11	56.00	46.00	-18.84	-9.89
4	3.85156	0.25	26.66	17.75	26.91	18.00	56.00	46.00	-29.09	-28.00
5	17.09375	0.64	41.12	40.72	41.76	41.36	60.00	50.00	-18.24	-8.64
6	25.77344	0.87	42.17	36.04	43.04	36.91	60.00	50.00	-16.96	-13.09

REMARKS:

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

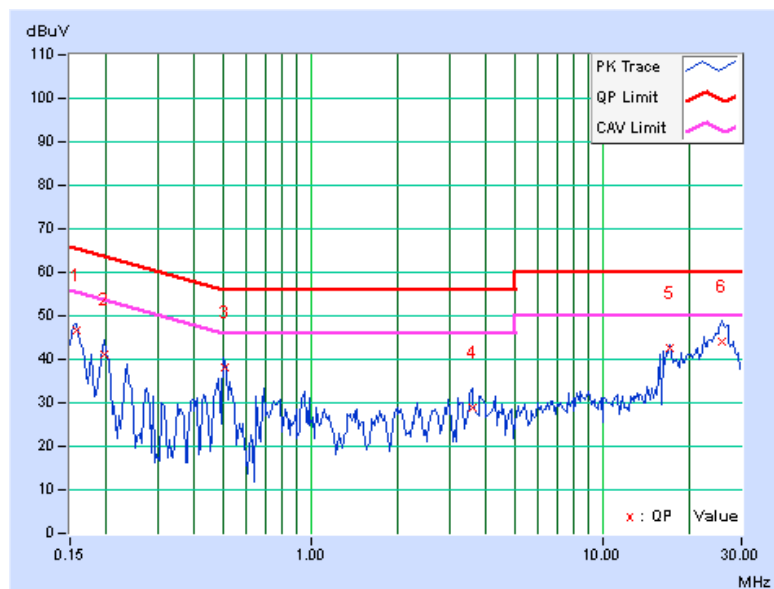


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.07	46.60	37.32	46.67	37.39	65.58	55.58	-18.90	-18.18
2	0.19687	0.07	41.06	32.55	41.13	32.62	63.74	53.74	-22.61	-21.12
3	0.50938	0.10	37.91	36.86	38.01	36.96	56.00	46.00	-17.99	-9.04
4	3.57422	0.24	28.82	22.10	29.06	22.34	56.00	46.00	-26.94	-23.66
5	17.09766	0.63	41.93	41.43	42.56	42.06	60.00	50.00	-17.44	-7.94
6	25.82422	0.86	43.20	37.28	44.06	38.14	60.00	50.00	-15.94	-11.86

REMARKS:

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



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	
789033 D02 General UNII Test Procedures New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBμV/m) ^{*1} PK:78.2 (dBμV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

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

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



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4.2.3 TEST INSTRUMENTS

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

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
- 5 The CANADA Site Registration No. is IC 7450H-3.
- 6 Tested Date: July 30 to Aug. 12, 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:

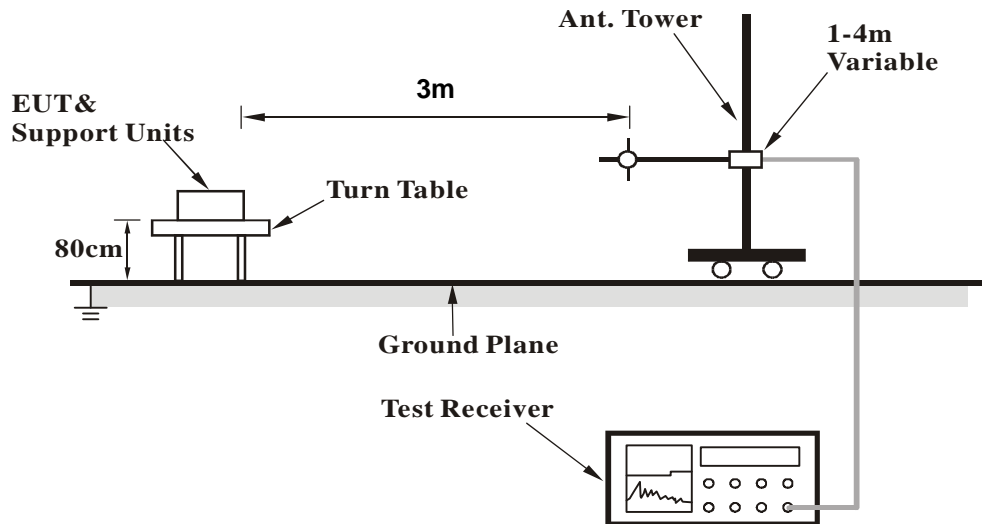
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

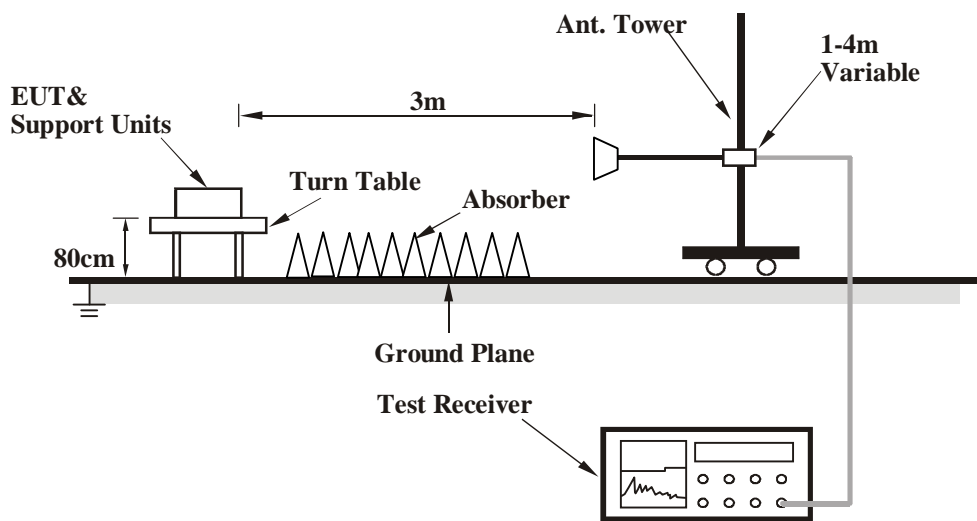
No deviation

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

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11ac (VHT40)

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	250.00	39.9 QP	46.0	-6.1	1.00 H	280	53.54	-13.66
2	375.03	35.0 QP	46.0	-11.1	1.00 H	25	44.86	-9.91
3	500.01	32.7 QP	46.0	-13.3	1.50 H	32	39.65	-6.91
4	625.00	43.9 QP	46.0	-2.2	1.00 H	360	47.93	-4.08
5	749.98	39.9 QP	46.0	-6.1	1.00 H	344	41.54	-1.64
6	1000.00	36.9 QP	54.0	-17.2	1.00 H	292	34.85	2.00

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	51.10	32.2 QP	40.0	-7.9	1.00 V	176	45.12	-12.97
2	250.00	33.2 QP	46.0	-12.8	2.00 V	0	46.86	-13.66
3	375.03	32.7 QP	46.0	-13.4	1.50 V	281	42.56	-9.91
4	625.00	38.4 QP	46.0	-7.6	1.00 V	170	42.44	-4.08
5	749.98	40.5 QP	46.0	-5.6	1.00 V	10	42.09	-1.64
6	1000.00	35.9 QP	54.0	-18.2	1.50 V	208	33.85	2.00

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

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.1 PK	74.0	-2.9	1.32 H	22	66.82	4.28
2	5150.00	53.9 AV	54.0	-0.1	1.32 H	22	49.62	4.28
3	*5180.00	115.8 PK			1.32 H	22	111.41	4.39
4	*5180.00	107.7 AV			1.32 H	22	103.31	4.39
5	#10360.00	65.6 PK	68.2	-2.6	1.08 H	165	55.54	10.06
6	15540.00	64.8 PK	74.0	-9.2	1.01 H	173	49.96	14.84
7	15540.00	50.8 AV	54.0	-3.2	1.01 H	173	35.96	14.84

