

FCC Test Report

Report No.: RF130103E06B-1

FCC ID: Q87-EA6400

Test Model: EA6400

Series Model: EA6300V1

Received Date: Mar. 17, 2016

Test Date: Mar. 22 to Apr. 07, 2016

Issued Date: May 19, 2016

Applicant: Linksys LLC

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**Report Issue History Record**

Issue No.	Reason for Change	Date Issued
RF130103E06-1	Original	Feb. 26, 2013
RF130103E06B-1	1. Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band. 2. Added the LV6 adapter.	May 19, 2016

Release Control Record

Issue No.	Description	Date Issued
RF130103E06B-1	Original release.	May 19, 2016

1 Certificate of Conformity

Product: Linksys Smart Wi-Fi Router AC1600, Linksys Smart Wi-Fi Router AC1200

Brand: Linksys

Test Model: EA6400

Series Model: EA6300V1

Sample Status: ENGINEERING SAMPLE

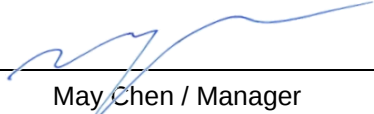
Applicant: Linksys LLC

Test Date: Mar. 22 to Apr. 07, 2016

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

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by :  , **Date:** May 19, 2016
Claire Kuan / Specialist

Approved by :  , **Date:** May 19, 2016
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.52dB at 0.34531MHz.
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
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	No antenna connector is used.

NOTE: 1. This report is prepared for FCC Class II change. (Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band)

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	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.40 dB
	6GHz ~ 18GHz	3.73 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Linksys Smart Wi-Fi Router AC1600, Linksys Smart Wi-Fi Router AC1200
Brand	Linksys
Test Model	EA6400
Series Model	EA6300V1
Status of EUT	ENGINEERING SAMPLE
Driver version	V6.37.14.62
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	2.4GHz: 2.412GHz ~ 2.462GHz 5GHz: 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40) 5GHz: 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
Output Power	2.4GHz: 802.11b: 140.281mW 802.11g: 174.181mW 802.11n (HT20): 195.489mW 802.11n (HT40): 60.227mW 5GHz (5.18 ~ 5.24GHz): 802.11a: 82.035mW 802.11n (HT20): 346.868mW 802.11n (HT40): 234.489mW 802.11n (VHT80): 84.102mW 5GHz (5.745 ~ 5.825GHz): 802.11a: 261.216mW 802.11n (HT20): 627.806mW 802.11n (HT40): 594.287mW 802.11n (VHT80): 74.549mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC Class II change. The difference compared with the Report No.: RF130103E06-1 design is as the following:

◆ Upgrade the standard to section 15.407 under new rule for U-NII-1, U-NII-3 band.

◆ Added one power adapter as below table:

Brand	Model No.	Spec.
LEI	MU42-3120300-A1	Input: 100-240V, 1.5A, 50/60Hz Output: 12V, 3A DC output cable: unshielded, 1.5m

2. According to above conditions, all test items of U-NII-1, U-NII-3 band need to be performed. And all data was verified to meet the requirements.
3. The EUT is a 2.4GHz & 5GHz WLAN device.
4. The EUT have two product names and model names, which are identical to each other in all aspects except for the following table:

Product	Model No.	Difference
Linksys Smart Wi-Fi Router AC1600	EA6400	For the different marketing
Linksys Smart Wi-Fi Router AC1200	EA6300V1	

From the above models, model: EA6400 was selected as representative model for the test and its data was recorded in this report.

5. The antenna provided to the EUT, please refer to the following table:

For 2.4GHz						
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain(dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connecter Type
Left side Chain (1)	Galtronics	02100073-05389A3	Dipole	1.515	2400~2483.5	NA
Front side Chain (0)	Galtronics	02100073-05389B2	Dipole	3.745	2400~2483.5	NA
For 5GHz (Band 1)						
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain(dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connecter Type
Left side Chain (1)	Galtronics	02102142-05389A4	Dipole	4.339	5150~5250	NA
Right side Chain (0)	Galtronics	02102142-05389A1	Dipole	2.734	5150~5250	NA
Front side Chain (2)	Galtronics	02102142-05389B1	Dipole	3.178	5150~5250	NA
For 5GHz (Band 4)						
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain(dBi) (Include cable loss)	Frequency range (MHz to MHz)	Connecter Type
Left side Chain (1)	Galtronics	02102142-05389A2	Dipole	4.162	5725~5850	NA
Right side Chain (0)	Galtronics	02102142-05389A3	Dipole	5.314	5725~5850	NA
Front side Chain (2)	Galtronics	02102142-05389B1	Dipole	3.463	5725~5850	NA
Note: According to the above antennas, there are three antennas will transmit simultaneously (one is Vertical and the others are Horizontal).						

6. The EUT incorporates a MIMO function.

Modulation Mode	TX/RX Function
802.11b	1TX/2RX
802.11g	1TX (Diversity)/2RX
802.11n (HT20) <2.4GHz>	2TX/2RX
802.11n (HT40) <2.4GHz>	2TX/2RX
802.11a	1TX (Diversity)/3Rx
802.11n (HT20) <5GHz>	3TX/3RX
802.11n (HT40) <5GHz>	3TX/3RX
802.11ac (VHT20)	3TX/3RX
802.11ac (VHT40)	3TX/3RX
802.11ac (VHT80)	3TX/3RX

Note: 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)

- Spurious emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
- When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.

9. When the EUT operating in 802.11ac, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.
10. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11n (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), 802.11n (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11n (VHT80):

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11n (VHT80):

Channel	Frequency
155	5775 MHz

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

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

NOTE: 1. The test mode was reference to the worst case in the original test report.

Radiated Emission Test (Above 1GHz):

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

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11n (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11n (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11n (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11n (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	5775	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

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

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	38 to 46, 151 to 159	157	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

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

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT20)	5180-5240, 5745-5825	38 to 46, 151 to 159	157	OFDM	BPSK	6.5

Antenna Port Conducted Measurement:

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

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11n (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11n (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11n (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11n (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	5775	OFDM	BPSK	29.3

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	24deg. C, 68%RH	120Vac, 60Hz	Andy Ho
RE $<$ 1G	20deg. C, 67%RH	120Vac, 60Hz	Gary Cheng
PLC	20deg. C, 60%RH	120Vac, 60Hz	Wythe Lin
APCM	15deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

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

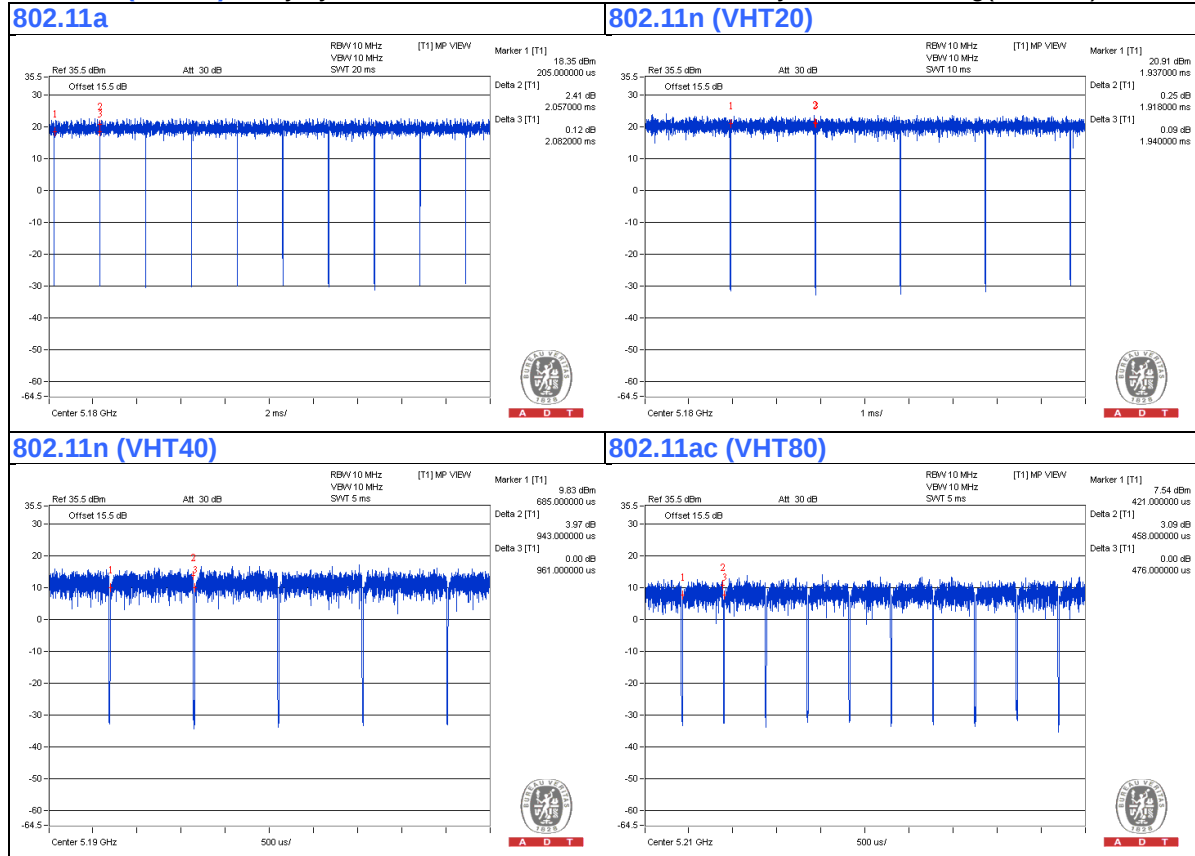
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $2.057 \text{ ms} / 2.082 \text{ ms} = 0.988$

