FCC Test Report

Report No.:	RF180223C02-1 R1
FCC ID:	NKR-DHUME997
Test Model:	Catapult ERM997-1
Received Date:	Feb. 23, 2018
Test Date:	Mar. 26 ~ May 04, 2018
Issued Date:	Jul. 04, 2018
Applicant:	Wistron NeWeb Corp.
Address:	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration/ Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RF180223C02-1	Original release.	May 14, 2018
RF180223C02-1 R1	Revising Test Model Name.	Jul. 04, 2018

1 Certificate of Conformity

Product:	Marvell 88W8997 11ac 2x2 and BT Combo module
Brand:	WNC
Test Model:	Catapult ERM997-1
Sample Status:	Engineering sample
Applicant:	Wistron NeWeb Corp.
Test Date:	Mar. 26 ~ May 04, 2018
Standards:	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 RF characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jul. 04, 2018

Polly Chien / Specialist

Approved by : _____ , **Date:** Jul. 04, 2018

Bruce Chen / Project Engineer

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 -15.71dB at 21.17016MHz.
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 -1.2dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

*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	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1000MHz	3.59 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.60 dB
	6GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Marvell 88W8997 11ac 2x2 and BT Combo module
Brand	WNC
Test Model	Catapult ERM997-1
Sample Status	Engineering sample
Power Supply Rating	5Vdc (Host equipment)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 867Mbps
Operating Frequency	5180~5240MHz, 5260~5320MHz, 5500~5700MHz, 5745~5825MHz
Number of Channel	5180~5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5260~5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500~5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 11 802.11n (HT40), 802.11ac (VHT40): 5 802.11ac (VHT80): 2 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	5180~5240MHz: 52.954mW 5260~5320MHz: 53.637mW 5500~5700MHz: 59.382mW 5745~5825MHz: 61.325mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	0.45m shielded USB cable w/o core attached on EUT

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT20)	2TX
802.11ac (VHT40)	2TX
802.11ac (VHT80)	2TX

* 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)

2. The following antennas were provided to the EUT.

Ant. Type	PIFA						
Connecter Type	NA						
Antenna Gain (dBi)	Frequency (MHz)						
Item	2400	2450	2500	5150	5350	5550	5850
WIFI_Ant. 1	3.51	2.93	2.08	3.79	4.26	4.53	2.77
WIFI_Ant. 2	1.56	2.11	1.73	4.50	6.25	6.22	4.85

3. The BT could transmit simultaneously either with WLAN 2.4GHz or 5GHz at the same time.

3.2 Description of Test Modes

5180~5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

5260~5320MHz:

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

5500~5700MHz:

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530MHz	122	5610 MHz

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	
-	√	√	√	√	-

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: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	7.2
	802.11n (HT40)		38 to 46	38, 46	OFDM	15.0
	802.11ac (VHT80)		42	42	OFDM	58.5
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	7.2
	802.11n (HT40)		54 to 62	54, 62	OFDM	15.0
	802.11ac (VHT80)		58	58	OFDM	58.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	7.2
	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	15.0
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	58.5
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	7.2
	802.11n (HT40)		151 to 159	151, 159	OFDM	15.0
	802.11ac (VHT80)		155	155	OFDM	58.5

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	6.0
		5260-5320	52 to 64		OFDM	6.0
		5500-5700	100 to 140		OFDM	6.0
		5745-5825	149 to 165		OFDM	6.0

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	6.0
		5260-5320	52 to 64		OFDM	6.0
		5500-5700	100 to 140		OFDM	6.0
		5745-5825	149 to 165		OFDM	6.0

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	7.2
	802.11n (HT40)		38 to 46	38, 46	OFDM	15.0
	802.11ac (VHT80)		42	42	OFDM	58.5
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	7.2
	802.11n (HT40)		54 to 62	54, 62	OFDM	15.0
	802.11ac (VHT80)		58	58	OFDM	58.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	6.0
	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	7.2
	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	15.0
	802.11ac (VHT80)		106 to 122	106, 122	OFDM	58.5
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	7.2
	802.11n (HT40)		151 to 159	151, 159	OFDM	15.0
	802.11ac (VHT80)		155	155	OFDM	58.5

Test Condition:

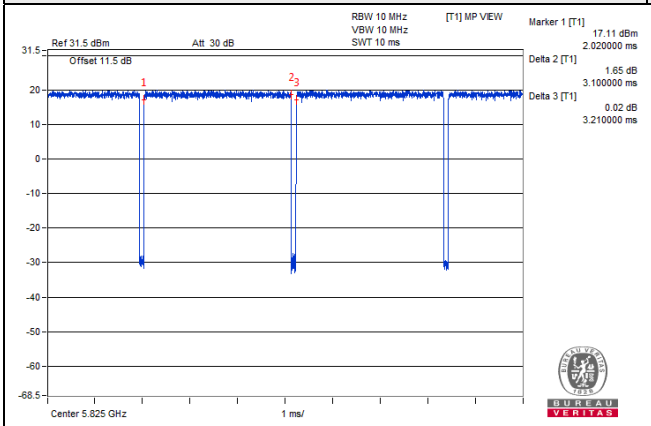
Applicable to	Environmental Conditions	Input Power (System)	Tested by
RE≥1G	25 deg. C, 66% RH	120Vac, 60Hz	Greg Lin
RE<1G	25 deg. C, 66% RH	120Vac, 60Hz	James Yang
PLC	25 deg. C, 75% RH	120Vac, 60Hz	James Yang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Alan Wu

3.3 Duty Cycle of Test Signal

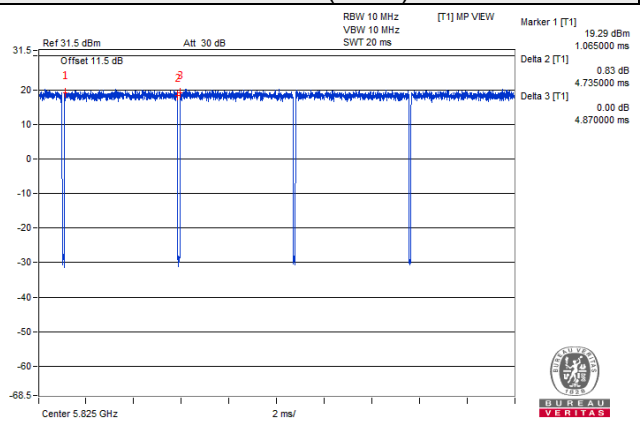
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 3.100/3.210 = 0.966, Duty factor = 10 * log(1/0.966) = 0.15
802.11n (HT20): Duty cycle = 4.735/4.870 = 0.972, Duty factor = 10 * log(1/0.972) = 0.12
802.11n (HT40): Duty cycle = 2.312/2.420 = 0.955, Duty factor = 10 * log(1/0.955) = 0.20
802.11ac (VHT80): Duty cycle = 1.090/1.206 = 0.904, Duty factor = 10 * log(1/0.904) = 0.44

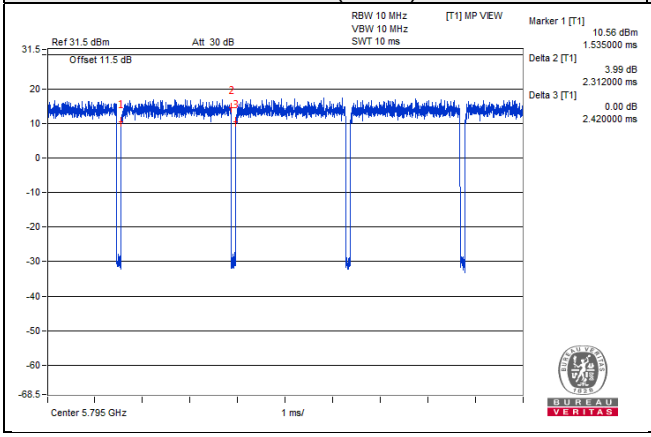
802.11a



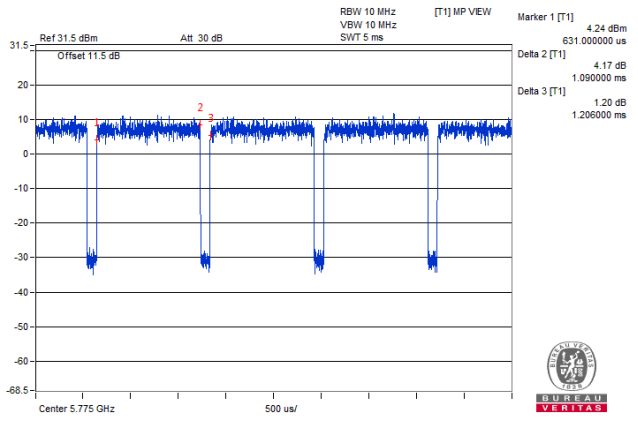
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

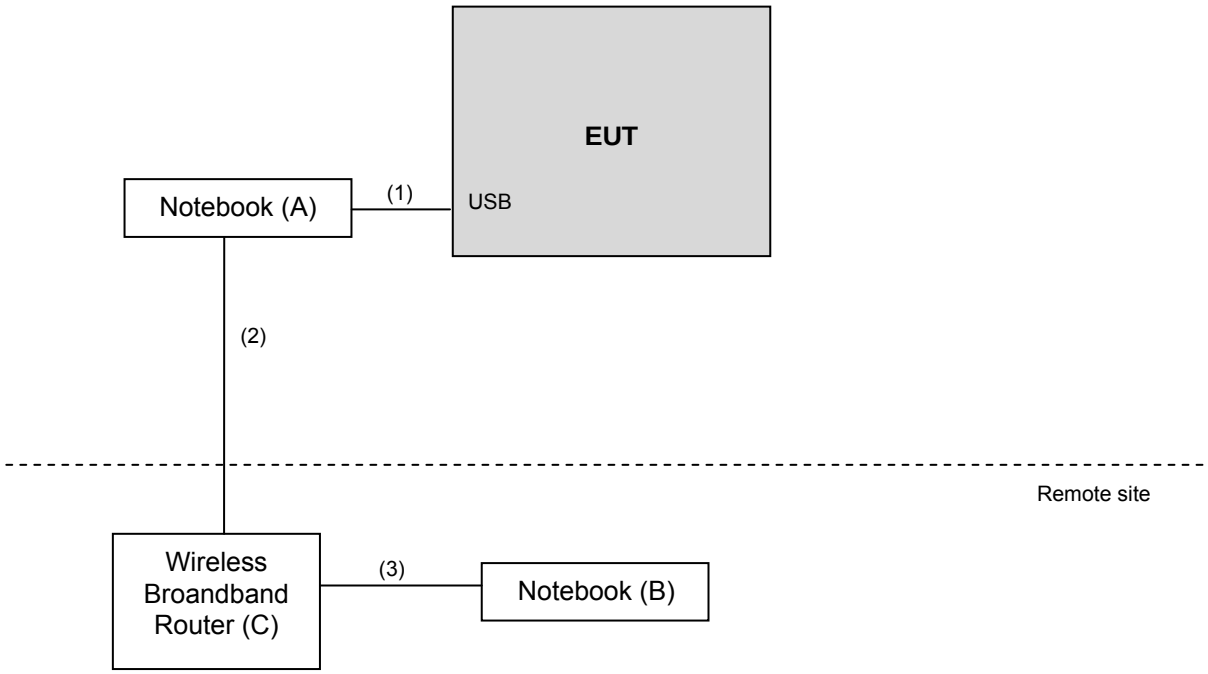
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5520	8Y4DMQ1	FCC DoC Approved	-
B.	Notebook	Lenovo	81A4	YD02TWF5	PPD-QCNFA435	-
C.	Wireless Broandband Router	Netgear	R7800	4H75745C00C5C	NA	-

Note:
1. All power cords of the above support units are non-shielded (1.8m).
2. Items B~C acted as communication partners to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	USB cable	1	0.45	Y	0	Accessory of EUT
2.	RJ45 cable	1	6	N	0	Cat5e
3.	RJ45 cable	1	1.5	N	0	Cat5e

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10:2013

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

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="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 17, 2017	Oct. 16, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Aug. 18, 2017	Aug. 17, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 11, 2017	Dec. 10, 2018
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 12, 2017	Dec. 11, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 01, 2017	Nov. 30, 2018
Loop Antenna EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Aug. 08, 2017	Aug. 07, 2018
Preamplifier Agilent (Above 1GHz)	8449B	3008A01638	Feb. 22, 2018	Feb. 21, 2019
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Jan. 15, 2018	Jan. 14, 2019
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Aug. 08, 2017	Aug. 07, 2018
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 01, 2017	Jul. 31, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
High Speed Peak Power Meter	ML2495A	0824012	Aug. 18, 2017	Aug. 17, 2018
Power Sensor	MA2411B	0738171	Aug. 18, 2017	Aug. 17, 2018
26GHz ~ 40GHz Amplifier Agilent	8449B	3008A1960	Aug. 08, 2017	Aug. 07, 2018

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
4. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

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. Parallel, perpendicular, and ground-parallel orientations 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.

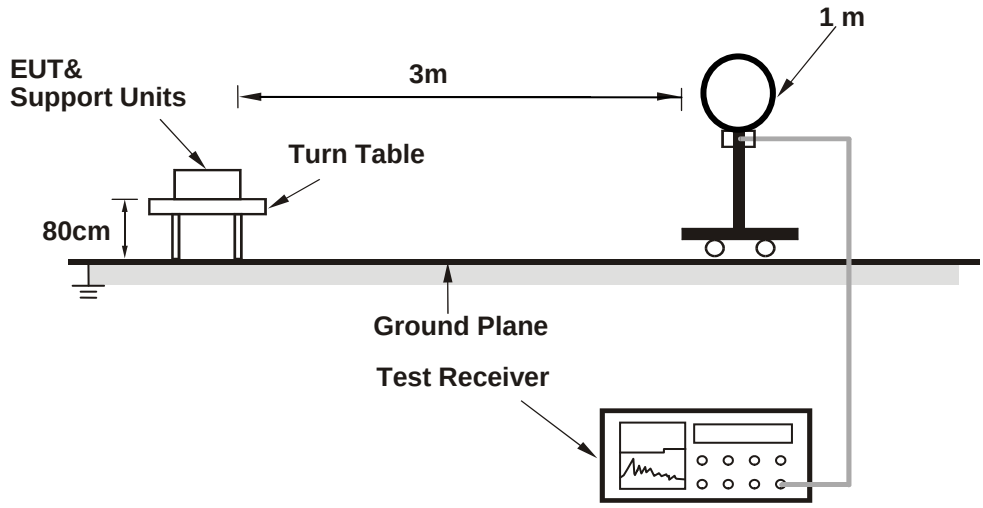
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

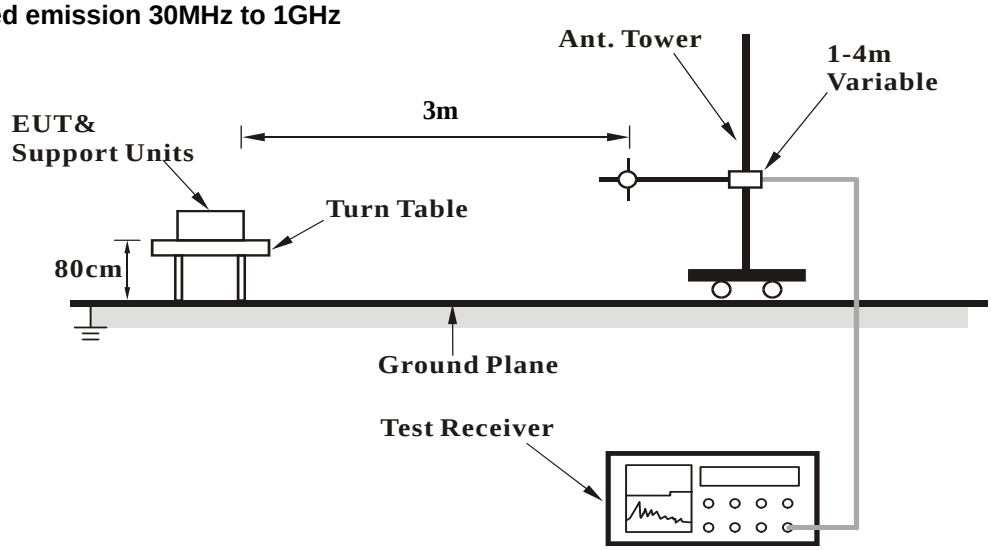
No deviation.

