

FCC Test Report

Report No.: RF151105C02-1

FCC ID: TE7C50V2

Test Model: Archer C50

Received Date: Nov. 05, 2015

Test Date: Dec. 07, 2015 ~ Mar. 03, 2016

Issued Date: Mar. 04, 2016

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Release Control Record

Issue No.	Description	Date Issued
RF151105C02-1	Original release	Mar. 04, 2016

1 Certificate of Conformity

Product: AC1200 Wireless Dual Band Router

Brand: TP-LINK

Test Model: Archer C50

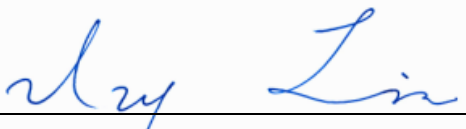
Sample Status: Prototype

Applicant: TP-LINK TECHNOLOGIES CO., LTD.

Test Date: Dec. 07, 2015 ~ Mar. 03, 2016

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 EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Mar. 04, 2016
Ivy Lin / Specialist

Approved by :  , **Date:** Mar. 04, 2016
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.63dB at 13.72458MHz
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5725.00MHz, 5714.90MHz
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is I-PEX not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.63 dB
	200MHz ~ 1000MHz	3.64 dB
Radiated Emissions above 1 GHz	1GHz ~ 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	AC1200 Wireless Dual Band Router
Brand	TP-LINK
Test Model	Archer C50
Status of EUT	Prototype
Power Supply Rating	12Vdc from adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz: 680.862mW 5745 ~ 5825MHz: 546.468mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	N/A

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 HT20/HT40 and 802.11ac mode for VHT20/VHT40, 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.

Antenna	Type	Gain(dBi)		Connector
		5150-5250MHz	5725-5850MHz	
1	Omni-Directional	1.94	1.75	I-PEX
2	Omni-Directional	1.33	2.48	I-PEX

3. The EUT uses following adapter.

Adapter 1	
Brand	Huntkey
Model	HKA02412020-2N
Input Power	100-240Vac, 0.8A, 50/60Hz
Output Power	12.0Vdc, 2.0A
Power Line	1.8m DC cable with 1 core attached on adapter

Adapter 2	
Brand	TP-LINK TECHNOLOGIES CO., LTD.
Model	T120200-2B1
Input Power	100-240Vac, 50/60Hz, 0.8A
Output Power	12.0Vdc, 2A
Power Line	1.45m DC cable without core attached on adapter

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power form adapter 1
B	-	√	√	-	Power form adapter 2

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

Note:

1. The EUT had been pre-tested on the positioned of X-plane and Z-plane. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11ac (VHT80)		42	42	OFDM	BPSK	65.5
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)		155	155	OFDM	BPSK	65.5

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	5180-5240	36 to 48	48	OFDM	BPSK	6.0
		5745-5825	149 to 165		OFDM	BPSK	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	5180-5240	36 to 48	48	OFDM	BPSK	6.0
		5745-5825	149 to 165		OFDM	BPSK	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11ac (VHT80)		42	42	OFDM	BPSK	65.5
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)		155	155	OFDM	BPSK	65.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	24deg. C, 45%RH	120Vac, 60Hz	Nick Chen
RE<1G	24deg. C, 45%RH, 22deg. C, 66%RH	120Vac, 60Hz	Nick Chen, Tank Wu
PLC	24deg. C, 64%RH, 25deg. C, 65%RH	120Vac, 60Hz	Rolan Zheng, Tank Wu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is > 98%, duty factor is not required.

802.11a: Duty cycle = $5.351/5.431 = 0.985$

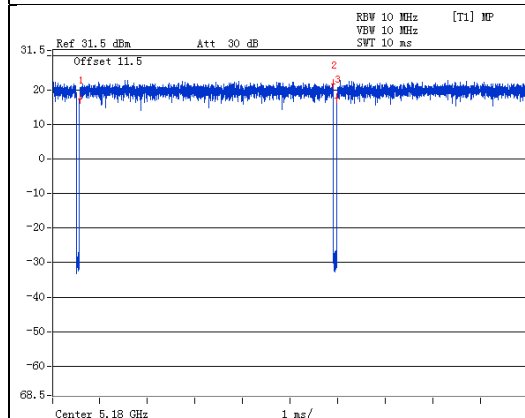
802.11n (HT20): Duty cycle = $4.957/5.038 = 0.984$

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

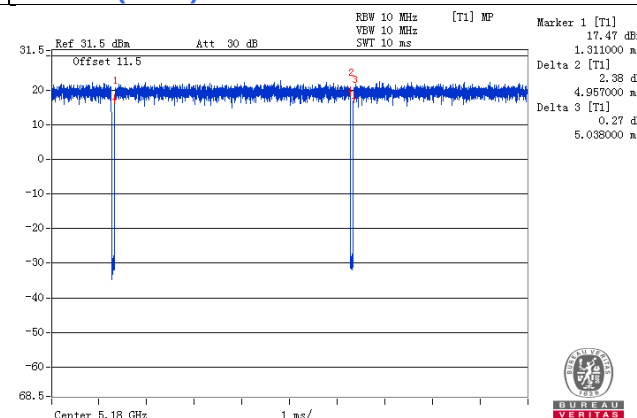
802.11n (HT40): Duty cycle = $2.405/2.483 = 0.969$, Duty factor = $10 * \log(1/0.969) = 0.14$

802.11ac (VHT80): Duty cycle = $1.136/1.206 = 0.942$, Duty factor = $10 * \log(1/0.942) = 0.26$

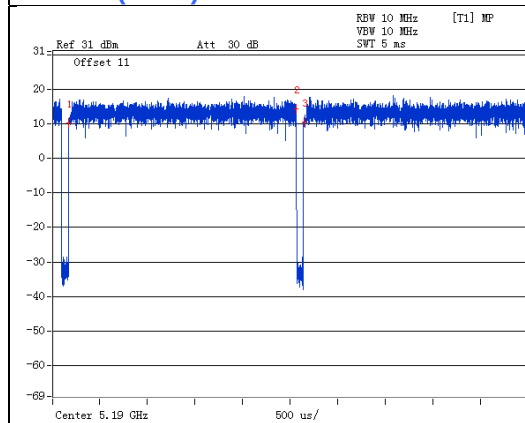
802.11a



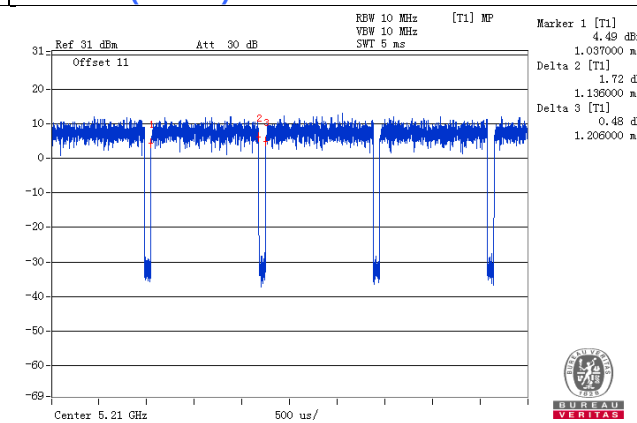
802.11n (HT20)



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.

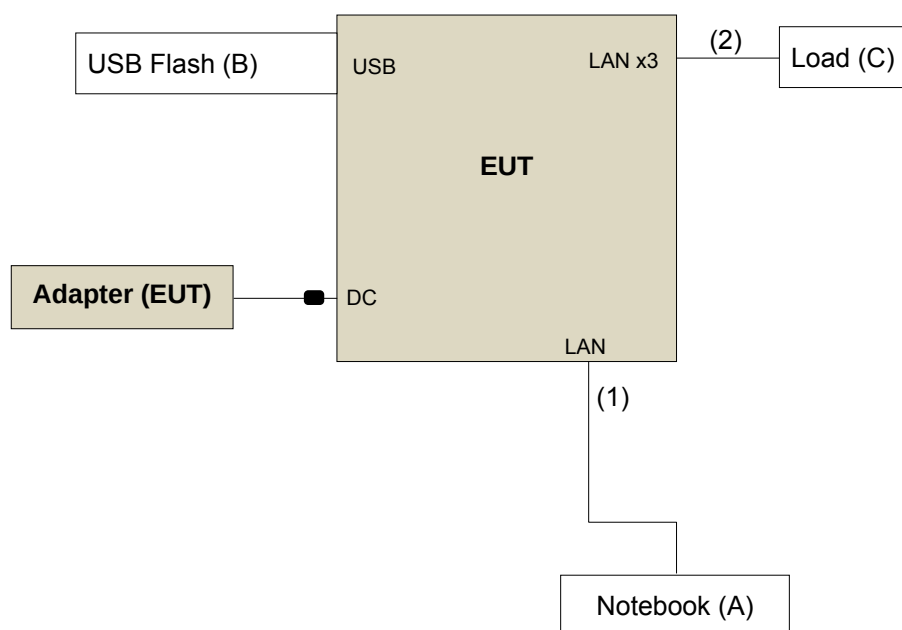
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	dell	E5430	79ZGLX1	FCC DoC Approved	-
B.	USB FLASH	HP	v250W	01	FCC DoC Approved	-
C.	Load	N/A	N/A	N/A	N/A	-

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

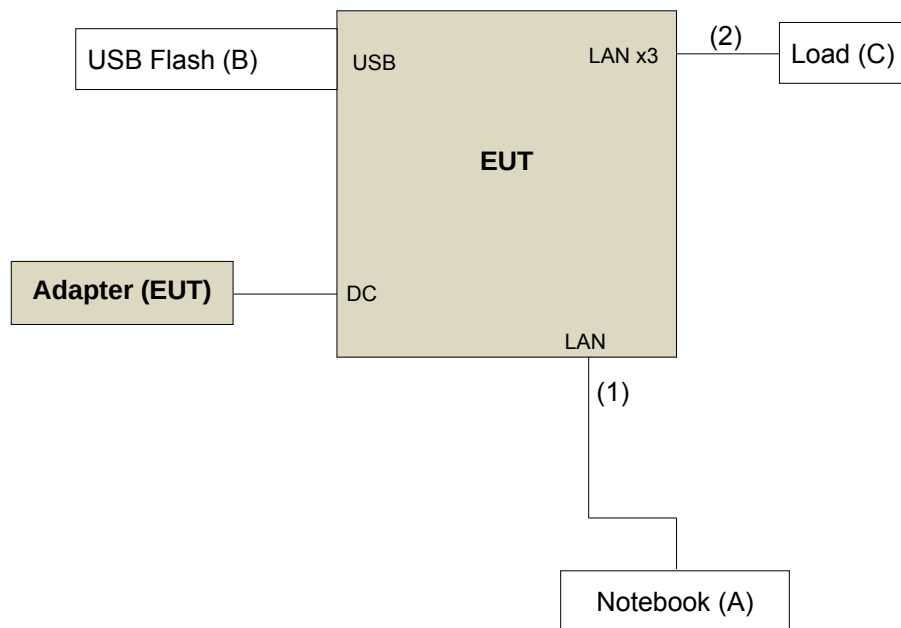
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Cat5e
2.	LAN cable	4	1.8	N	0	Cat.5e