802.11n (VHT20): Duty cycle = $1.918 \text{ ms} / 1.94 \text{ ms} = 0.989$

802.11n (VHT40): Duty cycle = $0.943 \text{ ms} / 0.961 \text{ ms} = 0.981$

802.11ac (VHT80): Duty cycle = $0.458 \text{ ms} / 0.476 \text{ ms} = 0.962$, Duty factor = $10 * \log(1/0.962) = 0.17$



3.4 Description of Support Units

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

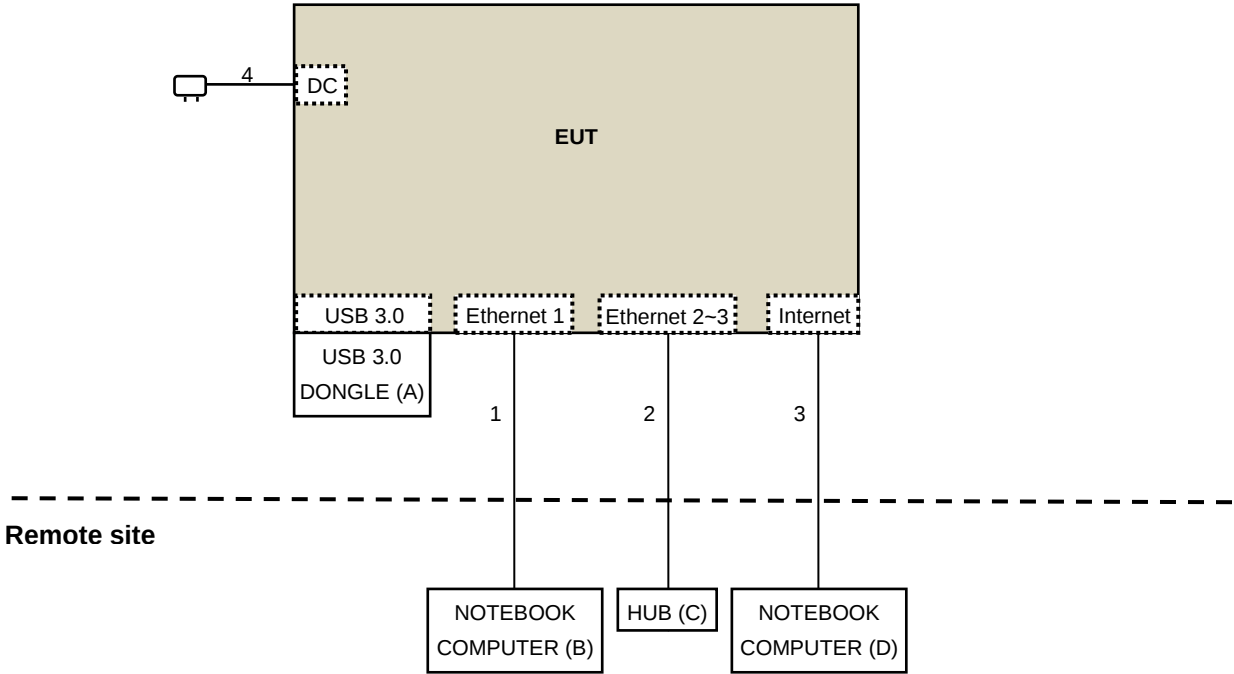
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB 3.0 DONGLE	TCELL	TC-025-005	NA	NA	Provided by Lab
B.	NOTEBOOK COMPUTER	HP	Pavilion 14-ab023TU	5CD5340WXZ	NA	Provided by Lab
C.	HUB	PCI	FX-05EA	NA	NA	Provided by Lab
D.	NOTEBOOK COMPUTER	EDLL	E5430	HL3SKV1	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45	1	10	No	0	Provided by Lab
2.	RJ-45	3	10	No	0	Provided by Lab
3.	RJ-45	1	10	No	0	Provided by Lab
4.	DC	1	1.5	No	0	Supplied by Client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D02 General UNII Test Procedure New Rules v01r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules 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:

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

4.1.2 Test Instruments

For below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier ^(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna ^(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 03, 2015	Apr. 02, 2016
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Boresight Antenna Fixture	NA	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The FCC Site Registration No. is 292998
5. The CANADA Site Registration No. is 20331-2
6. Tested Date: Mar. 22, 2016

For Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	Aug. 12, 2015	Aug. 11, 2016
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Jan. 20, 2016	Jan. 19, 2017
Pre-Amplifier Agilent	8449B	3008A02465	Apr. 06, 2015	Apr. 05, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150317 150321 150322	Mar. 31, 2015	Mar. 30, 2016
Spectrum Analyzer Keysight	N9030A	MY54490520	July 26, 2015	July 25, 2016
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated _V8.7.07	NA	NA	NA
Antenna Tower & Turn Table CT	NA	NA	NA	NA
Boresight Antenna Fixture	NA	NA	NA	NA
Power Meter Anritsu	ML2495A	1014008	Apr. 28, 2015	Apr. 27, 2016
Power Sensor Anritsu	MA2411B	0917122	Apr. 28, 2015	Apr. 27, 2016
Spectrum Analyzer R&S	FSP40	100060	May 08, 2015	May 07, 2016
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-S P-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. The FCC Site Registration No. is 147459
4. The CANADA Site Registration No. is 20331-1
5. Tested Date: Mar. 24, 2016

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:

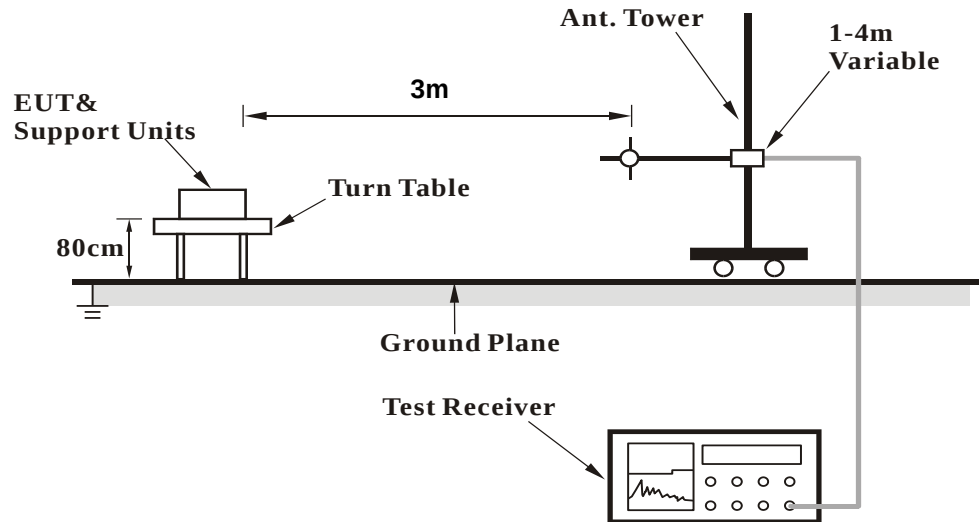
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

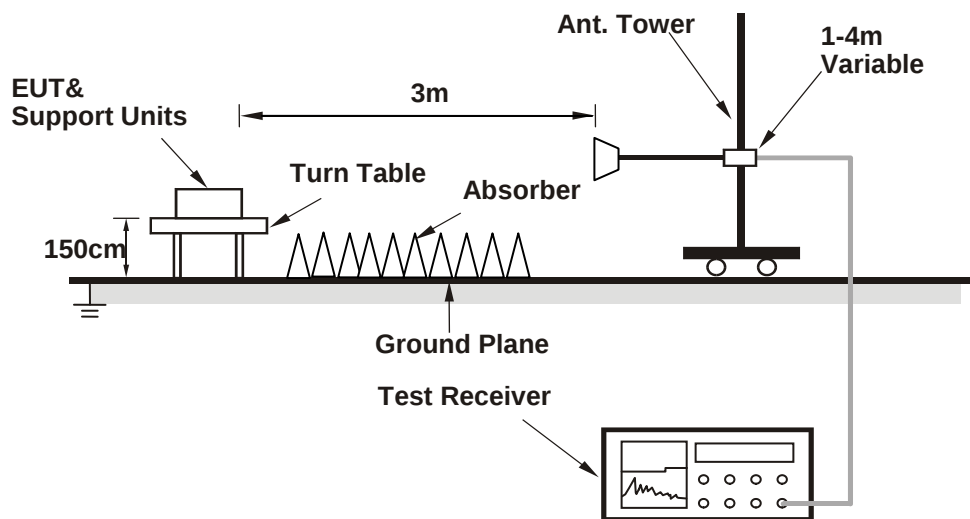
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