4.1.5 Test Set Up

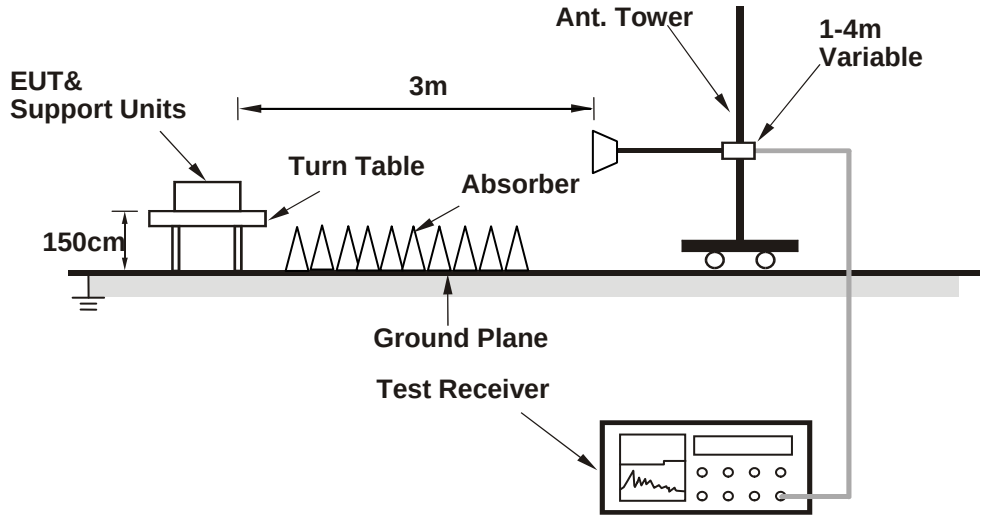
For Radiated emission below 30MHz



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 Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook & Wireless Broandband Router to act as a communication partners and placed them outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

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	48.8 PK	74.0	-25.2	3.37 H	194	46.70	2.10
2	5150.00	34.2 AV	54.0	-19.8	3.37 H	194	32.10	2.10
3	*5180.00	105.4 PK			3.29 H	198	66.60	38.80
4	*5180.00	95.3 AV			3.29 H	198	56.50	38.80
5	#10360.00	55.5 PK	74.0	-18.5	1.23 H	254	42.20	13.30
6	#10360.00	43.0 AV	54.0	-11.0	1.23 H	254	29.70	13.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.8 PK	74.0	-3.2	2.39 V	97	68.70	2.10
2	5150.00	52.7 AV	54.0	-1.3	2.39 V	97	50.60	2.10
3	*5180.00	109.7 PK			2.47 V	46	70.90	38.80
4	*5180.00	99.6 AV			2.47 V	46	60.80	38.80
5	#10360.00	56.5 PK	74.0	-17.5	1.96 V	109	43.20	13.30
6	#10360.00	43.4 AV	54.0	-10.6	1.96 V	109	30.10	13.30

Remarks:

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

CHANNEL	TX Channel 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	*5200.00	102.0 PK			3.23 H	186	63.30	38.70
2	*5200.00	91.9 AV			3.23 H	186	53.20	38.70
3	#10400.00	55.5 PK	74.0	-18.5	1.13 H	267	42.20	13.30
4	#10400.00	42.7 AV	54.0	-11.3	1.13 H	267	29.40	13.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	105.1 PK			1.01 V	251	66.40	38.70
2	*5200.00	95.7 AV			1.01 V	251	57.00	38.70
3	#10400.00	56.6 PK	74.0	-17.4	1.86 V	112	43.30	13.30
4	#10400.00	43.6 AV	54.0	-10.4	1.86 V	112	30.30	13.30

Remarks:

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

CHANNEL	TX Channel 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	101.6 PK			3.32 H	197	63.10	38.50
2	*5240.00	91.4 AV			3.32 H	197	52.90	38.50
3	5350.00	53.8 PK	74.0	-20.2	2.98 H	173	51.80	2.00
4	5350.00	41.6 AV	54.0	-12.4	2.98 H	173	39.60	2.00
5	#10480.00	56.0 PK	74.0	-18.0	1.26 H	271	42.10	13.90
6	#10480.00	43.2 AV	54.0	-10.8	1.26 H	271	29.30	13.90
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	105.2 PK			1.02 V	252	66.70	38.50
2	*5240.00	95.3 AV			1.02 V	252	56.80	38.50
3	5350.00	54.2 PK	74.0	-19.8	1.11 V	236	52.20	2.00
4	5350.00	42.3 AV	54.0	-11.7	1.11 V	236	40.30	2.00
5	#10480.00	57.5 PK	74.0	-16.5	1.95 V	104	43.60	13.90
6	#10480.00	44.1 AV	54.0	-9.9	1.95 V	104	30.20	13.90

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 52	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	52.8 PK	74.0	-21.2	2.84 H	355	50.90	1.90
2	5150.00	38.5 AV	54.0	-15.5	2.84 H	355	36.60	1.90
3	*5260.00	103.9 PK			3.01 H	354	65.50	38.40
4	*5260.00	94.4 AV			3.01 H	354	56.00	38.40
5	#10520.00	54.5 PK	74.0	-19.5	2.41 H	160	39.30	15.20
6	#10520.00	41.9 AV	54.0	-12.1	2.41 H	160	26.70	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	51.8 PK	74.0	-22.2	2.17 V	284	49.90	1.90
2	5150.00	40.1 AV	54.0	-13.9	2.17 V	284	38.20	1.90
3	*5260.00	109.7 PK			2.16 V	283	71.30	38.40
4	*5260.00	99.9 AV			2.16 V	283	61.50	38.40
5	#10520.00	54.6 PK	74.0	-19.4	2.87 V	105	39.40	15.20
6	#10520.00	41.8 AV	54.0	-12.2	2.87 V	105	26.60	15.20

Remarks:

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

CHANNEL	TX Channel 60	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	*5300.00	106.0 PK			2.90 H	186	67.50	38.50
2	*5300.00	96.5 AV			2.90 H	186	58.00	38.50
3	10600.00	55.2 PK	74.0	-18.8	2.85 H	100	40.10	15.10
4	10600.00	41.8 AV	54.0	-12.2	2.85 H	100	26.70	15.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	109.9 PK			2.28 V	283	71.40	38.50
2	*5300.00	100.4 AV			2.28 V	283	61.90	38.50
3	10600.00	55.6 PK	74.0	-18.4	2.74 V	277	40.50	15.10
4	10600.00	41.9 AV	54.0	-12.1	2.74 V	277	26.80	15.10

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 64	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	*5320.00	105.0 PK			2.89 H	184	66.40	38.60
2	*5320.00	95.8 AV			2.89 H	184	57.20	38.60
3	5350.00	57.8 PK	74.0	-16.2	2.84 H	186	56.00	1.80
4	5350.00	40.1 AV	54.0	-13.9	2.84 H	186	38.30	1.80
5	10640.00	54.7 PK	74.0	-19.3	1.77 H	163	39.50	15.20
6	10640.00	42.2 AV	54.0	-11.8	1.77 H	163	27.00	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	106.3 PK			2.32 V	311	67.70	38.60
2	*5320.00	96.3 AV			2.32 V	311	57.70	38.60
3	5350.00	58.0 PK	74.0	-16.0	2.34 V	320	56.20	1.80
4	5350.00	40.7 AV	54.0	-13.3	2.34 V	320	38.90	1.80
5	10640.00	54.7 PK	74.0	-19.3	1.84 V	185	39.50	15.20
6	10640.00	41.7 AV	54.0	-12.3	1.84 V	185	26.50	15.20

Remarks:

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

CHANNEL	TX Channel 100	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	5460.00	52.5 PK	74.0	-21.5	3.40 H	189	50.30	2.20
2	5460.00	38.4 AV	54.0	-15.6	3.40 H	189	36.20	2.20
3	#5470.00	53.4 PK	74.0	-20.6	3.41 H	189	51.20	2.20
4	#5470.00	39.0 AV	54.0	-15.0	3.41 H	189	36.80	2.20
5	*5500.00	101.9 PK			3.22 H	193	62.70	39.20
6	*5500.00	92.2 AV			3.22 H	193	53.00	39.20
7	11000.00	55.6 PK	74.0	-18.4	1.36 H	250	38.60	17.00
8	11000.00	43.0 AV	54.0	-11.0	1.36 H	250	26.00	17.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	52.5 PK	74.0	-21.5	1.24 V	267	50.30	2.20
2	5460.00	39.9 AV	54.0	-14.1	1.24 V	267	37.70	2.20
3	#5470.00	52.6 PK	74.0	-21.4	1.20 V	245	50.40	2.20
4	#5470.00	40.4 AV	54.0	-13.6	1.20 V	245	38.20	2.20
5	*5500.00	106.0 PK			1.11 V	295	66.80	39.20
6	*5500.00	96.4 AV			1.11 V	295	57.20	39.20
7	11000.00	56.2 PK	74.0	-17.8	1.84 V	166	39.20	17.00
8	11000.00	43.5 AV	54.0	-10.5	1.84 V	166	26.50	17.00

Remarks:

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

CHANNEL	TX Channel 116	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	*5580.00	102.6 PK			3.14 H	216	63.20	39.40
2	*5580.00	92.4 AV			3.14 H	216	53.00	39.40
3	11160.00	54.9 PK	74.0	-19.1	1.79 H	166	38.90	16.00
4	11160.00	41.9 AV	54.0	-12.1	1.79 H	166	25.90	16.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	106.6 PK			1.12 V	294	67.20	39.40
2	*5580.00	96.6 AV			1.12 V	294	57.20	39.40
3	11160.00	54.8 PK	74.0	-19.2	1.64 V	130	38.80	16.00
4	11160.00	43.5 AV	54.0	-10.5	1.64 V	130	27.50	16.00

Remarks:

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

CHANNEL	TX Channel 140	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	*5700.00	99.9 PK			3.15 H	194	60.40	39.50
2	*5700.00	90.3 AV			3.15 H	194	50.80	39.50
3	#5725.00	55.2 PK	74.0	-18.8	3.08 H	197	52.40	2.80
4	#5725.00	38.8 AV	54.0	-15.2	3.08 H	197	36.00	2.80
5	11400.00	56.3 PK	74.0	-17.7	1.94 H	233	40.50	15.80
6	11400.00	43.3 AV	54.0	-10.7	1.94 H	233	27.50	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	104.7 PK			1.10 V	296	65.20	39.50
2	*5700.00	95.1 AV			1.10 V	296	55.60	39.50
3	#5725.00	61.8 PK	74.0	-12.2	1.15 V	297	59.00	2.80
4	#5725.00	41.3 AV	54.0	-12.7	1.15 V	297	38.50	2.80
5	11400.00	56.4 PK	74.0	-17.6	2.97 V	99	40.60	15.80
6	11400.00	43.1 AV	54.0	-10.9	2.97 V	99	27.30	15.80

Remarks:

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

CHANNEL	TX Channel 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	#5602.40	53.6 PK	68.2	-14.6	3.09 H	189	51.10	2.50
2	*5745.00	101.9 PK			3.09 H	189	62.10	39.80
3	*5745.00	91.7 AV			3.09 H	189	51.90	39.80
4	#5988.80	54.7 PK	68.2	-13.5	3.09 H	189	50.90	3.80
5	11490.00	53.7 PK	74.0	-20.3	1.43 H	267	38.40	15.30
6	11490.00	41.9 AV	54.0	-12.1	1.43 H	267	26.60	15.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5630.40	53.5 PK	68.2	-14.7	1.05 V	287	50.90	2.60
2	*5745.00	103.4 PK			1.05 V	287	63.60	39.80
3	*5745.00	93.2 AV			1.05 V	287	53.40	39.80
4	#5957.60	54.8 PK	68.2	-13.4	1.05 V	287	51.10	3.70
5	11490.00	55.6 PK	74.0	-18.4	1.76 V	159	40.30	15.30
6	11490.00	42.9 AV	54.0	-11.1	1.76 V	159	27.60	15.30

Remarks:

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

CHANNEL	TX Channel 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	#5633.60	53.4 PK	68.2	-14.8	3.16 H	191	50.80	2.60
2	*5785.00	101.3 PK			3.16 H	191	61.30	40.00
3	*5785.00	91.4 AV			3.16 H	191	51.40	40.00
4	#5932.00	54.6 PK	68.2	-13.6	3.16 H	191	50.80	3.80
5	11570.00	53.8 PK	74.0	-20.2	1.34 H	266	38.80	15.00
6	11570.00	41.7 AV	54.0	-12.3	1.34 H	266	26.70	15.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5644.00	54.4 PK	68.2	-13.8	2.17 V	259	51.80	2.60
2	*5785.00	103.7 PK			2.17 V	259	63.70	40.00
3	*5785.00	93.7 AV			2.17 V	259	53.70	40.00
4	#5981.60	54.6 PK	68.2	-13.6	2.17 V	259	50.80	3.80
5	11570.00	55.2 PK	74.0	-18.8	1.63 V	147	40.20	15.00
6	11570.00	42.6 AV	54.0	-11.4	1.63 V	147	27.60	15.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	#5632.80	53.8 PK	68.2	-14.4	2.87 H	201	51.20	2.60
2	*5825.00	100.9 PK			2.87 H	201	60.80	40.10
3	*5825.00	90.8 AV			2.87 H	201	50.70	40.10
4	#5943.20	55.0 PK	68.2	-13.2	2.87 H	201	51.30	3.70
5	11650.00	53.4 PK	74.0	-20.6	1.58 H	274	38.50	14.90
6	11650.00	41.7 AV	54.0	-12.3	1.58 H	274	26.80	14.90
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	#5631.20	53.5 PK	68.2	-14.7	2.23 V	261	50.90	2.60
2	*5825.00	103.7 PK			2.23 V	261	63.60	40.10
3	*5825.00	93.6 AV			2.23 V	261	53.50	40.10
4	#5998.40	55.6 PK	68.2	-12.6	2.23 V	261	51.90	3.70
5	11650.00	54.7 PK	74.0	-19.3	1.73 V	156	39.80	14.90
6	11650.00	42.3 AV	54.0	-11.7	1.73 V	156	27.40	14.90

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.

