FCC Test Report

Report No.:	RF160914E09-1 R1
FCC ID:	UXX-S5A643A
Test Model:	S5A643A
Series Model:	S5A644A
Received Date:	Sep. 19, 2016
Test Date:	Sep. 24 to Oct. 07, 2016
Issued Date:	Oct. 20, 2016
Applicant:	Cradlepoint, Inc
Address:	1111 W. Jefferson Street, Suite 400,Boise, ID 83702 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF160914E09-1	Original release.	Oct. 19, 2016
RF160914E09-1 R1	Removed the model : S5A648A	Oct. 20, 2016

1 Certificate of Conformity

Product:	2x2 Dual Band Concurrent AP
Brand:	Cradlepoint
Test Model:	S5A643A
Series Model:	S5A644A
Sample Status:	ENGINEERING SAMPLE
Applicant:	Cradlepoint, Inc
Test Date:	Sep. 24 to Oct. 07, 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 : _____ , **Date:** Oct. 20, 2016

Midoli Peng / Specialist

Approved by : _____ , **Date:** Oct. 20, 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 -4.89dB at 0.34141MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
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 R-SMA not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

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	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 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	2x2 Dual Band Concurrent AP
Brand	Cradlepoint
Test Model	S5A643A
Series Model	S5A644A
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only.
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz and 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** **CDD Mode:** 645.542mW **Beamforming Mode:** 618.533mW **5GHz:** **5.18GHz ~ 5.24GHz:** **CDD Mode:** 180.436mW **Beamforming Mode:** 153.735mW **5.745GHz ~ 5.825GHz:** **CDD Mode:** 351.186mW **Beamforming Mode:** 349.474mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. All models are listed as below.

Model	Different			
	WiFi function	LTE function	Embedded radio	SKU
S5A643A	V	V	Model: MC7455	IBR900LP6
S5A644A	V	-	-	IBR900NM

From the above models, model: **S5A643A** was selected as representative model for the test and its data was recorded in this report.

2. There are WLAN, GPS and WWAN(LTE) technology used for the EUT.
3. EUT inside has one WWAN(LTE) module (contains FCC ID: N7NMC7455).
4. Simultaneously transmission condition.

Condition	**Technology**		
1	WLAN (2.4GHz)	WLAN (5GHz)	WWAN(LTE)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.			

5. The EUT must be supplied with a power adapter and following different models could be chosen as following table:

No	Brand	Model No.	Spec.
1	Asian Power Devices Inc.	WA-36A12R	Input: 100-240V~50-60Hz, 0.9A Max. Output: 12V / 3A DC output cable: 1.45m, unshielded
2	LEI	MU30-P120200-A1	Input: 100-240V~50/60Hz, 0.8A Output: 12V / 2A DC output cable: 1.5m, unshielded
3	Ten Pao International Inc.	S024WM1200150	Input: 100-240V~50/60Hz 600mA Max. Output: 12V / 1500mA DC output cable: 2m, unshielded
Note: 1. For radiated emissions test, the EUT was pre-tested with above adapters, the worst case was found in adapter 3. Therefore only the test data of the adapter was recorded in this report.			

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

Antenna No.	Antenna Gain(dBi) Including cable loss	Frequency Range (GHz to GHz)	Antenna Type	Connecter Type
1	4.49	2.4~2.4835	Dipole	R-SMA
	4.56	5.15~5.25		
	4.56	5.25~5.35		
	4.63	5.47~5.725		
	4.44	5.725~5.85		
2	4.49	2.4~2.4835	Dipole	R-SMA
	4.56	5.15~5.25		
	4.56	5.25~5.35		
	4.63	5.47~5.725		
	4.44	5.725~5.85		

7. The EUT incorporates a MIMO function.

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

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. 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)

8. 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	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

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

Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

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	-	-	√	-	With adapter 1
2	-	-	√	-	With adapter 2
3	√	√	√	√	With adapter 3

Where RE≥1G: Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: 1. The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on X-plane.
2. "-"means no effect.

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.

CDD Mode						
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
Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240	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
802.11ac (VHT20)	5745-5825	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.

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5180-5240	36 to 64	157	OFDM	BPSK	6
	5745-5825	149 to 165				

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.

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5180-5240	36 to 64	157	OFDM	BPSK	6
	5745-5825	149 to 165				

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.

CDD Mode (Output power only)						
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
CDD Mode (6dB Bandwidth / Occupied Bandwidth / Power density only)						
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
802.11a	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
Beamforming Mode (Output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5180-5240	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
802.11ac (VHT20)	5745-5825	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
Beamforming Mode (6dB Bandwidth / Occupied Bandwidth / Power density only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT80)	5180-5240	42	42	OFDM	BPSK	29.3
802.11ac (VHT80)	5745-5825	155	155	OFDM	BPSK	29.3

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 71%RH	120Vac, 60Hz	Gary Cheng
RE<1G	19deg. C, 67%RH	120Vac, 60Hz	Gary Cheng
PLC	27deg. C, 76%RH	120Vac, 60Hz	Eagle Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Gary Cheng

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor is required

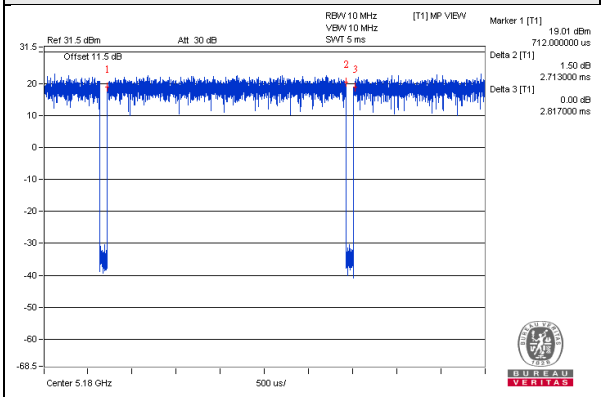
802.11a: Duty cycle = 2.713/2.817 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16

802.11ac (VHT20): Duty cycle = 2.514/2.605 = 0.965, Duty factor = 10 * log(1/0.965) = 0.15

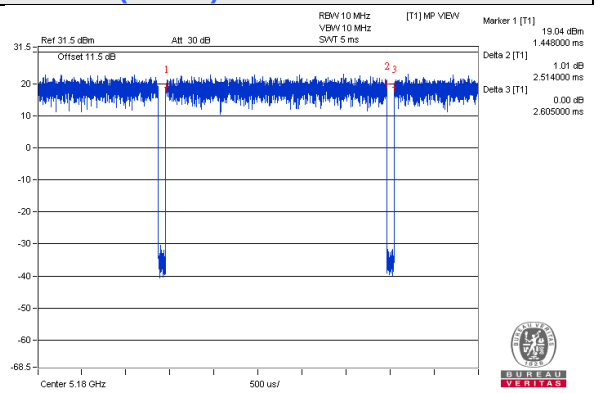
802.11ac (VHT40): Duty cycle = 1.84/1.925 = 0.956, Duty factor = 10 * log(1/0.956) = 0.20

802.11ac (VHT80): Duty cycle = 0.871/0.957 = 0.91, Duty factor = 10 * log(1/0.91) = 0.41

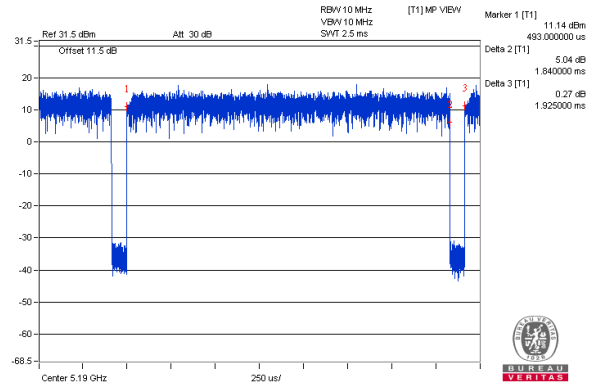
802.11a



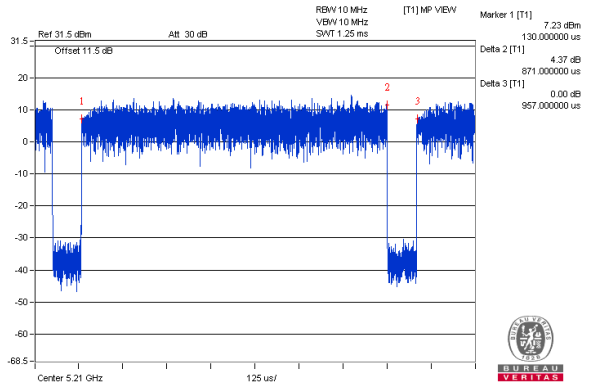
802.11ac (VHT20)



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.

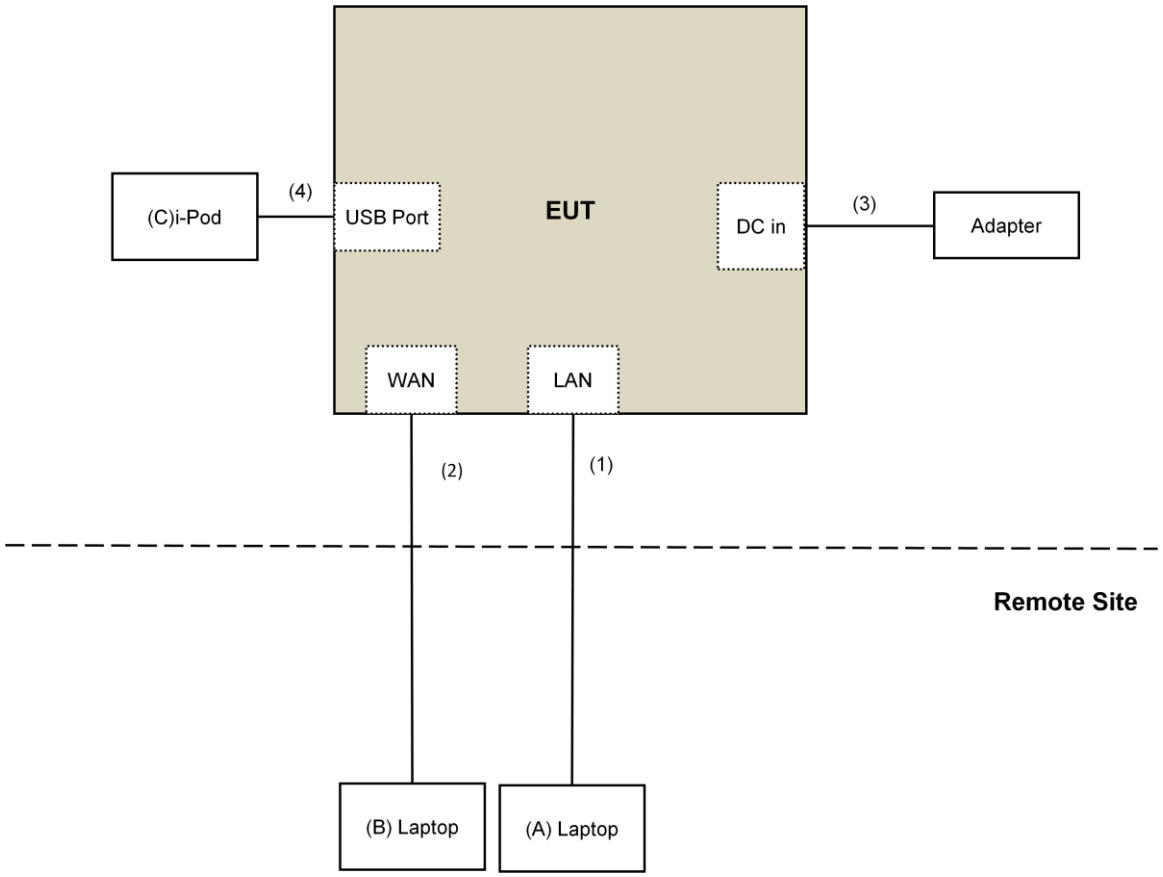
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B.	Laptop	DELL	PP32LA	FSLB32S	FCC DoC	Provided by Lab
C.	i-Pod	Apple	MD778TA/A	CC4JMFL0F4T1	NA	Provided by Lab

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.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	DC Cable	1	2	No	0	Supplied by client
		1	1.45	No	0	
		1	1.5	No	0	

3.4.1 Configuration of System under Test



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:

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

<table>
<tr><td colspan="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r02</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*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.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 20, 2016	July 19, 2017
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-1000VH2 B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
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_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSP40	100036	Jan. 27, 2016	Jan. 26, 2017
Power meter Anritsu	ML2495A	0824006	May 26, 2016	May 25, 2017
Power sensor Anritsu	MA2411B	0738172	May 26, 2016	May 25, 2017
AC Power Source Extech Electronics	6502	1140503	NA	NA
Temperature & Humidity Chamber TERCHY	MHU-225AU	911033	Dec. 03, 2015	Dec. 02, 2016
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2015	Nov. 09, 2016

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. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date: Sep. 24 to Oct. 07, 2016

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case 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.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 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:

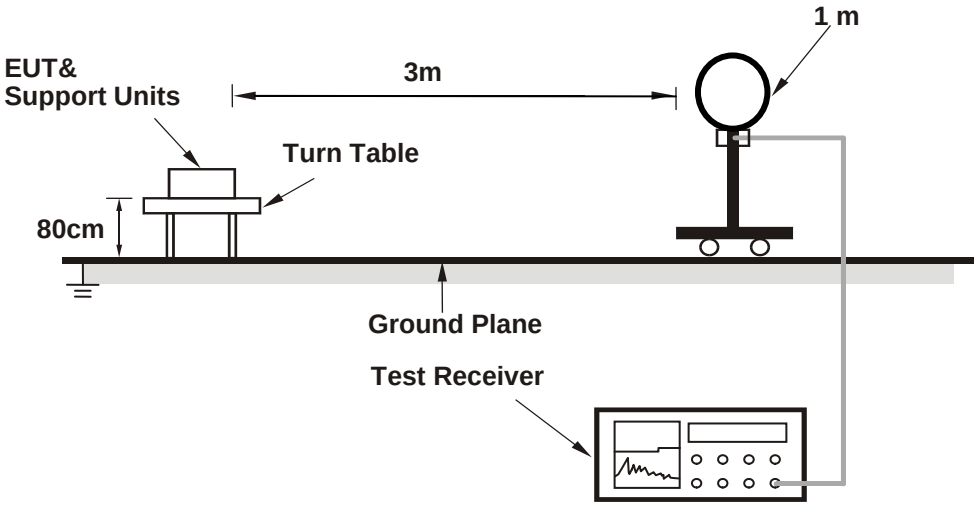
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
1. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

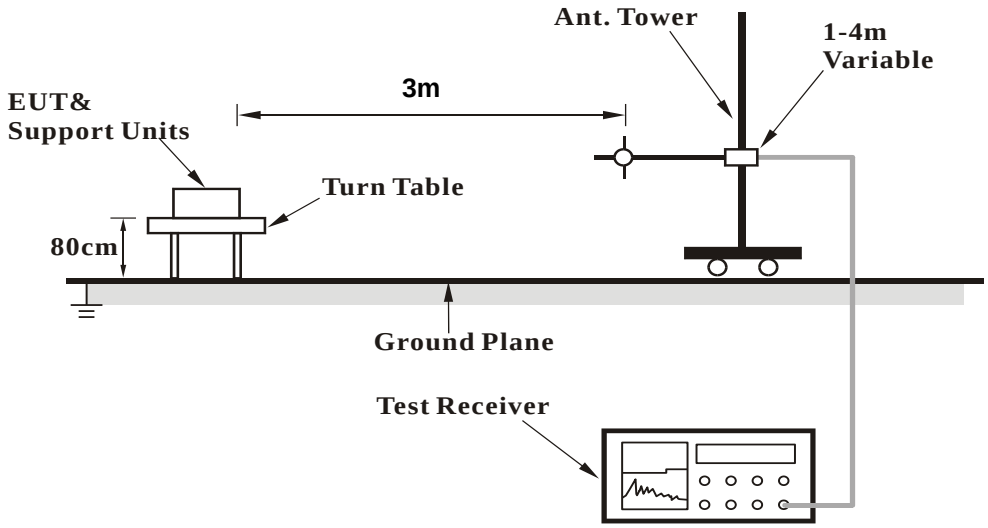
No deviation.