3.4.1 Configuration of System under Test

Mode A



Mode B



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)

789033 D02 General UNII Test Procedures New Rules v01r01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01r01	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBuV/m) ^{*1} PK: 78.2 (dBuV/m) ^{*2}

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

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

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

4.1.2 Test Instruments

Test date: Dec. 07, 2015 ~ Jan. 07, 2016 & Mar. 03, 2016

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Mar. 30, 2015	Mar. 29, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-150	Feb. 02, 2015 Jan. 04, 2016	Feb. 01, 2016 Jan. 03, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Feb. 09, 2015 Jan. 08, 2016	Feb. 08, 2016 Jan. 07, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015 Jan. 18, 2016	Feb. 08, 2016 Jan. 17, 2017
Preamplifier Agilent	8449B	3008A01911	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10638	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02(309222 +248780)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-03(274092)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 11, 2015	Aug. 10, 2016
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
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2015	Oct. 17, 2016
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 215374.
5. The IC Site Registration No. is IC 7450F-9.

4.1.3 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

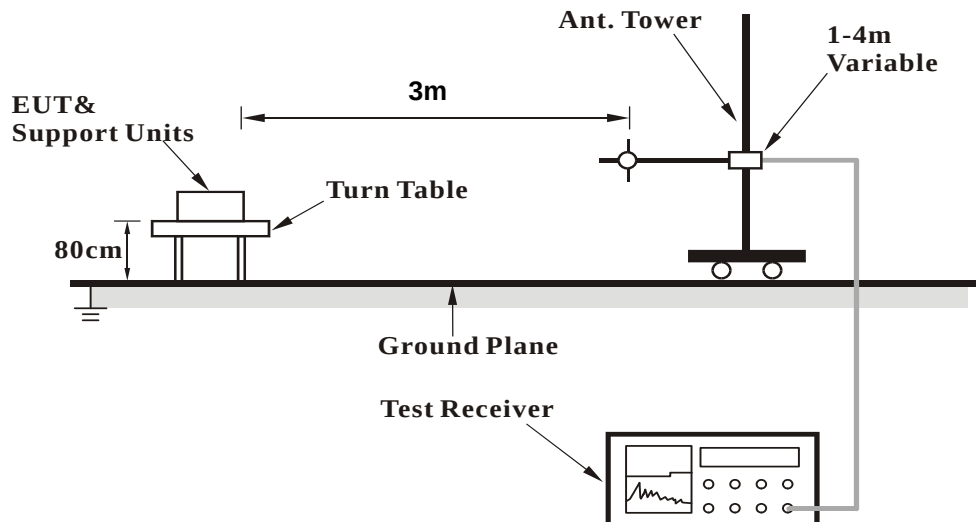
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

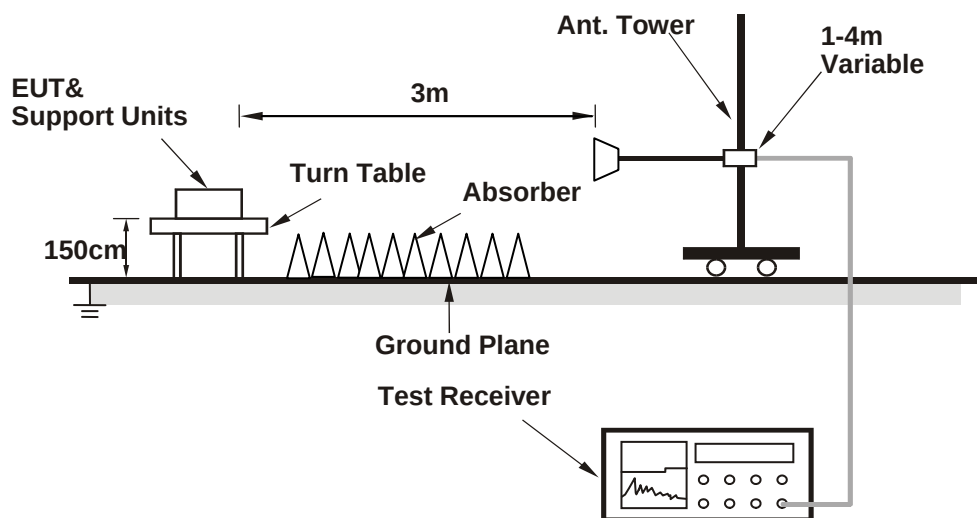
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Prepared notebook to act as communication partner and placed it outside of testing area.
- 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.
- The communication partner sent data to EUT by command "PING".
- The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.9 PK	74.0	-11.1	1.69 H	284	20.70	42.20
2	5150.00	51.1 AV	54.0	-2.9	1.69 H	284	8.90	42.20
3	*5180.00	110.8 PK			2.07 H	58	68.60	42.20
4	*5180.00	100.8 AV			2.07 H	58	58.60	42.20
5	#10360.00	56.9 PK	74.0	-17.1	1.00 H	166	41.10	15.80
6	#10360.00	42.5 AV	54.0	-11.5	1.00 H	166	26.70	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	5150.00	63.5 PK	74.0	-10.5	1.72 V	194	21.30	42.20
2	5150.00	53.2 AV	54.0	-0.8	1.72 V	194	11.00	42.20
3	*5180.00	119.1 PK			1.48 V	217	76.90	42.20
4	*5180.00	108.4 AV			1.48 V	217	66.20	42.20
5	#10360.00	56.1 PK	74.0	-17.9	1.32 V	64	40.30	15.80
6	#10360.00	43.6 AV	54.0	-10.4	1.32 V	64	27.80	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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	115.0 PK			1.72 H	62	72.80	42.20
2	*5200.00	105.4 AV			1.72 H	62	63.20	42.20
3	#10400.00	55.1 PK	74.0	-18.9	1.63 H	87	39.20	15.90
4	#10400.00	41.6 AV	54.0	-12.4	1.63 H	87	25.70	15.90
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	*5200.00	123.1 PK			1.31 V	224	80.90	42.20
2	*5200.00	113.1 AV			1.31 V	224	70.90	42.20
3	#10400.00	56.2 PK	74.0	-17.8	1.25 V	87	40.30	15.90
4	#10400.00	43.1 AV	54.0	-10.9	1.25 V	87	27.20	15.90

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	115.0 PK			2.19 H	58	72.70	42.30
2	*5240.00	104.6 AV			2.19 H	58	62.30	42.30
3	#10480.00	55.4 PK	74.0	-18.6	1.27 H	12	39.20	16.20
4	#10480.00	41.6 AV	54.0	-12.4	1.27 H	12	25.40	16.20
5	15720.00	59.9 PK	74.0	-14.1	1.53 H	33	44.40	15.50
6	15720.00	47.7 AV	54.0	-6.3	1.53 H	33	32.20	15.50
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	*5240.00	123.9 PK			1.42 V	217	81.60	42.30
2	*5240.00	113.0 AV			1.42 V	217	70.70	42.30
3	#10480.00	56.4 PK	74.0	-17.6	1.81 V	320	40.20	16.20
4	#10480.00	41.7 AV	54.0	-12.3	1.81 V	320	25.50	16.20
5	15720.00	60.6 PK	74.0	-13.4	1.46 V	271	45.10	15.50
6	15720.00	48.1 AV	54.0	-5.9	1.46 V	271	32.60	15.50

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	64.3 PK	68.2	-3.9	1.24 H	174	21.60	42.70
2	#5725.00	70.2 PK	78.2	-8.0	1.02 H	195	27.50	42.70
3	*5745.00	108.0 PK			1.00 H	70	65.20	42.80
4	*5745.00	97.2 AV			1.00 H	70	54.40	42.80
5	11490.00	55.6 PK	74.0	-18.4	1.42 H	157	39.80	15.80
6	11490.00	41.9 AV	54.0	-12.1	1.42 H	157	26.10	15.80
7	#17235.00	62.4 PK	74.0	-11.6	1.45 H	12	40.60	21.80
8	#17235.00	48.8 AV	54.0	-5.2	1.45 H	12	27.00	21.80
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	#5714.90	66.0 PK	68.2	-2.2	1.92 V	128	23.30	42.70
2	#5725.00	77.2 PK	78.2	-1.0	2.12 V	274	34.50	42.70
3	*5745.00	117.7 PK			1.87 V	209	74.90	42.80
4	*5745.00	107.8 AV			1.87 V	209	65.00	42.80
5	11490.00	54.9 PK	74.0	-19.1	1.89 V	37	39.10	15.80
6	11490.00	41.6 AV	54.0	-12.4	1.89 V	37	25.80	15.80
7	#17235.00	61.9 PK	74.0	-12.1	1.04 V	127	40.10	21.80
8	#17235.00	48.5 AV	54.0	-5.5	1.04 V	127	26.70	21.80

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	110.5 PK			1.94 H	70	67.70	42.80
2	*5785.00	100.7 AV			1.94 H	70	57.90	42.80
3	11570.00	54.6 PK	74.0	-19.4	1.52 H	35	39.10	15.50
4	11570.00	41.2 AV	54.0	-12.8	1.52 H	35	25.70	15.50
5	#17355.00	61.6 PK	74.0	-12.4	1.42 H	120	39.40	22.20
6	#17355.00	48.8 AV	54.0	-5.2	1.42 H	120	26.60	22.20
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	*5785.00	120.5 PK			2.17 V	199	77.70	42.80
2	*5785.00	110.1 AV			2.17 V	199	67.30	42.80
3	11570.00	55.4 PK	74.0	-18.6	1.84 V	48	39.90	15.50
4	11570.00	41.5 AV	54.0	-12.5	1.84 V	48	26.00	15.50
5	#17355.00	62.0 PK	74.0	-12.0	1.29 V	63	39.80	22.20
6	#17355.00	48.9 AV	54.0	-5.1	1.29 V	63	26.70	22.20