802.11n (HT20)

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	53.4 PK	74.0	-20.6	2.99 H	190	51.30	2.10
2	5150.00	41.5 AV	54.0	-12.5	2.99 H	190	39.40	2.10
3	*5180.00	102.3 PK			3.10 H	178	63.50	38.80
4	*5180.00	92.6 AV			3.10 H	178	53.80	38.80
5	#10360.00	55.2 PK	74.0	-18.8	1.17 H	268	41.90	13.30
6	#10360.00	42.5 AV	54.0	-11.5	1.17 H	268	29.20	13.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.5 PK	74.0	-12.5	2.08 V	72	59.40	2.10
2	5150.00	44.3 AV	54.0	-9.7	2.08 V	72	42.20	2.10
3	*5180.00	107.4 PK			2.33 V	48	68.60	38.80
4	*5180.00	97.3 AV			2.33 V	48	58.50	38.80
5	#10360.00	56.7 PK	74.0	-17.3	1.87 V	113	43.40	13.30
6	#10360.00	43.7 AV	54.0	-10.3	1.87 V	113	30.40	13.30

Remarks:

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

CHANNEL	TX Channel 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	*5200.00	104.5 PK			3.01 H	187	65.80	38.70
2	*5200.00	94.6 AV			3.01 H	187	55.90	38.70
3	#10400.00	54.6 PK	74.0	-19.4	1.98 H	42	39.90	14.70
4	#10400.00	42.2 AV	54.0	-11.8	1.98 H	42	27.50	14.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	107.3 PK			2.15 V	48	68.60	38.70
2	*5200.00	97.2 AV			2.15 V	48	58.50	38.70
3	#10400.00	55.2 PK	74.0	-18.8	1.97 V	150	40.50	14.70
4	#10400.00	42.0 AV	54.0	-12.0	1.97 V	150	27.30	14.70

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	103.6 PK			3.07 H	190	65.10	38.50
2	*5240.00	93.6 AV			3.07 H	190	55.10	38.50
3	5350.00	52.3 PK	74.0	-21.7	3.00 H	198	50.50	1.80
4	5350.00	40.0 AV	54.0	-14.0	3.00 H	198	38.20	1.80
5	#10480.00	56.2 PK	74.0	-17.8	1.84 H	175	41.10	15.10
6	#10480.00	44.1 AV	54.0	-9.9	1.84 H	175	29.00	15.10
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	108.4 PK			2.21 V	85	69.90	38.50
2	*5240.00	99.0 AV			2.21 V	85	60.50	38.50
3	5350.00	53.0 PK	74.0	-21.0	2.14 V	87	51.20	1.80
4	5350.00	40.6 AV	54.0	-13.4	2.14 V	87	38.80	1.80
5	#10480.00	55.0 PK	74.0	-19.0	1.68 V	130	39.90	15.10
6	#10480.00	41.7 AV	54.0	-12.3	1.68 V	130	26.60	15.10

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 52	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	2.84 H	165	50.20	1.90
2	5150.00	38.8 AV	54.0	-15.2	2.84 H	165	36.90	1.90
3	*5260.00	105.1 PK			2.93 H	185	66.70	38.40
4	*5260.00	95.3 AV			2.93 H	185	56.90	38.40
5	#10520.00	55.8 PK	74.0	-18.2	1.86 H	143	40.60	15.20
6	#10520.00	42.5 AV	54.0	-11.5	1.86 H	143	27.30	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	52.4 PK	74.0	-21.6	2.41 V	78	50.50	1.90
2	5150.00	39.4 AV	54.0	-14.6	2.41 V	78	37.50	1.90
3	*5260.00	108.6 PK			2.49 V	56	70.20	38.40
4	*5260.00	98.4 AV			2.49 V	56	60.00	38.40
5	#10520.00	55.6 PK	74.0	-18.4	2.78 V	11	40.40	15.20
6	#10520.00	41.8 AV	54.0	-12.2	2.78 V	11	26.60	15.20

Remarks:

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

CHANNEL	TX Channel 60	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	*5300.00	104.8 PK			3.19 H	185	66.30	38.50
2	*5300.00	95.2 AV			3.19 H	185	56.70	38.50
3	10600.00	55.3 PK	74.0	-18.7	2.55 H	107	40.20	15.10
4	10600.00	41.5 AV	54.0	-12.5	2.55 H	107	26.40	15.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	108.2 PK			2.16 V	78	69.70	38.50
2	*5300.00	98.0 AV			2.16 V	78	59.50	38.50
3	10600.00	54.8 PK	74.0	-19.2	2.89 V	199	39.70	15.10
4	10600.00	42.1 AV	54.0	-11.9	2.89 V	199	27.00	15.10

Remarks:

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

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) 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	*5320.00	100.7 PK			3.15 H	172	62.10	38.60
2	*5320.00	91.3 AV			3.15 H	172	52.70	38.60
3	5350.00	53.9 PK	74.0	-20.1	3.10 H	178	52.10	1.80
4	5350.00	39.8 AV	54.0	-14.2	3.10 H	178	38.00	1.80
5	10640.00	54.1 PK	74.0	-19.9	2.44 H	163	38.90	15.20
6	10640.00	41.7 AV	54.0	-12.3	2.44 H	163	26.50	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	108.1 PK			2.53 V	55	69.50	38.60
2	*5320.00	97.8 AV			2.53 V	55	59.20	38.60
3	5350.00	60.2 PK	74.0	-13.8	2.55 V	57	58.40	1.80
4	5350.00	40.7 AV	54.0	-13.3	2.55 V	57	38.90	1.80
5	10640.00	54.4 PK	74.0	-19.6	2.87 V	133	39.20	15.20
6	10640.00	42.2 AV	54.0	-11.8	2.87 V	133	27.00	15.20

Remarks:

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

CHANNEL	TX Channel 100	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	5460.00	52.8 PK	74.0	-21.2	3.28 H	187	50.60	2.20
2	5460.00	38.9 AV	54.0	-15.1	3.28 H	187	36.70	2.20
3	#5470.00	52.1 PK	74.0	-21.9	3.45 H	192	49.90	2.20
4	#5470.00	38.7 AV	54.0	-15.3	3.45 H	192	36.50	2.20
5	*5500.00	101.4 PK			3.35 H	191	62.20	39.20
6	*5500.00	92.1 AV			3.35 H	191	52.90	39.20
7	11000.00	55.7 PK	74.0	-18.3	2.48 H	163	38.70	17.00
8	11000.00	43.0 AV	54.0	-11.0	2.48 H	163	26.00	17.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	58.3 PK	74.0	-15.7	1.34 V	288	56.10	2.20
2	5460.00	40.1 AV	54.0	-13.9	1.34 V	288	37.90	2.20
3	#5470.00	60.3 PK	74.0	-13.7	1.42 V	294	58.10	2.20
4	#5470.00	41.9 AV	54.0	-12.1	1.42 V	294	39.70	2.20
5	*5500.00	106.6 PK			1.35 V	295	67.40	39.20
6	*5500.00	96.7 AV			1.35 V	295	57.50	39.20
7	11000.00	55.3 PK	74.0	-18.7	1.77 V	145	38.30	17.00
8	11000.00	43.2 AV	54.0	-10.8	1.77 V	145	26.20	17.00

Remarks:

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

CHANNEL	TX Channel 116	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	*5580.00	101.2 PK			3.15 H	217	61.80	39.40
2	*5580.00	91.7 AV			3.15 H	217	52.30	39.40
3	11160.00	55.5 PK	74.0	-18.5	2.70 H	150	39.50	16.00
4	11160.00	42.3 AV	54.0	-11.7	2.70 H	150	26.30	16.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	105.0 PK			1.79 V	300	65.60	39.40
2	*5580.00	95.4 AV			1.79 V	300	56.00	39.40
3	11160.00	55.1 PK	74.0	-18.9	2.80 V	160	39.10	16.00
4	11160.00	42.0 AV	54.0	-12.0	2.80 V	160	26.00	16.00

Remarks:

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

CHANNEL	TX Channel 140	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	*5700.00	99.0 PK			3.16 H	195	59.50	39.50
2	*5700.00	89.3 AV			3.16 H	195	49.80	39.50
3	#5725.00	52.2 PK	74.0	-21.8	3.10 H	187	49.40	2.80
4	#5725.00	38.7 AV	54.0	-15.3	3.10 H	187	35.90	2.80
5	11400.00	56.9 PK	74.0	-17.1	1.25 H	194	41.10	15.80
6	11400.00	43.4 AV	54.0	-10.6	1.25 H	194	27.60	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	103.7 PK			1.10 V	294	64.20	39.50
2	*5700.00	93.7 AV			1.10 V	294	54.20	39.50
3	#5725.00	61.2 PK	74.0	-12.8	1.14 V	296	58.40	2.80
4	#5725.00	40.4 AV	54.0	-13.6	1.14 V	296	37.60	2.80
5	11400.00	56.4 PK	74.0	-17.6	1.85 V	169	40.60	15.80
6	11400.00	43.1 AV	54.0	-10.9	1.85 V	169	27.30	15.80

Remarks:

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

CHANNEL	TX Channel 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	#5636.80	54.7 PK	68.2	-13.5	3.09 H	187	52.10	2.60
2	*5745.00	100.6 PK			3.09 H	187	60.80	39.80
3	*5745.00	90.4 AV			3.09 H	187	50.60	39.80
4	#5926.40	55.7 PK	68.2	-12.5	3.09 H	187	51.90	3.80
5	11490.00	53.7 PK	74.0	-20.3	1.49 H	263	38.40	15.30
6	11490.00	41.9 AV	54.0	-12.1	1.49 H	263	26.60	15.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.00	53.5 PK	68.2	-14.7	1.22 V	287	50.90	2.60
2	*5745.00	102.2 PK			1.22 V	287	62.40	39.80
3	*5745.00	92.2 AV			1.22 V	287	52.40	39.80
4	#5985.60	54.6 PK	68.2	-13.6	1.22 V	287	50.80	3.80
5	11490.00	55.1 PK	74.0	-18.9	1.58 V	139	39.80	15.30
6	11490.00	42.7 AV	54.0	-11.3	1.58 V	139	27.40	15.30

Remarks:

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

CHANNEL	TX Channel 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	#5600.80	53.4 PK	68.2	-14.8	2.88 H	190	50.90	2.50
2	*5785.00	100.3 PK			2.88 H	190	60.30	40.00
3	*5785.00	90.1 AV			2.88 H	190	50.10	40.00
4	#5961.60	54.9 PK	68.2	-13.3	2.88 H	190	51.20	3.70
5	11570.00	53.6 PK	74.0	-20.4	1.52 H	273	38.60	15.00
6	11570.00	41.5 AV	54.0	-12.5	1.52 H	273	26.50	15.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5643.20	54.8 PK	68.2	-13.4	1.09 V	286	52.20	2.60
2	*5785.00	102.6 PK			1.09 V	286	62.60	40.00
3	*5785.00	92.5 AV			1.09 V	286	52.50	40.00
4	#5985.60	55.6 PK	68.2	-12.6	1.09 V	286	51.80	3.80
5	11570.00	55.4 PK	74.0	-18.6	1.67 V	148	40.40	15.00
6	11570.00	42.6 AV	54.0	-11.4	1.67 V	148	27.60	15.00

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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	#5613.60	52.9 PK	68.2	-15.3	2.87 H	201	50.40	2.50
2	*5825.00	98.8 PK			2.87 H	201	58.70	40.10
3	*5825.00	88.7 AV			2.87 H	201	48.60	40.10
4	#5989.60	54.8 PK	68.2	-13.4	2.87 H	201	51.10	3.70
5	11650.00	53.5 PK	74.0	-20.5	1.52 H	251	38.60	14.90
6	11650.00	41.7 AV	54.0	-12.3	1.52 H	251	26.80	14.90
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	#5638.40	54.4 PK	68.2	-13.8	1.17 V	290	51.80	2.60
2	*5825.00	102.0 PK			1.17 V	290	61.90	40.10
3	*5825.00	91.9 AV			1.17 V	290	51.80	40.10
4	#5968.80	55.0 PK	68.2	-13.2	1.17 V	290	51.30	3.70
5	11650.00	54.5 PK	74.0	-19.5	1.71 V	153	39.60	14.90
6	11650.00	42.3 AV	54.0	-11.7	1.71 V	153	27.40	14.90

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.