4.1.5 Test Setup

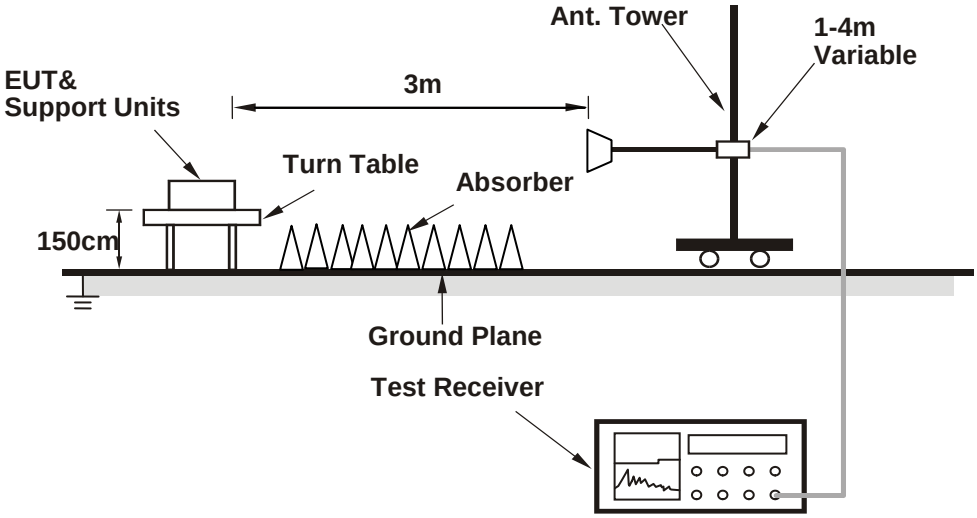
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Contorlling software (QDART-Connectivity1000036.exe) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

CDD Mode

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	53.1 PK	74.0	-20.9	2.00 H	335	51.6	1.5
2	5150.00	38.7 AV	54.0	-15.3	2.00 H	335	37.2	1.5
3	*5180.00	99.8 PK			2.00 H	335	98.2	1.6
4	*5180.00	87.4 AV			2.00 H	335	85.8	1.6
5	#10360.00	50.4 PK	74.0	-23.6	1.26 H	221	38.9	11.5
6	#10360.00	39.0 AV	54.0	-15.0	1.26 H	221	27.5	11.5
7	15540.00	52.9 PK	74.0	-21.1	1.08 H	128	39.8	13.1
8	15540.00	40.6 AV	54.0	-13.4	1.08 H	128	27.5	13.1
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	66.5 PK	74.0	-7.5	1.10 V	6	65.0	1.5
2	5150.00	53.2 AV	54.0	-0.8	1.10 V	6	51.7	1.5
3	*5180.00	113.9 PK			1.10 V	6	112.3	1.6
4	*5180.00	104.6 AV			1.10 V	6	103.0	1.6
5	#10360.00	50.4 PK	74.0	-23.6	1.83 V	168	38.9	11.5
6	#10360.00	39.2 AV	54.0	-14.8	1.83 V	168	27.7	11.5
7	15540.00	50.8 PK	74.0	-23.2	1.69 V	310	37.7	13.1
8	15540.00	39.6 AV	54.0	-14.4	1.69 V	310	26.5	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.3 PK	74.0	-21.7	2.00 H	330	50.8	1.5
2	5150.00	39.7 AV	54.0	-14.3	2.00 H	330	38.2	1.5
3	*5200.00	103.2 PK			2.00 H	330	101.5	1.7
4	*5200.00	93.7 AV			2.00 H	330	92.0	1.7
5	#10400.00	49.9 PK	74.0	-24.1	1.25 H	232	38.3	11.6
6	#10400.00	38.7 AV	54.0	-15.3	1.25 H	232	27.1	11.6
7	15600.00	52.6 PK	74.0	-21.4	1.10 H	124	39.5	13.1
8	15600.00	40.2 AV	54.0	-13.8	1.10 H	124	27.1	13.1
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	66.2 PK	74.0	-7.8	1.10 V	6	64.7	1.5
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.10 V**	**6**	**52.4**	**1.5**
3	*5200.00	117.5 PK			1.10 V	6	115.8	1.7
4	*5200.00	108.7 AV			1.10 V	6	107.0	1.7
5	#10400.00	49.9 PK	74.0	-24.1	1.77 V	165	38.3	11.6
6	#10400.00	38.9 AV	54.0	-15.1	1.77 V	165	27.3	11.6
7	15600.00	50.9 PK	74.0	-23.1	1.65 V	313	37.8	13.1
8	15600.00	39.8 AV	54.0	-14.2	1.65 V	313	26.7	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	40.5 PK	74.0	-33.5	2.10 H	300	39.0	1.5
2	5150.00	30.4 AV	54.0	-23.6	2.10 H	300	28.9	1.5
3	*5240.00	101.5 PK			2.10 H	300	99.9	1.6
4	*5240.00	90.3 AV			2.10 H	300	88.7	1.6
5	5350.00	40.8 PK	74.0	-33.2	2.10 H	300	38.9	1.9
6	5350.00	30.5 AV	54.0	-23.5	2.10 H	300	28.6	1.9
7	#10480.00	50.2 PK	74.0	-23.8	1.22 H	216	38.2	12.0
8	#10480.00	38.9 AV	54.0	-15.1	1.22 H	216	26.9	12.0
9	15720.00	53.1 PK	74.0	-20.9	1.07 H	119	39.9	13.2
10	15720.00	40.6 AV	54.0	-13.4	1.07 H	119	27.4	13.2
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	59.7 PK	74.0	-14.3	1.11 V	3	58.2	1.5
2	5150.00	41.6 AV	54.0	-12.4	1.11 V	3	40.1	1.5
3	*5240.00	115.6 PK			1.11 V	3	114.0	1.6
4	*5240.00	104.2 AV			1.11 V	3	102.6	1.6
5	5350.00	54.7 PK	74.0	-19.3	1.11 V	3	52.8	1.9
6	5350.00	41.1 AV	54.0	-12.9	1.11 V	3	39.2	1.9
7	#10480.00	50.0 PK	74.0	-24.0	1.77 V	170	38.0	12.0
8	#10480.00	39.2 AV	54.0	-14.8	1.77 V	170	27.2	12.0
9	15720.00	51.4 PK	74.0	-22.6	1.62 V	323	38.2	13.2
10	15720.00	40.0 AV	54.0	-14.0	1.62 V	323	26.8	13.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5562.35	57.8 PK	68.2	-10.4	2.05 H	310	55.5	2.3
2	*5745.00	109.0 PK			2.05 H	310	106.3	2.7
3	*5745.00	101.1 AV			2.05 H	310	98.4	2.7
4	#6009.32	58.0 PK	68.2	-10.2	2.05 H	310	54.7	3.3
5	11490.00	52.4 PK	74.0	-21.6	1.24 H	223	39.0	13.4
6	11490.00	40.4 AV	54.0	-13.6	1.24 H	223	27.0	13.4
7	#17235.00	55.4 PK	74.0	-18.6	1.07 H	134	37.1	18.3
8	#17235.00	44.9 AV	54.0	-9.1	1.07 H	134	26.6	18.3
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	#5565.68	57.9 PK	68.2	-10.3	1.10 V	5	55.4	2.5
2	*5745.00	114.6 PK			1.10 V	5	111.9	2.7
3	*5745.00	106.1 AV			1.10 V	5	103.4	2.7
4	#5986.05	59.2 PK	68.2	-9.0	1.10 V	5	55.9	3.3
5	11490.00	51.9 PK	74.0	-22.1	1.72 V	159	38.5	13.4
6	11490.00	40.6 AV	54.0	-13.4	1.72 V	159	27.2	13.4
7	#17235.00	54.9 PK	74.0	-19.1	1.70 V	309	36.6	18.3
8	#17235.00	44.6 AV	54.0	-9.4	1.70 V	309	26.3	18.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5606.05	58.4 PK	68.2	-9.8	2.10 H	303	55.9	2.5
2	*5785.00	108.5 PK			2.10 H	303	105.8	2.7
3	*5785.00	100.9 AV			2.10 H	303	98.2	2.7
4	#5952.80	57.6 PK	68.2	-10.6	2.10 H	303	54.6	3.0
5	11570.00	53.0 PK	74.0	-21.0	1.27 H	211	39.9	13.1
6	11570.00	40.8 AV	54.0	-13.2	1.27 H	211	27.7	13.1
7	#17355.00	55.6 PK	74.0	-18.4	1.06 H	141	36.8	18.8
8	#17355.00	45.2 AV	54.0	-8.8	1.06 H	141	26.4	18.8
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	#5629.32	58.2 PK	68.2	-10.0	1.10 V	0	55.6	2.6
2	*5785.00	115.1 PK			1.10 V	0	112.4	2.7
3	*5785.00	105.6 AV			1.10 V	0	102.9	2.7
4	#5935.70	58.0 PK	68.2	-10.2	1.10 V	0	54.9	3.1
5	11570.00	52.2 PK	74.0	-21.8	1.68 V	173	39.1	13.1
6	11570.00	41.0 AV	54.0	-13.0	1.68 V	173	27.9	13.1
7	#17355.00	55.1 PK	74.0	-18.9	1.67 V	325	36.3	18.8
8	#17355.00	45.0 AV	54.0	-9.0	1.67 V	325	26.2	18.8

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5569.48	58.2 PK	68.2	-10.0	2.06 H	314	55.9	2.3
2	*5825.00	108.8 PK			2.06 H	314	106.1	2.7
3	*5825.00	100.9 AV			2.06 H	314	98.2	2.7
4	#5981.30	58.0 PK	68.2	-10.2	2.06 H	314	54.8	3.2
5	11650.00	52.4 PK	74.0	-21.6	1.25 H	215	39.3	13.1
6	11650.00	40.7 AV	54.0	-13.3	1.25 H	215	27.6	13.1
7	#17475.00	54.8 PK	74.0	-19.2	1.08 H	124	35.6	19.2
8	#17475.00	44.6 AV	54.0	-9.4	1.08 H	124	25.4	19.2
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	#5626.95	58.0 PK	68.2	-10.2	1.10 V	0	55.4	2.6
2	*5825.00	115.6 PK			1.10 V	0	112.9	2.7
3	*5825.00	106.0 AV			1.10 V	0	103.3	2.7
4	#6024.52	59.7 PK	68.2	-8.5	1.10 V	0	56.3	3.4
5	11650.00	52.3 PK	74.0	-21.7	1.67 V	164	39.2	13.1
6	11650.00	40.7 AV	54.0	-13.3	1.67 V	164	27.6	13.1
7	#17475.00	55.2 PK	74.0	-18.8	1.66 V	304	36.0	19.2
8	#17475.00	44.8 AV	54.0	-9.2	1.66 V	304	25.6	19.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.3 PK	74.0	-20.7	1.99 H	333	51.8	1.5
2	5150.00	39.1 AV	54.0	-14.9	1.99 H	333	37.6	1.5
3	*5180.00	97.4 PK			1.99 H	333	95.8	1.6
4	*5180.00	85.4 AV			1.99 H	333	83.8	1.6
5	#10360.00	49.7 PK	74.0	-24.3	1.26 H	236	38.2	11.5
6	#10360.00	38.6 AV	54.0	-15.4	1.26 H	236	27.1	11.5
7	15540.00	52.2 PK	74.0	-21.8	1.03 H	141	39.1	13.1
8	15540.00	40.1 AV	54.0	-13.9	1.03 H	141	27.0	13.1
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	69.3 PK	74.0	-4.7	1.10 V	360	67.8	1.5
2	5150.00	53.8 AV	54.0	-0.2	1.10 V	360	52.3	1.5
3	*5180.00	112.4 PK			1.10 V	360	110.8	1.6
4	*5180.00	101.7 AV			1.10 V	360	100.1	1.6
5	#10360.00	50.5 PK	74.0	-23.5	1.80 V	176	39.0	11.5
6	#10360.00	39.4 AV	54.0	-14.6	1.80 V	176	27.9	11.5
7	15540.00	51.7 PK	74.0	-22.3	1.58 V	329	38.6	13.1
8	15540.00	40.2 AV	54.0	-13.8	1.58 V	329	27.1	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.1 PK	74.0	-21.9	2.02 H	344	50.6	1.5
2	5150.00	39.4 AV	54.0	-14.6	2.02 H	344	37.9	1.5
3	*5200.00	103.4 PK			2.02 H	344	101.7	1.7
4	*5200.00	93.8 AV			2.02 H	344	92.1	1.7
5	#10400.00	49.9 PK	74.0	-24.1	1.19 H	218	38.3	11.6
6	#10400.00	38.8 AV	54.0	-15.2	1.19 H	218	27.2	11.6
7	15600.00	52.8 PK	74.0	-21.2	1.15 H	118	39.7	13.1
8	15600.00	40.2 AV	54.0	-13.8	1.15 H	118	27.1	13.1
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	70.9 PK	74.0	-3.1	1.11 V	360	69.4	1.5
2	5150.00	53.3 AV	54.0	-0.7	1.11 V	360	51.8	1.5
3	*5200.00	117.5 PK			1.11 V	360	115.8	1.7
4	*5200.00	108.6 AV			1.11 V	360	106.9	1.7
5	#10400.00	49.7 PK	74.0	-24.3	1.79 V	161	38.1	11.6
6	#10400.00	38.7 AV	54.0	-15.3	1.79 V	161	27.1	11.6
7	15600.00	51.2 PK	74.0	-22.8	1.67 V	319	38.1	13.1
8	15600.00	40.1 AV	54.0	-13.9	1.67 V	319	27.0	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	101.4 PK			2.04 H	285	99.8	1.6
2	*5240.00	90.2 AV			2.04 H	285	88.6	1.6
3	5350.00	41.0 PK	74.0	-33.0	2.04 H	285	39.1	1.9
4	5350.00	30.2 AV	54.0	-23.8	2.04 H	285	28.3	1.9
5	#10480.00	50.5 PK	74.0	-23.5	1.23 H	211	38.5	12.0
6	#10480.00	39.0 AV	54.0	-15.0	1.23 H	211	27.0	12.0
7	15720.00	53.1 PK	74.0	-20.9	1.04 H	121	39.9	13.2
8	15720.00	40.5 AV	54.0	-13.5	1.04 H	121	27.3	13.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.2 PK			1.11 V	360	114.6	1.6
2	*5240.00	105.8 AV			1.11 V	360	104.2	1.6
3	5350.00	54.8 PK	74.0	-19.2	1.11 V	360	52.9	1.9
4	5350.00	41.3 AV	54.0	-12.7	1.11 V	360	39.4	1.9
5	#10480.00	50.0 PK	74.0	-24.0	1.76 V	170	38.0	12.0
6	#10480.00	39.0 AV	54.0	-15.0	1.76 V	170	27.0	12.0
7	15720.00	51.0 PK	74.0	-23.0	1.64 V	329	37.8	13.2
8	15720.00	39.7 AV	54.0	-14.3	1.64 V	329	26.5	13.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5572.32	58.7 PK	68.2	-9.5	1.19 H	204	56.4	2.3
2	*5745.00	110.7 PK			1.19 H	204	108.0	2.7
3	*5745.00	99.2 AV			1.19 H	204	96.5	2.7
4	#5939.50	58.0 PK	68.2	-10.2	1.19 H	204	55.1	2.9
5	11490.00	52.5 PK	74.0	-21.5	1.21 H	223	39.1	13.4
6	11490.00	40.4 AV	54.0	-13.6	1.21 H	223	27.0	13.4
7	#17235.00	54.7 PK	74.0	-19.3	1.04 H	124	36.4	18.3
8	#17235.00	44.0 AV	54.0	-10.0	1.04 H	124	25.7	18.3
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	#5640.73	58.5 PK	68.2	-9.7	1.37 V	360	55.9	2.6
2	*5745.00	115.3 PK			1.14 V	360	112.6	2.7
3	*5745.00	104.4 AV			1.14 V	360	101.7	2.7
4	#5990.80	59.1 PK	68.2	-9.1	1.37 V	360	55.7	3.4
5	11490.00	52.8 PK	74.0	-21.2	1.64 V	156	39.4	13.4
6	11490.00	41.1 AV	54.0	-12.9	1.64 V	156	27.7	13.4
7	#17235.00	55.0 PK	74.0	-19.0	1.60 V	300	36.7	18.3
8	#17235.00	44.4 AV	54.0	-9.6	1.60 V	300	26.1	18.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5610.80	57.9 PK	68.2	-10.3	2.06 H	319	55.4	2.5
2	*5785.00	108.7 PK			2.06 H	319	106.0	2.7
3	*5785.00	97.7 AV			2.06 H	319	95.0	2.7
4	#6001.25	58.4 PK	68.2	-9.8	2.06 H	319	55.1	3.3
5	11570.00	52.5 PK	74.0	-21.5	1.22 H	219	39.4	13.1
6	11570.00	40.3 AV	54.0	-13.7	1.22 H	219	27.2	13.1
7	#17355.00	55.0 PK	74.0	-19.0	1.05 H	135	36.2	18.8
8	#17355.00	44.4 AV	54.0	-9.6	1.05 H	135	25.6	18.8
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	#5623.62	59.9 PK	68.2	-8.3	1.11 V	360	57.3	2.6
2	*5785.00	113.5 PK			1.11 V	360	110.8	2.7
3	*5785.00	102.9 AV			1.11 V	360	100.2	2.7
4	#5988.43	58.2 PK	68.2	-10.0	1.11 V	360	54.8	3.4
5	11570.00	52.9 PK	74.0	-21.1	1.62 V	168	39.8	13.1
6	11570.00	41.2 AV	54.0	-12.8	1.62 V	168	28.1	13.1
7	#17355.00	55.2 PK	74.0	-18.8	1.67 V	316	36.4	18.8
8	#17355.00	44.8 AV	54.0	-9.2	1.67 V	316	26.0	18.8

