

FCC Test Report

Report No.: RF160120E04-1

FCC ID: HDC434RG

Test Model: 434RG

Received Date: Jan. 20, 2016

Test Date: Jan. 28 to Feb. 02, 2016

Issued Date: Mar. 07, 2016

Applicant: Adtran

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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A D T

Release Control Record

Issue No.	Description	Date Issued
RF160120E04-1	Original release.	Mar. 07, 2016



A D T

1 Certificate of Conformity

Product: Indoor GPON HGU

Brand: ADTRAN

Test Model: 434RG

Sample Status: ENGINEERING SAMPLE

Applicant: Adtran

Test Date: Jan. 28 to Feb. 02, 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 : C. K., **Date:** Mar. 07, 2016
Claire Kuan / Specialist

Approved by : May Chen, **Date:** Mar. 07, 2016
May Chen / Manager

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 -8.78dB at 4.45703MHz.
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 10400.00MHz, 10480.00MHz and 11490.00MHz,
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.

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	Expanded Uncertainty (k=2) ($\pm$)
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

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	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11g/a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 1300Mbps
Operating Frequency	For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz For 15.247 2.412 ~ 2.462GHz
Number of Channel	For 15.407 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80) For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	For 15.407 5.18 ~ 5.24GHz 802.11a: 146.893mW 802.11ac (VHT20): 192.527mW 802.11ac (VHT40): 260.004mW 802.11ac (VHT80): 172.055mW 5.745 ~ 5.825GHz 802.11a: 152.757mW 802.11ac (VHT20): 159.055mW 802.11ac (VHT40): 161.693mW 802.11ac (VHT80): 155.069mW For 15.247 802.11b: 338.065mW 802.11g: 311.889mW 802.11n (HT20): 573.758mW 802.11n (HT40): 165.018mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.

2. 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

3. 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
	MCS 0~7	3TX	3RX
802.11n (HT40)	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
	MCS 0~7	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 5180 ~ 5240MHz

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

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	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)	5180-5240	36 to 64	46	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)	5180-5240	36 to 64	46	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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	20deg. C, 60%RH	120Vac, 60Hz	Tim Ho
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Tim Ho
PLC	20deg. C, 65%RH	120Vac, 60Hz	Jason Huang
APCM	14deg. C, 66%RH	120Vac, 60Hz	Anderson Chen

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.

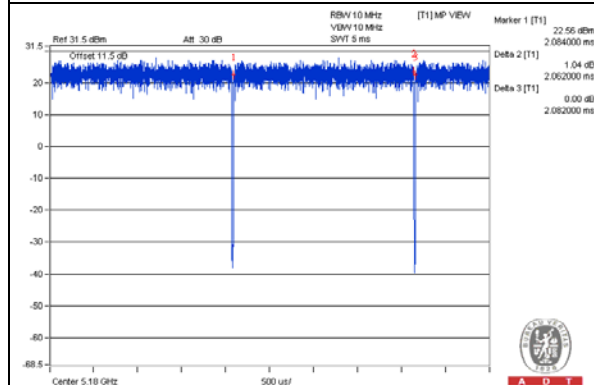
802.11a: Duty cycle = $2.062 \text{ ms} / 2.082 \text{ ms} = 0.99$

802.11ac (VHT20): Duty cycle = $1.918 \text{ ms} / 1.942 \text{ ms} = 0.988$

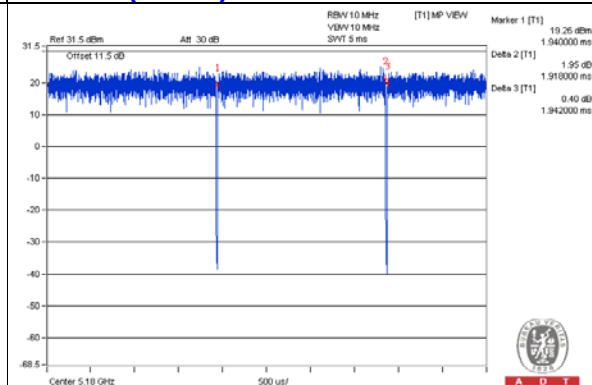
802.11ac (VHT40): Duty cycle = $0.946 \text{ ms} / 0.964 \text{ ms} = 0.981$

802.11ac (VHT80): Duty cycle = $0.458 \text{ ms} / 0.480 \text{ ms} = 0.954$, Duty factor = $10 * \log(1/0.954) = 0.2$

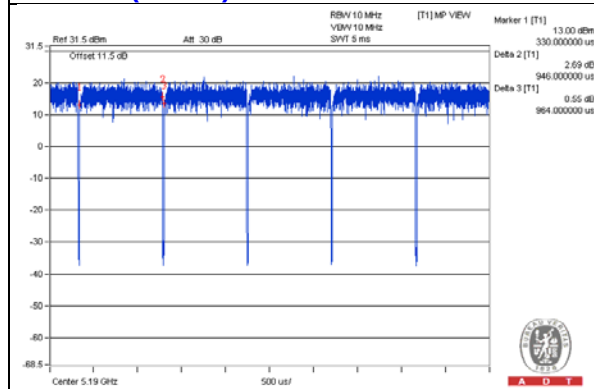
802.11a



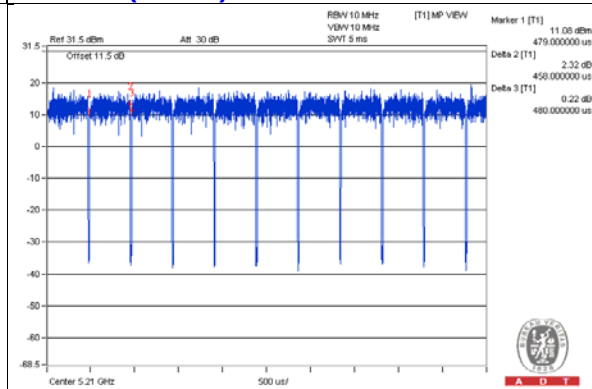
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



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.

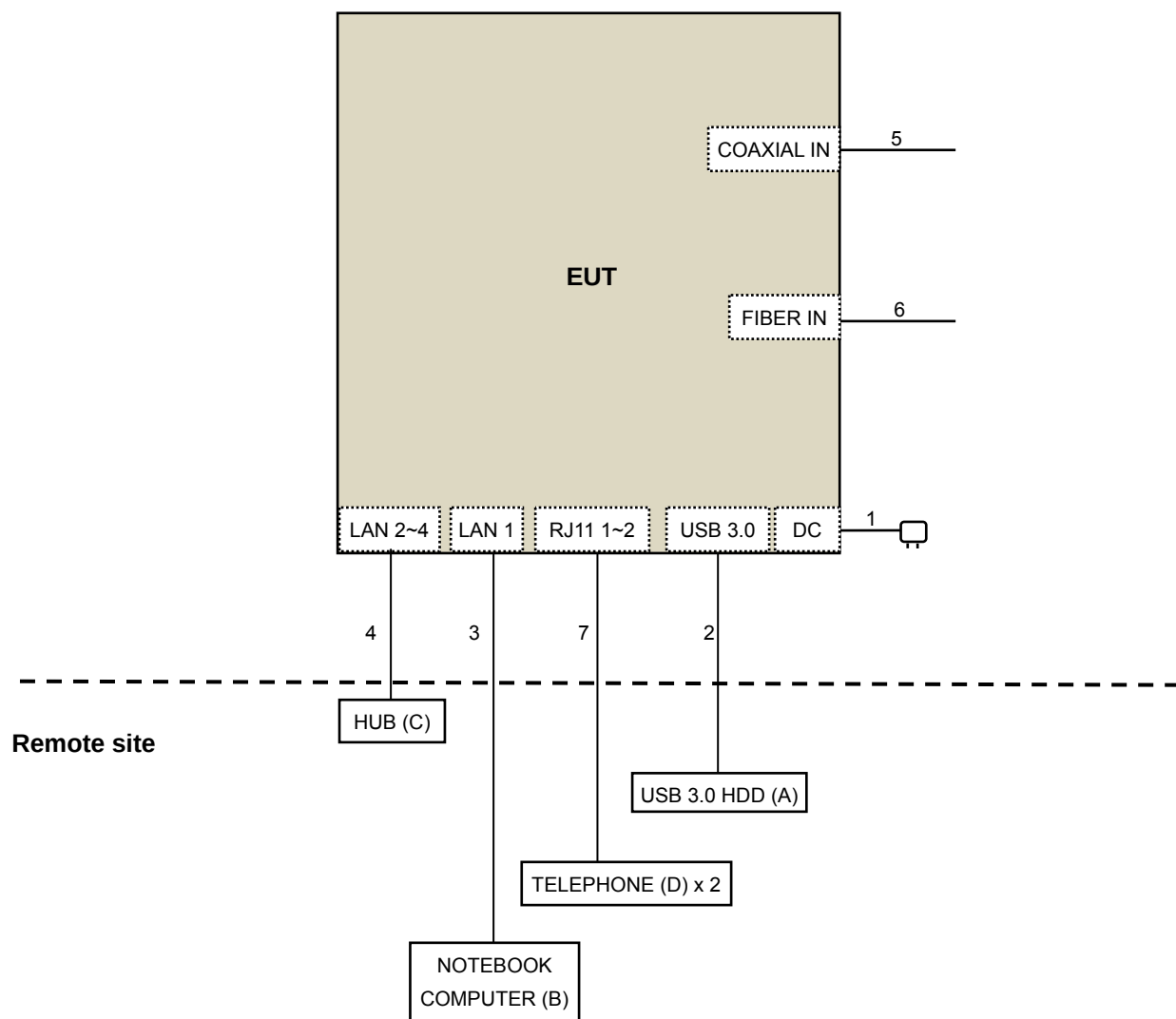
Note:

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

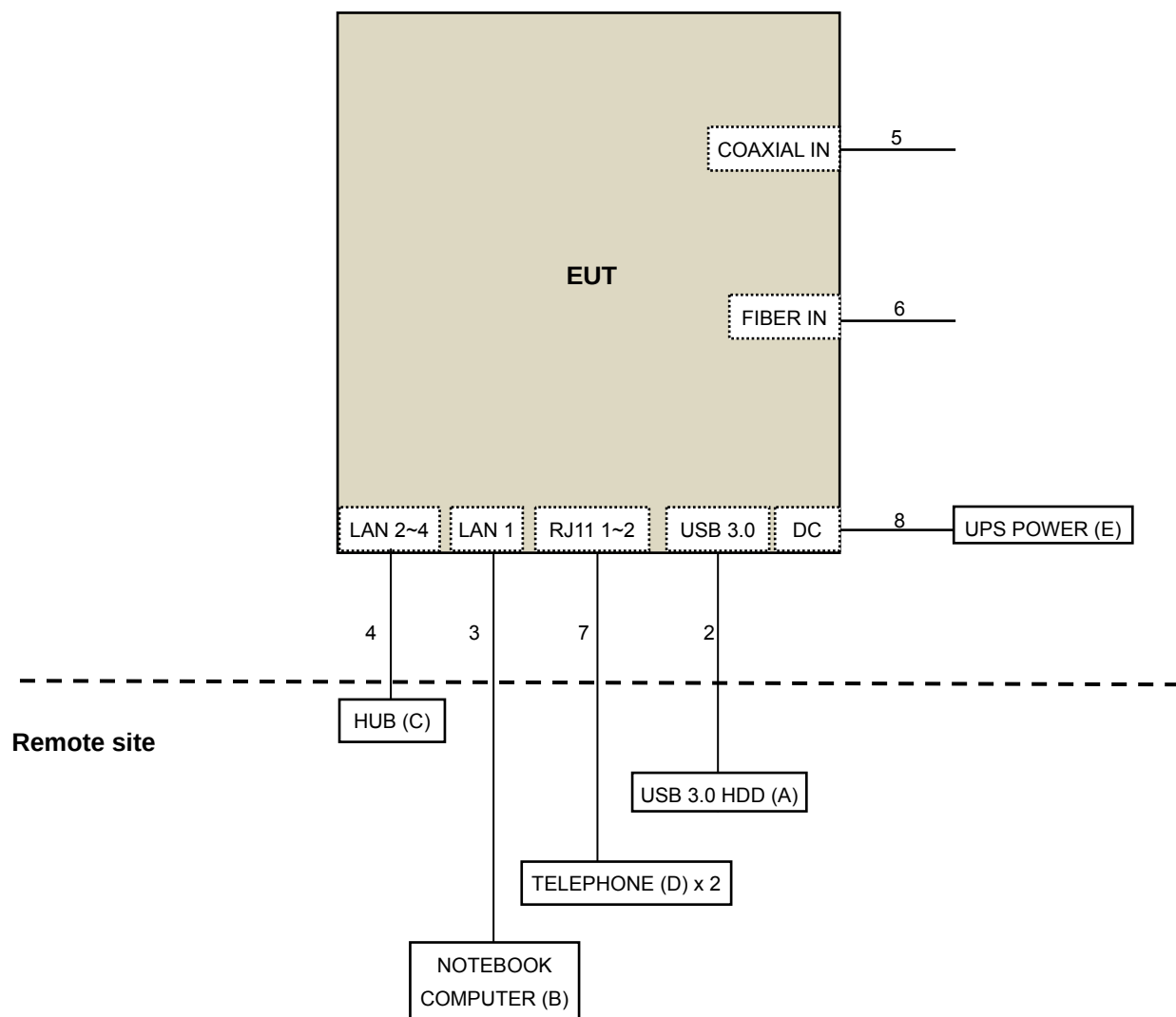
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC	1	1.4	No	0	Supplied by Client.
2.	USB	1	0.45	Yes	0	Provided by Lab
3.	RJ45	1	10	No	0	Provided by Lab
4.	RJ45	3	10	No	0	Provided by Lab
5.	COAXIAL	1	4	No	0	Provided by Lab
6.	FIBER	1	5	No	0	Supplied by Client.
7.	RJ11	2	10	No	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 v01r02

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:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules v01r02	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBuV/m) ^{*1} PK:78.2 (dBuV/m) ^{*2}

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

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

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

4.1.2 Test Instruments

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. 02, 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:

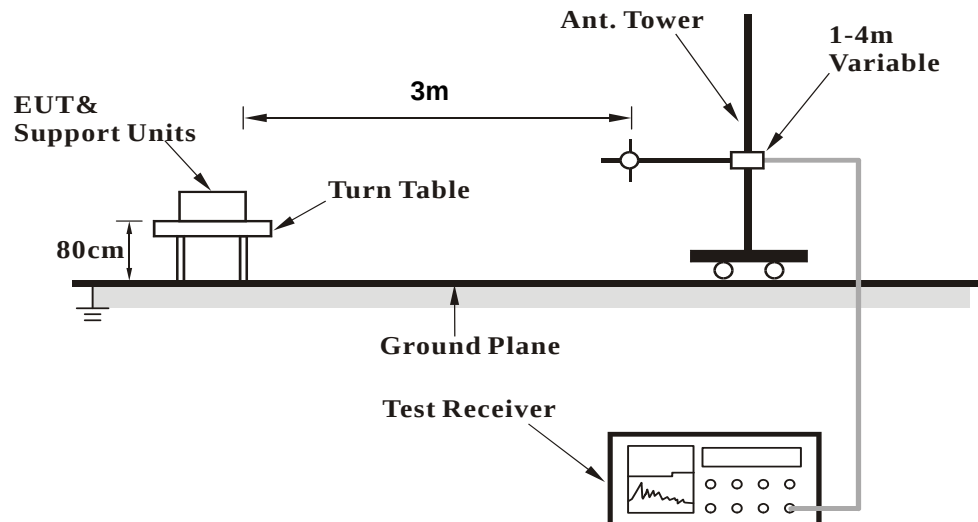
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

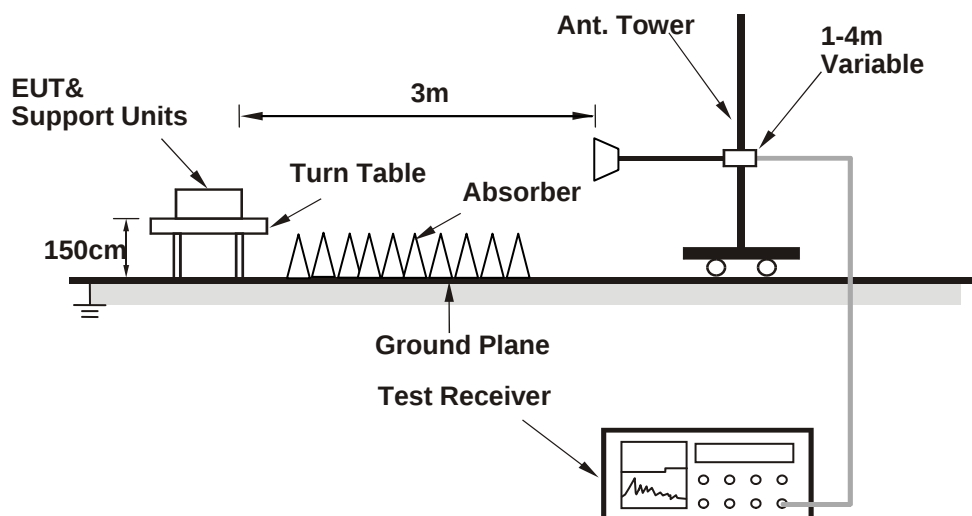
No deviation.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	50.6 PK	74.0	-23.4	1.00 H	319	48.69	1.91
2	5100.00	37.6 AV	54.0	-16.4	1.00 H	319	35.69	1.91
3	5150.00	51.7 PK	74.0	-22.3	1.00 H	319	49.68	2.02
4	5150.00	38.1 AV	54.0	-15.9	1.00 H	319	36.08	2.02
5	*5180.00	101.7 PK			1.00 H	319	99.61	2.09
6	*5180.00	92.4 AV			1.00 H	319	90.31	2.09
7	#10360.00	66.8 PK	74.0	-7.2	2.07 H	338	53.89	12.91
8	#10360.00	53.7 AV	54.0	-0.3	2.07 H	338	40.79	12.91
9	15540.00	62.9 PK	74.0	-11.1	2.15 H	195	48.22	14.68
10	15540.00	49.2 AV	54.0	-4.8	2.15 H	195	34.52	14.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	59.9 PK	74.0	-14.1	1.98 V	223	57.99	1.91
2	5100.00	49.2 AV	54.0	-4.8	1.98 V	223	47.29	1.91
3	5150.00	61.5 PK	74.0	-12.5	1.98 V	256	59.48	2.02
4	5150.00	47.3 AV	54.0	-6.7	1.98 V	256	45.28	2.02
5	*5180.00	111.9 PK			1.98 V	256	109.81	2.09
6	*5180.00	101.9 AV			1.98 V	256	99.81	2.09
7	#10360.00	61.7 PK	74.0	-12.3	2.73 V	122	48.79	12.91
8	#10360.00	49.6 AV	54.0	-4.4	2.73 V	122	36.69	12.91
9	15540.00	64.7 PK	74.0	-9.3	1.67 V	269	50.02	14.68
10	15540.00	49.6 AV	54.0	-4.4	1.67 V	269	34.92	14.68

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	49.8 PK	74.0	-24.2	1.00 H	316	47.84	1.96
2	5120.00	37.5 AV	54.0	-16.5	1.00 H	316	35.54	1.96
3	*5200.00	101.2 PK			1.00 H	316	99.06	2.14
4	*5200.00	90.7 AV			1.00 H	316	88.56	2.14
5	5360.00	51.2 PK	74.0	-22.8	1.00 H	316	48.65	2.55
6	5360.00	39.7 AV	54.0	-14.3	1.00 H	316	37.15	2.55
7	#10400.00	67.3 PK	74.0	-6.7	2.28 H	336	54.22	13.08
8	#10400.00	53.8 AV	54.0	-0.2	2.28 H	336	40.72	13.08
9	15600.00	63.2 PK	74.0	-10.8	2.15 H	203	48.64	14.56
10	15600.00	49.4 AV	54.0	-4.6	2.15 H	203	34.84	14.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	58.8 PK	74.0	-15.2	2.07 V	224	56.84	1.96
2	5120.00	48.1 AV	54.0	-5.9	2.07 V	224	46.14	1.96
3	*5200.00	111.8 PK			1.93 V	225	109.66	2.14
4	*5200.00	101.7 AV			1.93 V	225	99.56	2.14
5	5360.00	55.9 PK	74.0	-18.1	2.07 V	224	53.35	2.55
6	5360.00	45.2 AV	54.0	-8.8	2.07 V	224	42.65	2.55
7	#10400.00	61.6 PK	74.0	-12.4	2.72 V	116	48.52	13.08
8	#10400.00	49.6 AV	54.0	-4.4	2.72 V	116	36.52	13.08
9	15600.00	64.7 PK	74.0	-9.3	1.64 V	259	50.14	14.56
10	15600.00	49.5 AV	54.0	-4.5	1.64 V	259	34.94	14.56

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	101.1 PK			1.00 H	319	98.84	2.26
2	*5240.00	91.3 AV			1.00 H	319	89.04	2.26
3	5400.00	51.8 PK	74.0	-22.2	1.00 H	319	49.16	2.64
4	5400.00	39.4 AV	54.0	-14.6	1.00 H	319	36.76	2.64
5	#10480.00	67.4 PK	74.0	-6.6	2.24 H	338	54.28	13.12
6	#10480.00	53.6 AV	54.0	-0.4	2.24 H	338	40.48	13.12
7	15720.00	62.6 PK	74.0	-11.4	2.20 H	195	48.32	14.28
8	15720.00	49.1 AV	54.0	-4.9	2.20 H	195	34.82	14.28
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	111.8 PK			2.01 V	225	109.54	2.26
2	*5240.00	101.8 AV			2.01 V	225	99.54	2.26
3	5400.00	57.7 PK	74.0	-16.3	2.13 V	224	55.06	2.64
4	5400.00	46.6 AV	54.0	-7.4	2.13 V	224	43.96	2.64
5	#10480.00	61.6 PK	74.0	-12.4	2.70 V	110	48.48	13.12
6	#10480.00	49.7 AV	54.0	-4.3	2.70 V	110	36.58	13.12
7	15720.00	64.1 PK	74.0	-9.9	1.63 V	263	49.82	14.28
8	15720.00	49.3 AV	54.0	-4.7	1.63 V	263	35.02	14.28