802.11n (HT40)

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	54.2 PK	74.0	-19.8	3.41 H	328	52.30	1.90
2	5150.00	40.1 AV	54.0	-13.9	3.41 H	328	38.20	1.90
3	*5190.00	97.3 PK			3.37 H	334	58.60	38.70
4	*5190.00	88.1 AV			3.37 H	334	49.40	38.70
5	#10380.00	54.8 PK	74.0	-19.2	1.43 H	185	40.20	14.60
6	#10380.00	41.3 AV	54.0	-12.7	1.43 H	185	26.70	14.60
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	61.4 PK	74.0	-12.6	2.37 V	42	59.50	1.90
2	5150.00	43.5 AV	54.0	-10.5	2.37 V	42	41.60	1.90
3	*5190.00	99.9 PK			2.39 V	37	61.20	38.70
4	*5190.00	89.0 AV			2.39 V	37	50.30	38.70
5	#10380.00	54.2 PK	74.0	-19.8	1.96 V	240	39.60	14.60
6	#10380.00	41.4 AV	54.0	-12.6	1.96 V	240	26.80	14.60

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	97.4 PK			3.38 H	357	58.90	38.50
2	*5230.00	87.6 AV			3.38 H	357	49.10	38.50
3	5350.00	52.7 PK	74.0	-21.3	3.42 H	355	50.90	1.80
4	5350.00	39.4 AV	54.0	-14.6	3.42 H	355	37.60	1.80
5	#10460.00	54.1 PK	74.0	-19.9	1.75 H	143	39.20	14.90
6	#10460.00	41.3 AV	54.0	-12.7	1.75 H	143	26.40	14.90
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	100.2 PK			2.48 V	129	61.70	38.50
2	*5230.00	89.9 AV			2.48 V	129	51.40	38.50
3	5350.00	55.7 PK	74.0	-18.3	2.67 V	140	53.90	1.80
4	5350.00	41.4 AV	54.0	-12.6	2.67 V	140	39.60	1.80
5	#10460.00	53.9 PK	74.0	-20.1	1.67 V	143	39.00	14.90
6	#10460.00	41.2 AV	54.0	-12.8	1.67 V	143	26.30	14.90

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 54	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	52.2 PK	74.0	-21.8	3.41 H	168	50.30	1.90
2	5150.00	39.1 AV	54.0	-14.9	3.41 H	168	37.20	1.90
3	*5270.00	98.3 PK			3.51 H	194	59.80	38.50
4	*5270.00	88.8 AV			3.51 H	194	50.30	38.50
5	#10540.00	55.1 PK	74.0	-18.9	1.88 H	309	39.90	15.20
6	#10540.00	42.1 AV	54.0	-11.9	1.88 H	309	26.90	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.1 PK	74.0	-17.9	2.47 V	68	54.20	1.90
2	5150.00	41.5 AV	54.0	-12.5	2.47 V	68	39.60	1.90
3	*5270.00	103.0 PK			2.38 V	69	64.50	38.50
4	*5270.00	93.1 AV			2.38 V	69	54.60	38.50
5	#10540.00	55.0 PK	74.0	-19.0	3.78 V	310	39.80	15.20
6	#10540.00	41.9 AV	54.0	-12.1	3.78 V	310	26.70	15.20

Remarks:

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

CHANNEL	TX Channel 62	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	*5310.00	95.7 PK			3.51 H	159	57.20	38.50
2	*5310.00	86.5 AV			3.51 H	159	48.00	38.50
3	5350.00	55.3 PK	74.0	-18.7	3.45 H	157	53.50	1.80
4	5350.00	39.8 AV	54.0	-14.2	3.45 H	157	38.00	1.80
5	10620.00	54.7 PK	74.0	-19.3	2.84 H	110	39.50	15.20
6	10620.00	41.9 AV	54.0	-12.1	2.84 H	110	26.70	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	103.6 PK			2.28 V	56	65.10	38.50
2	*5310.00	93.3 AV			2.28 V	56	54.80	38.50
3	5350.00	65.5 PK	74.0	-8.5	2.37 V	36	63.70	1.80
4	5350.00	46.0 AV	54.0	-8.0	2.37 V	36	44.20	1.80
5	10620.00	54.4 PK	74.0	-19.6	1.87 V	192	39.20	15.20
6	10620.00	42.0 AV	54.0	-12.0	1.87 V	192	26.80	15.20

Remarks:

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

CHANNEL	TX Channel 102	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	5460.00	52.0 PK	74.0	-22.0	3.52 H	193	49.80	2.20
2	5460.00	38.9 AV	54.0	-15.1	3.52 H	193	36.70	2.20
3	#5470.00	52.2 PK	74.0	-21.8	3.42 H	189	50.00	2.20
4	#5470.00	43.4 AV	54.0	-10.6	3.42 H	189	41.20	2.20
5	*5510.00	96.9 PK			3.35 H	191	57.60	39.30
6	*5510.00	87.0 AV			3.35 H	191	47.70	39.30
7	11020.00	56.4 PK	74.0	-17.6	2.46 H	173	39.50	16.90
8	11020.00	43.7 AV	54.0	-10.3	2.46 H	173	26.80	16.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	53.2 PK	74.0	-20.8	1.21 V	289	51.00	2.20
2	5460.00	39.9 AV	54.0	-14.1	1.21 V	289	37.70	2.20
3	#5470.00	57.2 PK	74.0	-16.8	1.14 V	299	55.00	2.20
4	#5470.00	41.7 AV	54.0	-12.3	1.14 V	299	39.50	2.20
5	*5510.00	99.9 PK			1.15 V	296	60.60	39.30
6	*5510.00	89.8 AV			1.15 V	296	50.50	39.30
7	11020.00	56.5 PK	74.0	-17.5	2.84 V	178	39.60	16.90
8	11020.00	43.0 AV	54.0	-11.0	2.84 V	178	26.10	16.90

Remarks:

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

CHANNEL	TX Channel 110	DETECTOR FUNCTION	Peak (PK) 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	*5550.00	96.1 PK			3.06 H	170	56.80	39.30
2	*5550.00	86.2 AV			3.06 H	170	46.90	39.30
3	11100.00	56.1 PK	74.0	-17.9	1.47 H	156	39.80	16.30
4	11100.00	42.9 AV	54.0	-11.1	1.47 H	156	26.60	16.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	99.6 PK			1.15 V	295	60.30	39.30
2	*5550.00	90.0 AV			1.15 V	295	50.70	39.30
3	11100.00	55.2 PK	74.0	-18.8	2.79 V	153	38.90	16.30
4	11100.00	42.6 AV	54.0	-11.4	2.79 V	153	26.30	16.30

Remarks:

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

CHANNEL	TX Channel 134	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	*5670.00	96.3 PK			2.90 H	192	56.80	39.50
2	*5670.00	86.1 AV			2.90 H	192	46.60	39.50
3	#5725.00	52.6 PK	74.0	-21.4	2.94 H	187	49.80	2.80
4	#5725.00	39.0 AV	54.0	-15.0	2.94 H	187	36.20	2.80
5	11340.00	56.6 PK	74.0	-17.4	2.86 H	214	40.40	16.20
6	11340.00	43.1 AV	54.0	-10.9	2.86 H	214	26.90	16.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	99.2 PK			1.28 V	294	59.70	39.50
2	*5670.00	89.5 AV			1.28 V	294	50.00	39.50
3	#5725.00	56.2 PK	74.0	-17.8	1.34 V	295	53.40	2.80
4	#5725.00	39.5 AV	54.0	-14.5	1.34 V	295	36.70	2.80
5	11340.00	56.3 PK	74.0	-17.7	1.92 V	183	40.10	16.20
6	11340.00	44.0 AV	54.0	-10.0	1.92 V	183	27.80	16.20

Remarks:

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

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	#5604.80	53.5 PK	68.2	-14.7	2.82 H	201	51.00	2.50
2	*5755.00	95.0 PK			2.82 H	201	55.10	39.90
3	*5755.00	85.1 AV			2.82 H	201	45.20	39.90
4	#5968.80	54.5 PK	68.2	-13.7	2.82 H	201	50.80	3.70
5	11510.00	53.8 PK	74.0	-20.2	1.53 H	259	38.60	15.20
6	11510.00	41.9 AV	54.0	-12.1	1.53 H	259	26.70	15.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5616.00	55.2 PK	68.2	-13.0	1.16 V	303	52.70	2.50
2	*5755.00	98.6 PK			1.16 V	303	58.70	39.90
3	*5755.00	88.5 AV			1.16 V	303	48.60	39.90
4	#5985.60	56.6 PK	68.2	-11.6	1.16 V	303	52.80	3.80
5	11510.00	55.5 PK	74.0	-18.5	1.75 V	164	40.30	15.20
6	11510.00	42.6 AV	54.0	-11.4	1.75 V	164	27.40	15.20

Remarks:

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

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	#5628.00	54.4 PK	68.2	-13.8	2.89 H	199	51.80	2.60
2	*5795.00	95.0 PK			2.89 H	199	54.90	40.10
3	*5795.00	85.1 AV			2.89 H	199	45.00	40.10
4	#5988.00	54.9 PK	68.2	-13.3	2.89 H	199	51.10	3.80
5	11590.00	53.4 PK	74.0	-20.6	1.48 H	257	38.40	15.00
6	11590.00	41.4 AV	54.0	-12.6	1.48 H	257	26.40	15.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.80	53.4 PK	68.2	-14.8	1.17 V	290	50.80	2.60
2	*5795.00	98.6 PK			1.17 V	290	58.50	40.10
3	*5795.00	88.5 AV			1.17 V	290	48.40	40.10
4	#5958.40	54.9 PK	68.2	-13.3	1.17 V	290	51.20	3.70
5	11590.00	55.6 PK	74.0	-18.4	1.63 V	161	40.60	15.00
6	11590.00	42.7 AV	54.0	-11.3	1.63 V	161	27.70	15.00

Remarks:

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

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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	61.2 PK	74.0	-12.8	3.31 H	194	59.30	1.90
2	5150.00	46.4 AV	54.0	-7.6	3.31 H	194	44.50	1.90
3	*5210.00	96.2 PK			3.28 H	190	57.60	38.60
4	*5210.00	84.8 AV			3.28 H	190	46.20	38.60
5	5350.00	53.0 PK	74.0	-21.0	3.40 H	179	51.20	1.80
6	5350.00	39.8 AV	54.0	-14.2	3.40 H	179	38.00	1.80
7	#10420.00	54.6 PK	74.0	-19.4	2.88 H	149	39.90	14.70
8	#10420.00	42.0 AV	54.0	-12.0	2.88 H	149	27.30	14.70
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	68.4 PK	74.0	-5.6	2.34 V	41	66.50	1.90
2	**5150.00**	**52.8 AV**	**54.0**	**-1.2**	**2.34 V**	**41**	**50.90**	**1.90**
3	*5210.00	99.6 PK			2.46 V	186	61.00	38.60
4	*5210.00	87.5 AV			2.46 V	186	48.90	38.60
5	5350.00	59.4 PK	74.0	-14.6	2.47 V	56	57.60	1.80
6	5350.00	43.0 AV	54.0	-11.0	2.47 V	56	41.20	1.80
7	#10420.00	54.7 PK	74.0	-19.3	1.66 V	249	40.00	14.70
8	#10420.00	41.7 AV	54.0	-12.3	1.66 V	249	27.00	14.70

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 58	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	54.7 PK	74.0	-19.3	3.40 H	195	52.80	1.90
2	5150.00	41.1 AV	54.0	-12.9	3.40 H	195	39.20	1.90
3	*5290.00	94.2 PK			3.23 H	187	55.70	38.50
4	*5290.00	83.2 AV			3.23 H	187	44.70	38.50
5	5350.00	55.7 PK	74.0	-18.3	3.15 H	184	53.90	1.80
6	5350.00	41.7 AV	54.0	-12.3	3.15 H	184	39.90	1.80
7	#10580.00	54.9 PK	74.0	-19.1	1.47 H	135	39.90	15.00
8	#10580.00	41.9 AV	54.0	-12.1	1.47 H	135	26.90	15.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.5 PK	74.0	-16.5	2.46 V	55	55.60	1.90
2	5150.00	42.6 AV	54.0	-11.4	2.46 V	55	40.70	1.90
3	*5290.00	98.7 PK			2.15 V	47	60.20	38.50
4	*5290.00	86.9 AV			2.15 V	47	48.40	38.50
5	5350.00	68.7 PK	74.0	-5.3	2.38 V	52	66.90	1.80
6	5350.00	52.7 AV	54.0	-1.3	2.38 V	52	50.90	1.80
7	#10580.00	55.7 PK	74.0	-18.3	2.64 V	241	40.70	15.00
8	#10580.00	42.0 AV	54.0	-12.0	2.64 V	241	27.00	15.00

Remarks:

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

CHANNEL	TX Channel 106	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	5460.00	59.5 PK	74.0	-14.5	3.62 H	195	57.30	2.20
2	5460.00	42.7 AV	54.0	-11.3	3.62 H	195	40.50	2.20
3	#5470.00	58.4 PK	74.0	-15.6	3.58 H	194	56.20	2.20
4	#5470.00	41.4 AV	54.0	-12.6	3.58 H	194	39.20	2.20
5	*5530.00	95.0 PK			3.60 H	196	55.70	39.30
6	*5530.00	83.8 AV			3.60 H	196	44.50	39.30
7	#5725.00	53.8 PK	74.0	-20.2	3.47 H	168	51.00	2.80
8	#5725.00	39.7 AV	54.0	-14.3	3.47 H	168	36.90	2.80
9	11060.00	55.9 PK	74.0	-18.1	1.76 H	167	39.40	16.50
10	11060.00	43.0 AV	54.0	-11.0	1.76 H	167	26.50	16.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	65.2 PK	74.0	-8.8	1.26 V	289	63.00	2.20
2	5460.00	47.8 AV	54.0	-6.2	1.26 V	289	45.60	2.20
3	#5470.00	64.5 PK	74.0	-9.5	1.24 V	298	62.30	2.20
4	#5470.00	48.2 AV	54.0	-5.8	1.24 V	298	46.00	2.20
5	*5530.00	99.1 PK			1.21 V	296	59.80	39.30
6	*5530.00	86.9 AV			1.21 V	296	47.60	39.30
7	#5725.00	52.3 PK	74.0	-21.7	1.29 V	287	49.50	2.80
8	#5725.00	39.3 AV	54.0	-14.7	1.29 V	287	36.50	2.80
9	11060.00	56.0 PK	74.0	-18.0	1.98 V	106	39.50	16.50
10	11060.00	43.2 AV	54.0	-10.8	1.98 V	106	26.70	16.50

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 122	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	5460.00	41.6 PK	74.0	-32.4	3.48 H	170	39.40	2.20
2	5460.00	38.7 AV	54.0	-15.3	3.48 H	170	36.50	2.20
3	#5470.00	52.1 PK	74.0	-21.9	3.52 H	168	49.90	2.20
4	#5470.00	39.1 AV	54.0	-14.9	3.52 H	168	36.90	2.20
5	*5610.00	93.9 PK			3.61 H	162	54.50	39.40
6	*5610.00	80.4 AV			3.61 H	162	41.00	39.40
7	#5725.00	52.3 PK	74.0	-21.7	3.54 H	172	49.50	2.80
8	#5725.00	39.7 AV	54.0	-14.3	3.54 H	172	36.90	2.80
9	11220.00	55.1 PK	74.0	-18.9	1.85 H	194	39.30	15.80
10	11220.00	42.1 AV	54.0	-11.9	1.85 H	194	26.30	15.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	58.2 PK	74.0	-15.8	1.25 V	296	56.00	2.20
2	5460.00	43.2 AV	54.0	-10.8	1.25 V	296	41.00	2.20
3	#5470.00	58.9 PK	74.0	-15.1	1.38 V	295	56.70	2.20
4	#5470.00	44.1 AV	54.0	-9.9	1.38 V	295	41.90	2.20
5	*5610.00	99.1 PK			1.32 V	294	59.70	39.40
6	*5610.00	85.2 AV			1.32 V	294	45.80	39.40
7	#5725.00	54.5 PK	74.0	-19.5	1.34 V	300	51.70	2.80
8	#5725.00	39.7 AV	54.0	-14.3	1.34 V	300	36.90	2.80
9	11220.00	55.7 PK	74.0	-18.3	2.85 V	173	39.90	15.80
10	11220.00	42.5 AV	54.0	-11.5	2.85 V	173	26.70	15.80