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.4 PK	74.0	-2.6	1.02 V	105	67.12	4.28
2	5150.00	52.7 AV	54.0	-1.3	1.02 V	105	48.42	4.28
3	*5180.00	115.1 PK			1.01 V	94	110.71	4.39
4	*5180.00	107.6 AV			1.01 V	94	103.21	4.39
5	#10360.00	64.5 PK	68.2	-3.7	1.02 V	164	54.44	10.06
6	15540.00	59.2 PK	74.0	-14.8	1.03 V	230	44.36	14.84
7	15540.00	47.7 AV	54.0	-6.3	1.03 V	230	32.86	14.84

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	118.9 PK			1.00 H	22	114.46	4.44
2	*5200.00	110.1 AV			1.00 H	22	105.66	4.44
3	#10400.00	68.0 PK	68.2	-0.2	1.02 H	159	57.93	10.07
4	15600.00	65.2 PK	74.0	-8.8	1.01 H	173	50.14	15.06
5	15600.00	53.2 AV	54.0	-0.8	1.01 H	173	38.14	15.06

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	*5200.00	118.6 PK			1.00 V	101	114.16	4.44
2	*5200.00	109.7 AV			1.00 V	101	105.26	4.44
3	#10400.00	64.9 PK	68.2	-3.3	1.06 V	155	54.83	10.07
4	15600.00	59.0 PK	74.0	-15.0	1.03 V	238	43.94	15.06
5	15600.00	47.7 AV	54.0	-6.3	1.03 V	238	32.64	15.06

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.

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	114.3 PK			1.30 H	25	109.89	4.41
2	*5240.00	106.3 AV			1.30 H	25	101.89	4.41
3	5350.00	61.4 PK	74.0	-12.6	1.30 H	25	56.89	4.51
4	5350.00	52.1 AV	54.0	-1.9	1.30 H	25	47.59	4.51
5	#10480.00	67.5 PK	68.2	-0.7	1.02 H	177	57.24	10.26
6	15720.00	58.4 PK	74.0	-15.6	1.00 H	215	43.73	14.67
7	15720.00	47.5 AV	54.0	-6.5	1.00 H	215	32.83	14.67

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.6 PK			1.02 V	95	109.19	4.41
2	*5240.00	106.2 AV			1.02 V	95	101.79	4.41
3	5350.00	60.5 PK	74.0	-13.5	1.02 V	95	55.99	4.51
4	5350.00	50.0 AV	54.0	-4.0	1.02 V	95	45.49	4.51
5	#10480.00	65.1 PK	68.2	-3.1	1.00 V	170	54.84	10.26
6	15720.00	59.4 PK	74.0	-14.6	1.00 V	215	44.73	14.67
7	15720.00	47.9 AV	54.0	-6.1	1.00 V	215	33.23	14.67

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- " # ": The radiated frequency is out of the restricted band.



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	60.5 PK	74.0	-13.5	1.57 H	309	55.60	4.90
2	#5715.00	45.1 AV	54.0	-8.9	1.57 H	309	40.20	4.90
3	#5725.00	70.1 PK	78.2	-8.1	1.57 H	309	65.17	4.93
4	*5745.00	112.3 PK			1.57 H	309	107.38	4.92
5	*5745.00	103.3 AV			1.57 H	309	98.38	4.92
6	11490.00	66.2 PK	74.0	-7.8	1.04 H	180	55.55	10.65
7	11490.00	53.3 AV	54.0	-0.7	1.04 H	180	42.65	10.65
8	#17235.00	64.8 PK	74.0	-9.2	1.00 H	183	45.35	19.45
9	#17235.00	50.8 AV	54.0	-3.2	1.00 H	183	31.35	19.45

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	#5715.00	59.3 PK	74.0	-14.7	1.70 V	152	54.40	4.90
2	#5715.00	44.3 AV	54.0	-9.7	1.70 V	152	39.40	4.90
3	#5725.00	69.4 PK	78.2	-8.8	1.70 V	152	64.47	4.93
4	*5745.00	107.3 PK			1.70 V	152	102.38	4.92
5	*5745.00	101.0 AV			1.70 V	152	96.08	4.92
6	11490.00	65.3 PK	74.0	-8.7	1.05 V	180	54.65	10.65
7	11490.00	52.8 AV	54.0	-1.2	1.05 V	180	42.15	10.65
8	#17235.00	58.6 PK	74.0	-15.4	1.01 V	214	39.15	19.45
9	#17235.00	47.0 AV	54.0	-7.0	1.01 V	214	27.55	19.45

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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CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	112.5 PK			1.57 H	310	107.55	4.95
2	*5785.00	103.4 AV			1.57 H	310	98.45	4.95
3	11570.00	66.8 PK	74.0	-7.2	1.02 H	180	56.12	10.68
4	11570.00	53.8 AV	54.0	-0.2	1.02 H	180	43.12	10.68
5	#17355.00	58.0 PK	74.0	-16.0	1.00 H	228	38.24	19.76
6	#17355.00	47.4 AV	54.0	-6.6	1.00 H	228	27.64	19.76

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	*5785.00	107.5 PK			1.70 V	152	102.55	4.95
2	*5785.00	100.8 AV			1.70 V	152	95.85	4.95
3	11570.00	65.4 PK	74.0	-8.6	1.02 V	182	54.72	10.68
4	11570.00	53.0 AV	54.0	-1.0	1.02 V	182	42.32	10.68
5	#17355.00	59.1 PK	74.0	-14.9	1.01 V	218	39.34	19.76
6	#17355.00	47.3 AV	54.0	-6.7	1.01 V	218	27.54	19.76

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.



A D T

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	111.7 PK			1.56 H	336	106.72	4.98
2	*5825.00	102.6 AV			1.56 H	336	97.62	4.98
3	#5850.00	62.6 PK	78.2	-15.6	1.56 H	336	57.58	5.02
4	#5860.00	57.6 PK	74.0	-16.4	1.56 H	336	52.56	5.04
5	#5860.00	45.6 AV	54.0	-8.4	1.56 H	336	40.56	5.04
6	11650.00	66.7 PK	74.0	-7.3	1.04 H	180	56.11	10.59
7	11650.00	53.9 AV	54.0	-0.1	1.04 H	180	43.31	10.59
8	#17475.00	58.3 PK	74.0	-15.7	1.00 H	215	38.35	19.95
9	#17475.00	47.6 AV	54.0	-6.4	1.00 H	215	27.65	19.95

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.3 PK			1.71 V	153	103.32	4.98
2	*5825.00	100.0 AV			1.71 V	153	95.02	4.98
3	#5850.00	59.1 PK	78.2	-19.1	1.71 V	153	54.08	5.02
4	#5860.00	56.1 PK	74.0	-17.9	1.71 V	153	51.06	5.04
5	#5860.00	44.2 AV	54.0	-9.8	1.71 V	153	39.16	5.04
6	11650.00	65.4 PK	74.0	-8.6	1.00 V	181	54.81	10.59
7	11650.00	53.2 AV	54.0	-0.8	1.00 V	181	42.61	10.59
8	#17475.00	59.3 PK	74.0	-14.7	1.02 V	228	39.35	19.95
9	#17475.00	47.7 AV	54.0	-6.3	1.02 V	228	27.75	19.95

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.



A D T

802.11ac (VHT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5093.00	62.4 PK	74.0	-11.6	1.32 H	22	58.29	4.11
2	5093.00	52.8 AV	54.0	-1.2	1.32 H	22	48.69	4.11
3	5150.00	72.1 PK	74.0	-1.9	1.32 H	22	67.82	4.28
4	5150.00	52.5 AV	54.0	-1.5	1.32 H	22	48.22	4.28
5	*5180.00	116.1 PK			1.32 H	22	111.71	4.39
6	*5180.00	107.4 AV			1.32 H	22	103.01	4.39
7	#10360.00	67.0 PK	68.2	-1.2	1.06 H	174	56.94	10.06
8	15540.00	60.2 PK	74.0	-13.8	1.05 H	88	45.36	14.84
9	15540.00	48.3 AV	54.0	-5.7	1.05 H	88	33.46	14.84

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5093.00	61.0 PK	74.0	-13.0	1.02 V	105	56.89	4.11
2	5093.00	51.0 AV	54.0	-3.0	1.02 V	105	46.89	4.11
3	5150.00	71.2 PK	74.0	-2.8	1.02 V	105	66.92	4.28
4	5150.00	52.8 AV	54.0	-1.2	1.02 V	105	48.52	4.28
5	*5180.00	116.8 PK			1.02 V	105	112.41	4.39
6	*5180.00	107.4 AV			1.02 V	105	103.01	4.39
7	#10360.00	67.1 PK	68.2	-1.1	1.06 V	167	57.04	10.06
8	15540.00	57.6 PK	74.0	-16.4	1.00 V	207	42.76	14.84
9	15540.00	47.9 AV	54.0	-6.1	1.00 V	207	33.06	14.84

