FCC Test Report

Report No.:	RF150420E01-1
FCC ID:	VW3FAST3486
Test Model:	F@ST 3486
S/N:	Test sample only
P/N:	253641590
Received Date:	Apr. 20, 2015
Test Date:	Apr. 21 to 28, 2015
Issued Date:	May 18, 2015
Applicant:	SAGEMCOM SAS
Address:	250 Route de l’ Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE
Manufacturer:	SAGEMCOM SAS
Address:	250 Route de l’ Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (1):	No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF150420E01-1	Original release.	May 18, 2015

1 Certificate of Conformity

Product:	Cable Gateway
Brand:	SAGEMCOM
Test Model:	F@ST 3486
S/N:	Test sample only
P/N:	253641590
Sample Status:	ENGINEERING SAMPLE
Applicant:	SAGEMCOM SAS
Test Date:	Apr. 21 to 28, 2015
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2009

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 18, 2015
Lori Chung / Specialist

Approved by : _____ , **Date:** May 18, 2015
May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (SECTION 15.407 Under New Rule)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -5.70dB at 0.15000MHz.
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 5150.00MHz.
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(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) 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. For the 2400 ~ 2483.5MHz and 5725~5850MHz 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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.86 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.43 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.65 dB
	6GHz ~ 18GHz	3.88 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	Cable Gateway
Brand	SAGEMCOM
Test Model	F@ST 3486
S/N	Test sample only
P/N	253641590
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/g: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
Operating Frequency	**For 15.407** **5GHz:** 5.18 ~ 5.24GHz
	For 15.247 **2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.745 ~ 5.825GHz
Number of Channel	**For 15.407** 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
	For 15.247 (2.4GHz) 11 for 802.11b, 802.11g, 802.11n (HT20), VHT20 7 for 802.11n (HT40), VHT40 **For 15.247 (5GHz)** 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)

Output Power	**For 15.407** **CDD Mode:** 802.11a: 181.552mW 802.11ac (VHT20): 402.336mW 802.11ac (VHT40): 528.52mW 802.11ac (VHT80): 57.775mW **Beamforming Mode:** 802.11ac (VHT20): 134.999mW 802.11ac (VHT40): 185.281mW 802.11ac (VHT80): 45.689mW
	For 15.247 (2.4GHz) **CDD Mode:** 802.11b: 138.995mW 802.11g: 386.459mW 802.11n (HT20): 387.091mW 802.11n (HT40): 108.098mW **For 15.247 (5GHz)** **CDD Mode:** 802.11a: 270.396mW 802.11ac (VHT20): 789.256mW 802.11ac (VHT40): 862.64mW 802.11ac (VHT80): 291.867mW **Beamforming Mode:** 802.11ac (VHT20): 396.664mW 802.11ac (VHT40): 395.912mW 802.11ac (VHT80): 253.782mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The emission of the simultaneous operation (2.4GHz & 5GHz) has been evaluated and no non-compliance was found.
2. The antennas provided to the EUT, please refer to the following table:

2.4GHz Band								
Antenna No.	PCB Chain No.	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connecter Type	Cable Length (mm)
E	0	wanshih	NA	2.0979	2.4~2.4835	PIFA	None (like solder)	NA
B	1	wanshih	NA	2.9762	2.4~2.4835	PCB	i-pex(MHF)	160
F	2	wanshih	NA	2.51	2.4~2.4835	PIFA	None (like solder)	NA
5GHz Band								
Antenna No.	PCB Chain No.	Brand	Model	Ant. Gain(dBi) <Including cable loss>	Frequency range (GHz to GHz)	Antenna Type	Connecter Type	Cable Length (mm)
C	0	wanshih	NA	3.81	5.15~5.85	PIFA	None (like solder)	NA
D	1	wanshih	NA	3.92	5.15~5.85	PIFA	None (like solder)	NA
A	2	wanshih	NA	3.8509	5.15~5.85	PCB	i-pex(MHF)	75

3. The EUT must be supplied with a power adapter as below table :

Brand	Model No.	Spec.
SAGEMCOM	NBS30B120250VU	AC Input: 100-120V, 0.9A, 60Hz DC Output: 12V, 2.5A DC output cable: Unshielded, 2.0m, without core

4. The EUT incorporates a MIMO function with beamforming.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	1TX (diversity)	1RX
802.11g	6 ~ 54Mbps	3TX	3RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
5GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	1TX (diversity)	1RX
802.11n (HT20)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11n (HT40)	MCS 0~7	3TX	3RX
	MCS 8~15	3TX	3RX
	MCS 16~23	3TX	3RX
802.11ac (VHT20)	MCS 0~8, Nss=1	3TX	3RX
	MCS 0~8, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT40)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
802.11ac (VHT80)	MCS 0~9, Nss=1	3TX	3RX
	MCS 0~9, Nss=2	3TX	3RX
	MCS 0~9, Nss=3	3TX	3RX
Note: 1. For 2.4GHz band and 5GHz band (802.11a), the EUT doesn't support beamforming mode.			

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)

5. 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

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. **NOTE:** The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **wall-mount type**

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
CDD 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
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

Radiated Emission Test (Below 1GHz):

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

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

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.

