

FCC Test Report

Report No.: RF160120E04B-1

FCC ID: HDC434RG

Test Model: 434RG

Received Date: Feb. 26, 2016

Test Date: Jan. 28 to Mar. 03, 2016

Issued Date: Dec. 07, 2016

Applicant: Adtran

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Release Control Record

Issue No.	Description	Date Issued
RF160120E04B-1	Original release.	Dec. 07, 2016

1 Certificate of Conformity

Product: Indoor GPON HGU

Brand: ADTRAN

Test Model: 434RG

Sample Status: ENGINEERING SAMPLE

Applicant: Adtran

Test Date: Jan. 28 to Mar. 03, 2016

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10: 2013

The above equipment 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.

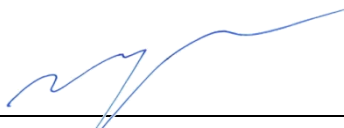
Prepared by :


Wendy Wu / Specialist

Date:

Dec. 07, 2016

Approved by :


May Chen / Manager

Date:

Dec. 07, 2016

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -8.74dB at 4.45707MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 11340.00MHz, 11440.00MHz and 5470.00MHz.
15.407(a)(1/2 /3)	Max Average 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 I-PEX not a standard connector.

NOTE: 1. This report is prepared for FCC class II permissive change. (Add DFS band: 5.26GHz ~ 5.32GHz, 5.5GHz ~ 5.7GHz).

2. The DFS report 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:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.31 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Indoor GPON HGU
Brand	ADTRAN
Test Model	434RG
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from adapter or UPS
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1300Mbps
Operating Frequency	5.26 ~ 5.32GHz, 5.50 ~ 5.58GHz & 5.66 ~ 5.72GHz
Number of Channel	13 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 6 for 802.11n (HT40), 802.11ac (VHT40) 3 for 802.11ac (VHT80)
Output Power	5.26 ~ 5.32GHz 802.11a: 153.462mW 802.11ac (VHT20): 147.164mW 802.11ac (VHT40): 227.658mW 802.11ac (VHT80): 225.256mW 5.50 ~ 5.58GHz & 5.66 ~ 5.72GHz 802.11a: 150.314mW 802.11ac (VHT20): 151.891mW 802.11ac (VHT40): 221.135mW 802.11ac (VHT80): 213.849mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

- 2.4GHz and 5GHz technology can transmit at same time.
- The antennas provided to the EUT, please refer to the following table:

For 2.4GHz						
Antenna No.	Brand	Part No.	Antenna Type	Connector	Gain (dBi)	Cable(mm)
Ant 1	WHAYU	C1597-510085-A	PCB	Soldering	2.8	47.7
Ant 2	WHAYU	C1597-510083-A	PCB	Soldering	2.4	98.7
For 5GHz						
Antenna No.	Brand	Part No.	Antenna Type	Connector	Gain (dBi)	Cable(mm)
Ant 3	WHAYU	C1597-510086-A	PCB	I-PEX	3.3	84.8
Ant 4	WHAYU	C1597-510084-A	PCB	I-PEX	3.4	74.8
Ant 5	WHAYU	C1597-510082-A	PCB	I-PEX	3.5	186.8

- The EUT power needs to be supplied from one power adapter, the information is as below table:

Brand	Model No.	Spec.
UMEC	UP0301A-12PA	Input: 100-240V, 0.8A, 50/60Hz Output: 12V, 2.5A DC output cable(1.4m, unshielded)

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

Mode	Power
A	with adapter
B	with UPS

Note: The worst radiated emissions was found in **Mode A**. Therefore only the test data of the modes were recorded in this report.

5. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX (Fixed Chain 0)	1RX
802.11g	6 ~ 54Mbps	1TX (Fixed Chain 0)	1RX
802.11n (HT20)	MCS 0~7	2TX (CDD Mode)	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX (CDD Mode)	2RX
	MCS 8~15	2TX	2RX
5GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11a	6 ~ 54Mbps	1TX (Fixed Chain 0)	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS0~8 Nss=1	3TX	3RX
	MCS0~8 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
802.11ac (VHT40)	MCS0~9 Nss=1	3TX	2RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX
802.11ac (VHT80)	MCS0~9 Nss=1	3TX	2RX
	MCS0~9 Nss=2	3TX	3RX
	MCS0~9 Nss=3	3TX	3RX

Note: 1. 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)

6. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.

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

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

FOR 5500 ~ 5580MHz & 5660 ~ 5720MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	132	5660 MHz
104	5520 MHz	136	5680 MHz
108	5540 MHz	140	5700 MHz
112	5560 MHz	144	5720 MHz
116	5580 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	118	5590 MHz
110	5550 MHz	134	5670 MHz

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	138	5690 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	√	√	√	√	Adapter Mode
2	-	-	√	-	UPS Mode

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

☒ 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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5580 & 5660-5720	100 to 116 & 132 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 116 & 132 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 110 , 134 & 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 138	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

☒ 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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5260-5320 5500-5580 & 5660-5720	54 to 62 102 to 110 , 134 & 142	54	OFDM	BPSK	13.5

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5260-5320 5500-5580 & 5660-5720	54 to 62 102 to 110 , 134 & 142	54	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ 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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11ac (VHT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11a	5500-5580 & 5660-5720	100 to 116 & 132 to 144	100, 116, 140, 144	OFDM	BPSK	6
802.11ac (VHT20)		100 to 116 & 132 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 110 , 134 & 142	102, 110, 134, 142	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 138	106, 138	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY	TEST LOCATION
RE $\geq$ 1G	23deg. C, 68%RH	120Vac, 60Hz	Tim Ho	1
RE $<$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Tim Ho	1
PLC	18deg. C, 60%RH	120Vac, 60Hz	Jason Huang	2
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng	1

3.3 Duty Cycle of Test Signal

If duty cycle of test signal is $\geq 98\%$, duty factor is not required.

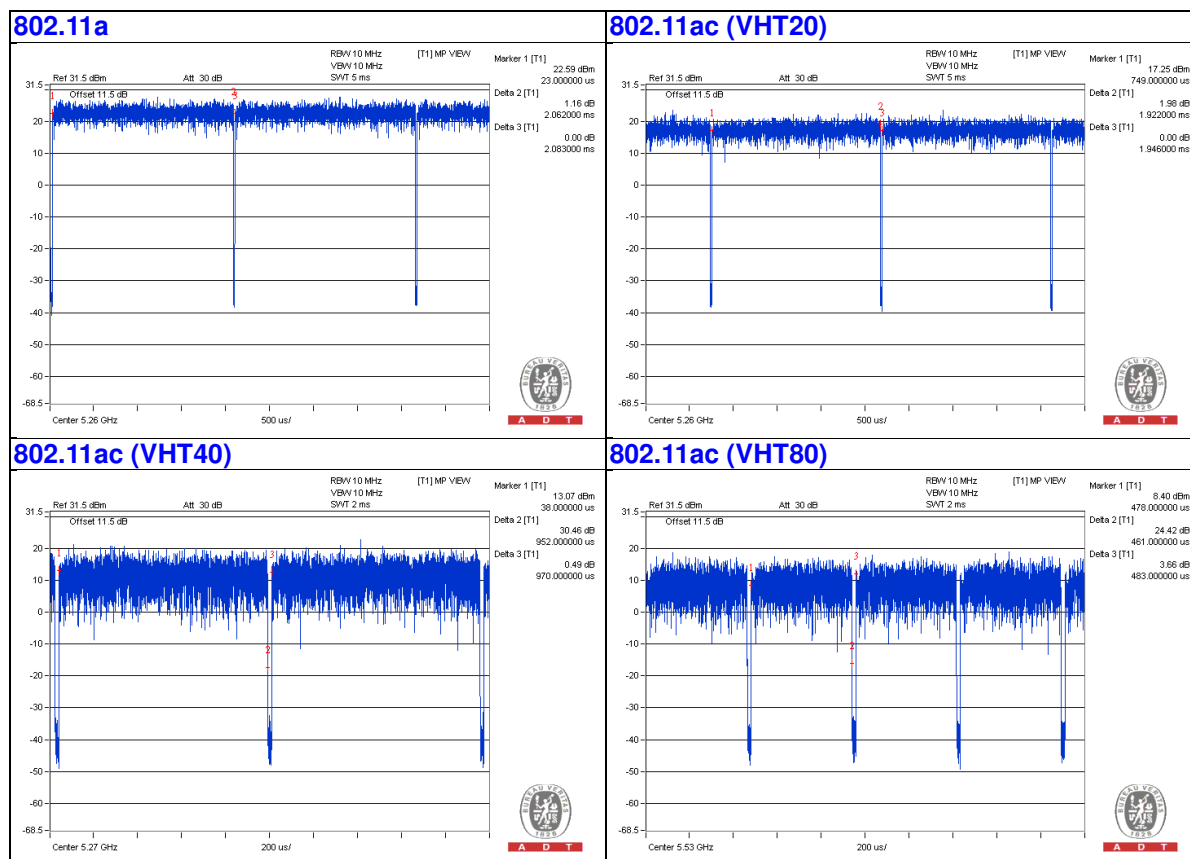
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $2.062 \text{ ms} / 2.083 \text{ ms} = 0.99$

802.11ac (VHT20): Duty cycle = $1.922 \text{ ms} / 1.946 \text{ ms} = 0.988$

802.11ac (VHT40): Duty cycle = $0.952 \text{ ms} / 0.97 \text{ ms} = 0.981$

802.11ac (VHT80): Duty cycle = $0.461 \text{ ms} / 0.483 \text{ ms} = 0.954$, Duty factor = $10 * \log(1/0.954) = 0.2$



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB 3.0 HDD	WD	WDBACW0010HBK-SESN	WCAZAL625787	FCC DoC	Provided by Lab.
B.	NOTEBOOK COMPUTER	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D.	TELEPHONE	WONDER	WD-303	7C17KA05211	NA	Provided by Lab
	TELEPHONE	WONDER	WD-303	7C17KA04011	NA	Provided by Lab
E.	UPS POWER	Cyber Power	CSN27U12V3	NA	NA	Supplied by Client.

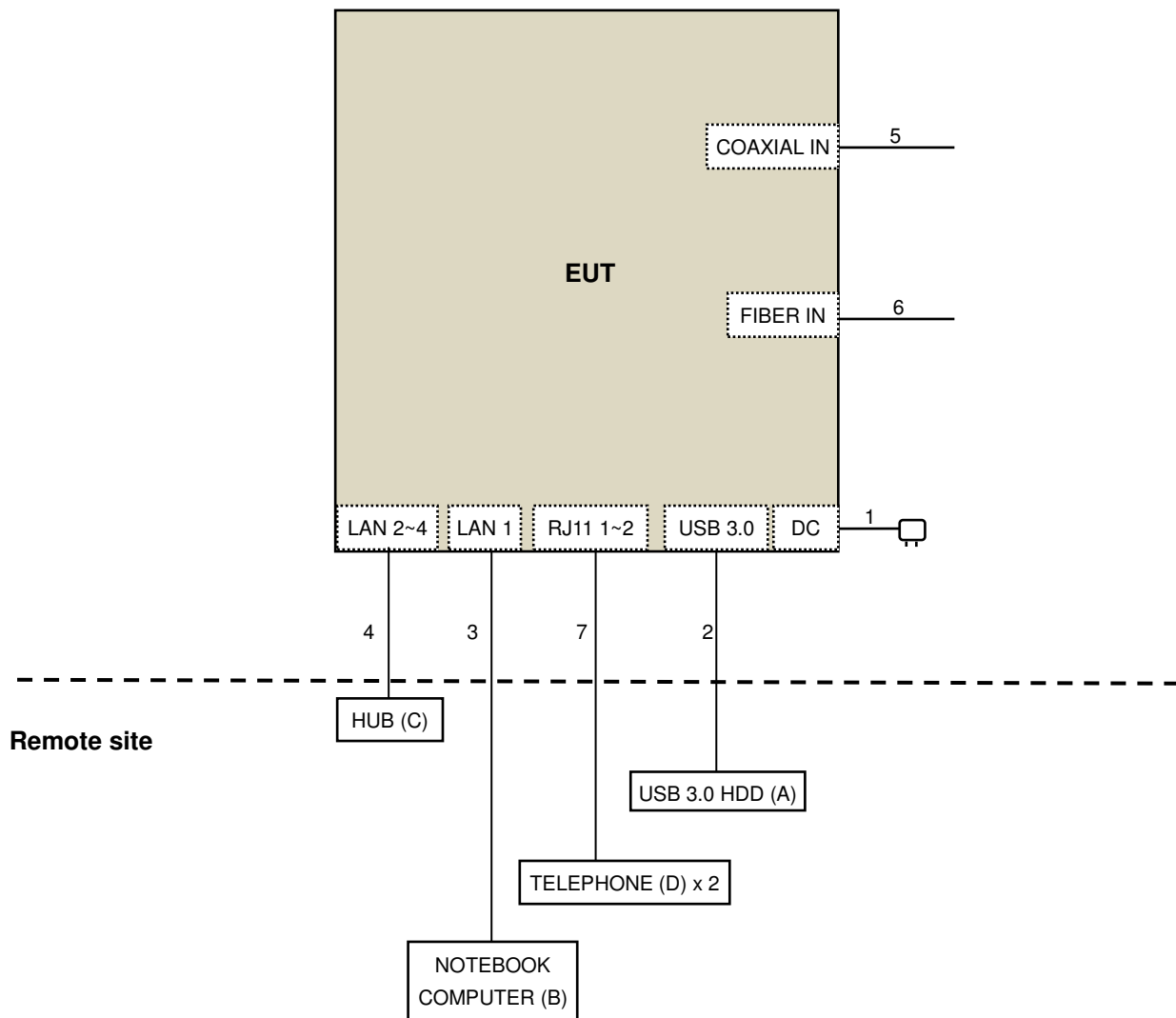
Note:

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

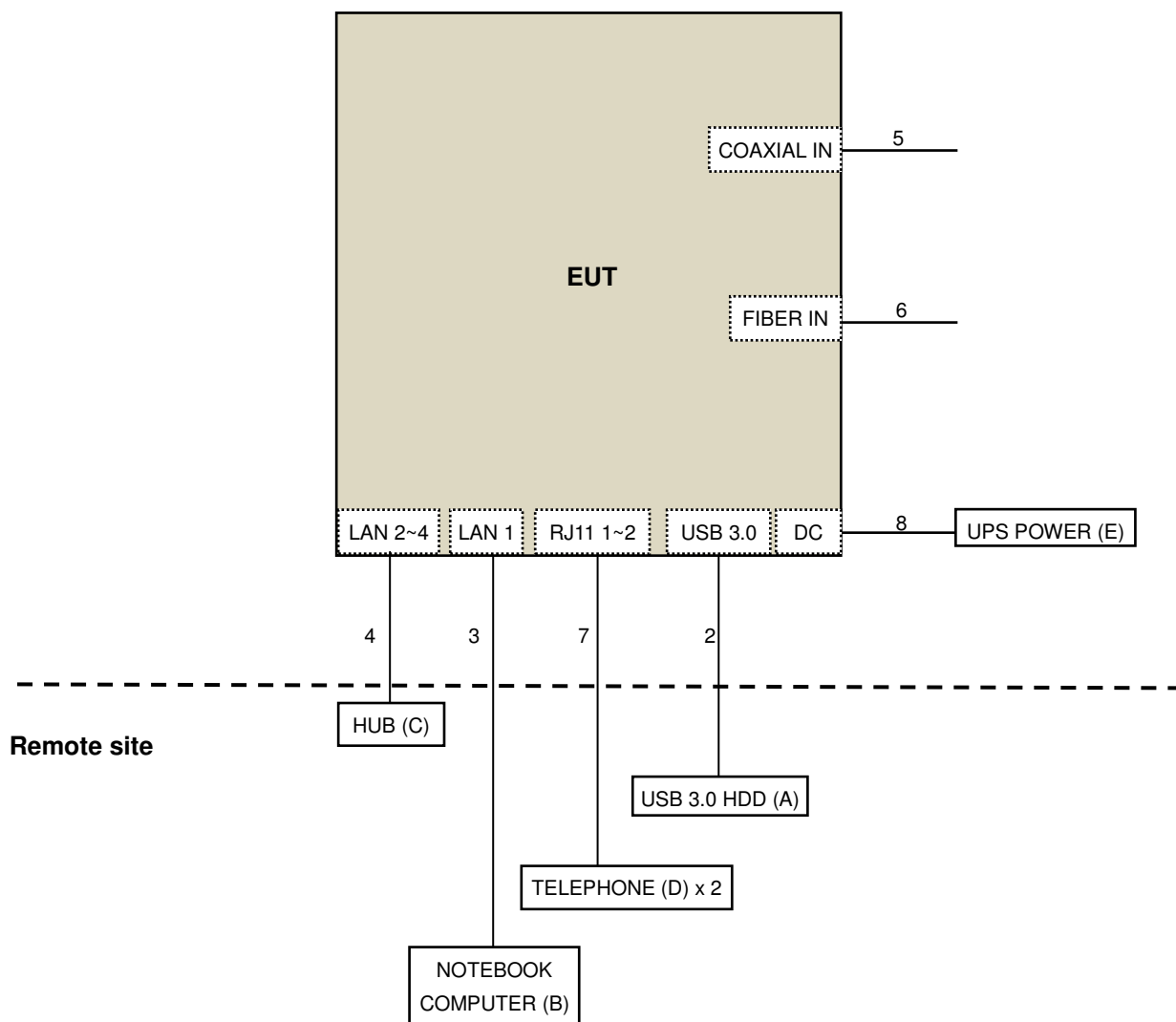
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC	1	1.4	No	0	Supplied by Client.
2.	USB	1	0.45	Yes	0	Provided by Lab
3.	RJ45	1	10	No	0	Provided by Lab
4.	RJ45	3	10	No	0	Provided by Lab
5.	COAXIAL	1	4	No	0	Provided by Lab
6.	FIBER	1	5	No	0	Supplied by Client.
7.	RJ11	2	10	No	0	Provided by Lab
8.	UPS	1	1	No	0	Provided by Lab

3.4.1 Configuration of System under Test

For mode 1



For mode 2



3.5 General Description of Applied Standard

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)

KDB 789033 D02 General UNII Test Procedure New Rules v01r03

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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.

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v01r03			Field Strength at 3m	
			PK:74 (dBμV/m)	AV:54 (dBμV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☐	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8(dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note:

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

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

4.1.2 Test Instruments

For U-NII-2C, U-NII-3 Channel 144 / Channel 142 / Channel 138:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 31, 2015	Mar. 30, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
- 4 Loop antenna was used for all emissions below 30 MHz.
5. The test was performed in 966 Chamber No. 4.
6. The FCC Site Registration No. is 292998
7. The CANADA Site Registration No. is 20331-2
8. Tested Date: Mar. 03, 2016

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-07	May 08, 2015	May 07, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	138	Jan. 18, 2016	Jan. 17, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 03, 2015	Apr. 02, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Spectrum analyzer R&S	FSP 40	100060	May 08, 2015	May 07, 2016
Power meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 3.
5. The FCC Site Registration No. is 147459
6. The CANADA Site Registration No. is 20331-1
7. Tested Date: Feb. 22 to 25, 2016

4.1.3 Test Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) 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:

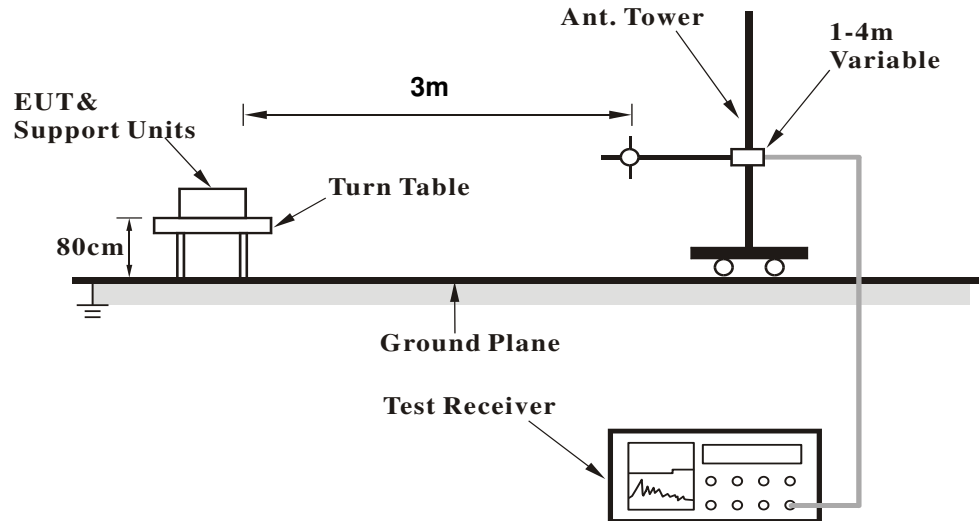
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

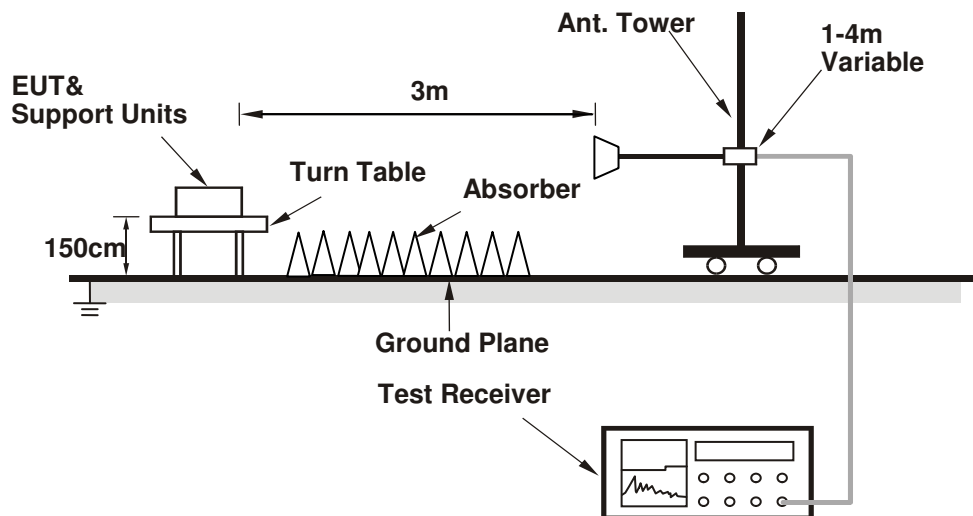
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Condition

- Connected the EUT with the support unit B (Notebook Computer) which is placed on remote site.
- Contorlling software (MTool.exe [2.0.0.7]) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 52	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	5100.00	46.9 PK	74.0	-27.1	2.66 H	342	38.79	8.11
2	5100.00	36.4 AV	54.0	-17.6	2.66 H	342	28.29	8.11
3	*5260.00	102.4 PK			2.66 H	342	93.77	8.63
4	*5260.00	92.1 AV			2.66 H	342	83.47	8.63
5	5420.00	51.8 PK	74.0	-22.2	2.66 H	342	42.79	9.01
6	5420.00	40.4 AV	54.0	-13.6	2.66 H	342	31.39	9.01
7	#10520.00	66.3 PK	74.0	-7.7	1.45 H	277	51.84	14.46
8	#10520.00	53.7 AV	54.0	-0.3	1.45 H	277	39.24	14.46
9	15780.00	66.4 PK	74.0	-7.6	1.57 H	266	47.18	19.22
10	15780.00	51.5 AV	54.0	-2.5	1.57 H	266	32.28	19.22
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	5100.00	56.9 PK	74.0	-17.1	2.02 V	330	48.79	8.11
2	5100.00	45.4 AV	54.0	-8.6	2.02 V	330	37.29	8.11
3	*5260.00	110.9 PK			1.94 V	333	102.27	8.63
4	*5260.00	102.4 AV			1.94 V	333	93.77	8.63
5	5420.00	60.2 PK	74.0	-13.8	1.94 V	333	51.19	9.01
6	5420.00	49.7 AV	54.0	-4.3	1.94 V	333	40.69	9.01
7	#10520.00	61.7 PK	74.0	-12.3	2.72 V	108	47.24	14.46
8	#10520.00	49.5 AV	54.0	-4.5	2.72 V	108	35.04	14.46
9	15780.00	65.0 PK	74.0	-9.0	1.73 V	270	45.78	19.22
10	15780.00	49.8 AV	54.0	-4.2	1.73 V	270	30.58	19.22

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 60	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	5080.00	44.6 PK	74.0	-29.4	2.54 H	330	36.54	8.06
2	5080.00	36.4 AV	54.0	-17.6	2.54 H	330	28.34	8.06
3	*5300.00	102.6 PK			2.71 H	332	93.91	8.69
4	*5300.00	92.3 AV			2.71 H	332	83.61	8.69
5	5380.00	50.2 PK	74.0	-23.8	2.68 H	316	41.32	8.88
6	5380.00	40.3 AV	54.0	-13.7	2.68 H	316	31.42	8.88
7	10600.00	65.9 PK	74.0	-8.1	1.47 H	261	51.36	14.54
8	10600.00	53.6 AV	54.0	-0.4	1.47 H	261	39.06	14.54
9	15900.00	66.6 PK	74.0	-7.4	1.52 H	260	47.21	19.39
10	15900.00	51.9 AV	54.0	-2.1	1.52 H	260	32.51	19.39

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	5080.00	52.9 PK	74.0	-21.1	1.56 V	259	44.84	8.06
2	5080.00	45.0 AV	54.0	-9.0	1.56 V	259	36.94	8.06
3	*5300.00	111.0 PK			1.99 V	330	102.31	8.69
4	*5300.00	102.5 AV			1.99 V	330	93.81	8.69
5	5380.00	59.9 PK	74.0	-14.1	2.00 V	334	51.02	8.88
6	5380.00	50.4 AV	54.0	-3.6	2.00 V	334	41.52	8.88
7	10600.00	61.5 PK	74.0	-12.5	2.67 V	131	46.96	14.54
8	10600.00	49.2 AV	54.0	-4.8	2.67 V	131	34.66	14.54
9	15900.00	64.6 PK	74.0	-9.4	1.72 V	280	45.21	19.39
10	15900.00	49.4 AV	54.0	-4.6	1.72 V	280	30.01	19.39

REMARKS:

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

CHANNEL	TX Channel 64	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	*5320.00	102.7 PK			2.66 H	327	93.97	8.73
2	*5320.00	92.2 AV			2.66 H	327	83.47	8.73
3	5350.00	53.6 PK	74.0	-20.4	2.66 H	327	44.80	8.80
4	5350.00	41.6 AV	54.0	-12.4	2.66 H	327	32.80	8.80
5	5400.00	51.7 PK	74.0	-22.3	2.54 H	330	42.77	8.93
6	5400.00	40.4 AV	54.0	-13.6	2.54 H	330	31.47	8.93
7	10640.00	65.9 PK	74.0	-8.1	1.48 H	262	51.32	14.58
8	10640.00	53.5 AV	54.0	-0.5	1.48 H	262	38.92	14.58
9	15960.00	66.8 PK	74.0	-7.2	1.54 H	248	47.45	19.35
10	15960.00	52.1 AV	54.0	-1.9	1.54 H	248	32.75	19.35

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	112.9 PK			1.94 V	336	104.17	8.73
2	*5320.00	102.1 AV			1.94 V	336	93.37	8.73
3	5350.00	63.5 PK	74.0	-10.5	1.94 V	336	54.70	8.80
4	5350.00	51.4 AV	54.0	-2.6	1.94 V	336	42.60	8.80
5	5400.00	61.5 PK	74.0	-12.5	1.86 V	335	52.57	8.93
6	5400.00	50.7 AV	54.0	-3.3	1.86 V	335	41.77	8.93
7	10640.00	61.0 PK	74.0	-13.0	2.77 V	124	46.42	14.58
8	10640.00	49.1 AV	54.0	-4.9	2.77 V	124	34.52	14.58
9	15960.00	64.2 PK	74.0	-9.8	1.62 V	284	44.85	19.35
10	15960.00	49.1 AV	54.0	-4.9	1.62 V	284	29.75	19.35