Remarks:

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

CHANNEL	TX Channel 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	#5635.20	58.5 PK	68.2	-9.7	2.80 H	199	55.90	2.60
2	#5650.00	57.2 PK	68.2	-11.0	2.87 H	206	54.70	2.50
3	*5775.00	95.4 PK			2.80 H	199	55.40	40.00
4	*5775.00	85.3 AV			2.80 H	199	45.30	40.00
5	#5925.00	56.0 PK	68.2	-12.2	2.92 H	211	52.20	3.80
6	#5936.80	56.7 PK	68.2	-11.5	2.80 H	199	53.00	3.70
7	11550.00	53.4 PK	74.0	-20.6	1.50 H	262	38.30	15.10
8	11550.00	41.5 AV	54.0	-12.5	1.50 H	262	26.40	15.10
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	#5620.00	61.6 PK	68.2	-6.6	1.23 V	291	59.10	2.50
2	#5650.00	60.9 PK	68.2	-7.3	1.32 V	306	58.40	2.50
3	*5775.00	98.6 PK			1.23 V	291	58.60	40.00
4	*5775.00	88.7 AV			1.23 V	291	48.70	40.00
5	#5925.00	56.3 PK	68.2	-11.9	1.36 V	311	52.50	3.80
6	#5928.00	56.8 PK	68.2	-11.4	1.23 V	291	53.00	3.80
7	11550.00	55.3 PK	74.0	-18.7	1.68 V	148	40.20	15.10
8	11550.00	42.6 AV	54.0	-11.4	1.68 V	148	27.50	15.10

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 Worst-Case Data: 802.11a

CHANNEL	TX Channel 36	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	88.20	34.4 QP	43.5	-9.1	2.00 H	177	53.20	-18.80
2	165.80	41.4 QP	43.5	-2.1	1.51 H	118	54.90	-13.50
3	299.66	36.1 QP	46.0	-9.9	1.01 H	52	48.40	-12.30
4	487.84	31.8 QP	46.0	-14.2	2.00 H	289	41.20	-9.40
5	664.38	30.3 QP	46.0	-15.7	1.51 H	227	36.70	-6.40
6	829.28	36.2 QP	46.0	-9.8	1.01 H	280	39.70	-3.50
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	30.17	26.1 QP	40.0	-13.9	1.00 V	309	41.20	-15.10
2	165.80	36.3 QP	43.5	-7.2	1.00 V	73	49.80	-13.50
3	365.62	31.6 QP	46.0	-14.4	1.49 V	196	43.00	-11.40
4	487.84	34.6 QP	46.0	-11.4	1.00 V	11	44.00	-9.40
5	664.38	32.4 QP	46.0	-13.6	1.00 V	26	38.80	-6.40
6	831.22	34.6 QP	46.0	-11.4	1.49 V	175	38.10	-3.50

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

Tested date: Apr. 10, 2018

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 06, 2018	Mar. 05, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. 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.

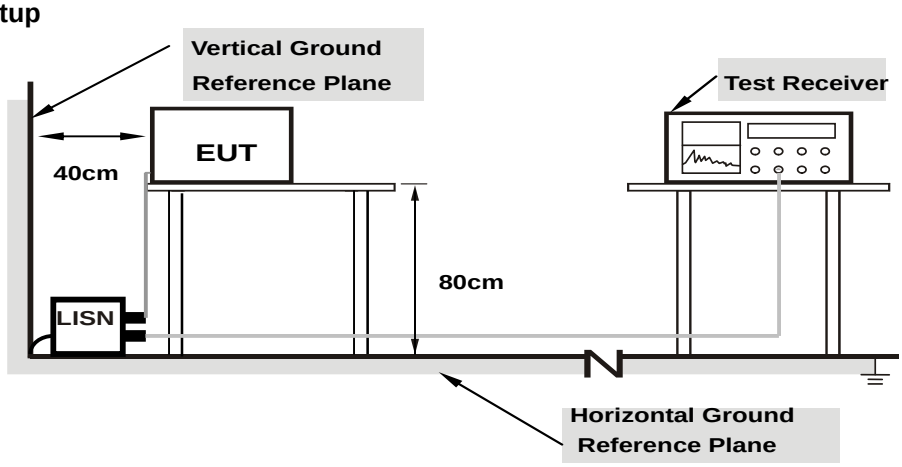
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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 Conditions

Same as 4.1.6.

4.2.7 Test Results

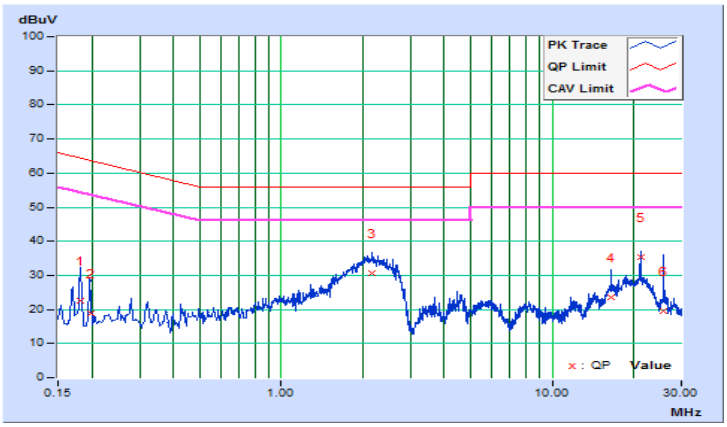
Worst-case data: 802.11a

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18075	10.10	12.34	0.83	22.44	10.93	64.45	54.45	-42.01	-43.52
2	0.19717	10.10	8.76	2.46	18.86	12.56	63.73	53.73	-44.87	-41.17
3	2.15144	10.19	20.29	16.39	30.48	26.58	56.00	46.00	-25.52	-19.42
4	16.40778	11.02	12.56	8.28	23.58	19.30	60.00	50.00	-36.42	-30.70
5	**21.17016**	**11.28**	**24.24**	**23.01**	**35.52**	**34.29**	**60.00**	**50.00**	**-24.48**	**-15.71**
6	25.61583	11.47	7.92	3.44	19.39	14.91	60.00	50.00	-40.61	-35.09

REMARKS:

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

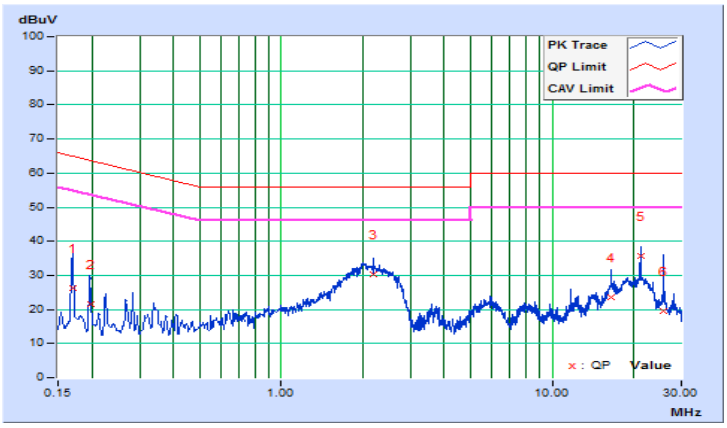


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16967	10.09	16.09	1.90	26.18	11.99	64.98	54.98	-38.80	-42.99
2	0.19717	10.09	11.38	2.75	21.47	12.84	63.73	53.73	-42.26	-40.89
3	2.17929	10.18	20.25	15.89	30.43	26.07	56.00	46.00	-25.57	-19.93
4	16.42342	10.83	12.65	8.13	23.48	18.96	60.00	50.00	-36.52	-31.04
5	21.17016	11.01	24.57	23.25	35.58	34.26	60.00	50.00	-24.42	-15.74
6	25.60885	11.14	8.32	3.73	19.46	14.87	60.00	50.00	-40.54	-35.13

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 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

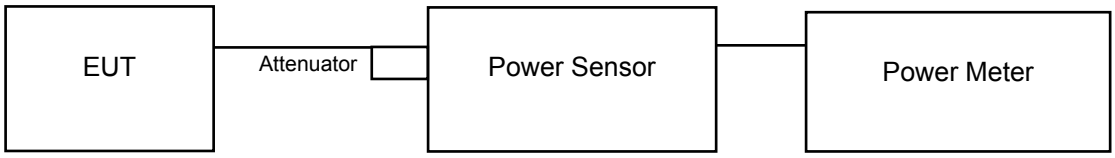
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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 $N_{ANT} \geq 5$.

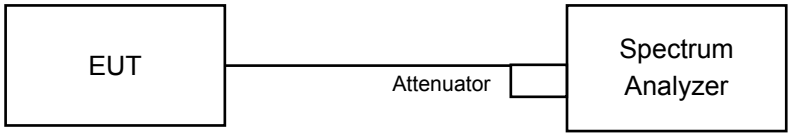
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

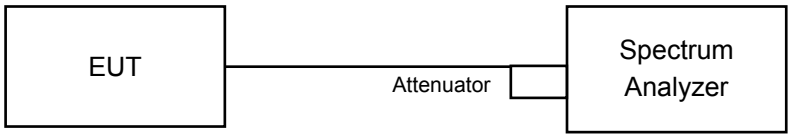
For Power Output
802.11a, 802.11n (HT20), 802.11n (HT40)



802.11ac (VHT80)



For 26dB Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For 802.11a, 802.11n (HT20), 802.11n (HT40)
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 and set the detector to AVERAGE. Duty factor is not added to measured value.

For 802.11ac (VHT80)
a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW
f. Sweep time ≤ (number of points in sweep) * T
g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
h. Detector = RMS
i. Trace mode = max hold
j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
k. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	14.04	13.45	47.482	16.77	23.75	Pass
40	5200	13.97	14.01	50.123	17.00	23.75	Pass
48	5240	13.87	14.56	**52.954**	17.24	23.75	Pass
52	5260	13.82	14.62	53.072	17.25	23.75	Pass
60	5300	13.36	14.65	50.851	17.06	23.75	Pass
64	5320	13.32	14.68	50.854	17.06	23.75	Pass
100	5500	13.37	14.88	52.488	17.20	23.78	Pass
116	5580	13.06	13.84	44.440	16.48	23.78	Pass
140	5700	14.62	14.83	**59.382**	17.74	23.78	Pass
149	5745	15.07	14.02	57.372	17.59	30.00	Pass
157	5785	14.96	14.77	**61.325**	17.88	30.00	Pass
165	5825	14.81	14.55	58.779	17.69	30.00	Pass

Note:
For U-NII-1, U-NII-2A Band: Antenna gain = 6.25dBi> 6dBi, so the power limit shall be reduced to 24-(6.25-6) = 23.75dBm.
For U-NII-2C Band: Antenna gain = 6.22dBi> 6dBi, so the power limit shall be reduced to 24-(6.22-6) = 23.78dBm.
For U-NII-3 Band: Antenna gain = 4.85dBi < 6dBi, so the power limit is not reduced.

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(20.88) = 24.20 dBm > 23.75dBm
2. 11dBm + 10log(20.34) = 24.08 dBm > 23.75dBm
3. 11dBm + 10log(20.60) = 24.14 dBm > 23.75dBm
4. 11dBm + 10log(26.37) = 25.21 dBm > 23.78dBm
5. 11dBm + 10log(26.62) = 25.25 dBm > 23.78dBm
6. 11dBm + 10log(33.04) = 26.19 dBm > 23.78dBm

Chain 1
1. 11dBm + 10log(20.19) = 24.05 dBm > 23.75dBm
2. 11dBm + 10log(20.22) = 24.06 dBm > 23.75dBm
3. 11dBm + 10log(20.00) = 24.01 dBm > 23.75dBm
4. 11dBm + 10log(21.55) = 24.33 dBm > 23.78dBm
5. 11dBm + 10log(22.62) = 24.54 dBm > 23.78dBm
6. 11dBm + 10log(27.41) = 25.38 dBm > 23.78dBm

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	13.32	12.65	39.886	16.01	23.75	Pass
40	5200	13.17	13.21	41.690	16.20	23.75	Pass
48	5240	13.08	13.77	44.147	16.45	23.75	Pass
52	5260	13.01	13.72	43.549	16.39	23.75	Pass
60	5300	14.71	13.68	52.915	17.24	23.75	Pass
64	5320	14.76	13.75	**53.637**	17.29	23.75	Pass
100	5500	13.74	14.39	51.138	17.09	23.78	Pass
116	5580	13.91	13.22	45.593	16.59	23.78	Pass
140	5700	13.01	13.16	40.700	16.10	23.78	Pass
149	5745	13.72	14.47	51.540	17.12	30.00	Pass
157	5785	13.62	14.08	48.600	16.87	30.00	Pass
165	5825	13.65	13.93	47.891	16.80	30.00	Pass

Note:
For U-NII-1, U-NII-2A Band: Antenna gain = 6.25dBi> 6dBi, so the power limit shall be reduced to 24-(6.25-6) = 23.75dBm.
For U-NII-2C Band: Antenna gain = 6.22dBi> 6dBi, so the power limit shall be reduced to 24-(6.22-6) = 23.78dBm.
For U-NII-3 Band: Antenna gain = 4.85dBi < 6dBi, so the power limit is not reduced.

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(20.47) = 24.11 dBm > 23.75dBm
2. 11dBm + 10log(20.70) = 24.16 dBm > 23.75dBm
3. 11dBm + 10log(20.67) = 24.15 dBm > 23.75dBm
4. 11dBm + 10log(32.11) = 26.07 dBm > 23.78dBm
5. 11dBm + 10log(32.92) = 26.17 dBm > 23.78dBm
6. 11dBm + 10log(30.04) = 25.78 dBm > 23.78dBm
Chain 1
1. 11dBm + 10log(20.44) = 24.10 dBm > 23.75dBm
2. 11dBm + 10log(20.57) = 24.13 dBm > 23.75dBm
3. 11dBm + 10log(20.49) = 24.12 dBm > 23.75dBm
4. 11dBm + 10log(20.68) = 24.16 dBm > 23.78dBm
5. 11dBm + 10log(20.67) = 24.15 dBm > 23.78dBm
6. 11dBm + 10log(20.94) = 24.21 dBm > 23.78dBm

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	11.25	10.37	24.224	13.84	29.75	Pass
46	5230	11.07	11.64	27.382	14.37	29.75	Pass
54	5270	11.03	11.67	27.366	14.37	23.75	Pass
62	5310	11.33	12.84	32.814	15.16	23.75	Pass
102	5510	11.55	12.65	32.697	15.15	23.78	Pass
110	5550	11.02	11.75	27.609	14.41	23.78	Pass
134	5670	11.25	11.37	27.044	14.32	23.78	Pass
151	5755	11.51	10.23	24.702	13.93	30.00	Pass
159	5795	11.72	12.24	31.608	15.00	30.00	Pass

Note:
For U-NII-1, U-NII-2A Band: Antenna gain = 6.25dBi> 6dBi, so the power limit shall be reduced to 24-(6.25-6) = 23.75dBm.
For U-NII-2C Band: Antenna gain = 6.22dBi> 6dBi, so the power limit shall be reduced to 24-(6.22-6) = 23.78dBm.
For U-NII-3 Band: Antenna gain = 4.85dBi < 6dBi, so the power limit is not reduced.