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	51.1 PK	74.0	-22.9	1.00 H	360	47.84	3.26
2	#5715.00	39.2 AV	54.0	-14.8	1.00 H	360	35.94	3.26
3	#5725.00	51.4 PK	78.2	-26.8	1.00 H	360	48.13	3.27
4	*5745.00	102.7 PK			1.00 H	360	99.42	3.28
5	*5745.00	94.2 AV			1.00 H	360	90.92	3.28
6	11490.00	67.1 PK	74.0	-6.9	2.19 H	294	52.46	14.64
7	11490.00	53.8 AV	54.0	-0.2	2.19 H	294	39.16	14.64
8	#17235.00	63.6 PK	74.0	-10.4	2.18 H	319	44.69	18.91
9	#17235.00	50.4 AV	54.0	-3.6	2.18 H	319	31.49	18.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.6 PK	74.0	-9.4	2.04 V	130	61.34	3.26
2	#5715.00	47.1 AV	54.0	-6.9	2.04 V	130	43.84	3.26
3	#5725.00	76.1 PK	78.2	-2.1	2.04 V	130	72.83	3.27
4	*5745.00	112.9 PK			2.04 V	130	109.62	3.28
5	*5745.00	102.8 AV			2.04 V	130	99.52	3.28
6	11490.00	60.8 PK	74.0	-13.2	1.59 V	254	46.16	14.64
7	11490.00	47.8 AV	54.0	-6.2	1.59 V	254	33.16	14.64
8	#17235.00	65.5 PK	74.0	-8.5	2.29 V	233	46.59	18.91
9	#17235.00	52.8 AV	54.0	-1.2	2.29 V	233	33.89	18.91

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5706.30	55.1 PK	74.0	-18.9	1.00 H	316	51.85	3.25
2	#5706.30	45.2 AV	54.0	-8.8	1.00 H	316	41.95	3.25
3	*5785.00	102.4 PK			1.00 H	360	99.10	3.30
4	*5785.00	93.8 AV			1.00 H	360	90.50	3.30
5	#5866.20	56.1 PK	74.0	-17.9	1.00 H	295	52.77	3.33
6	#5866.20	45.0 AV	54.0	-9.0	1.00 H	295	41.67	3.33
7	11570.00	66.9 PK	74.0	-7.1	1.39 H	256	52.50	14.40
8	11570.00	53.4 AV	54.0	-0.6	1.39 H	256	39.00	14.40
9	#17355.00	62.9 PK	74.0	-11.1	2.19 H	195	43.57	19.33
10	#17355.00	49.0 AV	54.0	-5.0	2.19 H	195	29.67	19.33

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	#5706.30	62.6 PK	74.0	-11.4	1.89 V	142	59.35	3.25
2	#5706.30	52.1 AV	54.0	-1.9	1.89 V	142	48.85	3.25
3	*5785.00	113.5 PK			1.94 V	118	110.20	3.30
4	*5785.00	103.4 AV			1.94 V	118	100.10	3.30
5	#5866.20	63.2 PK	74.0	-10.8	1.90 V	116	59.87	3.33
6	#5866.20	52.6 AV	54.0	-1.4	1.90 V	116	49.27	3.33
7	11570.00	61.3 PK	74.0	-12.7	2.70 V	129	46.90	14.40
8	11570.00	49.1 AV	54.0	-4.9	2.70 V	129	34.70	14.40
9	#17355.00	64.6 PK	74.0	-9.4	1.62 V	260	45.27	19.33
10	#17355.00	49.7 AV	54.0	-4.3	1.62 V	260	30.37	19.33

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	104.3 PK			1.58 H	327	100.99	3.31
2	*5825.00	93.8 AV			1.58 H	327	90.49	3.31
3	#5850.00	62.5 PK	78.2	-15.7	1.58 H	327	59.19	3.31
4	#5860.00	56.6 PK	74.0	-17.4	1.58 H	327	53.28	3.32
5	#5860.00	40.6 AV	54.0	-13.4	1.58 H	327	37.28	3.32
6	#5906.70	55.1 PK	74.0	-18.9	1.48 H	314	51.76	3.34
7	#5906.70	43.2 AV	54.0	-10.8	1.48 H	314	39.86	3.34
8	11650.00	67.3 PK	74.0	-6.7	1.70 H	289	53.11	14.19
9	11650.00	53.5 AV	54.0	-0.5	1.70 H	289	39.31	14.19
10	#17475.00	63.2 PK	74.0	-10.8	2.18 H	188	43.08	20.12
11	#17475.00	49.4 AV	54.0	-4.6	2.18 H	188	29.28	20.12
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	112.0 PK			1.13 V	229	108.69	3.31
2	*5825.00	101.8 AV			1.13 V	229	98.49	3.31
3	#5850.00	69.1 PK	78.2	-9.1	1.13 V	229	65.79	3.31
4	#5860.00	60.9 PK	74.0	-13.1	1.13 V	229	57.58	3.32
5	#5860.00	44.5 AV	54.0	-9.5	1.13 V	229	41.18	3.32
6	#5906.70	61.2 PK	74.0	-12.8	1.13 V	229	57.86	3.34
7	#5906.70	51.1 AV	54.0	-2.9	1.13 V	229	47.76	3.34
8	11650.00	62.0 PK	74.0	-12.0	2.77 V	116	47.81	14.19
9	11650.00	50.0 AV	54.0	-4.0	2.77 V	116	35.81	14.19
10	#17475.00	65.0 PK	74.0	-9.0	1.69 V	263	44.88	20.12
11	#17475.00	50.0 AV	54.0	-4.0	1.69 V	263	29.88	20.12

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – 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 36	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5102.50	58.7 PK	74.0	-15.3	1.00 H	120	56.79	1.91
2	5102.50	48.5 AV	54.0	-5.5	1.00 H	120	46.59	1.91
3	5150.00	64.8 PK	74.0	-9.2	1.00 H	120	62.78	2.02
4	5150.00	51.1 AV	54.0	-2.9	1.00 H	120	49.08	2.02
5	*5180.00	107.4 PK			1.00 H	122	105.31	2.09
6	*5180.00	98.1 AV			1.00 H	122	96.01	2.09
7	#10360.00	62.9 PK	74.0	-11.1	1.05 H	211	49.99	12.91
8	#10360.00	50.8 AV	54.0	-3.2	1.05 H	211	37.89	12.91
9	15540.00	62.3 PK	74.0	-11.7	1.01 H	335	47.62	14.68
10	15540.00	48.9 AV	54.0	-5.1	1.01 H	335	34.22	14.68
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5102.50	59.8 PK	74.0	-14.2	2.01 V	267	57.89	1.91
2	5102.50	49.7 AV	54.0	-4.3	2.01 V	267	47.79	1.91
3	5150.00	65.2 PK	74.0	-8.8	2.01 V	267	63.18	2.02
4	5150.00	51.8 AV	54.0	-2.2	2.01 V	267	49.78	2.02
5	*5180.00	119.9 PK			2.01 V	267	117.81	2.09
6	*5180.00	110.2 AV			2.01 V	267	108.11	2.09
7	#10360.00	69.8 PK	74.0	-4.2	1.02 V	322	56.89	12.91
8	#10360.00	53.7 AV	54.0	-0.3	1.02 V	322	40.79	12.91
9	15540.00	64.9 PK	74.0	-9.1	1.73 V	279	50.22	14.68
10	15540.00	50.0 AV	54.0	-4.0	1.73 V	279	35.32	14.68

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5117.70	58.1 PK	74.0	-15.9	1.65 H	75	56.16	1.94
2	5117.70	47.8 AV	54.0	-6.2	1.65 H	75	45.86	1.94
3	*5200.00	111.8 PK			1.65 H	72	109.66	2.14
4	*5200.00	101.8 AV			1.65 H	72	99.66	2.14
5	5416.40	51.2 PK	74.0	-22.8	1.65 H	75	48.51	2.69
6	5416.40	39.1 AV	54.0	-14.9	1.65 H	75	36.41	2.69
7	#10400.00	62.9 PK	74.0	-11.1	1.06 H	215	49.82	13.08
8	#10400.00	51.1 AV	54.0	-2.9	1.06 H	215	38.02	13.08
9	15600.00	62.0 PK	74.0	-12.0	1.05 H	335	47.44	14.56
10	15600.00	48.8 AV	54.0	-5.2	1.05 H	335	34.24	14.56

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5117.70	59.3 PK	74.0	-14.7	2.04 V	282	57.36	1.94
2	5117.70	48.7 AV	54.0	-5.3	2.04 V	282	46.76	1.94
3	*5200.00	119.6 PK			2.04 V	282	117.46	2.14
4	*5200.00	109.8 AV			2.04 V	282	107.66	2.14
5	5416.40	51.6 PK	74.0	-22.4	2.04 V	282	48.91	2.69
6	5416.40	39.8 AV	54.0	-14.2	2.04 V	282	37.11	2.69
7	#10400.00	69.6 PK	74.0	-4.4	1.08 V	327	56.52	13.08
8	#10400.00	53.3 AV	54.0	-0.7	1.08 V	327	40.22	13.08
9	15600.00	64.8 PK	74.0	-9.2	1.69 V	259	50.24	14.56
10	15600.00	49.7 AV	54.0	-4.3	1.69 V	259	35.14	14.56

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5088.40	50.5 PK	74.0	-23.5	1.65 H	75	48.62	1.88
2	5088.40	38.8 AV	54.0	-15.2	1.65 H	75	36.92	1.88
3	*5240.00	113.1 PK			1.65 H	75	110.84	2.26
4	*5240.00	102.4 AV			1.65 H	75	100.14	2.26
5	5400.00	51.2 PK	74.0	-22.8	1.65 H	75	48.56	2.64
6	5400.00	39.2 AV	54.0	-14.8	1.65 H	75	36.56	2.64
7	#10480.00	62.7 PK	74.0	-11.3	1.07 H	214	49.58	13.12
8	#10480.00	50.7 AV	54.0	-3.3	1.07 H	214	37.58	13.12
9	15720.00	62.6 PK	74.0	-11.4	1.00 H	333	48.32	14.28
10	15720.00	49.3 AV	54.0	-4.7	1.00 H	333	35.02	14.28