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	59.9 PK	74.0	-14.1	1.01 H	20	55.72	4.18
2	5120.00	50.4 AV	54.0	-3.6	1.01 H	20	46.22	4.18
3	*5200.00	115.7 PK			1.34 H	34	111.26	4.44
4	*5200.00	107.3 AV			1.34 H	34	102.86	4.44
5	#10400.00	68.1 PK	68.2	-0.1	1.10 H	174	58.03	10.07
6	15600.00	60.5 PK	74.0	-13.5	1.00 H	95	45.44	15.06
7	15600.00	48.7 AV	54.0	-5.3	1.00 H	95	33.64	15.06

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	5120.00	58.3 PK	74.0	-15.7	1.35 V	341	54.12	4.18
2	5120.00	50.5 AV	54.0	-3.5	1.35 V	341	46.32	4.18
3	*5200.00	116.9 PK			1.04 V	108	112.46	4.44
4	*5200.00	107.3 AV			1.04 V	108	102.86	4.44
5	#10400.00	67.8 PK	68.2	-0.4	1.03 V	175	57.73	10.07
6	15600.00	58.0 PK	74.0	-16.0	1.00 V	201	42.94	15.06
7	15600.00	48.3 AV	54.0	-5.7	1.00 V	201	33.24	15.06

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.



A D T

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.2 PK			1.31 H	38	111.79	4.41
2	*5240.00	107.5 AV			1.31 H	38	103.09	4.41
3	5350.00	54.4 PK	74.0	-19.6	1.00 H	7	49.89	4.51
4	5350.00	41.6 AV	54.0	-12.4	1.00 H	7	37.09	4.51
5	#10480.00	68.1 PK	68.2	-0.1	1.10 H	179	57.84	10.26
6	15720.00	58.4 PK	74.0	-15.6	1.00 H	87	43.73	14.67
7	15720.00	46.9 AV	54.0	-7.1	1.00 H	87	32.23	14.67

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.8 PK			1.02 V	102	112.39	4.41
2	*5240.00	107.6 AV			1.02 V	102	103.19	4.41
3	5350.00	53.8 PK	74.0	-20.2	1.02 V	102	49.29	4.51
4	5350.00	40.9 AV	54.0	-13.1	1.02 V	102	36.39	4.51
5	#10480.00	67.1 PK	68.2	-1.1	1.01 V	170	56.84	10.26
6	15720.00	58.1 PK	74.0	-15.9	1.00 V	214	43.43	14.67
7	15720.00	48.2 AV	54.0	-5.8	1.00 V	214	33.53	14.67

REMARKS:

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



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	61.9 PK	74.0	-12.1	1.58 H	14	57.00	4.90
2	#5715.00	46.8 AV	54.0	-7.2	1.58 H	14	41.90	4.90
3	#5725.00	68.5 PK	78.2	-9.7	1.58 H	14	63.57	4.93
4	*5745.00	109.9 PK			1.53 H	341	104.98	4.92
5	*5745.00	101.6 AV			1.53 H	341	96.68	4.92
6	11490.00	66.7 PK	74.0	-7.3	1.02 H	183	56.05	10.65
7	11490.00	53.9 AV	54.0	-0.1	1.02 H	183	43.25	10.65
8	#17235.00	64.1 PK	74.0	-9.9	1.00 H	185	44.65	19.45
9	#17235.00	50.3 AV	54.0	-3.7	1.00 H	185	30.85	19.45

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	#5715.00	57.4 PK	74.0	-16.6	1.72 V	160	52.50	4.90
2	#5715.00	44.3 AV	54.0	-9.7	1.72 V	160	39.40	4.90
3	#5725.00	58.8 PK	78.2	-19.4	1.01 V	213	53.87	4.93
4	*5745.00	106.4 PK			1.69 V	155	101.48	4.92
5	*5745.00	100.4 AV			1.69 V	155	95.48	4.92
6	11490.00	65.7 PK	74.0	-8.3	1.03 V	195	55.05	10.65
7	11490.00	53.7 AV	54.0	-0.3	1.03 V	195	43.05	10.65
8	#17235.00	65.6 PK	74.0	-8.4	1.02 V	100	46.15	19.45
9	#17235.00	52.5 AV	54.0	-1.5	1.02 V	100	33.05	19.45

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.



A D T

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.3 PK			1.53 H	340	105.35	4.95
2	*5785.00	101.7 AV			1.53 H	340	96.75	4.95
3	11570.00	65.9 PK	74.0	-8.1	1.03 H	183	55.22	10.68
4	11570.00	53.9 AV	54.0	-0.1	1.03 H	183	43.22	10.68
5	#17355.00	64.9 PK	74.0	-9.1	1.00 H	202	45.14	19.76
6	#17355.00	52.8 AV	54.0	-1.2	1.00 H	202	33.04	19.76

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	*5785.00	106.5 PK			1.63 V	140	101.55	4.95
2	*5785.00	100.6 AV			1.63 V	140	95.65	4.95
3	11570.00	65.3 PK	74.0	-8.7	1.03 V	180	54.62	10.68
4	11570.00	53.2 AV	54.0	-0.8	1.03 V	180	42.52	10.68
5	#17355.00	65.8 PK	74.0	-8.2	1.00 V	106	46.04	19.76
6	#17355.00	52.6 AV	54.0	-1.4	1.00 V	106	32.84	19.76

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.



A D T

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	111.1 PK			1.53 H	340	106.12	4.98
2	*5825.00	102.2 AV			1.53 H	340	97.22	4.98
3	#5850.00	62.5 PK	78.2	-15.7	1.53 H	340	57.48	5.02
4	#5860.00	57.4 PK	74.0	-16.6	1.53 H	340	52.36	5.04
5	#5860.00	45.4 AV	54.0	-8.6	1.53 H	340	40.36	5.04
6	11650.00	65.2 PK	74.0	-8.8	1.03 H	178	54.61	10.59
7	11650.00	53.9 AV	54.0	-0.1	1.03 H	178	43.31	10.59
8	#17475.00	64.9 PK	74.0	-9.1	1.05 H	171	44.95	19.95
9	#17475.00	50.9 AV	54.0	-3.1	1.05 H	171	30.95	19.95

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	107.9 PK			1.65 V	135	102.92	4.98
2	*5825.00	101.8 AV			1.65 V	135	96.82	4.98
3	#5850.00	58.6 PK	78.2	-19.6	1.65 V	135	53.58	5.02
4	#5860.00	55.3 PK	74.0	-18.7	1.65 V	135	50.26	5.04
5	#5860.00	44.3 AV	54.0	-9.7	1.65 V	135	39.26	5.04
6	11650.00	64.2 PK	74.0	-9.8	1.03 V	180	53.61	10.59
7	11650.00	52.6 AV	54.0	-1.4	1.03 V	180	42.01	10.59
8	#17475.00	65.8 PK	74.0	-8.2	1.02 V	119	45.85	19.95
9	#17475.00	52.4 AV	54.0	-1.6	1.02 V	119	32.45	19.95

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.