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(42.05) = 27.24 dBm > 23.75dBm
2. 11dBm + 10log(42.11) = 27.24 dBm > 23.75dBm
3. 11dBm + 10log(55.39) = 28.43 dBm > 23.78dBm
4. 11dBm + 10log(54.74) = 28.38 dBm > 23.78dBm
5. 11dBm + 10log(51.98) = 28.16 dBm > 23.78dBm
Chain 1
1. 11dBm + 10log(41.50) = 27.18 dBm > 23.75dBm
2. 11dBm + 10log(41.83) = 27.21 dBm > 23.75dBm
3. 11dBm + 10log(42.11) = 27.24 dBm > 23.78dBm
4. 11dBm + 10log(41.44) = 27.17 dBm > 23.78dBm
5. 11dBm + 10log(43.03) = 27.34 dBm > 23.78dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	8.51	8.32	13.888	11.43	29.75	Pass
58	5290	8.25	9.43	15.453	11.89	23.75	Pass
106	5530	8.86	10.27	18.332	12.63	23.78	Pass
122	5610	8.14	9.15	14.738	11.68	23.78	Pass
155	5775	8.85	8.82	15.295	11.85	30.00	Pass

Note:
For U-NII-1, U-NII-2A Band: Antenna gain = 6.25dBi> 6dBi, so the power limit shall be reduced to 24-(6.25-6) = 23.75dBm.
For U-NII-2C Band: Antenna gain = 6.22dBi> 6dBi, so the power limit shall be reduced to 24-(6.22-6) = 23.78dBm.
For U-NII-3 Band: Antenna gain = 4.85dBi < 6dBi, so the power limit is not reduced.

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(82.94) = 30.19 dBm > 23.75dBm
2. 11dBm + 10log(82.19) = 30.15 dBm > 23.78dBm
3. 11dBm + 10log(82.61) = 30.17 dBm > 23.78dBm
Chain 1
1. 11dBm + 10log(81.78) = 30.13 dBm > 23.75dBm
2. 11dBm + 10log(81.82) = 30.13 dBm > 23.78dBm
3. 11dBm + 10log(81.90) = 30.13 dBm > 23.78dBm

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	24.05	20.30
40	5200	23.35	20.30
48	5240	20.73	20.85
52	5260	20.88	20.19
60	5300	20.34	20.22
64	5320	20.60	20.00
100	5500	26.37	21.55
116	5580	26.62	22.62
140	5700	33.04	27.41

802.11n (HT20)

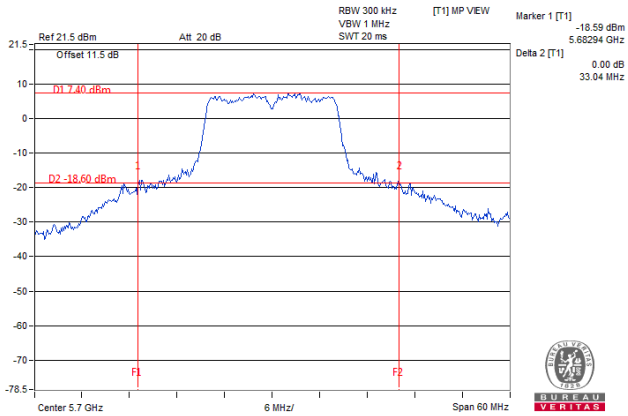
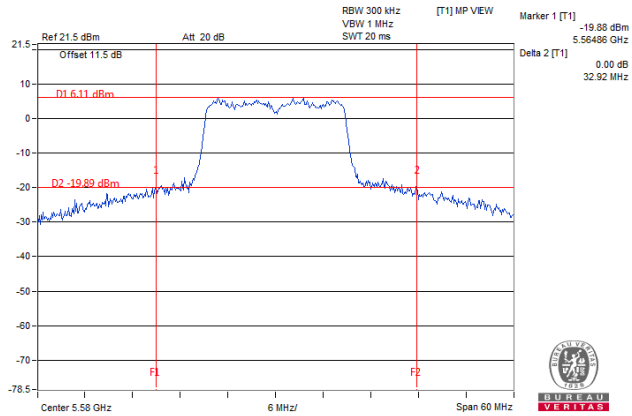
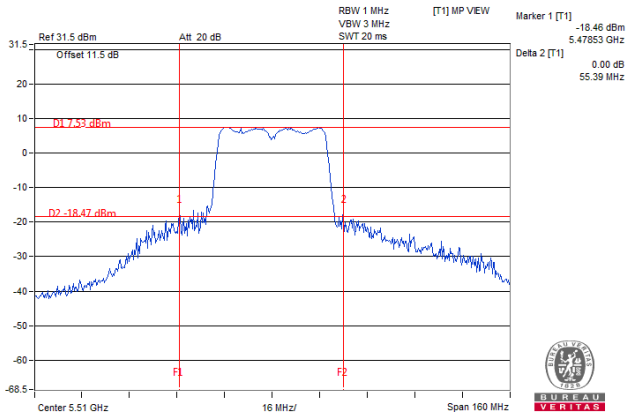
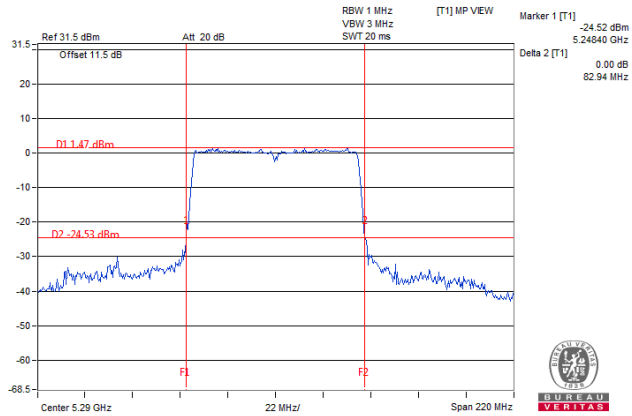
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	20.41	20.52
40	5200	20.47	20.45
48	5240	20.59	20.34
52	5260	20.47	20.44
60	5300	20.70	20.57
64	5320	20.67	20.49
100	5500	32.11	20.68
116	5580	32.92	20.67
140	5700	30.04	20.94

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	42.94	41.32
46	5230	42.03	41.37
54	5270	42.05	41.50
62	5310	42.11	41.83
102	5510	55.39	42.11
110	5550	54.74	41.44
134	5670	51.98	43.03

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	82.51	81.72
58	5290	82.94	81.78
106	5530	82.19	81.82
122	5610	82.61	81.90

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

EUT Maximum Conducted Power

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	53.072	17.25
5470~5725	59.382	17.74

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	53.637	17.29
5470~5725	51.138	17.09

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	32.814	15.16
5470~5725	32.697	15.15

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

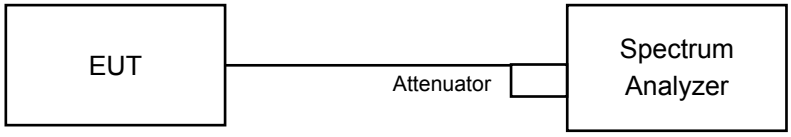
802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	15.453	11.89
5470~5725	18.332	12.63

Note: Manufacturer provides Transmit Power Control description to meet this requirement.

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 sampling. 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 Result

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.92	16.80
40	5200	16.92	16.96
48	5240	16.92	16.80
52	5260	16.92	16.80
60	5300	16.92	16.68
64	5320	16.92	16.80
100	5500	17.04	16.92
116	5580	16.92	16.92
140	5700	17.16	16.92
149	5745	19.32	16.92
157	5785	19.44	16.92
165	5825	19.08	16.92

802.11n (HT20)

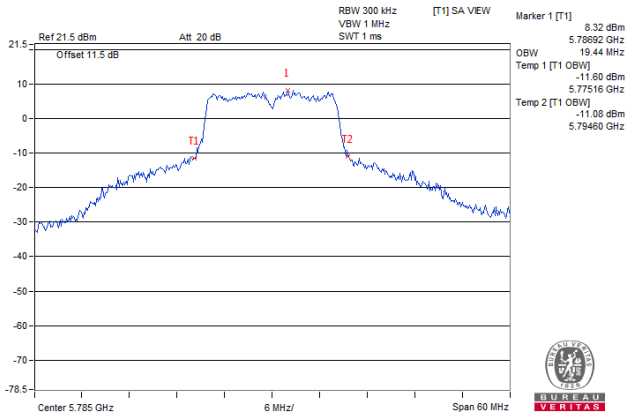
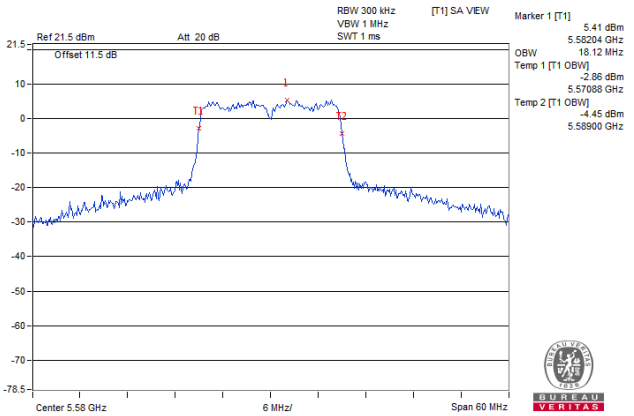
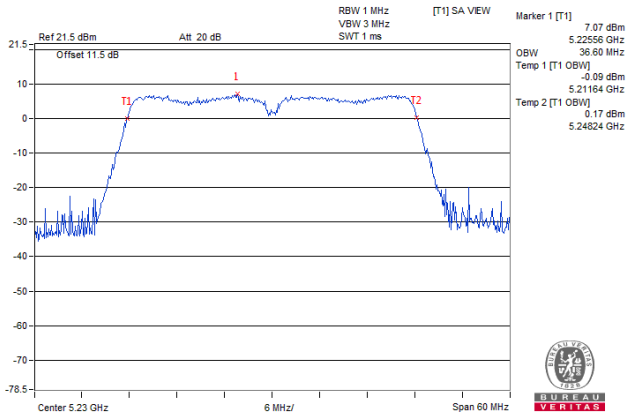
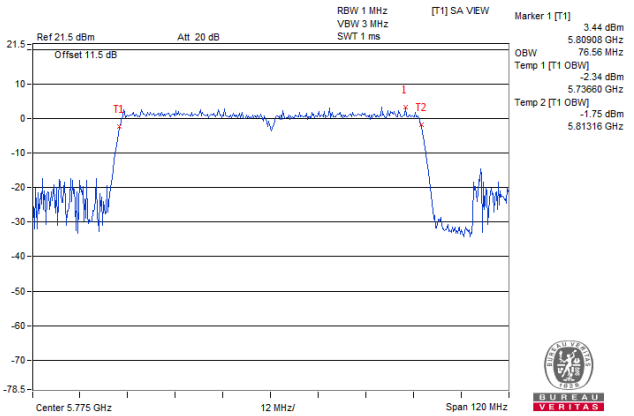
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.76	17.76
40	5200	17.88	17.76
48	5240	17.64	17.76
52	5260	17.76	17.88
60	5300	17.88	17.76
64	5320	17.76	17.64
100	5500	18.00	17.76
116	5580	18.12	17.88
140	5700	18.12	17.76
149	5745	18.12	17.88
157	5785	18.12	17.88
165	5825	18.00	17.88

802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.36	36.48
46	5230	36.60	36.48
54	5270	36.48	36.48
62	5310	36.60	36.60
102	5510	36.60	36.60
110	5550	36.60	36.60
134	5670	36.60	36.60
151	5755	36.60	36.60
159	5795	36.60	36.60

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.08	75.84
58	5290	76.08	76.08
106	5530	76.08	76.08
122	5610	76.08	76.08
155	5775	76.32	76.56

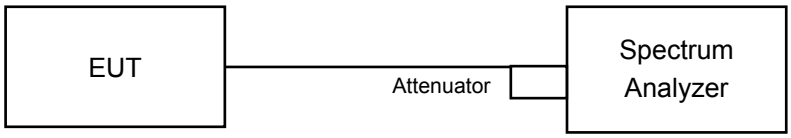
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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 Procedures

For U-NII-1, U-NII-2A, U-NII-2C band:
Duty cycle of test signal is < 98%
Using method SA-2
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:
Duty cycle of test signal is < 98%
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 / 300 kHz)
5) Sweep time = auto, trigger set to “free run”.
6) Trace average at least 100 traces in power averaging mode.
7) Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

For U-NII-1, U-NII-2A, U-NII-2C band

802.11a

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	3.05	2.56	0.15	5.97	7.74	Pass
40	5200	3.08	3.18	0.15	6.29	7.74	Pass
48	5240	2.94	3.36	0.15	6.32	7.74	Pass
52	5260	3.21	2.65	0.15	6.10	7.74	Pass
60	5300	2.61	2.83	0.15	5.88	7.74	Pass
64	5320	2.39	2.82	0.15	5.77	7.74	Pass
100	5500	2.76	2.67	0.15	5.88	7.77	Pass
116	5580	2.63	2.52	0.15	5.74	7.77	Pass
140	5700	2.89	3.09	0.15	6.15	7.77	Pass

Note:

1. Method 1 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. U-NII-1 and U-NII-2A band: Directional gain = 6.25dBi + 10log(2) = 9.26dBi > 6dBi, so the power density limit shall be reduced to 11-(9.26-6) = 10.12dBm.
   U-NII-2C band: Directional gain = 6.22dBi + 10log(2) = 9.23dBi > 6dBi, so the power density limit shall be reduced to 11-(9.23-6) = 7.77dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

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	1.68	1.31	0.12	4.63	7.74	Pass
40	5200	1.83	1.51	0.12	4.81	7.74	Pass
48	5240	1.90	1.71	0.12	4.94	7.74	Pass
52	5260	1.92	1.69	0.12	4.94	7.74	Pass
60	5300	1.94	2.03	0.12	5.12	7.74	Pass
64	5320	1.87	2.03	0.12	5.08	7.74	Pass
100	5500	2.64	1.59	0.12	5.28	7.77	Pass
116	5580	1.22	1.66	0.12	4.58	7.77	Pass
140	5700	1.80	1.57	0.12	4.82	7.77	Pass