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	5088.40	58.8 PK	74.0	-15.2	2.02 V	269	56.92	1.88
2	5088.40	48.1 AV	54.0	-5.9	2.02 V	269	46.22	1.88
3	*5240.00	120.3 PK			2.02 V	269	118.04	2.26
4	*5240.00	110.7 AV			2.02 V	269	108.44	2.26
5	5400.00	61.3 PK	74.0	-12.7	2.02 V	269	58.66	2.64
6	5400.00	50.5 AV	54.0	-3.5	2.02 V	269	47.86	2.64
7	#10480.00	69.0 PK	74.0	-5.0	1.03 V	322	55.88	13.12
8	#10480.00	53.8 AV	54.0	-0.2	1.03 V	322	40.68	13.12
9	15720.00	59.9 PK	74.0	-14.1	1.97 V	277	45.62	14.28
10	15720.00	46.3 AV	54.0	-7.7	1.97 V	277	32.02	14.28

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5666.10	57.1 PK	74.0	-16.9	1.65 H	89	53.89	3.21
2	#5666.10	46.7 AV	54.0	-7.3	1.65 H	89	43.49	3.21
3	#5715.00	65.8 PK	74.0	-8.2	1.65 H	89	62.54	3.26
4	#5715.00	50.9 AV	54.0	-3.1	1.65 H	89	47.64	3.26
5	*5745.00	109.1 PK			1.65 H	89	105.82	3.28
6	*5745.00	99.2 AV			1.65 H	89	95.92	3.28
7	11490.00	62.3 PK	74.0	-11.7	1.12 H	205	47.66	14.64
8	11490.00	50.2 AV	54.0	-3.8	1.12 H	205	35.56	14.64
9	#17235.00	68.2 PK	74.0	-5.8	1.23 H	314	49.29	18.91
10	#17235.00	53.3 AV	54.0	-0.7	1.23 H	314	34.39	18.91

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5666.10	58.7 PK	74.0	-15.3	1.97 V	276	55.49	3.21
2	#5666.10	48.2 AV	54.0	-5.8	1.97 V	276	44.99	3.21
3	#5715.00	67.3 PK	74.0	-6.7	1.97 V	276	64.04	3.26
4	#5715.00	52.1 AV	54.0	-1.9	1.97 V	276	48.84	3.26
5	*5745.00	115.5 PK			1.97 V	276	112.22	3.28
6	*5745.00	105.7 AV			1.97 V	276	102.42	3.28
7	11490.00	62.2 PK	74.0	-11.8	2.76 V	109	47.56	14.64
8	11490.00	50.0 AV	54.0	-4.0	2.76 V	109	35.36	14.64
9	#17235.00	64.5 PK	74.0	-9.5	1.67 V	278	45.59	18.91
10	#17235.00	49.3 AV	54.0	-4.7	1.67 V	278	30.39	18.91

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5706.30	57.1 PK	74.0	-16.9	1.52 H	84	53.85	3.25
2	#5706.30	47.3 AV	54.0	-6.7	1.52 H	84	44.05	3.25
3	*5785.00	110.2 PK			1.52 H	84	106.90	3.30
4	*5785.00	99.7 AV			1.52 H	84	96.40	3.30
5	#5866.20	51.6 PK	74.0	-22.4	1.52 H	84	48.27	3.33
6	#5866.20	41.1 AV	54.0	-12.9	1.52 H	84	37.77	3.33
7	11570.00	63.1 PK	74.0	-10.9	1.03 H	203	48.70	14.40
8	11570.00	50.8 AV	54.0	-3.2	1.03 H	203	36.40	14.40
9	#17355.00	68.7 PK	74.0	-5.3	1.19 H	303	49.37	19.33
10	#17355.00	53.6 AV	54.0	-0.4	1.19 H	303	34.27	19.33

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	#5706.30	57.4 PK	74.0	-16.6	2.03 V	285	54.15	3.25
2	#5706.30	47.8 AV	54.0	-6.2	2.03 V	285	44.55	3.25
3	*5785.00	115.3 PK			2.03 V	285	112.00	3.30
4	*5785.00	105.6 AV			2.03 V	285	102.30	3.30
5	#5866.20	52.2 PK	74.0	-21.8	2.03 V	285	48.87	3.33
6	#5866.20	41.9 AV	54.0	-12.1	2.03 V	285	38.57	3.33
7	11570.00	61.6 PK	74.0	-12.4	2.71 V	109	47.20	14.40
8	11570.00	49.3 AV	54.0	-4.7	2.71 V	109	34.90	14.40
9	#17355.00	64.2 PK	74.0	-9.8	1.65 V	259	44.87	19.33
10	#17355.00	49.4 AV	54.0	-4.6	1.65 V	259	30.07	19.33

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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	106.8 PK			2.78 H	87	103.49	3.31
2	*5825.00	97.5 AV			2.78 H	87	94.19	3.31
3	#5850.00	58.4 PK	78.2	-19.8	2.58 H	320	55.09	3.31
4	#5860.00	51.3 PK	74.0	-22.7	2.58 H	320	47.98	3.32
5	#5860.00	40.3 AV	54.0	-13.7	2.58 H	320	36.98	3.32
6	#5906.70	52.4 PK	74.0	-21.6	2.58 H	320	49.06	3.34
7	#5906.70	41.7 AV	54.0	-12.3	2.58 H	320	38.36	3.34
8	11650.00	63.0 PK	74.0	-11.0	1.11 H	217	48.81	14.19
9	11650.00	50.9 AV	54.0	-3.1	1.11 H	217	36.71	14.19
10	#17475.00	68.9 PK	74.0	-5.1	1.21 H	315	48.78	20.12
11	#17475.00	53.6 AV	54.0	-0.4	1.21 H	315	33.48	20.12
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	115.0 PK			1.96 V	279	111.69	3.31
2	*5825.00	105.4 AV			1.96 V	279	102.09	3.31
3	#5850.00	59.0 PK	78.2	-19.2	1.96 V	279	55.69	3.31
4	#5860.00	52.5 PK	74.0	-21.5	1.96 V	279	49.18	3.32
5	#5860.00	41.6 AV	54.0	-12.4	1.96 V	279	38.28	3.32
6	#5906.70	53.6 PK	74.0	-20.4	1.96 V	279	50.26	3.34
7	#5906.70	43.0 AV	54.0	-11.0	1.96 V	279	39.66	3.34
8	11650.00	61.7 PK	74.0	-12.3	2.77 V	124	47.51	14.19
9	11650.00	49.7 AV	54.0	-4.3	2.77 V	124	35.51	14.19
10	#17475.00	65.1 PK	74.0	-8.9	1.65 V	254	44.98	20.12
11	#17475.00	49.8 AV	54.0	-4.2	1.65 V	254	29.68	20.12

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.5 PK	74.0	-10.5	2.41 H	77	61.48	2.02
2	5150.00	52.8 AV	54.0	-1.2	2.41 H	77	50.78	2.02
3	*5190.00	107.5 PK			2.41 H	77	105.38	2.12
4	*5190.00	97.5 AV			2.41 H	77	95.38	2.12
5	#5622.00	51.7 PK	74.0	-22.3	2.41 H	77	48.54	3.16
6	#5622.00	40.9 AV	54.0	-13.1	2.41 H	77	37.74	3.16
7	#10380.00	63.0 PK	74.0	-11.0	1.06 H	199	50.01	12.99
8	#10380.00	50.9 AV	54.0	-3.1	1.06 H	199	37.91	12.99
9	15570.00	62.7 PK	74.0	-11.3	1.23 H	259	48.08	14.62
10	15570.00	48.9 AV	54.0	-5.1	1.23 H	259	34.28	14.62
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.6 PK	74.0	-4.4	2.17 V	284	67.58	2.02
2	5150.00	53.3 AV	54.0	-0.7	2.17 V	284	51.28	2.02
3	*5190.00	110.7 PK			1.87 V	207	108.58	2.12
4	*5190.00	99.4 AV			1.87 V	207	97.28	2.12
5	#5622.00	56.5 PK	74.0	-17.5	1.97 V	328	53.34	3.16
6	#5622.00	50.1 AV	54.0	-3.9	1.97 V	328	46.94	3.16
7	#10380.00	64.2 PK	74.0	-9.8	1.30 V	323	51.21	12.99
8	#10380.00	51.0 AV	54.0	-3.0	1.30 V	323	38.01	12.99
9	15570.00	64.4 PK	74.0	-9.6	1.70 V	270	49.78	14.62
10	15570.00	49.5 AV	54.0	-4.5	1.70 V	270	34.88	14.62

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5140.00	54.7 PK	74.0	-19.3	2.50 H	337	52.69	2.01
2	5140.00	43.7 AV	54.0	-10.3	2.50 H	337	41.69	2.01
3	*5230.00	102.7 PK			2.50 H	360	100.48	2.22
4	*5230.00	93.9 AV			2.50 H	360	91.68	2.22
5	5390.00	52.8 PK	74.0	-21.2	2.50 H	337	50.17	2.63
6	5390.00	40.5 AV	54.0	-13.5	2.50 H	337	37.87	2.63
7	#10460.00	62.4 PK	74.0	-11.6	1.01 H	195	49.29	13.11
8	#10460.00	50.5 AV	54.0	-3.5	1.01 H	195	37.39	13.11
9	15690.00	62.9 PK	74.0	-11.1	1.26 H	259	48.53	14.37
10	15690.00	48.8 AV	54.0	-5.2	1.26 H	259	34.43	14.37

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	5140.00	55.2 PK	74.0	-18.8	1.87 V	195	53.19	2.01
2	5140.00	44.5 AV	54.0	-9.5	1.87 V	195	42.49	2.01
3	*5230.00	112.2 PK			1.87 V	195	109.98	2.22
4	*5230.00	101.0 AV			1.87 V	195	98.78	2.22
5	5390.00	53.2 PK	74.0	-20.8	1.87 V	195	50.57	2.63
6	5390.00	41.0 AV	54.0	-13.0	1.87 V	195	38.37	2.63
7	#10460.00	68.3 PK	74.0	-5.7	1.24 V	325	55.19	13.11
8	#10460.00	53.5 AV	54.0	-0.5	1.24 V	325	40.39	13.11
9	15690.00	65.2 PK	74.0	-8.8	1.65 V	284	50.83	14.37
10	15690.00	50.0 AV	54.0	-4.0	1.65 V	284	35.63	14.37

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	58.9 PK	74.0	-15.1	2.53 H	360	55.64	3.26
2	#5715.00	44.3 AV	54.0	-9.7	2.53 H	360	41.04	3.26
3	#5725.00	67.3 PK	78.2	-10.9	2.53 H	360	64.03	3.27
4	*5755.00	103.9 PK			2.53 H	360	100.62	3.28
5	*5755.00	93.4 AV			2.53 H	360	90.12	3.28
6	11510.00	62.7 PK	74.0	-11.3	1.03 H	207	48.10	14.60
7	11510.00	50.7 AV	54.0	-3.3	1.03 H	207	36.10	14.60
8	#17265.00	62.9 PK	74.0	-11.1	1.22 H	259	43.97	18.93
9	#17265.00	49.0 AV	54.0	-5.0	1.22 H	259	30.07	18.93