802.11ac (VHT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.1 PK	74.0	-6.9	1.33 H	21	62.82	4.28
2	5150.00	53.4 AV	54.0	-0.6	1.33 H	21	49.12	4.28
3	*5190.00	110.7 PK			1.33 H	21	106.29	4.41
4	*5190.00	101.2 AV			1.33 H	21	96.79	4.41
5	5350.00	54.6 PK	74.0	-19.4	1.33 H	21	50.09	4.51
6	5350.00	44.8 AV	54.0	-9.2	1.33 H	21	40.29	4.51
7	#10380.00	67.9 PK	68.2	-0.3	1.06 H	172	57.83	10.07
8	15570.00	58.1 PK	74.0	-15.9	1.00 H	208	43.15	14.95
9	15570.00	48.4 AV	54.0	-5.6	1.00 H	208	33.45	14.95

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.2 PK	74.0	-6.8	1.02 V	107	62.92	4.28
2	5150.00	52.5 AV	54.0	-1.5	1.02 V	107	48.22	4.28
3	*5190.00	111.6 PK			1.02 V	107	107.19	4.41
4	*5190.00	100.6 AV			1.02 V	107	96.19	4.41
5	5350.00	53.1 PK	74.0	-20.9	1.02 V	107	48.59	4.51
6	5350.00	43.2 AV	54.0	-10.8	1.02 V	107	38.69	4.51
7	#10380.00	66.2 PK	68.2	-2.0	1.00 V	169	56.13	10.07
8	15570.00	58.3 PK	74.0	-15.7	1.02 V	209	43.35	14.95
9	15570.00	46.3 AV	54.0	-7.7	1.02 V	209	31.35	14.95

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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CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	115.1 PK			1.00 H	6	110.68	4.42
2	*5230.00	104.8 AV			1.00 H	6	100.38	4.42
3	5350.00	54.9 PK	74.0	-19.1	1.00 H	6	50.39	4.51
4	5350.00	43.1 AV	54.0	-10.9	1.00 H	6	38.59	4.51
5	#10460.00	67.5 PK	68.2	-0.7	1.06 H	170	57.29	10.21
6	15690.00	57.8 PK	74.0	-16.2	1.01 H	221	43.12	14.68
7	15690.00	47.9 AV	54.0	-6.1	1.01 H	221	33.22	14.68

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	*5230.00	114.2 PK			1.01 V	105	109.78	4.42
2	*5230.00	103.6 AV			1.01 V	105	99.18	4.42
3	5350.00	53.4 PK	74.0	-20.6	1.01 V	105	48.89	4.51
4	5350.00	41.9 AV	54.0	-12.1	1.01 V	105	37.39	4.51
5	#10460.00	66.3 PK	68.2	-1.9	1.00 V	169	56.09	10.21
6	15690.00	57.6 PK	74.0	-16.4	1.02 V	220	42.92	14.68
7	15690.00	46.1 AV	54.0	-7.9	1.02 V	220	31.42	14.68

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.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.1 PK	74.0	-9.9	1.57 H	13	59.20	4.90
2	#5715.00	49.6 AV	54.0	-4.4	1.57 H	13	44.70	4.90
3	#5725.00	65.8 PK	78.2	-12.4	1.57 H	13	60.87	4.93
4	*5755.00	107.8 PK			1.57 H	13	102.87	4.93
5	*5755.00	98.6 AV			1.57 H	13	93.67	4.93
6	11510.00	64.7 PK	74.0	-9.3	1.03 H	168	54.04	10.66
7	11510.00	53.5 AV	54.0	-0.5	1.03 H	168	42.84	10.66
8	#17265.00	65.6 PK	74.0	-8.4	1.04 H	158	46.08	19.52
9	#17265.00	51.4 AV	54.0	-2.6	1.04 H	158	31.88	19.52

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	#5715.00	68.8 PK	74.0	-5.2	1.38 V	98	63.90	4.90
2	#5715.00	53.9 AV	54.0	-0.1	1.38 V	98	49.00	4.90
3	#5725.00	68.9 PK	78.2	-9.3	1.38 V	98	63.97	4.93
4	*5755.00	112.4 PK			1.38 V	98	107.47	4.93
5	*5755.00	101.1 AV			1.38 V	98	96.17	4.93
6	11510.00	64.8 PK	74.0	-9.2	1.06 V	170	54.14	10.66
7	11510.00	53.1 AV	54.0	-0.9	1.06 V	170	42.44	10.66
8	#17265.00	65.1 PK	74.0	-8.9	1.01 V	110	45.58	19.52
9	#17265.00	51.9 AV	54.0	-2.1	1.01 V	110	32.38	19.52

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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CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	112.2 PK			1.56 H	334	107.24	4.96
2	*5795.00	102.2 AV			1.56 H	334	97.24	4.96
3	#5850.00	62.6 PK	78.2	-15.6	1.56 H	334	57.58	5.02
4	#5860.00	60.7 PK	74.0	-13.3	1.56 H	334	55.66	5.04
5	#5860.00	47.3 AV	54.0	-6.7	1.56 H	334	42.26	5.04
6	11590.00	66.8 PK	74.0	-7.2	1.04 H	180	56.11	10.69
7	11590.00	53.6 AV	54.0	-0.4	1.04 H	180	42.91	10.69
8	#17385.00	65.0 PK	74.0	-9.0	1.05 H	159	45.14	19.86
9	#17385.00	51.3 AV	54.0	-2.7	1.05 H	159	31.44	19.86

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	*5795.00	112.4 PK			1.40 V	100	107.44	4.96
2	*5795.00	102.1 AV			1.40 V	100	97.14	4.96
3	#5850.00	61.5 PK	78.2	-16.7	1.40 V	100	56.48	5.02
4	#5860.00	59.9 PK	74.0	-14.1	1.40 V	100	54.86	5.04
5	#5860.00	47.0 AV	54.0	-7.0	1.40 V	100	41.96	5.04
6	11590.00	64.4 PK	74.0	-9.6	1.06 V	194	53.71	10.69
7	11590.00	53.1 AV	54.0	-0.9	1.06 V	194	42.41	10.69
8	#17385.00	65.5 PK	74.0	-8.5	1.02 V	123	45.64	19.86
9	#17385.00	52.3 AV	54.0	-1.7	1.02 V	123	32.44	19.86

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.



802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	1.31 H	24	61.12	4.28
2	5150.00	53.6 AV	54.0	-0.4	1.31 H	24	49.32	4.28
3	*5210.00	107.8 PK			1.31 H	24	103.37	4.43
4	*5210.00	97.5 AV			1.31 H	24	93.07	4.43
5	5370.00	53.3 PK	74.0	-20.7	1.31 H	24	48.73	4.57
6	5370.00	44.7 AV	54.0	-9.3	1.31 H	24	40.13	4.57
7	#10420.00	64.4 PK	68.2	-3.8	1.06 H	172	54.29	10.11
8	15630.00	56.4 PK	74.0	-17.6	1.03 H	229	41.46	14.94
9	15630.00	46.9 AV	54.0	-7.1	1.03 H	229	31.96	14.94

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.3 PK	74.0	-9.7	1.01 V	103	60.02	4.28
2	5150.00	52.4 AV	54.0	-1.6	1.01 V	103	48.12	4.28
3	*5210.00	106.4 PK			1.01 V	103	101.97	4.43
4	*5210.00	96.3 AV			1.01 V	103	91.87	4.43
5	5370.00	51.8 PK	74.0	-22.2	1.01 V	103	47.23	4.57
6	5370.00	43.2 AV	54.0	-10.8	1.01 V	103	38.63	4.57
7	#10420.00	62.8 PK	68.2	-5.4	1.00 V	168	52.69	10.11
8	15630.00	54.3 PK	74.0	-19.7	1.01 V	215	39.36	14.94
9	15630.00	44.3 AV	54.0	-9.7	1.01 V	215	29.36	14.94

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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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CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	63.0 PK	68.2	-5.2	1.57 H	335	58.10	4.90
2	#5725.00	64.2 PK	78.2	-14.0	1.57 H	335	59.27	4.93
3	*5775.00	104.8 PK			1.57 H	335	99.87	4.93
4	*5775.00	94.4 AV			1.57 H	335	89.47	4.93
5	#5850.00	58.6 PK	78.2	-19.6	1.57 H	335	53.58	5.02
6	#5860.00	57.6 PK	68.2	-10.6	1.57 H	335	52.56	5.04
7	11550.00	62.8 PK	74.0	-11.2	1.01 H	181	52.13	10.67
8	11550.00	50.3 AV	54.0	-3.7	1.01 H	181	39.63	10.67
9	#17325.00	63.3 PK	68.2	-4.9	1.00 H	125	43.61	19.69

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	#5715.00	67.7 PK	68.2	-0.5	1.37 V	100	62.80	4.90
2	#5725.00	68.7 PK	78.2	-9.5	1.37 V	100	63.77	4.93
3	*5775.00	107.1 PK			1.37 V	100	102.17	4.93
4	*5775.00	96.6 AV			1.37 V	100	91.67	4.93
5	#5850.00	60.1 PK	78.2	-18.1	1.37 V	100	55.08	5.02
6	#5860.00	59.5 PK	68.2	-8.7	1.37 V	100	54.46	5.04
7	11550.00	61.4 PK	74.0	-12.6	1.05 V	194	50.73	10.67
8	11550.00	48.3 AV	54.0	-5.7	1.05 V	194	37.63	10.67
9	#17325.00	60.1 PK	68.2	-8.1	1.02 V	123	40.41	19.69

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.