1. Placed the EUT on testing table.
2. Connect the EUT with the support unit A (Notebook Computer) which is placed in a remote area.
3. The communication partner run test program "QA Tool[RT5x9xQA V1.0.7.6.exe]" to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	55.1 PK	74.0	-18.9	3.25 H	360	52.69	2.41
2	5100.00	44.2 AV	54.0	-9.8	3.25 H	360	41.79	2.41
3	*5180.00	109.8 PK			3.25 H	360	107.15	2.65
4	*5180.00	99.3 AV			3.25 H	360	96.65	2.65
5	#10360.00	60.2 PK	74.0	-13.8	1.23 H	309	46.98	13.22
6	#10360.00	46.5 AV	54.0	-7.5	1.23 H	309	33.28	13.22
7	15540.00	51.5 PK	74.0	-22.5	1.06 H	337	36.02	15.48
8	15540.00	42.5 AV	54.0	-11.5	1.06 H	337	27.02	15.48
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	51.5 PK	74.0	-22.5	3.73 V	70	49.09	2.41
2	5100.00	41.7 AV	54.0	-12.3	3.73 V	70	39.29	2.41
3	*5180.00	104.1 PK			3.73 V	70	101.45	2.65
4	*5180.00	94.1 AV			3.73 V	70	91.45	2.65
5	#10360.00	57.3 PK	74.0	-16.7	1.14 V	226	44.08	13.22
6	#10360.00	43.7 AV	54.0	-10.3	1.14 V	226	30.48	13.22
7	15540.00	55.0 PK	74.0	-19.0	2.05 V	307	39.52	15.48
8	15540.00	41.7 AV	54.0	-12.3	2.05 V	307	26.22	15.48

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	54.9 PK	74.0	-19.1	3.24 H	334	52.43	2.47
2	5120.00	44.4 AV	54.0	-9.6	3.24 H	334	41.93	2.47
3	*5200.00	109.1 PK			3.24 H	334	106.39	2.71
4	*5200.00	98.7 AV			3.24 H	334	95.99	2.71
5	#10400.00	59.9 PK	74.0	-14.1	1.25 H	323	46.43	13.47
6	#10400.00	46.3 AV	54.0	-7.7	1.25 H	323	32.83	13.47
7	15600.00	51.5 PK	74.0	-22.5	1.12 H	338	36.07	15.43
8	15600.00	42.4 AV	54.0	-11.6	1.12 H	338	26.97	15.43
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	53.6 PK	74.0	-20.4	3.92 V	71	51.13	2.47
2	5120.00	42.7 AV	54.0	-11.3	3.92 V	71	40.23	2.47
3	*5200.00	105.2 PK			3.92 V	71	102.49	2.71
4	*5200.00	95.3 AV			3.92 V	71	92.59	2.71
5	#10400.00	57.2 PK	74.0	-16.8	1.19 V	227	43.73	13.47
6	#10400.00	43.9 AV	54.0	-10.1	1.19 V	227	30.43	13.47
7	15600.00	55.0 PK	74.0	-19.0	2.11 V	323	39.57	15.43
8	15600.00	41.7 AV	54.0	-12.3	2.11 V	323	26.27	15.43

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	108.7 PK			3.06 H	342	105.89	2.81
2	*5240.00	98.2 AV			3.06 H	342	95.39	2.81
3	5400.00	55.1 PK	74.0	-18.9	3.06 H	342	51.87	3.23
4	5400.00	45.1 AV	54.0	-8.9	3.06 H	342	41.87	3.23
5	#10480.00	60.6 PK	74.0	-13.4	1.20 H	314	47.20	13.40
6	#10480.00	46.8 AV	54.0	-7.2	1.20 H	314	33.40	13.40
7	15720.00	51.7 PK	74.0	-22.3	1.15 H	326	36.69	15.01
8	15720.00	42.7 AV	54.0	-11.3	1.15 H	326	27.69	15.01
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	104.8 PK			3.96 V	80	101.99	2.81
2	*5240.00	94.8 AV			3.96 V	80	91.99	2.81
3	5400.00	53.8 PK	74.0	-20.2	3.96 V	80	50.57	3.23
4	5400.00	43.4 AV	54.0	-10.6	3.96 V	80	40.17	3.23
5	#10480.00	57.6 PK	74.0	-16.4	1.16 V	242	44.20	13.40
6	#10480.00	44.2 AV	54.0	-9.8	1.16 V	242	30.80	13.40
7	15720.00	54.8 PK	74.0	-19.2	2.07 V	309	39.79	15.01
8	15720.00	41.6 AV	54.0	-12.4	2.07 V	309	26.59	15.01

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	63.5 PK	74.0	-10.5	1.03 H	360	59.71	3.79
2	#5715.00	48.9 AV	54.0	-5.1	1.03 H	360	45.11	3.79
3	#5725.00	78.1 PK	78.2	-0.1	1.03 H	360	74.30	3.80
4	*5745.00	110.1 PK			1.03 H	360	106.30	3.80
5	*5745.00	100.3 AV			1.03 H	360	96.50	3.80
6	11490.00	60.8 PK	74.0	-13.2	1.64 H	308	45.77	15.03
7	11490.00	48.6 AV	54.0	-5.4	1.64 H	308	33.57	15.03
8	#17235.00	59.7 PK	74.0	-14.3	1.00 H	309	40.10	19.60
9	#17235.00	46.0 AV	54.0	-8.0	1.00 H	309	26.40	19.60

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	#5715.00	57.2 PK	74.0	-16.8	1.03 V	270	53.41	3.79
2	#5715.00	43.7 AV	54.0	-10.3	1.03 V	270	39.91	3.79
3	#5725.00	72.1 PK	78.2	-6.1	1.03 V	270	68.30	3.80
4	*5745.00	102.7 PK			1.03 V	270	98.90	3.80
5	*5745.00	91.8 AV			1.03 V	270	88.00	3.80
6	11490.00	55.9 PK	74.0	-18.1	1.11 V	257	40.87	15.03
7	11490.00	44.7 AV	54.0	-9.3	1.11 V	257	29.67	15.03
8	#17235.00	57.0 PK	74.0	-17.0	2.05 V	318	37.40	19.60
9	#17235.00	44.6 AV	54.0	-9.4	2.05 V	318	25.00	19.60

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 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	#5715.00	66.8 PK	74.0	-7.2	1.00 H	9	63.01	3.79
2	#5715.00	53.6 AV	54.0	-0.4	1.00 H	9	49.81	3.79
3	#5725.00	56.7 PK	78.2	-21.5	1.00 H	9	52.90	3.80
4	*5785.00	113.3 PK			1.00 H	9	109.47	3.83
5	*5785.00	103.3 AV			1.00 H	9	99.47	3.83
6	#5850.00	63.6 PK	78.2	-14.6	1.00 H	9	59.77	3.83
7	#5860.00	65.1 PK	74.0	-8.9	1.00 H	9	61.26	3.84
8	#5860.00	53.1 AV	54.0	-0.9	1.00 H	9	49.26	3.84
9	11570.00	61.1 PK	74.0	-12.9	1.59 H	301	46.26	14.84
10	11570.00	49.0 AV	54.0	-5.0	1.59 H	301	34.16	14.84
11	#17355.00	59.4 PK	74.0	-14.6	1.04 H	312	39.16	20.24
12	#17355.00	45.5 AV	54.0	-8.5	1.04 H	312	25.26	20.24

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	63.5 PK	74.0	-10.5	1.03 V	278	59.71	3.79
2	#5715.00	50.4 AV	54.0	-3.6	1.03 V	278	46.61	3.79
3	#5725.00	53.2 PK	78.2	-25.0	1.03 V	278	49.40	3.80
4	*5785.00	109.7 PK			1.03 V	278	105.87	3.83
5	*5785.00	95.1 AV			1.03 V	278	91.27	3.83
6	#5850.00	59.7 PK	78.2	-18.5	1.03 V	278	55.87	3.83
7	#5860.00	61.6 PK	74.0	-12.4	1.03 V	278	57.76	3.84
8	#5860.00	50.1 AV	54.0	-3.9	1.03 V	278	46.26	3.84
9	11570.00	56.4 PK	74.0	-17.6	1.08 V	251	41.56	14.84
10	11570.00	44.9 AV	54.0	-9.1	1.08 V	251	30.06	14.84
11	#17355.00	56.7 PK	74.0	-17.3	2.04 V	307	36.46	20.24
12	#17355.00	44.2 AV	54.0	-9.8	2.04 V	307	23.96	20.24

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	113.4 PK			1.10 H	10	109.57	3.83
2	*5825.00	103.3 AV			1.10 H	10	99.47	3.83
3	#5850.00	78.0 PK	78.2	-0.2	1.10 H	10	74.17	3.83
4	#5905.00	61.4 PK	74.0	-12.6	1.10 H	10	57.54	3.86
5	#5905.00	48.9 AV	54.0	-5.1	1.10 H	10	45.04	3.86
6	11650.00	61.1 PK	74.0	-12.9	1.59 H	313	46.43	14.67
7	11650.00	49.3 AV	54.0	-4.7	1.59 H	313	34.63	14.67
8	#17475.00	60.0 PK	74.0	-14.0	1.08 H	309	39.17	20.83
9	#17475.00	46.0 AV	54.0	-8.0	1.08 H	309	25.17	20.83
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	106.9 PK			1.05 V	277	103.07	3.83
2	*5825.00	96.5 AV			1.05 V	277	92.67	3.83
3	#5850.00	74.1 PK	78.2	-4.1	1.05 V	277	70.27	3.83
4	#5905.00	57.4 PK	74.0	-16.6	1.05 V	277	53.54	3.86
5	#5905.00	45.2 AV	54.0	-8.8	1.05 V	277	41.34	3.86
6	11650.00	56.9 PK	74.0	-17.1	1.02 V	252	42.23	14.67
7	11650.00	45.2 AV	54.0	-8.8	1.02 V	252	30.53	14.67
8	#17475.00	56.2 PK	74.0	-17.8	2.09 V	313	35.37	20.83
9	#17475.00	43.8 AV	54.0	-10.2	2.09 V	313	22.97	20.83