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	109.4 PK			1.87 H	63	66.60	42.80
2	*5825.00	99.4 AV			1.87 H	63	56.60	42.80
3	#5850.00	73.2 PK	78.2	-5.0	1.47 H	2	30.30	42.90
4	#5860.10	64.8 PK	68.2	-3.4	1.27 H	41	21.90	42.90
5	11650.00	55.4 PK	74.0	-18.6	1.27 H	243	39.60	15.80
6	11650.00	42.2 AV	54.0	-11.8	1.27 H	243	26.40	15.80
7	#17475.00	62.6 PK	74.0	-11.4	1.36 H	100	40.20	22.40
8	#17475.00	49.5 AV	54.0	-4.5	1.36 H	100	27.10	22.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	119.0 PK			1.59 V	202	76.20	42.80
2	*5825.00	108.6 AV			1.59 V	202	65.80	42.80
3	#5850.00	77.7 PK	78.2	-0.5	1.57 V	25	34.80	42.90
4	#5860.10	67.6 PK	68.2	-0.6	1.43 V	223	24.70	42.90
5	11650.00	56.3 PK	74.0	-17.7	1.87 V	225	40.50	15.80
6	11650.00	43.0 AV	54.0	-11.0	1.87 V	225	27.20	15.80
7	#17475.00	63.5 PK	74.0	-10.5	1.54 V	57	41.10	22.40
8	#17475.00	49.6 AV	54.0	-4.4	1.54 V	57	27.20	22.40

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.1 PK	74.0	-9.9	1.42 H	84	21.90	42.20
2	5150.00	51.3 AV	54.0	-2.7	1.42 H	84	9.10	42.20
3	*5180.00	109.7 PK			2.09 H	59	67.50	42.20
4	*5180.00	99.8 AV			2.09 H	59	57.60	42.20
5	#10360.00	54.7 PK	74.0	-19.3	1.54 H	49	38.90	15.80
6	#10360.00	41.2 AV	54.0	-12.8	1.54 H	49	25.40	15.80
7	15540.00	60.5 PK	74.0	-13.5	1.62 H	27	44.00	16.50
8	15540.00	46.9 AV	54.0	-7.1	1.62 H	27	30.40	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	5150.00	65.9 PK	74.0	-8.1	1.02 V	114	23.70	42.20
2	5150.00	53.4 AV	54.0	-0.6	1.02 V	114	11.20	42.20
3	*5180.00	119.1 PK			1.74 V	215	76.90	42.20
4	*5180.00	108.7 AV			1.74 V	215	66.50	42.20
5	#10360.00	55.4 PK	74.0	-18.6	1.82 V	205	39.60	15.80
6	#10360.00	41.6 AV	54.0	-12.4	1.82 V	205	25.80	15.80
7	15540.00	60.6 PK	74.0	-13.4	1.20 V	32	44.10	16.50
8	15540.00	47.9 AV	54.0	-6.1	1.20 V	32	31.40	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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	114.2 PK			1.69 H	63	72.00	42.20
2	*5200.00	104.6 AV			1.69 H	63	62.40	42.20
3	#10400.00	54.5 PK	74.0	-19.5	1.56 H	248	38.60	15.90
4	#10400.00	41.4 AV	54.0	-12.6	1.56 H	248	25.50	15.90
5	15600.00	60.1 PK	74.0	-13.9	1.46 H	53	44.30	15.80
6	15600.00	46.4 AV	54.0	-7.6	1.46 H	53	30.60	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	*5200.00	123.2 PK			1.00 V	216	81.00	42.20
2	*5200.00	113.3 AV			1.00 V	216	71.10	42.20
3	#10400.00	54.9 PK	74.0	-19.1	1.42 V	295	39.00	15.90
4	#10400.00	42.0 AV	54.0	-12.0	1.42 V	295	26.10	15.90
5	15600.00	60.5 PK	74.0	-13.5	1.89 V	139	44.70	15.80
6	15600.00	47.6 AV	54.0	-6.4	1.89 V	139	31.80	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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	114.0 PK			2.13 H	60	71.70	42.30
2	*5240.00	104.2 AV			2.13 H	60	61.90	42.30
3	#10480.00	54.7 PK	74.0	-19.3	1.77 H	54	38.50	16.20
4	#10480.00	41.6 AV	54.0	-12.4	1.77 H	54	25.40	16.20
5	15720.00	60.4 PK	74.0	-13.6	1.23 H	258	44.90	15.50
6	15720.00	46.9 AV	54.0	-7.1	1.23 H	258	31.40	15.50
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	*5240.00	123.3 PK			1.85 V	214	81.00	42.30
2	*5240.00	113.4 AV			1.85 V	214	71.10	42.30
3	#10480.00	55.1 PK	74.0	-18.9	1.41 V	27	38.90	16.20
4	#10480.00	42.1 AV	54.0	-11.9	1.41 V	27	25.90	16.20
5	15720.00	60.6 PK	74.0	-13.4	1.80 V	231	45.10	15.50
6	15720.00	47.6 AV	54.0	-6.4	1.80 V	231	32.10	15.50

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	64.9 PK	68.2	-3.3	1.36 H	241	22.20	42.70
2	#5725.00	73.9 PK	78.2	-4.3	1.59 H	54	31.20	42.70
3	*5745.00	108.4 PK			1.83 H	70	65.60	42.80
4	*5745.00	99.1 AV			1.83 H	70	56.30	42.80
5	11490.00	54.3 PK	74.0	-19.7	1.81 H	24	38.50	15.80
6	11490.00	41.9 AV	54.0	-12.1	1.81 H	24	26.10	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	#5714.90	65.6 PK	68.2	-2.6	1.68 V	24	22.90	42.70
2	#5725.00	78.1 PK	78.2	-0.1	1.59 V	54	35.40	42.70
3	*5745.00	119.7 PK			1.96 V	205	76.90	42.80
4	*5745.00	109.9 AV			1.96 V	205	67.10	42.80
5	11490.00	55.3 PK	74.0	-18.7	1.47 V	99	39.50	15.80
6	11490.00	41.6 AV	54.0	-12.4	1.47 V	99	25.80	15.80
7	#17235.00	62.6 PK	74.0	-11.4	1.24 V	2	40.80	21.80
8	#17235.00	49.1 AV	54.0	-4.9	1.24 V	2	27.30	21.80

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	114.1 PK			1.72 H	63	71.30	42.80
2	*5785.00	102.6 AV			1.72 H	63	59.80	42.80
3	11570.00	54.9 PK	74.0	-19.1	1.71 H	54	1.50	53.40
4	11570.00	41.3 AV	54.0	-12.7	1.71 H	54	-12.10	53.40
5	#17355.00	62.0 PK	74.0	-12.0	1.62 H	271	2.70	59.30
6	#17355.00	48.6 AV	54.0	-5.4	1.62 H	271	-10.70	59.30
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	*5785.00	121.3 PK			2.29 V	153	78.50	42.80
2	*5785.00	112.0 AV			2.29 V	153	69.20	42.80
3	11570.00	55.8 PK	74.0	-18.2	1.89 V	36	2.40	53.40
4	11570.00	41.7 AV	54.0	-12.3	1.89 V	36	-11.70	53.40
5	#17355.00	62.5 PK	74.0	-11.5	1.27 V	43	3.20	59.30
6	#17355.00	49.5 AV	54.0	-4.5	1.27 V	43	-9.80	59.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.0 PK			1.76 H	38	65.20	42.80
2	*5825.00	99.1 AV			1.76 H	38	56.30	42.80
3	#5850.00	71.9 PK	78.2	-6.3	1.52 H	24	29.00	42.90
4	#5860.10	65.1 PK	68.2	-3.1	1.58 H	168	22.20	42.90
5	11650.00	55.3 PK	74.0	-18.7	1.88 H	5	39.50	15.80
6	11650.00	42.1 AV	54.0	-11.9	1.88 H	5	26.30	15.80
7	#17475.00	63.3 PK	74.0	-10.7	1.69 H	358	40.90	22.40
8	#17475.00	49.4 AV	54.0	-4.6	1.69 H	358	27.00	22.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	118.0 PK			2.07 V	207	75.20	42.80
2	*5825.00	108.9 AV			2.07 V	207	66.10	42.80
3	#5850.00	74.8 PK	78.2	-3.4	1.72 V	55	31.90	42.90
4	#5860.10	67.5 PK	68.2	-0.7	1.86 V	173	24.60	42.90
5	11650.00	56.5 PK	74.0	-17.5	1.12 V	203	40.70	15.80
6	11650.00	42.6 AV	54.0	-11.4	1.12 V	203	26.80	15.80
7	#17475.00	63.1 PK	74.0	-10.9	1.28 V	57	40.70	22.40
8	#17475.00	49.9 AV	54.0	-4.1	1.28 V	57	27.50	22.40

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.1 PK	74.0	-10.9	1.04 H	215	20.90	42.20
2	5150.00	51.4 AV	54.0	-2.6	1.04 H	215	9.20	42.20
3	*5190.00	103.0 PK			1.62 H	62	60.80	42.20
4	*5190.00	92.5 AV			1.62 H	62	50.30	42.20
5	#10380.00	53.7 PK	74.0	-20.3	1.28 H	223	37.80	15.90
6	#10380.00	41.5 AV	54.0	-12.5	1.28 H	223	25.60	15.90
7	15570.00	59.5 PK	74.0	-14.5	1.51 H	341	43.40	16.10
8	15570.00	46.5 AV	54.0	-7.5	1.51 H	341	30.40	16.10
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	5150.00	64.8 PK	74.0	-9.2	1.54 V	74	22.60	42.20
2	5150.00	53.7 AV	54.0	-0.3	1.54 V	74	11.50	42.20
3	*5190.00	110.2 PK			1.75 V	233	68.00	42.20
4	*5190.00	101.0 AV			1.75 V	233	58.80	42.20
5	#10380.00	54.8 PK	74.0	-19.2	1.55 V	27	38.90	15.90
6	#10380.00	41.6 AV	54.0	-12.4	1.55 V	27	25.70	15.90
7	15570.00	60.5 PK	74.0	-13.5	1.27 V	147	44.40	16.10
8	15570.00	47.2 AV	54.0	-6.8	1.27 V	147	31.10	16.10