4.3 TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p \leq 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	---		1 Watt (30 dBm)

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

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT \leq 4;

Array Gain = 0 dB (i.e., no array gain) for channel widths \geq 40 MHz for any NANT;

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT \geq 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.



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4.3.2 TEST INSTRUMENTS

FOR POWER OUTPUT MEASUREMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	1014008	Apr. 30, 2014	Apr. 29, 2015
Power sensor Anritsu	MA2411B	0917122	Apr. 30, 2014	Apr. 29, 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 : Aug. 19, 2014

FOR 26dB OCCUPIED BANDWIDTH

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 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 : Aug. 19, 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

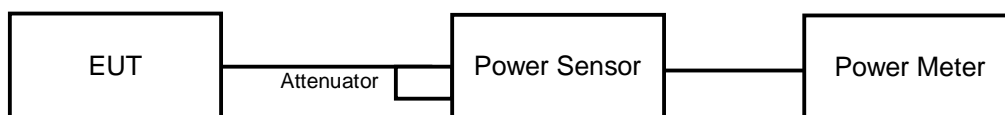
1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement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

4.3.4 DEVIATION FROM TEST STANDARD

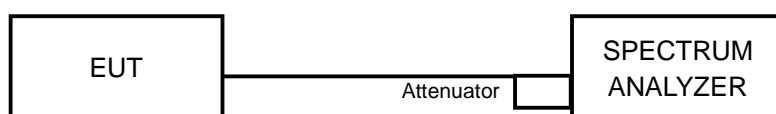
No deviation

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

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	186.638	22.71	30	PASS
40	5200	312.608	24.95	30	PASS
48	5240	132.739	21.23	30	PASS
149	5745	109.396	20.39	30	PASS
157	5785	110.662	20.44	30	PASS
165	5825	86.298	19.36	30	PASS

26dB OCCUPIED BANDWIDTH:

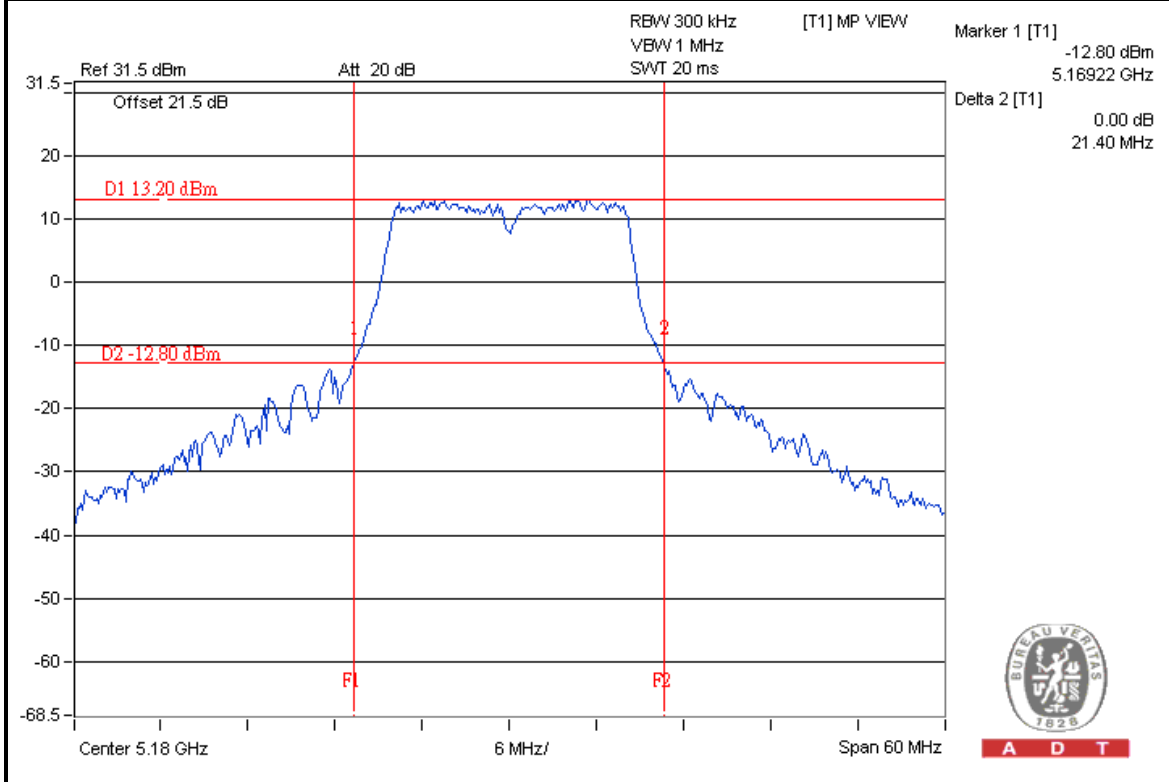
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)
36	5180	21.40
40	5200	27.26
48	5240	21.40



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SPECTRUM PLOT OF WORST VALUE

802.11a : CH36





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802.11ac (VHT20)

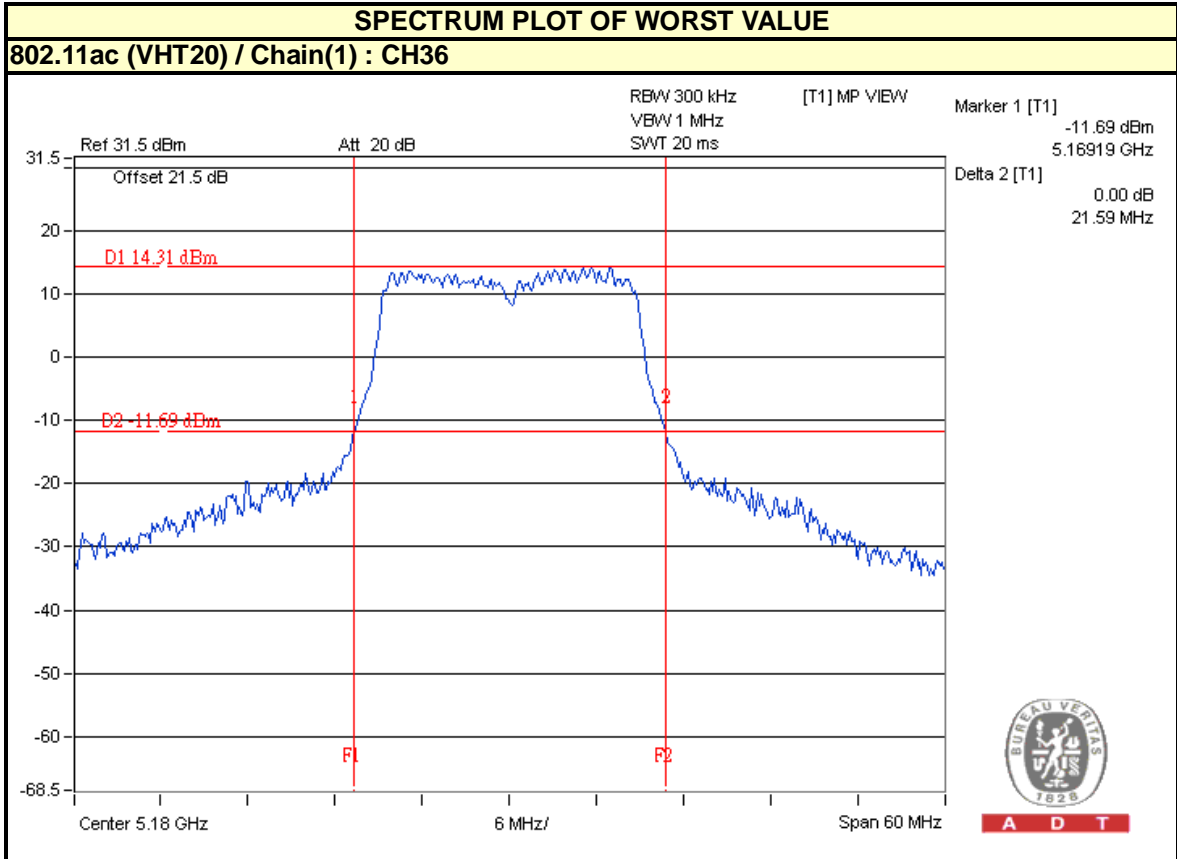
CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	22.32	22.73	358.107	25.54	30	PASS
40	5200	22.42	22.62	357.392	25.53	30	PASS
48	5240	22.76	22.85	381.551	25.82	30	PASS
149	5745	20.46	21.01	237.356	23.75	30	PASS
157	5785	20.62	21.12	244.765	23.89	30	PASS
165	5825	19.37	19.96	185.58	22.69	30	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
36	5180	21.85	21.59
40	5200	22.11	21.62
48	5240	21.95	21.62