REMARKS:

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

CHANNEL	TX Channel 100	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	5422.10	52.6 PK	74.0	-21.4	2.69 H	309	43.59	9.01
2	5422.10	42.5 AV	54.0	-11.5	2.69 H	309	33.49	9.01
3	#5470.00	62.4 PK	74.0	-11.6	2.55 H	314	53.22	9.18
4	#5470.00	44.6 AV	54.0	-9.4	2.55 H	314	35.42	9.18
5	*5500.00	102.1 PK			2.67 H	353	92.81	9.29
6	*5500.00	92.0 AV			2.67 H	353	82.71	9.29
7	11000.00	66.0 PK	74.0	-8.0	1.50 H	264	50.73	15.27
8	11000.00	53.2 AV	54.0	-0.8	1.50 H	264	37.93	15.27
9	#16500.00	67.0 PK	74.0	-7.0	1.50 H	235	46.13	20.87
10	#16500.00	52.1 AV	54.0	-1.9	1.50 H	235	31.23	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	5422.10	62.8 PK	74.0	-11.2	1.93 V	334	53.79	9.01
2	5422.10	52.5 AV	54.0	-1.5	1.93 V	334	43.49	9.01
3	#5470.00	72.2 PK	74.0	-1.8	1.92 V	333	63.02	9.18
4	#5470.00	52.3 AV	54.0	-1.7	1.92 V	333	43.12	9.18
5	*5500.00	112.6 PK			1.93 V	333	103.31	9.29
6	*5500.00	102.4 AV			1.93 V	333	93.11	9.29
7	11000.00	61.5 PK	74.0	-12.5	2.68 V	113	46.23	15.27
8	11000.00	49.3 AV	54.0	-4.7	2.68 V	113	34.03	15.27
9	#16500.00	64.3 PK	74.0	-9.7	1.70 V	258	43.43	20.87
10	#16500.00	49.3 AV	54.0	-4.7	1.70 V	258	28.43	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.

CHANNEL	TX Channel 116	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	5423.00	48.3 PK	74.0	-25.7	2.77 H	346	39.29	9.01
2	5423.00	38.4 AV	54.0	-15.6	2.77 H	346	29.39	9.01
3	*5580.00	102.5 PK			2.69 H	356	93.15	9.35
4	*5580.00	92.2 AV			2.69 H	356	82.85	9.35
5	#5734.90	52.4 PK	74.0	-21.6	2.69 H	351	42.67	9.73
6	#5734.90	40.5 AV	54.0	-13.5	2.69 H	351	30.77	9.73
7	11160.00	65.7 PK	74.0	-8.3	1.51 H	253	50.46	15.24
8	11160.00	53.3 AV	54.0	-0.7	1.51 H	253	38.06	15.24
9	#16740.00	66.7 PK	74.0	-7.3	1.54 H	232	44.93	21.77
10	#16740.00	51.9 AV	54.0	-2.1	1.54 H	232	30.13	21.77

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	5423.00	56.1 PK	74.0	-17.9	2.12 V	251	47.09	9.01
2	5423.00	46.3 AV	54.0	-7.7	2.12 V	251	37.29	9.01
3	*5580.00	112.8 PK			1.91 V	347	103.45	9.35
4	*5580.00	102.1 AV			1.91 V	347	92.75	9.35
5	#5734.90	61.4 PK	74.0	-12.6	1.73 V	337	51.67	9.73
6	#5734.90	49.3 AV	54.0	-4.7	1.73 V	337	39.57	9.73
7	11160.00	62.0 PK	74.0	-12.0	2.73 V	123	46.76	15.24
8	11160.00	49.7 AV	54.0	-4.3	2.73 V	123	34.46	15.24
9	#16740.00	64.4 PK	74.0	-9.6	1.66 V	254	42.63	21.77
10	#16740.00	49.3 AV	54.0	-4.7	1.66 V	254	27.53	21.77

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 140	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	*5700.00	102.7 PK			2.60 H	332	93.06	9.64
2	*5700.00	92.5 AV			2.60 H	332	82.86	9.64
3	#5725.00	59.4 PK	74.0	-14.6	2.60 H	332	49.70	9.70
4	#5725.00	43.6 AV	54.0	-10.4	2.60 H	332	33.90	9.70
5	#5786.20	54.5 PK	74.0	-19.5	2.54 H	314	44.65	9.85
6	#5786.20	44.6 AV	54.0	-9.4	2.54 H	314	34.75	9.85
7	11400.00	65.0 PK	74.0	-9.0	1.44 H	272	49.65	15.35
8	11400.00	52.9 AV	54.0	-1.1	1.44 H	272	37.55	15.35
9	#17100.00	66.5 PK	74.0	-7.5	1.55 H	262	42.70	23.80
10	#17100.00	51.8 AV	54.0	-2.2	1.55 H	262	28.00	23.80

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	112.8 PK			1.53 V	340	103.16	9.64
2	*5700.00	103.1 AV			1.53 V	340	93.46	9.64
3	#5725.00	69.2 PK	74.0	-4.8	1.53 V	340	59.50	9.70
4	#5725.00	53.4 AV	54.0	-0.6	1.53 V	340	43.70	9.70
5	#5786.20	63.6 PK	74.0	-10.4	1.98 V	339	53.75	9.85
6	#5786.20	53.0 AV	54.0	-1.0	1.98 V	339	43.15	9.85
7	11400.00	61.4 PK	74.0	-12.6	2.64 V	104	46.05	15.35
8	11400.00	49.4 AV	54.0	-4.6	2.64 V	104	34.05	15.35
9	#17100.00	64.5 PK	74.0	-9.5	1.69 V	271	40.70	23.80
10	#17100.00	49.7 AV	54.0	-4.3	1.69 V	271	25.90	23.80

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 144	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	#5470.00	52.1 PK	74.0	-21.9	2.65 H	342	50.73	1.37
2	#5470.00	40.2 AV	54.0	-13.8	2.65 H	342	38.83	1.37
3	*5720.00	102.8 PK			2.65 H	342	101.13	1.67
4	*5720.00	92.4 AV			2.65 H	342	90.73	1.67
5	#5850.00	54.3 PK	74.0	-19.7	2.65 H	342	52.53	1.77
6	#5850.00	42.4 AV	54.0	-11.6	2.65 H	342	40.63	1.77
7	11440.00	65.6 PK	74.0	-8.4	1.46 H	275	53.03	12.57
8	11440.00	53.2 AV	54.0	-0.8	1.46 H	275	40.63	12.57
9	#17160.00	67.2 PK	74.0	-6.8	1.50 H	237	49.82	17.38
10	#17160.00	52.3 AV	54.0	-1.7	1.50 H	237	34.92	17.38

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	53.2 PK	74.0	-20.8	1.49 V	120	51.83	1.37
2	#5470.00	41.5 AV	54.0	-12.5	1.49 V	120	40.13	1.37
3	*5720.00	113.3 PK			1.49 V	120	111.63	1.67
4	*5720.00	103.6 AV			1.49 V	120	101.93	1.67
5	#5850.00	55.2 PK	74.0	-18.8	1.49 V	120	53.43	1.77
6	#5850.00	43.6 AV	54.0	-10.4	1.49 V	120	41.83	1.77
7	11440.00	61.5 PK	74.0	-12.5	2.83 V	134	48.93	12.57
8	11440.00	49.4 AV	54.0	-4.6	2.83 V	134	36.83	12.57
9	#17160.00	63.5 PK	74.0	-10.5	1.57 V	276	46.12	17.38
10	#17160.00	48.6 AV	54.0	-5.4	1.57 V	276	31.22	17.38

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 (VHT20)

CHANNEL	TX Channel 52	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	*5260.00	102.1 PK			2.60 H	329	93.47	8.63
2	*5260.00	91.7 AV			2.60 H	329	83.07	8.63
3	5413.30	47.4 PK	74.0	-26.6	2.60 H	329	38.43	8.97
4	5413.30	38.4 AV	54.0	-15.6	2.60 H	329	29.43	8.97
5	#10520.00	64.5 PK	74.0	-9.5	3.62 H	325	50.04	14.46
6	#10520.00	50.9 AV	54.0	-3.1	3.62 H	325	36.44	14.46
7	15780.00	62.0 PK	74.0	-12.0	1.00 H	320	42.78	19.22
8	15780.00	49.0 AV	54.0	-5.0	1.00 H	320	29.78	19.22
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	112.1 PK			1.40 V	268	103.47	8.63
2	*5260.00	101.8 AV			1.40 V	268	93.17	8.63
3	5413.30	55.6 PK	74.0	-18.4	1.29 V	262	46.63	8.97
4	5413.30	46.8 AV	54.0	-7.2	1.29 V	262	37.83	8.97
5	#10520.00	66.5 PK	74.0	-7.5	1.22 V	321	52.04	14.46
6	#10520.00	51.8 AV	54.0	-2.2	1.22 V	321	37.34	14.46
7	15780.00	64.5 PK	74.0	-9.5	1.68 V	261	45.28	19.22
8	15780.00	49.6 AV	54.0	-4.4	1.68 V	261	30.38	19.22

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 60	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	*5300.00	102.8 PK			2.68 H	346	94.11	8.69
2	*5300.00	92.6 AV			2.68 H	346	83.91	8.69
3	5380.60	52.8 PK	74.0	-21.2	2.77 H	354	43.92	8.88
4	5380.60	42.6 AV	54.0	-11.4	2.77 H	354	33.72	8.88
5	10600.00	64.2 PK	74.0	-9.8	3.57 H	317	49.66	14.54
6	10600.00	50.8 AV	54.0	-3.2	3.57 H	317	36.26	14.54
7	15900.00	62.1 PK	74.0	-11.9	1.04 H	306	42.71	19.39
8	15900.00	49.2 AV	54.0	-4.8	1.04 H	306	29.81	19.39

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	113.3 PK			1.91 V	228	104.61	8.69
2	*5300.00	102.8 AV			1.91 V	228	94.11	8.69
3	5380.60	60.5 PK	74.0	-13.5	1.44 V	271	51.62	8.88
4	5380.60	50.3 AV	54.0	-3.7	1.44 V	271	41.42	8.88
5	10600.00	67.3 PK	74.0	-6.7	1.29 V	321	52.76	14.54
6	10600.00	52.8 AV	54.0	-1.2	1.29 V	321	38.26	14.54
7	15900.00	64.3 PK	74.0	-9.7	1.67 V	260	44.91	19.39
8	15900.00	49.3 AV	54.0	-4.7	1.67 V	260	29.91	19.39

REMARKS:

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

CHANNEL	TX Channel 64	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	*5320.00	102.3 PK			2.64 H	349	93.57	8.73
2	*5320.00	92.0 AV			2.64 H	349	83.27	8.73
3	5397.90	50.4 PK	74.0	-23.6	2.55 H	356	41.48	8.92
4	5397.90	41.6 AV	54.0	-12.4	2.55 H	356	32.68	8.92
5	10640.00	64.3 PK	74.0	-9.7	3.58 H	324	49.72	14.58
6	10640.00	50.8 AV	54.0	-3.2	3.58 H	324	36.22	14.58
7	15960.00	61.7 PK	74.0	-12.3	1.03 H	317	42.35	19.35
8	15960.00	48.6 AV	54.0	-5.4	1.03 H	317	29.25	19.35

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	112.3 PK			1.83 V	240	103.57	8.73
2	*5320.00	102.2 AV			1.83 V	240	93.47	8.73
3	5397.90	59.8 PK	74.0	-14.2	1.57 V	270	50.88	8.92
4	5397.90	50.1 AV	54.0	-3.9	1.57 V	270	41.18	8.92
5	10640.00	66.9 PK	74.0	-7.1	1.30 V	323	52.32	14.58
6	10640.00	52.1 AV	54.0	-1.9	1.30 V	323	37.52	14.58
7	15960.00	64.4 PK	74.0	-9.6	1.69 V	249	45.05	19.35
8	15960.00	49.4 AV	54.0	-4.6	1.69 V	249	30.05	19.35

REMARKS:

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

CHANNEL	TX Channel 100	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	5421.40	51.8 PK	74.0	-22.2	2.68 H	349	42.79	9.01
2	5421.40	41.5 AV	54.0	-12.5	2.68 H	349	32.49	9.01
3	#5470.00	50.4 PK	74.0	-23.6	2.72 H	352	41.22	9.18
4	#5470.00	36.6 AV	54.0	-17.4	2.72 H	352	27.42	9.18
5	*5500.00	103.0 PK			2.72 H	352	93.71	9.29
6	*5500.00	92.5 AV			2.72 H	352	83.21	9.29
7	11000.00	63.8 PK	74.0	-10.2	2.12 H	328	48.53	15.27
8	11000.00	50.1 AV	54.0	-3.9	2.12 H	328	34.83	15.27
9	#16500.00	64.1 PK	74.0	-9.9	1.41 H	277	43.23	20.87
10	#16500.00	49.8 AV	54.0	-4.2	1.41 H	277	28.93	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	5421.40	61.5 PK	74.0	-12.5	1.48 V	271	52.49	9.01
2	5421.40	50.4 AV	54.0	-3.6	1.48 V	271	41.39	9.01
3	#5470.00	59.4 PK	74.0	-14.6	1.89 V	231	50.22	9.18
4	#5470.00	43.3 AV	54.0	-10.7	1.89 V	231	34.12	9.18
5	*5500.00	112.8 PK			1.89 V	231	103.51	9.29
6	*5500.00	102.6 AV			1.89 V	231	93.31	9.29
7	11000.00	65.8 PK	74.0	-8.2	1.33 V	325	50.53	15.27
8	11000.00	51.8 AV	54.0	-2.2	1.33 V	325	36.53	15.27
9	#16500.00	64.3 PK	74.0	-9.7	1.66 V	249	43.43	20.87
10	#16500.00	49.5 AV	54.0	-4.5	1.66 V	249	28.63	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.