CDD 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

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
CDD 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
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

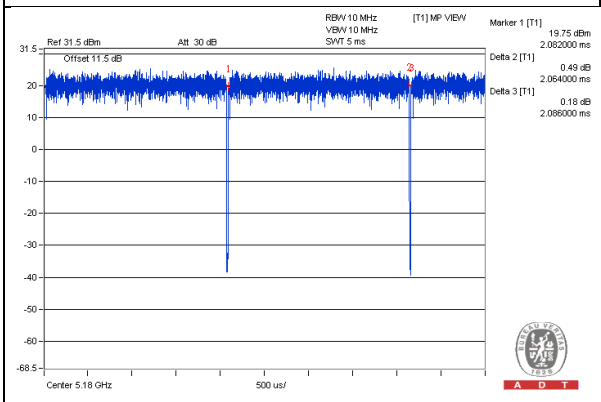
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 69%RH 23deg. C, 69%RH	120Vac, 60Hz	Robert Cheng
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Robert Cheng
PLC	20deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

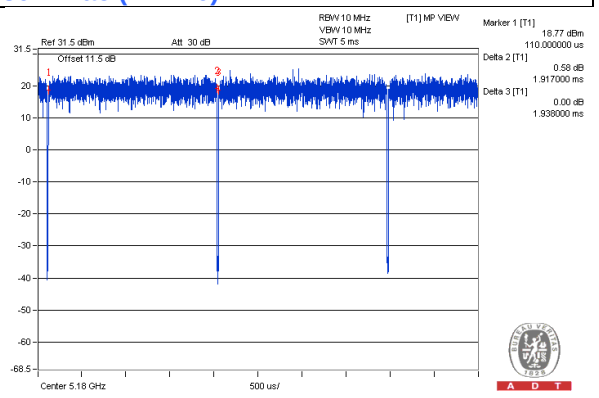
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.064 ms/2.086 ms = 0.989
802.11ac (VHT20): Duty cycle = 1.917 ms/1.938 ms= 0.989
802.11ac (VHT40): Duty cycle = 0.942 ms/0.963 ms= 0.978, Duty factor = 10 * log(1/0.978) = 0.10
802.11ac (VHT80): Duty cycle = 0.458 ms/0.483 ms= 0.948, Duty factor = 10 * log(1/0.948) = 0.23

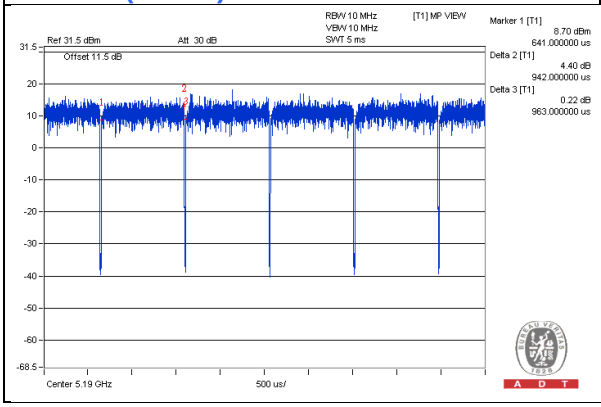
802.11a



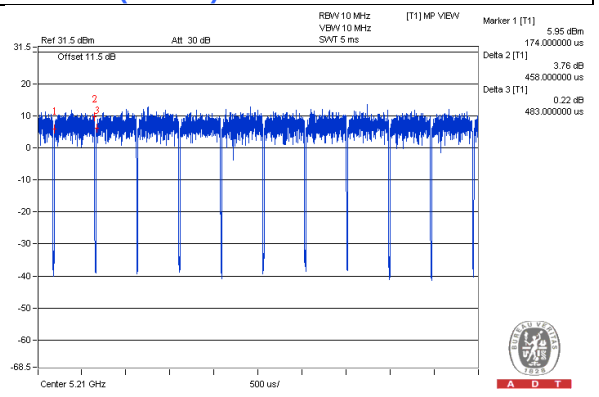
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

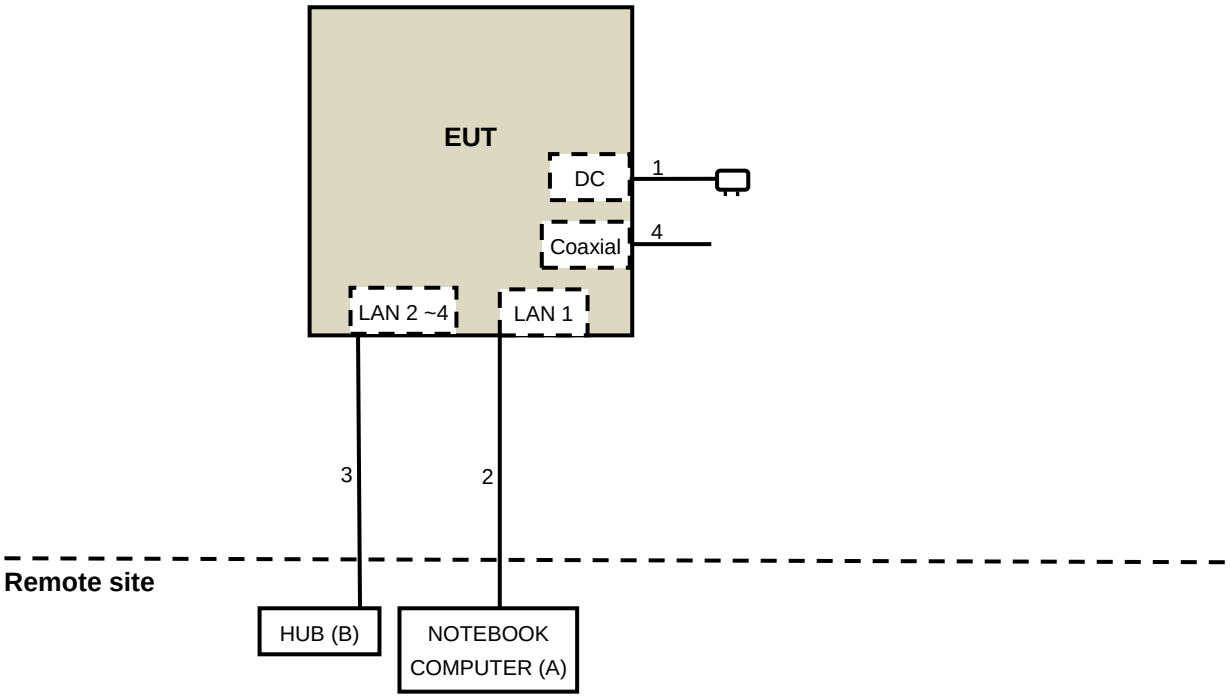
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	NOTEBOOK COMPUTER	DELL	E5440	6FC7F12	FCC DoC	Provided by Lab
B	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab

NOTE:

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

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1	DC	1	2	No	0	Supplied by Client
2	RJ45	1	10	No	0	Provided by Lab
3	RJ45	3	10	No	0	Provided by Lab
4	Coaxial	1	10	Yes	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 C63.10-2009

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 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	**EIRP LIMIT**	**EQUIVALENT FIELD STRENGTH AT 3m**
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/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(dBμV/m) *1 PK:78.2 (dBμV/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:

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

4.1.2 Test Instruments

For above 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY51210105	July 21, 2014	July 20, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-03	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 09, 2015	Feb. 08, 2016
RF Cable	NA	CHGCAB_001	Oct. 04, 2014	Oct. 03, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Feb. 09, 2015	Feb. 08, 2016
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	131205 131216 131217 SNMY23684/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
Antenna Tower & Turn Table CT	NA	NA	NA	NA
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 2015
Power Meter Anritsu	ML2495A	0824006	May 22, 2014	May 21, 2015
Power Sensor Anritsu	MA2411B	0738172	May 22, 2014	May 21, 2015
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 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. G.
4. The FCC Site Registration No. is 966073.
5 The VCCI Site Registration No. is G-137.
6 The CANADA Site Registration No. is IC 7450H-2.
7 Tested Date: Apr. 22 to 28, 2015

For below 1GHz test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-04	Nov. 12, 2014	Nov. 11, 2015
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 06, 2015	Feb. 05, 2016
RF Cable	NA	CHHCAB_001	Oct. 05, 2014	Oct. 04, 2015
Horn_Antenna AISI	AIH.8018	0000220091110	Feb. 06, 2015	Feb. 05, 2016
Pre-Amplifier Agilent	8449B	300801923	Oct. 28, 2014	Oct. 27, 2015
RF Cable	NA	131206 131213 131215 SNMY23685/4	Jan. 16, 2015	Jan. 15, 2016
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Dec. 12, 2014	Dec. 11, 2015
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Feb. 05, 2015	Feb. 04, 2016
RF Cable	NA	329751/4 RF104-204	Dec. 11, 2014	Dec. 10, 2015
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. H.
4. The FCC Site Registration No. is 797305.
5 The CANADA Site Registration No. is IC 7450H-3.
6 Tested Date: Apr. 21, 2015

4.1.3 Test Procedure

a. The EUT was placed on the top of a rotating table 0.8 meters 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:

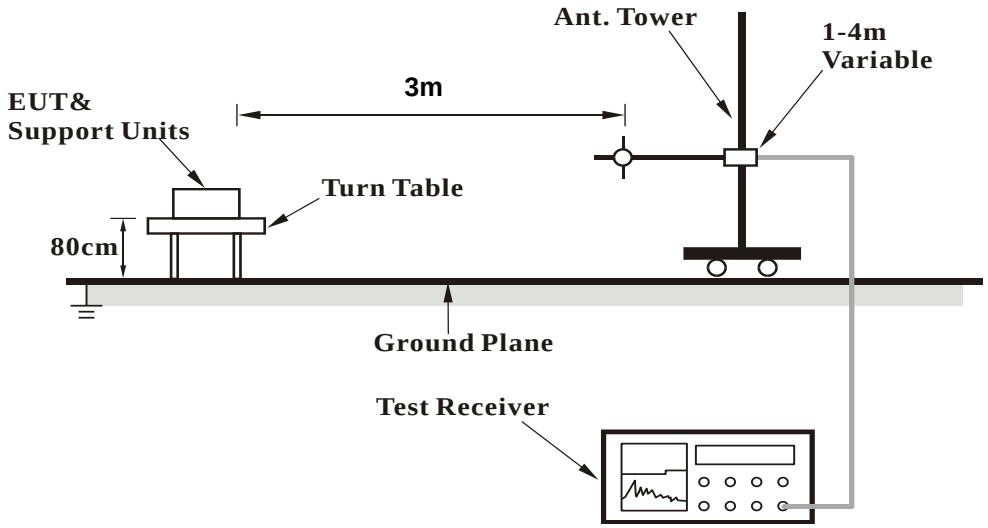
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. 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/duty cycle)).
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

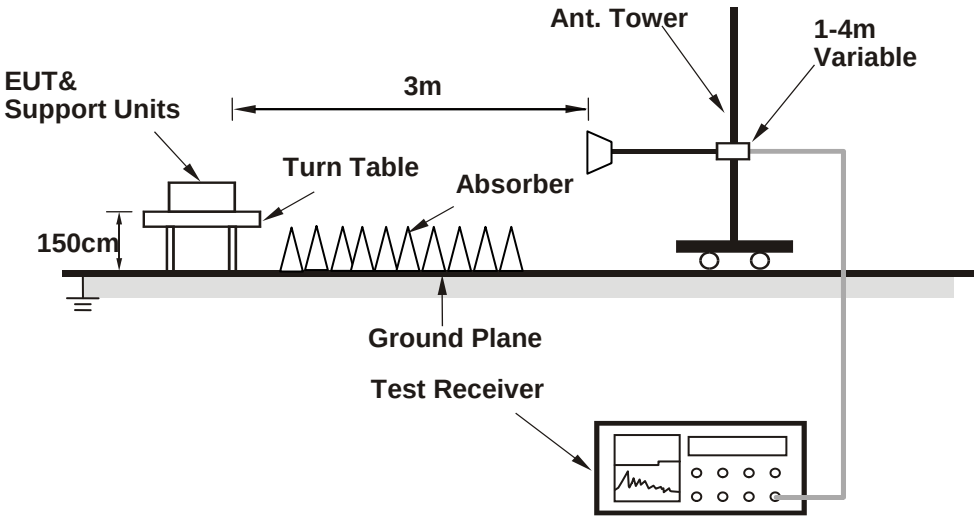
No deviation.