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	112.2 PK			1.94 H	65	69.90	42.30
2	*5230.00	100.5 AV			1.94 H	65	58.20	42.30
3	#10460.00	54.3 PK	74.0	-19.7	1.47 H	223	38.40	15.90
4	#10460.00	41.2 AV	54.0	-12.8	1.47 H	223	25.30	15.90
5	15690.00	59.7 PK	74.0	-14.3	1.48 H	96	44.10	15.60
6	15690.00	46.6 AV	54.0	-7.4	1.48 H	96	31.00	15.60
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	*5230.00	120.9 PK			1.01 V	216	78.60	42.30
2	*5230.00	111.0 AV			1.01 V	216	68.70	42.30
3	#10460.00	55.3 PK	74.0	-18.7	1.99 V	71	39.40	15.90
4	#10460.00	42.2 AV	54.0	-11.8	1.99 V	71	26.30	15.90
5	15690.00	60.6 PK	74.0	-13.4	1.36 V	258	45.00	15.60
6	15690.00	47.7 AV	54.0	-6.3	1.36 V	258	32.10	15.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	64.2 PK	68.2	-4.0	1.65 H	254	21.50	42.70
2	#5725.00	68.9 PK	78.2	-9.3	1.25 H	61	26.20	42.70
3	*5755.00	97.3 PK			1.94 H	66	54.50	42.80
4	*5755.00	86.9 AV			1.94 H	66	44.10	42.80
5	11510.00	54.3 PK	74.0	-19.7	1.37 H	24	38.70	15.60
6	11510.00	41.6 AV	54.0	-12.4	1.37 H	24	26.00	15.60
7	#17265.00	62.4 PK	74.0	-11.6	1.07 H	139	40.50	21.90
8	#17265.00	48.8 AV	54.0	-5.2	1.07 H	139	26.90	21.90
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	#5714.90	67.6 PK	68.2	-0.6	1.23 V	216	24.90	42.70
2	#5725.00	74.0 PK	78.2	-4.2	1.42 V	120	31.30	42.70
3	*5755.00	109.3 PK			2.23 V	206	66.50	42.80
4	*5755.00	99.8 AV			2.23 V	206	57.00	42.80
5	11510.00	55.5 PK	74.0	-18.5	1.84 V	104	39.90	15.60
6	11510.00	41.6 AV	54.0	-12.4	1.84 V	104	26.00	15.60
7	#17265.00	63.0 PK	74.0	-11.0	1.06 V	25	41.10	21.90
8	#17265.00	48.7 AV	54.0	-5.3	1.06 V	25	26.80	21.90

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	105.6 PK			1.62 H	38	62.80	42.80
2	*5795.00	97.2 AV			1.62 H	38	54.40	42.80
3	#5850.00	68.1 PK	78.2	-10.1	1.27 H	73	25.20	42.90
4	#5860.10	66.4 PK	68.2	-1.8	1.53 H	24	23.50	42.90
5	11590.00	54.7 PK	74.0	-19.3	1.03 H	85	39.20	15.50
6	11590.00	41.6 AV	54.0	-12.4	1.03 H	85	26.10	15.50
7	#17385.00	62.6 PK	74.0	-11.4	1.63 H	20	40.40	22.20
8	#17385.00	48.9 AV	54.0	-5.1	1.63 H	20	26.70	22.20
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	*5795.00	113.9 PK			2.18 V	206	71.10	42.80
2	*5795.00	104.3 AV			2.18 V	206	61.50	42.80
3	#5850.00	68.7 PK	78.2	-9.5	1.72 V	36	25.80	42.90
4	#5860.10	66.3 PK	68.2	-1.9	1.67 V	47	23.40	42.90
5	11590.00	55.4 PK	74.0	-18.6	1.47 V	5	39.90	15.50
6	11590.00	42.1 AV	54.0	-11.9	1.47 V	5	26.60	15.50
7	#17385.00	63.0 PK	74.0	-11.0	1.25 V	12	40.80	22.20
8	#17385.00	49.5 AV	54.0	-4.5	1.25 V	12	27.30	22.20

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.0 PK	74.0	-10.0	1.65 H	248	21.80	42.20
2	5150.00	51.0 AV	54.0	-3.0	1.65 H	248	8.80	42.20
3	*5210.00	98.2 PK			1.73 H	60	55.90	42.30
4	*5210.00	88.1 AV			1.73 H	60	45.80	42.30
5	#10420.00	54.2 PK	74.0	-19.8	1.78 H	224	38.20	16.00
6	#10420.00	41.6 AV	54.0	-12.4	1.78 H	224	25.60	16.00
7	15630.00	59.9 PK	74.0	-14.1	1.03 H	128	44.20	15.70
8	15630.00	46.6 AV	54.0	-7.4	1.03 H	128	30.90	15.70
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	67.4 PK	74.0	-6.6	1.14 V	284	25.20	42.20
2	5150.00	53.3 AV	54.0	-0.7	1.14 V	284	11.10	42.20
3	*5210.00	105.8 PK			1.19 V	230	63.50	42.30
4	*5210.00	97.0 AV			1.19 V	230	54.70	42.30
5	#10420.00	55.7 PK	74.0	-18.3	1.38 V	57	39.70	16.00
6	#10420.00	41.6 AV	54.0	-12.4	1.38 V	57	25.60	16.00
7	15630.00	60.7 PK	74.0	-13.3	1.81 V	241	45.00	15.70
8	15630.00	47.5 AV	54.0	-6.5	1.81 V	241	31.80	15.70

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	65.7 PK	68.2	-2.5	1.14 H	145	23.00	42.70
2	#5725.00	67.9 PK	78.2	-10.3	1.42 H	12	25.20	42.70
3	*5775.00	96.3 PK			1.82 H	69	53.50	42.80
4	*5775.00	87.1 AV			1.82 H	69	44.30	42.80
5	#5850.00	65.7 PK	78.2	-12.5	1.71 H	72	22.80	42.90
6	#5860.10	65.5 PK	68.2	-2.7	1.33 H	41	22.60	42.90
7	11550.00	54.8 PK	74.0	-19.2	1.36 H	22	39.30	15.50
8	11550.00	41.4 AV	54.0	-12.6	1.36 H	22	25.90	15.50
9	#17325.00	61.8 PK	74.0	-12.2	1.27 H	345	39.70	22.10
10	#17325.00	48.2 AV	54.0	-5.8	1.27 H	345	26.10	22.10
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	#5714.90	68.1 PK	68.2	-0.1	1.01 V	242	25.40	42.70
2	#5725.00	75.6 PK	78.2	-2.6	2.21 V	30	32.90	42.70
3	*5775.00	103.9 PK			2.28 V	301	61.10	42.80
4	*5775.00	94.0 AV			2.28 V	301	51.20	42.80
5	#5850.00	68.0 PK	78.2	-10.2	1.47 V	254	25.10	42.90
6	#5860.10	65.5 PK	68.2	-2.7	1.84 V	41	22.60	42.90
7	11550.00	55.1 PK	74.0	-18.9	1.24 V	240	39.60	15.50
8	11550.00	41.8 AV	54.0	-12.2	1.24 V	240	26.30	15.50
9	#17325.00	62.9 PK	74.0	-11.1	1.58 V	32	40.80	22.10
10	#17325.00	48.7 AV	54.0	-5.3	1.58 V	32	26.60	22.10

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)
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 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
TEST MODE	A		

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	30.00	26.7 QP	40.0	-13.3	2.00 H	0	42.30	-15.60
2	93.26	26.5 QP	43.5	-17.0	2.00 H	0	45.80	-19.30
3	302.72	28.0 QP	46.0	-18.0	2.00 H	0	40.30	-12.30
4	374.42	29.0 QP	46.0	-17.0	2.00 H	0	39.80	-10.80
5	499.54	32.9 QP	46.0	-13.1	2.00 H	0	41.10	-8.20
6	624.65	33.0 QP	46.0	-13.0	2.00 H	0	38.80	-5.80
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	30.63	36.4 QP	40.0	-3.6	1.00 V	12	52.20	-15.80
2	58.12	31.1 QP	40.0	-8.9	1.00 V	0	45.70	-14.60
3	105.91	27.5 QP	43.5	-16.0	1.00 V	0	45.30	-17.80
4	142.46	27.4 QP	43.5	-16.1	1.00 V	0	41.60	-14.20
5	374.42	30.8 QP	46.0	-15.2	1.00 V	0	41.60	-10.80
6	499.54	30.8 QP	46.0	-15.2	1.00 V	0	39.00	-8.20

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
TEST MODE	B		

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	30.00	24.8 QP	40.0	-15.2	1.99 H	190	40.40	-15.60
2	103.72	27.4 QP	43.5	-16.1	1.99 H	91	45.70	-18.30
3	119.24	26.0 QP	43.5	-17.5	1.49 H	157	42.40	-16.40
4	142.52	23.9 QP	43.5	-19.6	1.99 H	107	38.30	-14.40
5	295.78	30.3 QP	46.0	-15.7	1.24 H	210	42.80	-12.50
6	961.20	48.4 QP	54.0	-5.6	1.49 H	327	48.00	0.40
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	32.59	31.1 QP	40.0	-8.9	1.23 V	324	46.90	-15.80
2	45.52	34.0 QP	40.0	-6.0	1.50 V	156	48.30	-14.30
3	90.14	30.5 QP	43.5	-13.0	1.00 V	265	50.20	-19.70
4	142.52	30.1 QP	43.5	-13.4	1.00 V	258	44.50	-14.40
5	293.84	27.1 QP	46.0	-18.9	1.24 V	142	39.70	-12.60
6	961.20	45.8 QP	54.0	-8.2	1.50 V	15	45.40	0.40

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)
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

Mode A

Test date: Jan. 15, 2016

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Apr. 27, 2015	Apr. 26, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 11, 2016	Jan. 10, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 21, 2015	Jul. 20, 2016
Software ADT	BV ADT_Conc_ 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 2.