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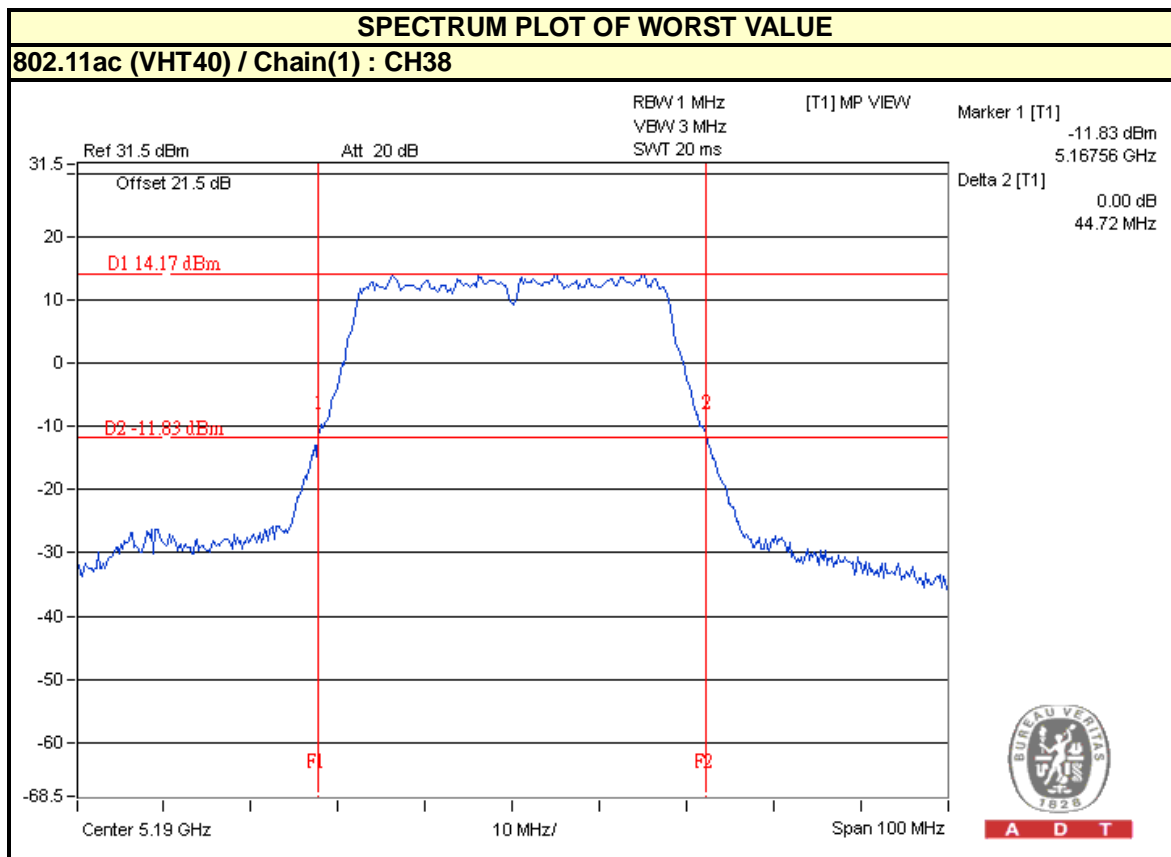
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802.11ac (VHT40)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	20.12	20.21	207.756	23.18	30	PASS
46	5230	24.86	25.11	630.536	28.00	30	PASS
151	5755	20.89	21.54	265.305	24.24	30	PASS
159	5795	22.01	22.65	342.932	25.35	30	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
38	5190	44.85	44.72
46	5230	51.36	49.23



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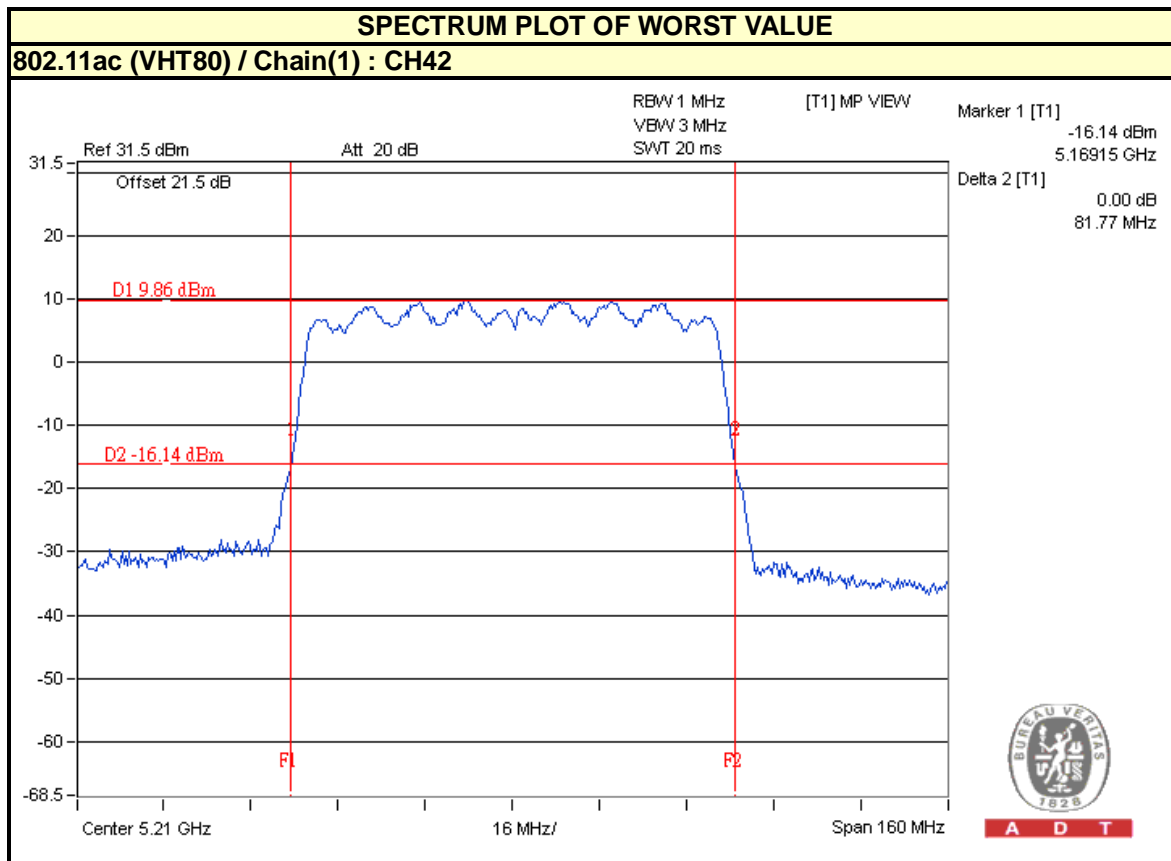
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802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
42	5210	18.17	18.22	131.989	21.21	30	PASS
155	5775	19.04	19.35	166.267	22.21	30	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	
		CHAIN 0	CHAIN 1
42	5210	82.66	81.77





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4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
	√	Indoor Access Point	
		Mobile and Portable client device	11dBm/ MHz
U-NII-2A	---		11dBm/ MHz
U-NII-2C	---		11dBm/ MHz
U-NII-3	---		30dBm/ 500kHz

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 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 : Aug. 19, 2014

4.4.3 TEST PROCEDURES

Using method SA-1

For U-NII-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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW \geq 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

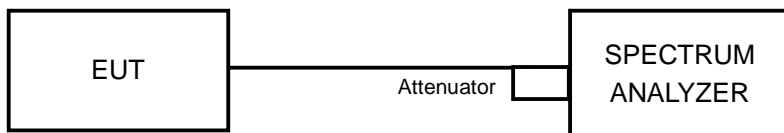
4.4.4 DEVIATION FROM TEST STANDARD

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

For U-NII-1:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
36	5180	8.62	17	PASS
40	5200	10.95	17	PASS
48	5240	6.69	17	PASS

NOTE: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

802.11ac (VHT20)

CHAN.	CHANNEL FREQUENCY (MHz)	PSD (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
36	5180	8.21	8.56	11.40	17	PASS
40	5200	8.44	8.83	11.65	17	PASS
48	5240	8.56	8.35	11.47	17	PASS

NOTE: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

802.11ac (VHT40)

CHAN.	CHANNEL FREQUENCY (MHz)	PSD (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
38	5190	2.56	2.84	5.71	17	PASS
46	5230	7.56	7.81	10.70	17	PASS

NOTE: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.