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 unit A (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

CDD MODE

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	64.5 PK	74.0	-9.5	1.59 H	21	61.31	3.19
2	5150.00	51.1 AV	54.0	-2.9	1.59 H	21	47.91	3.19
3	*5180.00	112.6 PK			1.58 H	21	109.30	3.30
4	*5180.00	102.6 AV			1.58 H	21	99.30	3.30
5	#10360.00	58.0 PK	74.0	-16.0	1.60 H	179	49.26	8.74
6	#10360.00	44.4 AV	54.0	-9.6	1.60 H	179	35.66	8.74
7	15540.00	62.0 PK	74.0	-12.0	1.61 H	84	48.40	13.60
8	15540.00	50.2 AV	54.0	-3.8	1.61 H	84	36.60	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	68.4 PK	74.0	-5.6	1.80 V	170	65.21	3.19
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.80 V**	**170**	**50.71**	**3.19**
3	*5180.00	116.4 PK			1.80 V	170	113.10	3.30
4	*5180.00	105.9 AV			1.80 V	170	102.60	3.30
5	#10360.00	59.0 PK	74.0	-15.0	1.64 V	142	50.26	8.74
6	#10360.00	44.8 AV	54.0	-9.2	1.64 V	142	36.06	8.74
7	15540.00	63.0 PK	74.0	-11.0	1.65 V	160	49.40	13.60
8	15540.00	51.6 AV	54.0	-2.4	1.65 V	160	38.00	13.60

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	114.9 PK			1.59 H	46	111.52	3.38
2	*5200.00	104.5 AV			1.59 H	46	101.12	3.38
3	5362.00	61.1 PK	74.0	-12.9	1.58 H	30	57.41	3.69
4	5362.00	50.3 AV	54.0	-3.7	1.58 H	30	46.61	3.69
5	#10400.00	57.9 PK	74.0	-16.1	1.60 H	184	49.10	8.80
6	#10400.00	44.7 AV	54.0	-9.3	1.60 H	184	35.90	8.80
7	15600.00	61.9 PK	74.0	-12.1	1.67 H	77	48.09	13.81
8	15600.00	50.1 AV	54.0	-3.9	1.67 H	77	36.29	13.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	118.3 PK			1.71 V	171	114.92	3.38
2	*5200.00	107.9 AV			1.71 V	171	104.52	3.38
3	5362.00	64.3 PK	74.0	-9.7	1.71 V	171	60.61	3.69
4	5362.00	53.1 AV	54.0	-0.9	1.71 V	171	49.41	3.69
5	#10400.00	58.9 PK	74.0	-15.1	1.57 V	161	50.10	8.80
6	#10400.00	45.1 AV	54.0	-8.9	1.57 V	161	36.30	8.80
7	15600.00	62.5 PK	74.0	-11.5	1.70 V	153	48.69	13.81
8	15600.00	51.2 AV	54.0	-2.8	1.70 V	153	37.39	13.81

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	114.2 PK			1.60 H	34	110.78	3.42
2	*5240.00	104.1 AV			1.60 H	34	100.68	3.42
3	5402.10	61.4 PK	74.0	-12.6	1.58 H	18	57.56	3.84
4	5402.10	50.4 AV	54.0	-3.6	1.58 H	18	46.56	3.84
5	#10480.00	58.3 PK	74.0	-15.7	1.57 H	174	49.29	9.01
6	#10480.00	45.0 AV	54.0	-9.0	1.57 H	174	35.99	9.01
7	15720.00	62.3 PK	74.0	-11.7	1.63 H	94	48.93	13.37
8	15720.00	51.0 AV	54.0	-3.0	1.63 H	94	37.63	13.37
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	*5240.00	117.9 PK			1.71 V	171	114.48	3.42
2	*5240.00	107.5 AV			1.71 V	171	104.08	3.42
3	5402.10	64.1 PK	74.0	-9.9	1.68 V	182	60.26	3.84
4	5402.10	52.9 AV	54.0	-1.1	1.68 V	182	49.06	3.84
5	#10480.00	58.9 PK	74.0	-15.1	1.61 V	154	49.89	9.01
6	#10480.00	44.8 AV	54.0	-9.2	1.61 V	154	35.79	9.01
7	15720.00	62.5 PK	74.0	-11.5	1.64 V	155	49.13	13.37
8	15720.00	50.9 AV	54.0	-3.1	1.64 V	155	37.53	13.37

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.9 PK	74.0	-12.1	1.23 H	168	58.71	3.19
2	5150.00	50.3 AV	54.0	-3.7	1.23 H	168	47.11	3.19
3	*5180.00	115.3 PK			1.98 H	170	112.00	3.30
4	*5180.00	106.1 AV			1.98 H	170	102.80	3.30
5	#10360.00	59.0 PK	74.0	-15.0	1.65 H	155	50.26	8.74
6	#10360.00	43.8 AV	54.0	-10.2	1.65 H	155	35.06	8.74
7	15540.00	62.3 PK	74.0	-11.7	1.69 H	89	48.70	13.60
8	15540.00	50.5 AV	54.0	-3.5	1.69 H	89	36.90	13.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.7 PK	74.0	-8.3	1.52 V	190	62.51	3.19
2	5150.00	53.3 AV	54.0	-0.7	1.52 V	190	50.11	3.19
3	*5180.00	114.1 PK			1.62 V	191	110.80	3.30
4	*5180.00	107.0 AV			1.62 V	191	103.70	3.30
5	#10360.00	58.5 PK	74.0	-15.5	1.55 V	160	49.76	8.74
6	#10360.00	44.7 AV	54.0	-9.3	1.55 V	160	35.96	8.74
7	15540.00	63.4 PK	74.0	-10.6	1.61 V	191	49.80	13.60
8	15540.00	51.4 AV	54.0	-2.6	1.61 V	191	37.80	13.60