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5596.07	57.4 PK	68.2	-10.8	2.06 H	312	55.1	2.3
2	*5825.00	109.4 PK			2.06 H	312	106.7	2.7
3	*5825.00	98.4 AV			2.06 H	312	95.7	2.7
4	#5939.50	57.9 PK	68.2	-10.3	2.06 H	312	55.0	2.9
5	11650.00	52.8 PK	74.0	-21.2	1.20 H	231	39.7	13.1
6	11650.00	40.5 AV	54.0	-13.5	1.20 H	231	27.4	13.1
7	#17475.00	55.9 PK	74.0	-18.1	1.06 H	127	36.7	19.2
8	#17475.00	45.1 AV	54.0	-8.9	1.06 H	127	25.9	19.2
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	#5594.18	57.4 PK	68.2	-10.8	1.10 V	360	54.9	2.5
2	*5825.00	114.2 PK			1.10 V	360	111.5	2.7
3	*5825.00	103.2 AV			1.10 V	360	100.5	2.7
4	#5990.32	57.4 PK	68.2	-10.8	1.10 V	360	54.0	3.4
5	11650.00	51.7 PK	74.0	-22.3	1.64 V	165	38.6	13.1
6	11650.00	40.2 AV	54.0	-13.8	1.64 V	165	27.1	13.1
7	#17475.00	55.7 PK	74.0	-18.3	1.71 V	310	36.5	19.2
8	#17475.00	45.2 AV	54.0	-8.8	1.71 V	310	26.0	19.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	53.0 PK	74.0	-21.0	1.97 H	346	51.5	1.5
2	5150.00	40.3 AV	54.0	-13.7	1.97 H	346	38.8	1.5
3	*5190.00	95.3 PK			1.97 H	346	93.6	1.7
4	*5190.00	84.1 AV			1.97 H	346	82.4	1.7
5	5350.00	40.4 PK	74.0	-33.6	1.97 H	346	38.5	1.9
6	5350.00	30.6 AV	54.0	-23.4	1.97 H	346	28.7	1.9
7	#10380.00	50.1 PK	74.0	-23.9	1.23 H	225	38.6	11.5
8	#10380.00	38.9 AV	54.0	-15.1	1.23 H	225	27.4	11.5
9	15570.00	52.7 PK	74.0	-21.3	1.03 H	150	39.6	13.1
10	15570.00	40.5 AV	54.0	-13.5	1.03 H	150	27.4	13.1
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	66.0 PK	74.0	-8.0	1.10 V	360	64.5	1.5
2	5150.00	53.6 AV	54.0	-0.4	1.10 V	360	52.1	1.5
3	*5190.00	108.9 PK			1.10 V	360	107.2	1.7
4	*5190.00	97.4 AV			1.10 V	360	95.7	1.7
5	5350.00	53.4 PK	74.0	-20.6	1.10 V	360	51.5	1.9
6	5350.00	41.1 AV	54.0	-12.9	1.10 V	360	39.2	1.9
7	#10380.00	50.7 PK	74.0	-23.3	1.81 V	172	39.2	11.5
8	#10380.00	39.4 AV	54.0	-14.6	1.81 V	172	27.9	11.5
9	15570.00	51.5 PK	74.0	-22.5	1.64 V	328	38.4	13.1
10	15570.00	40.1 AV	54.0	-13.9	1.64 V	328	27.0	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	98.6 PK			1.95 H	334	97.0	1.6
2	*5230.00	87.5 AV			1.95 H	334	85.9	1.6
3	5350.00	40.9 PK	74.0	-33.1	1.95 H	334	39.0	1.9
4	5350.00	31.5 AV	54.0	-22.5	1.95 H	334	29.6	1.9
5	#10460.00	50.7 PK	74.0	-23.3	1.21 H	225	38.8	11.9
6	#10460.00	39.3 AV	54.0	-14.7	1.21 H	225	27.4	11.9
7	15690.00	52.9 PK	74.0	-21.1	1.04 H	151	39.6	13.3
8	15690.00	40.9 AV	54.0	-13.1	1.04 H	151	27.6	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	112.2 PK			1.10 V	360	110.6	1.6
2	*5230.00	100.8 AV			1.10 V	360	99.2	1.6
3	5350.00	53.9 PK	74.0	-20.1	1.10 V	360	52.0	1.9
4	5350.00	42.5 AV	54.0	-11.5	1.10 V	360	40.6	1.9
5	#10460.00	50.0 PK	74.0	-24.0	1.71 V	163	38.1	11.9
6	#10460.00	39.3 AV	54.0	-14.7	1.71 V	163	27.4	11.9
7	15690.00	50.7 PK	74.0	-23.3	1.60 V	333	37.4	13.3
8	15690.00	39.5 AV	54.0	-14.5	1.60 V	333	26.2	13.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5639.77	62.3 PK	68.2	-5.9	2.08 H	305	59.8	2.5
2	*5755.00	108.6 PK			2.08 H	305	105.9	2.7
3	*5755.00	97.8 AV			2.08 H	305	95.1	2.7
4	#5958.50	57.8 PK	68.2	-10.4	2.08 H	305	54.8	3.0
5	11510.00	53.1 PK	74.0	-20.9	1.22 H	209	39.7	13.4
6	11510.00	40.6 AV	54.0	-13.4	1.22 H	209	27.2	13.4
7	#17265.00	55.0 PK	74.0	-19.0	1.01 H	122	36.7	18.3
8	#17265.00	44.4 AV	54.0	-9.6	1.01 H	122	26.1	18.3
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	#5646.90	61.8 PK	68.2	-6.4	1.10 V	360	59.2	2.6
2	*5755.00	112.4 PK			1.10 V	360	109.7	2.7
3	*5755.00	100.6 AV			1.10 V	360	97.9	2.7
4	#5962.77	58.4 PK	68.2	-9.8	1.10 V	360	55.2	3.2
5	11510.00	51.2 PK	74.0	-22.8	1.64 V	163	37.8	13.4
6	11510.00	39.9 AV	54.0	-14.1	1.64 V	163	26.5	13.4
7	#17265.00	56.4 PK	74.0	-17.6	1.74 V	305	38.1	18.3
8	#17265.00	45.6 AV	54.0	-8.4	1.74 V	305	27.3	18.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.27	59.7 PK	68.2	-8.5	2.08 H	328	57.2	2.5
2	*5795.00	108.5 PK			2.08 H	328	105.8	2.7
3	*5795.00	97.4 AV			2.08 H	328	94.7	2.7
4	#5938.55	62.4 PK	68.2	-5.8	2.08 H	328	59.5	2.9
5	11590.00	52.7 PK	74.0	-21.3	1.19 H	227	39.7	13.0
6	11590.00	40.4 AV	54.0	-13.6	1.19 H	227	27.4	13.0
7	#17385.00	55.0 PK	74.0	-19.0	1.07 H	142	36.0	19.0
8	#17385.00	44.6 AV	54.0	-9.4	1.07 H	142	25.6	19.0
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	#5644.52	58.8 PK	68.2	-9.4	1.10 V	360	56.2	2.6
2	*5795.00	113.1 PK			1.10 V	360	110.4	2.7
3	*5795.00	101.0 AV			1.10 V	360	98.3	2.7
4	#5924.77	60.8 PK	68.4	-7.6	1.10 V	360	57.7	3.1
5	11590.00	52.0 PK	74.0	-22.0	1.67 V	154	39.0	13.0
6	11590.00	40.6 AV	54.0	-13.4	1.67 V	154	27.6	13.0
7	#17385.00	55.7 PK	74.0	-18.3	1.75 V	312	36.7	19.0
8	#17385.00	45.0 AV	54.0	-9.0	1.75 V	312	26.0	19.0

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.9 PK	74.0	-21.1	1.96 H	332	51.4	1.5
2	5150.00	40.0 AV	54.0	-14.0	1.96 H	332	38.5	1.5
3	*5210.00	91.3 PK			1.96 H	332	89.6	1.7
4	*5210.00	80.4 AV			1.96 H	332	78.7	1.7
5	5350.00	40.3 PK	74.0	-33.7	1.96 H	332	38.4	1.9
6	5350.00	30.7 AV	54.0	-23.3	1.96 H	332	28.8	1.9
7	#10420.00	49.6 PK	74.0	-24.4	1.26 H	230	37.9	11.7
8	#10420.00	38.6 AV	54.0	-15.4	1.26 H	230	26.9	11.7
9	15630.00	53.1 PK	74.0	-20.9	1.02 H	142	39.9	13.2
10	15630.00	41.0 AV	54.0	-13.0	1.02 H	142	27.8	13.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.6 PK	74.0	-6.4	1.10 V	359	66.1	1.5
2	5150.00	53.4 AV	54.0	-0.6	1.10 V	359	51.9	1.5
3	*5210.00	104.5 PK			1.10 V	359	102.8	1.7
4	*5210.00	91.4 AV			1.10 V	359	89.7	1.7
5	5350.00	54.7 PK	74.0	-19.3	1.10 V	359	52.8	1.9
6	5350.00	42.9 AV	54.0	-11.1	1.10 V	359	41.0	1.9
7	#10420.00	49.7 PK	74.0	-24.3	1.67 V	149	38.0	11.7
8	#10420.00	39.2 AV	54.0	-14.8	1.67 V	149	27.5	11.7
9	15630.00	50.4 PK	74.0	-23.6	1.60 V	325	37.2	13.2
10	15630.00	39.1 AV	54.0	-14.9	1.60 V	325	25.9	13.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.27	63.8 PK	68.2	-4.4	2.02 H	323	61.3	2.5
2	*5775.00	100.5 PK			2.02 H	323	97.8	2.7
3	*5775.00	91.5 AV			2.02 H	323	88.8	2.7
4	#5937.60	63.8 PK	68.2	-4.4	2.02 H	323	60.9	2.9
5	11550.00	52.9 PK	74.0	-21.1	1.27 H	219	39.7	13.2
6	11550.00	40.5 AV	54.0	-13.5	1.27 H	219	27.3	13.2
7	#17325.00	54.8 PK	74.0	-19.2	1.00 H	121	36.2	18.6
8	#17325.00	44.3 AV	54.0	-9.7	1.00 H	121	25.7	18.6
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	#5647.85	65.6 PK	68.2	-2.6	1.10 V	360	63.0	2.6
2	*5775.00	106.8 PK			1.10 V	360	104.1	2.7
3	*5775.00	97.7 AV			1.10 V	360	95.0	2.7
4	#5926.68	67.5 PK	68.2	-0.7	1.10 V	360	64.4	3.1
5	11550.00	51.6 PK	74.0	-22.4	1.62 V	170	38.4	13.2
6	11550.00	40.1 AV	54.0	-13.9	1.62 V	170	26.9	13.2
7	#17325.00	56.3 PK	74.0	-17.7	1.76 V	319	37.7	18.6
8	#17325.00	45.6 AV	54.0	-8.4	1.76 V	319	27.0	18.6

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.

Beamforming Mode

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	61.6 PK	74.0	-12.4	2.33 H	312	60.1	1.5
2	5150.00	49.1 AV	54.0	-4.9	2.33 H	312	47.6	1.5
3	*5180.00	102.3 PK			2.33 H	312	100.7	1.6
4	*5180.00	92.0 AV			2.33 H	312	90.4	1.6
5	#10360.00	50.3 PK	74.0	-23.7	1.22 H	226	38.8	11.5
6	#10360.00	38.7 AV	54.0	-15.3	1.22 H	226	27.2	11.5
7	15540.00	53.1 PK	74.0	-20.9	1.09 H	139	40.0	13.1
8	15540.00	40.9 AV	54.0	-13.1	1.09 H	139	27.8	13.1
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	69.5 PK	74.0	-4.5	1.10 V	358	68.0	1.5
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.10 V**	**358**	**52.4**	**1.5**
3	*5180.00	113.7 PK			1.10 V	358	112.1	1.6
4	*5180.00	103.2 AV			1.10 V	358	101.6	1.6
5	#10360.00	50.2 PK	74.0	-23.8	1.84 V	178	38.7	11.5
6	#10360.00	39.0 AV	54.0	-15.0	1.84 V	178	27.5	11.5
7	15540.00	51.3 PK	74.0	-22.7	1.72 V	304	38.2	13.1
8	15540.00	39.9 AV	54.0	-14.1	1.72 V	304	26.8	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.6 PK	74.0	-18.4	2.34 H	300	54.1	1.5
2	5150.00	42.2 AV	54.0	-11.8	2.34 H	300	40.7	1.5
3	*5200.00	105.9 PK			2.34 H	300	104.2	1.7
4	*5200.00	95.7 AV			2.34 H	300	94.0	1.7
5	#10400.00	49.9 PK	74.0	-24.1	1.22 H	223	38.3	11.6
6	#10400.00	38.8 AV	54.0	-15.2	1.22 H	223	27.2	11.6
7	15600.00	52.9 PK	74.0	-21.1	1.08 H	117	39.8	13.1
8	15600.00	40.7 AV	54.0	-13.3	1.08 H	117	27.6	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.2 PK	74.0	-6.8	1.10 V	356	65.7	1.5
2	5150.00	53.8 AV	54.0	-0.2	1.10 V	356	52.3	1.5
3	*5200.00	117.5 PK			1.10 V	356	115.8	1.7
4	*5200.00	107.3 AV			1.10 V	356	105.6	1.7
5	#10400.00	50.5 PK	74.0	-23.5	1.81 V	161	38.9	11.6
6	#10400.00	39.6 AV	54.0	-14.4	1.81 V	161	28.0	11.6
7	15600.00	50.9 PK	74.0	-23.1	1.67 V	322	37.8	13.1
8	15600.00	39.8 AV	54.0	-14.2	1.67 V	322	26.7	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	46.9 PK	74.0	-27.1	2.30 H	315	45.4	1.5
2	5150.00	31.0 AV	54.0	-23.0	2.30 H	315	29.5	1.5
3	*5240.00	104.4 PK			2.30 H	315	102.8	1.6
4	*5240.00	93.5 AV			2.30 H	315	91.9	1.6
5	5350.00	43.3 PK	74.0	-30.7	2.30 H	315	41.4	1.9
6	5350.00	31.4 AV	54.0	-22.6	2.30 H	315	29.5	1.9
7	#10480.00	50.2 PK	74.0	-23.8	1.26 H	226	38.2	12.0
8	#10480.00	38.8 AV	54.0	-15.2	1.26 H	226	26.8	12.0
9	15720.00	53.3 PK	74.0	-20.7	1.03 H	140	40.1	13.2
10	15720.00	40.9 AV	54.0	-13.1	1.03 H	140	27.7	13.2
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	58.5 PK	74.0	-15.5	1.10 V	2	57.0	1.5
2	5150.00	42.1 AV	54.0	-11.9	1.10 V	2	40.6	1.5
3	*5240.00	115.5 PK			1.10 V	2	113.9	1.6
4	*5240.00	105.1 AV			1.10 V	2	103.5	1.6
5	5350.00	54.9 PK	74.0	-19.1	1.10 V	2	53.0	1.9
6	5350.00	42.2 AV	54.0	-11.8	1.10 V	2	40.3	1.9
7	#10480.00	50.2 PK	74.0	-23.8	1.83 V	176	38.2	12.0
8	#10480.00	39.2 AV	54.0	-14.8	1.83 V	176	27.2	12.0
9	15720.00	50.5 PK	74.0	-23.5	1.69 V	313	37.3	13.2
10	15720.00	39.2 AV	54.0	-14.8	1.69 V	313	26.0	13.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5611.75	58.1 PK	68.2	-10.1	2.10 H	299	55.6	2.5
2	*5745.00	108.6 PK			2.10 H	299	105.9	2.7
3	*5745.00	100.8 AV			2.10 H	299	98.1	2.7
4	#5979.40	57.6 PK	68.2	-10.6	2.10 H	299	54.4	3.2
5	11490.00	52.2 PK	74.0	-21.8	1.30 H	222	38.8	13.4
6	11490.00	40.0 AV	54.0	-14.0	1.30 H	222	26.6	13.4
7	#17235.00	55.9 PK	74.0	-18.1	1.06 H	148	37.6	18.3
8	#17235.00	45.3 AV	54.0	-8.7	1.06 H	148	27.0	18.3
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	#5610.32	62.1 PK	68.2	-6.1	1.10 V	360	59.5	2.6
2	*5745.00	116.1 PK			1.10 V	360	113.4	2.7
3	*5745.00	105.7 AV			1.10 V	360	103.0	2.7
4	#5995.55	60.2 PK	68.2	-8.0	1.10 V	360	56.8	3.4
5	11490.00	51.7 PK	74.0	-22.3	1.68 V	155	38.3	13.4
6	11490.00	40.3 AV	54.0	-13.7	1.68 V	155	26.9	13.4
7	#17235.00	55.3 PK	74.0	-18.7	1.68 V	309	37.0	18.3
8	#17235.00	44.9 AV	54.0	-9.1	1.68 V	309	26.6	18.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5641.20	57.3 PK	68.2	-10.9	2.00 H	297	54.8	2.5
2	*5785.00	109.5 PK			2.00 H	297	106.8	2.7
3	*5785.00	101.4 AV			2.00 H	297	98.7	2.7
4	#5970.85	57.1 PK	68.2	-11.1	2.00 H	297	54.1	3.0
5	11570.00	51.8 PK	74.0	-22.2	1.29 H	215	38.7	13.1
6	11570.00	40.1 AV	54.0	-13.9	1.29 H	215	27.0	13.1
7	#17355.00	55.4 PK	74.0	-18.6	1.09 H	145	36.6	18.8
8	#17355.00	45.1 AV	54.0	-8.9	1.09 H	145	26.3	18.8
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	#5584.20	60.8 PK	68.2	-7.4	1.10 V	358	58.3	2.5
2	*5785.00	116.0 PK			1.10 V	358	113.3	2.7
3	*5785.00	106.5 AV			1.10 V	358	103.8	2.7
4	#5944.73	61.3 PK	68.2	-6.9	1.10 V	358	58.2	3.1
5	11570.00	52.2 PK	74.0	-21.8	1.73 V	158	39.1	13.1
6	11570.00	41.0 AV	54.0	-13.0	1.73 V	158	27.9	13.1
7	#17355.00	55.3 PK	74.0	-18.7	1.72 V	305	36.5	18.8
8	#17355.00	45.0 AV	54.0	-9.0	1.72 V	305	26.2	18.8