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	68.4 PK	74.0	-5.6	2.01 V	270	65.14	3.26
2	#5715.00	53.6 AV	54.0	-0.4	2.01 V	270	50.34	3.26
3	#5725.00	75.7 PK	78.2	-2.5	1.63 V	273	72.43	3.27
4	*5755.00	112.8 PK			1.99 V	247	109.52	3.28
5	*5755.00	102.3 AV			1.99 V	247	99.02	3.28
6	11510.00	62.4 PK	74.0	-11.6	2.68 V	110	47.80	14.60
7	11510.00	50.1 AV	54.0	-3.9	2.68 V	110	35.50	14.60
8	#17265.00	64.6 PK	74.0	-9.4	1.66 V	284	45.67	18.93
9	#17265.00	49.6 AV	54.0	-4.4	1.66 V	284	30.67	18.93

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	104.1 PK			2.48 H	360	100.79	3.31
2	*5795.00	93.7 AV			2.48 H	360	90.39	3.31
3	#5850.00	54.1 PK	78.2	-24.1	2.48 H	360	50.79	3.31
4	#5860.00	56.8 PK	74.0	-17.2	2.48 H	360	53.48	3.32
5	#5860.00	44.7 AV	54.0	-9.3	2.48 H	360	41.38	3.32
6	11590.00	62.4 PK	74.0	-11.6	1.05 H	195	48.08	14.32
7	11590.00	50.5 AV	54.0	-3.5	1.05 H	195	36.18	14.32
8	#17385.00	62.3 PK	74.0	-11.7	1.21 H	271	42.77	19.53
9	#17385.00	48.7 AV	54.0	-5.3	1.21 H	271	29.17	19.53
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	113.1 PK			2.03 V	253	109.79	3.31
2	*5795.00	102.5 AV			2.03 V	253	99.19	3.31
3	#5850.00	63.1 PK	78.2	-15.1	2.32 V	248	59.79	3.31
4	#5860.00	65.4 PK	74.0	-8.6	1.53 V	250	62.08	3.32
5	#5860.00	53.6 AV	54.0	-0.4	1.53 V	250	50.28	3.32
6	11590.00	61.7 PK	74.0	-12.3	2.63 V	115	47.38	14.32
7	11590.00	49.7 AV	54.0	-4.3	2.63 V	115	35.38	14.32
8	#17385.00	64.6 PK	74.0	-9.4	1.64 V	296	45.07	19.53
9	#17385.00	49.9 AV	54.0	-4.1	1.64 V	296	30.37	19.53

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.0 PK	74.0	-12.0	2.47 H	360	59.98	2.02
2	5150.00	44.3 AV	54.0	-9.7	2.47 H	360	42.28	2.02
3	*5210.00	99.0 PK			2.47 H	360	96.83	2.17
4	*5210.00	87.2 AV			2.47 H	360	85.03	2.17
5	5350.00	55.8 PK	74.0	-18.2	2.47 H	360	53.26	2.54
6	5350.00	43.8 AV	54.0	-10.2	2.47 H	360	41.26	2.54
7	#10420.00	62.8 PK	74.0	-11.2	1.00 H	202	49.71	13.09
8	#10420.00	50.8 AV	54.0	-3.2	1.00 H	202	37.71	13.09
9	15630.00	62.5 PK	74.0	-11.5	1.28 H	250	48.01	14.49
10	15630.00	48.9 AV	54.0	-5.1	1.28 H	250	34.41	14.49
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.0 PK	74.0	-3.0	1.74 V	270	68.98	2.02
2	5150.00	53.4 AV	54.0	-0.6	1.74 V	270	51.38	2.02
3	*5210.00	107.3 PK			1.47 V	273	105.13	2.17
4	*5210.00	95.7 AV			1.47 V	273	93.53	2.17
5	5350.00	55.2 PK	74.0	-18.8	1.74 V	270	52.66	2.54
6	5350.00	43.4 AV	54.0	-10.6	1.74 V	270	40.86	2.54
7	#10420.00	62.1 PK	74.0	-11.9	2.70 V	126	49.01	13.09
8	#10420.00	49.8 AV	54.0	-4.2	2.70 V	126	36.71	13.09
9	15630.00	64.4 PK	74.0	-9.6	1.64 V	286	49.91	14.49
10	15630.00	49.4 AV	54.0	-4.6	1.64 V	286	34.91	14.49

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 155	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	61.2 PK	74.0	-12.8	2.53 H	360	57.94	3.26
2	#5715.00	44.6 AV	54.0	-9.4	2.53 H	360	41.34	3.26
3	#5725.00	66.8 PK	78.2	-11.4	2.53 H	360	63.53	3.27
4	*5775.00	99.3 PK			2.53 H	360	96.01	3.29
5	*5775.00	88.3 AV			2.53 H	360	85.01	3.29
6	#5850.00	61.4 PK	78.2	-16.8	2.53 H	360	58.09	3.31
7	#5860.00	57.1 PK	74.0	-16.9	2.53 H	360	53.78	3.32
8	#5860.00	43.1 AV	54.0	-10.9	2.53 H	360	39.78	3.32
9	11550.00	62.7 PK	74.0	-11.3	1.08 H	200	48.24	14.46
10	11550.00	50.6 AV	54.0	-3.4	1.08 H	200	36.14	14.46
11	#17325.00	62.6 PK	74.0	-11.4	1.23 H	262	43.47	19.13
12	#17325.00	48.8 AV	54.0	-5.2	1.23 H	262	29.67	19.13

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	69.6 PK	74.0	-4.4	2.36 V	270	66.34	3.26
2	#5715.00	53.3 AV	54.0	-0.7	2.36 V	270	50.04	3.26
3	#5725.00	76.4 PK	78.2	-1.8	2.36 V	270	73.13	3.27
4	*5775.00	108.9 PK			2.07 V	247	105.61	3.29
5	*5775.00	97.7 AV			2.07 V	247	94.41	3.29
6	#5850.00	70.7 PK	78.2	-7.5	2.36 V	270	67.39	3.31
7	#5860.00	65.3 PK	74.0	-8.7	2.36 V	270	61.98	3.32
8	#5860.00	51.6 AV	54.0	-2.4	2.36 V	270	48.28	3.32
9	11550.00	62.8 PK	74.0	-11.2	2.70 V	107	48.34	14.46
10	11550.00	50.4 AV	54.0	-3.6	2.70 V	107	35.94	14.46
11	#17325.00	64.3 PK	74.0	-9.7	1.67 V	288	45.17	19.13
12	#17325.00	49.5 AV	54.0	-4.5	1.67 V	288	30.37	19.13

REMARKS:

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

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 46	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	33.67	33.3 QP	40.0	-6.7	1.00 H	272	42.85	-9.56
2	189.33	30.3 QP	43.5	-13.2	1.50 H	292	41.32	-10.98
3	219.76	33.4 QP	46.0	-12.6	1.00 H	263	44.58	-11.14
4	403.34	41.3 QP	46.0	-4.7	1.00 H	335	46.23	-4.96
5	625.12	31.6 QP	46.0	-14.4	1.00 H	245	31.39	0.25
6	800.15	34.2 QP	46.0	-11.9	1.50 H	109	31.11	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	33.43	33.8 QP	40.0	-6.2	1.00 V	44	43.37	-9.61
2	85.85	31.6 QP	40.0	-8.4	1.00 V	194	45.52	-13.90
3	218.67	35.9 QP	46.0	-10.1	1.00 V	24	47.09	-11.23
4	351.13	39.3 QP	46.0	-6.7	1.00 V	327	45.53	-6.27
5	400.05	39.2 QP	46.0	-6.8	1.00 V	56	44.19	-5.02
6	625.05	34.8 QP	46.0	-11.2	1.50 V	231	34.52	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

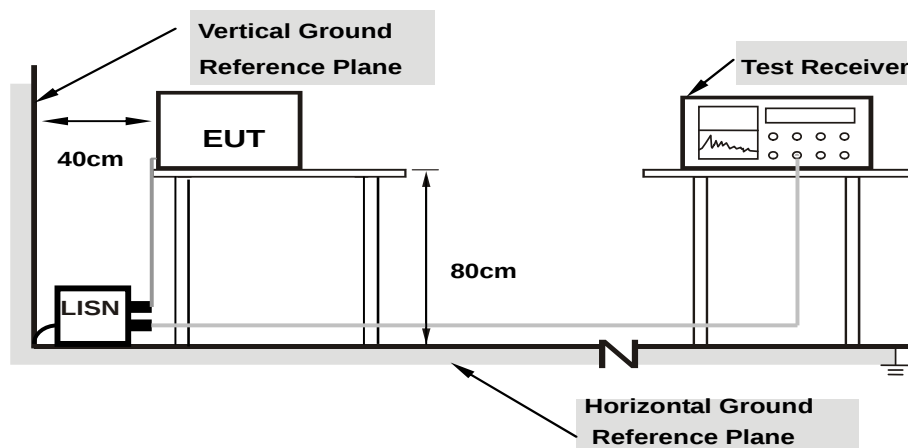
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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.

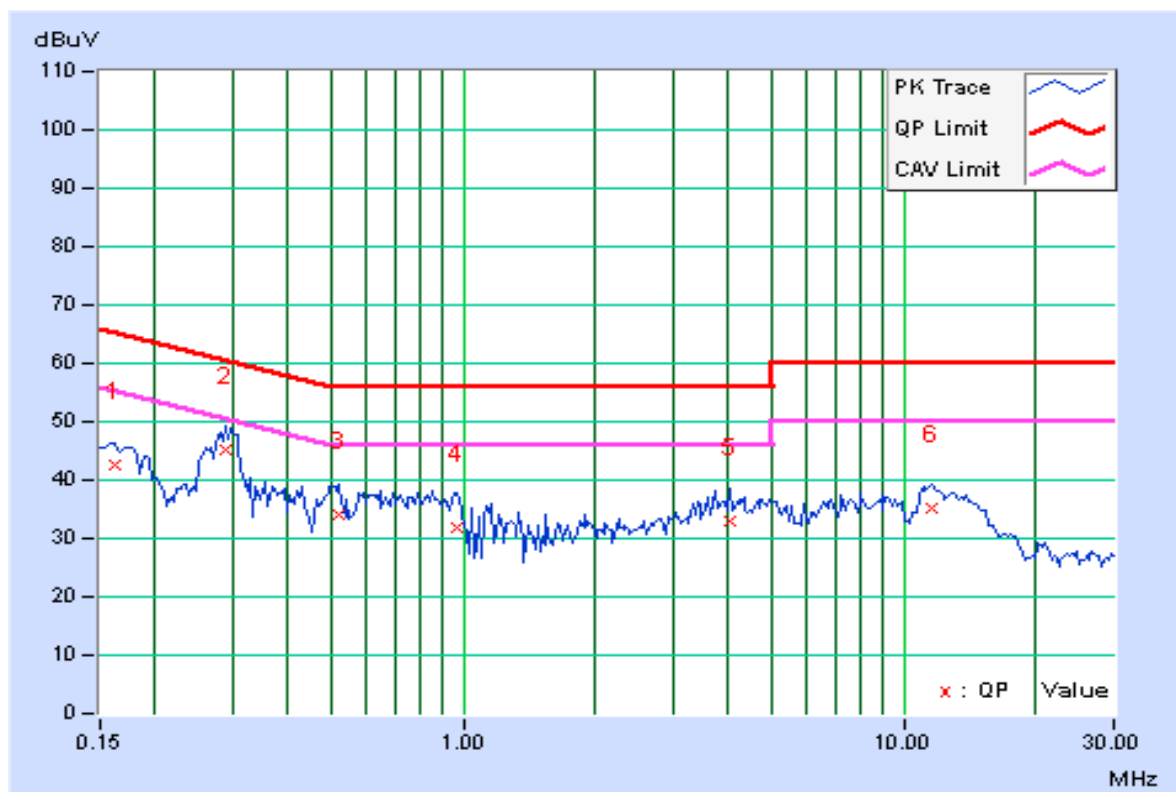
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	10.37	32.27	21.19	42.64	31.56	65.38	55.38	-22.73	-23.81
2	0.29063	10.35	34.80	24.01	45.15	34.36	60.51	50.51	-15.35	-16.14
3	0.52500	10.36	23.86	15.50	34.22	25.86	56.00	46.00	-21.78	-20.14
4	0.97031	10.32	21.47	13.21	31.79	23.53	56.00	46.00	-24.21	-22.47
5	4.01563	10.58	22.40	16.07	32.98	26.65	56.00	46.00	-23.02	-19.35
6	11.52344	11.00	24.27	19.93	35.27	30.93	60.00	50.00	-24.73	-19.07