3. The VCCI Site Registration No. is C-2047.

Mode B

Test date: Mar. 03, 2016

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 16, 2015	Nov. 15, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 26, 2015	Dec. 25, 2016
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Conf_ 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

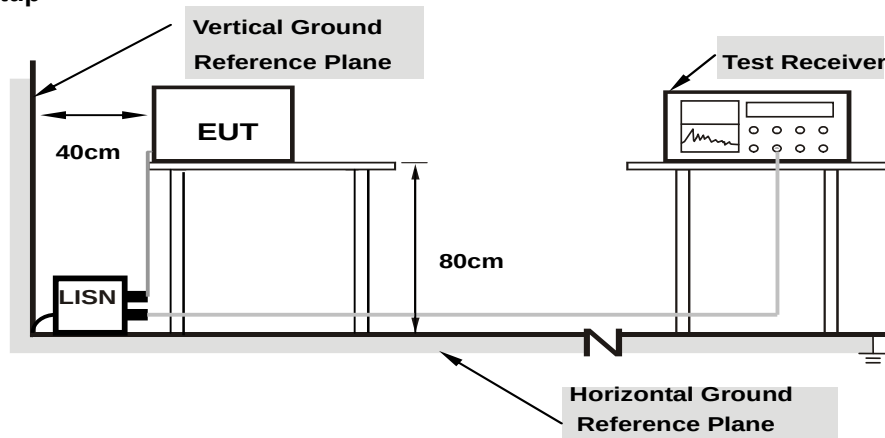
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

NOTE: 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.

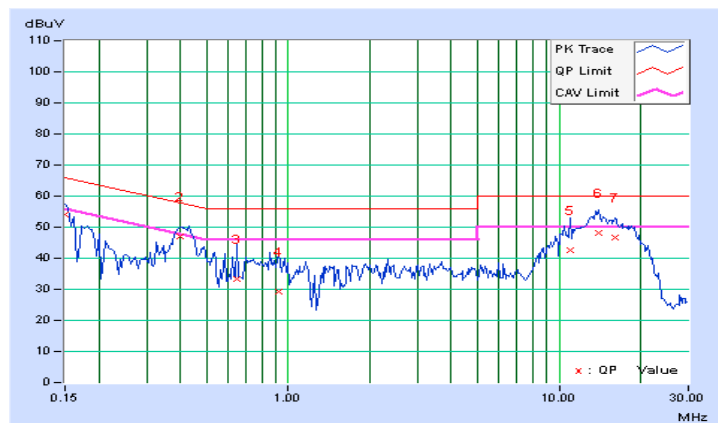
4.2.7 Test Results

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15045	9.99	44.24	36.08	54.23	46.07	65.98	55.98	-11.75	-9.91
2	0.40041	10.02	37.05	25.00	47.07	35.02	57.84	47.84	-10.77	-12.82
3	0.64611	10.06	23.21	6.77	33.27	16.83	56.00	46.00	-22.73	-29.17
4	0.91852	10.10	19.19	6.28	29.29	16.38	56.00	46.00	-26.71	-29.62
5	11.00041	10.47	32.04	25.44	42.51	35.91	60.00	50.00	-17.49	-14.09
6	13.99359	10.55	37.63	30.80	48.18	41.35	60.00	50.00	-11.82	-8.65
7	16.07145	10.61	36.04	29.59	46.65	40.20	60.00	50.00	-13.35	-9.80

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.

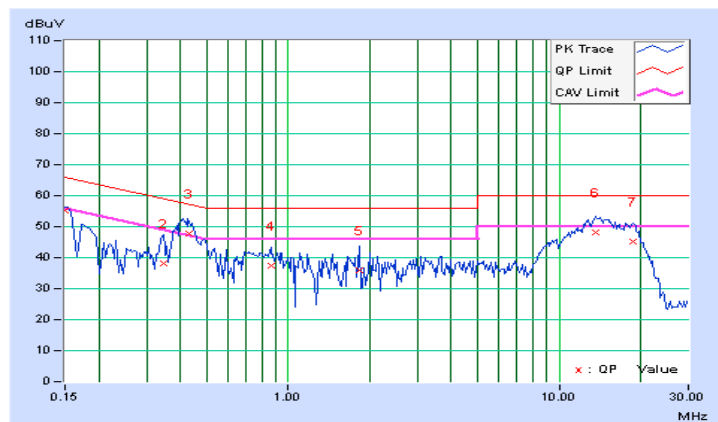


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15052	10.00	45.21	34.87	55.21	44.87	65.97	55.97	-10.76	-11.10
2	0.34574	10.06	28.05	14.62	38.11	24.68	59.06	49.06	-20.95	-24.38
3	0.42863	10.08	37.54	24.58	47.62	34.66	57.28	47.28	-9.66	-12.62
4	0.86117	10.09	27.23	16.08	37.32	26.17	56.00	46.00	-18.68	-19.83
5	1.83358	10.20	25.87	13.89	36.07	24.09	56.00	46.00	-19.93	-21.91
6	13.72458	10.68	37.55	30.69	48.23	41.37	60.00	50.00	-11.77	-8.63
7	18.83106	10.88	34.24	27.29	45.12	38.17	60.00	50.00	-14.88	-11.83

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.

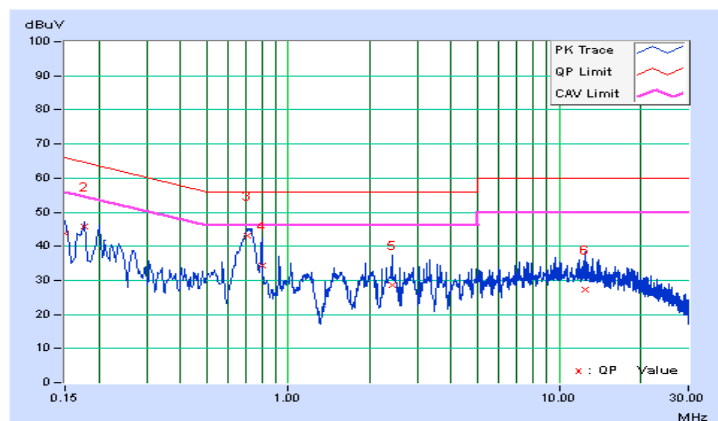


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.01	33.67	23.28	43.68	33.29	66.00	56.00	-22.32	-22.71
2	0.17615	10.07	35.58	22.52	45.65	32.59	64.67	54.67	-19.02	-22.08
3	0.70609	10.21	32.98	24.45	43.19	34.66	56.00	46.00	-12.81	-11.34
4	0.79800	10.24	23.99	14.66	34.23	24.90	56.00	46.00	-21.77	-21.10
5	2.41000	10.30	18.31	12.59	28.61	22.89	56.00	46.00	-27.39	-23.11
6	12.43400	10.82	16.50	10.95	27.32	21.77	60.00	50.00	-32.68	-28.23

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.

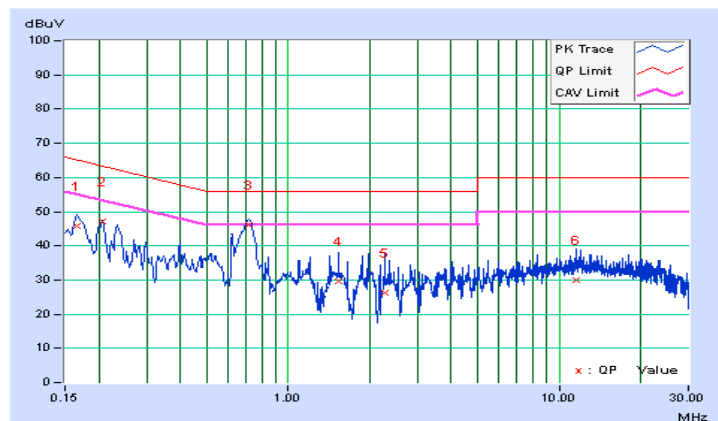


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16623	10.02	35.82	24.85	45.84	34.87	65.15	55.15	-19.31	-20.28
2	0.20600	10.04	36.94	26.22	46.98	36.26	63.37	53.37	-16.38	-17.10
3	0.71169	10.19	35.92	26.45	46.11	36.64	56.00	46.00	-9.89	-9.36
4	1.53400	10.26	19.28	12.72	29.54	22.98	56.00	46.00	-26.46	-23.02
5	2.27000	10.30	15.82	9.55	26.12	19.85	56.00	46.00	-29.88	-26.15
6	11.59800	10.66	19.47	13.16	30.13	23.82	60.00	50.00	-29.87	-26.18

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

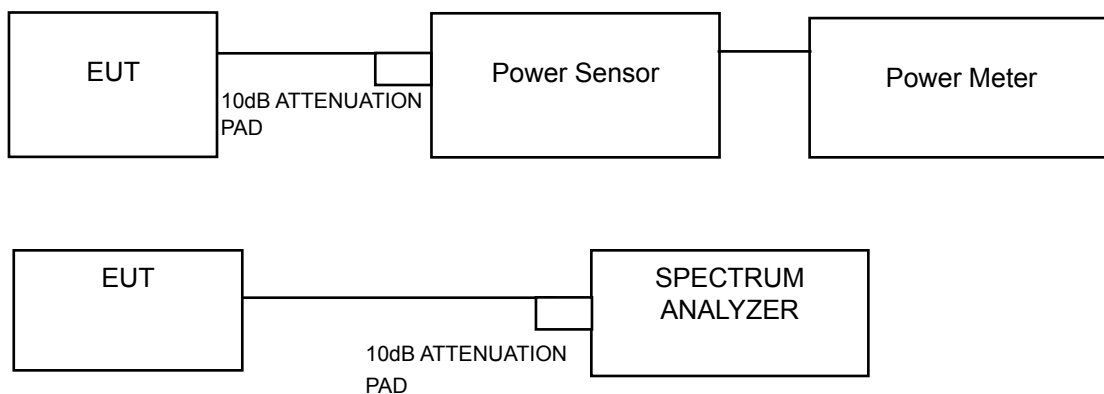
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

789033 D02 General UNII Test Procedures New Rules v01r01 E/3/b

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. Duty factor is not added to measured value.