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5582.30	57.1 PK	68.2	-11.1	2.01 H	312	54.8	2.3
2	*5825.00	109.6 PK			2.01 H	312	106.9	2.7
3	*5825.00	101.4 AV			2.01 H	312	98.7	2.7
4	#5936.18	57.3 PK	68.2	-10.9	2.01 H	312	54.4	2.9
5	11650.00	53.0 PK	74.0	-21.0	1.22 H	225	39.9	13.1
6	11650.00	40.9 AV	54.0	-13.1	1.22 H	225	27.8	13.1
7	#17475.00	55.2 PK	74.0	-18.8	1.08 H	137	36.0	19.2
8	#17475.00	44.8 AV	54.0	-9.2	1.08 H	137	25.6	19.2
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	#5556.65	60.9 PK	68.2	-7.3	1.10 V	359	58.4	2.5
2	*5825.00	115.7 PK			1.10 V	359	113.0	2.7
3	*5825.00	105.5 AV			1.10 V	359	102.8	2.7
4	#5952.80	60.6 PK	68.2	-7.6	1.10 V	359	57.4	3.2
5	11650.00	52.0 PK	74.0	-22.0	1.70 V	151	38.9	13.1
6	11650.00	40.8 AV	54.0	-13.2	1.70 V	151	27.7	13.1
7	#17475.00	55.2 PK	74.0	-18.8	1.69 V	324	36.0	19.2
8	#17475.00	44.9 AV	54.0	-9.1	1.69 V	324	25.7	19.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.7 PK	74.0	-13.3	2.33 H	301	59.2	1.5
2	5150.00	42.5 AV	54.0	-11.5	2.33 H	301	41.0	1.5
3	*5190.00	90.3 PK			2.33 H	301	88.6	1.7
4	*5190.00	87.9 AV			2.33 H	301	86.2	1.7
5	5350.00	43.1 PK	74.0	-30.9	2.33 H	301	41.2	1.9
6	5350.00	31.5 AV	54.0	-22.5	2.33 H	301	29.6	1.9
7	#10380.00	50.3 PK	74.0	-23.7	1.20 H	235	38.8	11.5
8	#10380.00	38.8 AV	54.0	-15.2	1.20 H	235	27.3	11.5
9	15570.00	52.9 PK	74.0	-21.1	1.00 H	165	39.8	13.1
10	15570.00	40.9 AV	54.0	-13.1	1.00 H	165	27.8	13.1
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	72.3 PK	74.0	-1.7	1.10 V	360	70.8	1.5
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.10 V**	**360**	**52.4**	**1.5**
3	*5190.00	101.8 PK			1.10 V	360	100.1	1.7
4	*5190.00	99.4 AV			1.10 V	360	97.7	1.7
5	5350.00	54.7 PK	74.0	-19.3	1.10 V	360	52.8	1.9
6	5350.00	42.3 AV	54.0	-11.7	1.10 V	360	40.4	1.9
7	#10380.00	50.2 PK	74.0	-23.8	1.76 V	183	38.7	11.5
8	#10380.00	38.9 AV	54.0	-15.1	1.76 V	183	27.4	11.5
9	15570.00	51.8 PK	74.0	-22.2	1.63 V	326	38.7	13.1
10	15570.00	40.2 AV	54.0	-13.8	1.63 V	326	27.1	13.1

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.1 PK	74.0	-23.9	2.30 H	288	48.6	1.5
2	5150.00	37.5 AV	54.0	-16.5	2.30 H	288	36.0	1.5
3	*5230.00	100.4 PK			2.30 H	288	98.8	1.6
4	*5230.00	91.4 AV			2.30 H	288	89.8	1.6
5	5350.00	45.1 PK	74.0	-28.9	2.30 H	288	43.2	1.9
6	5350.00	33.4 AV	54.0	-20.6	2.30 H	288	31.5	1.9
7	#10460.00	50.5 PK	74.0	-23.5	1.25 H	233	38.6	11.9
8	#10460.00	39.3 AV	54.0	-14.7	1.25 H	233	27.4	11.9
9	15690.00	52.6 PK	74.0	-21.4	1.08 H	155	39.3	13.3
10	15690.00	40.7 AV	54.0	-13.3	1.08 H	155	27.4	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.5 PK	74.0	-12.5	1.10 V	0	60.0	1.5
2	5150.00	49.1 AV	54.0	-4.9	1.10 V	0	47.6	1.5
3	*5230.00	113.2 PK			1.10 V	0	111.6	1.6
4	*5230.00	103.4 AV			1.10 V	0	101.8	1.6
5	5350.00	56.6 PK	74.0	-17.4	1.10 V	0	54.7	1.9
6	5350.00	43.4 AV	54.0	-10.6	1.10 V	0	41.5	1.9
7	#10460.00	50.3 PK	74.0	-23.7	1.75 V	172	38.4	11.9
8	#10460.00	38.9 AV	54.0	-15.1	1.75 V	172	27.0	11.9
9	15690.00	51.3 PK	74.0	-22.7	1.60 V	322	38.0	13.3
10	15690.00	39.8 AV	54.0	-14.2	1.60 V	322	26.5	13.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5644.05	64.7 PK	68.2	-3.5	2.11 H	316	62.2	2.5
2	*5755.00	107.7 PK			2.11 H	316	105.0	2.7
3	*5755.00	97.1 AV			2.11 H	316	94.4	2.7
4	#5945.20	59.2 PK	68.2	-9.0	2.11 H	316	56.3	2.9
5	11510.00	52.9 PK	74.0	-21.1	1.19 H	210	39.5	13.4
6	11510.00	40.2 AV	54.0	-13.8	1.19 H	210	26.8	13.4
7	#17265.00	54.3 PK	74.0	-19.7	1.02 H	113	36.0	18.3
8	#17265.00	44.0 AV	54.0	-10.0	1.02 H	113	25.7	18.3
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	#5648.32	65.4 PK	68.2	-2.8	1.10 V	3	62.8	2.6
2	*5755.00	113.8 PK			1.10 V	3	111.1	2.7
3	*5755.00	103.2 AV			1.10 V	3	100.5	2.7
4	#5955.18	58.6 PK	68.2	-9.6	1.10 V	3	55.4	3.2
5	11510.00	51.3 PK	74.0	-22.7	1.67 V	173	37.9	13.4
6	11510.00	40.2 AV	54.0	-13.8	1.67 V	173	26.8	13.4
7	#17265.00	56.9 PK	74.0	-17.1	1.78 V	292	38.6	18.3
8	#17265.00	46.0 AV	54.0	-8.0	1.78 V	292	27.7	18.3

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5648.80	59.2 PK	68.2	-9.0	2.04 H	314	56.7	2.5
2	*5795.00	108.7 PK			2.04 H	314	106.0	2.7
3	*5795.00	97.9 AV			2.04 H	314	95.2	2.7
4	#5937.60	62.1 PK	68.2	-6.1	2.04 H	314	59.2	2.9
5	11590.00	53.5 PK	74.0	-20.5	1.24 H	196	40.5	13.0
6	11590.00	41.0 AV	54.0	-13.0	1.24 H	196	28.0	13.0
7	#17385.00	55.4 PK	74.0	-18.6	1.07 H	136	36.4	19.0
8	#17385.00	44.7 AV	54.0	-9.3	1.07 H	136	25.7	19.0
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	#5646.90	59.5 PK	68.2	-8.7	1.10 V	1	56.9	2.6
2	*5795.00	113.5 PK			1.10 V	1	110.8	2.7
3	*5795.00	102.9 AV			1.10 V	1	100.2	2.7
4	#5926.68	62.7 PK	68.2	-5.5	1.10 V	1	59.6	3.1
5	11590.00	51.2 PK	74.0	-22.8	1.66 V	161	38.2	13.0
6	11590.00	40.0 AV	54.0	-14.0	1.66 V	161	27.0	13.0
7	#17385.00	56.9 PK	74.0	-17.1	1.69 V	311	37.9	19.0
8	#17385.00	46.0 AV	54.0	-8.0	1.69 V	311	27.0	19.0

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.9 PK	74.0	-10.1	2.31 H	290	62.4	1.5
2	5150.00	46.7 AV	54.0	-7.3	2.31 H	290	45.2	1.5
3	*5210.00	100.5 PK			2.31 H	290	98.8	1.7
4	*5210.00	90.1 AV			2.31 H	290	88.4	1.7
5	5350.00	48.3 PK	74.0	-25.7	2.31 H	290	46.4	1.9
6	5350.00	31.1 AV	54.0	-22.9	2.31 H	290	29.2	1.9
7	#10420.00	50.9 PK	74.0	-23.1	1.23 H	237	39.2	11.7
8	#10420.00	39.6 AV	54.0	-14.4	1.23 H	237	27.9	11.7
9	15630.00	52.9 PK	74.0	-21.1	1.07 H	140	39.7	13.2
10	15630.00	41.1 AV	54.0	-12.9	1.07 H	140	27.9	13.2
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	69.9 PK	74.0	-4.1	1.10 V	3	68.4	1.5
2	5150.00	53.2 AV	54.0	-0.8	1.10 V	3	51.7	1.5
3	*5210.00	106.2 PK			1.10 V	3	104.5	1.7
4	*5210.00	95.5 AV			1.10 V	3	93.8	1.7
5	5350.00	54.3 PK	74.0	-19.7	1.10 V	3	52.4	1.9
6	5350.00	43.1 AV	54.0	-10.9	1.10 V	3	41.2	1.9
7	#10420.00	49.9 PK	74.0	-24.1	1.68 V	145	38.2	11.7
8	#10420.00	39.4 AV	54.0	-14.6	1.68 V	145	27.7	11.7
9	15630.00	49.7 PK	74.0	-24.3	1.59 V	324	36.5	13.2
10	15630.00	38.7 AV	54.0	-15.3	1.59 V	324	25.5	13.2

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5646.43	64.9 PK	68.2	-3.3	2.03 H	319	62.4	2.5
2	*5775.00	100.9 PK			2.03 H	319	98.2	2.7
3	*5775.00	91.8 AV			2.03 H	319	89.1	2.7
4	#5937.60	60.1 PK	68.2	-8.1	2.03 H	319	57.2	2.9
5	11550.00	53.2 PK	74.0	-20.8	1.29 H	224	40.0	13.2
6	11550.00	40.8 AV	54.0	-13.2	1.29 H	224	27.6	13.2
7	#17325.00	54.4 PK	74.0	-19.6	1.02 H	133	35.8	18.6
8	#17325.00	43.9 AV	54.0	-10.1	1.02 H	133	25.3	18.6
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	#5629.80	66.5 PK	68.2	-1.7	1.10 V	2	63.9	2.6
2	*5775.00	107.7 PK			1.10 V	2	105.0	2.7
3	*5775.00	97.5 AV			1.10 V	2	94.8	2.7
4	#5925.25	67.6 PK	68.2	-0.6	1.10 V	2	64.5	3.1
5	11550.00	51.8 PK	74.0	-22.2	1.67 V	158	38.6	13.2
6	11550.00	40.5 AV	54.0	-13.5	1.67 V	158	27.3	13.2
7	#17325.00	56.1 PK	74.0	-17.9	1.76 V	303	37.5	18.6
8	#17325.00	45.3 AV	54.0	-8.7	1.76 V	303	26.7	18.6

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:

802.11a

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	50.50	33.8 QP	40.0	-6.2	1.10 H	300	42.6	-8.8
2	59.42	32.2 QP	40.0	-7.8	2.00 H	256	41.2	-9.0
3	86.10	26.3 QP	40.0	-13.7	2.10 H	106	40.8	-14.5
4	125.14	40.3 QP	43.5	-3.2	2.00 H	290	50.7	-10.4
5	230.40	25.2 QP	46.0	-20.8	1.00 H	201	36.6	-11.4
6	874.90	33.1 QP	46.0	-12.9	1.00 H	300	29.7	3.4
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	52.88	36.5 QP	40.0	-3.5	1.00 V	300	45.3	-8.8
2	67.88	35.4 QP	40.0	-4.6	1.05 V	105	46.0	-10.6
3	86.44	34.2 QP	40.0	-5.8	1.50 V	101	48.7	-14.5
4	95.22	32.8 QP	43.5	-10.7	2.05 V	100	46.6	-13.8
5	125.00	36.2 QP	43.5	-7.3	1.05 V	330	46.5	-10.3
6	874.90	32.5 QP	46.0	-13.5	1.05 V	300	29.1	3.4

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 09, 2016	May 08, 2017
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Aug. 31, 2016	Aug. 30, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 13, 2016	June 12, 2017
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-003	Sep. 13, 2016	Sep. 12, 2017
50 ohms Terminator	N/A	04	Nov. 18, 2015	Nov. 17, 2016
50 ohms Terminator	50	3	Oct. 21, 2015	Oct. 20, 2016
Software BVADT	BVADT_Cond_ V7.3.7.4	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: Oct. 01, 2016

4.2.3 Test Procedure

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

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

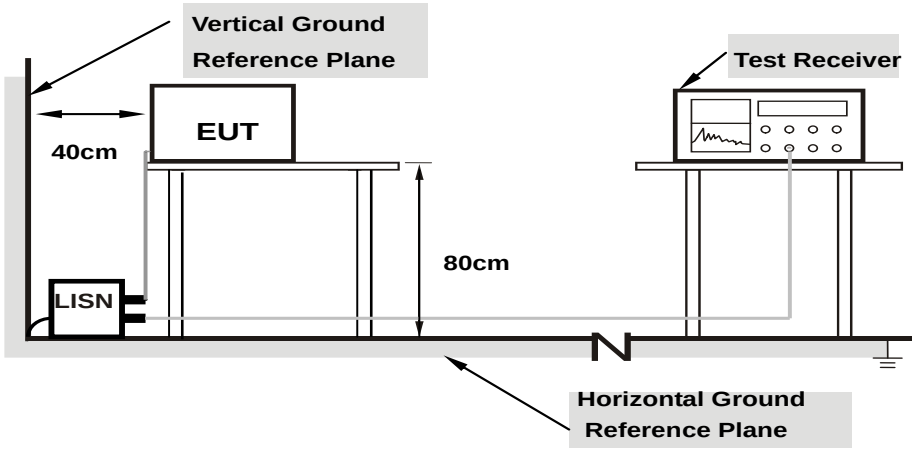
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

