

FCC Test Report

Report No.: RF141016E01B-1

FCC ID: PY315200315

Test Model: D6400

Received Date: June 02, 2015

Test Date: June 08 to Nov. 09, 2015

Issued Date: Nov. 17, 2015

Applicant: NETGEAR, Inc.

Address: 350 East Plumeria Drive San Jose, CA 95134

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results	6
2.1 Measurement Uncertainty	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes	10
3.2.1 Test Mode Applicability and Tested Channel Detail	11
3.3 Duty Cycle of Test Signal	13
3.4 Description of Support Units	14
3.4.1 Configuration of System under Test	15
3.5 General Description of Applied Standard	16
4 Test Types and Results	17
4.1 Radiated Emission and Bandedge Measurement.....	17
4.1.1 Limits of Radiated Emission and Bandedge Measurement	17
4.1.2 Test Instruments	18
4.1.3 Test Procedure	20
4.1.4 Deviation from Test Standard	20
4.1.5 Test Setup.....	21
4.1.6 EUT Operating Condition	21
4.1.7 Test Results	22
4.2 Conducted Emission Measurement	41
4.2.1 Limits of Conducted Emission Measurement	41
4.2.2 Test Instruments	41
4.2.3 Test Procedure	42
4.2.4 Deviation from Test Standard	42
4.2.5 Test Setup.....	42
4.2.6 EUT Operating Condition	42
4.2.7 Test Results (Mode 1).....	43
4.2.8 Test Results (Mode 2).....	45
4.3 Transmit Power Measurement	47
4.3.1 Limits of Transmit Power Measurement	47
4.3.2 Test Setup.....	47
4.3.3 Test Instruments	47
4.3.4 Test Procedure	47
4.3.5 Deviation from Test Standard	47
4.3.6 EUT Operating Condition	47
4.3.7 Test Result	48
4.4 Peak Power Spectral Density Measurement	49
4.4.1 Limits of Peak Power Spectral Density Measurement	49
4.4.2 Test Setup.....	49
4.4.3 Test Instruments	49
4.4.4 Test Procedure	50
4.4.5 Deviation from Test Standard	50
4.4.6 EUT Operating Condition	50
4.4.7 Test Results	51
4.5 Frequency Stability Measurement	57
4.5.1 Limits of Frequency Stability Measurement	57
4.5.2 Test Setup.....	57
4.5.3 Test Instruments	57
4.5.4 Test Procedure	57
4.5.5 Deviation from Test Standard	57



4.5.6 EUT Operating Condition	57
4.5.7 Test Results	58
4.6 6dB Bandwidth Measurement	59
4.6.1 Limits of 6dB Bandwidth Measurement	59
4.6.2 Test Setup	59
4.6.3 Test Instruments	59
4.6.4 Test Procedure	59
4.6.5 Deviation from Test Standard	59
4.6.6 EUT Operating Condition	59
4.6.7 Test Results	60
5 Pictures of Test Arrangements	62
Appendix – Information on the Testing Laboratories	63



A D T

Release Control Record

Issue No.	Description	Date Issued
RF141016E01B-1	Original release.	Nov. 17, 2015




1 Certificate of Conformity

Product: AC1600 WiFi VDSL/ADSL Modem Router
Brand: NETGEAR
Test Model: D6400
Sample Status: ENGINEERING SAMPLE
Applicant: NETGEAR, Inc.
Test Date: June 08 to Nov. 09, 2015
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:** Nov. 17, 2015
Lori Chung / Specialist

Approved by :  , **Date:** Nov. 17, 2015
Moy Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -4.91dB at 0.29844MHz.
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 5099.00MHz, 5118.00MHz, 5865.00MHz, 5905.00MHz & 5722.90MHz.
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.

NOTE: The EUT was operating in 2400 ~ 2483.5MHz, 5150~5250MHz and 5725~5850MHz frequencies band. This report was recorded the RF parameters including 5150~5250MHz and 5725~5850MHz. For the 2400 ~ 2483.5MHz RF parameters was recorded in another test report.

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	30MHz ~ 200MHz	3.59 dB
	200MHz ~ 1000MHz	3.60 dB
	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	AC1600 WiFi VDSL/ADSL Modem Router
Brand	NETGEAR
Test Model	D6400
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	For 15.407 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
	For 15.247 2.412 ~ 2.462GHz
Number of Channel	For 15.407 9 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 4 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
	For 15.247 11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Output Power	For 15.407 5.18~5.24 GHz CDD Mode: 802.11a: 148.551mW Beamforming Mode: 802.11ac (VHT20): 163.829mW 802.11ac (VHT40): 327.522mW 802.11ac (VHT80): 78.925mW 5.745~5.825 GHz CDD Mode: 802.11a: 152.554mW Beamforming Mode: 802.11ac (VHT20): 139.193mW 802.11ac (VHT40): 168.809mW 802.11ac (VHT80): 98.605mW
	For 15.247 CDD Mode: 802.11b: 104.713mW 802.11g: 183.097mW 802.11n (HT20): 180.027mW 802.11n (HT40): 66.443mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Splitter 1 (Model No.: DSL499, P/N: 350-10064-01) x 1 Adapter x 1
Data Cable Supplied	RJ11 cable (unshielded, 1.5m) x 1
	RJ45 cable (shielded, 1.5m) x 1

Note:

1. 2.4GHz and 5GHz technology can transmit at same time.
2. The EUT must be supplied with a power adapter and following two different model names could be chosen:

Adapter	Brand	Model No.	P/N	Spec.
Adapter 1	NETGEAR	2ABL030F	332-10756-01	AC Input: 100-240V 1.0A, 50/60Hz DC Output: 12V, 2.5A DC cable (Unshielded, 1.8m)
Adapter 2	NETGEAR	ADS-40FPA-12 12030GPCU/GPC	332-10757-01	AC Input: 100-240V 1.0A, 50/60Hz DC Output: 12V, 2.5A DC cable (Unshielded, 1.8m)

Note: From the above adapters, the worst radiated emission test item was found in Adapter 2. Therefore only the test data of the mode was recorded in this report.

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

For 2.4GHz Band

PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (GHz ~ GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Chain 0	NETGEAR	98P91MIPF044	2	2.4~2.4835	PCB	I-Pex	85
Chain 1	NETGEAR	98P91MIPF045	2	2.4~2.4835	PCB	I-Pex	150

For 5GHz Band

PCB Chain No.	Brand	Model	Antenna Gain(dBi) < including cable loss>	Frequency range (GHz ~ GHz)	Antenna Type	Connecter Type	Cable Length (mm)
Chain 0	NETGEAR	98P92UIPF061	3	5.15~5.85	PCB	I-Pex	60
Chain 1	NETGEAR	98P92UIPF062	3	5.15~5.85	PCB	I-Pex	70
Chain 2	NETGEAR	98P92UIPF063	3	5.15~5.85	PCB	I-Pex	80

4. The EUT incorporates a MIMO function.

For 2.4GHz Band			
MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	1TX (Diversity)	1RX (Diversity)
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
For 5GHz Band			
802.11a	6 ~ 54Mbps	3TX	3RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS0~8 Nss= 1	3TX	3RX
	MCS0~8 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss= 1	3TX	3RX
	MCS0~9 Nss= 2	3TX	3RX
	MCS0~9 Nss= 3	3TX	3RX

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)

5. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	With adapter 2
2	-	-	√	-	With adapter 1

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. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

Beamforming MODE						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5180-5240	38 to 46	46	OFDM	BPSK	13.5
	5745-5825	151 to 159				

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.

Beamforming MODE						
MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11ac (VHT40)	5180-5240 5745-5825	38 to 46 151 to 159	46	OFDM	BPSK	13.5

Antenna Port Conducted Measurement:

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

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

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Alan Wu
RE<1G	25deg. C, 64%RH	120Vac, 60Hz	Jyunchun Lin
PLC	25deg. C, 54%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. 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.

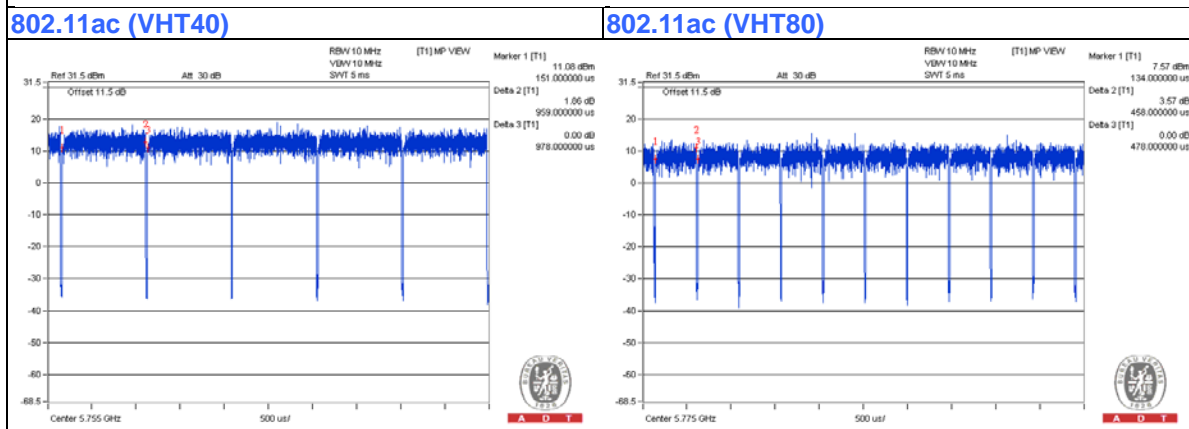
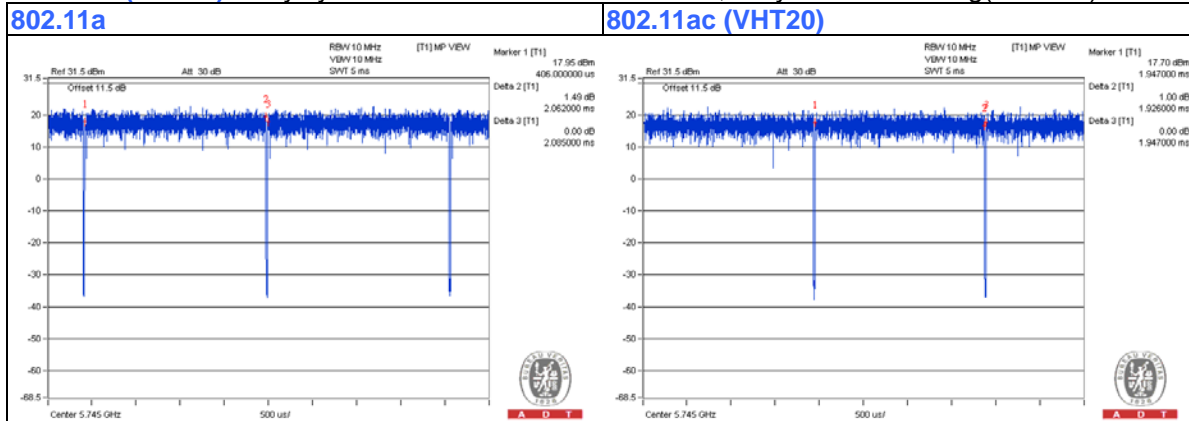
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = $2.062 \text{ ms} / 2.085 \text{ ms} = 0.989$

802.11ac (VHT20): Duty cycle = $1.926 \text{ ms} / 1.947 \text{ ms} = 0.989$

802.11ac (VHT40): Duty cycle = $0.959 \text{ ms} / 0.978 \text{ ms} = 0.981$

802.11ac (VHT80): Duty cycle = $0.458 \text{ ms} / 0.478 \text{ ms} = 0.958$, Duty factor = $10 * \log(1/0.958) = 0.19$



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.