For 802.11ac (VHT80)

789033 D02 General UNII Test Procedure New Rules v01r01

- 1) Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- 2) Set sweep trigger to "free run".
- 3) Set RBW = 1 MHz.
- 4) Set VBW $\geq$ 3 MHz
- 5) Number of points in sweep $\geq$ 2 Span / RBW.
- 6) Sweep time $\leq$ (number of points in sweep) * T
- 7) Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- 8) Detector = RMS.
- 9) Trace mode = max hold.
- 10) Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

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

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.51	20.64	228.338	23.59	30	Pass
40	5200	24.33	24.42	547.713	27.39	30	Pass
48	5240	25.27	25.37	680.862	28.33	30	Pass
149	5745	19.42	19.61	178.909	22.53	30	Pass
157	5785	24.31	24.42	546.468	27.38	30	Pass
165	5825	22.27	22.33	339.657	25.31	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.43	20.61	225.488	23.53	30	Pass
40	5200	24.29	24.39	543.323	27.35	30	Pass
48	5240	24.34	24.51	554.132	27.44	30	Pass
149	5745	21.66	21.73	295.491	24.71	30	Pass
157	5785	24.07	24.16	515.885	27.13	30	Pass
165	5825	22.37	22.49	350.003	25.44	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.03	17.24	103.432	20.15	30	Pass
46	5230	24.14	24.29	527.952	27.23	30	Pass
151	5755	17.02	17.18	102.59	20.11	30	Pass
159	5795	22.02	22.35	331.012	25.20	30	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	15.18	15.24	66.381	18.22	30	Pass
155	5775	16.29	16.41	86.312	19.36	30	Pass

26dB BANDWIDTH:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	22.40	22.11	Pass
40	5200	26.69	27.27	Pass
48	5240	26.11	27.00	Pass

802.11n (HT20)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	23.31	23.20	Pass
40	5200	27.76	27.75	Pass
48	5240	26.21	28.28	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	46.53	46.52	Pass
46	5230	50.70	49.53	Pass

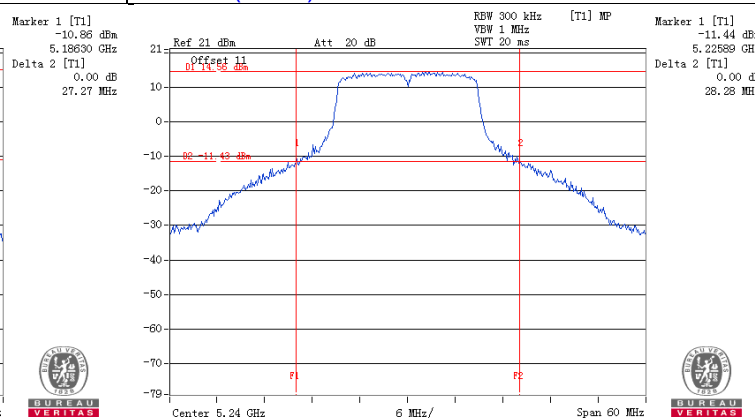
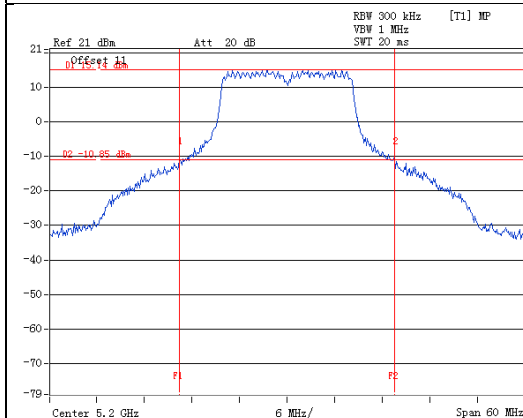
802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	87.56	90.93	Pass

SPECTRUM PLOT OF WORST VALUE

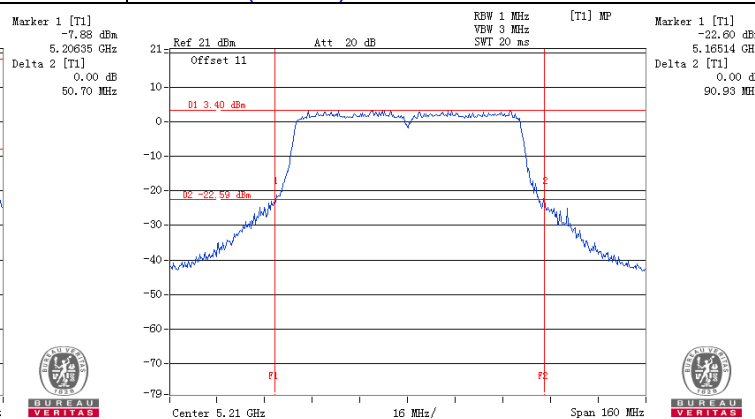
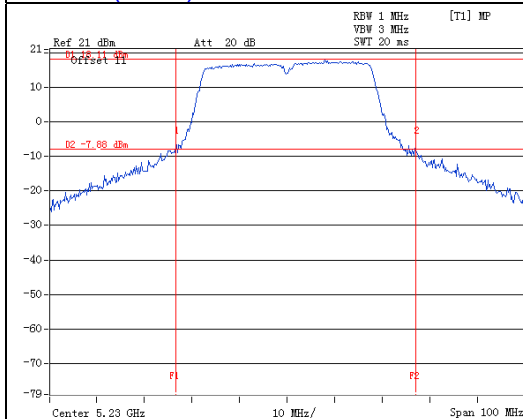
802.11a

802.11n (HT20)



802.11n (HT40)

802.11ac (VHT80)



OCCUPIED BANDWIDTH:

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.80	16.68
40	5200	17.04	17.04
48	5240	17.04	17.04
149	5745	16.69	16.78
157	5785	16.92	17.64
165	5825	16.68	16.92

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.00	17.76
40	5200	18.12	18.12
48	5240	18.24	18.12
149	5745	17.88	17.88
157	5785	18.12	18.48
165	5825	17.88	18.00

802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.00	36.80
46	5230	37.00	37.00
151	5755	37.00	36.80
159	5795	37.00	37.20

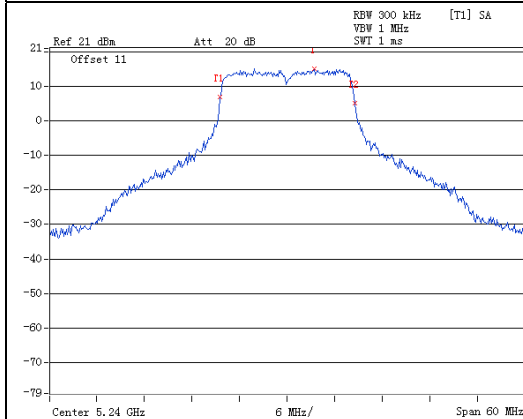
802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.08	76.08
155	5775	76.32	75.84

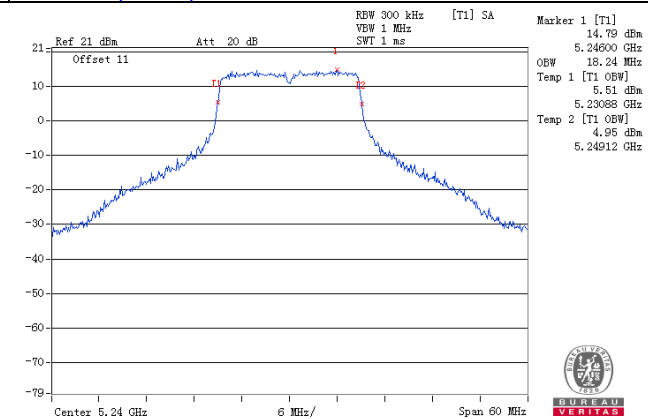
For U-NII-1 band:

SPECTRUM PLOT OF WORST VALUE

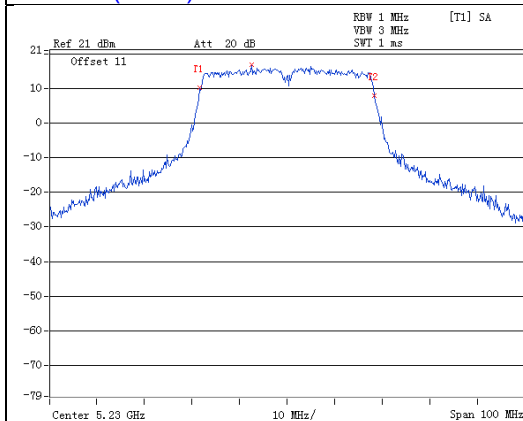
802.11a



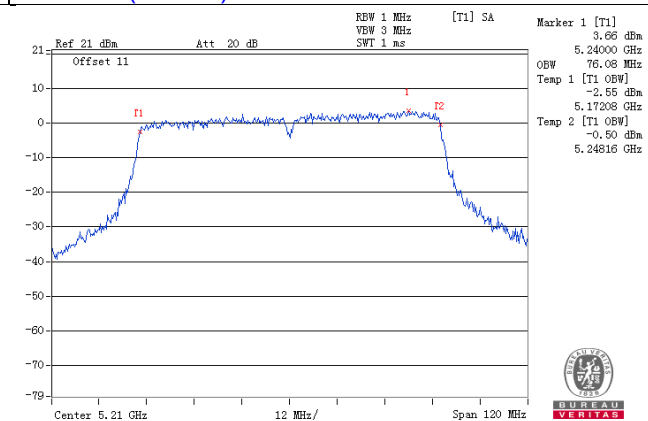
802.11n (HT20)



802.11n (HT40)



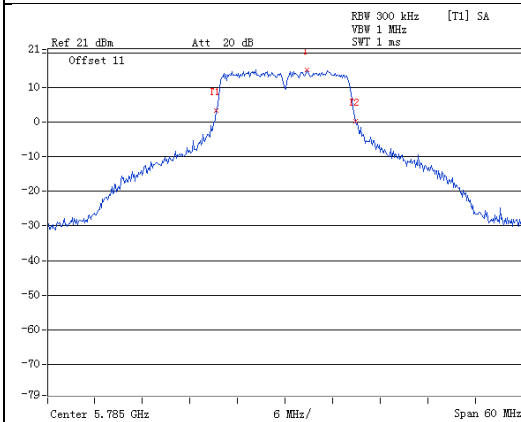
802.11ac (VHT80)



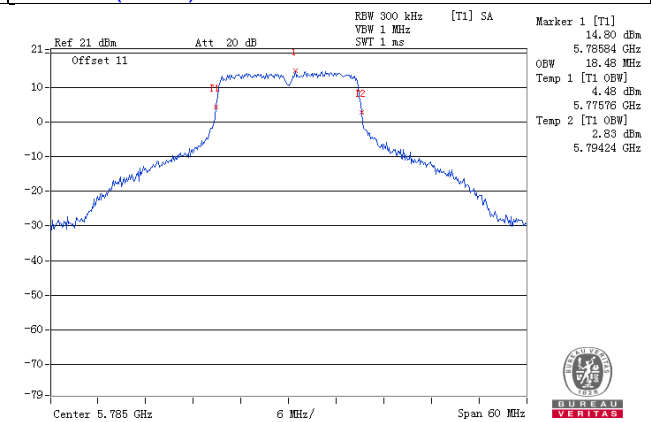
For U-NII-3 band:

SPECTRUM PLOT OF WORST VALUE

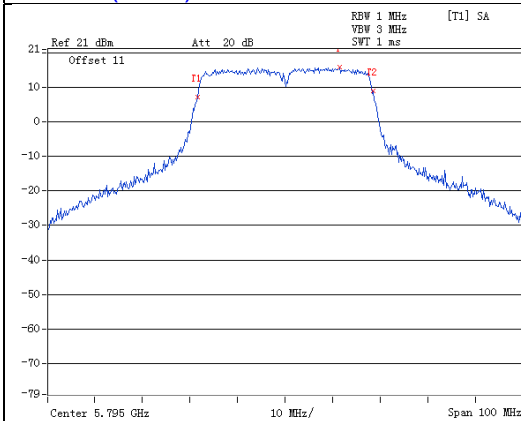
802.11a



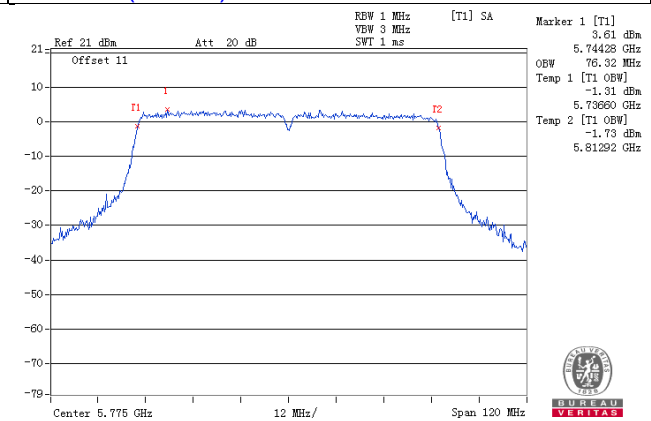
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

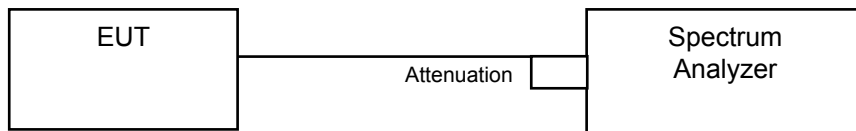


4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

789033 D02 General UNII Test Procedures New Rules v01r01 E/2/b

For U-NII-1 band:

802.11a, 802.11n (HT20):

Using method SA-1

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
- Set Channel power measure = 1MHz
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value

802.11n (HT40), 802.11ac (VHT80):

Using method SA-2

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
- Set Channel power measure = 1MHz
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)

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For U-NII-3 band:

802.11a, 802.11n (HT20):

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

802.11n (HT40), 802.11ac (VHT80):

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value and add 10 log (1/duty cycle)
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	7.01	5.94	9.52	17	Pass
40	5200	11.00	10.14	13.60	17	Pass
48	5240	10.93	10.41	13.69	17	Pass

Note:

- 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.
- For U-NII-1:** Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.65\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.

802.11n (HT20)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	7.00	5.65	9.39	17	Pass
40	5200	10.76	9.90	13.36	17	Pass
48	5240	10.66	10.11	13.40	17	Pass

Note:

- 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.
- For U-NII-1:** Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.65\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.

802.11n (HT40)

Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD W/O Duty Factor (dBm/MHz)	Duty Factor	Total PSD With Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1					
38	5190	-1.78	-2.56	0.85	0.14	0.99	17	Pass
46	5230	7.04	6.20	9.65	0.14	9.79	17	Pass

Note:

- 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.
- For U-NII-1:** Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.65\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

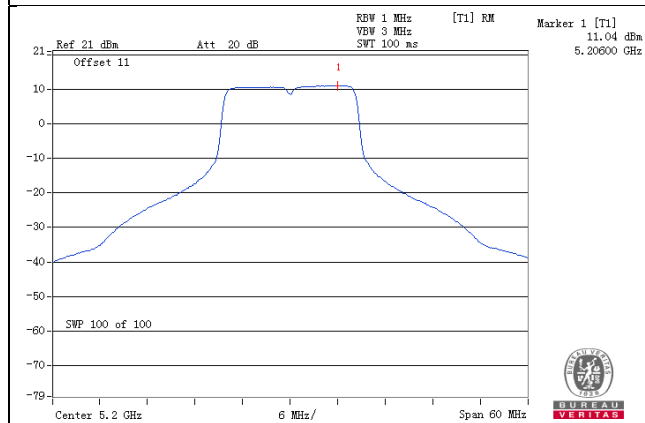
Chan.	Frequency (MHz)	PSD (dBm/MHz)		Total PSD W/O Duty Factor (dBm/MHz)	Duty Factor	Total PSD With Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-6.46	-8.04	-4.17	0.26	-3.91	17	Pass

Note:

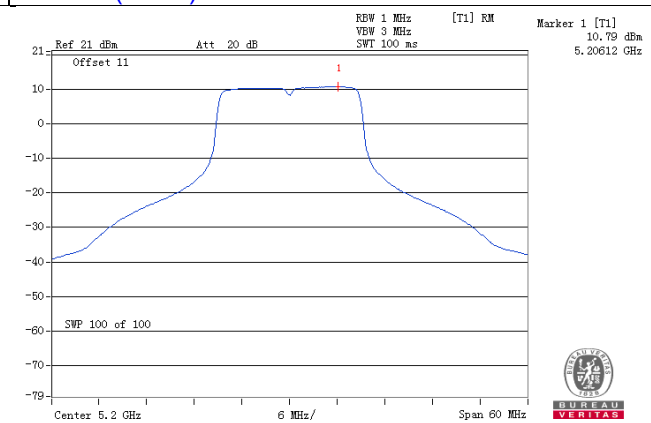
- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1:** Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.65 \text{ dBi} < 6 \text{ dBi}$, so the power density limit shall be not reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

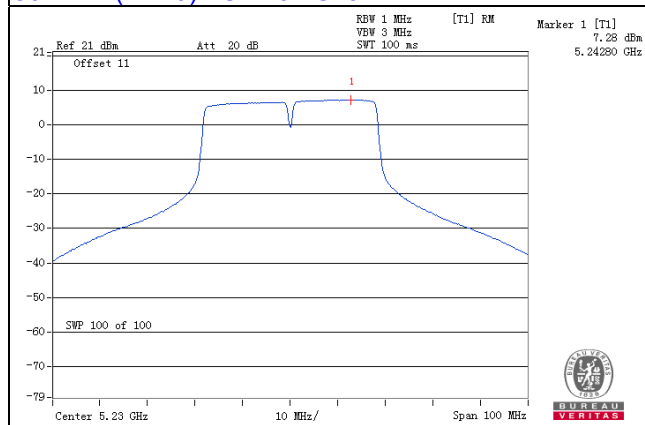
802.11a / Ch 40 / Chain 0



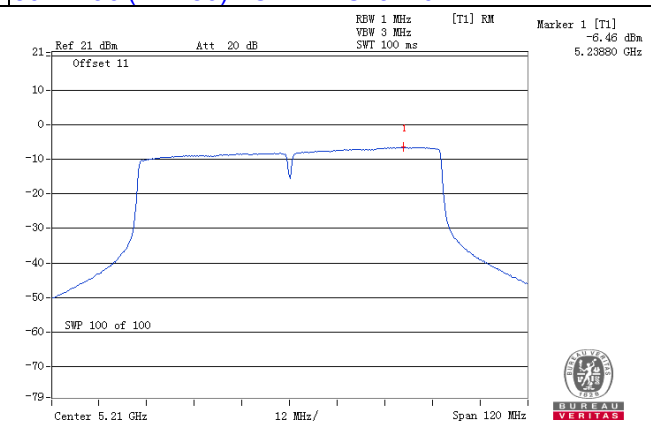
802.11n (HT20) / Ch 40 / Chain 0



802.11n (HT40) / Ch 46 / Chain 1



802.11ac (VHT80) / Ch 42 / Chain 0



For U-NII-3 Band

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-1.67	0.55	3.01	3.56	30.00	Pass
	157	5785	2.02	4.24	3.01	7.25	30.00	Pass
	165	5825	0.33	2.55	3.01	5.56	30.00	Pass
1	149	5745	-1.68	0.54	3.01	3.55	30.00	Pass
	157	5785	2.52	4.74	3.01	7.75	30.00	Pass
	165	5825	1.36	3.58	3.01	6.59	30.00	Pass

Note:

- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.13\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-0.03	2.19	3.01	5.20	30.00	Pass
	157	5785	1.73	3.95	3.01	6.96	30.00	Pass
	165	5825	-0.10	2.12	3.01	5.13	30.00	Pass
1	149	5745	0.07	2.29	3.01	5.30	30.00	Pass
	157	5785	2.14	4.36	3.01	7.37	30.00	Pass
	165	5825	0.88	3.10	3.01	6.11	30.00	Pass

Note:

- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.13\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-9.07	-6.85	3.01	0.14	-3.70	30.00	Pass
	159	5795	-3.78	-1.56	3.01	0.14	1.59	30.00	Pass
1	151	5755	-8.53	-6.31	3.01	0.14	-3.16	30.00	Pass
	159	5795	-3.02	-0.80	3.01	0.14	2.35	30.00	Pass

Note:

- Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.13\text{dBi} < 6\text{dBi}$, so the power density limit shall be not reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

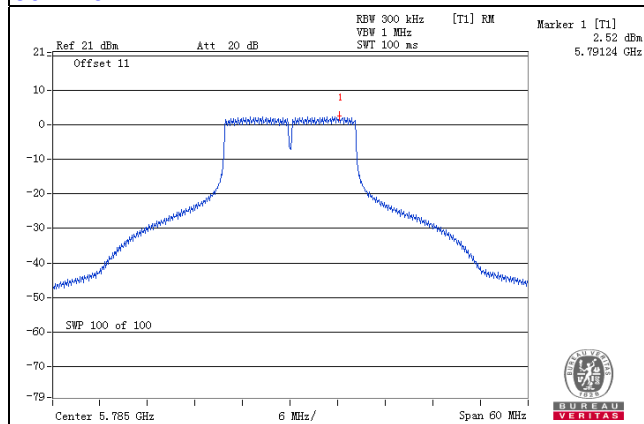
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty Factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-15.97	-13.75	3.01	0.26	-10.48	30.00	Pass
1	155	5775	-14.05	-11.83	3.01	0.26	-8.56	30.00	Pass

Note:

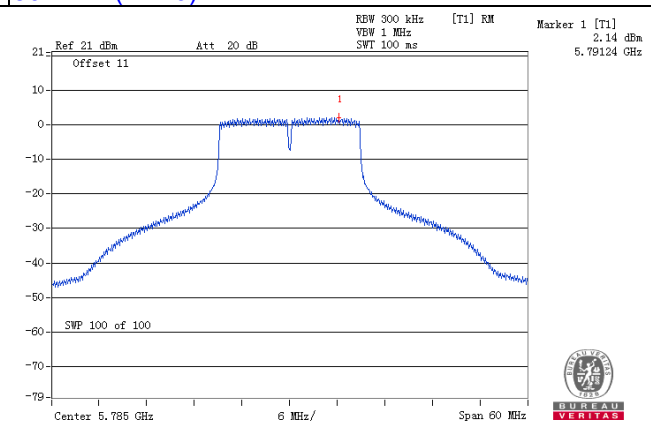
1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.13 \text{ dBi} < 6 \text{ dBi}$, so the power density limit shall be not reduced.
2. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

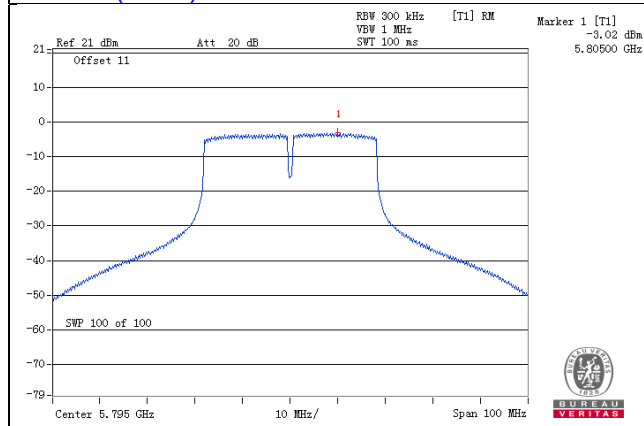
802.11a



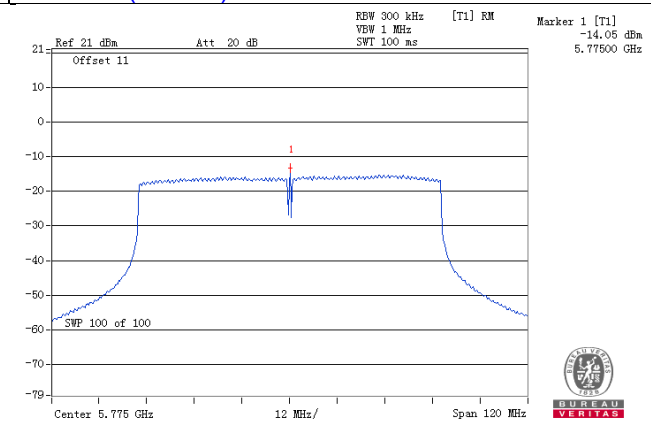
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

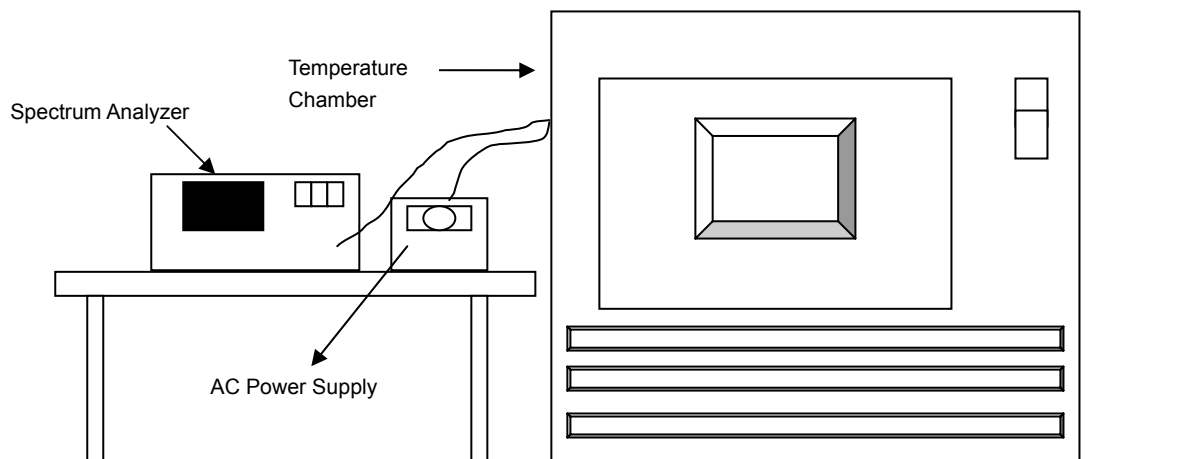


4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0135	0.00026	5180.0135	0.00026	5180.0106	0.00020	5180.0105	0.00020
40	120	5179.9860	-0.00027	5179.9877	-0.00024	5179.9849	-0.00029	5179.9864	-0.00026
30	120	5180.0210	0.00041	5180.0181	0.00035	5180.0209	0.00040	5180.0204	0.00039
20	120	5179.9749	-0.00048	5179.9751	-0.00048	5179.9776	-0.00043	5179.9788	-0.00041
10	120	5180.0164	0.00032	5180.0142	0.00027	5180.0159	0.00031	5180.0139	0.00027
0	120	5179.9964	-0.00007	5179.9968	-0.00006	5179.9946	-0.00010	5179.9935	-0.00013
-10	120	5179.9961	-0.00008	5179.994	-0.00012	5179.9967	-0.00006	5179.9950	-0.00010
-20	120	5179.9752	-0.00048	5179.9768	-0.00045	5179.9784	-0.00042	5179.9774	-0.00044
-30	120	5180.0232	0.00045	5180.0228	0.00044	5180.0241	0.00047	5180.0239	0.00046

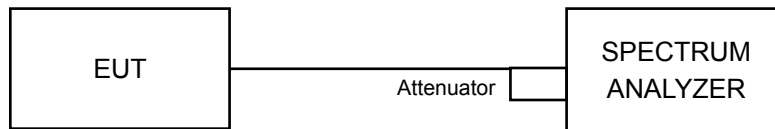
Frequency Stability Versus Voltage.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9756	-0.00047	5179.9750	-0.00048	5179.9777	-0.00043	5179.9793	-0.00040
	120	5179.9749	-0.00048	5179.9751	-0.00048	5179.9776	-0.00043	5179.9788	-0.00041
	102	5179.9753	-0.00048	5179.9758	-0.00047	5179.9769	-0.00045	5179.9783	-0.00042

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

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

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.62	17.61	0.5	Pass
157	5785	17.59	17.61	0.5	Pass
165	5825	17.62	17.63	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.34	36.40	0.5	Pass
159	5795	36.12	36.20	0.5	Pass

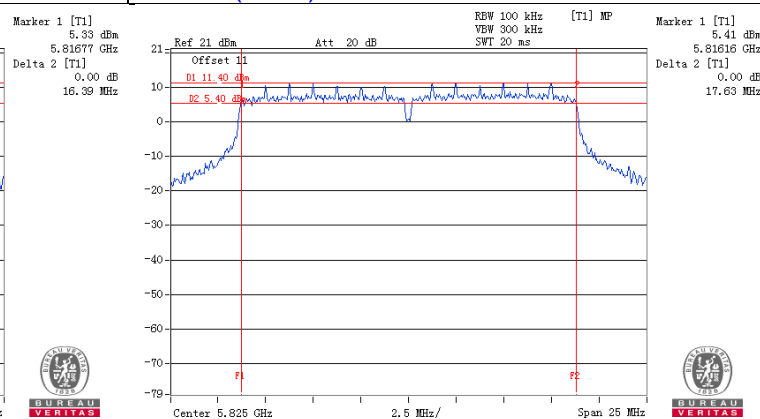
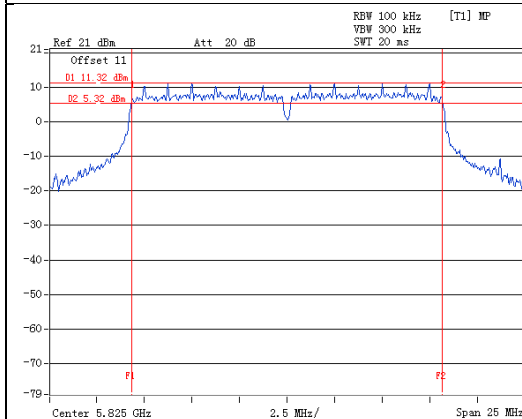
802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.37	75.58	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

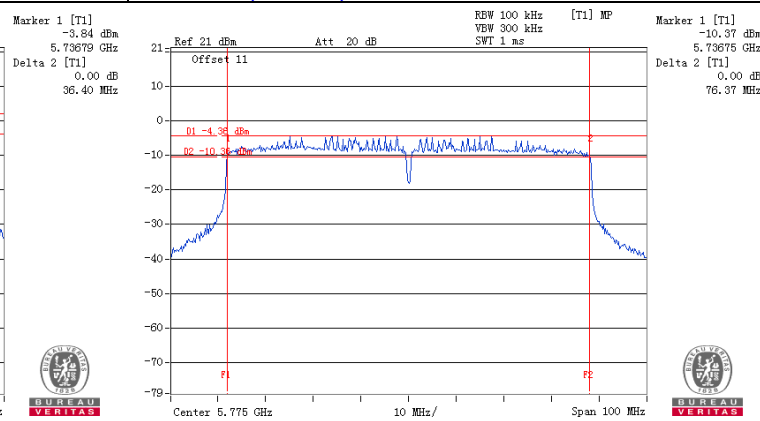
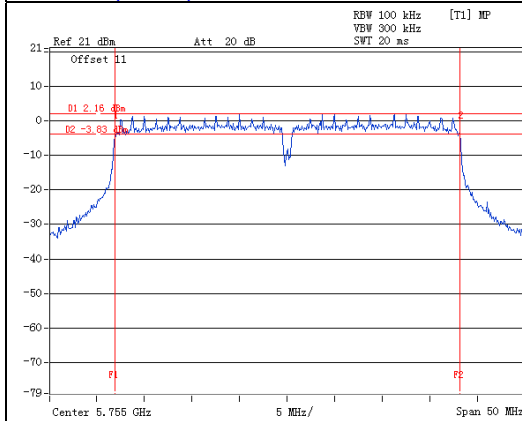
802.11a

802.11n (HT20)



802.11n (HT40)

802.11ac (VHT80)



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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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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