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802.11ac (VHT80)

CHAN.	CHANNEL FREQUENCY (MHz)	PSD (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1			
42	5210	-0.90	-0.93	2.10	17	PASS

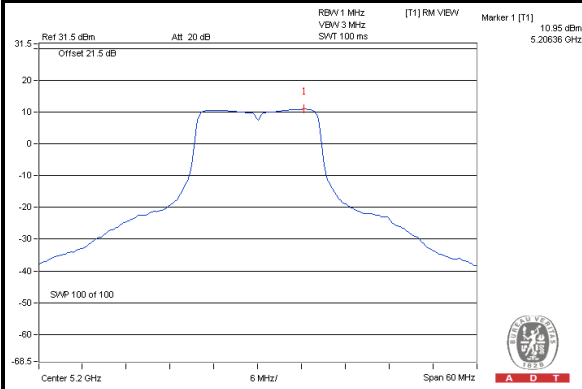
NOTE: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.



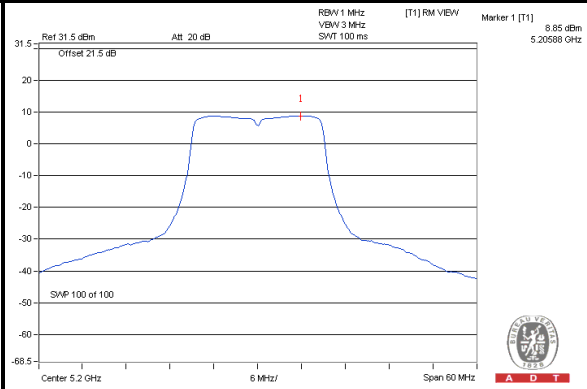
A D T

SPECTRUM PLOT OF WORST VALUE

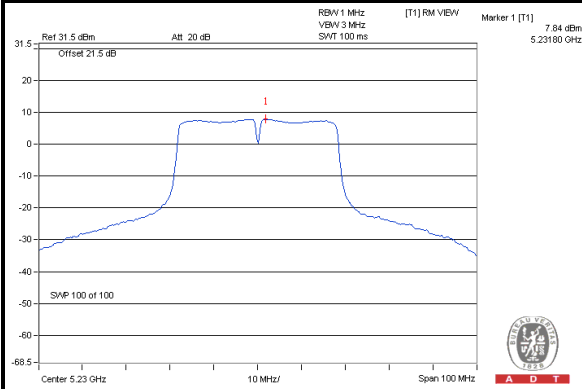
802.11a : CH40



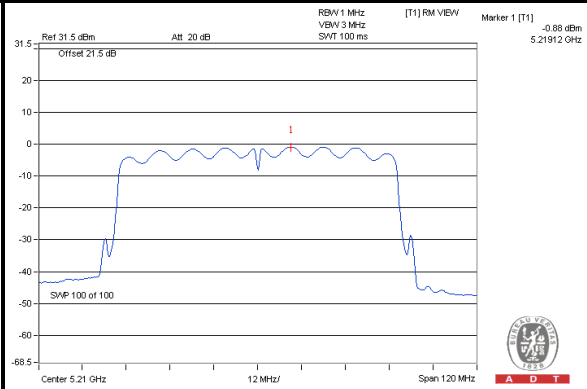
802.11ac (VHT20) / Chain(1) : CH40



802.11ac (VHT40) / Chain(1) : CH46



802.11ac (VHT80) / Chain(0) : CH42





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For U-NII-3:

802.11a

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR		TOTAL PSD WITH DUTY FACTOR (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
		(dBm/300kHz)	(dBm/500kHz)			
149	5745	-1.33	0.89	0.89	30	PASS
157	5785	-1.35	0.87	0.87	30	PASS
165	5825	-2.10	0.12	0.12	30	PASS

802.11ac (VHT20)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR		10 log (N=2) dB	TOTAL PSD WITH DUTY FACTOR (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-1.91	0.31	3.01	3.32	30	PASS
	157	5785	-1.76	0.46	3.01	3.47	30	PASS
	165	5825	-2.29	-0.07	3.01	2.94	30	PASS
1	149	5745	-1.33	0.89	3.01	3.90	30	PASS
	157	5785	-1.00	1.22	3.01	4.23	30	PASS
	165	5825	-1.33	0.89	3.01	3.90	30	PASS

802.11ac (VHT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR		10 log (N=2) dB	TOTAL PSD WITH DUTY FACTOR (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)				
0	151	5755	-4.78	-2.56	3.01	0.45	30	PASS
	159	5795	-2.99	-0.77	3.01	2.24	30	PASS
1	151	5755	-3.92	-1.70	3.01	1.31	30	PASS
	159	5795	-2.48	-0.26	3.01	2.75	30	PASS



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802.11ac (VHT80)

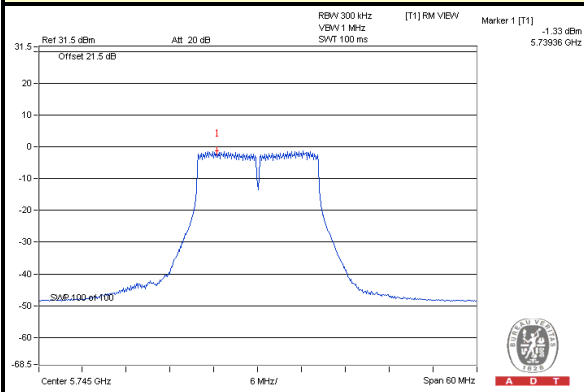
TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR		10 log (N=2) dB	TOTAL PSD WITH DUTY FACTOR (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
			(dBm/300kHz)	(dBm/500kHz)				
0	155	5775	-8.28	-6.06	3.01	-3.05	30	PASS
1	155	5775	-7.54	-5.32	3.01	-2.31	30	PASS



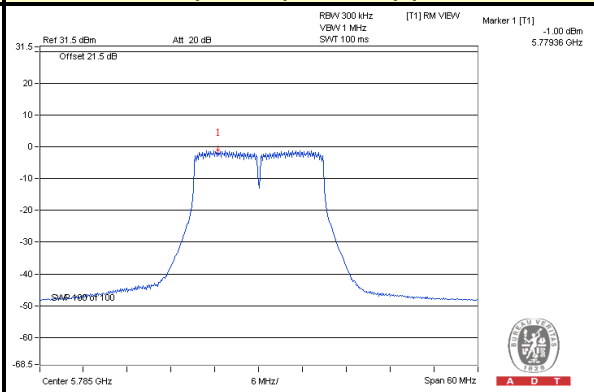
A D T

SPECTRUM PLOT OF WORST VALUE

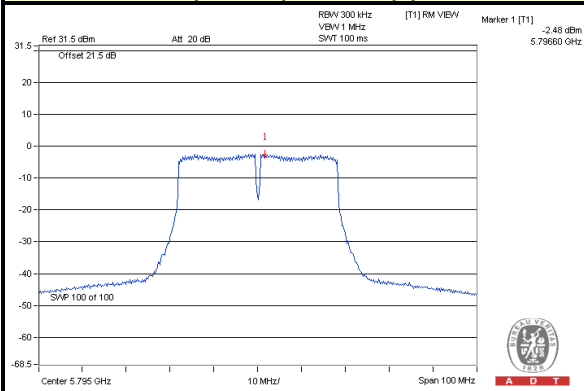
802.11a : CH149



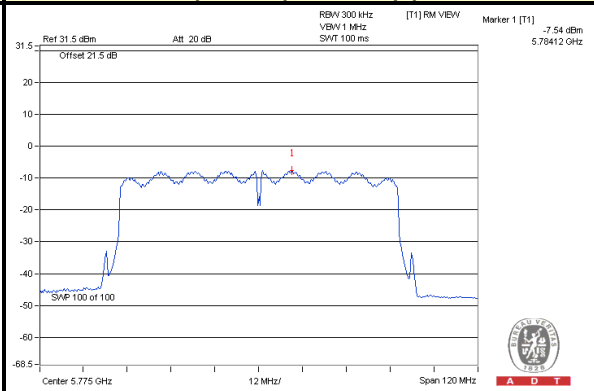
802.11ac (VHT20) / Chain(1) : CH157



802.11ac (VHT40) / Chain(1) : CH159



802.11ac (VHT80) / Chain(1) : CH155





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4.5 FREQUENCY STABILITY

4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015
Temperature Humidity Chamber GIANTFORCE	& GTH-150-40-SP -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 : Aug. 19, 2014