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 (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5099.00	59.6 PK	74.0	-14.4	1.37 H	360	57.19	2.41
2	5099.00	49.9 AV	54.0	-4.1	1.37 H	360	47.49	2.41
3	5150.00	67.5 PK	74.0	-6.5	1.37 H	360	64.94	2.56
4	5150.00	50.9 AV	54.0	-3.1	1.37 H	360	48.34	2.56
5	*5180.00	112.4 PK			1.37 H	360	109.75	2.65
6	*5180.00	102.4 AV			1.37 H	360	99.75	2.65
7	#10360.00	60.8 PK	74.0	-13.2	1.15 H	321	47.58	13.22
8	#10360.00	46.8 AV	54.0	-7.2	1.15 H	321	33.58	13.22
9	15540.00	52.1 PK	74.0	-21.9	1.00 H	334	36.62	15.48
10	15540.00	42.9 AV	54.0	-11.1	1.00 H	334	27.42	15.48
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	5099.00	59.5 PK	74.0	-14.5	1.00 V	120	57.09	2.41
2	5099.00	49.3 AV	54.0	-4.7	1.00 V	120	46.89	2.41
3	5150.00	62.9 PK	74.0	-11.1	1.00 V	120	60.34	2.56
4	5150.00	48.2 AV	54.0	-5.8	1.00 V	120	45.64	2.56
5	*5180.00	113.2 PK			1.00 V	120	110.55	2.65
6	*5180.00	102.6 AV			1.00 V	120	99.95	2.65
7	#10360.00	57.4 PK	74.0	-16.6	1.17 V	231	44.18	13.22
8	#10360.00	43.9 AV	54.0	-10.1	1.17 V	231	30.68	13.22
9	15540.00	55.1 PK	74.0	-18.9	2.04 V	296	39.62	15.48
10	15540.00	41.7 AV	54.0	-12.3	2.04 V	296	26.22	15.48

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	60.8 PK	74.0	-13.2	1.55 H	359	58.33	2.47
2	5120.00	50.6 AV	54.0	-3.4	1.55 H	359	48.13	2.47
3	*5200.00	112.5 PK			1.55 H	359	109.79	2.71
4	*5200.00	103.2 AV			1.55 H	359	100.49	2.71
5	5360.00	57.1 PK	74.0	-16.9	1.55 H	359	53.99	3.11
6	5360.00	47.2 AV	54.0	-6.8	1.55 H	359	44.09	3.11
7	#10400.00	60.4 PK	74.0	-13.6	1.13 H	329	46.93	13.47
8	#10400.00	46.6 AV	54.0	-7.4	1.13 H	329	33.13	13.47
9	15600.00	52.8 PK	74.0	-21.2	1.02 H	321	37.37	15.43
10	15600.00	43.4 AV	54.0	-10.6	1.02 H	321	27.97	15.43

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	61.3 PK	74.0	-12.7	1.00 V	121	58.83	2.47
2	5120.00	50.1 AV	54.0	-3.9	1.00 V	121	47.63	2.47
3	*5200.00	112.2 PK			1.00 V	121	109.49	2.71
4	*5200.00	102.8 AV			1.00 V	121	100.09	2.71
5	5360.00	55.5 PK	74.0	-18.5	1.00 V	121	52.39	3.11
6	5360.00	45.7 AV	54.0	-8.3	1.00 V	121	42.59	3.11
7	#10400.00	57.2 PK	74.0	-16.8	1.13 V	235	43.73	13.47
8	#10400.00	43.6 AV	54.0	-10.4	1.13 V	235	30.13	13.47
9	15600.00	55.1 PK	74.0	-18.9	2.05 V	292	39.67	15.43
10	15600.00	41.7 AV	54.0	-12.3	2.05 V	292	26.27	15.43

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5080.00	57.7 PK	74.0	-16.3	1.58 H	356	55.32	2.38
2	5080.00	47.7 AV	54.0	-6.3	1.58 H	356	45.32	2.38
3	*5240.00	113.8 PK			1.58 H	356	110.99	2.81
4	*5240.00	104.3 AV			1.58 H	356	101.49	2.81
5	5400.00	60.6 PK	74.0	-13.4	1.58 H	356	57.37	3.23
6	5400.00	50.9 AV	54.0	-3.1	1.58 H	356	47.67	3.23
7	#10480.00	59.9 PK	74.0	-14.1	1.03 H	341	46.50	13.40
8	#10480.00	46.1 AV	54.0	-7.9	1.03 H	341	32.70	13.40
9	15720.00	52.9 PK	74.0	-21.1	1.00 H	311	37.89	15.01
10	15720.00	43.7 AV	54.0	-10.3	1.00 H	311	28.69	15.01

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5080.00	56.8 PK	74.0	-17.2	1.00 V	121	54.42	2.38
2	5080.00	47.3 AV	54.0	-6.7	1.00 V	121	44.92	2.38
3	*5240.00	114.0 PK			1.00 V	121	111.19	2.81
4	*5240.00	103.5 AV			1.00 V	121	100.69	2.81
5	5400.00	61.2 PK	74.0	-12.8	1.00 V	121	57.97	3.23
6	5400.00	50.1 AV	54.0	-3.9	1.00 V	121	46.87	3.23
7	#10480.00	57.2 PK	74.0	-16.8	1.16 V	243	43.80	13.40
8	#10480.00	43.6 AV	54.0	-10.4	1.16 V	243	30.20	13.40
9	15720.00	55.2 PK	74.0	-18.8	2.08 V	293	40.19	15.01
10	15720.00	42.0 AV	54.0	-12.0	2.08 V	293	26.99	15.01

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	65.6 PK	74.0	-8.4	2.30 H	360	61.81	3.79
2	#5715.00	50.5 AV	54.0	-3.5	2.30 H	360	46.71	3.79
3	#5725.00	78.1 PK	78.2	-0.1	2.30 H	360	74.30	3.80
4	*5745.00	111.4 PK			2.30 H	360	107.60	3.80
5	*5745.00	101.5 AV			2.30 H	360	97.70	3.80
6	11490.00	61.4 PK	74.0	-12.6	1.64 H	328	46.37	15.03
7	11490.00	49.4 AV	54.0	-4.6	1.64 H	328	34.37	15.03
8	#17235.00	60.4 PK	74.0	-13.6	1.08 H	302	40.80	19.60
9	#17235.00	46.3 AV	54.0	-7.7	1.08 H	302	26.70	19.60

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	#5715.00	64.3 PK	74.0	-9.7	1.02 V	131	60.51	3.79
2	#5715.00	49.6 AV	54.0	-4.4	1.02 V	131	45.81	3.79
3	#5725.00	77.4 PK	78.2	-0.8	1.02 V	131	73.60	3.80
4	*5745.00	110.3 PK			1.02 V	131	106.50	3.80
5	*5745.00	100.2 AV			1.02 V	131	96.40	3.80
6	11490.00	57.3 PK	74.0	-16.7	1.05 V	266	42.27	15.03
7	11490.00	45.7 AV	54.0	-8.3	1.05 V	266	30.67	15.03
8	#17235.00	55.9 PK	74.0	-18.1	2.12 V	326	36.30	19.60
9	#17235.00	43.5 AV	54.0	-10.5	2.12 V	326	23.90	19.60

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 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	#5715.00	66.1 PK	68.2	-2.1	2.33 H	360	62.31	3.79
2	#5725.00	58.4 PK	78.2	-19.8	2.33 H	360	54.60	3.80
3	*5785.00	115.5 PK			2.33 H	360	111.67	3.83
4	*5785.00	106.2 AV			2.33 H	360	102.37	3.83
5	#5850.00	64.5 PK	78.2	-13.7	2.33 H	360	60.67	3.83
6	#5860.00	65.4 PK	68.2	-2.8	2.33 H	360	61.56	3.84
7	11570.00	61.9 PK	74.0	-12.1	1.69 H	325	47.06	14.84
8	11570.00	49.8 AV	54.0	-4.2	1.69 H	325	34.96	14.84
9	#17355.00	60.0 PK	74.0	-14.0	1.02 H	295	39.76	20.24
10	#17355.00	45.9 AV	54.0	-8.1	1.02 H	295	25.66	20.24

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.3 PK	68.2	-3.9	1.03 V	276	60.51	3.79
2	#5725.00	57.2 PK	78.2	-21.0	1.03 V	279	53.40	3.80
3	*5785.00	113.7 PK			1.03 V	279	109.87	3.83
4	*5785.00	104.2 AV			1.03 V	279	100.37	3.83
5	#5850.00	69.6 PK	78.2	-8.6	1.03 V	279	65.77	3.83
6	#5860.00	63.9 PK	68.2	-4.3	1.03 V	280	60.06	3.84
7	11570.00	57.3 PK	74.0	-16.7	1.02 V	263	42.46	14.84
8	11570.00	45.9 AV	54.0	-8.1	1.02 V	263	31.06	14.84
9	#17355.00	56.4 PK	74.0	-17.6	2.06 V	324	36.16	20.24
10	#17355.00	43.8 AV	54.0	-10.2	2.06 V	324	23.56	20.24