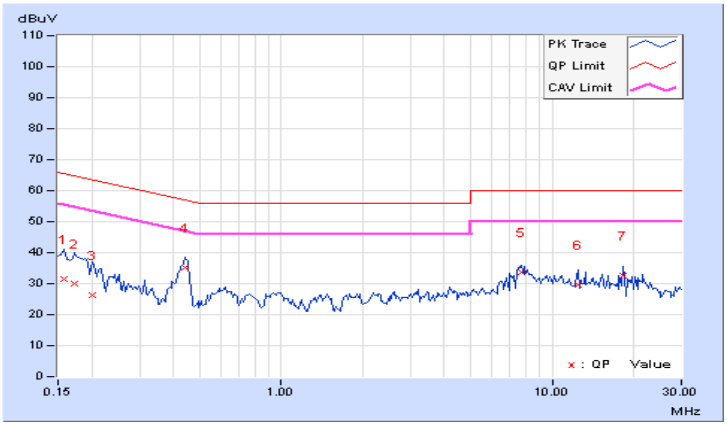
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
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	0.15781	10.24	21.11	10.48	31.35	20.72	65.58	55.58	-34.23	-34.86
2	0.17344	10.24	19.72	10.39	29.96	20.63	64.79	54.79	-34.83	-34.16
3	0.20078	10.25	16.04	6.74	26.29	16.99	63.58	53.58	-37.29	-36.59
4	0.44297	10.24	25.05	22.72	35.29	32.96	57.01	47.01	-21.72	-14.05
5	7.75000	10.69	23.18	21.96	33.87	32.65	60.00	50.00	-26.13	-17.35
6	12.50391	10.95	18.79	15.03	29.74	25.98	60.00	50.00	-30.26	-24.02
7	18.24219	11.28	21.31	20.84	32.59	32.12	60.00	50.00	-27.41	-17.88

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

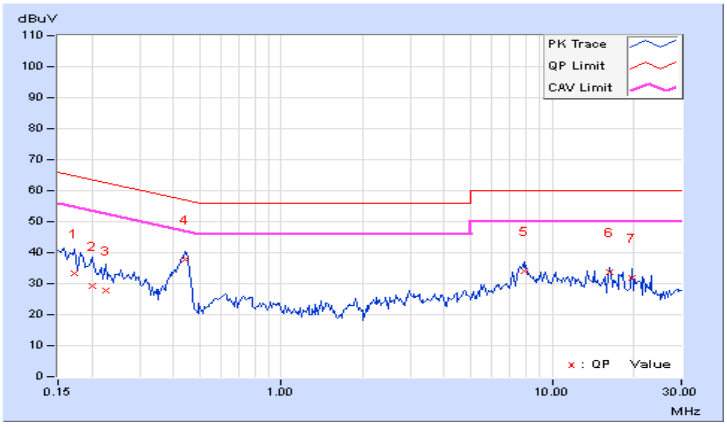


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
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	0.17344	10.25	23.12	15.09	33.37	25.34	64.79	54.79	-31.42	-29.45
2	0.20078	10.22	19.11	9.89	29.33	20.11	63.58	53.58	-34.25	-33.47
3	0.22422	10.23	17.62	10.73	27.85	20.96	62.66	52.66	-34.81	-31.70
4	0.44297	10.31	27.50	25.73	37.81	36.04	57.01	47.01	-19.20	-10.97
5	7.87409	10.78	23.24	21.59	34.02	32.37	60.00	50.00	-25.98	-17.63
6	16.22656	11.19	22.51	22.06	33.70	33.25	60.00	50.00	-26.30	-16.75
7	19.71094	11.35	20.50	19.55	31.85	30.90	60.00	50.00	-28.15	-19.10

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



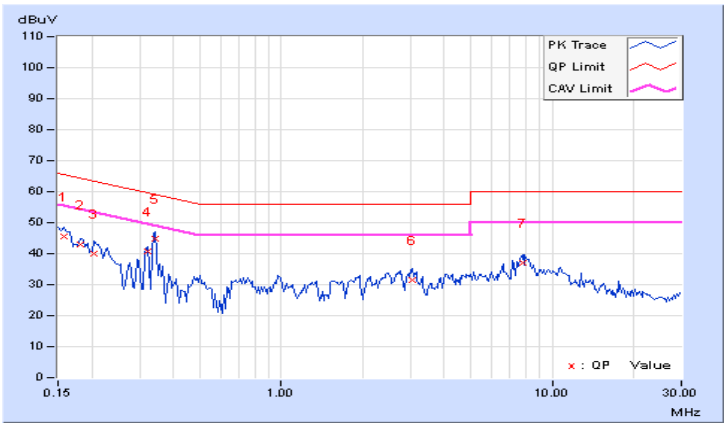
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
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	0.15781	10.24	35.42	20.78	45.66	31.02	65.58	55.58	-19.92	-24.56
2	0.18125	10.25	32.65	17.84	42.90	28.09	64.43	54.43	-21.53	-26.34
3	0.20469	10.25	29.88	18.55	40.13	28.80	63.42	53.42	-23.29	-24.62
4	0.32188	10.24	30.54	29.47	40.78	39.71	59.66	49.66	-18.88	-9.95
5	**0.34141**	**10.24**	**34.74**	**34.04**	**44.98**	**44.28**	**59.17**	**49.17**	**-14.19**	**-**
6	3.05859	10.48	21.01	13.44	31.49	23.92	56.00	46.00	-24.51	-22.08
7	7.75391	10.69	26.17	23.30	36.86	33.99	60.00	50.00	-23.14	-16.01

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

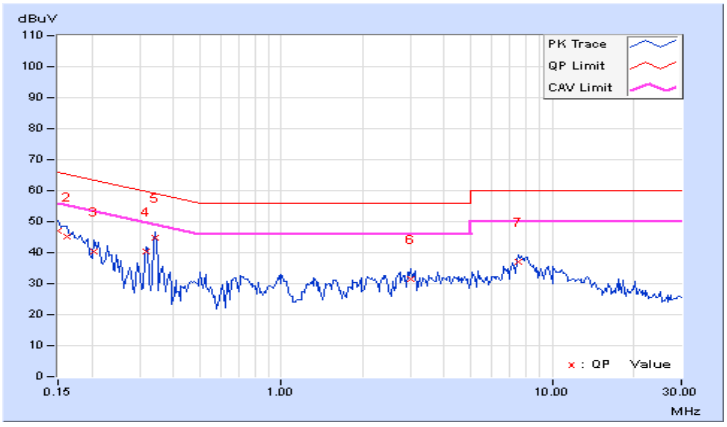


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
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	10.28	36.86	20.66	47.14	30.94	66.00	56.00	-18.86	-25.06
2	0.16172	10.27	35.01	19.94	45.28	30.21	65.38	55.38	-20.10	-25.17
3	0.20469	10.22	30.01	17.79	40.23	28.01	63.42	53.42	-23.19	-25.41
4	0.31797	10.27	30.21	29.64	40.48	39.91	59.76	49.76	-19.28	-9.85
5	0.34141	10.28	34.41	33.82	44.69	44.10	59.17	49.17	-14.48	-5.07
6	3.02734	10.50	20.85	12.68	31.35	23.18	56.00	46.00	-24.65	-22.82
7	7.50000	10.76	26.12	24.07	36.88	34.83	60.00	50.00	-23.12	-15.17

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



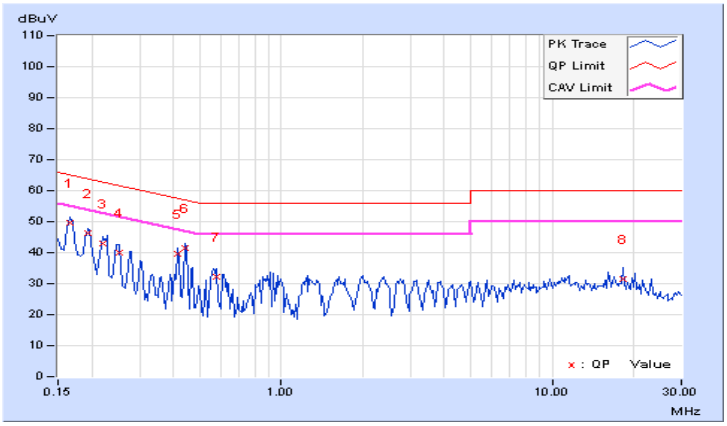
4.2.9 Test Results (Mode 3)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Line (L)										
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	0.16562	10.24	39.39	28.86	49.63	39.10	65.18	55.18	-15.55	-16.08
2	0.19297	10.25	36.04	25.95	46.29	36.20	63.91	53.91	-17.62	-17.71
3	0.21987	10.25	32.76	23.90	43.01	34.15	62.82	52.82	-19.81	-18.67
4	0.25156	10.25	29.65	22.51	39.90	32.76	61.71	51.71	-21.81	-18.95
5	0.41563	10.24	29.51	27.83	39.75	38.07	57.54	47.54	-17.79	-9.47
6	0.44297	10.24	31.12	29.32	41.36	39.56	57.01	47.01	-15.65	-7.45
7	0.57969	10.25	22.04	20.69	32.29	30.94	56.00	46.00	-23.71	-15.06
8	18.24219	11.28	20.35	16.09	31.63	27.37	60.00	50.00	-28.37	-22.63

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

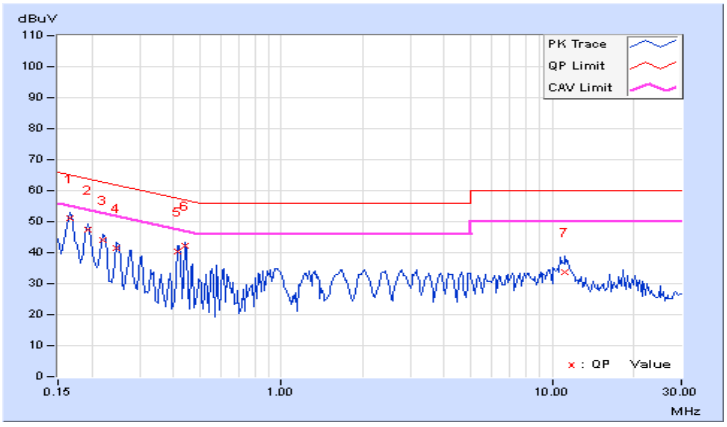


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
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	0.16562	10.26	40.73	30.62	50.99	40.88	65.18	55.18	-14.19	-14.30
2	0.19297	10.23	37.11	27.71	47.34	37.94	63.91	53.91	-16.57	-15.97
3	0.22031	10.23	34.01	26.33	44.24	36.56	62.81	52.81	-18.57	-16.25
4	0.24766	10.24	31.13	25.74	41.37	35.98	61.84	51.84	-20.47	-15.86
5	0.41563	10.30	29.91	29.02	40.21	39.32	57.54	47.54	-17.33	-8.22
6	0.44297	10.31	31.73	30.84	42.04	41.15	57.01	47.01	-14.97	-5.86
7	11.12500	10.94	22.66	17.50	33.60	28.44	60.00	50.00	-26.40	-21.56

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 Measurment

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 ≦ 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

CDD Mode

802.11a

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	18.08	18.14	129.432	21.12	30.00	Pass
40	5200	18.95	18.77	153.86	21.87	30.00	Pass
48	5240	19.18	18.45	152.778	21.84	30.00	Pass
149	5745	22.08	22.48	338.447	25.29	30.00	Pass
157	5785	22.23	22.65	351.186	25.46	30.00	Pass
165	5825	22.00	22.84	350.798	25.45	30.00	Pass

802.11ac (VHT20)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	18.00	18.07	127.217	21.05	30.00	Pass
40	5200	19.00	18.71	153.735	21.87	30.00	Pass
48	5240	19.12	18.44	151.481	21.80	30.00	Pass
149	5745	22.11	22.49	339.974	25.31	30.00	Pass
157	5785	22.01	22.62	341.665	25.34	30.00	Pass
165	5825	22.00	22.81	349.474	25.43	30.00	Pass

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	16.09	16.08	81.195	19.10	30.00	Pass
46	5230	19.93	19.14	180.436	22.56	30.00	Pass
151	5755	22.07	22.55	340.952	25.33	30.00	Pass
159	5795	21.95	22.67	341.602	25.34	30.00	Pass

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	14.73	14.46	57.642	17.61	30.00	Pass
155	5775	19.52	20.48	201.222	23.04	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
36	5180	17.55	17.62	114.695	20.60	28.43	Pass
40	5200	19.00	18.71	153.735	21.87	28.43	Pass
48	5240	19.12	18.44	151.481	21.80	28.43	Pass
149	5745	22.11	22.49	339.974	25.31	28.55	Pass
157	5785	22.01	22.62	341.665	25.34	28.55	Pass
165	5825	22.00	22.81	349.474	25.43	28.55	Pass

Note: 1. For U-NII-1 band: Directional gain = 4.56dBi + 10log(2) = 7.57dBi > 6dBi , so the power limit shall be reduced to 30-(7.57-6) = 28.43dBm.
2. For U-NII-3 band: Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power limit shall be reduced to 30-(7.45-6) = 28.55dBm.

802.11ac (VHT40)

CHAN.	FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
38	5190	15.62	15.71	73.714	18.68	28.43	Pass
46	5230	19.12	18.23	148.185	21.71	28.43	Pass
151	5755	22.07	22.55	340.952	25.33	28.55	Pass
159	5795	21.95	22.67	341.602	25.34	28.55	Pass

Note: 1. For U-NII-1 band: Directional gain = 4.56dBi + 10log(2) = 7.57dBi > 6dBi , so the power limit shall be reduced to 30-(7.57-6) = 28.43dBm.
2. For U-NII-3 band: Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power limit shall be reduced to 30-(7.45-6) = 28.55dBm.

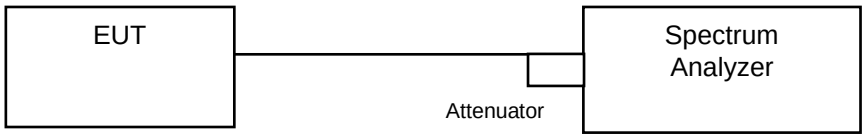
802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass/Fail
		Chain 0	Chain 1				
42	5210	15.20	14.98	64.59	18.10	28.43	Pass
155	5775	19.96	20.83	220.143	23.43	28.55	Pass

Note: 1. For U-NII-1 band: Directional gain = 4.56dBi + 10log(2) = 7.57dBi > 6dBi , so the power limit shall be reduced to 30-(7.57-6) = 28.43dBm.
2. For U-NII-3 band: Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power limit shall be reduced to 30-(7.45-6) = 28.55dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.16	17.16
40	5200	16.92	17.16
48	5240	17.04	17.04
149	5745	34.44	34.68
157	5785	34.08	35.40
165	5825	35.04	33.24

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	18.24
40	5200	18.12	18.48
48	5240	18.24	18.24
149	5745	36.72	37.08
157	5785	36.24	36.48
165	5825	37.56	36.24

802.11ac (VHT40)

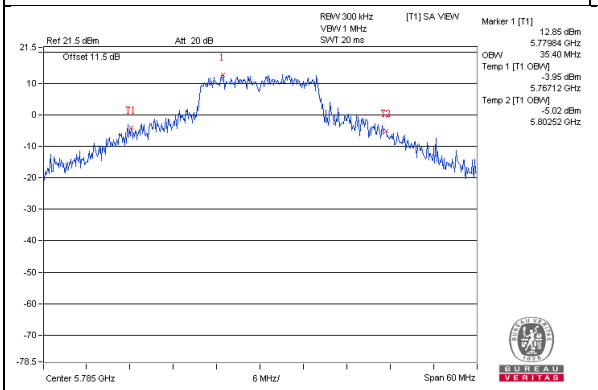
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.72	36.96
46	5230	37.44	37.20
151	5755	60.72	60.64
159	5795	72.96	69.36

802.11ac (VHT80)

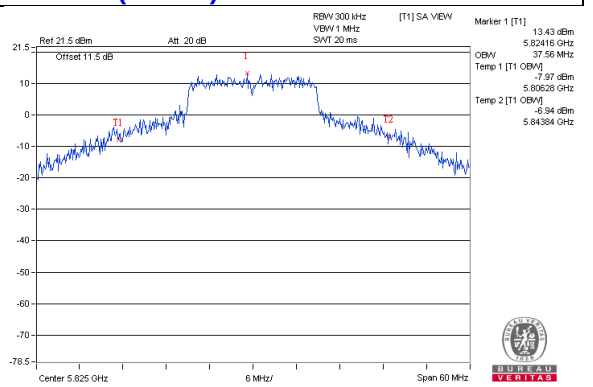
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.32	76.80
155	5775	102.24	88.32