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

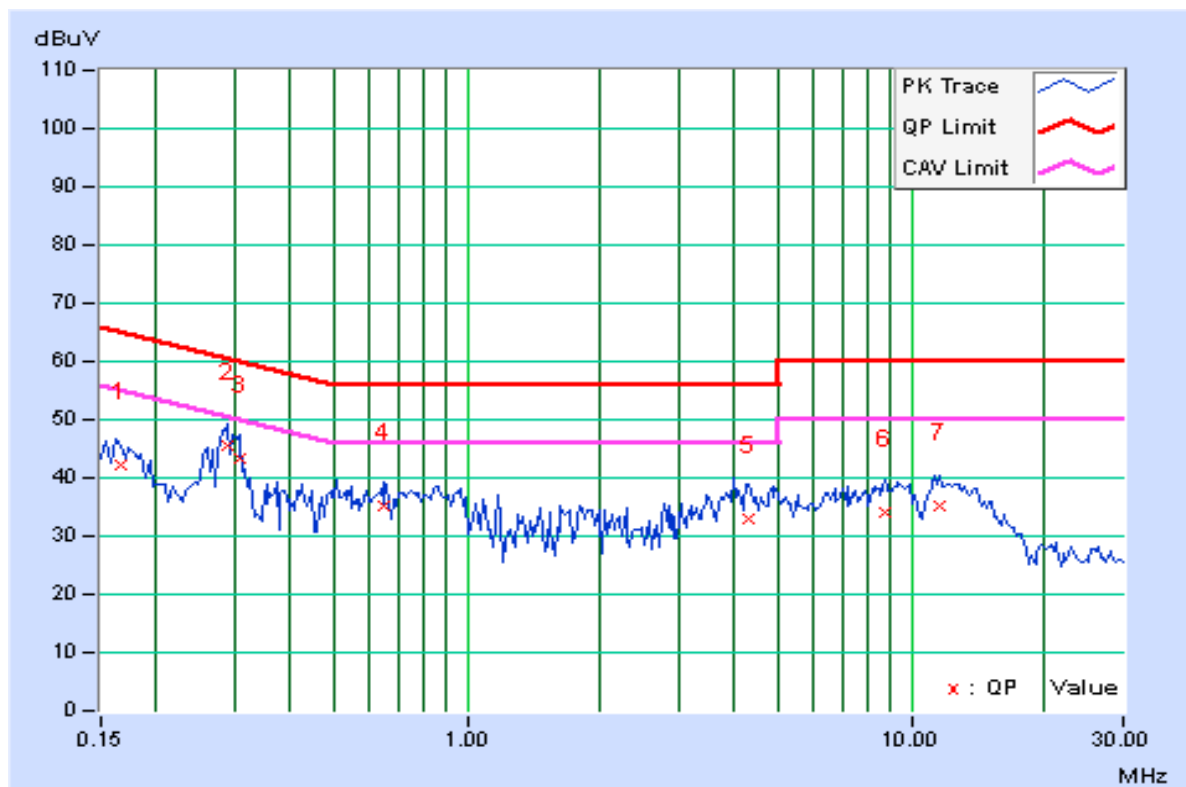


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16647	10.38	31.75	21.53	42.13	31.91	65.13	55.13	-23.00	-23.22
2	0.29063	10.40	35.00	24.25	45.40	34.65	60.51	50.51	-15.10	-15.85
3	0.30625	10.41	33.02	25.65	43.43	36.06	60.07	50.07	-16.65	-14.02
4	0.65000	10.40	24.77	14.46	35.17	24.86	56.00	46.00	-20.83	-21.14
5	4.31250	10.69	22.43	15.86	33.12	26.55	56.00	46.00	-22.88	-19.45
6	8.69922	10.87	23.31	18.64	34.18	29.51	60.00	50.00	-25.82	-20.49
7	11.60938	11.02	24.29	19.85	35.31	30.87	60.00	50.00	-24.69	-19.13

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



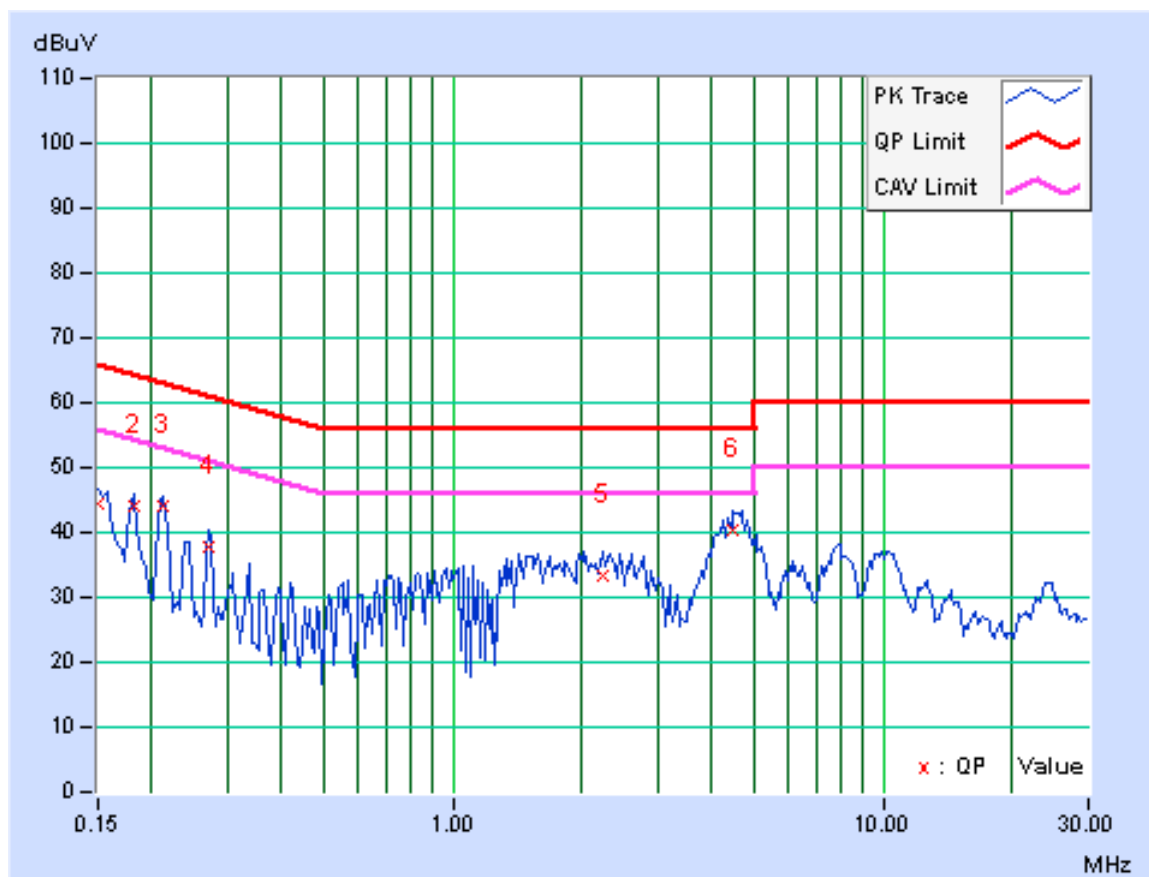
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.26	34.32	28.35	44.58	38.61	66.00	56.00	-21.42	-17.39
2	0.18125	10.24	33.76	28.03	44.00	38.27	64.43	54.43	-20.43	-16.16
3	0.21250	10.22	33.76	31.88	43.98	42.10	63.11	53.11	-19.13	-11.01
4	0.27109	10.23	27.61	25.23	37.84	35.46	61.08	51.08	-23.25	-15.63
5	2.23047	10.23	23.24	17.73	33.47	27.96	56.00	46.00	-22.53	-18.04
6	4.48047	10.39	29.96	25.61	40.35	36.00	56.00	46.00	-15.65	-10.00