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.6 PK			2.29 H	360	110.77	3.83
2	*5825.00	105.0 AV			2.29 H	360	101.17	3.83
3	#5850.00	78.0 PK	78.2	-0.2	2.29 H	360	74.17	3.83
4	#5860.00	65.6 PK	68.2	-2.6	2.29 H	360	61.76	3.84
5	11650.00	61.8 PK	74.0	-12.2	1.67 H	327	47.13	14.67
6	11650.00	49.9 AV	54.0	-4.1	1.67 H	327	35.23	14.67
7	#17475.00	60.1 PK	74.0	-13.9	1.06 H	306	39.27	20.83
8	#17475.00	46.0 AV	54.0	-8.0	1.06 H	306	25.17	20.83
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	113.0 PK			1.05 V	277	109.17	3.83
2	*5825.00	103.6 AV			1.05 V	277	99.77	3.83
3	#5850.00	76.8 PK	78.2	-1.4	1.05 V	277	72.97	3.83
4	#5860.00	64.0 PK	68.2	-4.2	1.05 V	277	60.16	3.84
5	11650.00	57.4 PK	74.0	-16.6	1.01 V	276	42.73	14.67
6	11650.00	45.8 AV	54.0	-8.2	1.01 V	276	31.13	14.67
7	#17475.00	56.3 PK	74.0	-17.7	2.06 V	310	35.47	20.83
8	#17475.00	43.8 AV	54.0	-10.2	2.06 V	310	22.97	20.83

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 (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.3 PK	74.0	-2.7	1.00 H	122	68.74	2.56
2	5150.00	53.5 AV	54.0	-0.5	1.00 H	122	50.94	2.56
3	*5190.00	109.5 PK			1.00 H	122	106.82	2.68
4	*5190.00	97.1 AV			1.00 H	122	94.42	2.68
5	#10380.00	59.4 PK	74.0	-14.6	1.67 H	326	46.06	13.34
6	#10380.00	47.6 AV	54.0	-6.4	1.67 H	326	34.26	13.34
7	15570.00	58.4 PK	74.0	-15.6	1.10 H	317	42.95	15.45
8	15570.00	43.5 AV	54.0	-10.5	1.10 H	317	28.05	15.45
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	70.0 PK	74.0	-4.0	1.04 V	142	67.44	2.56
2	5150.00	52.2 AV	54.0	-1.8	1.04 V	142	49.64	2.56
3	*5190.00	109.0 PK			1.04 V	142	106.32	2.68
4	*5190.00	97.2 AV			1.04 V	142	94.52	2.68
5	#10380.00	55.4 PK	74.0	-18.6	1.05 V	263	42.06	13.34
6	#10380.00	43.4 AV	54.0	-10.6	1.05 V	263	30.06	13.34
7	15570.00	53.6 PK	74.0	-20.4	2.07 V	341	38.15	15.45
8	15570.00	41.6 AV	54.0	-12.4	2.07 V	341	26.15	15.45

REMARKS:

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

CHANNEL	TX Channel 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	5150.00	58.5 PK	74.0	-15.5	1.53 H	0	55.94	2.56
2	5150.00	48.1 AV	54.0	-5.9	1.53 H	0	45.54	2.56
3	*5230.00	110.1 PK			1.53 H	0	107.33	2.77
4	*5230.00	99.9 AV			1.53 H	0	97.13	2.77
5	5388.00	55.6 PK	74.0	-18.4	1.53 H	0	52.40	3.20
6	5388.00	44.3 AV	54.0	-9.7	1.53 H	0	41.10	3.20
7	#10460.00	61.5 PK	74.0	-12.5	1.67 H	326	48.08	13.42
8	#10460.00	49.6 AV	54.0	-4.4	1.67 H	326	36.18	13.42
9	15690.00	60.4 PK	74.0	-13.6	1.10 H	317	45.26	15.14
10	15690.00	46.6 AV	54.0	-7.4	1.10 H	317	31.46	15.14

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	57.6 PK	74.0	-16.4	1.00 V	121	55.04	2.56
2	5150.00	46.8 AV	54.0	-7.2	1.00 V	121	44.24	2.56
3	*5230.00	110.4 PK			1.00 V	121	107.63	2.77
4	*5230.00	99.2 AV			1.00 V	121	96.43	2.77
5	5388.00	54.6 PK	74.0	-19.4	1.00 V	121	51.40	3.20
6	5388.00	42.9 AV	54.0	-11.1	1.00 V	121	39.70	3.20
7	#10460.00	57.4 PK	74.0	-16.6	1.05 V	263	43.98	13.42
8	#10460.00	45.6 AV	54.0	-8.4	1.05 V	263	32.18	13.42
9	15690.00	55.7 PK	74.0	-18.3	2.07 V	341	40.56	15.14
10	15690.00	43.5 AV	54.0	-10.5	2.07 V	341	28.36	15.14

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	68.1 PK	74.0	-5.9	1.52 H	0	64.31	3.79
2	#5715.00	53.5 AV	54.0	-0.5	1.52 H	0	49.71	3.79
3	#5725.00	72.3 PK	78.2	-5.9	1.52 H	0	68.50	3.80
4	*5755.00	106.0 PK			1.52 H	0	102.19	3.81
5	*5755.00	95.4 AV			1.52 H	0	91.59	3.81
6	11510.00	59.2 PK	74.0	-14.8	1.65 H	331	44.21	14.99
7	11510.00	47.7 AV	54.0	-6.3	1.65 H	331	32.71	14.99
8	#17265.00	59.0 PK	74.0	-15.0	1.11 H	327	39.23	19.77
9	#17265.00	43.9 AV	54.0	-10.1	1.11 H	327	24.13	19.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	67.5 PK	74.0	-6.5	1.02 V	140	63.71	3.79
2	#5715.00	53.1 AV	54.0	-0.9	1.02 V	140	49.31	3.79
3	#5725.00	71.5 PK	78.2	-6.7	1.02 V	140	67.70	3.80
4	*5755.00	105.2 PK			1.02 V	140	101.39	3.81
5	*5755.00	94.6 AV			1.02 V	140	90.79	3.81
6	11510.00	55.4 PK	74.0	-18.6	1.02 V	254	40.41	14.99
7	11510.00	43.6 AV	54.0	-10.4	1.02 V	254	28.61	14.99
8	#17265.00	54.3 PK	74.0	-19.7	2.03 V	347	34.53	19.77
9	#17265.00	42.0 AV	54.0	-12.0	2.03 V	347	22.23	19.77

REMARKS:

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

CHANNEL	TX Channel 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	#5711.00	65.6 PK	74.0	-8.4	1.50 H	360	61.81	3.79
2	#5711.00	53.5 AV	54.0	-0.5	1.50 H	360	49.71	3.79
3	#5725.00	71.4 PK	78.2	-6.8	1.50 H	360	67.60	3.80
4	*5795.00	112.8 PK			1.50 H	360	108.96	3.84
5	*5795.00	102.1 AV			1.50 H	360	98.26	3.84
6	#5850.00	76.2 PK	78.2	-2.0	1.50 H	360	72.37	3.83
7	#5860.00	69.4 PK	74.0	-4.6	1.50 H	360	65.56	3.84
8	#5860.00	53.6 AV	54.0	-0.4	1.50 H	360	49.76	3.84
9	11590.00	61.3 PK	74.0	-12.7	1.69 H	319	46.51	14.79
10	11590.00	49.5 AV	54.0	-4.5	1.69 H	319	34.71	14.79
11	#17385.00	60.4 PK	74.0	-13.6	1.12 H	310	40.00	20.40
12	#17385.00	46.6 AV	54.0	-7.4	1.12 H	310	26.20	20.40

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	#5711.00	65.0 PK	74.0	-9.0	1.05 V	146	61.21	3.79
2	#5711.00	52.8 AV	54.0	-1.2	1.05 V	146	49.01	3.79
3	#5725.00	70.3 PK	78.2	-7.9	1.05 V	146	66.50	3.80
4	*5795.00	111.3 PK			1.05 V	146	107.46	3.84
5	*5795.00	101.1 AV			1.05 V	146	97.26	3.84
6	#5850.00	75.4 PK	78.2	-2.8	1.05 V	146	71.57	3.83
7	#5860.00	58.4 PK	74.0	-15.6	1.05 V	146	54.56	3.84
8	#5860.00	53.0 AV	54.0	-1.0	1.05 V	146	49.16	3.84
9	11590.00	56.9 PK	74.0	-17.1	1.04 V	266	42.11	14.79
10	11590.00	45.3 AV	54.0	-8.7	1.04 V	266	30.51	14.79
11	#17385.00	56.2 PK	74.0	-17.8	2.08 V	336	35.80	20.40
12	#17385.00	44.0 AV	54.0	-10.0	2.08 V	336	23.60	20.40

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.1 PK	74.0	-4.9	1.45 H	356	66.54	2.56
2	5150.00	53.7 AV	54.0	-0.3	1.45 H	356	51.14	2.56
3	*5210.00	105.2 PK			1.45 H	356	102.47	2.73
4	*5210.00	93.4 AV			1.45 H	356	90.67	2.73
5	#10420.00	57.4 PK	74.0	-16.6	1.60 H	328	43.94	13.46
6	#10420.00	46.4 AV	54.0	-7.6	1.60 H	328	32.94	13.46
7	15630.00	58.2 PK	74.0	-15.8	1.07 H	342	42.87	15.33
8	15630.00	43.5 AV	54.0	-10.5	1.07 H	342	28.17	15.33
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	1.10 V	143	65.84	2.56
2	5150.00	53.0 AV	54.0	-1.0	1.10 V	143	50.44	2.56
3	*5210.00	104.0 PK			1.10 V	143	101.27	2.73
4	*5210.00	91.9 AV			1.10 V	143	89.17	2.73
5	#10420.00	54.3 PK	74.0	-19.7	1.06 V	261	40.84	13.46
6	#10420.00	42.4 AV	54.0	-11.6	1.06 V	261	28.94	13.46
7	15630.00	53.5 PK	74.0	-20.5	2.02 V	341	38.17	15.33
8	15630.00	40.6 AV	54.0	-13.4	2.02 V	341	25.27	15.33