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.5 PK			1.30 H	154	114.12	3.38
2	*5200.00	108.6 AV			1.30 H	154	105.22	3.38
3	#5280.00	60.3 PK	74.0	-13.7	1.34 H	150	56.86	3.44
4	#5280.00	49.2 AV	54.0	-4.8	1.34 H	150	45.76	3.44
5	5360.00	62.5 PK	74.0	-11.5	1.26 H	161	58.82	3.68
6	5360.00	51.0 AV	54.0	-3.0	1.26 H	161	47.32	3.68
7	#10400.00	58.2 PK	74.0	-15.8	1.65 H	156	49.40	8.80
8	#10400.00	45.3 AV	54.0	-8.7	1.65 H	156	36.50	8.80
9	15600.00	61.9 PK	74.0	-12.1	1.66 H	87	48.09	13.81
10	15600.00	50.3 AV	54.0	-3.7	1.66 H	87	36.49	13.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.7 PK			1.68 V	189	114.32	3.38
2	*5200.00	110.4 AV			1.68 V	189	107.02	3.38
3	#5280.00	60.6 PK	74.0	-13.4	1.68 V	189	57.16	3.44
4	#5280.00	52.4 AV	54.0	-1.6	1.68 V	189	48.96	3.44
5	5360.00	62.6 PK	74.0	-11.4	1.67 V	194	58.92	3.68
6	5360.00	53.1 AV	54.0	-0.9	1.67 V	194	49.42	3.68
7	#10400.00	58.9 PK	74.0	-15.1	1.66 V	179	50.10	8.80
8	#10400.00	45.4 AV	54.0	-8.6	1.66 V	179	36.60	8.80
9	15600.00	64.1 PK	74.0	-9.9	1.52 V	188	50.29	13.81
10	15600.00	51.8 AV	54.0	-2.2	1.52 V	188	37.99	13.81

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	117.3 PK			1.32 H	167	113.88	3.42
2	*5240.00	108.3 AV			1.32 H	167	104.88	3.42
3	5360.00	59.7 PK	74.0	-14.3	1.36 H	166	56.02	3.68
4	5360.00	48.7 AV	54.0	-5.3	1.36 H	166	45.02	3.68
5	5397.00	62.4 PK	74.0	-11.6	1.25 H	136	58.58	3.82
6	5397.00	50.5 AV	54.0	-3.5	1.25 H	136	46.68	3.82
7	#10480.00	58.7 PK	74.0	-15.3	1.60 H	177	49.69	9.01
8	#10480.00	45.8 AV	54.0	-8.2	1.60 H	177	36.79	9.01
9	15720.00	62.2 PK	74.0	-11.8	1.61 H	119	48.83	13.37
10	15720.00	50.8 AV	54.0	-3.2	1.61 H	119	37.43	13.37
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	*5240.00	117.1 PK			1.76 V	192	113.68	3.42
2	*5240.00	109.8 AV			1.76 V	192	106.38	3.42
3	5360.00	61.1 PK	74.0	-12.9	1.67 V	191	57.42	3.68
4	5360.00	51.7 AV	54.0	-2.3	1.67 V	191	48.02	3.68
5	5397.00	62.2 PK	74.0	-11.8	1.72 V	190	58.38	3.82
6	5397.00	53.5 AV	54.0	-0.5	1.72 V	190	49.68	3.82
7	#10480.00	58.0 PK	74.0	-16.0	1.65 V	161	48.99	9.01
8	#10480.00	44.5 AV	54.0	-9.5	1.65 V	161	35.49	9.01
9	15720.00	63.2 PK	74.0	-10.8	1.57 V	165	49.83	13.37
10	15720.00	51.4 AV	54.0	-2.6	1.57 V	165	38.03	13.37

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.7 PK	74.0	-11.3	1.27 H	168	59.51	3.19
2	5150.00	50.9 AV	54.0	-3.1	1.27 H	168	47.71	3.19
3	*5190.00	108.9 PK			1.41 H	143	105.55	3.35
4	*5190.00	98.1 AV			1.41 H	143	94.75	3.35
5	#10380.00	53.1 PK	74.0	-20.9	1.16 H	320	44.33	8.77
6	#10380.00	39.4 AV	54.0	-14.6	1.16 H	320	30.63	8.77
7	15570.00	48.5 PK	74.0	-25.5	1.29 H	185	34.79	13.71
8	15570.00	41.0 AV	54.0	-13.0	1.29 H	185	27.29	13.71
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	67.7 PK	74.0	-6.3	1.68 V	190	64.51	3.19
2	5150.00	53.6 AV	54.0	-0.4	1.68 V	190	50.41	3.19
3	*5190.00	110.3 PK			1.68 V	190	106.95	3.35
4	*5190.00	99.4 AV			1.68 V	190	96.05	3.35
5	#10380.00	57.2 PK	74.0	-16.8	1.23 V	218	48.43	8.77
6	#10380.00	42.3 AV	54.0	-11.7	1.23 V	218	33.53	8.77
7	15570.00	59.4 PK	74.0	-14.6	1.14 V	311	45.69	13.71
8	15570.00	43.4 AV	54.0	-10.6	1.14 V	311	29.69	13.71

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 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	61.6 PK	74.0	-12.4	1.30 H	167	58.41	3.19
2	5150.00	50.2 AV	54.0	-3.8	1.30 H	167	47.01	3.19
3	*5230.00	116.9 PK			1.41 H	173	113.50	3.40
4	*5230.00	106.4 AV			1.41 H	173	103.00	3.40
5	5393.30	59.2 PK	74.0	-14.8	1.28 H	170	55.40	3.80
6	5393.30	47.6 AV	54.0	-6.4	1.28 H	170	43.80	3.80
7	#10460.00	54.5 PK	74.0	-19.5	1.11 H	302	45.54	8.96
8	#10460.00	41.7 AV	54.0	-12.3	1.11 H	302	32.74	8.96
9	15690.00	49.6 PK	74.0	-24.4	1.27 H	4	36.21	13.39
10	15690.00	42.4 AV	54.0	-11.6	1.27 H	4	29.01	13.39
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.6 PK	74.0	-6.4	1.53 V	188	64.41	3.19
2	5150.00	53.5 AV	54.0	-0.5	1.53 V	188	50.31	3.19
3	*5230.00	118.2 PK			1.53 V	188	114.80	3.40
4	*5230.00	107.7 AV			1.53 V	188	104.30	3.40
5	5393.30	61.4 PK	74.0	-12.6	1.53 V	188	57.60	3.80
6	5393.30	49.6 AV	54.0	-4.4	1.53 V	188	45.80	3.80
7	#10460.00	55.6 PK	74.0	-18.4	1.38 V	202	46.64	8.96
8	#10460.00	43.4 AV	54.0	-10.6	1.38 V	202	34.44	8.96
9	15690.00	59.8 PK	74.0	-14.2	1.05 V	106	46.41	13.39
10	15690.00	45.6 AV	54.0	-8.4	1.05 V	106	32.21	13.39