CHANNEL	TX Channel 116	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	*5580.00	102.1 PK			2.64 H	353	92.75	9.35
2	*5580.00	91.8 AV			2.64 H	353	82.45	9.35
3	#5737.30	50.4 PK	74.0	-23.6	2.54 H	344	40.66	9.74
4	#5737.30	40.4 AV	54.0	-13.6	2.54 H	344	30.66	9.74
5	11160.00	68.4 PK	74.0	-5.6	2.14 H	329	53.16	15.24
6	11160.00	53.2 AV	54.0	-0.8	2.14 H	329	37.96	15.24
7	#16740.00	64.1 PK	74.0	-9.9	1.46 H	293	42.33	21.77
8	#16740.00	49.9 AV	54.0	-4.1	1.46 H	293	28.13	21.77

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	113.0 PK			1.93 V	219	103.65	9.35
2	*5580.00	102.8 AV			1.93 V	219	93.45	9.35
3	#5737.30	59.1 PK	74.0	-14.9	1.70 V	312	49.36	9.74
4	#5737.30	49.6 AV	54.0	-4.4	1.70 V	312	39.86	9.74
5	11160.00	65.7 PK	74.0	-8.3	1.62 V	323	50.46	15.24
6	11160.00	52.3 AV	54.0	-1.7	1.62 V	323	37.06	15.24
7	#16740.00	64.7 PK	74.0	-9.3	1.65 V	254	42.93	21.77
8	#16740.00	50.0 AV	54.0	-4.0	1.65 V	254	28.23	21.77

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 140	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	*5700.00	102.1 PK			2.68 H	335	92.46	9.64
2	*5700.00	92.1 AV			2.68 H	335	82.46	9.64
3	#5725.00	52.6 PK	74.0	-21.4	2.68 H	335	42.90	9.70
4	#5725.00	42.2 AV	54.0	-11.8	2.68 H	335	32.50	9.70
5	#5777.30	54.6 PK	74.0	-19.4	2.77 H	340	44.77	9.83
6	#5777.30	44.2 AV	54.0	-9.8	2.77 H	340	34.37	9.83
7	11400.00	67.5 PK	74.0	-6.5	2.12 H	289	52.15	15.35
8	11400.00	53.3 AV	54.0	-0.7	2.12 H	289	37.95	15.35
9	#17100.00	65.1 PK	74.0	-8.9	1.52 H	293	41.30	23.80
10	#17100.00	51.4 AV	54.0	-2.6	1.52 H	293	27.60	23.80

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	113.2 PK			1.56 V	245	103.56	9.64
2	*5700.00	102.8 AV			1.56 V	245	93.16	9.64
3	#5725.00	64.4 PK	74.0	-9.6	1.60 V	244	54.70	9.70
4	#5725.00	50.4 AV	54.0	-3.6	1.60 V	244	40.70	9.70
5	#5777.30	62.3 PK	74.0	-11.7	2.00 V	308	52.47	9.83
6	#5777.30	52.1 AV	54.0	-1.9	2.00 V	308	42.27	9.83
7	11400.00	62.1 PK	74.0	-11.9	1.51 V	323	46.75	15.35
8	11400.00	49.6 AV	54.0	-4.4	1.51 V	323	34.25	15.35
9	#17100.00	57.3 PK	74.0	-16.7	1.56 V	245	33.50	23.80
10	#17100.00	44.7 AV	54.0	-9.3	1.56 V	245	20.90	23.80

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 144	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	#5470.00	52.1 PK	74.0	-21.9	2.71 H	323	50.73	1.37
2	#5470.00	39.6 AV	54.0	-14.4	2.71 H	323	38.23	1.37
3	*5720.00	101.9 PK			2.71 H	323	100.23	1.67
4	*5720.00	92.0 AV			2.71 H	323	90.33	1.67
5	#5850.00	52.4 PK	74.0	-21.6	2.71 H	323	50.63	1.77
6	#5850.00	40.2 AV	54.0	-13.8	2.71 H	323	38.43	1.77
7	11440.00	66.9 PK	74.0	-7.1	1.44 H	330	54.33	12.57
8	11440.00	53.8 AV	54.0	-0.2	1.44 H	330	41.23	12.57
9	#17160.00	64.7 PK	74.0	-9.3	1.56 H	302	47.32	17.38
10	#17160.00	51.0 AV	54.0	-3.0	1.56 H	302	33.62	17.38

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	53.0 PK	74.0	-21.0	2.37 V	269	51.63	1.37
2	#5470.00	40.6 AV	54.0	-13.4	2.37 V	269	39.23	1.37
3	*5720.00	112.8 PK			2.37 V	269	111.13	1.67
4	*5720.00	103.6 AV			2.37 V	269	101.93	1.67
5	#5850.00	53.4 PK	74.0	-20.6	2.37 V	269	51.63	1.77
6	#5850.00	41.8 AV	54.0	-12.2	2.37 V	269	40.03	1.77
7	11440.00	62.4 PK	74.0	-11.6	1.53 V	309	49.83	12.57
8	11440.00	50.1 AV	54.0	-3.9	1.53 V	309	37.53	12.57
9	#17160.00	56.9 PK	74.0	-17.1	1.59 V	232	39.52	17.38
10	#17160.00	44.5 AV	54.0	-9.5	1.59 V	232	27.12	17.38

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 54	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	51.4 PK	74.0	-22.6	2.70 H	142	43.07	8.33
2	5150.00	40.6 AV	54.0	-13.4	2.70 H	142	32.27	8.33
3	*5270.00	103.4 PK			2.70 H	142	94.76	8.64
4	*5270.00	90.9 AV			2.70 H	142	82.26	8.64
5	5350.00	51.6 PK	74.0	-22.4	2.70 H	142	42.80	8.80
6	5350.00	42.2 AV	54.0	-11.8	2.70 H	142	33.40	8.80
7	#10540.00	64.4 PK	74.0	-9.6	1.38 H	284	49.93	14.47
8	#10540.00	52.8 AV	54.0	-1.2	1.38 H	284	38.33	14.47
9	15810.00	64.1 PK	74.0	-9.9	1.32 H	236	44.80	19.30
10	15810.00	50.4 AV	54.0	-3.6	1.32 H	236	31.10	19.30
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	5150.00	53.2 PK	74.0	-20.8	1.39 V	270	44.87	8.33
2	5150.00	41.6 AV	54.0	-12.4	1.39 V	270	33.27	8.33
3	*5270.00	112.4 PK			1.39 V	270	103.76	8.64
4	*5270.00	101.1 AV			1.39 V	270	92.46	8.64
5	5350.00	62.7 PK	74.0	-11.3	1.44 V	272	53.90	8.80
6	5350.00	51.1 AV	54.0	-2.9	1.44 V	272	42.30	8.80
7	#10540.00	62.9 PK	74.0	-11.1	1.38 V	84	48.43	14.47
8	#10540.00	50.3 AV	54.0	-3.7	1.38 V	84	35.83	14.47
9	15810.00	63.3 PK	74.0	-10.7	1.62 V	258	44.00	19.30
10	15810.00	49.0 AV	54.0	-5.0	1.62 V	258	29.70	19.30

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

CHANNEL	TX Channel 62	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	*5310.00	103.9 PK			2.65 H	136	95.18	8.72
2	*5310.00	91.1 AV			2.65 H	136	82.38	8.72
3	5352.50	60.4 PK	74.0	-13.6	2.65 H	136	51.58	8.82
4	5352.50	44.4 AV	54.0	-9.6	2.65 H	136	35.58	8.82
5	#5752.50	50.3 PK	68.2	-17.9	2.00 H	197	40.53	9.77
6	10620.00	64.6 PK	74.0	-9.4	1.35 H	279	50.03	14.57
7	10620.00	52.6 AV	54.0	-1.4	1.35 H	279	38.03	14.57
8	15930.00	65.1 PK	74.0	-8.9	1.31 H	230	45.73	19.37
9	15930.00	51.1 AV	54.0	-2.9	1.31 H	230	31.73	19.37

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	111.8 PK			1.48 V	270	103.08	8.72
2	*5310.00	101.4 AV			1.48 V	270	92.68	8.72
3	5352.50	67.4 PK	74.0	-6.6	1.48 V	270	58.58	8.82
4	5352.50	52.2 AV	54.0	-1.8	1.48 V	270	43.38	8.82
5	#5752.50	60.8 PK	68.2	-7.4	2.03 V	266	51.03	9.77
6	10620.00	62.7 PK	74.0	-11.3	1.42 V	98	48.13	14.57
7	10620.00	50.3 AV	54.0	-3.7	1.42 V	98	35.73	14.57
8	15930.00	63.2 PK	74.0	-10.8	1.57 V	269	43.83	19.37
9	15930.00	49.1 AV	54.0	-4.9	1.57 V	269	29.73	19.37

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 102	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	5433.10	51.6 PK	74.0	-22.4	2.60 H	142	42.55	9.05
2	5433.10	41.4 AV	54.0	-12.6	2.60 H	142	32.35	9.05
3	#5470.00	62.4 PK	74.0	-11.6	2.60 H	142	53.22	9.18
4	#5470.00	43.6 AV	54.0	-10.4	2.60 H	142	34.42	9.18
5	*5510.00	102.4 PK			2.60 H	142	93.11	9.29
6	*5510.00	90.5 AV			2.60 H	142	81.21	9.29
7	#5969.20	48.4 PK	74.0	-25.6	2.32 H	165	38.13	10.27
8	#5969.20	40.6 AV	54.0	-13.4	2.32 H	165	30.33	10.27
9	11020.00	64.4 PK	74.0	-9.6	2.21 H	267	49.13	15.27
10	11020.00	52.2 AV	54.0	-1.8	2.21 H	267	36.93	15.27
11	#16530.00	64.8 PK	74.0	-9.2	1.31 H	249	43.73	21.07
12	#16530.00	51.0 AV	54.0	-3.0	1.31 H	249	29.93	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	5433.10	61.2 PK	74.0	-12.8	1.46 V	270	52.15	9.05
2	5433.10	48.9 AV	54.0	-5.1	1.46 V	270	39.85	9.05
3	#5470.00	73.3 PK	74.0	-0.7	1.93 V	228	64.12	9.18
4	#5470.00	53.1 AV	54.0	-0.9	1.93 V	228	43.92	9.18
5	*5510.00	111.4 PK			1.47 V	259	102.11	9.29
6	*5510.00	99.9 AV			1.47 V	259	90.61	9.29
7	#5969.20	53.4 PK	74.0	-20.6	1.79 V	271	43.13	10.27
8	#5969.20	47.3 AV	54.0	-6.7	1.79 V	271	37.03	10.27
9	11020.00	62.2 PK	74.0	-11.8	1.39 V	107	46.93	15.27
10	11020.00	50.1 AV	54.0	-3.9	1.39 V	107	34.83	15.27
11	#16530.00	63.3 PK	74.0	-10.7	1.61 V	271	42.23	21.07
12	#16530.00	48.8 AV	54.0	-5.2	1.61 V	271	27.73	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.
6. " # ": The radiated frequency is out of the restricted band.

CHANNEL	TX Channel 110	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	#5464.10	54.4 PK	74.0	-19.6	2.43 H	140	45.24	9.16
2	#5464.10	43.6 AV	54.0	-10.4	2.43 H	140	34.44	9.16
3	*5550.00	103.3 PK			2.64 H	139	93.97	9.33
4	*5550.00	90.8 AV			2.64 H	139	81.47	9.33
5	#5725.00	49.2 PK	74.0	-24.8	2.64 H	139	39.50	9.70
6	#5725.00	39.6 AV	54.0	-14.4	2.64 H	139	29.90	9.70
7	11100.00	65.4 PK	74.0	-8.6	2.19 H	272	50.15	15.25
8	11100.00	53.4 AV	54.0	-0.6	2.19 H	272	38.15	15.25
9	#16650.00	64.5 PK	74.0	-9.5	1.38 H	236	42.92	21.58
10	#16650.00	50.9 AV	54.0	-3.1	1.38 H	236	29.32	21.58

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5464.10	63.1 PK	74.0	-10.9	1.32 V	228	53.94	9.16
2	#5464.10	52.7 AV	54.0	-1.3	1.32 V	228	43.54	9.16
3	*5550.00	111.7 PK			1.50 V	256	102.37	9.33
4	*5550.00	100.4 AV			1.50 V	256	91.07	9.33
5	#5725.00	59.6 PK	74.0	-14.4	1.59 V	264	49.90	9.70
6	#5725.00	48.0 AV	54.0	-6.0	1.59 V	264	38.30	9.70
7	11100.00	62.5 PK	74.0	-11.5	1.40 V	102	47.25	15.25
8	11100.00	50.5 AV	54.0	-3.5	1.40 V	102	35.25	15.25
9	#16650.00	63.9 PK	74.0	-10.1	1.62 V	249	42.32	21.58
10	#16650.00	49.3 AV	54.0	-4.7	1.62 V	249	27.72	21.58

REMARKS:

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

CHANNEL	TX Channel 134	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	*5670.00	103.4 PK			2.50 H	142	93.85	9.55
2	*5670.00	90.9 AV			2.50 H	142	81.35	9.55
3	#5736.40	56.6 PK	74.0	-17.4	2.42 H	166	46.86	9.74
4	#5736.40	43.5 AV	54.0	-10.5	2.42 H	166	33.76	9.74
5	11340.00	68.1 PK	74.0	-5.9	1.89 H	288	52.86	15.24
6	11340.00	53.8 AV	54.0	-0.2	1.89 H	288	38.56	15.24
7	#17010.00	64.5 PK	74.0	-9.5	1.33 H	241	41.28	23.22
8	#17010.00	50.7 AV	54.0	-3.3	1.33 H	241	27.48	23.22