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	69.3 PK	74.0	-4.7	1.50 H	360	65.51	3.79
2	#5715.00	53.8 AV	54.0	-0.2	1.50 H	360	50.01	3.79
3	#5725.00	70.2 PK	78.2	-8.0	1.50 H	360	66.40	3.80
4	*5775.00	102.4 PK			1.50 H	360	98.59	3.81
5	*5775.00	91.2 AV			1.50 H	360	87.39	3.81
6	#5850.00	63.8 PK	78.2	-14.4	1.50 H	360	59.97	3.83
7	#5860.00	45.2 PK	68.2	-23.0	1.50 H	360	41.36	3.84
8	11550.00	57.7 PK	74.0	-16.3	1.62 H	326	42.81	14.89
9	11550.00	46.6 AV	54.0	-7.4	1.62 H	326	31.71	14.89
10	#17325.00	58.5 PK	74.0	-15.5	1.08 H	342	38.42	20.08
11	#17325.00	43.7 AV	54.0	-10.3	1.08 H	342	23.62	20.08

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	68.4 PK	74.0	-5.6	1.14 V	141	64.61	3.79
2	#5715.00	52.9 AV	54.0	-1.1	1.14 V	141	49.11	3.79
3	#5725.00	68.8 PK	78.2	-9.4	1.14 V	141	65.00	3.80
4	*5775.00	103.7 PK			1.14 V	141	99.89	3.81
5	*5775.00	91.5 AV			1.14 V	141	87.69	3.81
6	#5850.00	62.6 PK	78.2	-15.6	1.14 V	141	58.77	3.83
7	#5860.00	44.2 PK	68.2	-24.0	1.14 V	141	40.36	3.84
8	11550.00	53.7 PK	74.0	-20.3	1.08 V	274	38.81	14.89
9	11550.00	41.9 AV	54.0	-12.1	1.08 V	274	27.01	14.89
10	#17325.00	53.0 PK	74.0	-21.0	2.02 V	333	32.92	20.08
11	#17325.00	40.1 AV	54.0	-13.9	2.02 V	333	20.02	20.08

REMARKS:

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

Below 1GHz Data

802.11ac (VHT20)

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	32.62	33.2 QP	40.0	-6.8	1.00 H	67	43.05	-9.86
2	145.21	26.7 QP	43.5	-16.8	2.00 H	90	35.42	-8.70
3	303.20	34.4 QP	46.0	-11.6	1.00 H	322	42.14	-7.78
4	666.68	39.0 QP	46.0	-7.0	2.00 H	30	38.78	0.25
5	750.01	34.5 QP	46.0	-11.6	1.00 H	35	32.57	1.88
6	1000.00	41.9 QP	54.0	-12.1	1.50 H	0	37.09	4.83
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	38.09	32.5 QP	40.0	-7.5	1.00 V	0	41.79	-9.27
2	74.55	34.7 QP	40.0	-5.3	1.00 V	349	46.74	-12.00
3	302.62	34.7 QP	46.0	-11.3	1.50 V	355	42.54	-7.80
4	442.86	35.8 QP	46.0	-10.2	1.00 V	80	39.61	-3.81
5	666.68	36.1 QP	46.0	-9.9	1.50 V	360	35.81	0.25
6	1000.00	42.0 QP	54.0	-12.0	1.00 V	251	37.14	4.83

REMARKS:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100375	May 06, 2015	May 05, 2016
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 01, 2015	Aug. 31, 2016
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 11, 2015	June 10, 2016
RF Cable	5D-FB	COCCAB-001	Mar. 08, 2016	Mar. 07, 2017
50 ohms Terminator	N/A	EMC-03	Sep. 23, 2015	Sep. 22, 2016
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2015	Sep. 30, 2016
Software BVADT	BVADT_Cond_ V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.
4. Tested Date: Apr. 07, 2016

4.2.3 Test Procedure

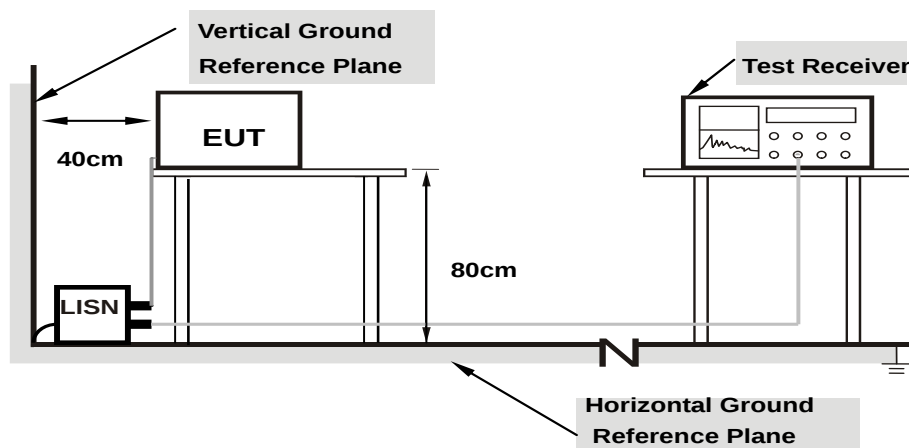
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

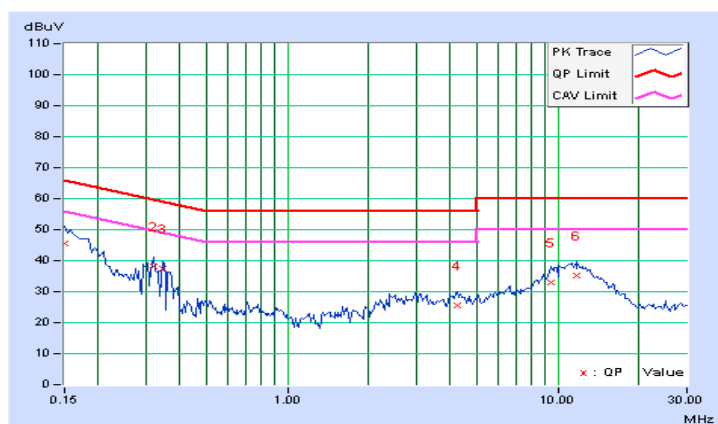
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.44	35.17	21.11	45.61	31.55	66.00	56.00	-20.39	-24.45
2	0.32188	10.42	27.77	23.54	38.19	33.96	59.66	49.66	-21.47	-15.70
3	0.34531	10.42	26.92	25.13	37.34	35.55	59.07	49.07	-21.73	-13.52
4	4.24609	10.64	14.96	9.81	25.60	20.45	56.00	46.00	-30.40	-25.55
5	9.38672	10.89	22.08	17.22	32.97	28.11	60.00	50.00	-27.03	-21.89
6	11.69141	11.03	24.09	19.59	35.12	30.62	60.00	50.00	-24.88	-19.38

Remarks:

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

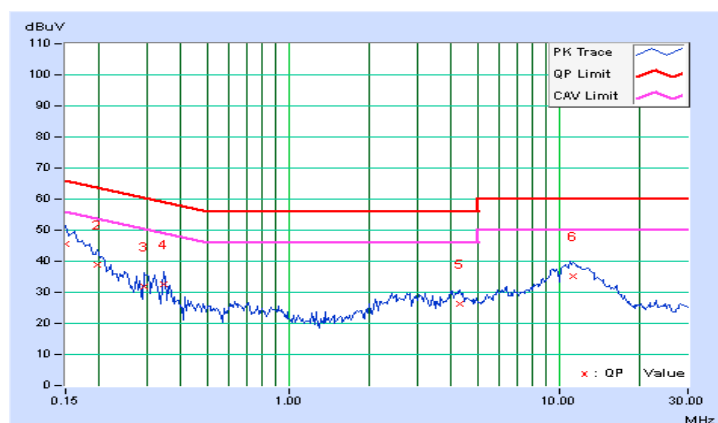


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.44	34.97	19.92	45.41	30.36	66.00	56.00	-20.59	-25.64
2	0.19687	10.45	28.27	14.47	38.72	24.92	63.74	53.74	-25.02	-28.82
3	0.29453	10.46	21.57	15.54	32.03	26.00	60.40	50.40	-28.36	-24.39
4	0.34531	10.47	22.21	19.57	32.68	30.04	59.07	49.07	-26.39	-19.03
5	4.29297	10.74	15.55	10.57	26.29	21.31	56.00	46.00	-29.71	-24.69
6	11.30078	11.02	24.26	19.70	35.28	30.72	60.00	50.00	-24.72	-19.28

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 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

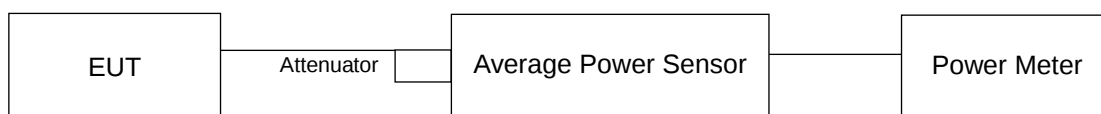
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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 Procedures

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating 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 Results

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)	Limit (dBm)	Pass / Fail
36	5180	65.615	18.17	30	Pass
40	5200	71.614	18.55	30	Pass
48	5240	82.035	19.14	30	Pass
149	5745	73.961	18.69	30	Pass
157	5785	261.216	24.17	30	Pass
165	5825	143.88	21.58	30	Pass