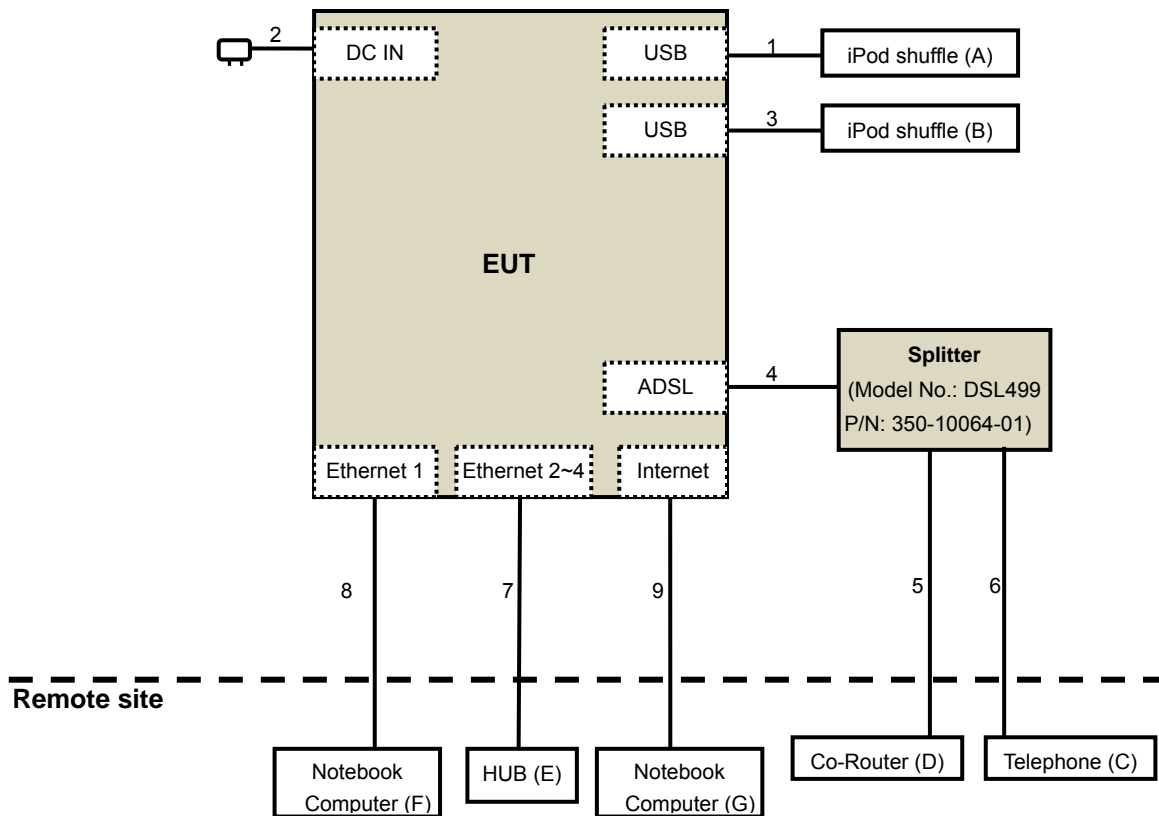
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	iPod shuffle	Apple	MD778TA/A	CC4JMFL0F4T1	NA	Provided by Lab
B.	iPod shuffle	Apple	MD778TA/A	CC4JG3SSF4T1	NA	Provided by Lab
C.	Telephone	WONDER	WD-303	7C17KA04011	NA	Provided by Lab
D.	Co-Router	ZyXEL	IES-1000	S08024701597	FCC DoC	Provided by Lab
E.	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
F.	Notebook Computer	DELL	E6420	H62T3R1	FCC DoC	Provided by Lab
G.	Notebook Computer	DELL	E6420	B92T3R1	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.	USB	1	0.1	No	0	Provided by Lab
2.	DC	1	1.8	No	0	Supplied by Client
3.	USB	1	0.1	No	0	Provided by Lab
4.	RJ11	1	1.5	No	0	Supplied by Client
5.	RJ11	1	10	No	0	Provided by Lab
6.	RJ11	1	10	No	0	Provided by Lab
7.	RJ45	3	10	No	0	Provided by Lab
8.	RJ45	1	10	No	0	Provided by Lab
9.	RJ45	1	10	No	0	Provided by Lab

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)
789033 D02 General UNII Test Procedure New Rules v01
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules v01	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 test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-06	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Feb. 03, 2015	Feb. 02, 2016
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

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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
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: Nov. 09, 2015



For Other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 12, 2015	Oct. 11, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	July 08, 2015	July 07, 2016
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2015	Aug. 08, 2016
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-02(295012+309220)	Aug. 09, 2015	Aug. 08, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03(250724)	Aug. 09, 2015	Aug. 08, 2016
Software BV ADT	ADT_Radiated_V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	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-SP-AR	MAA0812-008	Jan. 12, 2015	Jan. 11, 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 4.
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 460141.
5. The IC Site Registration No. is IC7450F-4.
6. Tested Date: Nov. 05 to 09, 2015

4.1.3 Test Procedure

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

Note:

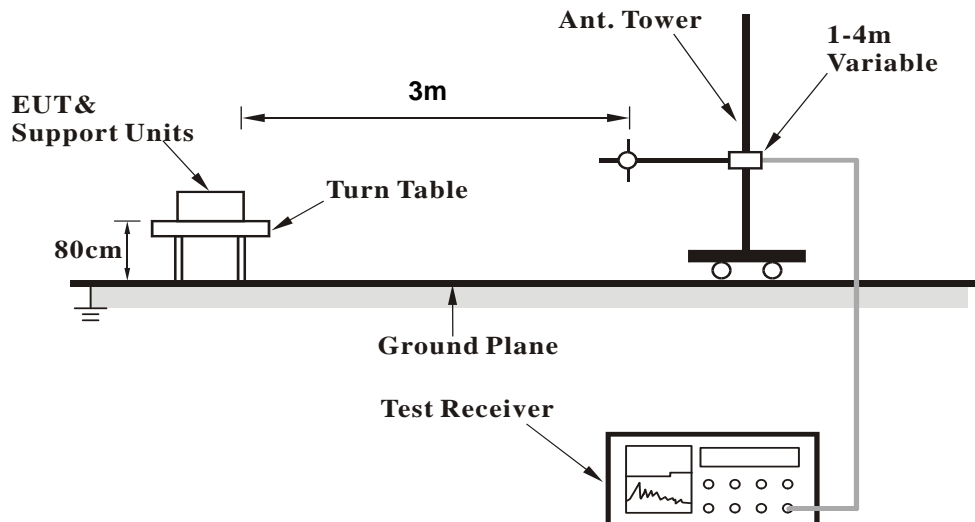
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

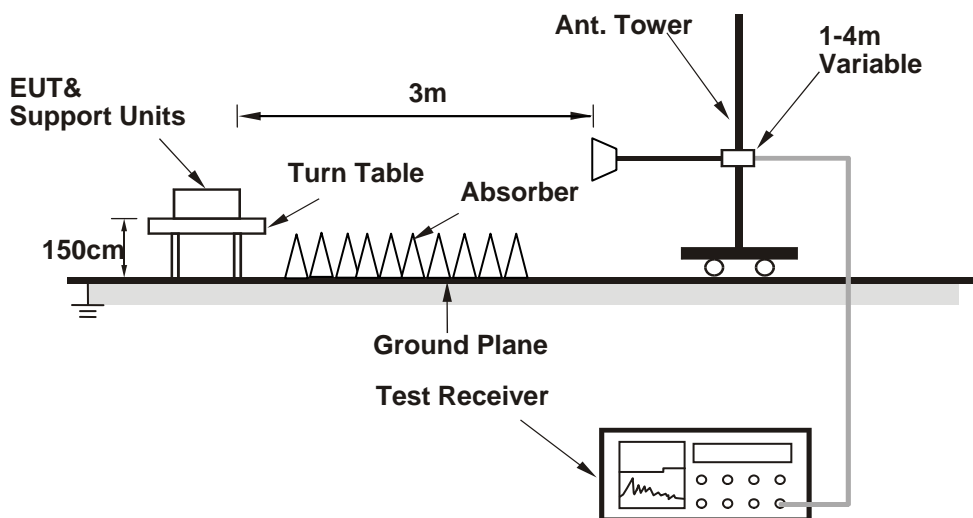
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

1. Connect the EUT with the support units F & G (Notebook Computer) which is placed on remote site.
2. Controlling software (Mtool_2.0.1.0.msi) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data (Subcontract Item):