Spectrum Plot of Worst Value

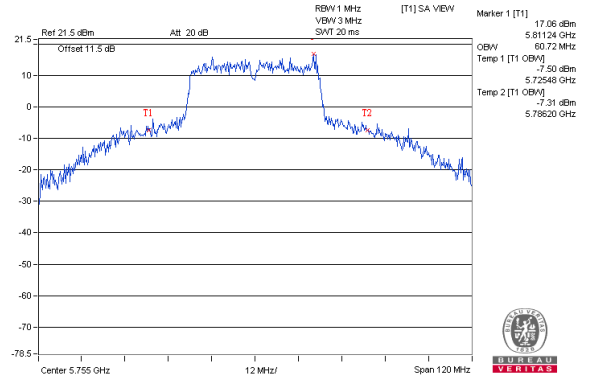
802.11a / Chain 1 : CH157



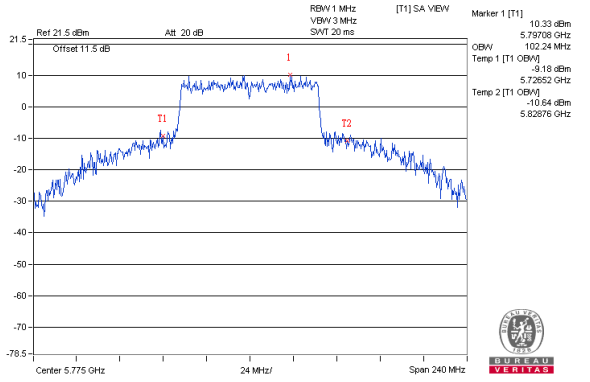
802.11ac (VHT20) / Chain0 : CH165



802.11ac (VHT40) / Chain 0: CH151

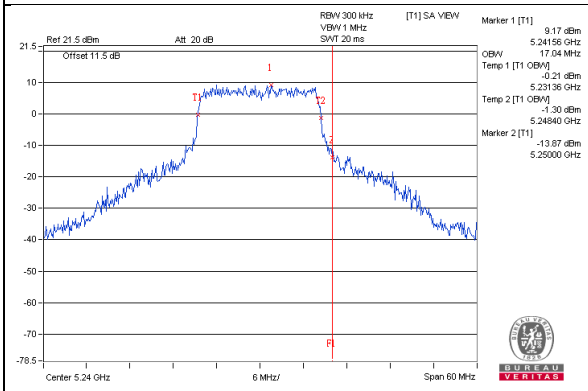


802.11ac (VHT80) / Chain0 : CH155

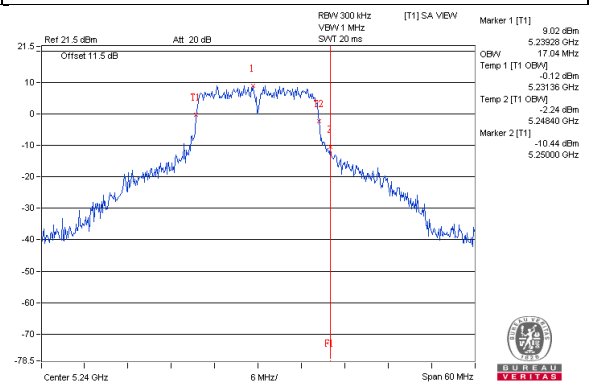


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

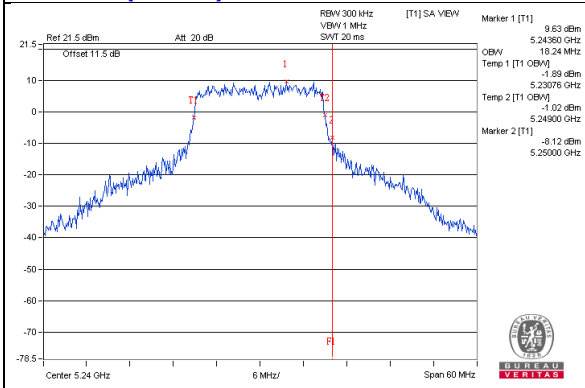
802.11a / Chain 0 : CH48



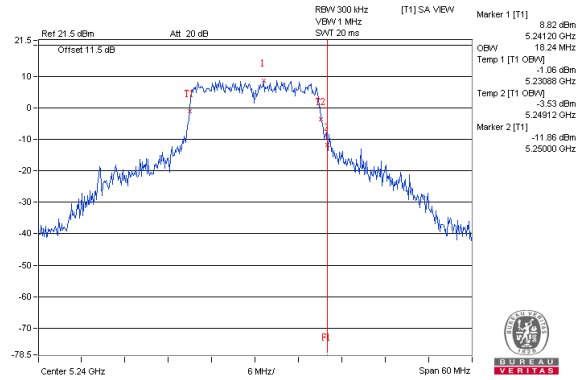
802.11a / Chain 1 : CH48



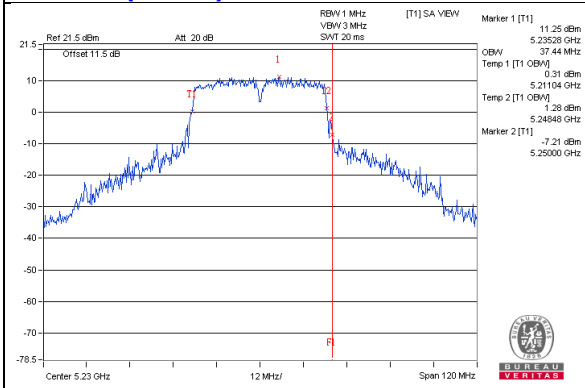
802.11ac (VHT20) / Chain 0 : CH48



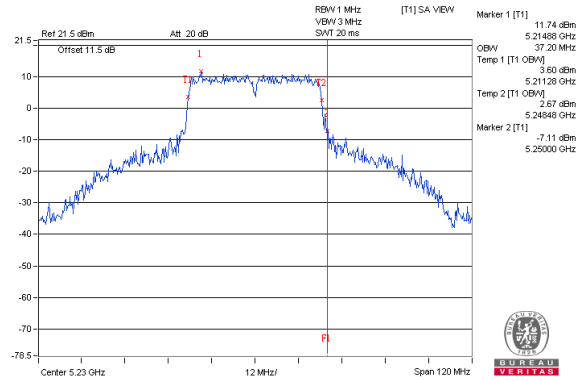
802.11ac (VHT20) / Chain 1 : CH48



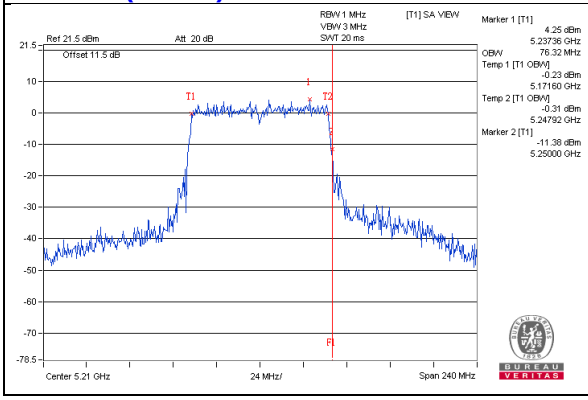
802.11ac (VHT40) / Chain 0 : CH46



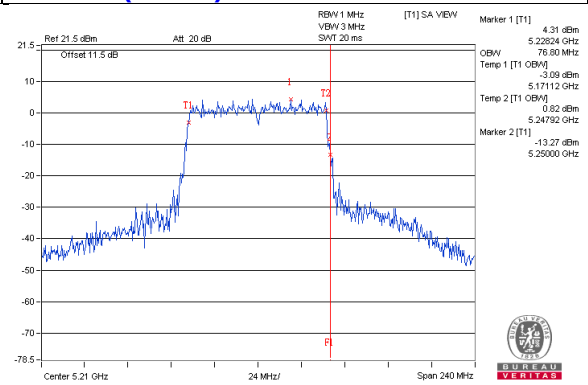
802.11ac (VHT40) / Chain 1 : CH46



802.11ac (VHT80) / Chain 0 : CH42

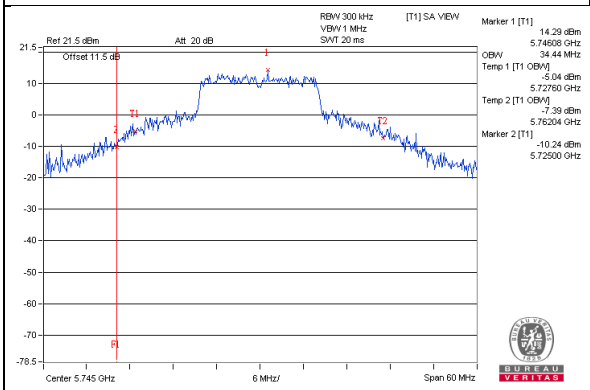


802.11ac (VHT80) / Chain 1 : CH42

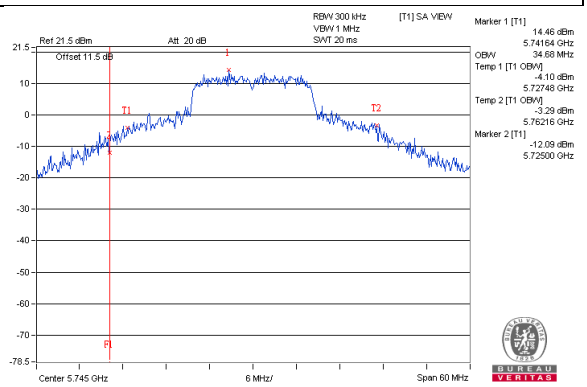


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

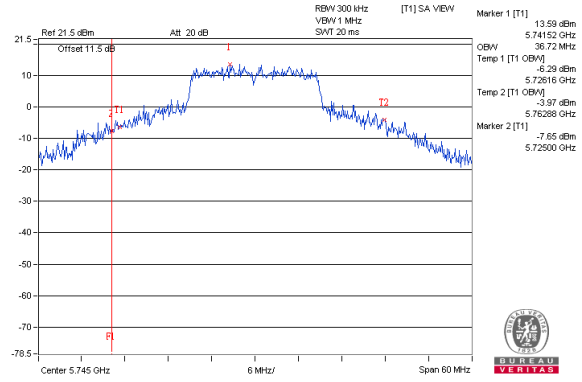
802.11a / Chain 0 : CH149



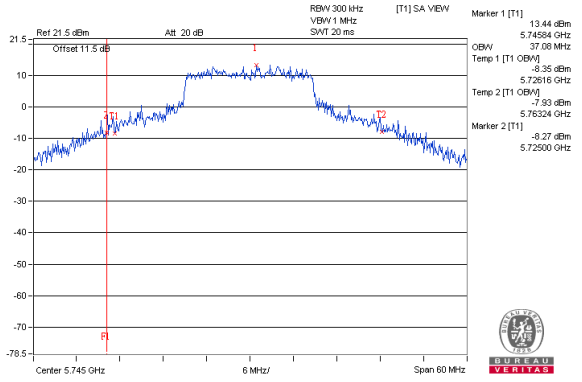
802.11a / Chain 1 : CH149



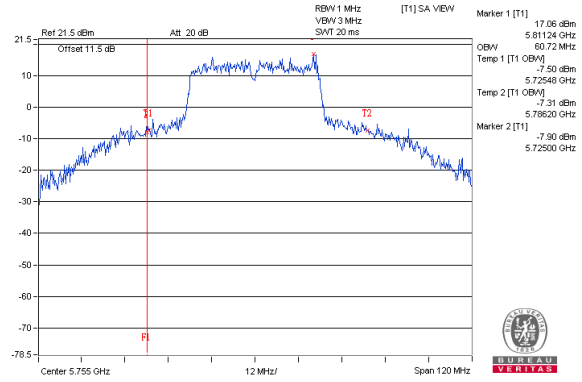
802.11ac (VHT20) / Chain 0 : CH149



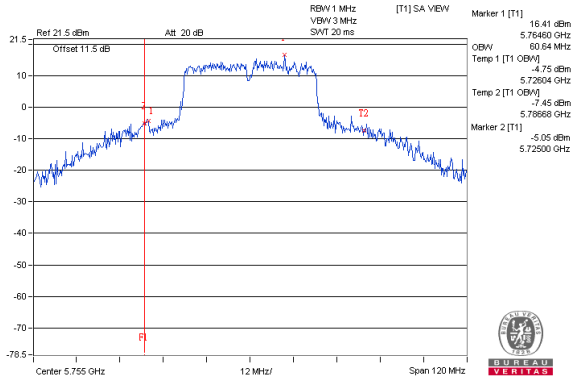
802.11ac (VHT20) / Chain 1 : CH149



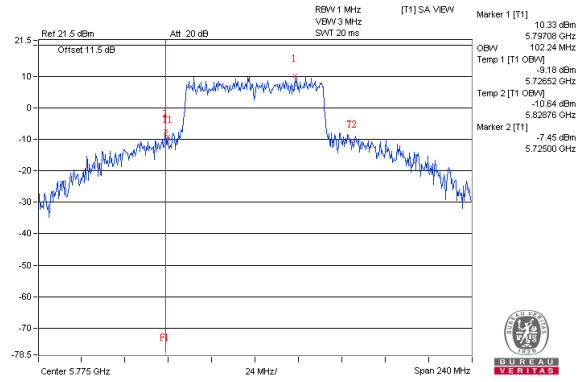
802.11ac (VHT40) / Chain 0 : CH151



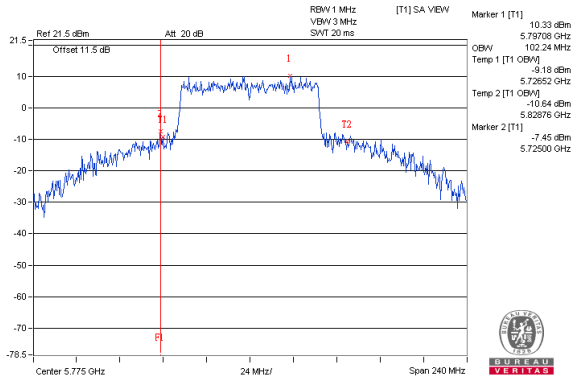
802.11ac (VHT40) / Chain 1 : CH151



802.11ac (VHT80) / Chain 0 : CH155



802.11ac (VHT80) / Chain 1 : CH155

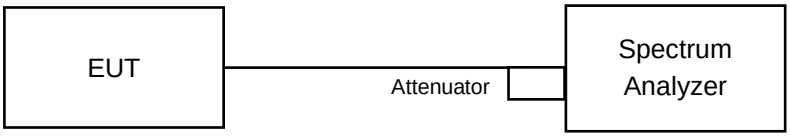


4.5 Peak Power Spectral Density Measurement

4.5.1 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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 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/duty cycle)

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 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 = 10log(500 kHz/300kHz)
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/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	3.98	3.88	0.16	7.10	15.43	Pass
40	5200	4.73	4.75	0.16	7.91	15.43	Pass
48	5240	5.34	4.98	0.16	8.34	15.43	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 = 4.49dBi + 10log(2) = 7.57dBi > 6dBi , so the power density limit shall be reduced to 17-(7.57-6) = 9.43dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	3.94	2.45	0.15	6.42	15.43	Pass
40	5200	4.12	4.28	0.15	7.37	15.43	Pass
48	5240	4.85	4.68	0.15	7.93	15.43	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 = 4.49dBi + 10log(2) = 7.57dBi > 6dBi , so the power density limit shall be reduced to 17-(7.57-6) = 9.43dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-2.75	-1.51	0.20	1.12	15.43	Pass
46	5230	1.79	1.10	0.20	4.67	15.43	Pass