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

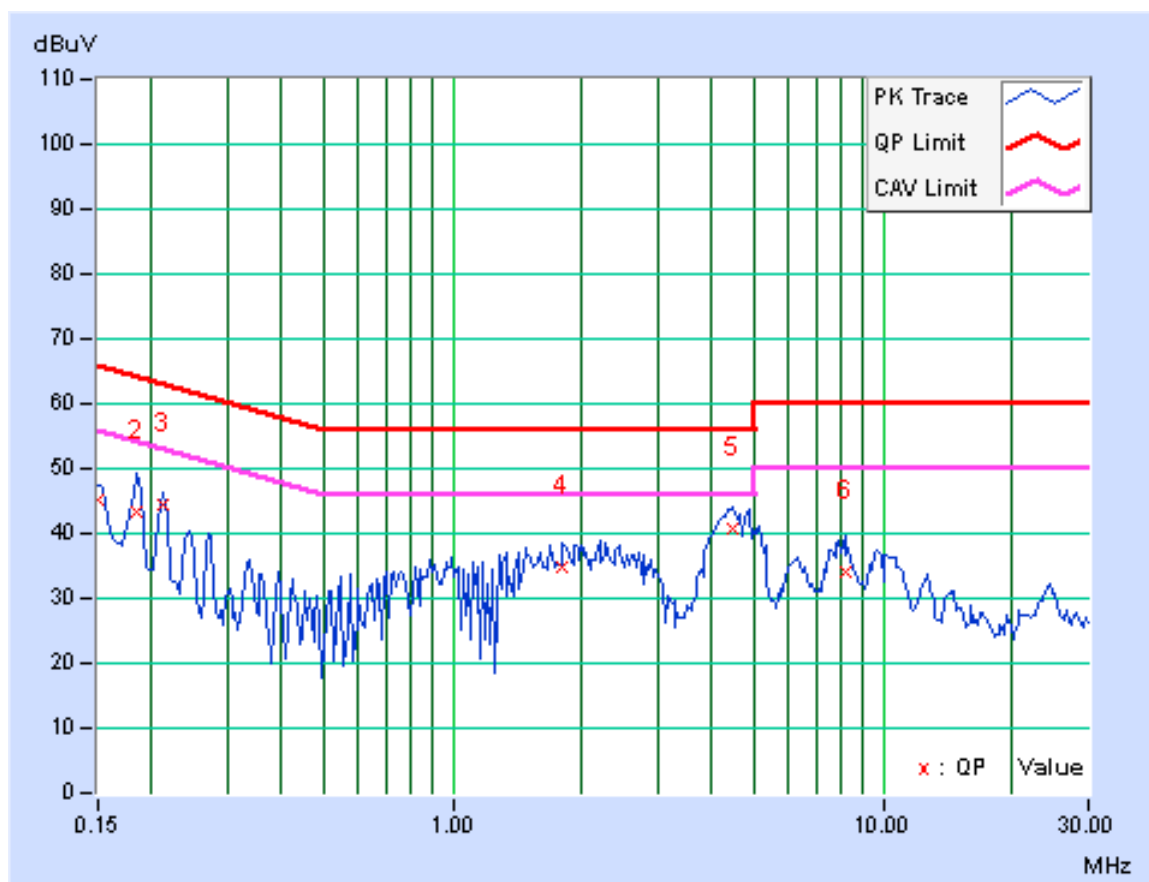


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.24	34.89	29.08	45.13	39.32	66.00	56.00	-20.87	-16.68
2	0.18516	10.21	33.15	27.10	43.36	37.31	64.25	54.25	-20.89	-16.94
3	0.21250	10.20	34.28	32.70	44.48	42.90	63.11	53.11	-18.63	-10.21
4	1.78906	10.20	24.43	18.95	34.63	29.15	56.00	46.00	-21.37	-16.85
5	4.45703	10.40	30.23	26.82	40.63	37.22	56.00	46.00	-15.37	-8.78
6	8.17969	10.49	23.65	18.65	34.14	29.14	60.00	50.00	-25.86	-20.86

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

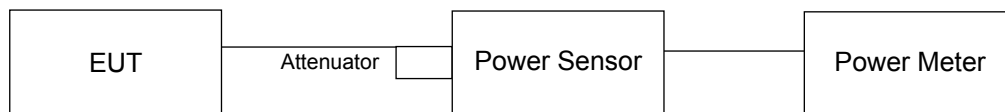
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 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
36	5180	146.893	21.67	30	Pass
40	5200	143.549	21.57	30	Pass
48	5240	142.233	21.53	30	Pass
149	5745	137.404	21.38	30	Pass
157	5785	152.757	21.84	30	Pass
165	5825	129.122	21.11	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
36	5180	179.556	22.54	30	Pass
40	5200	154.974	21.90	30	Pass
48	5240	192.527	22.84	30	Pass
149	5745	159.055	22.02	30	Pass
157	5785	158.081	21.99	30	Pass
165	5825	123.361	20.91	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
38	5190	171.208	22.34	30	Pass
46	5230	260.004	24.15	30	Pass
151	5755	160.136	22.04	30	Pass
159	5795	161.693	22.09	30	Pass

802.11ac (VHT80)

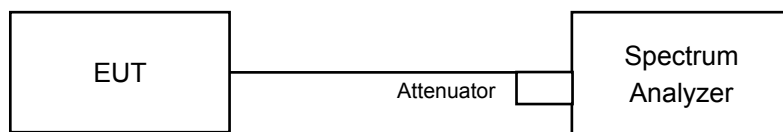
Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
42	5210	172.055	22.36	30	Pass
155	5775	155.069	21.91	30	Pass

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

For U-NII-1 band:

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 U-NII-3 band:

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

For 802.11ac (VHT80):

For U-NII-1 band:

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

For U-NII-3 band:

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

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
36	5180	8.42	17	Pass
40	5200	8.24	17	Pass
48	5240	8.65	17	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			
36	5180	4.87	4.38	4.85	9.48	14.83	Pass
40	5200	4.25	4.37	5.02	9.33	14.83	Pass
48	5240	5.69	5.22	6.01	10.42	14.83	Pass

Note: 1. 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 $17 - (8.17 - 6) = 14.83\text{dBm}$.

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			
38	5190	1.93	1.87	2.48	6.87	14.83	Pass
46	5230	3.19	3.23	3.96	8.25	14.83	Pass

Note: 1. 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 $17 - (8.17 - 6) = 14.83\text{dBm}$.

802.11ac (VHT80)

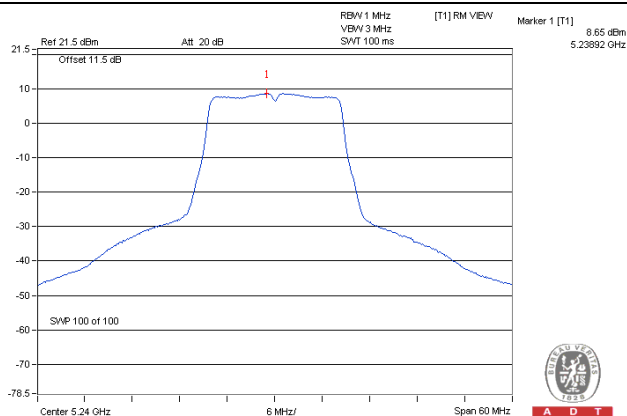
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. EIRP Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	-1.38	-1.70	-1.48	0.2	3.46	14.83	Pass

Note: 1. 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 $17 - (8.17 - 6) = 14.83\text{dBm}$.

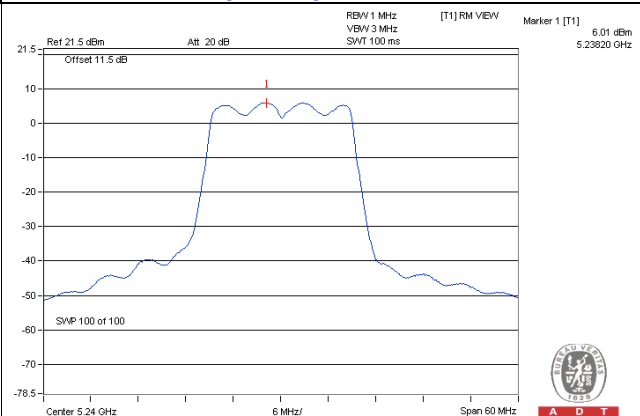
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

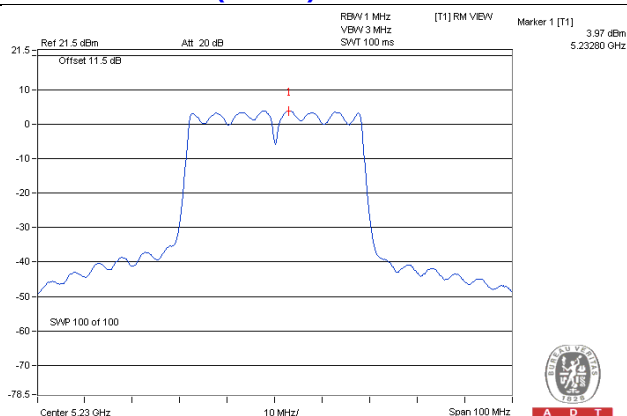
802.11a – Chain 0 / CH48



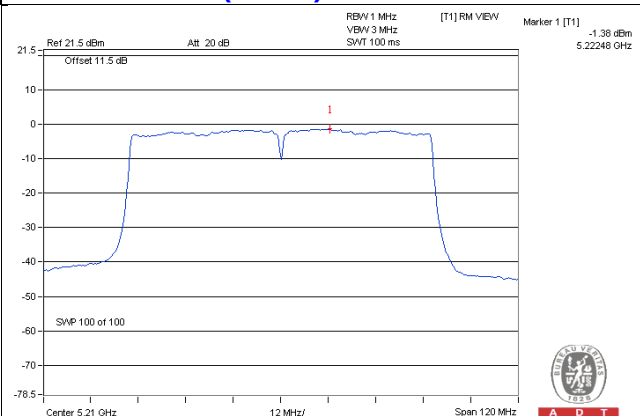
802.11ac (VHT20) – Chain 2 / CH48



802.11ac (VHT40) – Chain 2 / CH46



802.11ac (VHT80) – Chain 0 / CH42



For U-NII-3 Band:

802.11a

Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
149	5745	1.72	3.94	30	Pass
157	5785	1.62	3.84	30	Pass
165	5825	0.71	2.93	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	149	5745	-3.03	-0.81	4.77	3.96	27.83	Pass
	157	5785	-2.99	-0.77	4.77	4.00	27.83	Pass
	165	5825	-4.73	-2.51	4.77	2.26	27.83	Pass
1	149	5745	-3.43	-1.21	4.77	3.56	27.83	Pass
	157	5785	-3.42	-1.20	4.77	3.57	27.83	Pass
	165	5825	-4.32	-2.10	4.77	2.67	27.83	Pass
2	149	5745	-1.94	0.28	4.77	5.05	27.83	Pass
	157	5785	-2.33	-0.11	4.77	4.66	27.83	Pass
	165	5825	-3.99	-1.77	4.77	3.00	27.83	Pass

Note: 1. 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 $30 - (8.17 - 6) = 27.83\text{dBm}$.

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	151	5755	-6.06	-3.84	4.77	0.93	27.83	Pass
	159	5795	-6.80	-4.58	4.77	0.19	27.83	Pass
1	151	5755	-6.84	-4.62	4.77	0.15	27.83	Pass
	159	5795	-6.85	-4.63	4.77	0.14	27.83	Pass
2	151	5755	-5.41	-3.19	4.77	1.58	27.83	Pass
	159	5795	-5.81	-3.59	4.77	1.18	27.83	Pass

Note: 1. 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 $30 - (8.17 - 6) = 27.83\text{dBm}$.