CDD Mode

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	5099.00	62.1 PK	74.0	-11.9	1.79 H	163	57.18	4.92
2	5099.00	51.3 AV	54.0	-2.7	1.79 H	163	46.38	4.92
3	*5180.00	112.3 PK			1.83 H	169	107.30	5.00
4	*5180.00	101.4 AV			1.83 H	169	96.40	5.00
5	#6907.00	57.3 PK	74.0	-16.7	1.79 H	176	47.39	9.91
6	#6907.00	49.4 AV	54.0	-4.6	1.79 H	176	39.49	9.91
7	#10360.00	56.7 PK	74.0	-17.3	1.53 H	100	41.03	15.67
8	#10360.00	41.7 AV	54.0	-12.3	1.53 H	100	26.03	15.67
9	15540.00	54.2 PK	74.0	-19.8	1.48 H	106	36.96	17.24
10	15540.00	40.0 AV	54.0	-14.0	1.48 H	106	22.76	17.24

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	5099.00	64.4 PK	74.0	-9.6	1.58 V	360	59.48	4.92
2	5099.00	53.9 AV	54.0	-0.1	1.58 V	360	48.98	4.92
3	*5180.00	114.3 PK			1.70 V	107	109.30	5.00
4	*5180.00	104.0 AV			1.70 V	107	99.00	5.00
5	#6907.00	61.1 PK	74.0	-12.9	1.48 V	236	51.19	9.91
6	#6907.00	51.9 AV	54.0	-2.1	1.48 V	236	41.99	9.91
7	#10360.00	58.4 PK	74.0	-15.6	1.53 V	219	42.73	15.67
8	#10360.00	43.9 AV	54.0	-10.1	1.53 V	219	28.23	15.67
9	15540.00	54.6 PK	74.0	-19.4	1.55 V	214	37.36	17.24
10	15540.00	39.5 AV	54.0	-14.5	1.55 V	214	22.26	17.24

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 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	5118.00	61.9 PK	74.0	-12.1	1.88 H	179	56.96	4.94
2	5118.00	50.5 AV	54.0	-3.5	1.88 H	179	45.56	4.94
3	*5200.00	110.9 PK			1.88 H	179	105.87	5.03
4	*5200.00	100.6 AV			1.88 H	179	95.57	5.03
5	5358.00	58.8 PK	74.0	-15.2	1.88 H	179	53.41	5.39
6	5358.00	50.4 AV	54.0	-3.6	1.88 H	179	45.01	5.39
7	#10400.00	56.7 PK	74.0	-17.3	1.54 H	112	40.59	16.11
8	#10400.00	41.8 AV	54.0	-12.2	1.54 H	112	25.69	16.11
9	15600.00	54.5 PK	74.0	-19.5	1.43 H	101	36.97	17.53
10	15600.00	40.1 AV	54.0	-13.9	1.43 H	101	22.57	17.53

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5118.00	65.2 PK	74.0	-8.8	1.80 V	113	60.26	4.94
2	5118.00	53.9 AV	54.0	-0.1	1.80 V	113	48.96	4.94
3	*5200.00	114.1 PK			1.80 V	106	109.07	5.03
4	*5200.00	103.8 AV			1.80 V	106	98.77	5.03
5	5358.00	62.2 PK	74.0	-11.8	1.82 V	112	56.81	5.39
6	5358.00	53.8 AV	54.0	-0.2	1.82 V	112	48.41	5.39
7	#10400.00	58.4 PK	74.0	-15.6	1.53 V	209	42.29	16.11
8	#10400.00	44.1 AV	54.0	-9.9	1.53 V	209	27.99	16.11
9	15600.00	53.9 PK	74.0	-20.1	1.55 V	220	36.37	17.53
10	15600.00	39.1 AV	54.0	-14.9	1.55 V	220	21.57	17.53

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 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	5075.00	55.7 PK	74.0	-18.3	1.67 H	184	50.80	4.90
2	5075.00	44.5 AV	54.0	-9.5	1.67 H	184	39.60	4.90
3	*5240.00	109.4 PK			1.67 H	184	104.30	5.10
4	*5240.00	99.5 AV			1.67 H	184	94.40	5.10
5	5398.00	60.2 PK	74.0	-13.8	1.68 H	138	54.70	5.50
6	5398.00	49.1 AV	54.0	-4.9	1.68 H	138	43.60	5.50
7	#10480.00	56.4 PK	74.0	-17.6	1.51 H	104	40.15	16.25
8	#10480.00	41.6 AV	54.0	-12.4	1.51 H	104	25.35	16.25
9	15720.00	53.7 PK	74.0	-20.3	1.47 H	94	36.13	17.57
10	15720.00	39.6 AV	54.0	-14.4	1.47 H	94	22.03	17.57

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	5075.00	55.5 PK	74.0	-18.5	1.59 V	0	50.60	4.90
2	5075.00	44.3 AV	54.0	-9.7	1.59 V	0	39.40	4.90
3	*5240.00	113.3 PK			1.65 V	2	108.20	5.10
4	*5240.00	103.0 AV			1.65 V	2	97.90	5.10
5	5398.00	64.1 PK	74.0	-9.9	1.59 V	104	58.60	5.50
6	5398.00	53.8 AV	54.0	-0.2	1.59 V	104	48.30	5.50
7	#10480.00	58.2 PK	74.0	-15.8	1.49 V	219	41.95	16.25
8	#10480.00	43.6 AV	54.0	-10.4	1.49 V	219	27.35	16.25
9	15720.00	54.1 PK	74.0	-19.9	1.59 V	201	36.53	17.57
10	15720.00	39.1 AV	54.0	-14.9	1.59 V	201	21.53	17.57

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	#5672.00	62.7 PK	68.2	-5.5	1.95 H	149	56.71	5.99
2	#5722.90	68.8 PK	78.2	-9.4	1.95 H	149	62.66	6.14
3	*5745.00	112.0 PK			1.95 H	149	105.81	6.19
4	*5745.00	101.1 AV			1.95 H	149	94.91	6.19
5	#5903.00	59.8 PK	68.2	-8.4	1.95 H	149	53.36	6.44
6	11490.00	56.4 PK	74.0	-17.6	1.58 H	95	39.52	16.88
7	11490.00	41.4 AV	54.0	-12.6	1.58 H	95	24.52	16.88
8	#17235.00	54.4 PK	68.2	-13.8	1.52 H	119	32.28	22.12

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5672.00	67.9 PK	68.2	-0.3	1.82 V	275	61.91	5.99
2	#5722.90	78.0 PK	78.2	-0.2	1.82 V	275	71.86	6.14
3	*5745.00	117.3 PK			1.82 V	275	111.11	6.19
4	*5745.00	105.8 AV			1.82 V	275	99.61	6.19
5	#5903.00	67.5 PK	68.2	-0.7	1.82 V	275	61.06	6.44
6	11490.00	58.5 PK	74.0	-15.5	1.59 V	219	41.62	16.88
7	11490.00	44.3 AV	54.0	-9.7	1.59 V	219	27.42	16.88
8	#17235.00	55.1 PK	68.2	-13.1	1.58 V	200	32.98	22.12

REMARKS:

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



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	#5702.00	63.2 PK	68.2	-5.0	1.94 H	154	57.13	6.07
2	*5785.00	113.6 PK			1.94 H	154	107.28	6.32
3	*5785.00	103.9 AV			1.94 H	154	97.58	6.32
4	#5857.00	64.0 PK	78.2	-14.2	1.94 H	154	57.60	6.40
5	#5865.00	64.8 PK	68.2	-3.4	1.94 H	154	58.38	6.42
6	11570.00	57.0 PK	74.0	-17.0	1.51 H	108	40.33	16.67
7	11570.00	41.8 AV	54.0	-12.2	1.51 H	108	25.13	16.67
8	#17355.00	54.1 PK	68.2	-14.1	1.44 H	93	31.45	22.65

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	#5702.00	66.6 PK	68.2	-1.6	1.88 V	91	60.53	6.07
2	*5785.00	116.4 PK			1.70 V	273	110.08	6.32
3	*5785.00	106.5 AV			1.70 V	273	100.18	6.32
4	#5857.00	66.8 PK	78.2	-11.4	1.88 V	91	60.40	6.40
5	#5865.00	68.1 PK	68.2	-0.1	1.88 V	91	61.68	6.42
6	11570.00	58.5 PK	74.0	-15.5	1.56 V	220	41.83	16.67
7	11570.00	44.2 AV	54.0	-9.8	1.56 V	220	27.53	16.67
8	#17355.00	55.0 PK	68.2	-13.2	1.58 V	186	32.35	22.65

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	#5670.00	58.2 PK	68.2	-10.0	1.91 H	147	52.23	5.97
2	*5825.00	113.2 PK			1.91 H	147	106.82	6.38
3	*5825.00	103.3 AV			1.91 H	147	96.92	6.38
4	#5850.00	65.9 PK	78.2	-12.3	1.91 H	147	59.51	6.39
5	#5905.00	65.8 PK	68.2	-2.4	1.91 H	147	59.37	6.43
6	11650.00	56.2 PK	74.0	-17.8	1.52 H	115	39.75	16.45
7	11650.00	41.5 AV	54.0	-12.5	1.52 H	115	25.05	16.45
8	#17475.00	54.7 PK	68.2	-13.5	1.52 H	105	31.55	23.15

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5670.00	61.1 PK	68.2	-7.1	1.75 V	276	55.13	5.97
2	*5825.00	116.2 PK			1.75 V	276	109.82	6.38
3	*5825.00	106.5 AV			1.75 V	276	100.12	6.38
4	#5850.00	69.4 PK	78.2	-8.8	1.75 V	276	63.01	6.39
5	#5905.00	68.1 PK	68.2	-0.1	1.75 V	276	61.67	6.43
6	11650.00	58.6 PK	74.0	-15.4	1.62 V	207	42.15	16.45
7	11650.00	44.1 AV	54.0	-9.9	1.62 V	207	27.65	16.45
8	#17475.00	55.0 PK	68.2	-13.2	1.59 V	197	31.85	23.15

REMARKS:

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

Beamforming Mode
802.11ac (VHT20)