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	111.7 PK			1.50 V	257	102.15	9.55
2	*5670.00	100.5 AV			1.50 V	257	90.95	9.55
3	#5736.40	66.4 PK	74.0	-7.6	1.94 V	246	56.66	9.74
4	#5736.40	52.8 AV	54.0	-1.2	1.94 V	246	43.06	9.74
5	11340.00	62.4 PK	74.0	-11.6	1.39 V	94	47.16	15.24
6	11340.00	50.1 AV	54.0	-3.9	1.39 V	94	34.86	15.24
7	#17010.00	63.7 PK	74.0	-10.3	1.64 V	263	40.48	23.22
8	#17010.00	49.1 AV	54.0	-4.9	1.64 V	263	25.88	23.22

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 142	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	#5470.00	44.5 PK	74.0	-29.5	2.52 H	144	43.13	1.37
2	#5470.00	32.4 AV	54.0	-21.6	2.52 H	144	31.03	1.37
3	*5710.00	103.6 PK			2.52 H	144	101.93	1.67
4	*5710.00	91.3 AV			2.52 H	144	89.63	1.67
5	#5850.00	52.4 PK	74.0	-21.6	2.52 H	144	50.63	1.77
6	#5850.00	42.2 AV	54.0	-11.8	2.52 H	144	40.43	1.77
7	11420.00	65.2 PK	74.0	-8.8	1.36 H	330	52.63	12.57
8	11420.00	53.7 AV	54.0	-0.3	1.36 H	330	41.13	12.57
9	#17130.00	64.6 PK	74.0	-9.4	1.30 H	232	47.27	17.33
10	#17130.00	51.0 AV	54.0	-3.0	1.30 H	232	33.67	17.33

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	53.7 PK	74.0	-20.3	2.38 V	268	52.33	1.37
2	#5470.00	41.2 AV	54.0	-12.8	2.38 V	268	39.83	1.37
3	*5710.00	113.8 PK			2.38 V	268	112.13	1.67
4	*5710.00	102.1 AV			2.38 V	268	100.43	1.67
5	#5850.00	57.6 PK	74.0	-16.4	2.38 V	268	55.83	1.77
6	#5850.00	47.0 AV	54.0	-7.0	2.38 V	268	45.23	1.77
7	11420.00	61.8 PK	74.0	-12.2	1.40 V	82	49.23	12.57
8	11420.00	49.7 AV	54.0	-4.3	1.40 V	82	37.13	12.57
9	#17130.00	63.1 PK	74.0	-10.9	1.63 V	271	45.77	17.33
10	#17130.00	48.7 AV	54.0	-5.3	1.63 V	271	31.37	17.33

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 58	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	51.6 PK	74.0	-22.4	2.44 H	146	43.27	8.33
2	5150.00	38.4 AV	54.0	-15.6	2.44 H	146	30.07	8.33
3	*5290.00	97.5 PK			2.44 H	146	88.82	8.68
4	*5290.00	85.4 AV			2.44 H	146	76.72	8.68
5	5350.00	57.4 PK	74.0	-16.6	2.44 H	146	48.60	8.80
6	5350.00	42.4 AV	54.0	-11.6	2.44 H	146	33.60	8.80
7	#10580.00	65.4 PK	74.0	-8.6	1.94 H	302	50.88	14.52
8	#10580.00	51.5 AV	54.0	-2.5	1.94 H	302	36.98	14.52
9	15870.00	63.6 PK	74.0	-10.4	1.30 H	255	44.25	19.35
10	15870.00	49.6 AV	54.0	-4.4	1.30 H	255	30.25	19.35

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	56.2 PK	74.0	-17.8	1.54 V	272	47.87	8.33
2	5150.00	42.8 AV	54.0	-11.2	1.54 V	272	34.47	8.33
3	*5290.00	108.2 PK			1.54 V	272	99.52	8.68
4	*5290.00	96.8 AV			1.54 V	272	88.12	8.68
5	5350.00	67.4 PK	74.0	-6.6	1.54 V	272	58.60	8.80
6	5350.00	52.9 AV	54.0	-1.1	1.54 V	272	44.10	8.80
7	#10580.00	60.0 PK	74.0	-14.0	1.41 V	98	45.48	14.52
8	#10580.00	48.8 AV	54.0	-5.2	1.41 V	98	34.28	14.52
9	15870.00	62.0 PK	74.0	-12.0	1.68 V	262	42.65	19.35
10	15870.00	47.2 AV	54.0	-6.8	1.68 V	262	27.85	19.35

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.

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.2 PK	74.0	-11.8	2.48 H	158	53.06	9.14
2	5460.00	42.6 AV	54.0	-11.4	2.48 H	158	33.46	9.14
3	#5470.00	62.5 PK	74.0	-11.5	2.48 H	158	53.32	9.18
4	#5470.00	44.6 AV	54.0	-9.4	2.48 H	158	35.42	9.18
5	*5530.00	96.6 PK			2.48 H	158	87.29	9.31
6	*5530.00	94.4 AV			2.48 H	158	85.09	9.31
7	#5725.00	54.6 PK	74.0	-19.4	2.48 H	158	44.90	9.70
8	#5725.00	38.6 AV	54.0	-15.4	2.48 H	158	28.90	9.70
9	11060.00	65.2 PK	74.0	-8.8	1.93 H	291	49.94	15.26
10	11060.00	51.3 AV	54.0	-2.7	1.93 H	291	36.04	15.26
11	#16590.00	63.7 PK	74.0	-10.3	1.24 H	251	42.26	21.44
12	#16590.00	49.5 AV	54.0	-4.5	1.24 H	251	28.06	21.44

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	70.0 PK	74.0	-4.0	1.44 V	263	60.86	9.14
2	5460.00	51.5 AV	54.0	-2.5	1.44 V	263	42.36	9.14
3	#5470.00	73.8 PK	74.0	-0.2	1.44 V	263	64.62	9.18
4	#5470.00	53.1 AV	54.0	-0.9	1.44 V	263	43.92	9.18
5	*5530.00	109.1 PK			1.44 V	263	99.79	9.31
6	*5530.00	95.7 AV			1.44 V	263	86.39	9.31
7	#5725.00	62.6 PK	74.0	-11.4	1.44 V	263	52.90	9.70
8	#5725.00	43.5 AV	54.0	-10.5	1.44 V	263	33.80	9.70
9	11060.00	60.4 PK	74.0	-13.6	1.35 V	93	45.14	15.26
10	11060.00	49.3 AV	54.0	-4.7	1.35 V	93	34.04	15.26
11	#16590.00	61.9 PK	74.0	-12.1	1.60 V	251	40.46	21.44
12	#16590.00	47.1 AV	54.0	-6.9	1.60 V	251	25.66	21.44

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 138	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	#5470.00	52.1 PK	74.0	-21.9	2.41 H	152	50.73	1.37
2	#5470.00	40.2 AV	54.0	-13.8	2.41 H	152	38.83	1.37
3	*5690.00	96.8 PK			2.41 H	152	95.15	1.65
4	*5690.00	84.9 AV			2.41 H	152	83.25	1.65
5	#5850.00	50.4 PK	74.0	-23.6	2.41 H	152	48.63	1.77
6	#5850.00	37.6 AV	54.0	-16.4	2.41 H	152	35.83	1.77
7	11380.00	66.2 PK	74.0	-7.8	1.85 H	305	53.54	12.66
8	11380.00	51.8 AV	54.0	-2.2	1.85 H	305	39.14	12.66
9	#17070.00	63.3 PK	74.0	-10.7	1.24 H	239	46.09	17.21
10	#17070.00	49.5 AV	54.0	-4.5	1.24 H	239	32.29	17.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	53.3 PK	74.0	-20.7	2.33 V	267	51.93	1.37
2	#5470.00	41.3 AV	54.0	-12.7	2.33 V	267	39.93	1.37
3	*5690.00	110.7 PK			2.33 V	267	109.05	1.65
4	*5690.00	97.9 AV			2.33 V	267	96.25	1.65
5	#5850.00	59.4 PK	74.0	-14.6	2.33 V	267	57.63	1.77
6	#5850.00	46.2 AV	54.0	-7.8	2.33 V	267	44.43	1.77
7	11380.00	59.7 PK	74.0	-14.3	1.43 V	115	47.04	12.66
8	11380.00	48.4 AV	54.0	-5.6	1.43 V	115	35.74	12.66
9	#17070.00	62.4 PK	74.0	-11.6	1.70 V	254	45.19	17.21
10	#17070.00	47.5 AV	54.0	-6.5	1.70 V	254	30.29	17.21

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.

Below 1GHz Data:

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.41	33.1 QP	40.0	-6.9	1.24 H	301	42.72	-9.61
2	189.12	30.0 QP	43.5	-13.5	1.45 H	100	40.97	-10.96
3	219.15	33.7 QP	46.0	-12.3	1.67 H	301	44.86	-11.19
4	403.57	41.0 QP	46.0	-5.0	1.78 H	245	45.97	-4.96
5	625.72	31.7 QP	46.0	-14.3	1.88 H	45	31.42	0.25
6	800.12	34.5 QP	46.0	-11.5	1.74 H	278	31.47	3.04
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	33.21	33.3 QP	40.0	-6.7	1.45 V	100	42.96	-9.65
2	85.52	31.4 QP	40.0	-8.6	1.34 V	67	45.27	-13.85
3	218.41	35.5 QP	46.0	-10.5	1.74 V	100	46.77	-11.25
4	351.31	39.1 QP	46.0	-6.9	1.74 V	88	45.36	-6.26
5	400.25	39.6 QP	46.0	-6.4	1.87 V	300	44.66	-5.02
6	625.24	34.4 QP	46.0	-11.6	1.24 V	99	34.17	0.25

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	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 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 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: Jan. 28, 2016

4.2.3 Test Procedure

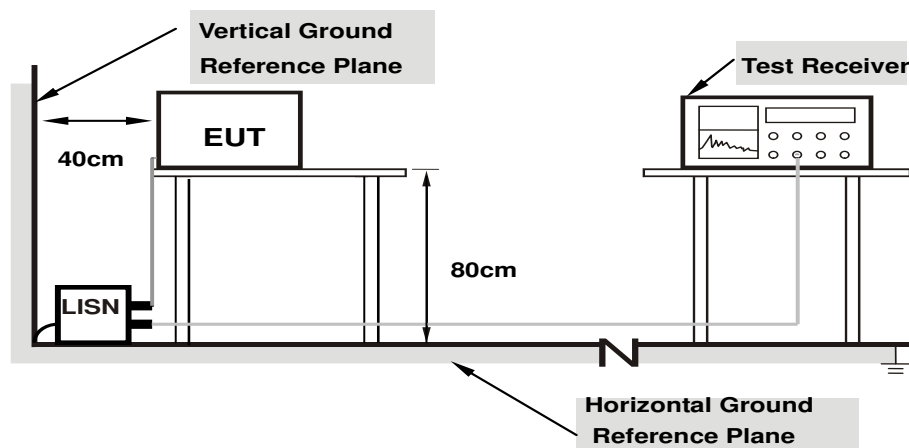
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Condition

Same as 4.1.6.

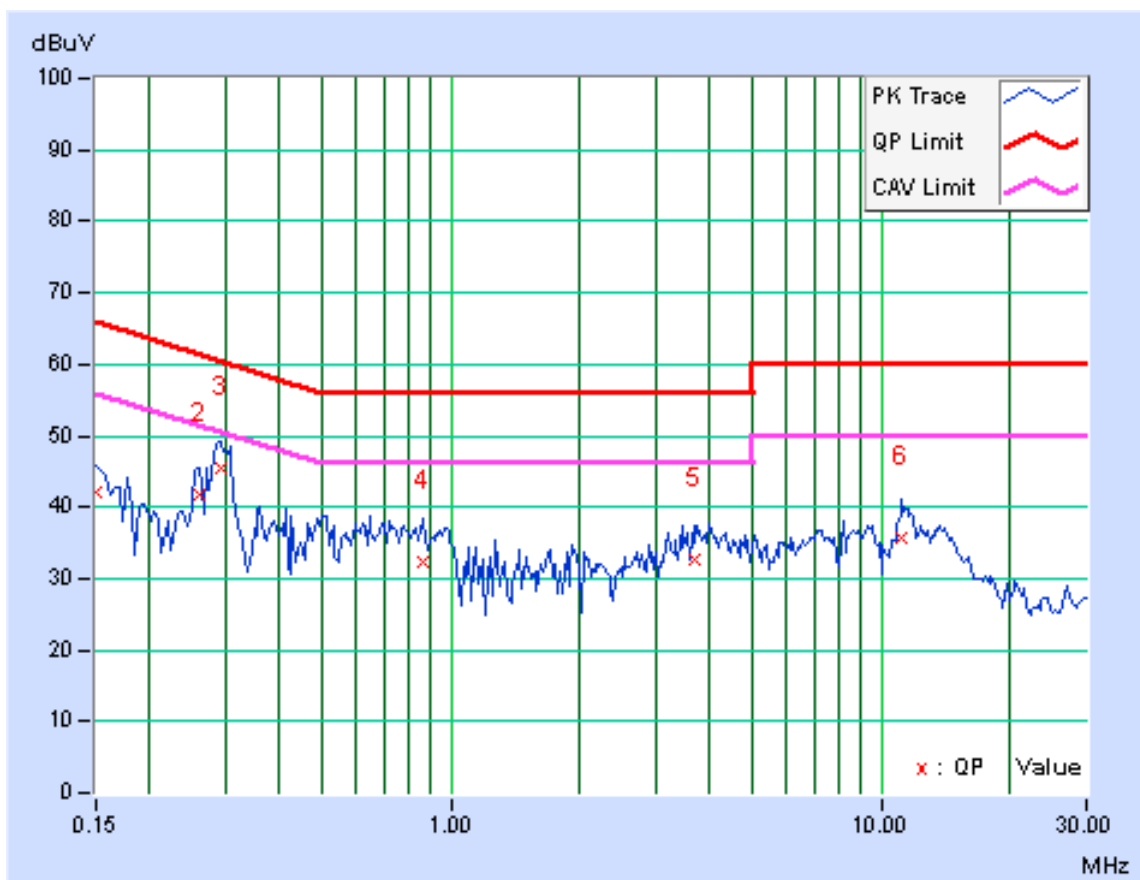
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15001	10.38	31.79	20.71	42.17	31.09	66.00	56.00	-23.83	-24.91
2	0.25936	10.35	31.52	24.22	41.87	34.57	61.45	51.45	-19.58	-16.88
3	0.29457	10.35	35.03	25.41	45.38	35.76	60.39	50.39	-15.01	-14.63
4	0.85713	10.33	21.92	13.89	32.25	24.22	56.00	46.00	-23.75	-21.78
5	3.66799	10.55	22.22	15.63	32.77	26.18	56.00	46.00	-23.23	-19.82
6	11.19142	10.98	24.57	19.91	35.55	30.89	60.00	50.00	-24.45	-19.11