802.11ac (VHT80)

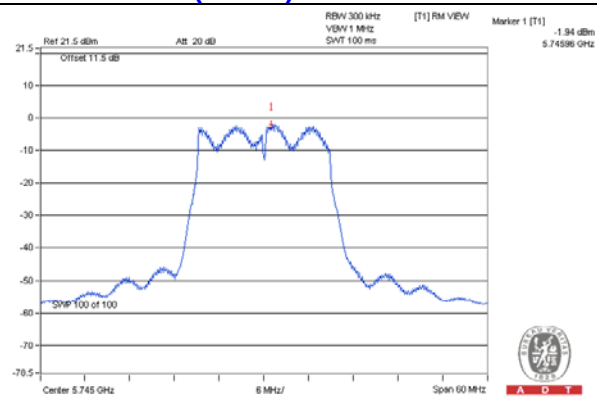
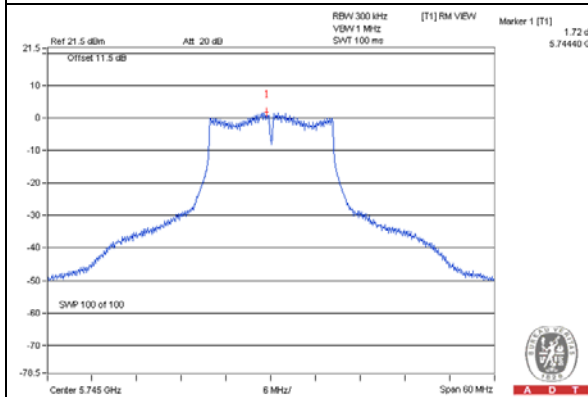
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-9.25	-7.03	4.77	0.2	-2.06	27.83	Pass
1	155	5775	-10.08	-7.86	4.77	0.2	-2.89	27.83	Pass
2	155	5775	-7.81	-5.59	4.77	0.2	-0.62	27.83	Pass

- Note:**
1. 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 $30-(8.17-6) = 27.83\text{dBm}$.
 2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

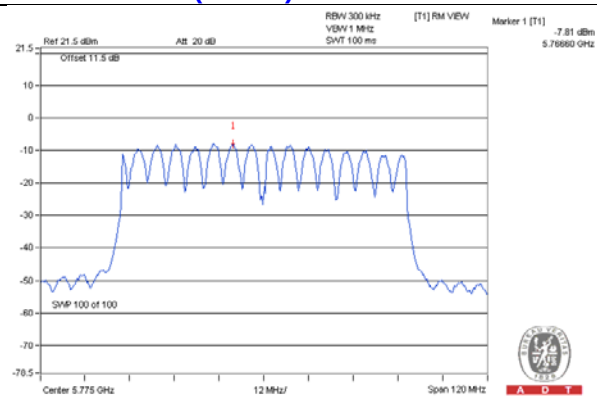
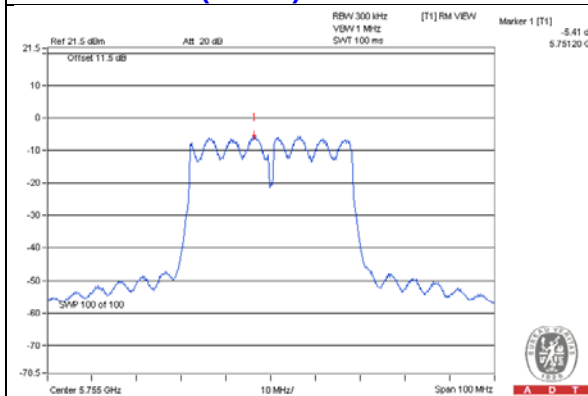
802.11a – Chain 0: CH 149

802.11ac (VHT20) – Chain 2: CH 149



802.11ac (VHT40) – Chain 2: CH 151

802.11ac (VHT80) – Chain 2: CH 155

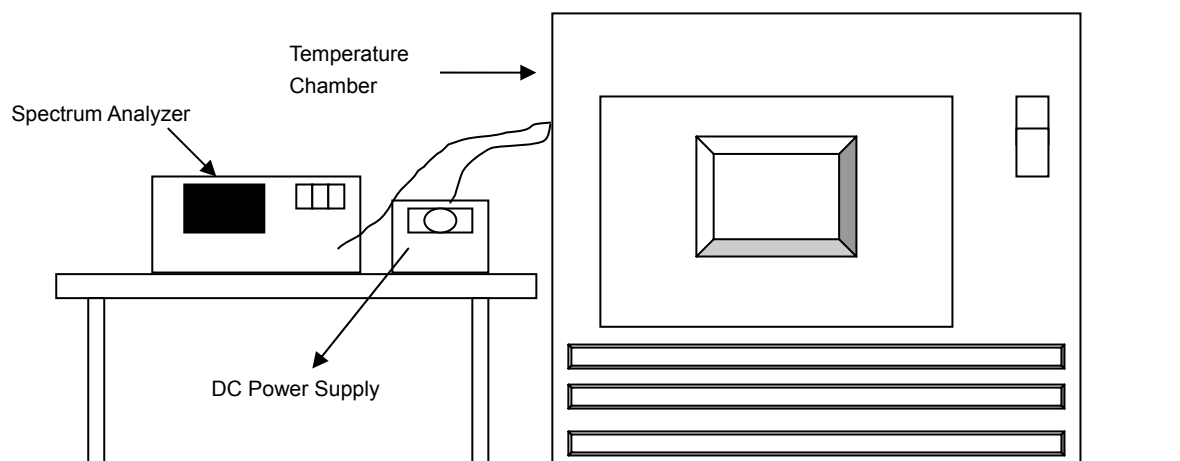


4.5 Frequency Stability Measurement

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: 5180MHz									
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	5180.0113	0.00022	5180.0123	0.00024	5180.0138	0.00027	5180.01	0.00019
40	120	5180.0224	0.00043	5180.0202	0.00039	5180.0231	0.00045	5180.0198	0.00038
30	120	5179.9753	-0.00048	5179.9764	-0.00046	5179.9745	-0.00049	5179.9769	-0.00045
20	120	5180.0115	0.00022	5180.0122	0.00024	5180.0124	0.00024	5180.0123	0.00024
10	120	5179.9866	-0.00026	5179.9849	-0.00029	5179.9868	-0.00025	5179.9837	-0.00031
0	120	5179.9934	-0.00013	5179.994	-0.00012	5179.996	-0.00008	5179.9945	-0.00011
-10	120	5180.0249	0.00048	5180.0237	0.00046	5180.0255	0.00049	5180.0259	0.00050
-20	120	5179.9936	-0.00012	5179.9961	-0.00008	5179.9943	-0.00011	5179.9949	-0.00010
-30	120	5180.0014	0.00003	5179.9978	-0.00004	5180	0.00000	5180.0017	0.00003

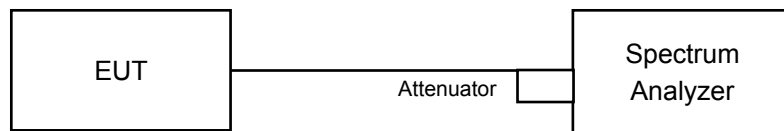
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0107	0.00021	5180.0113	0.00022	5180.0119	0.00023	5180.0119	0.00023
	120	5180.0115	0.00022	5180.0122	0.00024	5180.0124	0.00024	5180.0123	0.00024
	102	5180.0105	0.00020	5180.0123	0.00024	5180.0127	0.00025	5180.0123	0.00024

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
149	5745	16.41	0.5	PASS
157	5785	16.43	0.5	PASS
165	5825	16.40	0.5	PASS

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.58	17.72	17.11	0.5	PASS
157	5785	17.59	17.72	17.05	0.5	PASS
165	5825	17.64	17.71	17.40	0.5	PASS

802.11ac (VHT40)

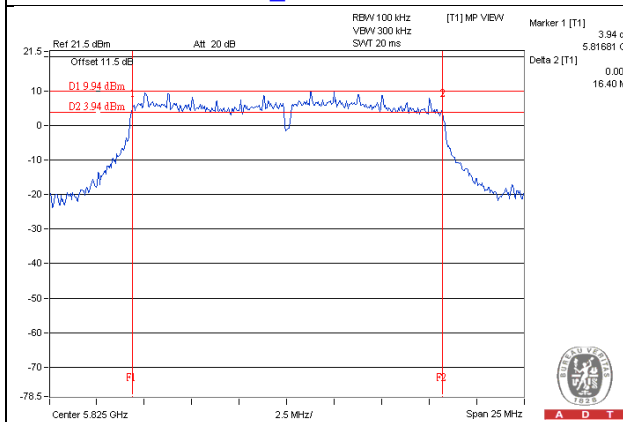
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.50	36.50	36.16	0.5	PASS
159	5795	36.51	36.47	36.45	0.5	PASS

802.11ac (VHT80)

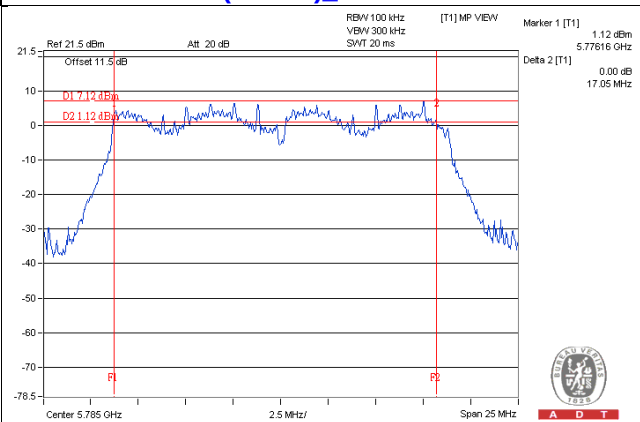
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	76.10	76.19	75.98	0.5	PASS

Spectrum Plot of Worst Value

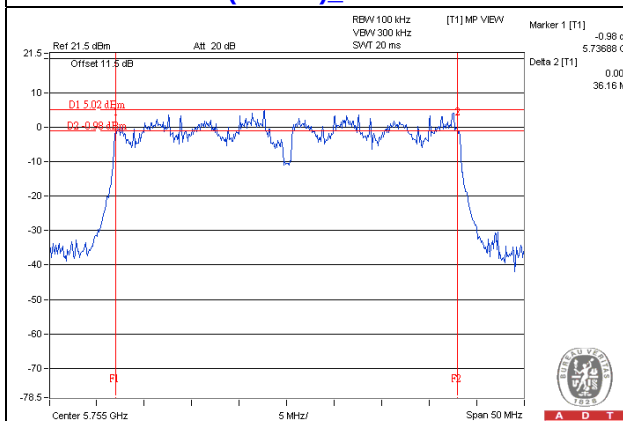
802.11a_Chain 0 / CH165



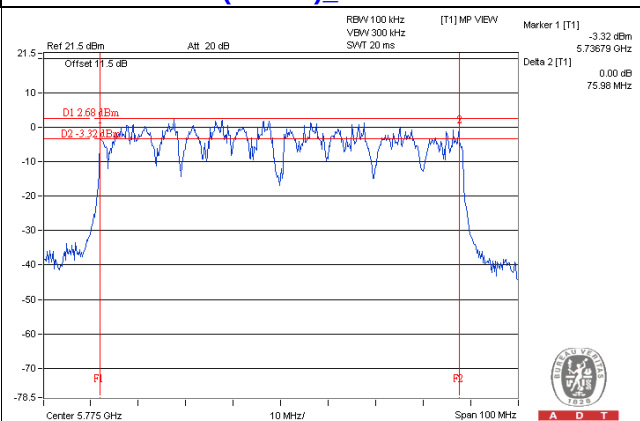
802.11ac (VHT20)_Chain 2 / CH157



802.11ac (VHT40)_Chain 2 / CH151



802.11ac (VHT80)_Chain 2 / CH155



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:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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