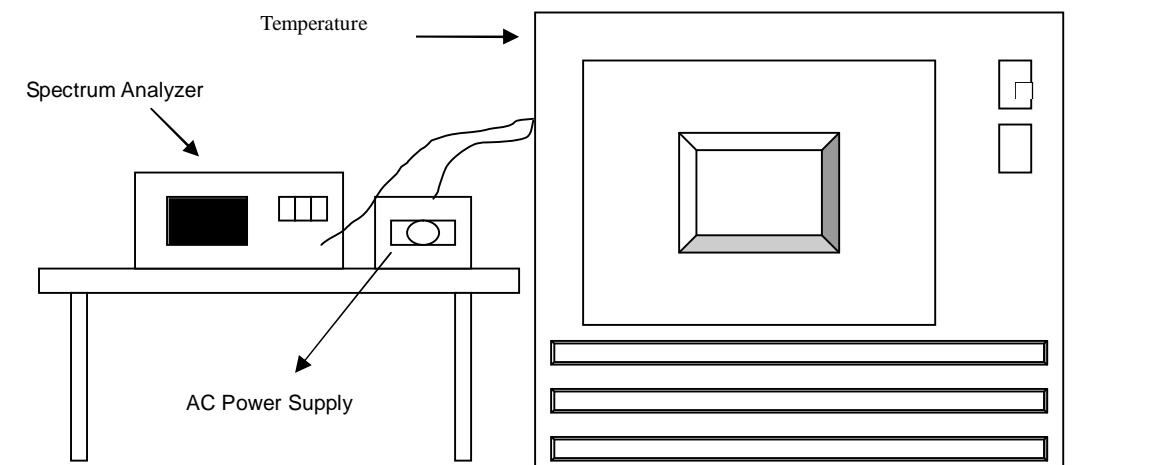
4.5.3 TEST PROCEDURE

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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

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



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4.5.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
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	5239.978	-0.00042	5239.9755	-0.00047	5239.9784	-0.00041	5239.976	-0.00046
40	120	5239.9858	-0.00027	5239.9849	-0.00029	5239.9896	-0.00020	5239.9853	-0.00028
30	120	5239.9845	-0.00030	5239.9843	-0.00030	5239.9855	-0.00028	5239.9814	-0.00035
20	120	5239.984	-0.00031	5239.9829	-0.00033	5239.981	-0.00036	5239.9837	-0.00031
10	120	5240.0097	0.00019	5240.0128	0.00024	5240.0123	0.00023	5240.0114	0.00022
0	120	5240	0.00000	5240.003	0.00006	5239.9979	-0.00004	5240.001	0.00002
-10	120	5240.0272	0.00052	5240.0231	0.00044	5240.0275	0.00052	5240.0232	0.00044
-20	120	5240.0259	0.00049	5240.0264	0.00050	5240.0232	0.00044	5240.0244	0.00047
-30	120	5239.9896	-0.00020	5239.9917	-0.00016	5239.9891	-0.00021	5239.9897	-0.00020

FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5240MHz									
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	5239.9847	-0.00029	5239.9825	-0.00033	5239.9811	-0.00036	5239.983	-0.00032
	120	5239.984	-0.00031	5239.9829	-0.00033	5239.981	-0.00036	5239.9837	-0.00031
	102	5239.9831	-0.00032	5239.9824	-0.00034	5239.9816	-0.00035	5239.9831	-0.00032

4.6 6dB BANDWIDTH MEASUREMENT

4.6.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 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 : Aug. 19, 2014

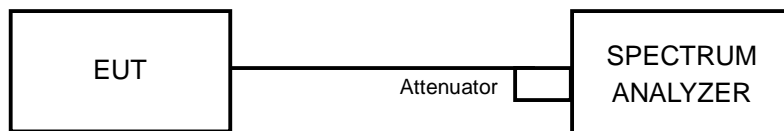
4.6.3 TEST PROCEDURE

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITIONS

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



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4.6.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.61	0.5	PASS
157	5785	16.61	0.5	PASS
165	5825	16.60	0.5	PASS

802.11ac (VHT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.82	17.75	0.5	PASS
157	5785	17.81	17.74	0.5	PASS
165	5825	17.80	17.71	0.5	PASS

802.11ac (VHT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.62	36.56	0.5	PASS
159	5795	36.61	36.51	0.5	PASS

802.11ac (VHT80)

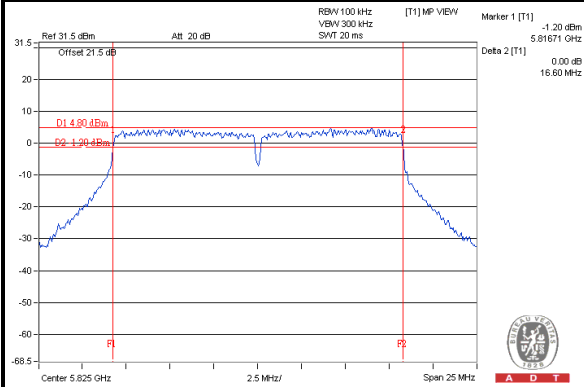
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
155	5775	76.18	75.97	0.5	PASS



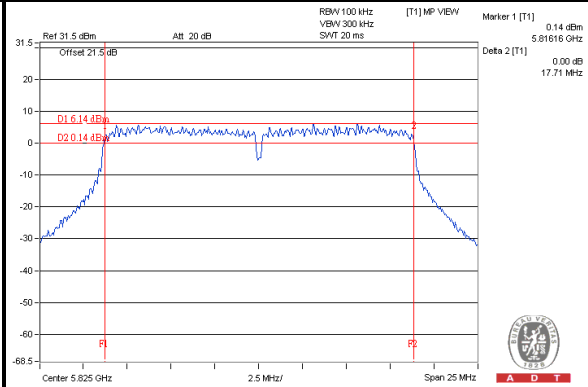
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SPECTRUM PLOT OF WORST VALUE

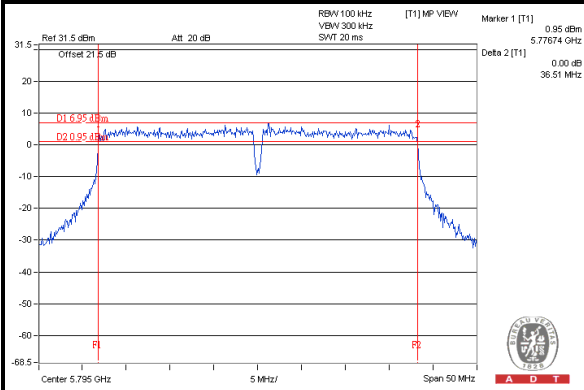
802.11a : CH165



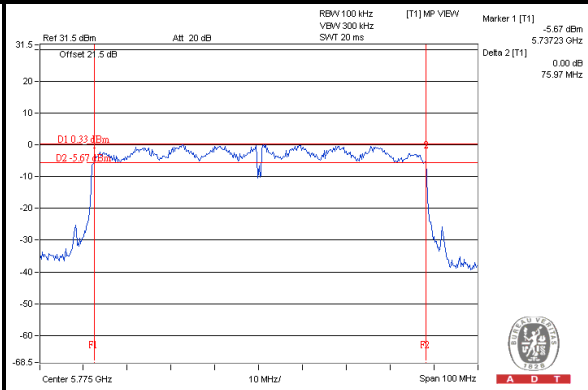
802.11ac (VHT20) / Chain(1) : CH165



802.11ac (VHT40) / Chain(1) : CH159



802.11ac (VHT80) / Chain(1) : CH155



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:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



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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 ---