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

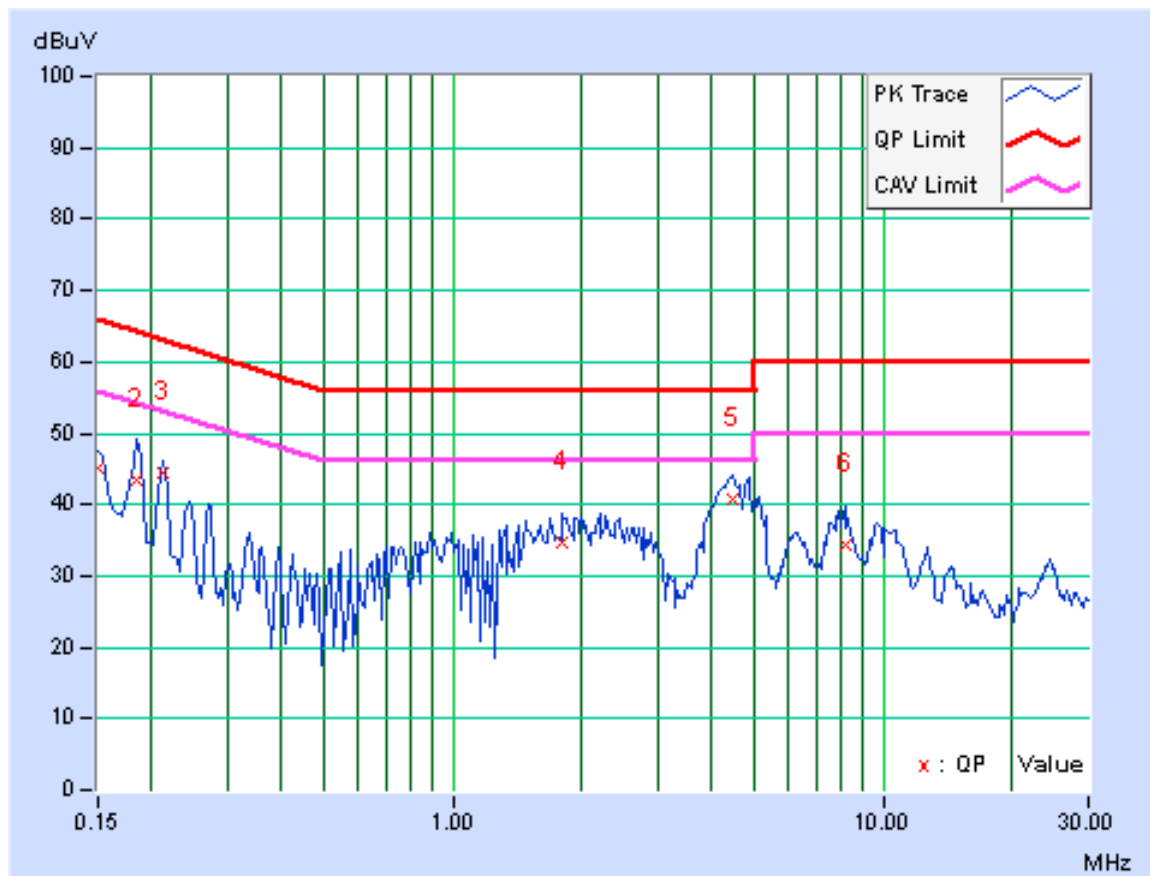


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15012	10.24	34.92	29.13	45.16	39.37	65.99	55.99	-20.83	-16.62
2	0.18521	10.21	33.22	27.21	43.43	37.42	64.25	54.25	-20.82	-16.83
3	0.21252	10.20	34.29	32.76	44.49	42.96	63.11	53.11	-18.61	-10.14
4	1.78909	10.20	24.49	18.93	34.69	29.13	56.00	46.00	-21.31	-16.87
5	4.45707	10.40	30.33	26.86	40.73	37.26	56.00	46.00	-15.27	-8.74
6	8.17972	10.49	23.72	18.66	34.21	29.15	60.00	50.00	-25.79	-20.85

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



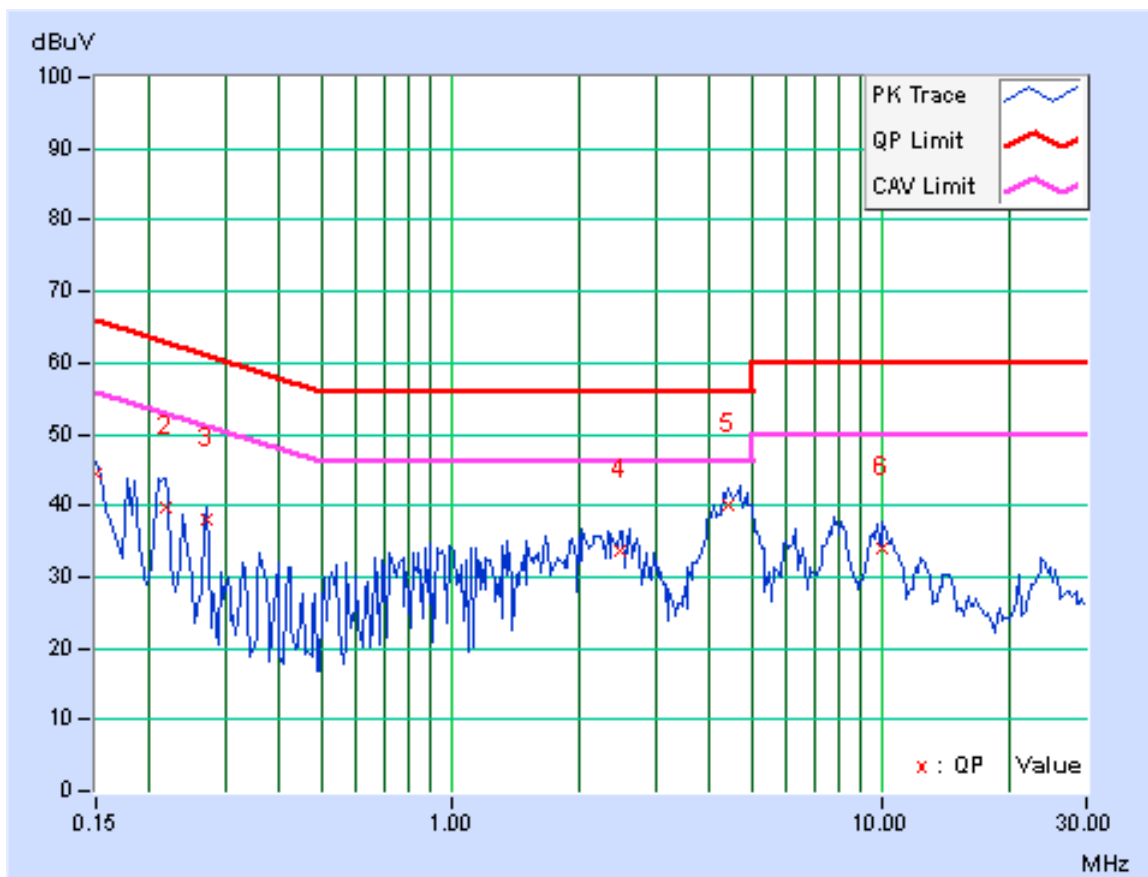
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15017	10.26	34.29	28.26	44.55	38.52	65.99	55.99	-21.44	-17.47
2	0.21648	10.22	29.57	26.63	39.79	36.85	62.95	52.95	-23.16	-16.10
3	0.27111	10.23	27.92	25.63	38.15	35.86	61.08	51.08	-22.94	-15.23
4	2.48049	10.25	23.38	18.22	33.63	28.47	56.00	46.00	-22.37	-17.53
5	4.43753	10.39	29.57	24.93	39.96	35.32	56.00	46.00	-16.04	-10.68
6	10.02349	10.52	23.38	18.81	33.90	29.33	60.00	50.00	-26.10	-20.67

REMARKS:

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

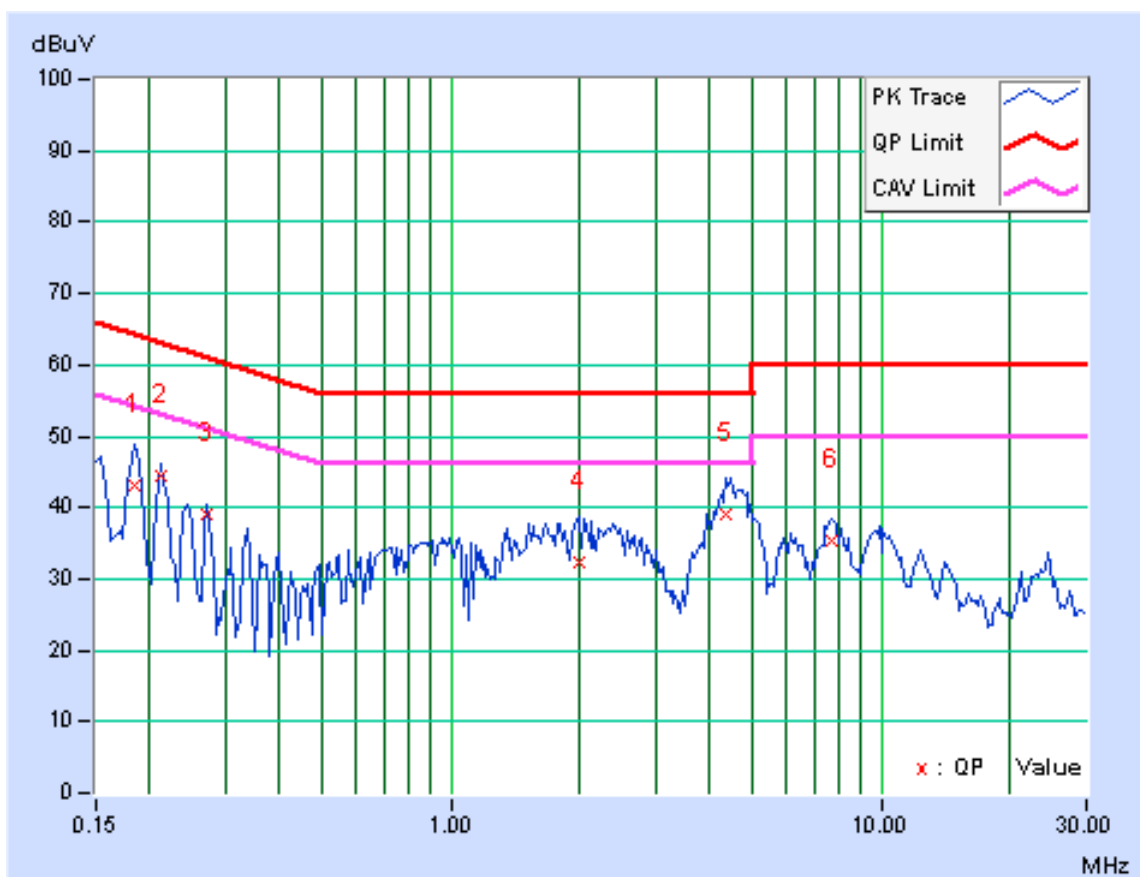


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	10.21	32.73	26.83	42.94	37.04	64.25	54.25	-21.31	-17.21
2	0.21258	10.20	34.38	33.19	44.58	43.39	63.10	53.10	-18.52	-9.71
3	0.27119	10.21	28.99	26.84	39.20	37.05	61.08	51.08	-21.88	-14.03
4	1.97657	10.21	22.28	14.11	32.49	24.32	56.00	46.00	-23.51	-21.68
5	4.33983	10.40	28.53	20.39	38.93	30.79	56.00	46.00	-17.07	-15.21
6	7.72262	10.48	24.97	20.36	35.45	30.84	60.00	50.00	-24.55	-19.16

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



4.3 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	$\sqrt{\quad}$		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	$\sqrt{\quad}$		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	$\sqrt{\quad}$		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

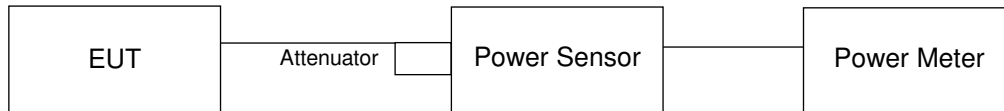
Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

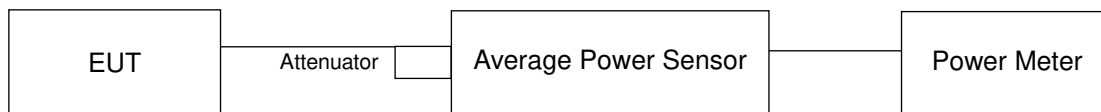
4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

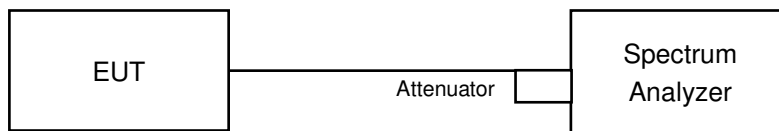
For channel straddling 5725MHz:



For other channels:



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

For channel straddling 5725MHz:

802.11ac (VHT80)

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \times$ Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

Other Modulation mode

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep $\geq 2 \times$ Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

For other channels:

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%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

POWER OUTPUT:

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
52	5260	153.462	21.86	24	Pass
60	5300	151.008	21.79	24	Pass
64	5320	152.055	21.82	24	Pass
100	5500	150.314	21.77	24	Pass
116	5580	149.968	21.76	24	Pass
140	5700	142.561	21.54	24	Pass
*144 (UNII-2c Band)	5720	66.834	18.25	24	Pass
*144 (UNII-3 Band)	5720	16.069	12.06	30	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*144	5720	82.903	19.19

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)
52	5260	20.74
60	5300	20.68
64	5320	20.73
100	5500	20.67
116	5580	21.42
140	5700	29.45
144 (UNII-2c Band)	5720	21.24

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	20.74	24.16 > 24
60	5300	20.68	24.15 > 24
64	5320	20.73	24.16 > 24
100	5500	20.67	24.15 > 24
120	5600	21.42	24.3 > 24
140	5700	29.45	25.69 > 24
144 (UNII-2c Band)	5720	21.24	24.27 > 24

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	16.92	16.94	16.86	147.164	21.68	24	Pass
60	5300	16.86	16.90	16.84	145.813	21.64	24	Pass
64	5320	16.88	16.86	16.83	145.477	21.63	24	Pass
100	5500	16.54	17.65	16.69	149.958	21.76	24	Pass
116	5580	16.62	17.54	16.72	149.663	21.75	24	Pass
140	5700	16.70	17.51	16.88	151.891	21.82	24	Pass
*144 (UNII-2c Band)	5720	13.47	13.81	12.89	65.731	18.18	22.83	Pass
*144 (UNII-3 Band)	5720	7.67	8.10	7.29	17.663	12.47	30	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*144	5720	83.394	19.21

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	20.83	20.61	20.83
60	5300	20.79	20.64	21.02
64	5320	20.76	20.54	20.83
100	5500	21.15	20.61	20.77
116	5580	20.88	20.75	21.02
140	5700	20.84	20.58	20.83
144 (UNII-2c Band)	5720	15.48	15.27	15.35

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	20.61	24.14 > 24
60	5300	20.64	24.14 > 24
64	5320	20.54	24.12 > 24
100	5500	20.61	24.14 > 24
116	5580	20.75	24.17 > 24
140	5700	20.58	24.13 > 24
144 (UNII-2c Band)	5720	15.27	22.83 < 24

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
54	5270	18.34	19.06	18.97	227.658	23.57	24	Pass
62	5310	18.30	19.10	18.86	225.804	23.54	24	Pass
102	5510	18.06	18.92	18.70	216.087	23.35	24	Pass
110	5550	18.21	18.96	18.82	221.135	23.45	24	Pass
134	5670	18.11	18.92	18.73	217.342	23.37	24	Pass
*142 (UNII-2c Band)	5710	15.64	15.92	16.29	118.288	20.73	24	Pass
*142 (UNII-3 Band)	5710	5.36	5.70	6.69	11.818	10.73	30	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*142	5710	130.106	21.14

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	41.41	41.16	41.65
62	5310	41.59	41.30	41.35
102	5510	41.39	41.01	41.39
110	5550	41.45	41.18	41.64
134	5670	41.82	43.01	49.84
142 (UNII-2c Band)	5710	35.89	35.61	35.44

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	41.16	27.14 > 24
62	5310	41.30	27.15 > 24
102	5510	41.01	27.12 > 24
110	5550	41.18	27.14 > 24
134	5670	41.82	27.21 > 24
142 (UNII-2c Band)	5710	35.44	26.49 > 24

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
58	5290	18.44	18.87	18.94	225.256	23.53	24	Pass
106	5530	18.20	18.77	18.60	213.849	23.30	24	Pass
*138 (UNII-2c Band)	5690	16.39	16.83	17.19	150.983	21.79	24	Pass
*138 (UNII-3 Band)	5690	2.48	2.99	3.96	6.548	8.16	30	Pass

Note: * Test was performed in accordance with Measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test.

The Total Power for the straddle channel:

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
*138	5690	157.531	21.97

Note: The total power was calculated through formula and record the value for reference only.

26dB OCCUPIED BANDWIDTH

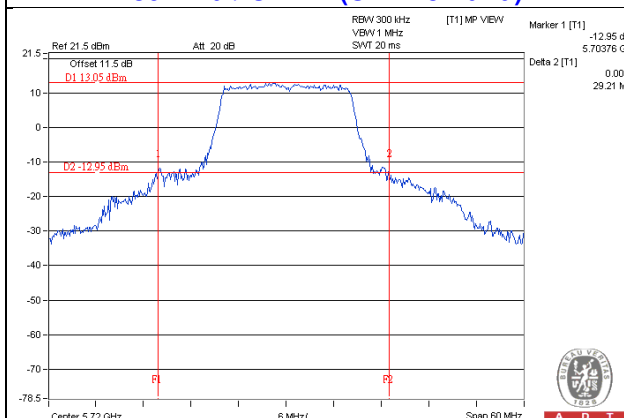
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
58	5290	82.89	82.57	82.85
106	5530	83.37	82.57	82.29
138 (UNII-2c Band)	5690	76.49	76.60	76.13

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

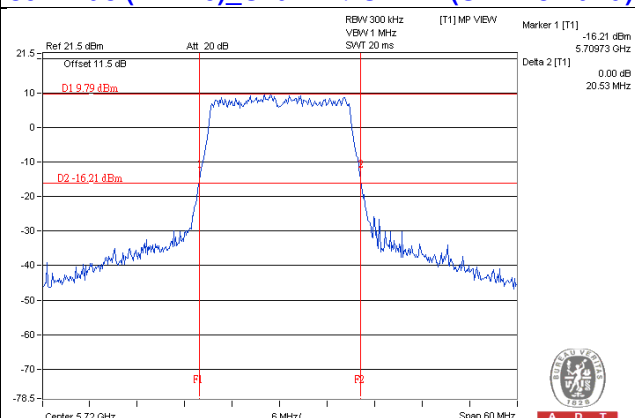
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.57	30.16 > 24
106	5530	82.29	30.15 > 24
138 (UNII-2c Band)	5690	76.13	29.81 > 24

Spectrum Plot of Worst Value

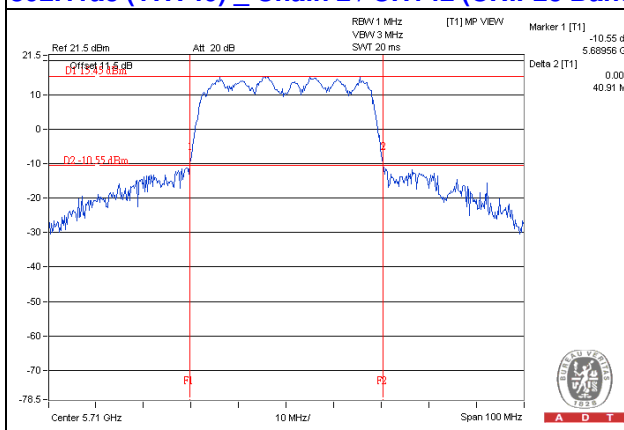
802.11a / CH144 (UNII-2c Band)



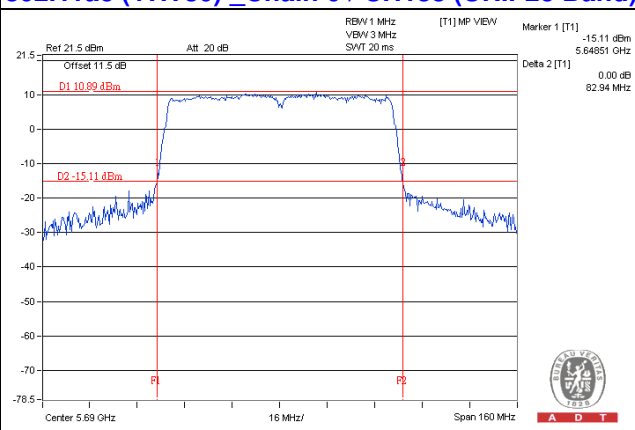
802.11ac (VHT20)_Chain 1 / CH144 (UNII-2c Band)



802.11ac (VHT40)_Chain 2 / CH142 (UNII-2c Band)



802.11ac (VHT80)_Chain 0 / CH138 (UNII-2c Band)



NOTE:

- For CH144 (UNII-2c Band) = 5725MHz - Marker 1
- For CH142 (UNII-2c Band) = 5725MHz - Marker 1
- For CH138 (UNII-2c Band) = 5725MHz - Marker 1

For Reference only – Power meter value

The power value was measured by power meter with average sensor.

Chan.	Chan. Freq. (MHz)	Average Power (dBm)	Average Power (mW)
802.11a			
144	5720	21.60	144.544
802.11ac (VHT20)			
144	5720	21.80	151.525
802.11ac (VHT40)			
142	5710	23.35	216.433
802.11ac (VHT80)			
138	5690	23.53	225.302

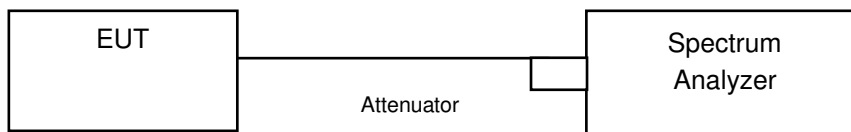
Note: The total power was calculated through formula and record the value for reference only.

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 Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For U-NII-2A, U-NII-2C and U-NII-3 band:

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

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

For 802.11ac (VHT80):

Using method SA-2

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 and add $10 \log (1/\text{duty cycle})$

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-2A, U-NII-2C band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
52	5260	8.35	11.00	Pass
60	5300	8.30	11.00	Pass
64	5320	8.35	11.00	Pass
100	5500	8.38	11.00	Pass
116	5580	8.37	11.00	Pass
140	5700	8.11	11.00	Pass
144 (UNII-2c Band)	5720	8.26	11.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
52	5260	3.00	3.21	2.84	7.79	8.83	Pass
60	5300	2.74	3.14	2.94	7.71	8.83	Pass
64	5320	3.10	3.10	3.08	7.86	8.83	Pass
100	5500	3.14	3.21	3.02	7.90	8.83	Pass
116	5580	2.93	3.98	2.80	8.04	8.83	Pass
140	5700	3.12	3.76	3.12	8.12	8.83	Pass
144 (UNII-2c Band)	5720	3.41	3.68	2.87	8.10	8.83	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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (8.17 - 6) = 8.83\text{dBm}$.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
54	5270	1.90	2.56	2.17	6.99	8.83	Pass
62	5310	1.97	2.48	2.19	6.99	8.83	Pass
102	5510	1.65	2.42	2.03	6.82	8.83	Pass
110	5550	1.65	2.53	2.04	6.86	8.83	Pass
134	5670	1.44	1.94	2.18	6.64	8.83	Pass
142 (UNII-2c Band)	5710	1.84	2.05	4.65	7.82	8.83	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.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (8.17 - 6) = 8.83\text{dBm}$.

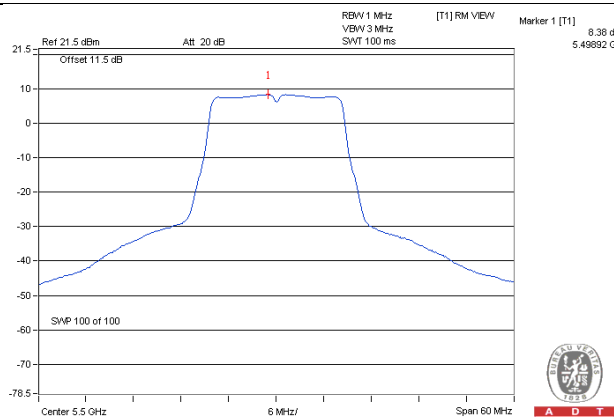
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)			Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
58	5290	-1.35	-0.86	-0.83	0.2	3.97	8.83	Pass
106	5530	-1.51	-0.87	-0.72	0.2	3.95	8.83	Pass
138 (UNII-2c Band)	5690	-0.72	-0.13	1.96	0.2	5.50	8.83	Pass

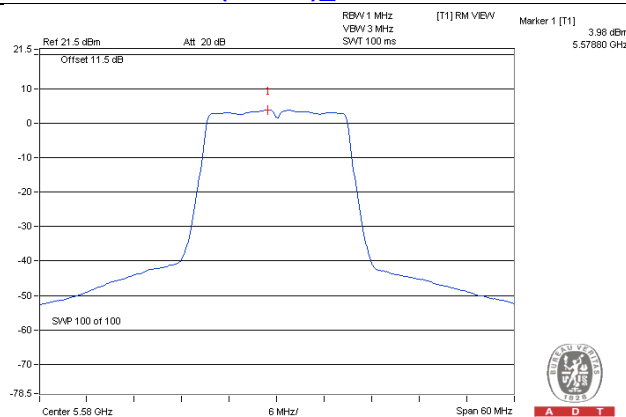
- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (8.17 - 6) = 8.83\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

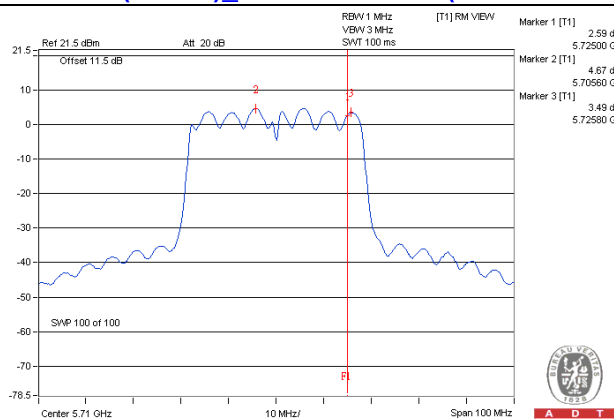
802.11a / CH100



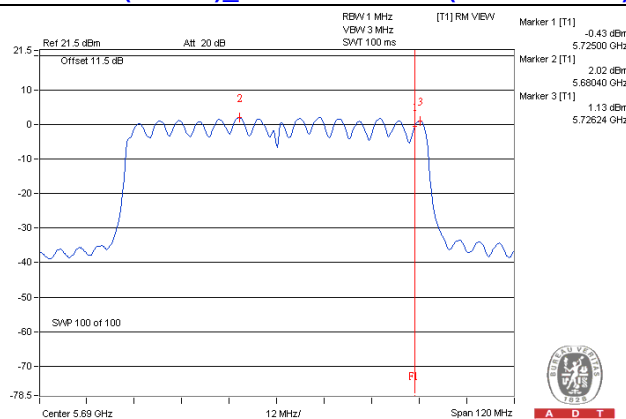
802.11ac (VHT20)_Chain 1 / CH116



802.11ac (VHT40)_Chain 2 / CH142 (UNII-2c Band)



802.11ac (VHT80)_Chain 2 / CH138 (UNII-2c Band)



For U-NII-3 band:

802.11a

Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
144 (UNII-3 Band)	5720	-0.02	2.20	30	Pass

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	144 (UNII-3 Band)	5720	-4.44	-2.22	4.77	2.55	27.83	Pass
1	144 (UNII-3 Band)	5720	-4.92	-2.70	4.77	2.07	27.83	Pass
2	144 (UNII-3 Band)	5720	-5.33	-3.11	4.77	1.66	27.83	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.