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Peak (PK)
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	61.9 PK	74.0	-12.1	1.93 H	164	56.98	4.92
2	5099.00	50.5 AV	54.0	-3.5	1.93 H	164	45.58	4.92
3	*5180.00	111.2 PK			1.93 H	164	106.20	5.00
4	*5180.00	100.0 AV			1.93 H	164	95.00	5.00
5	#10360.00	56.7 PK	74.0	-17.3	1.58 H	113	41.03	15.67
6	#10360.00	41.5 AV	54.0	-12.5	1.58 H	113	25.83	15.67
7	15540.00	53.9 PK	74.0	-20.1	1.47 H	110	36.66	17.24
8	15540.00	40.0 AV	54.0	-14.0	1.47 H	110	22.76	17.24

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	5099.00	65.3 PK	74.0	-8.7	1.65 V	0	60.38	4.92
2	5099.00	53.6 AV	54.0	-0.4	1.65 V	0	48.68	4.92
3	*5180.00	114.1 PK			1.65 V	111	109.10	5.00
4	*5180.00	103.0 AV			1.65 V	111	98.00	5.00
5	#10360.00	58.2 PK	74.0	-15.8	1.63 V	204	42.53	15.67
6	#10360.00	44.0 AV	54.0	-10.0	1.63 V	204	28.33	15.67
7	15540.00	55.4 PK	74.0	-18.6	1.58 V	191	38.16	17.24
8	15540.00	40.0 AV	54.0	-14.0	1.58 V	191	22.76	17.24

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 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	5123.00	62.0 PK	74.0	-12.0	1.99 H	151	57.06	4.94
2	5123.00	50.9 AV	54.0	-3.1	1.99 H	151	45.96	4.94
3	*5200.00	112.3 PK			1.99 H	151	107.27	5.03
4	*5200.00	100.4 AV			1.99 H	151	95.37	5.03
5	5362.00	61.3 PK	74.0	-12.7	1.99 H	151	55.90	5.40
6	5362.00	50.5 AV	54.0	-3.5	1.99 H	151	45.10	5.40
7	#10400.00	56.3 PK	74.0	-17.7	1.48 H	112	40.19	16.11
8	#10400.00	41.4 AV	54.0	-12.6	1.48 H	112	25.29	16.11
9	15600.00	53.9 PK	74.0	-20.1	1.46 H	106	36.37	17.53
10	15600.00	39.6 AV	54.0	-14.4	1.46 H	106	22.07	17.53

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5123.00	65.1 PK	74.0	-8.9	1.58 V	336	60.16	4.94
2	5123.00	53.8 AV	54.0	-0.2	1.58 V	336	48.86	4.94
3	*5200.00	115.1 PK			1.69 V	359	110.07	5.03
4	*5200.00	103.4 AV			1.69 V	359	98.37	5.03
5	5362.00	64.1 PK	74.0	-9.9	1.58 V	115	58.70	5.40
6	5362.00	53.4 AV	54.0	-0.6	1.58 V	115	48.00	5.40
7	#10400.00	58.6 PK	74.0	-15.4	1.63 V	218	42.49	16.11
8	#10400.00	44.2 AV	54.0	-9.8	1.63 V	218	28.09	16.11
9	15600.00	54.9 PK	74.0	-19.1	1.56 V	187	37.37	17.53
10	15600.00	39.9 AV	54.0	-14.1	1.56 V	187	22.37	17.53

REMARKS:

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



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	111.8 PK			1.92 H	138	106.70	5.10
2	*5240.00	100.7 AV			1.92 H	138	95.60	5.10
3	5399.00	61.1 PK	74.0	-12.9	1.92 H	138	55.60	5.50
4	5399.00	50.6 AV	54.0	-3.4	1.92 H	138	45.10	5.50
5	#10480.00	56.6 PK	74.0	-17.4	1.54 H	102	40.35	16.25
6	#10480.00	41.7 AV	54.0	-12.3	1.54 H	102	25.45	16.25
7	15720.00	54.4 PK	74.0	-19.6	1.48 H	91	36.83	17.57
8	15720.00	40.0 AV	54.0	-14.0	1.48 H	91	22.43	17.57

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	114.6 PK			1.69 V	360	109.50	5.10
2	*5240.00	103.3 AV			1.69 V	360	98.20	5.10
3	5399.00	64.3 PK	74.0	-9.7	1.70 V	204	58.80	5.50
4	5399.00	53.7 AV	54.0	-0.3	1.70 V	204	48.20	5.50
5	#10480.00	58.1 PK	74.0	-15.9	1.58 V	233	41.85	16.25
6	#10480.00	43.8 AV	54.0	-10.2	1.58 V	233	27.55	16.25
7	15720.00	54.9 PK	74.0	-19.1	1.54 V	213	37.33	17.57
8	15720.00	40.0 AV	54.0	-14.0	1.54 V	213	22.43	17.57

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	#5657.00	64.7 PK	68.2	-3.5	1.89 H	146	58.75	5.95
2	#5722.90	75.2 PK	78.2	-3.0	1.89 H	146	69.06	6.14
3	*5745.00	114.5 PK			1.89 H	146	108.31	6.19
4	*5745.00	104.0 AV			1.89 H	146	97.81	6.19
5	#5899.00	65.1 PK	68.2	-3.1	1.89 H	146	58.67	6.43
6	11490.00	56.4 PK	74.0	-17.6	1.52 H	88	39.52	16.88
7	11490.00	41.5 AV	54.0	-12.5	1.52 H	88	24.62	16.88
8	#17235.00	54.9 PK	68.2	-13.3	1.51 H	90	32.78	22.12

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5657.00	67.4 PK	68.2	-0.8	1.83 V	278	61.45	5.95
2	#5722.90	77.9 PK	78.2	-0.3	1.83 V	278	71.76	6.14
3	*5745.00	116.8 PK			1.83 V	278	110.61	6.19
4	*5745.00	106.6 AV			1.83 V	278	100.41	6.19
5	#5899.00	67.9 PK	68.2	-0.3	1.83 V	278	61.47	6.43
6	11490.00	58.6 PK	74.0	-15.4	1.65 V	203	41.72	16.88
7	11490.00	44.1 AV	54.0	-9.9	1.65 V	203	27.22	16.88
8	#17235.00	55.6 PK	68.2	-12.6	1.58 V	211	33.48	22.12

REMARKS:

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



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	#5697.00	64.4 PK	68.2	-3.8	1.89 H	154	58.35	6.05
2	*5785.00	113.9 PK			1.89 H	154	107.58	6.32
3	*5785.00	103.7 AV			1.89 H	154	97.38	6.32
4	#5850.00	66.3 PK	78.2	-11.9	1.89 H	154	59.91	6.39
5	#5865.00	64.9 PK	68.2	-3.3	1.89 H	154	58.48	6.42
6	11570.00	57.4 PK	74.0	-16.6	1.51 H	110	40.73	16.67
7	11570.00	42.2 AV	54.0	-11.8	1.51 H	110	25.53	16.67
8	#17355.00	54.0 PK	68.2	-14.2	1.53 H	119	31.35	22.65

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	#5697.00	67.6 PK	68.2	-0.6	1.87 V	280	61.55	6.05
2	*5785.00	116.6 PK			1.88 V	277	110.28	6.32
3	*5785.00	106.6 AV			1.88 V	277	100.28	6.32
4	#5850.00	69.2 PK	78.2	-9.0	1.87 V	280	62.81	6.39
5	#5865.00	68.0 PK	68.2	-0.2	1.87 V	280	61.58	6.42
6	11570.00	58.5 PK	74.0	-15.5	1.58 V	212	41.83	16.67
7	11570.00	44.5 AV	54.0	-9.5	1.58 V	212	27.83	16.67
8	#17355.00	55.2 PK	68.2	-13.0	1.61 V	212	32.55	22.65

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	#5673.00	59.5 PK	68.2	-8.7	1.90 H	164	53.51	5.99
2	*5825.00	113.6 PK			1.90 H	164	107.22	6.38
3	*5825.00	103.7 AV			1.90 H	164	97.32	6.38
4	#5850.00	66.1 PK	78.2	-12.1	1.90 H	164	59.71	6.39
5	#5905.00	64.9 PK	68.2	-3.3	1.90 H	164	58.47	6.43
6	11650.00	56.9 PK	74.0	-17.1	1.55 H	90	40.45	16.45
7	11650.00	41.8 AV	54.0	-12.2	1.55 H	90	25.35	16.45
8	#17475.00	54.7 PK	68.2	-13.5	1.47 H	114	31.55	23.15

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	#5673.00	62.4 PK	68.2	-5.8	1.82 V	83	56.41	5.99
2	*5825.00	116.2 PK			1.88 V	277	109.82	6.38
3	*5825.00	106.2 AV			1.88 V	277	99.82	6.38
4	#5850.00	69.6 PK	78.2	-8.6	1.82 V	91	63.21	6.39
5	#5905.00	68.0 PK	68.2	-0.2	1.86 V	88	61.57	6.43
6	11650.00	58.8 PK	74.0	-15.2	1.61 V	221	42.35	16.45
7	11650.00	44.7 AV	54.0	-9.3	1.61 V	221	28.25	16.45
8	#17475.00	54.8 PK	68.2	-13.4	1.60 V	209	31.65	23.15

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.0 PK	74.0	-3.0	1.91 H	138	66.03	4.97
2	5150.00	50.0 AV	54.0	-4.0	1.91 H	138	45.03	4.97
3	*5190.00	107.4 PK			1.91 H	138	102.38	5.02
4	*5190.00	95.9 AV			1.91 H	138	90.88	5.02
5	5355.00	57.1 PK	74.0	-16.9	1.91 H	138	51.72	5.38
6	5355.00	46.5 AV	54.0	-7.5	1.91 H	138	41.12	5.38
7	#10380.00	56.8 PK	74.0	-17.2	1.48 H	94	40.92	15.88
8	#10380.00	41.8 AV	54.0	-12.2	1.48 H	94	25.92	15.88
9	15570.00	54.2 PK	74.0	-19.8	1.51 H	116	36.83	17.37
10	15570.00	39.7 AV	54.0	-14.3	1.51 H	116	22.33	17.37