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.4 PK	74.0	-11.6	1.34 H	174	59.21	3.19
2	5150.00	50.5 AV	54.0	-3.5	1.34 H	174	47.31	3.19
3	*5210.00	103.4 PK			1.31 H	163	100.02	3.38
4	*5210.00	93.8 AV			1.31 H	163	90.42	3.38
5	5350.00	57.1 PK	74.0	-16.9	1.37 H	170	53.46	3.64
6	5350.00	46.1 AV	54.0	-7.9	1.37 H	170	42.46	3.64
7	#10420.00	53.2 PK	74.0	-20.8	1.10 H	313	44.35	8.85
8	#10420.00	41.1 AV	54.0	-12.9	1.10 H	313	32.25	8.85
9	15630.00	50.8 PK	74.0	-23.2	1.27 H	31	37.13	13.67
10	15630.00	41.0 AV	54.0	-13.0	1.27 H	31	27.33	13.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.3 PK	74.0	-6.7	1.53 V	194	64.11	3.19
2	5150.00	53.7 AV	54.0	-0.3	1.53 V	194	50.51	3.19
3	*5210.00	104.7 PK			1.53 V	194	101.32	3.38
4	*5210.00	95.0 AV			1.53 V	194	91.62	3.38
5	5350.00	59.5 PK	74.0	-14.5	1.53 V	194	55.86	3.64
6	5350.00	47.6 AV	54.0	-6.4	1.53 V	194	43.96	3.64
7	#10420.00	53.7 PK	74.0	-20.3	1.01 V	15	44.85	8.85
8	#10420.00	41.8 AV	54.0	-12.2	1.01 V	15	32.95	8.85
9	15630.00	58.4 PK	74.0	-15.6	1.01 V	315	44.73	13.67
10	15630.00	42.7 AV	54.0	-11.3	1.01 V	315	29.03	13.67

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 (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	147.13	31.5 QP	43.5	-12.0	1.25 H	117	44.37	-12.85
2	250.00	34.7 QP	46.0	-11.3	1.25 H	285	48.57	-13.87
3	374.98	36.9 QP	46.0	-9.1	1.25 H	303	47.10	-10.22
4	500.01	32.4 QP	46.0	-13.6	1.25 H	343	39.53	-7.16
5	625.00	40.5 QP	46.0	-5.5	1.25 H	350	44.80	-4.33
6	875.02	36.1 QP	46.0	-9.9	1.25 H	263	36.41	-0.33
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	35.72	35.6 QP	40.0	-4.4	1.50 V	173	49.92	-14.32
2	51.58	31.2 QP	40.0	-8.8	1.50 V	183	44.57	-13.35
3	70.59	29.4 QP	40.0	-10.6	1.50 V	263	44.67	-15.28
4	250.00	31.0 QP	46.0	-15.0	1.50 V	308	44.83	-13.87
5	625.00	39.8 QP	46.0	-6.2	1.50 V	267	44.12	-4.33
6	801.01	36.9 QP	46.0	-9.1	1.50 V	269	38.34	-1.48

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

Beamforming MODE

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5022.00	60.2 PK	74.0	-13.8	1.54 H	195	57.51	2.69
2	5022.00	46.5 AV	54.0	-7.5	1.54 H	195	43.81	2.69
3	5150.00	62.1 PK	74.0	-11.9	1.85 H	171	58.91	3.19
4	5150.00	51.4 AV	54.0	-2.6	1.85 H	171	48.21	3.19
5	*5180.00	112.9 PK			1.75 H	201	109.60	3.30
6	*5180.00	105.0 AV			1.75 H	201	101.70	3.30
7	#10360.00	58.4 PK	74.0	-15.6	1.67 H	166	49.66	8.74
8	#10360.00	43.4 AV	54.0	-10.6	1.67 H	166	34.66	8.74
9	15540.00	62.3 PK	74.0	-11.7	1.75 H	104	48.70	13.60
10	15540.00	50.7 AV	54.0	-3.3	1.75 H	104	37.10	13.60
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	5022.00	61.1 PK	74.0	-12.9	1.45 V	172	58.41	2.69
2	5022.00	48.7 AV	54.0	-5.3	1.45 V	172	46.01	2.69
3	5150.00	63.8 PK	74.0	-10.2	2.07 V	175	60.61	3.19
4	5150.00	53.6 AV	54.0	-0.4	2.07 V	175	50.41	3.19
5	*5180.00	115.9 PK			1.86 V	174	112.60	3.30
6	*5180.00	107.8 AV			1.86 V	174	104.50	3.30
7	#10360.00	58.8 PK	74.0	-15.2	1.52 V	150	50.06	8.74
8	#10360.00	45.1 AV	54.0	-8.9	1.52 V	150	36.36	8.74
9	15540.00	63.6 PK	74.0	-10.4	1.67 V	182	50.00	13.60
10	15540.00	51.8 AV	54.0	-2.2	1.67 V	182	38.20	13.60