2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 8.83\text{dBm}$.

802.11ac (VHT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	142 (UNII-3 Band)	5710	-6.10	-3.88	4.77	0.89	27.83	Pass
1	142 (UNII-3 Band)	5710	-6.75	-4.53	4.77	0.24	27.83	Pass
2	142 (UNII-3 Band)	5710	-4.69	-2.47	4.77	2.30	27.83	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.

2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 8.83\text{dBm}$.

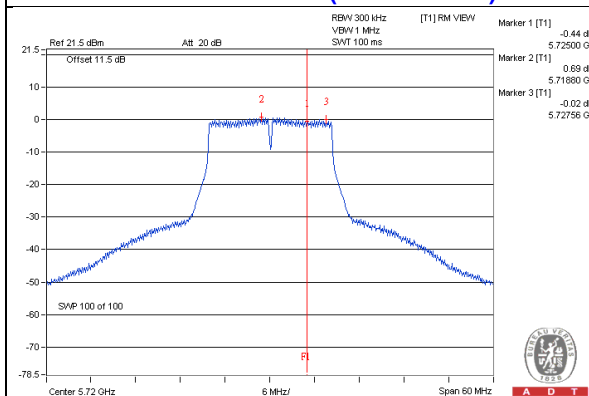
802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	138 (UNII-3 Band)	5690	-10.27	-8.05	4.77	0.2	-3.08	27.83	Pass
1	138 (UNII-3 Band)	5690	-9.62	-7.40	4.77	0.2	-2.43	27.83	Pass
2	138 (UNII-3 Band)	5690	-7.29	-5.07	4.77	0.2	-0.10	27.83	Pass

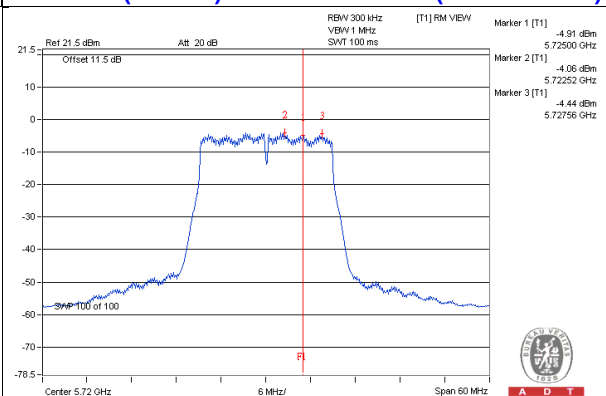
- Note:**
- Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 - Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.17\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 8.83\text{dBm}$.
 - Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

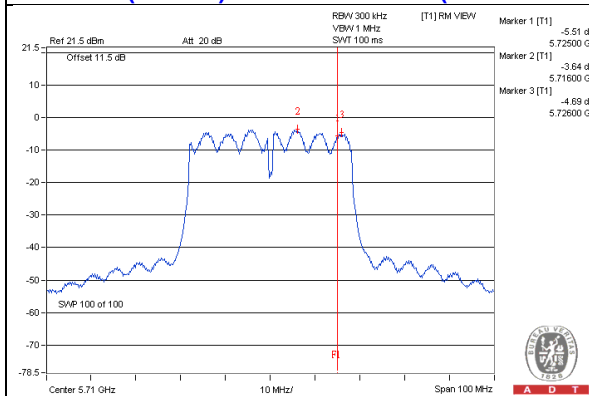
802.11a : CH 144(UNII-3 Band)



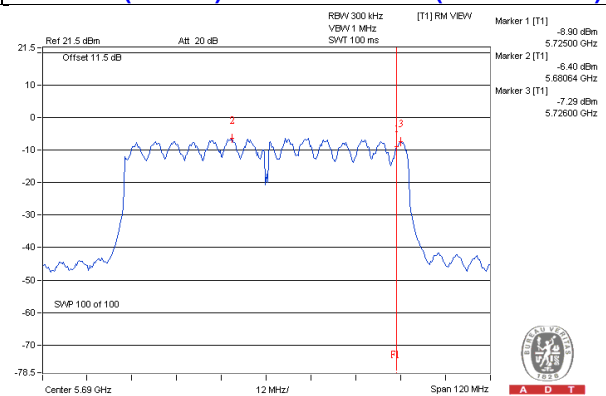
802.11ac (VHT20)-Chain 0: CH 144(UNII-3 Band)



802.11ac (VHT40)-Chain 2: CH 142(UNII-3 Band)



802.11ac (VHT80)-Chain 2: CH 138(UNII-3 Band)

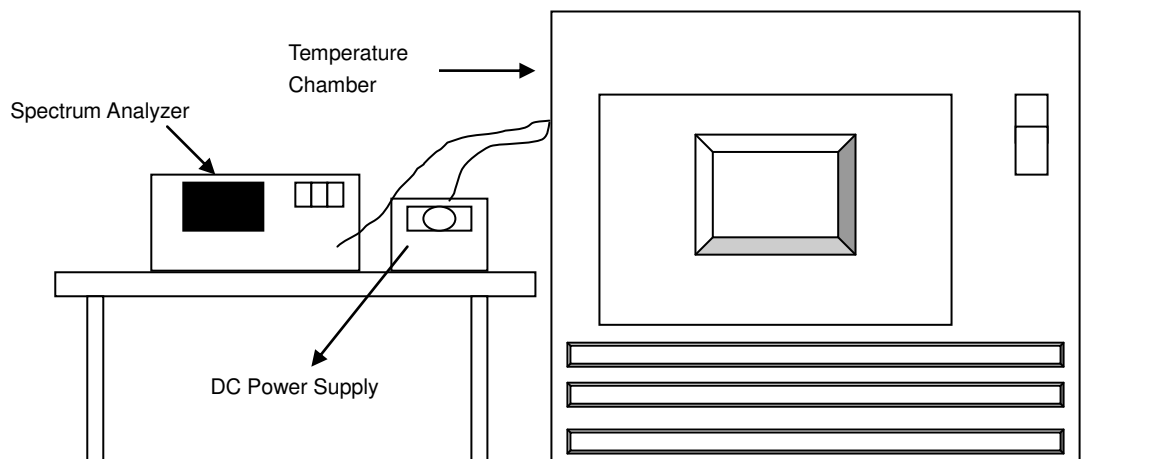


4.5 Frequency Stability Measurement

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 Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5260MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5259.9763	-0.00045	5259.9736	-0.00050	5259.9752	-0.00047	5259.9774	-0.00043
40	120	5260.0032	0.00006	5260.002	0.00004	5260.003	0.00006	5260.0025	0.00005
30	120	5260.0012	0.00002	5260.0028	0.00005	5260.0017	0.00003	5260.0053	0.00010
20	120	5259.9748	-0.00048	5259.9783	-0.00041	5259.9736	-0.00050	5259.9774	-0.00043
10	120	5259.9815	-0.00035	5259.9813	-0.00036	5259.9837	-0.00031	5259.9853	-0.00028
0	120	5260.0152	0.00029	5260.0164	0.00031	5260.0175	0.00033	5260.0158	0.00030
-10	120	5260.0121	0.00023	5260.0134	0.00025	5260.0102	0.00019	5260.0136	0.00026
-20	120	5260.0245	0.00047	5260.0253	0.00048	5260.0273	0.00052	5260.0266	0.00051
-30	120	5260.0138	0.00026	5260.0155	0.00029	5260.0122	0.00023	5260.0155	0.00029

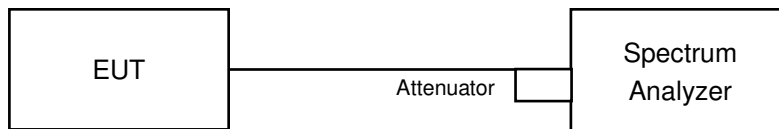
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5260MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5259.9753	-0.00047	5259.978	-0.00042	5259.9731	-0.00051	5259.9775	-0.00043
	120	5259.9748	-0.00048	5259.9783	-0.00041	5259.9736	-0.00050	5259.9774	-0.00043
	102	5259.9753	-0.00047	5259.9778	-0.00042	5259.9735	-0.00050	5259.9778	-0.00042

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
*144 (UNII-3 Band)	5720	3.24	0.5	PASS

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
*144 (UNII-3 Band)	5720	3.82	3.88	3.87	0.5	PASS

802.11ac (VHT40)

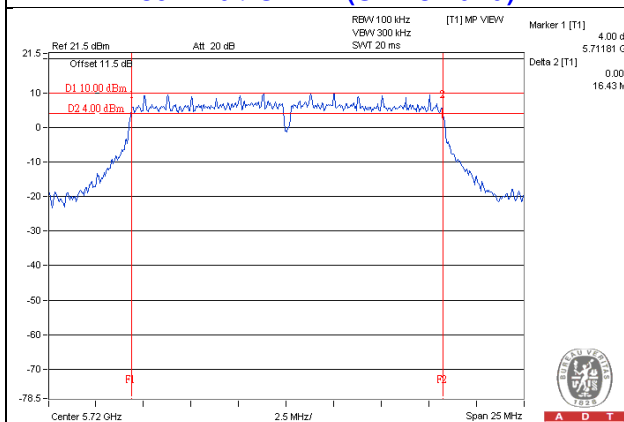
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
*142 (UNII-3 Band)	5710	3.26	3.25	3.21	0.5	PASS

802.11ac (VHT80)

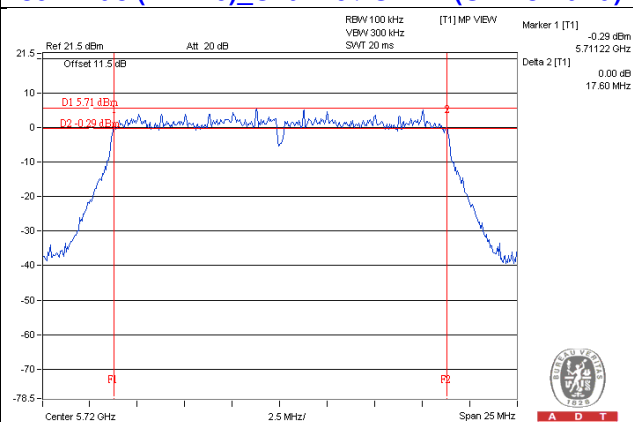
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
*138 (UNII-3 Band)	5690	3.26	3.28	3.32	0.5	PASS

Spectrum Plot of Worst Value

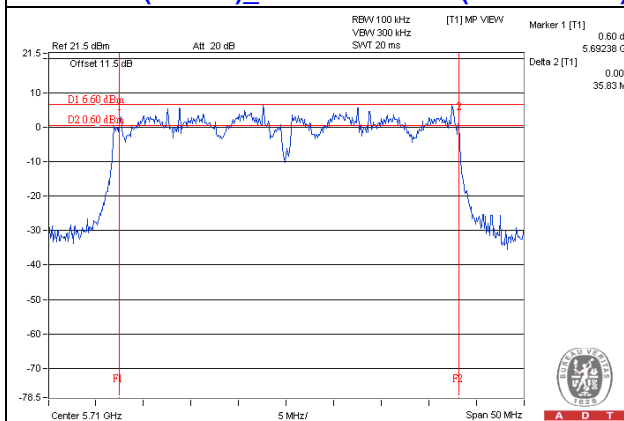
802.11a / CH144 (UNII-3 Band)



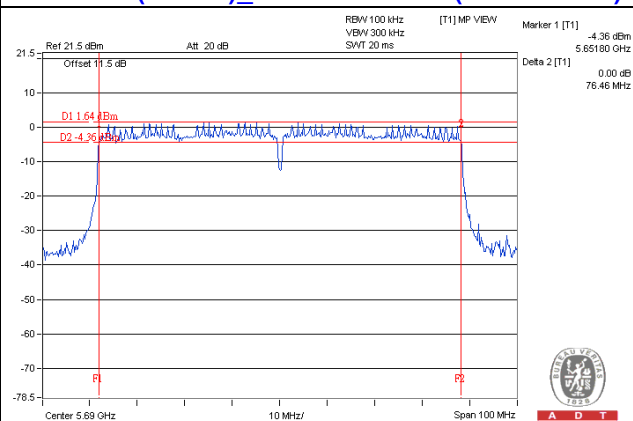
802.11ac (VHT20)_Chain 0 / CH144(UNII-3 Band)



802.11ac (VHT40)_Chain 2 / CH142(UNII-3 Band)



802.11ac (VHT80)_Chain 0 / CH138(UNII-3 Band)



Note: * The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

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

Appendix – 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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