802.11n (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	20.93	18.77	18.79	274.899	24.39	30	Pass
40	5200	21.18	18.88	20.13	311.527	24.93	30	Pass
48	5240	21.91	19.33	20.25	346.868	25.40	30	Pass
149	5745	17.01	17.37	17.12	156.333	21.94	30	Pass
157	5785	23.42	22.98	23.21	627.806	27.98	30	Pass
165	5825	20.92	21.92	21.32	414.711	26.18	30	Pass

802.11n (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	14.78	15.13	14.33	89.747	19.53	30	Pass
46	5230	20.22	17.56	18.59	234.489	23.70	30	Pass
151	5755	14.62	14.86	14.68	88.969	19.49	30	Pass
159	5795	21.96	22.75	23.96	594.287	27.74	30	Pass

802.11ac (VHT80)

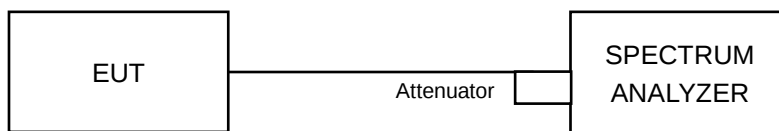
Chan.	Chan. Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	14.58	14.86	13.94	84.102	19.25	30	Pass
155	5775	13.88	14.18	13.79	74.549	18.72	30	Pass

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

For U-NII-1:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

For U-NII-3:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.2.6.

4.4.7 Test Results

For U-NII-1:

802.11a

Channel	Frequency (MHz)	Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
36	5180	4.81	17	Pass
40	5200	5.90	17	Pass
48	5240	6.86	17	Pass

802.11n (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
36	5180	5.24	3.98	4.88	9.50	16.42	Pass
40	5200	5.36	4.23	5.08	9.69	16.42	Pass
48	5240	6.72	5.58	5.70	10.80	16.42	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 6.58\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(6.58-6) = 16.42\text{dBm}$.

802.11n (VHT40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)			Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
38	5190	-3.28	-2.05	-1.39	2.60	16.42	Pass
46	5230	3.64	2.62	2.52	7.73	16.42	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 6.58\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(6.58-6) = 16.42\text{dBm}$.

802.11ac (VHT80)

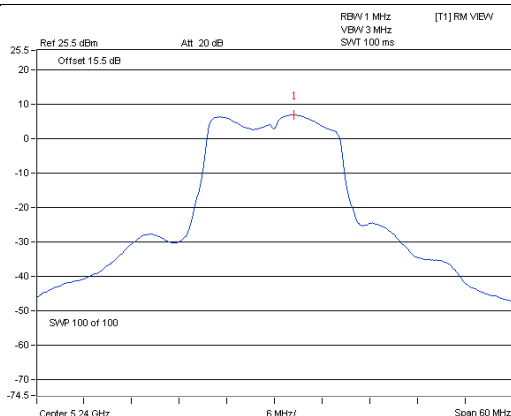
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)			Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	-6.00	-4.33	-4.81	0.17	-0.05	16.42	Pass

- Note:** 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 6.58\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(6.58-6) = 16.42\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

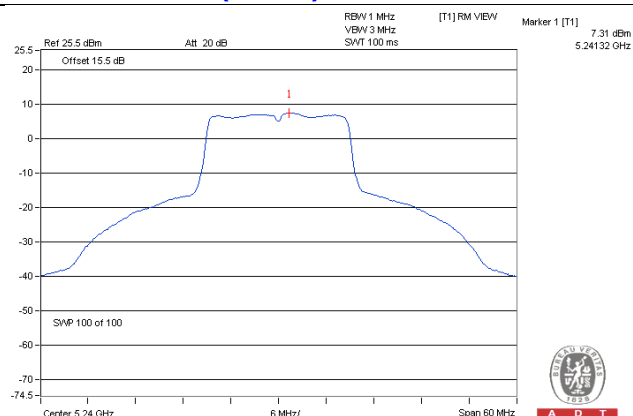
Spectrum Plot of Worst Value

802.11a / CH48

802.11n (VHT20)_Chain 0 / CH48



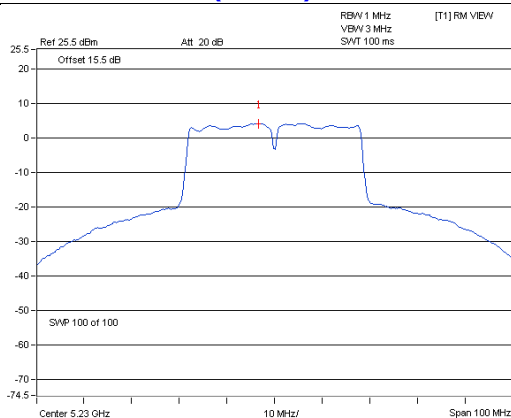
A D T



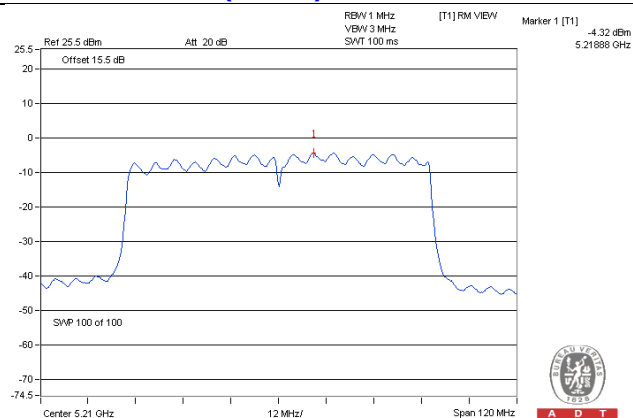
A D T

802.11n (VHT40)_Chain 0 / CH46

802.11ac (VHT80)_Chain 1 / CH42



A D T



A D T

For U-NII-3:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
149	5745	-1.49	0.73	30	Pass
157	5785	2.05	4.27	30	Pass
165	5825	1.69	3.91	30	Pass

802.11n (VHT20)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	149	5745	-4.72	-2.50	4.77	2.27	28.24	Pass
	157	5785	1.20	3.42	4.77	8.19	28.24	Pass
	165	5825	-1.35	0.87	4.77	5.64	28.24	Pass
1	149	5745	-3.91	-1.69	4.77	3.08	28.24	Pass
	157	5785	0.74	2.96	4.77	7.73	28.24	Pass
	165	5825	0.76	2.98	4.77	7.75	28.24	Pass
2	149	5745	-3.40	-1.18	4.77	3.59	28.24	Pass
	157	5785	2.05	4.27	4.77	9.04	28.24	Pass
	165	5825	0.00	2.22	4.77	6.99	28.24	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 7.76\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $30 - (7.76 - 6) = 28.24\text{dBm}$.

802.11n (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD		10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)				
0	151	5755	-10.58	-8.36	4.77	-3.59	28.24	Pass
	159	5795	-3.42	-1.20	4.77	3.57	28.24	Pass
1	151	5755	-9.81	-7.59	4.77	-2.82	28.24	Pass
	159	5795	-2.77	-0.55	4.77	4.22	28.24	Pass
2	151	5755	-9.34	-7.12	4.77	-2.35	28.24	Pass
	159	5795	-1.64	0.58	4.77	5.35	28.24	Pass

Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 7.76\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $30 - (7.76 - 6) = 28.24\text{dBm}$.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Duty Factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-14.53	-12.31	4.77	0.17	-7.37	28.24	Pass
1	155	5775	-14.16	-11.94	4.77	0.17	-7.00	28.24	Pass
2	155	5775	-13.54	-11.32	4.77	0.17	-6.38	28.24	Pass

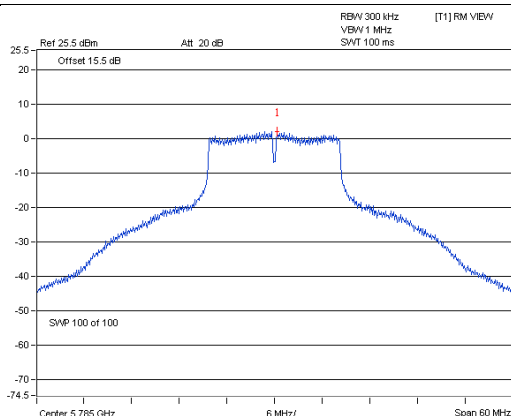
Note: 1. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G2/20})^2 / 3] = 7.76\text{dBi} > 6\text{dBi}$, therefore the limit needs to reduce, so the power density limit shall be reduced to $30 - (7.76 - 6) = 28.24\text{dBm}$.