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	113.3 PK			1.72 H	198	109.92	3.38
2	*5200.00	105.2 AV			1.72 H	198	101.82	3.38
3	5367.00	62.5 PK	74.0	-11.5	1.29 H	158	58.79	3.71
4	5367.00	51.1 AV	54.0	-2.9	1.29 H	158	47.39	3.71
5	#10400.00	59.7 PK	74.0	-14.3	1.60 H	151	50.90	8.80
6	#10400.00	44.3 AV	54.0	-9.7	1.60 H	151	35.50	8.80
7	15600.00	62.5 PK	74.0	-11.5	1.73 H	94	48.69	13.81
8	15600.00	50.9 AV	54.0	-3.1	1.73 H	94	37.09	13.81
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	116.2 PK			1.74 V	173	112.82	3.38
2	*5200.00	108.2 AV			1.74 V	173	104.82	3.38
3	5367.00	63.8 PK	74.0	-10.2	1.77 V	171	60.09	3.71
4	5367.00	53.8 AV	54.0	-0.2	1.77 V	171	50.09	3.71
5	#10400.00	58.3 PK	74.0	-15.7	1.53 V	161	49.50	8.80
6	#10400.00	44.5 AV	54.0	-9.5	1.53 V	161	35.70	8.80
7	15600.00	62.9 PK	74.0	-11.1	1.59 V	207	49.09	13.81
8	15600.00	51.0 AV	54.0	-3.0	1.59 V	207	37.19	13.81

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	112.6 PK			1.65 H	189	109.18	3.42
2	*5240.00	104.2 AV			1.65 H	189	100.78	3.42
3	5400.00	62.2 PK	74.0	-11.8	1.22 H	148	58.37	3.83
4	5400.00	50.6 AV	54.0	-3.4	1.22 H	148	46.77	3.83
5	#10480.00	59.5 PK	74.0	-14.5	1.60 H	162	50.49	9.01
6	#10480.00	44.0 AV	54.0	-10.0	1.60 H	162	34.99	9.01
7	15720.00	62.0 PK	74.0	-12.0	1.65 H	91	48.63	13.37
8	15720.00	50.4 AV	54.0	-3.6	1.65 H	91	37.03	13.37
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	*5240.00	115.2 PK			1.75 V	171	111.78	3.42
2	*5240.00	107.4 AV			1.75 V	171	103.98	3.42
3	5400.00	63.6 PK	74.0	-10.4	1.57 V	152	59.77	3.83
4	5400.00	53.8 AV	54.0	-0.2	1.57 V	152	49.97	3.83
5	#10480.00	58.9 PK	74.0	-15.1	1.59 V	147	49.89	9.01
6	#10480.00	44.9 AV	54.0	-9.1	1.59 V	147	35.89	9.01
7	15720.00	63.6 PK	74.0	-10.4	1.58 V	178	50.23	13.37
8	15720.00	51.8 AV	54.0	-2.2	1.58 V	178	38.43	13.37

REMARKS:

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

802.11ac (VHT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.7 PK	74.0	-12.3	1.21 H	178	58.51	3.19
2	5150.00	50.3 AV	54.0	-3.7	1.21 H	178	47.11	3.19
3	*5190.00	108.3 PK			1.36 H	139	104.95	3.35
4	*5190.00	97.7 AV			1.36 H	139	94.35	3.35
5	5354.00	57.0 PK	74.0	-17.0	1.21 H	162	53.34	3.66
6	5354.00	45.1 AV	54.0	-8.9	1.21 H	162	41.44	3.66
7	#10380.00	53.1 PK	74.0	-20.9	1.10 H	325	44.33	8.77
8	#10380.00	39.2 AV	54.0	-14.8	1.10 H	325	30.43	8.77
9	15570.00	48.9 PK	74.0	-25.1	1.28 H	174	35.19	13.71
10	15570.00	41.4 AV	54.0	-12.6	1.28 H	174	27.69	13.71
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	64.3 PK	74.0	-9.7	2.08 V	172	61.11	3.19
2	5150.00	53.8 AV	54.0	-0.2	2.08 V	172	50.61	3.19
3	*5190.00	110.5 PK			1.79 V	174	107.15	3.35
4	*5190.00	100.2 AV			1.79 V	174	96.85	3.35
5	5354.00	59.2 PK	74.0	-14.8	1.64 V	177	55.54	3.66
6	5354.00	48.3 AV	54.0	-5.7	1.64 V	177	44.64	3.66
7	#10380.00	57.3 PK	74.0	-16.7	1.25 V	207	48.53	8.77
8	#10380.00	42.6 AV	54.0	-11.4	1.25 V	207	33.83	8.77
9	15570.00	59.9 PK	74.0	-14.1	1.15 V	305	46.19	13.71
10	15570.00	43.7 AV	54.0	-10.3	1.15 V	305	29.99	13.71

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.1 PK	74.0	-15.9	1.66 H	5	54.91	3.19
2	5150.00	47.8 AV	54.0	-6.2	1.66 H	5	44.61	3.19
3	*5230.00	113.1 PK			1.66 H	3	109.70	3.40
4	*5230.00	103.2 AV			1.66 H	3	99.80	3.40
5	5394.00	60.1 PK	74.0	-13.9	1.66 H	3	56.29	3.81
6	5394.00	50.4 AV	54.0	-3.6	1.66 H	3	46.59	3.81
7	#10460.00	53.2 PK	74.0	-20.8	1.05 H	313	44.24	8.96
8	#10460.00	39.2 AV	54.0	-14.8	1.05 H	313	30.24	8.96
9	15690.00	48.6 PK	74.0	-25.4	1.27 H	176	35.21	13.39
10	15690.00	40.9 AV	54.0	-13.1	1.27 H	176	27.51	13.39
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	62.1 PK	74.0	-11.9	1.82 V	169	58.91	3.19
2	5150.00	51.6 AV	54.0	-2.4	1.82 V	169	48.41	3.19
3	*5230.00	115.9 PK			1.66 V	178	112.50	3.40
4	*5230.00	105.9 AV			1.66 V	178	102.50	3.40
5	5394.00	64.3 PK	74.0	-9.7	1.79 V	173	60.49	3.81
6	5394.00	53.8 AV	54.0	-0.2	1.79 V	173	49.99	3.81
7	#10460.00	56.7 PK	74.0	-17.3	1.21 V	223	47.74	8.96
8	#10460.00	42.1 AV	54.0	-11.9	1.21 V	223	33.14	8.96
9	15690.00	59.5 PK	74.0	-14.5	1.12 V	311	46.11	13.39
10	15690.00	43.6 AV	54.0	-10.4	1.12 V	311	30.21	13.39