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	73.8 PK	74.0	-0.2	1.61 V	359	68.83	4.97
2	5150.00	52.9 AV	54.0	-1.1	1.61 V	359	47.93	4.97
3	*5190.00	110.7 PK			1.61 V	359	105.68	5.02
4	*5190.00	98.9 AV			1.61 V	359	93.88	5.02
5	5355.00	60.6 PK	74.0	-13.4	1.61 V	359	55.22	5.38
6	5355.00	49.8 AV	54.0	-4.2	1.61 V	359	44.42	5.38
7	#10380.00	58.2 PK	74.0	-15.8	1.62 V	232	42.32	15.88
8	#10380.00	43.8 AV	54.0	-10.2	1.62 V	232	27.92	15.88
9	15570.00	55.0 PK	74.0	-19.0	1.58 V	199	37.63	17.37
10	15570.00	39.6 AV	54.0	-14.4	1.58 V	199	22.23	17.37

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	61.3 PK	74.0	-12.7	1.91 H	148	56.33	4.97
2	5150.00	50.5 AV	54.0	-3.5	1.91 H	148	45.53	4.97
3	*5230.00	111.1 PK			1.91 H	148	106.01	5.09
4	*5230.00	99.5 AV			1.91 H	148	94.41	5.09
5	5395.00	60.4 PK	74.0	-13.6	1.91 H	148	54.91	5.49
6	5395.00	49.5 AV	54.0	-4.5	1.91 H	148	44.01	5.49
7	#10460.00	57.1 PK	74.0	-16.9	1.57 H	93	40.88	16.22
8	#10460.00	41.8 AV	54.0	-12.2	1.57 H	93	25.58	16.22
9	15690.00	54.0 PK	74.0	-20.0	1.48 H	95	36.29	17.71
10	15690.00	39.6 AV	54.0	-14.4	1.48 H	95	21.89	17.71

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	64.5 PK	74.0	-9.5	1.57 V	0	59.53	4.97
2	5150.00	53.7 AV	54.0	-0.3	1.57 V	0	48.73	4.97
3	*5230.00	114.9 PK			1.57 V	0	109.81	5.09
4	*5230.00	103.0 AV			1.57 V	0	97.91	5.09
5	5395.00	63.4 PK	74.0	-10.6	1.68 V	360	57.91	5.49
6	5395.00	52.3 AV	54.0	-1.7	1.68 V	360	46.81	5.49
7	#10460.00	59.1 PK	74.0	-14.9	1.64 V	231	42.88	16.22
8	#10460.00	44.6 AV	54.0	-9.4	1.64 V	231	28.38	16.22
9	15690.00	55.1 PK	74.0	-18.9	1.55 V	200	37.39	17.71
10	15690.00	40.0 AV	54.0	-14.0	1.55 V	200	22.29	17.71

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	#5661.00	61.0 PK	68.2	-7.2	1.72 H	130	55.04	5.96
2	#5715.00	60.8 PK	68.2	-7.4	1.72 H	130	54.69	6.11
3	#5722.90	67.6 PK	78.2	-10.6	1.72 H	130	61.46	6.14
4	*5755.00	107.1 PK			1.72 H	130	100.86	6.24
5	*5755.00	96.1 AV			1.72 H	130	89.86	6.24
6	#5901.00	56.8 PK	68.2	-11.4	1.72 H	130	50.36	6.44
7	11510.00	56.5 PK	74.0	-17.5	1.58 H	89	39.69	16.81
8	11510.00	41.5 AV	54.0	-12.5	1.58 H	89	24.69	16.81
9	#17265.00	53.7 PK	68.2	-14.5	1.46 H	112	31.55	22.15

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	#5661.00	64.6 PK	68.2	-3.6	1.80 V	276	58.64	5.96
2	#5715.00	68.0 PK	68.2	-0.2	1.80 V	276	61.89	6.11
3	#5722.90	78.1 PK	78.2	-0.1	1.80 V	276	71.96	6.14
4	*5755.00	112.5 PK			1.80 V	276	106.26	6.24
5	*5755.00	102.8 AV			1.80 V	276	96.56	6.24
6	#5901.00	66.2 PK	68.2	-2.0	1.80 V	276	59.76	6.44
7	11510.00	58.6 PK	74.0	-15.4	1.61 V	229	41.79	16.81
8	11510.00	44.2 AV	54.0	-9.8	1.61 V	229	27.39	16.81
9	#17265.00	55.0 PK	68.2	-13.2	1.64 V	195	32.85	22.15

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	#5715.00	63.2 PK	68.2	-5.0	2.01 H	165	57.09	6.11
2	*5795.00	111.3 PK			2.01 H	165	104.96	6.34
3	*5795.00	101.8 AV			2.01 H	165	95.46	6.34
4	#5850.00	65.0 PK	78.2	-13.2	2.01 H	165	58.61	6.39
5	#5860.10	64.9 PK	68.2	-3.3	2.01 H	165	58.49	6.41
6	11590.00	57.3 PK	74.0	-16.7	1.59 H	90	40.69	16.61
7	11590.00	42.2 AV	54.0	-11.8	1.59 H	90	25.59	16.61
8	#17385.00	54.1 PK	68.2	-14.1	1.51 H	120	31.19	22.91

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	66.6 PK	68.2	-1.6	1.83 V	275	60.49	6.11
2	*5795.00	114.5 PK			1.83 V	275	108.16	6.34
3	*5795.00	104.8 AV			1.83 V	275	98.46	6.34
4	#5850.00	68.1 PK	78.2	-10.1	1.83 V	275	61.71	6.39
5	#5860.10	68.0 PK	68.2	-0.2	1.83 V	275	61.59	6.41
6	11590.00	58.6 PK	74.0	-15.4	1.59 V	218	41.99	16.61
7	11590.00	44.7 AV	54.0	-9.3	1.59 V	218	28.09	16.61
8	#17385.00	55.4 PK	68.2	-12.8	1.59 V	198	32.49	22.91

REMARKS:

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

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	70.2 PK	74.0	-3.8	1.90 H	147	65.23	4.97
2	5150.00	50.5 AV	54.0	-3.5	1.90 H	147	45.53	4.97
3	*5210.00	103.8 PK			1.90 H	147	98.75	5.05
4	*5210.00	92.2 AV			1.90 H	147	87.15	5.05
5	5350.00	58.0 PK	74.0	-16.0	1.90 H	147	52.64	5.36
6	5350.00	45.4 AV	54.0	-8.6	1.90 H	147	40.04	5.36
7	#10420.00	57.0 PK	74.0	-17.0	1.57 H	94	40.86	16.14
8	#10420.00	41.9 AV	54.0	-12.1	1.57 H	94	25.76	16.14
9	15630.00	54.1 PK	74.0	-19.9	1.48 H	110	36.51	17.59
10	15630.00	39.7 AV	54.0	-14.3	1.48 H	110	22.11	17.59

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	73.1 PK	74.0	-0.9	1.85 V	109	68.13	4.97
2	5150.00	53.6 AV	54.0	-0.4	1.85 V	109	48.63	4.97
3	*5210.00	106.6 PK			1.85 V	109	101.55	5.05
4	*5210.00	95.2 AV			1.85 V	109	90.15	5.05
5	5350.00	61.5 PK	74.0	-12.5	1.85 V	112	56.14	5.36
6	5350.00	48.8 AV	54.0	-5.2	1.85 V	112	43.44	5.36
7	#10420.00	58.5 PK	74.0	-15.5	1.59 V	206	42.36	16.14
8	#10420.00	44.1 AV	54.0	-9.9	1.59 V	206	27.96	16.14
9	15630.00	54.6 PK	74.0	-19.4	1.63 V	190	37.01	17.59
10	15630.00	39.4 AV	54.0	-14.6	1.63 V	190	21.81	17.59

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	#5714.90	65.9 PK	74.0	-8.1	1.81 H	128	59.79	6.11
2	#5714.90	49.6 AV	54.0	-4.4	1.81 H	128	43.49	6.11
3	#5725.00	69.3 PK	78.2	-8.9	1.81 H	128	63.16	6.14
4	*5775.00	107.6 PK			1.81 H	128	101.31	6.29
5	*5775.00	94.9 AV			1.81 H	128	88.61	6.29
6	#5850.00	70.5 PK	78.2	-7.7	1.81 H	128	64.11	6.39
7	#5860.00	59.9 PK	74.0	-14.1	1.81 H	128	53.49	6.41
8	#5860.00	44.4 AV	54.0	-9.6	1.81 H	128	37.99	6.41
9	11550.00	57.2 PK	74.0	-16.8	1.63 H	76	40.49	16.71
10	11550.00	41.9 AV	54.0	-12.1	1.63 H	76	25.19	16.71
11	#17325.00	53.9 PK	74.0	-20.1	1.51 H	122	31.50	22.40
12	#17325.00	39.8 AV	54.0	-14.2	1.51 H	122	17.40	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	#5714.90	73.1 PK	74.0	-0.9	1.58 V	86	66.99	6.11
2	#5714.90	53.8 AV	54.0	-0.2	1.58 V	86	47.69	6.11
3	#5725.00	75.1 PK	78.2	-3.1	1.58 V	86	68.96	6.14
4	*5775.00	111.2 PK			1.58 V	86	104.91	6.29
5	*5775.00	95.5 AV			1.58 V	86	89.21	6.29
6	#5850.00	74.1 PK	78.2	-4.1	1.58 V	86	67.71	6.39
7	#5860.00	68.3 PK	74.0	-5.7	1.58 V	86	61.89	6.41
8	#5860.00	50.8 AV	54.0	-3.2	1.58 V	86	44.39	6.41
9	11550.00	58.5 PK	74.0	-15.5	1.54 V	230	41.79	16.71
10	11550.00	44.3 AV	54.0	-9.7	1.54 V	230	27.59	16.71
11	#17325.00	55.6 PK	74.0	-18.4	1.59 V	209	33.20	22.40
12	#17325.00	40.2 AV	54.0	-13.8	1.59 V	209	17.80	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) – 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:
Beamforming Mode
802.11ac (VHT40)

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	Below 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	30.10	35.5 QP	40.0	-4.5	1.00 H	222	52.15	-16.61
2	125.01	36.4 QP	43.5	-7.1	1.50 H	84	53.39	-16.97
3	250.00	42.4 QP	46.0	-3.6	1.00 H	137	58.49	-16.12
4	625.00	41.8 QP	46.0	-4.2	1.50 H	211	48.08	-6.24
5	800.01	40.5 QP	46.0	-5.5	1.00 H	173	44.07	-3.56
6	875.02	39.8 QP	46.0	-6.2	1.50 H	184	42.24	-2.46