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

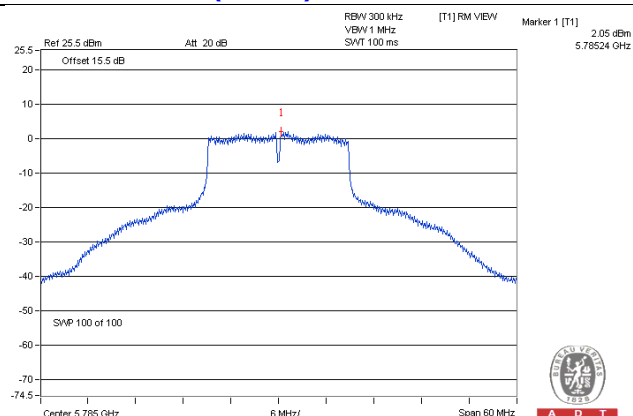
Spectrum Plot of Worst Value

802.11a / CH157

802.11n (VHT20)_Chain 2 / CH157



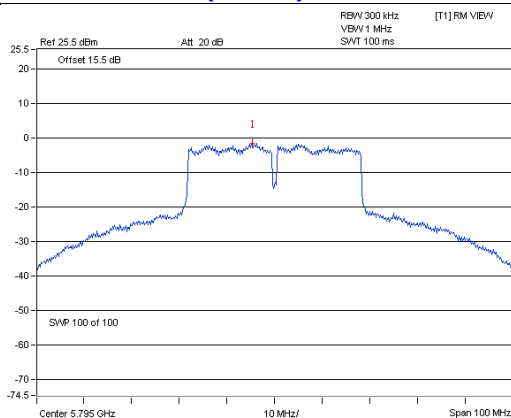
A D T



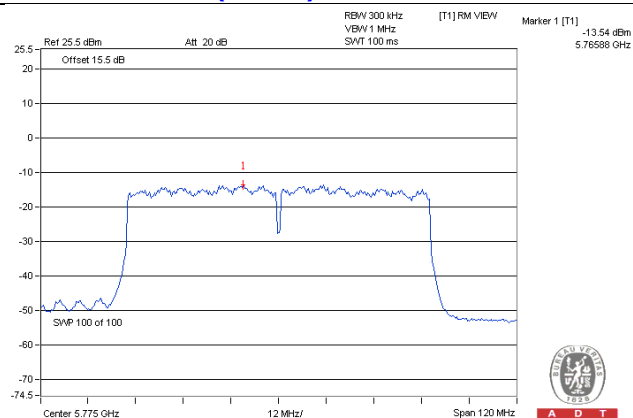
A D T

802.11n (VHT40)_Chain 2 / CH159

802.11ac (VHT80)_Chain 2 / CH155



A D T



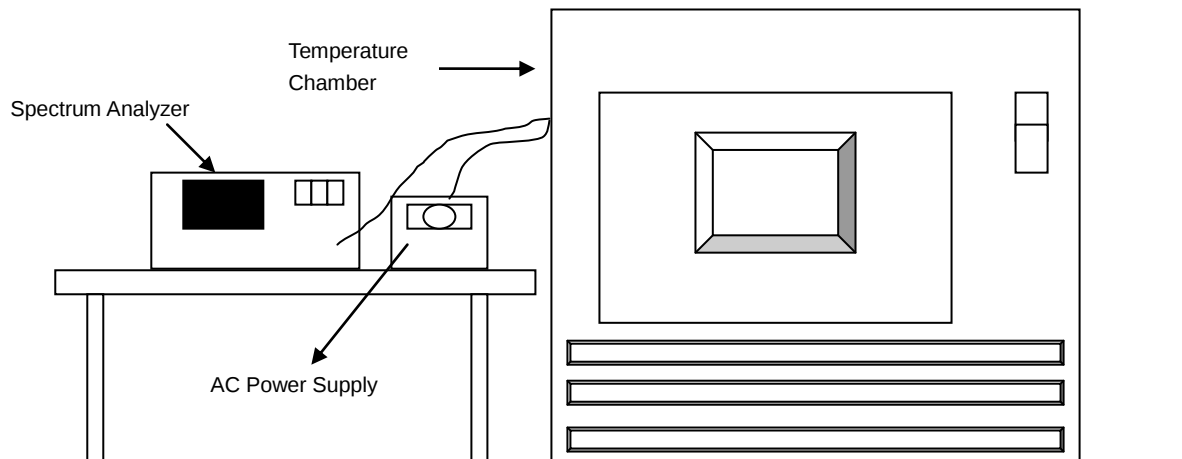
A D T

4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

- 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 Conditions

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	5180.0188	0.00036	5180.0175	0.00034	5180.0178	0.00034	5180.0211	0.00041
40	120	5180.0016	0.00003	5179.9982	-0.00003	5180.0031	0.00006	5179.9987	-0.00003
30	120	5180.0205	0.00040	5180.0191	0.00037	5180.0192	0.00037	5180.0218	0.00042
20	120	5180.0233	0.00045	5180.0261	0.00050	5180.0261	0.00050	5180.0236	0.00046
10	120	5179.9718	-0.00054	5179.9723	-0.00053	5179.9752	-0.00048	5179.9725	-0.00053
0	120	5179.9805	-0.00038	5179.9819	-0.00035	5179.9795	-0.00040	5179.9805	-0.00038
-10	120	5179.9973	-0.00005	5179.9966	-0.00007	5179.9968	-0.00006	5179.9927	-0.00014
-20	120	5180.0221	0.00043	5180.0249	0.00048	5180.0232	0.00045	5180.0206	0.00040
-30	120	5180.0066	0.00013	5180.0089	0.00017	5180.0061	0.00012	5180.0054	0.00010

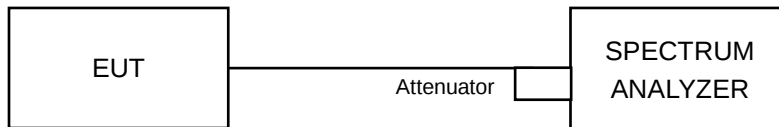
Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0236	0.00046	5180.0262	0.00051	5180.0269	0.00052	5180.0232	0.00045
	120	5180.0233	0.00045	5180.0261	0.00050	5180.0261	0.00050	5180.0236	0.00046
	102	5180.0239	0.00046	5180.0261	0.00050	5180.0258	0.00050	5180.0233	0.00045

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 Procedures

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 Conditions

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.40	0.5	Pass
157	5785	16.40	0.5	Pass
165	5825	16.39	0.5	Pass

802.11n (VHT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.65	17.65	17.62	0.5	Pass
157	5785	17.62	17.60	17.33	0.5	Pass
165	5825	17.62	17.63	17.34	0.5	Pass

802.11n (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.20	36.35	36.15	0.5	Pass
159	5795	36.37	36.43	36.17	0.5	Pass

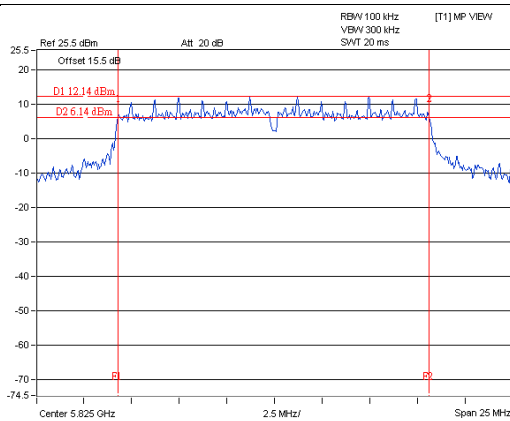
802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	76.00	76.03	75.52	0.5	Pass

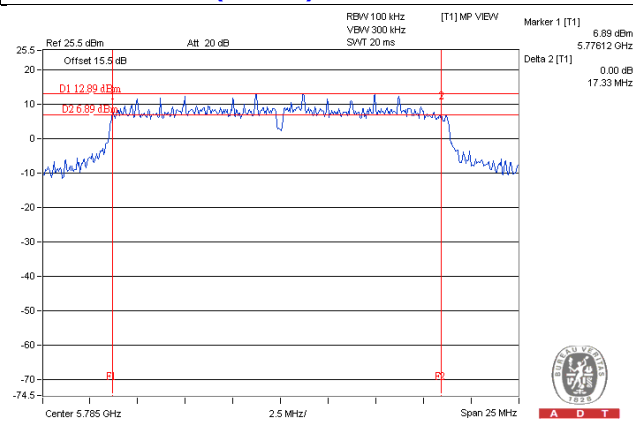
Spectrum Plot of Worst Value

802.11a / CH165

802.11n (VHT20)_Chain 2 / CH157



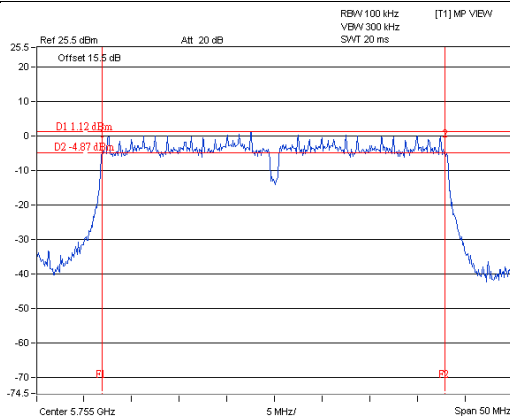
A D T



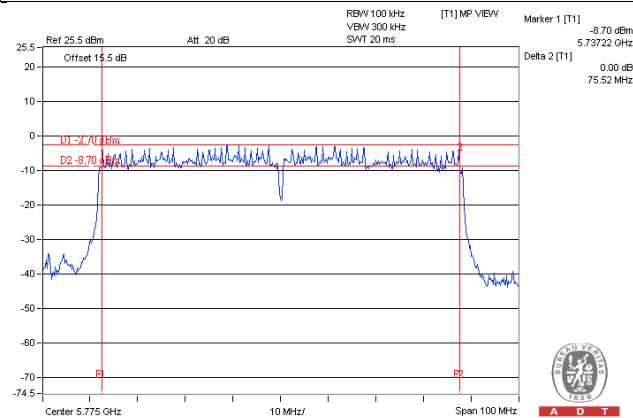
A D T

802.11n (VHT40)_Chain 2 / CH151

802.11ac (VHT80)_Chain 2 / CH155



A D T



A D T

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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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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