Note:
1. Method 1 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. U-NII-1 and U-NII-2A band: Directional gain = 6.25dBi + 10log(2) = 9.26dBi > 6dBi, so the power density limit shall be reduced to 11-(9.26-6) = 10.12dBm.
   U-NII-2C band: Directional gain = 6.22dBi + 10log(2) = 9.23dBi > 6dBi, so the power density limit shall be reduced to 11-(9.23-6) = 7.77dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

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	-2.27	-3.60	0.20	0.32	7.74	Pass
46	5230	-2.79	-2.19	0.20	0.73	7.74	Pass
54	5270	-2.86	-2.28	0.20	0.65	7.74	Pass
62	5310	-2.98	-2.57	0.20	0.44	7.74	Pass
102	5510	-2.33	-2.40	0.20	0.84	7.77	Pass
110	5550	-2.57	-2.48	0.20	0.68	7.77	Pass
134	5670	-2.68	-2.38	0.20	0.68	7.77	Pass

Note:
1. Method 1 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. U-NII-1 and U-NII-2A band: Directional gain = 6.25dBi + 10log(2) = 9.26dBi > 6dBi, so the power density limit shall be reduced to 11-(9.26-6) = 10.12dBm.
   U-NII-2C band: Directional gain = 6.22dBi + 10log(2) = 9.23dBi > 6dBi, so the power density limit shall be reduced to 11-(9.23-6) = 7.77dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

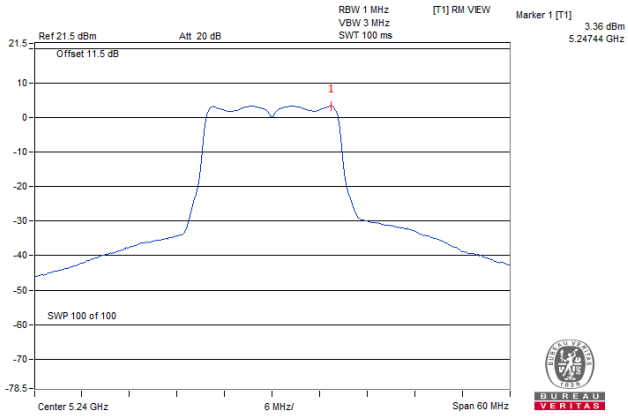
Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-8.58	-9.17	0.44	-5.42	7.74	Pass
58	5290	-9.40	-8.73	0.44	-5.60	7.74	Pass
106	5530	-9.02	-8.87	0.44	-5.50	7.77	Pass
122	5610	-9.08	-8.81	0.44	-5.49	7.77	Pass

Note:

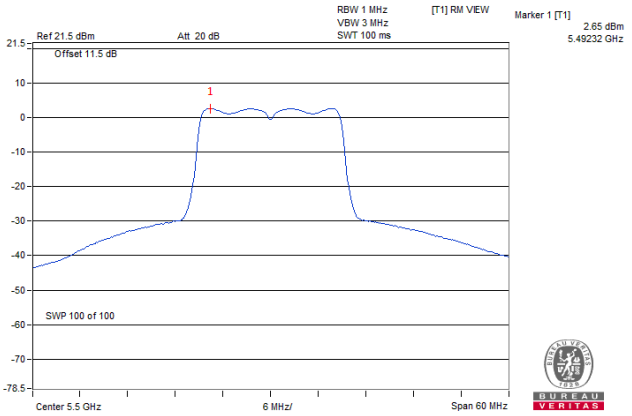
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. U-NII-1 and U-NII-2A band: Directional gain = 6.25dBi + 10log(2) = 9.26dBi > 6dBi, so the power density limit shall be reduced to 11-(9.26-6) = 10.12dBm.
   U-NII-2C band: Directional gain = 6.22dBi + 10log(2) = 9.23dBi > 6dBi, so the power density limit shall be reduced to 11-(9.23-6) = 7.77dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

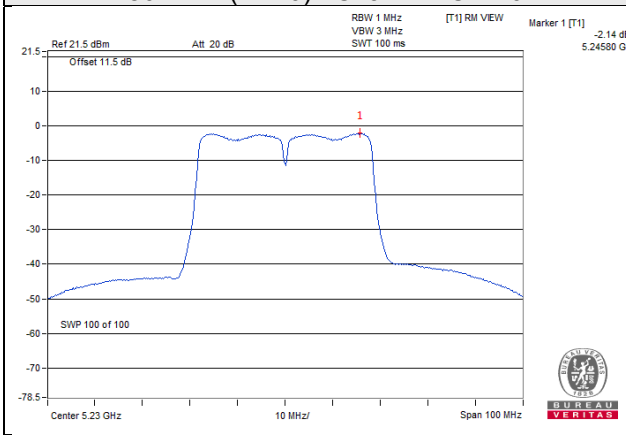
802.11a / Chain 1 / CH 48



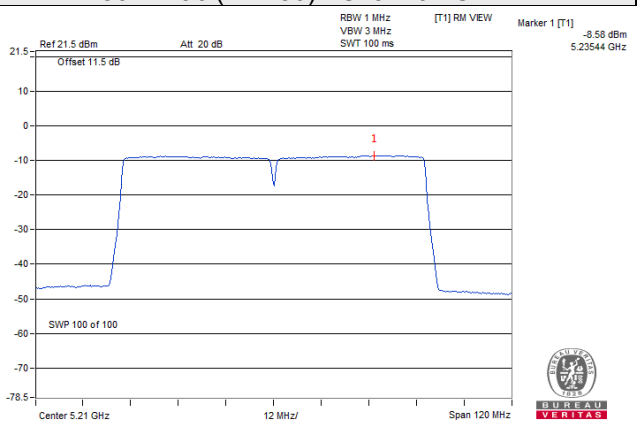
802.11n (HT20) / Chain 0 / CH 100



802.11n (HT40) / Chain 1 / CH 46



802.11ac (VHT80) / Chain 0 / CH 42



For U-NII-3 band:

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	-4.46	-2.24	3.01	0.15	0.92	28.14	Pass
	157	5785	-4.74	-2.52	3.01	0.15	0.64	28.14	Pass
	165	5825	-5.08	-2.86	3.01	0.15	0.30	28.14	Pass
1	149	5745	-5.46	-3.24	3.01	0.15	-0.08	28.14	Pass
	157	5785	-5.51	-3.29	3.01	0.15	-0.13	28.14	Pass
	165	5825	-5.79	-3.57	3.01	0.15	-0.41	28.14	Pass

Note:

1. Method 1 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. U-NII-3 band: Directional gain = 4.85dBi + 10log(2) = 7.86dBi > 6dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	149	5745	-5.90	-3.68	3.01	0.12	-0.55	28.14	Pass
	157	5785	-6.16	-3.94	3.01	0.12	-0.81	28.14	Pass
	165	5825	-6.30	-4.08	3.01	0.12	-0.95	28.14	Pass
1	149	5745	-6.41	-4.19	3.01	0.12	-1.06	28.14	Pass
	157	5785	-6.68	-4.46	3.01	0.12	-1.33	28.14	Pass
	165	5825	-6.72	-4.50	3.01	0.12	-1.37	28.14	Pass

Note:

1. Method 1 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. U-NII-3 band: Directional gain = 4.85dBi + 10log(2) = 7.86dBi > 6dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	151	5755	-10.99	-8.77	3.01	0.20	-5.56	28.14	Pass
	159	5795	-11.41	-9.19	3.01	0.20	-5.98	28.14	Pass
1	151	5755	-11.68	-9.46	3.01	0.20	-6.25	28.14	Pass
	159	5795	-10.93	-8.71	3.01	0.20	-5.50	28.14	Pass

Note:

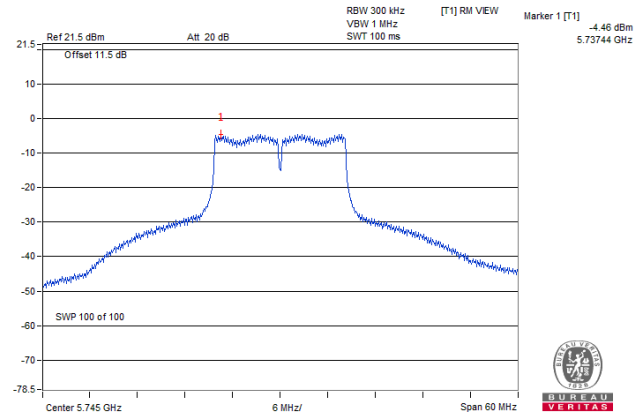
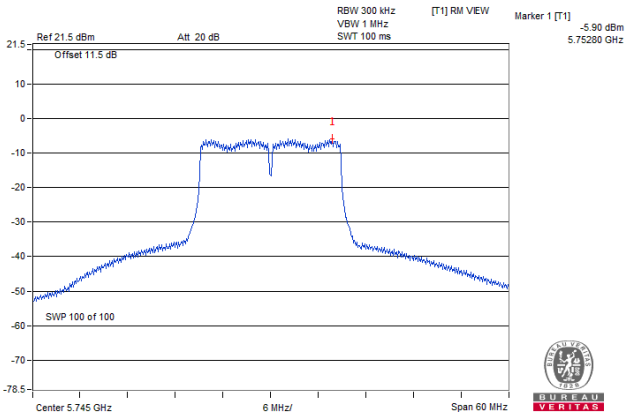
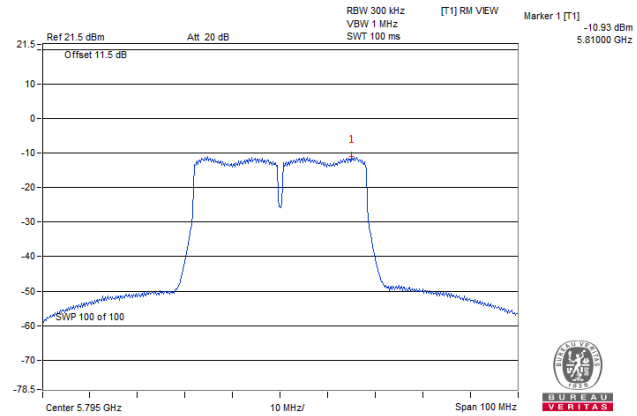
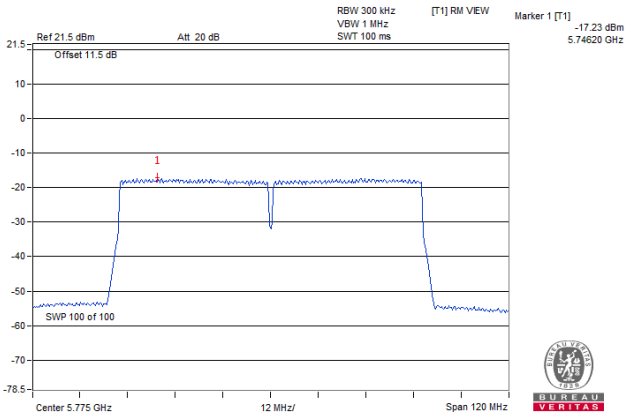
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. U-NII-3 band: Directional gain = 4.85dBi + 10log(2) = 7.86dBi > 6dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
0	155	5775	-17.57	-15.35	3.01	0.44	-11.90	28.14	Pass
1	155	5775	-17.23	-15.01	3.01	0.44	-11.56	28.14	Pass

Note:

1. Method 1 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. U-NII-3 band: Directional gain = 4.85dBi + 10log(2) = 7.86dBi > 6dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

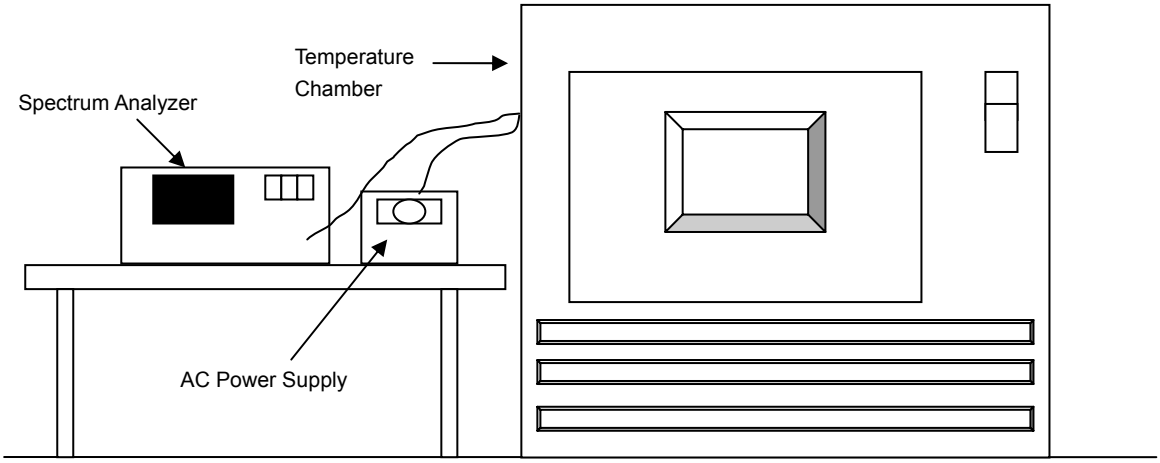
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Aug. 18, 2017	Aug. 17, 2018
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 07, 2017	Jun. 06, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018
AC Power Supply Extech	CFW-105	E000603	NA	NA

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: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
50	120	5179.9852	Pass	5179.9884	Pass	5179.9869	Pass	5179.9865	Pass
40	120	5180.0026	Pass	5180.0028	Pass	5179.9981	Pass	5180.0031	Pass
30	120	5180.0052	Pass	5180.0028	Pass	5180.0020	Pass	5180.0033	Pass
20	120	5180.0162	Pass	5180.0160	Pass	5180.0161	Pass	5180.0148	Pass
10	120	5179.9944	Pass	5179.9926	Pass	5179.9932	Pass	5179.9938	Pass
0	120	5179.9790	Pass	5179.9799	Pass	5179.9804	Pass	5179.9790	Pass
-10	120	5179.9954	Pass	5179.9963	Pass	5179.9983	Pass	5179.9950	Pass
-20	120	5180.0191	Pass	5180.0207	Pass	5180.0188	Pass	5180.0233	Pass
-30	120	5180.0082	Pass	5180.0110	Pass	5180.0081	Pass	5180.0091	Pass

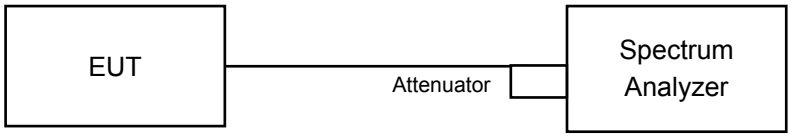
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5180.0153	Pass	5180.0153	Pass	5180.0153	Pass	5180.0141	Pass
	120	5180.0162	Pass	5180.016	Pass	5180.0161	Pass	5180.0148	Pass
	102	5180.0167	Pass	5180.0158	Pass	5180.0169	Pass	5180.0145	Pass