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	36.64	36.7 QP	40.0	-3.3	1.00 V	245	52.95	-16.28
2	109.03	37.1 QP	43.5	-6.4	1.50 V	96	55.16	-18.09
3	199.99	35.8 QP	43.5	-7.7	1.00 V	190	54.05	-18.29
4	250.00	39.2 QP	46.0	-6.8	1.00 V	298	55.29	-16.12
5	500.01	37.5 QP	46.0	-8.5	1.00 V	356	46.67	-9.18
6	800.01	40.3 QP	46.0	-5.7	1.50 V	212	43.85	-3.56

REMARKS:

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

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. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable	5D-FB	COCCAB-001	Mar. 09, 2015	Mar. 08, 2016
50 ohms Terminator	N/A	EMC-03	Sep. 22, 2014	Sep. 21, 2015
50 ohms Terminator	N/A	EMC-02	Sep. 30, 2014	Sep. 29, 2015
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: June 08, 2015

4.2.3 Test Procedure

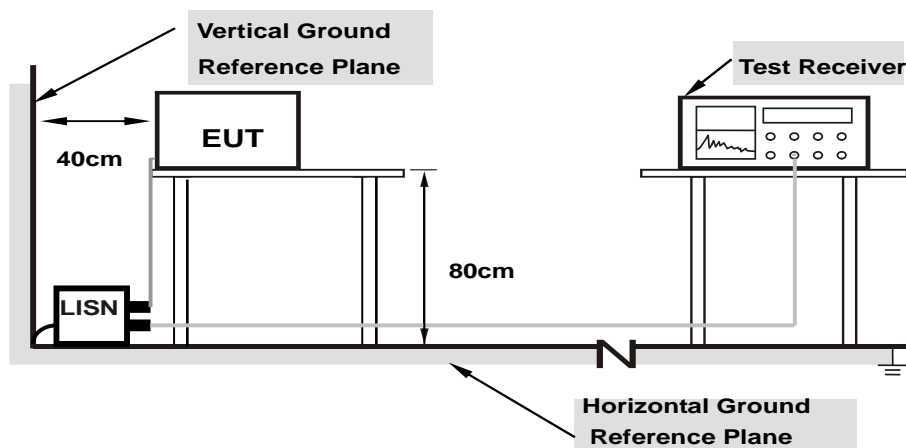
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

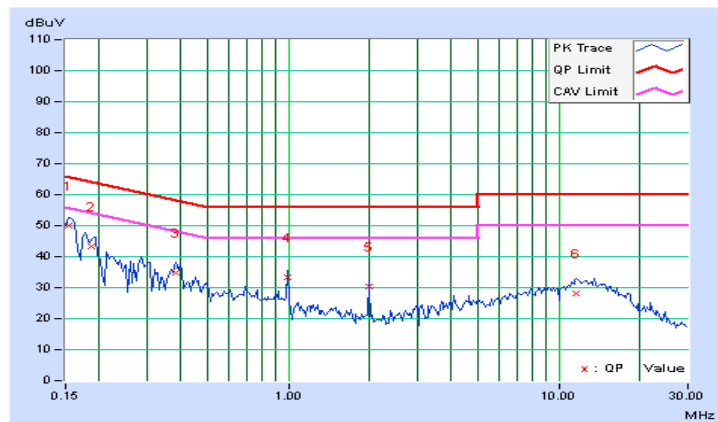
4.2.7 Test Results (Mode 1)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15391	0.14	50.03	35.61	50.17	35.75	65.79	55.79	-15.62	-20.04
2	0.18672	0.15	43.12	30.85	43.27	31.00	64.18	54.18	-20.91	-23.18
3	0.38438	0.17	34.80	29.78	34.97	29.95	58.18	48.18	-23.22	-18.24
4	0.99375	0.20	32.97	32.25	33.17	32.45	56.00	46.00	-22.83	-13.55
5	1.98322	0.26	30.29	29.09	30.55	29.35	56.00	46.00	-25.45	-16.65
6	11.57422	0.80	27.39	22.27	28.19	23.07	60.00	50.00	-31.81	-26.93

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.

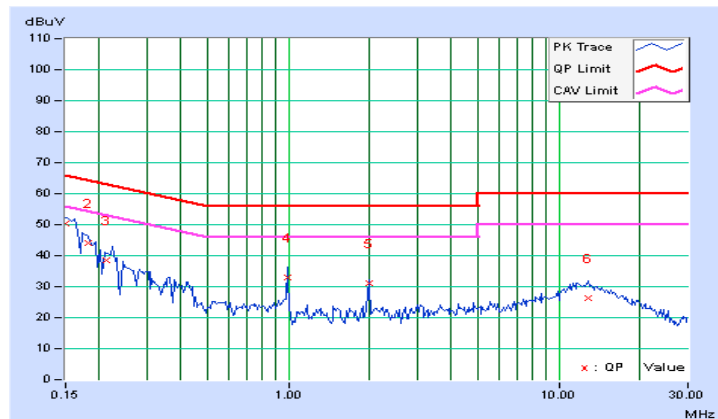


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15000	0.14	50.05	39.84	50.19	39.98	66.00	56.00	-15.81	-16.02
2	0.18125	0.15	44.07	34.06	44.22	34.21	64.43	54.43	-20.21	-20.22
3	0.21359	0.15	38.42	28.75	38.57	28.90	63.06	53.06	-24.49	-24.16
4	0.99375	0.24	32.85	32.05	33.09	32.29	56.00	46.00	-22.91	-13.71
5	1.98272	0.30	30.98	28.75	31.28	29.05	56.00	46.00	-24.72	-16.95
6	12.82422	0.91	25.51	20.39	26.42	21.30	60.00	50.00	-33.58	-28.70

REMARKS:

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



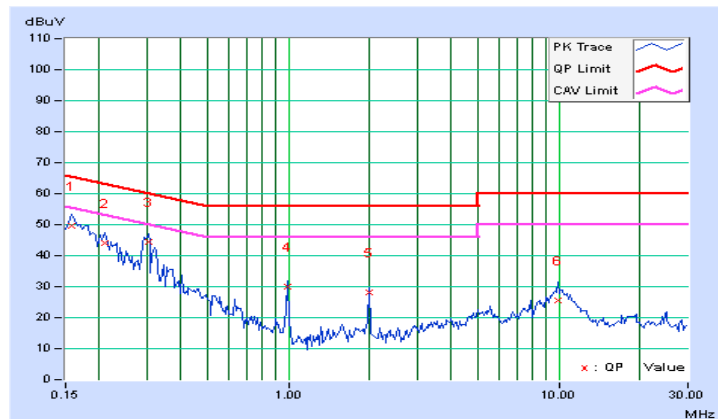
4.2.8 Test Results (Mode 2)

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.15781	0.14	49.64	40.51	49.78	40.65	65.58	55.58	-15.80
2	0.20859	0.15	43.97	37.86	44.12	38.01	63.26	53.26	-19.14	-15.25
3	0.30234	0.16	44.24	39.85	44.40	40.01	60.18	50.18	-15.78	-10.17
4	0.99187	0.20	29.73	29.64	29.93	29.84	56.00	46.00	-26.07	-16.16
5	1.98047	0.26	27.73	25.79	27.99	26.05	56.00	46.00	-28.01	-19.95
6	9.94922	0.74	24.87	20.95	25.61	21.69	60.00	50.00	-34.39	-28.31

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.

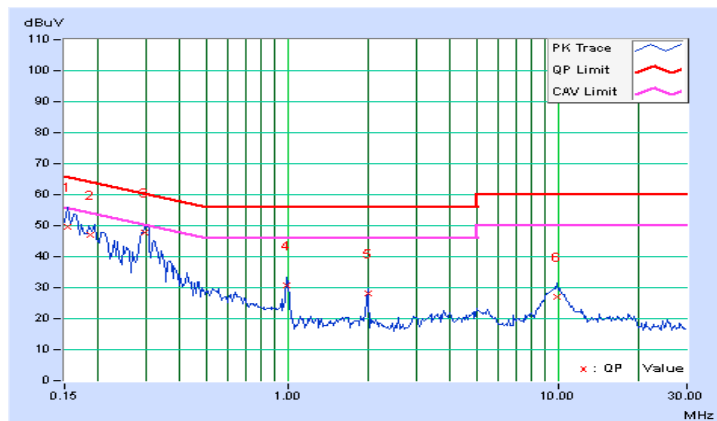


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
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No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	
1	0.15391	0.14	49.40	39.56	49.54	39.70	65.79	55.79	-16.25	-16.09
2	0.18572	0.15	46.87	38.35	47.02	38.50	64.23	54.23	-17.21	-15.73
3	0.29844	0.17	47.78	45.21	47.95	45.38	60.29	50.29	-12.34	-4.91
4	0.98984	0.24	30.63	29.67	30.87	29.91	56.00	46.00	-25.13	-16.09
5	1.98484	0.30	28.01	26.03	28.31	26.33	56.00	46.00	-27.69	-19.67
6	9.87500	0.78	26.18	22.22	26.96	23.00	60.00	50.00	-33.04	-27.00

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

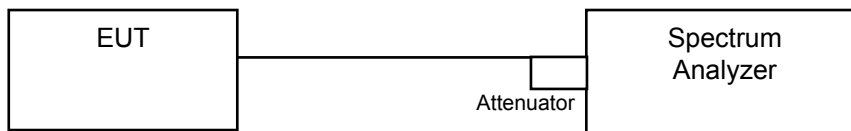
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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

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

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

CDD Mode

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11a								
36	5180	16.72	16.01	17.90	148.551	21.72	30	Pass
40	5200	15.81	15.46	17.42	128.471	21.09	30	Pass
48	5240	14.99	14.43	16.36	102.534	20.11	30	Pass
149	5745	17.32	16.31	17.47	152.554	21.83	30	Pass
157	5785	16.24	15.22	16.76	122.763	20.89	30	Pass
165	5825	16.04	15.50	16.75	122.975	20.90	30	Pass

Beamforming Mode

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11ac (VHT20)								
36	5180	16.63	16.02	17.86	147.114	21.68	28.23	Pass
40	5200	17.09	16.43	18.37	163.829	22.14	28.23	Pass
48	5240	15.78	15.14	17.07	121.436	20.84	28.23	Pass
149	5745	16.74	15.94	17.22	139.193	21.44	28.23	Pass
157	5785	16.03	15.37	16.91	123.613	20.92	28.23	Pass
165	5825	16.21	15.21	16.81	122.945	20.90	28.23	Pass
802.11ac (VHT40)								
38	5190	14.82	14.31	16.16	98.621	19.94	28.23	Pass
46	5230	20.27	20.05	20.79	327.522	25.15	28.23	Pass
151	5755	15.53	14.92	16.15	107.983	20.33	28.23	Pass
159	5795	17.77	16.71	17.93	168.809	22.27	28.23	Pass
802.11ac (VHT80)								
42	5210	13.46	13.50	15.36	78.925	18.97	28.23	Pass
155	5775	14.98	14.73	15.73	98.605	19.94	28.23	Pass

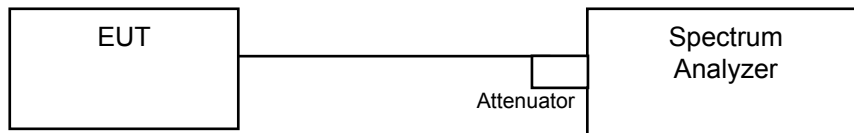
Note: 1. Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to $30 - (7.77 - 6) = 28.23\text{dBm}$.