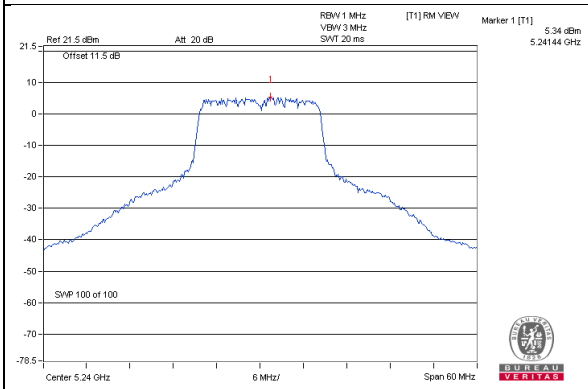
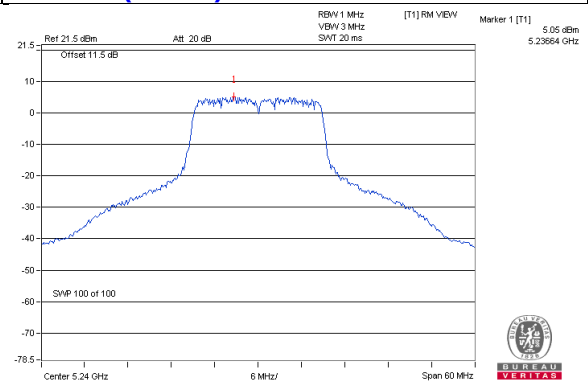
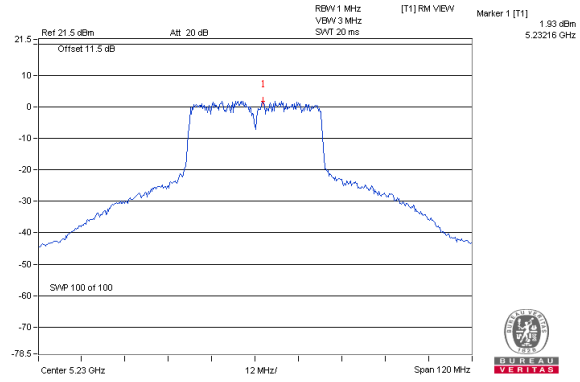
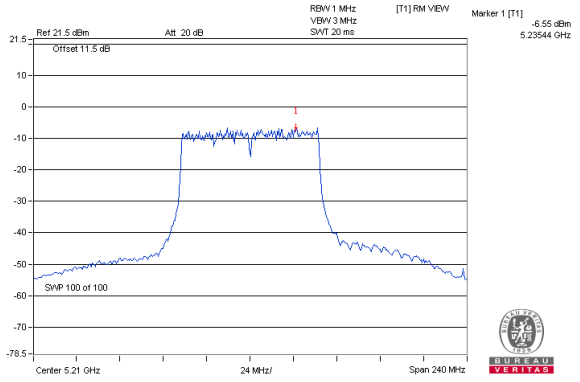
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.49dBi + 10log(2) = 7.57dBi > 6dBi , so the power density limit shall be reduced to 17-(7.57-6) = 9.43dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Baemforming Mode

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. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-6.68	-7.96	0.41	-3.85	15.43	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 = 4.49dBi + 10log(2) = 7.57dBi > 6dBi , so the power density limit shall be reduced to 17-(7.57-6) = 9.43dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 0 : CH48	**802.11ac (VHT20) / Chain0 : CH48**
	
802.11ac (VHT40) / Chain 0: CH46	**802.11ac (VHT80) / Chain0 : CH42**
	

For U-NII-3:

CDD Mode

802.11a

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	0.74	2.96	3.01	0.16	6.13	28.55	Pass
	157	5785	0.90	3.12	3.01	0.16	6.29	28.55	Pass
	165	5825	0.45	2.67	3.01	0.16	5.84	28.55	Pass
1	149	5745	0.74	2.96	3.01	0.16	6.13	28.55	Pass
	157	5785	0.73	2.95	3.01	0.16	6.12	28.55	Pass
	165	5825	0.97	3.19	3.01	0.16	6.36	28.55	Pass

Note: 1. Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power density limit shall be reduced to 30-(7.45-6) = 28.55dBm.

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

802.11ac (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	0.52	2.74	3.01	0.15	5.90	28.55	Pass
	157	5785	-0.61	1.61	3.01	0.15	4.77	28.55	Pass
	165	5825	0.17	2.39	3.01	0.15	5.55	28.55	Pass
1	149	5745	0.11	2.33	3.01	0.15	5.49	28.55	Pass
	157	5785	-0.54	1.68	3.01	0.15	4.84	28.55	Pass
	165	5825	0.02	2.24	3.01	0.15	5.40	28.55	Pass

Note: 1. Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power density limit shall be reduced to 30-(7.45-6) = 28.55dBm.

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

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.53	-1.31	3.01	0.20	1.90	28.55	Pass
	159	5795	-3.78	-1.56	3.01	0.20	1.65	28.55	Pass
1	151	5755	-3.52	-1.30	3.01	0.20	1.91	28.55	Pass
	159	5795	-4.02	-1.80	3.01	0.20	1.41	28.55	Pass

Note: 1. Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power density limit shall be reduced to 30-(7.45-6) = 28.55dBm.

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

Beamforming Mode

802.11ac (VHT80)

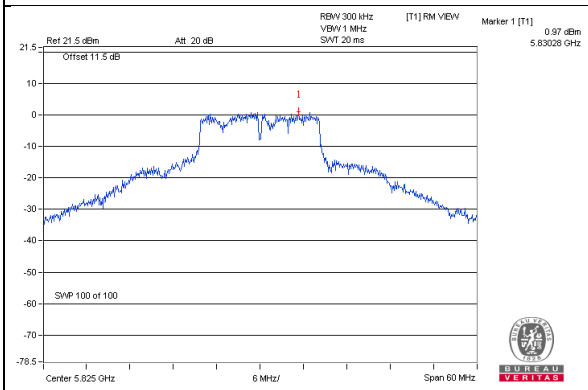
TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-9.06	-6.84	3.01	0.41	-3.42	28.55	Pass
1	155	5775	-9.90	-7.68	3.01	0.41	-4.26	28.55	Pass

Note: 1. Directional gain = 4.44dBi + 10log(2) = 7.45dBi > 6dBi , so the power density limit shall be reduced to 30-(7.45-6) = 28.55dBm.

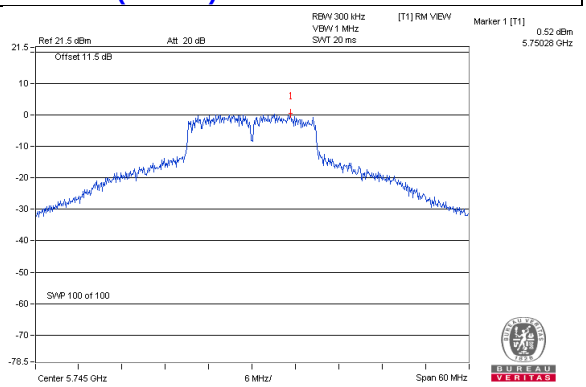
2. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

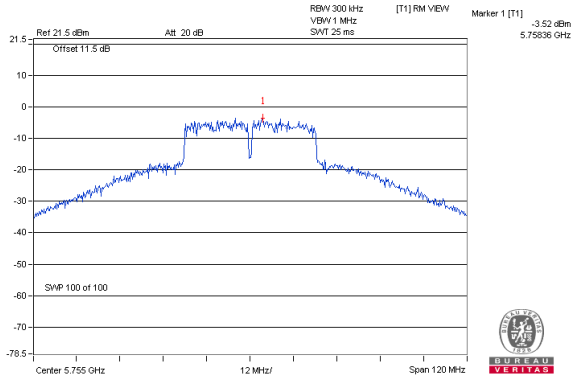
802.11a / Chain 1 : CH165



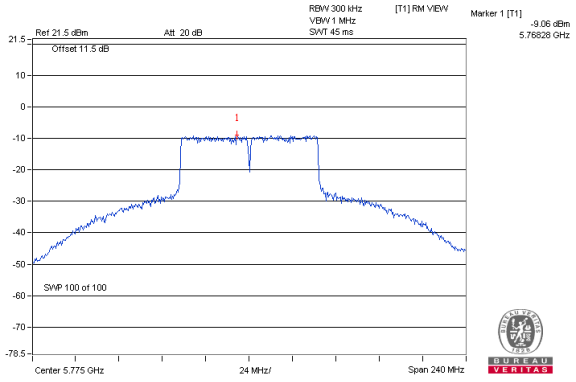
802.11ac (VHT20) / Chain0 : CH149



802.11ac (VHT40) / Chain 1: CH151



802.11ac (VHT80) / Chain0 : CH155

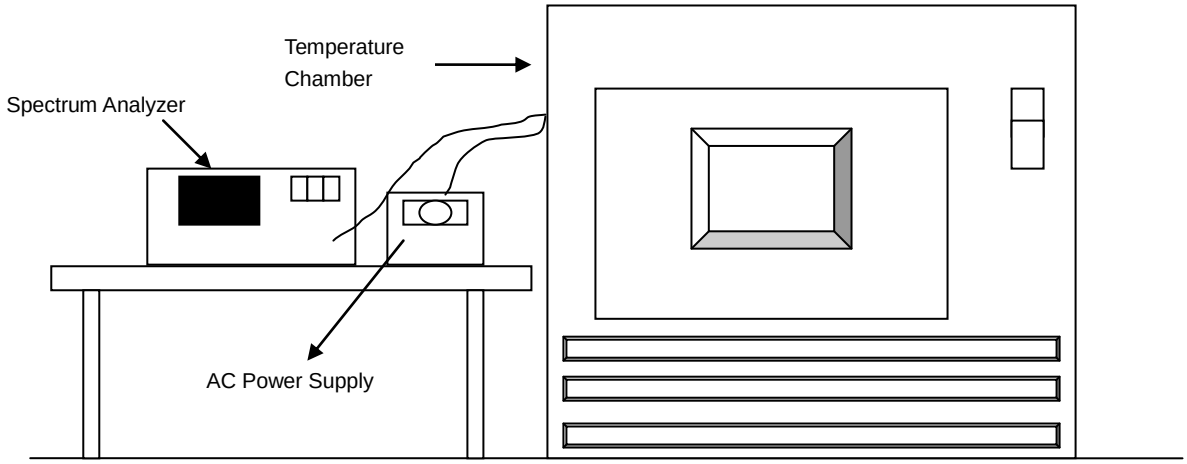


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. 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.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9808	PASS	5179.9804	PASS	5179.9784	PASS	5179.9816	PASS
40	120	5180.001	PASS	5179.9981	PASS	5179.9997	PASS	5180.0005	PASS
30	120	5180.0266	PASS	5180.0242	PASS	5180.0228	PASS	5180.0227	PASS
20	120	5180.0213	PASS	5180.0232	PASS	5180.0241	PASS	5180.0248	PASS
10	120	5179.9782	PASS	5179.9793	PASS	5179.9811	PASS	5179.9798	PASS
0	120	5180.0028	PASS	5180.0021	PASS	5180.0041	PASS	5180.003	PASS
-10	120	5180.0025	PASS	5180.0015	PASS	5180.0034	PASS	5180.0026	PASS
-20	120	5180.0105	PASS	5180.0131	PASS	5180.01	PASS	5180.0125	PASS
-30	120	5180.0184	PASS	5180.0185	PASS	5180.0179	PASS	5180.0192	PASS

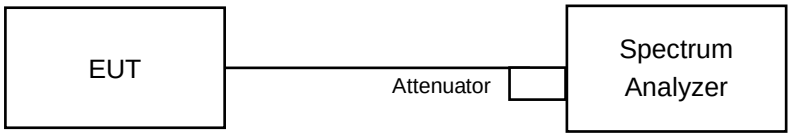
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0207	PASS	5180.0239	PASS	5180.0233	PASS	5180.0245	PASS
	120	5180.0213	PASS	5180.0232	PASS	5180.0241	PASS	5180.0248	PASS
	102	5180.0204	PASS	5180.0229	PASS	5180.0235	PASS	5180.0244	PASS

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. 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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.36	16.34	0.5	Pass
157	5785	16.38	16.32	0.5	Pass
165	5825	16.37	16.39	0.5	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.67	17.65	0.5	Pass
157	5785	17.64	17.61	0.5	Pass
165	5825	17.66	17.65	0.5	Pass

802.11ac (VHT40)

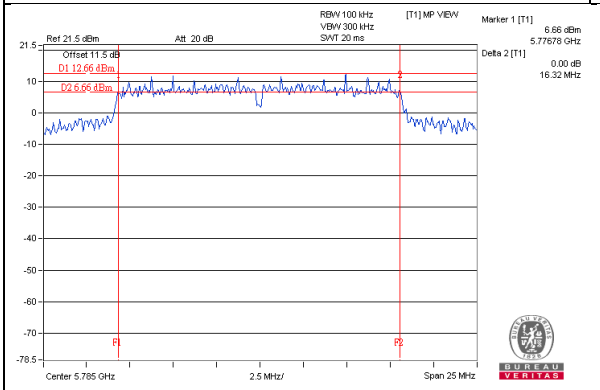
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.34	36.34	0.5	Pass
159	5795	36.31	35.45	0.5	Pass

802.11ac (VHT80)

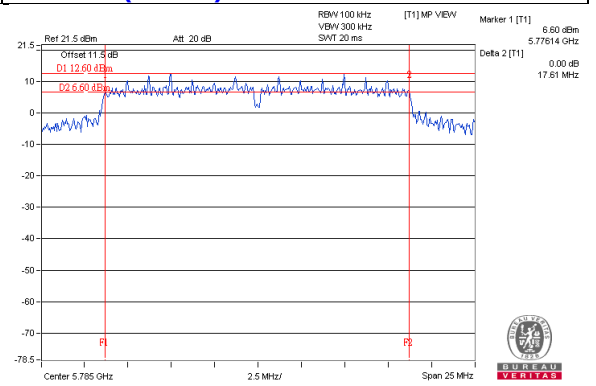
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.39	76.30	0.5	Pass

Spectrum Plot of Worst Value

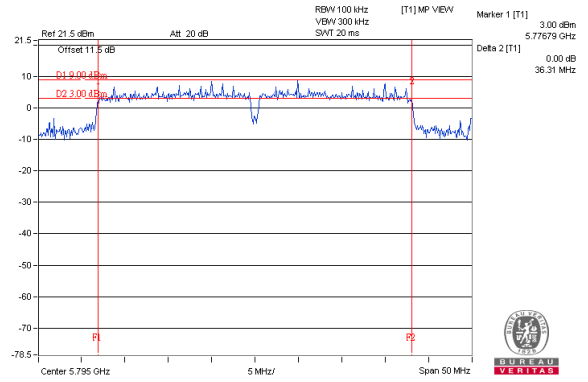
802.11a / Chain 1 : CH157



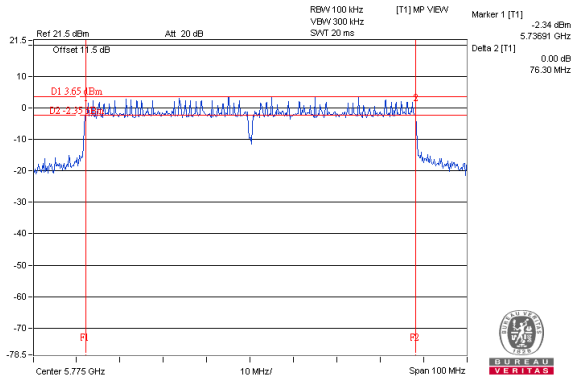
802.11ac (VHT20) / Chain1 : CH157



802.11ac (VHT40) / Chain 0: CH159



802.11ac (VHT80) / Chain1 : CH155



5 Pictures of Test Arrangements

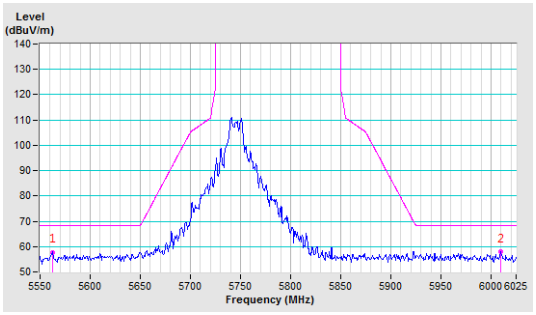
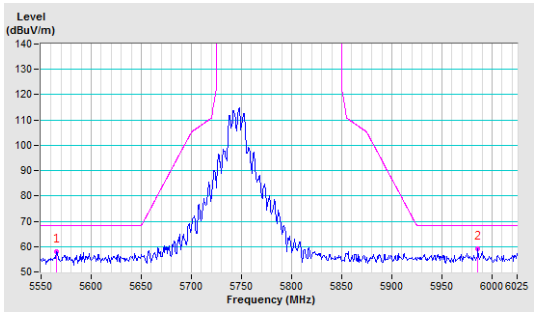
Please refer to the attached file (Test Setup Photo).

Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

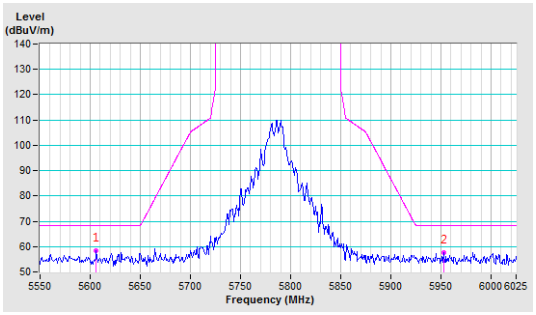
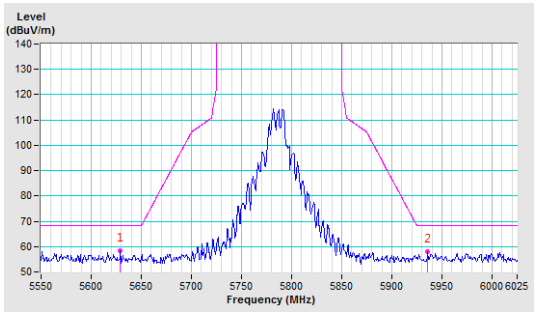
CDD Mode

802.11a

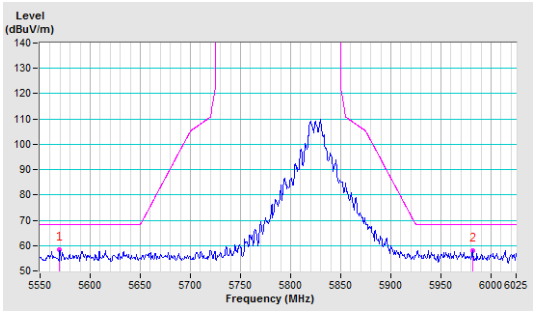
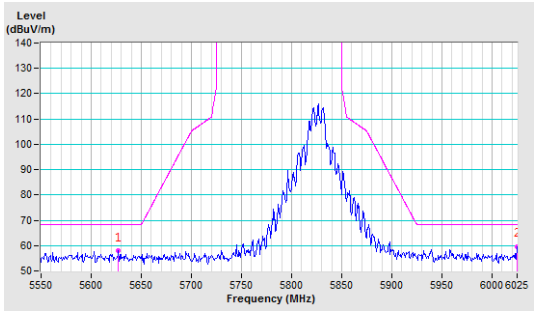
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

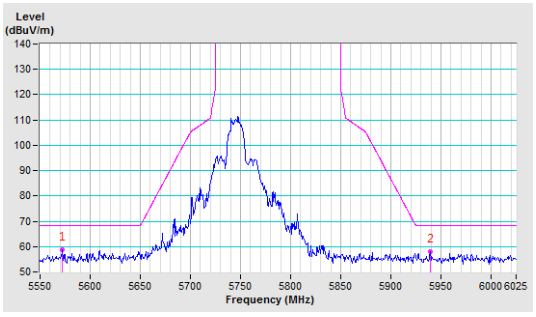
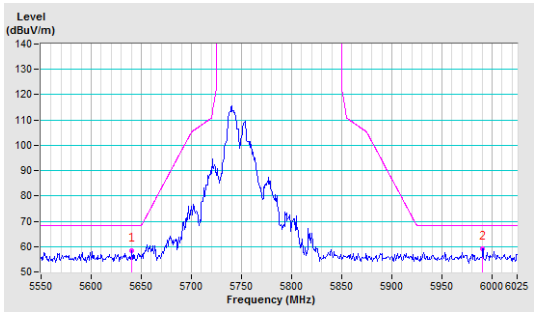
Horizontal	Vertical
	

CH 165 5825 MHz

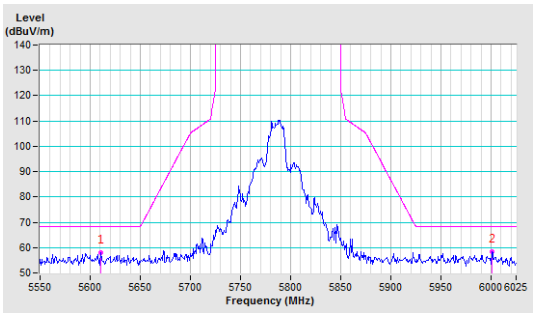
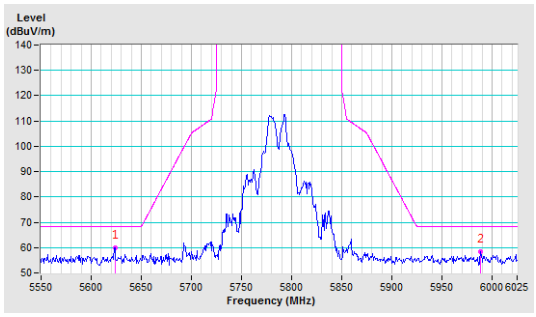
Horizontal	Vertical
	

802.11ac (VHT20)

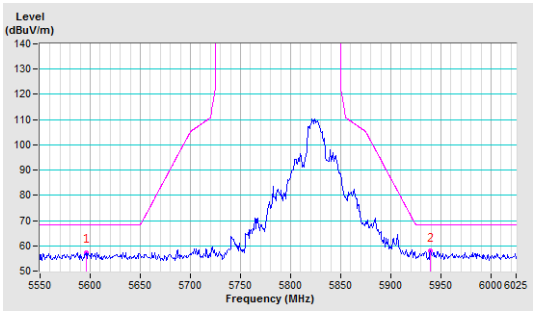
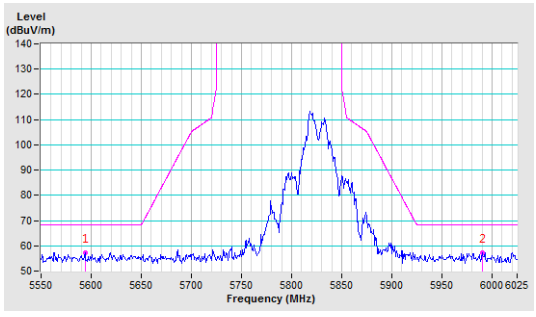
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

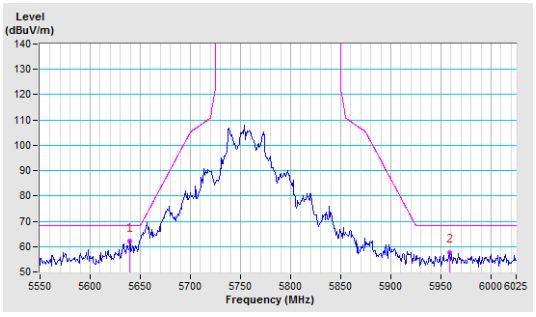
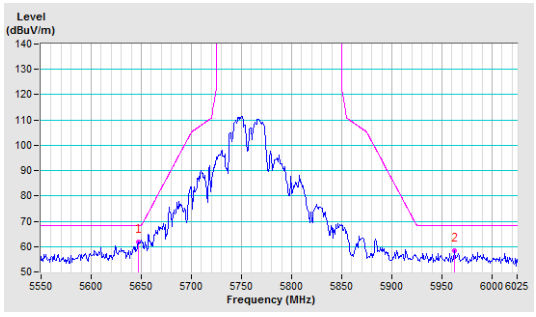
Horizontal	Vertical
	

CH 165 5825 MHz

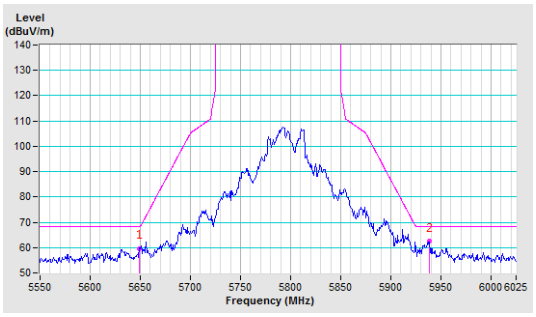
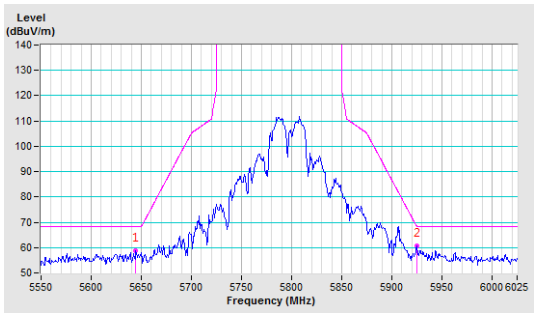
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

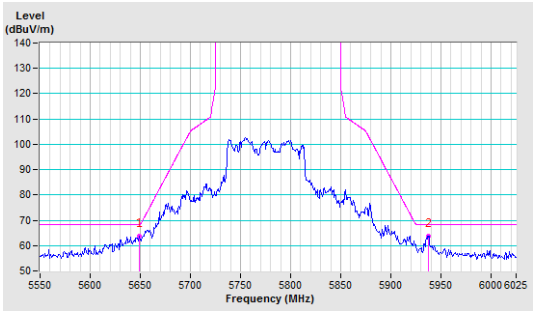
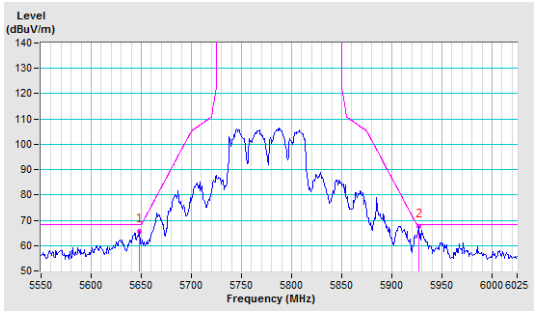
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

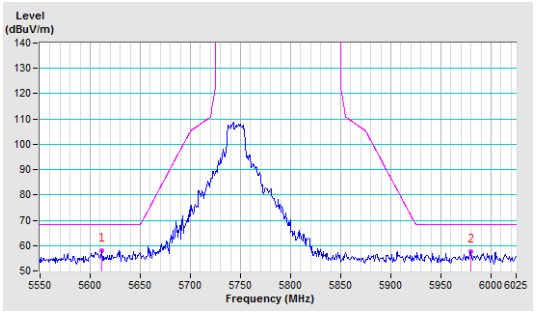
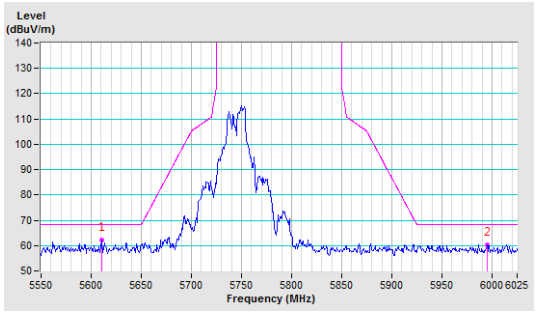
CH 155 5775 MHz

Horizontal	Vertical
	

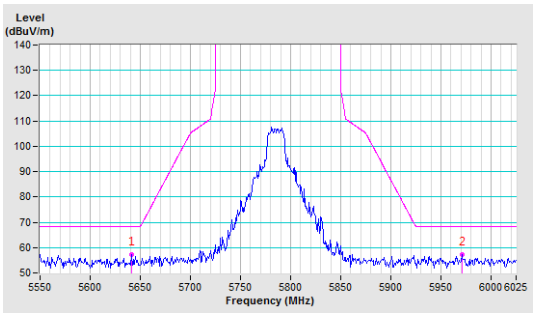
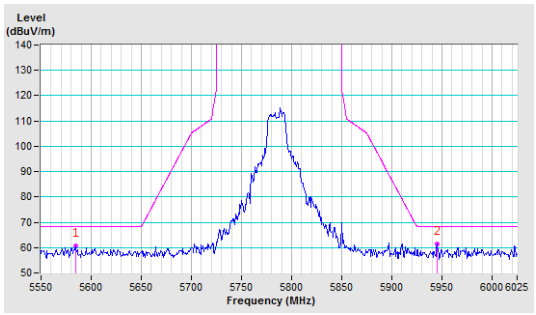
Beamforming Mode

802.11ac (VHT20)

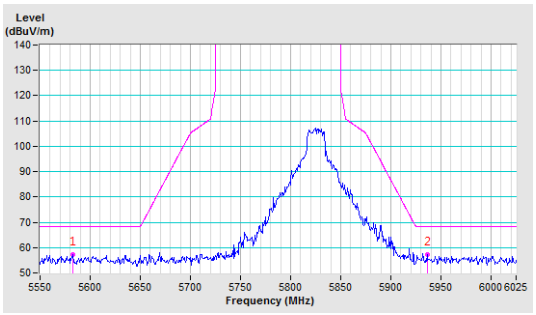
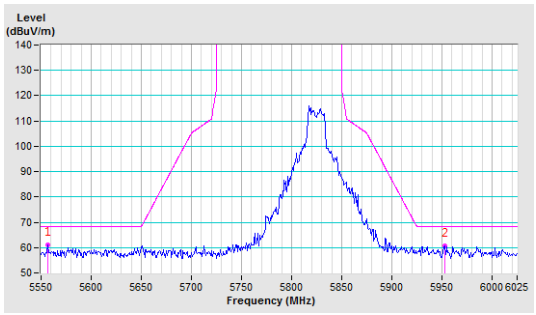
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

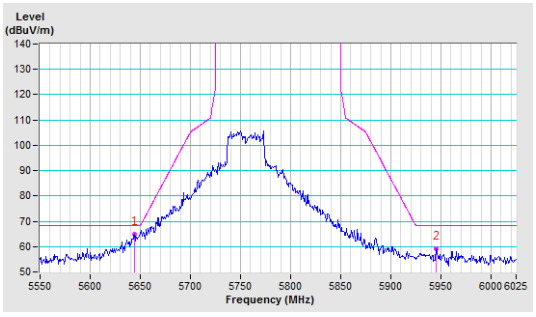
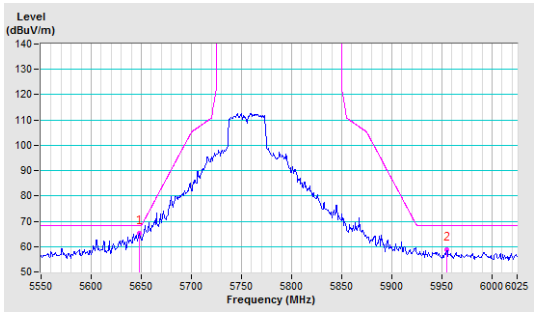
Horizontal	Vertical
	

CH 165 5825 MHz

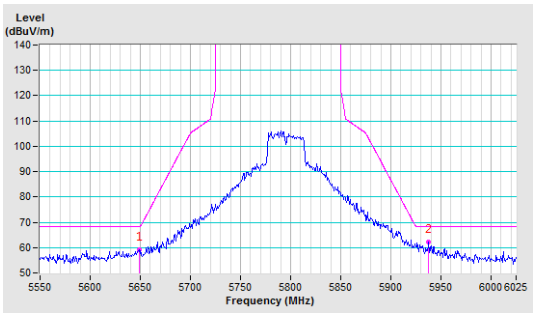
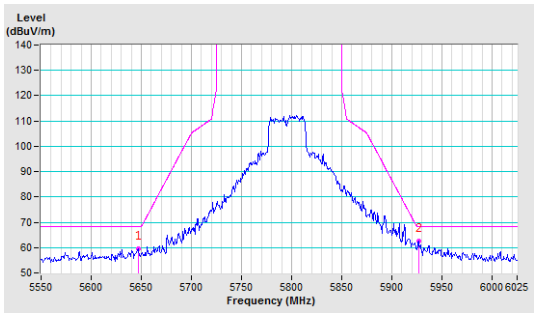
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

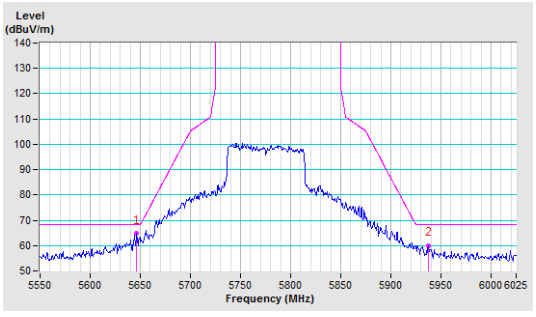
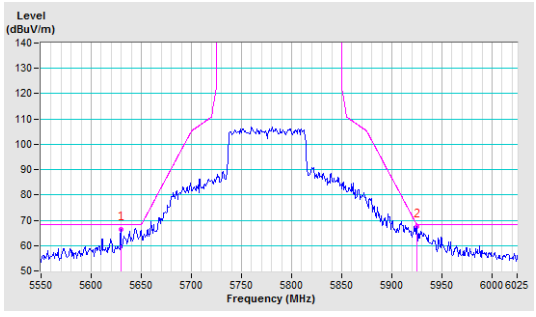
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz

Horizontal	Vertical
	

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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