4.7 6dB Bandwidth Measurement

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	16.39	16.42	0.5	Pass
157	5785	16.40	16.41	0.5	Pass
165	5825	16.39	16.42	0.5	Pass

802.11n (HT20)

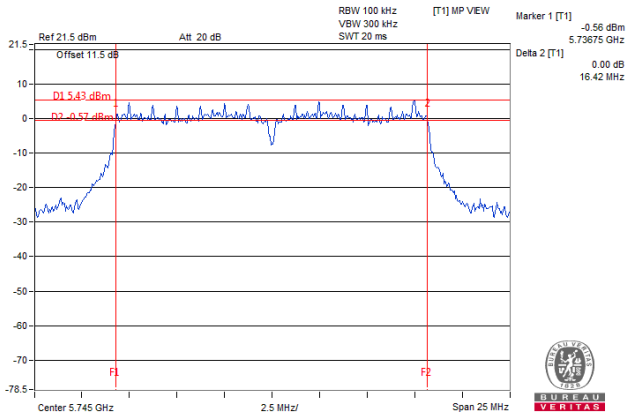
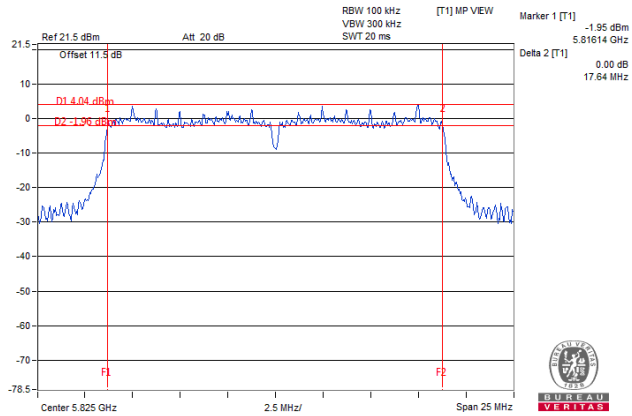
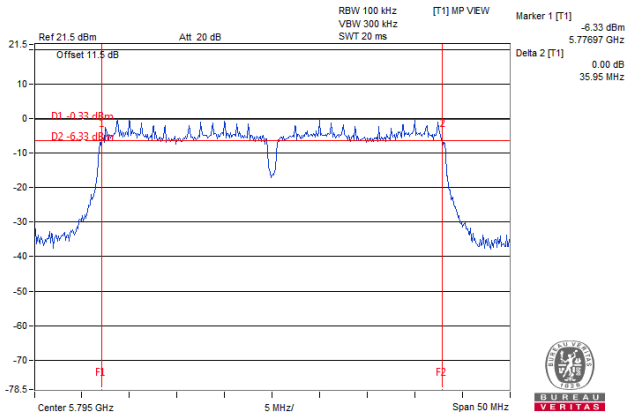
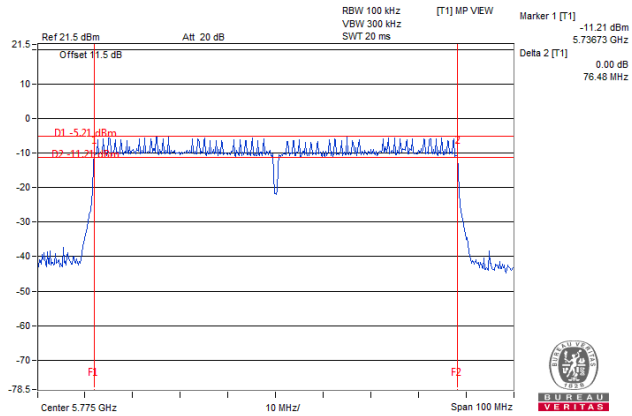
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.61	17.63	0.5	Pass
157	5785	17.63	17.62	0.5	Pass
165	5825	17.62	17.64	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.73	35.92	0.5	Pass
159	5795	35.95	35.93	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.43	76.48	0.5	Pass

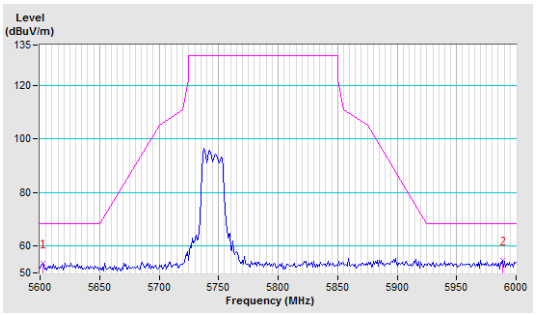
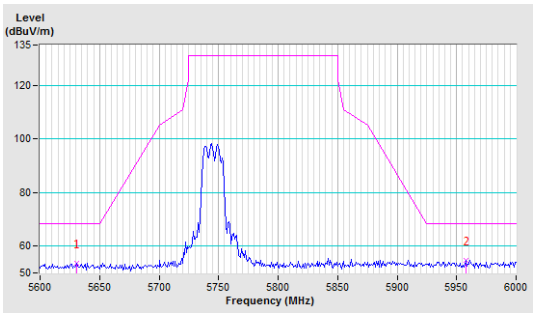
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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)

802.11a

CH149	
Horizontal	Vertical
	
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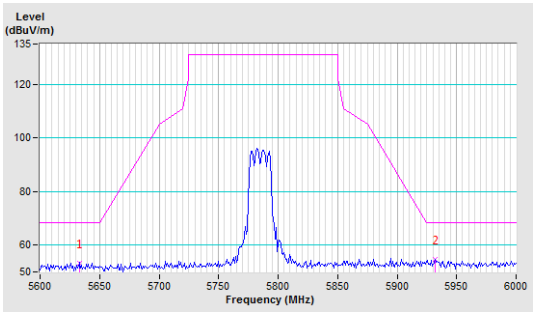
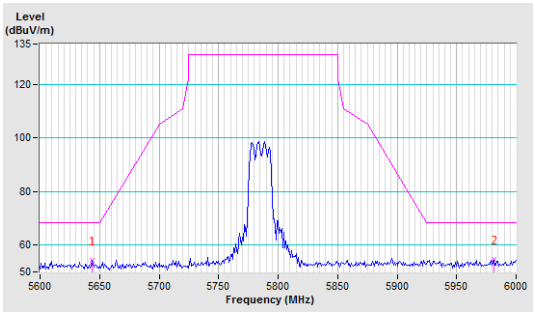
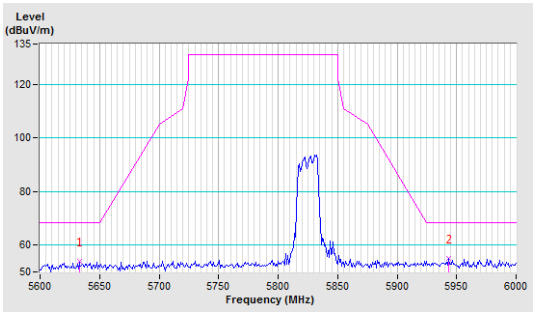
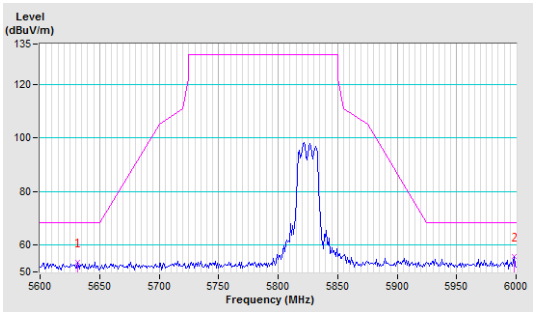
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11n (HT20)

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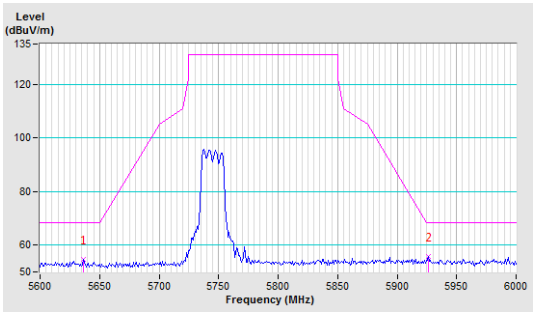	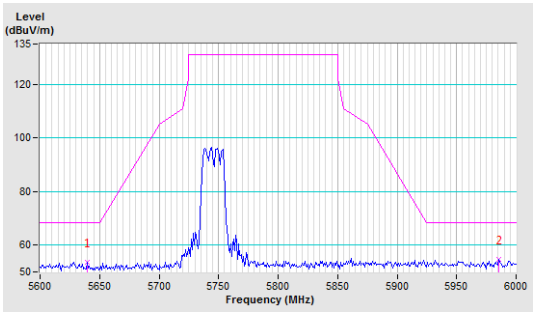
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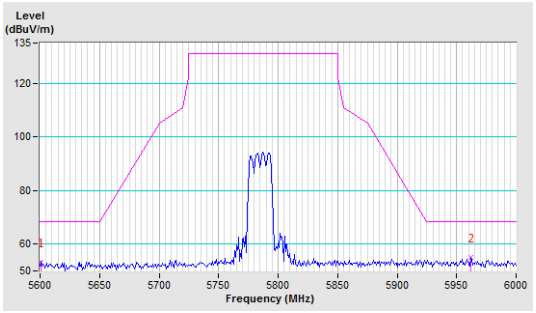	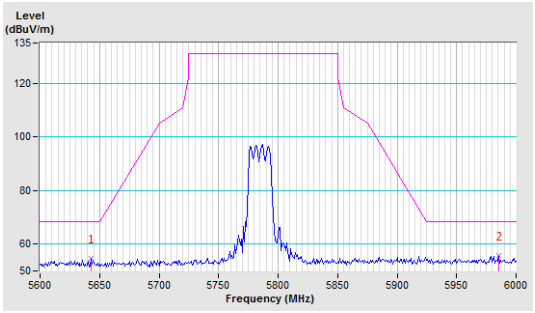
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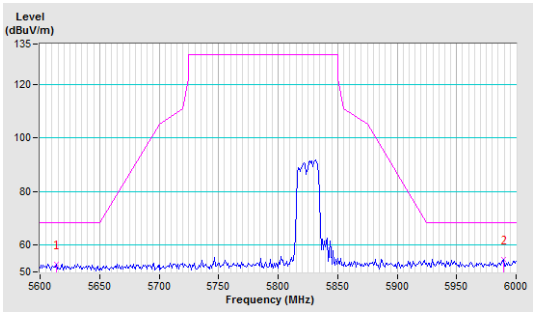
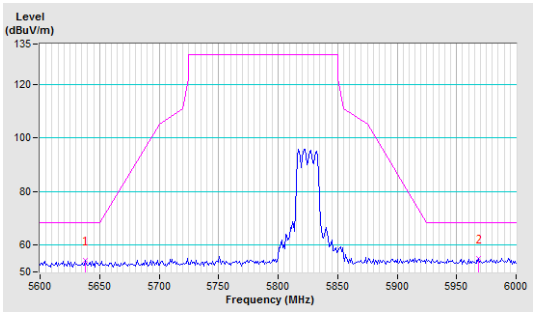
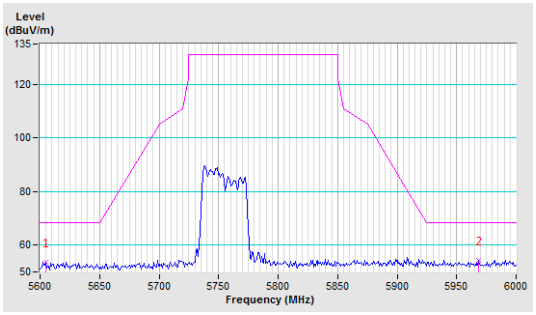
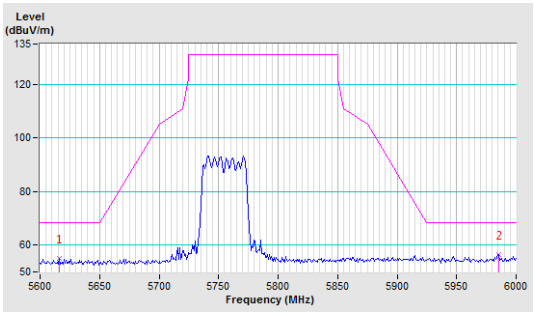
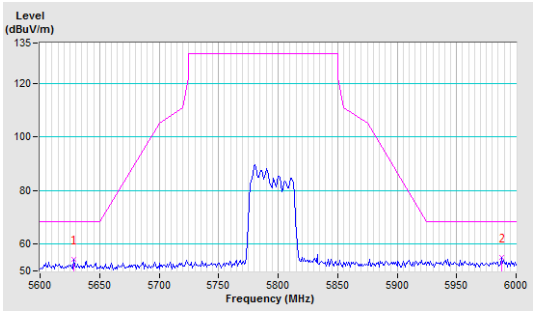
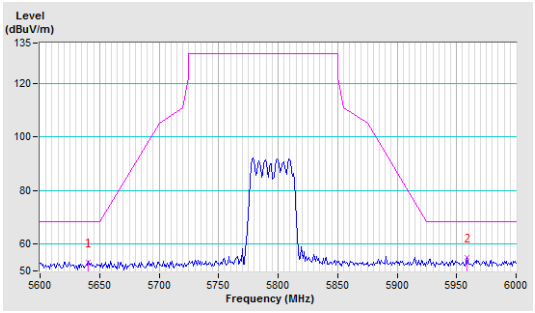
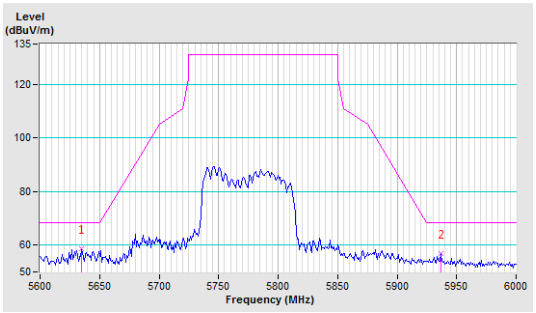
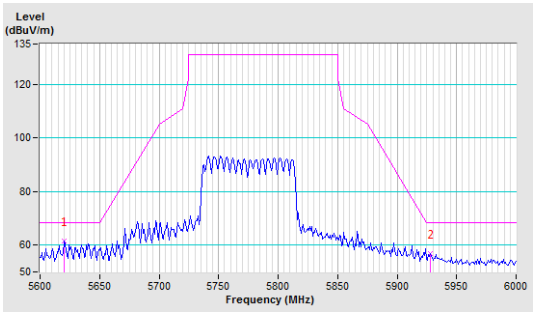
	

802.11n (HT40)

CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

CH155	
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 FCC recognized accredited test firms and 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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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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