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

802.11a, 802.11ac (VH20) & 802.11ac (VHT40)

For U-NII-1 band:

Using method SA-1

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

For U-NII-3 band:

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

802.11ac (VHT80)

For U-NII-1 band:

Using method SA-2

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

For U-NII-3 band:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results
For U-NII-1 Band
CDD Mode

Chan.	Chan. Freq. (MHz)	PSD (dBm)			Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
802.11a							
36	5180	4.71	4.83	5.64	9.85	15.23	Pass
40	5200	3.93	4.17	5.25	9.26	15.23	Pass
48	5240	3.53	3.07	4.19	8.39	15.23	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 = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17-(7.77-6) = 15.23\text{dBm}$.

Beamforming Mode

Chan.	Chan. Freq. (MHz)	PSD (dBm)			Total Power Density (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
802.11ac (VHT20)							
36	5180	4.65	4.22	5.52	9.60	15.23	Pass
40	5200	4.94	4.74	5.80	9.96	15.23	Pass
48	5240	4.12	4.03	5.04	9.19	15.23	Pass
802.11ac (VHT40)							
38	5190	-0.41	-0.40	0.74	4.78	15.23	Pass
46	5230	3.04	2.89	3.33	7.86	15.23	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.

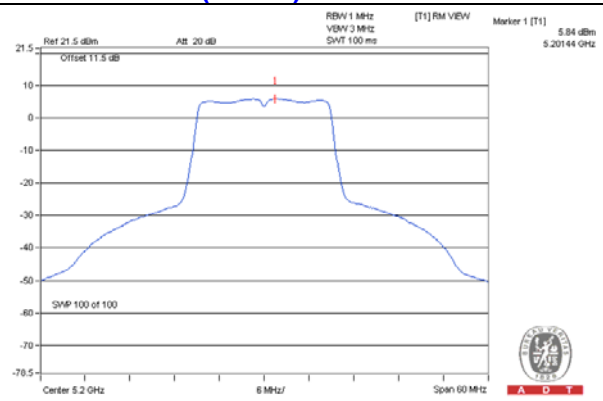
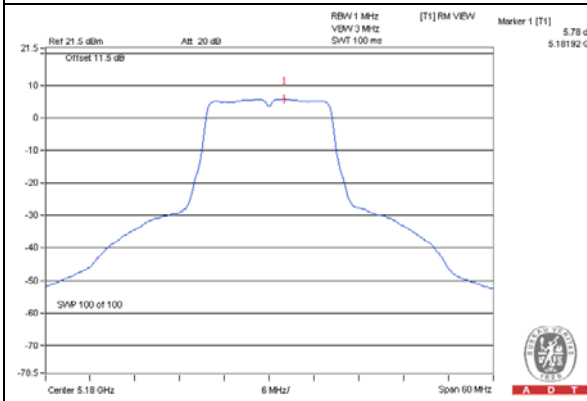
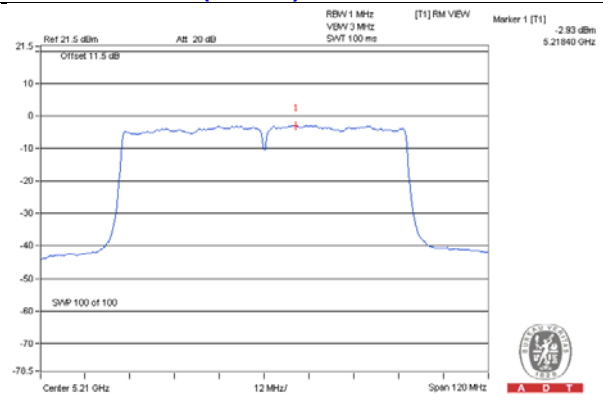
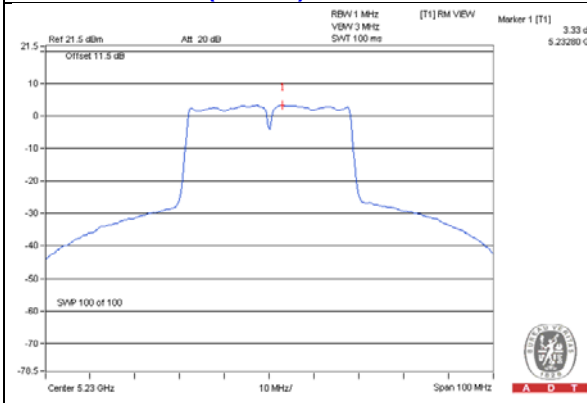
2. Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (7.77 - 6) = 15.23\text{dBm}$.

Chan.	Chan. Freq. (MHz)	PSD w/o duty factor (dBm)			Duty Factor (dB)	Total PSD with Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
802.11ac (VHT80)								
42	5210	-4.15	-3.91	-2.93	0.19	1.33	15.23	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 = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $17 - (7.77 - 6) = 15.23\text{dBm}$.

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

SPECTRUM PLOT OF WORST VALUE**802.11a – Chain 2: CH 36****802.11ac (VHT20) – Chain 2: CH 40****802.11ac (VHT40) – Chain 2: CH 46****802.11ac (VHT80) – Chain 2: CH 42**

For U-NII-3 Band

CDD Mode

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
802.11a								
0	149	5745	-4.30	-2.08	4.77	2.69	28.23	Pass
	157	5785	-5.49	-3.27	4.77	1.50	28.23	Pass
	165	5825	-5.05	-2.83	4.77	1.94	28.23	Pass
1	149	5745	-4.18	-1.96	4.77	2.81	28.23	Pass
	157	5785	-5.37	-3.15	4.77	1.62	28.23	Pass
	165	5825	-5.43	-3.21	4.77	1.56	28.23	Pass
2	149	5745	-3.16	-0.94	4.77	3.83	28.23	Pass
	157	5785	-4.27	-2.05	4.77	2.72	28.23	Pass
	165	5825	-4.22	-2.00	4.77	2.77	28.23	Pass

Note: 1. Directional gain = $3\text{dBi} + 10\log(3) = 7.77\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.77 - 6) = 28.23\text{dBm}$.

Beamforming Mode

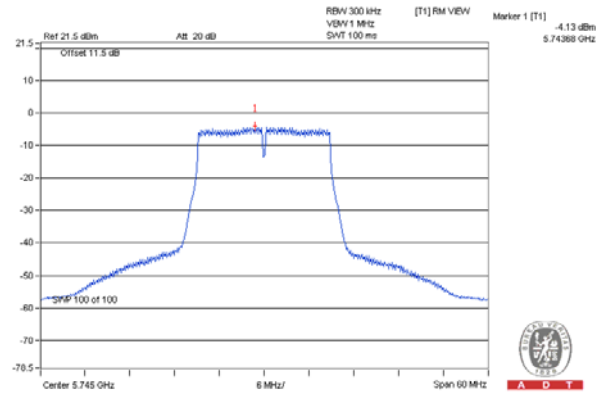
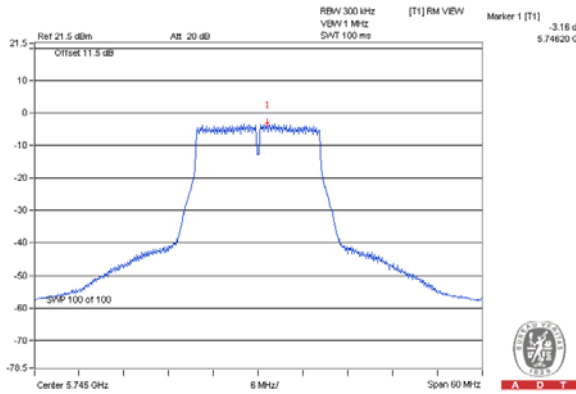
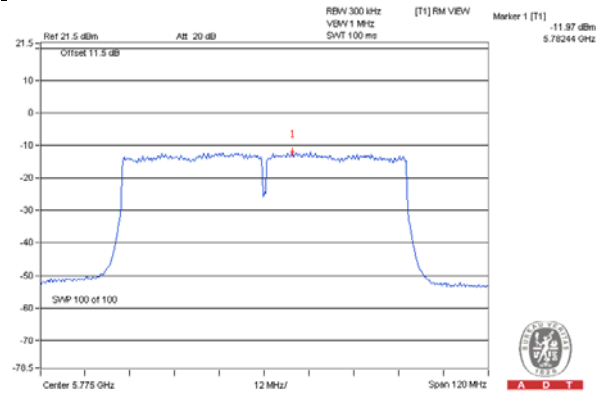
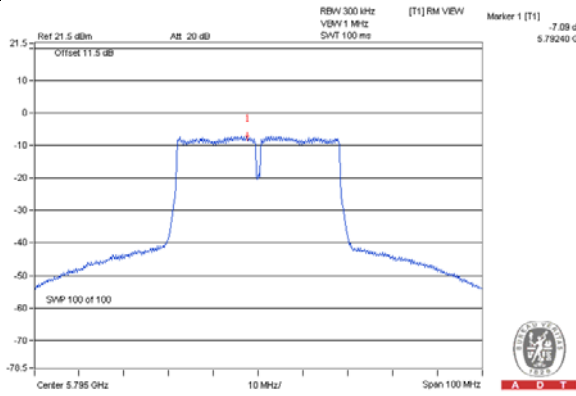
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
802.11ac (VHT20)								
0	149	5745	-5.13	-2.91	4.77	1.86	28.23	Pass
	157	5785	-6.27	-4.05	4.77	0.72	28.23	Pass
	165	5825	-5.84	-3.62	4.77	1.15	28.23	Pass
1	149	5745	-5.34	-3.12	4.77	1.65	28.23	Pass
	157	5785	-6.01	-3.79	4.77	0.98	28.23	Pass
	165	5825	-5.85	-3.63	4.77	1.14	28.23	Pass
2	149	5745	-4.13	-1.91	4.77	2.86	28.23	Pass
	157	5785	-4.64	-2.42	4.77	2.35	28.23	Pass
	165	5825	-4.70	-2.48	4.77	2.29	28.23	Pass
802.11ac (VHT40)								
0	151	5755	-9.53	-7.31	4.77	-2.54	28.23	Pass
	159	5795	-7.68	-5.46	4.77	-0.69	28.23	Pass
1	151	5755	-9.73	-7.51	4.77	-2.74	28.23	Pass
	159	5795	-8.17	-5.95	4.77	-1.18	28.23	Pass
2	151	5755	-8.88	-6.66	4.77	-1.89	28.23	Pass
	159	5795	-7.09	-4.87	4.77	-0.10	28.23	Pass

Note: 1. Directional gain = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 30-(7.77-6) = 28.23dBm.

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
802.11ac (VHT80)									
0	155	5775	-13.33	-11.11	4.77	0.19	-6.15	28.23	Pass
1	155	5775	-13.17	-10.95	4.77	0.19	-5.99	28.23	Pass
2	155	5775	-11.97	-9.75	4.77	0.19	-4.79	28.23	Pass

Note: 1. Directional gain = 3dBi + 10log(3) = 7.77dBi > 6dBi , so the power density limit shall be reduced to 30-(7.77-6) = 28.23dBm.

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

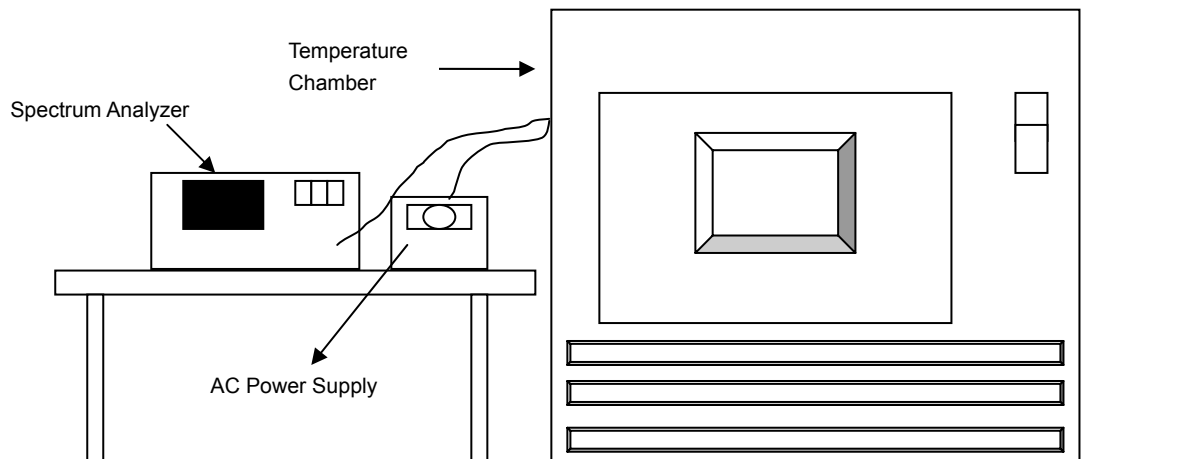
SPECTRUM PLOT OF WORST VALUE**802.11a – Chain 2: CH 149****802.11a (VHT20) – Chain 2: CH 149****802.11ac (VHT40) – Chain 2: CH 159****802.11ac (VHT80) – Chain 2: CH 155**

4.5 Frequency Stability Measurement

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal 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	5179.9881	-0.00023	5179.9905	-0.00018	5179.9887	-0.00022	5179.9867	-0.00026
40	120	5179.9964	-0.00007	5179.9925	-0.00014	5179.9923	-0.00015	5179.9969	-0.00006
30	120	5179.9894	-0.00020	5179.9892	-0.00021	5179.9846	-0.00030	5179.9895	-0.00020
20	120	5180.0079	0.00015	5180.0049	0.00009	5180.0054	0.00010	5180.0055	0.00011
10	120	5180.0234	0.00045	5180.0258	0.00050	5180.0266	0.00051	5180.0238	0.00046
0	120	5179.9743	-0.00050	5179.9737	-0.00051	5179.9762	-0.00046	5179.9767	-0.00045
-10	120	5179.9809	-0.00037	5179.9807	-0.00037	5179.9832	-0.00032	5179.9813	-0.00036
-20	120	5180.0082	0.00016	5180.008	0.00015	5180.0089	0.00017	5180.0077	0.00015
-30	120	5180.0232	0.00045	5180.0216	0.00042	5180.0241	0.00047	5180.0218	0.00042

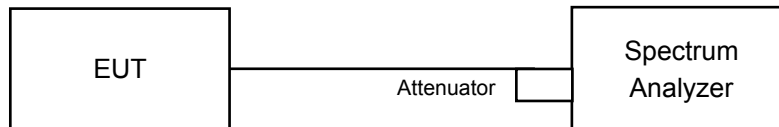
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5180.0078	0.00015	5180.0054	0.00010	5180.0057	0.00011	5180.0049	0.00009
	120	5180.0079	0.00015	5180.0049	0.00009	5180.0054	0.00010	5180.0055	0.00011
	102	5180.0074	0.00014	5180.0044	0.00008	5180.0062	0.00012	5180.0064	0.00012

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

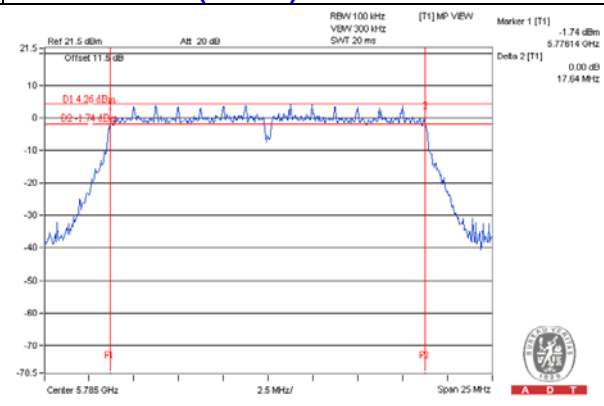
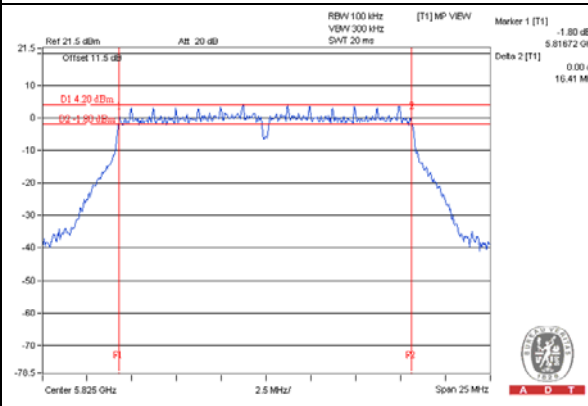
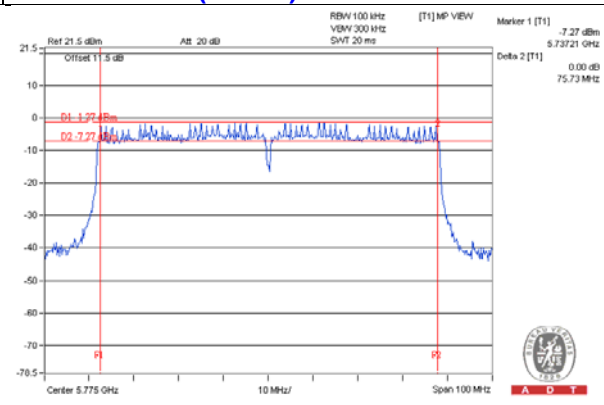
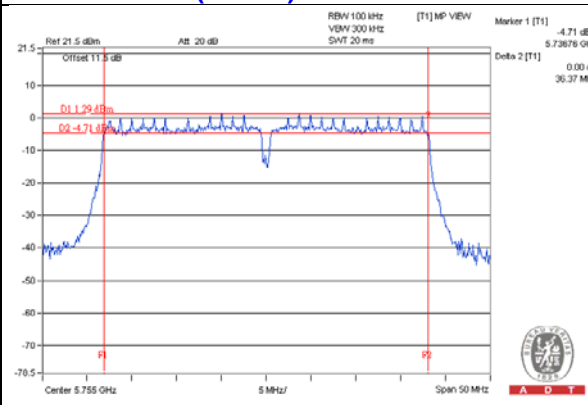
4.6.7 Test Results

CDD Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11a						
149	5745	16.42	16.44	16.44	0.5	Pass
157	5785	16.41	16.42	16.43	0.5	Pass
165	5825	16.41	16.41	16.44	0.5	Pass

Beamforming Mode

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
802.11ac (VHT20)						
149	5745	17.66	17.67	17.68	0.5	Pass
157	5785	17.64	17.66	17.68	0.5	Pass
165	5825	17.65	17.68	17.66	0.5	Pass
802.11ac (VHT40)						
151	5755	36.37	36.41	36.41	0.5	Pass
159	5795	36.37	36.44	36.41	0.5	Pass
802.11ac (VHT80)						
155	5775	75.88	76.45	75.73	0.5	Pass

SPECTRUM PLOT OF WORST VALUE**802.11a – Chain 1: CH 165****802.11ac (VHT20) – Chain 0: CH 157****802.11ac (VHT40) – Chain 0: CH 151****802.11ac (VHT80) – Chain 2: CH 155**

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab/Telecom Lab

Tel: 886-3-5935343

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Tel: 886-3-3183232

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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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