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.2 PK	74.0	-11.8	1.34 H	180	59.01	3.19
2	5150.00	50.5 AV	54.0	-3.5	1.34 H	180	47.31	3.19
3	*5210.00	102.4 PK			1.36 H	156	99.02	3.38
4	*5210.00	92.6 AV			1.36 H	156	89.22	3.38
5	5350.00	56.9 PK	74.0	-17.1	1.33 H	174	53.26	3.64
6	5350.00	45.7 AV	54.0	-8.3	1.33 H	174	42.06	3.64
7	#10420.00	52.4 PK	74.0	-21.6	1.12 H	334	43.55	8.85
8	#10420.00	38.7 AV	54.0	-15.3	1.12 H	334	29.85	8.85
9	15630.00	48.7 PK	74.0	-25.3	1.33 H	184	35.03	13.67
10	15630.00	41.3 AV	54.0	-12.7	1.33 H	184	27.63	13.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.5 PK	74.0	-8.5	1.80 V	175	62.31	3.19
2	5150.00	53.6 AV	54.0	-0.4	1.80 V	175	50.41	3.19
3	*5210.00	104.8 PK			1.56 V	208	101.42	3.38
4	*5210.00	95.1 AV			1.56 V	208	91.72	3.38
5	5350.00	59.8 PK	74.0	-14.2	1.58 V	196	56.16	3.64
6	5350.00	48.0 AV	54.0	-6.0	1.58 V	196	44.36	3.64
7	#10420.00	57.3 PK	74.0	-16.7	1.21 V	221	48.45	8.85
8	#10420.00	42.6 AV	54.0	-11.4	1.21 V	221	33.75	8.85
9	15630.00	59.9 PK	74.0	-14.1	1.15 V	318	46.23	13.67
10	15630.00	43.7 AV	54.0	-10.3	1.15 V	318	30.03	13.67

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.

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 ROHDE & SCHWARZ	ESCS 30	847124/029	Oct. 22, 2014	Oct. 21, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 15, 2014	Sep. 14, 2015
Line-Impedance Stabilization Network (for Peripheral) ROHDE & SCHWARZ	ENV216	100071	Nov. 10, 2014	Nov. 09, 2015
RF Cable (JYEBAO)	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 ADT	BV ADT_Cond_V7.3.7.3	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3 The VCCI Con C Registration No. is C-3611.
4 Tested Date: Apr. 21, 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.

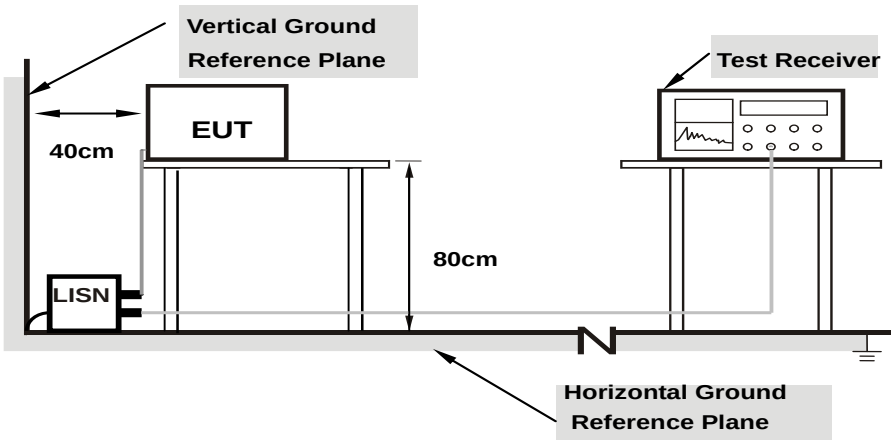
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

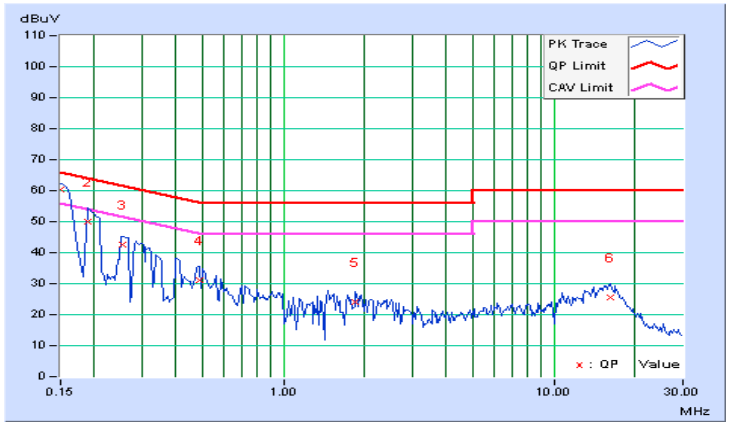
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	60.16	49.12	60.24	49.20	66.00	56.00	-5.76	-6.80
2	0.18906	0.09	49.92	30.33	50.01	30.42	64.08	54.08	-14.07	-23.66
3	0.25547	0.09	42.50	27.93	42.59	28.02	61.58	51.58	-18.98	-23.55
4	0.48984	0.10	31.16	16.48	31.26	16.58	56.17	46.17	-24.91	-29.59
5	1.84375	0.16	23.74	15.14	23.90	15.30	56.00	46.00	-32.10	-30.70
6	16.25391	0.61	24.95	19.61	25.56	20.22	60.00	50.00	-34.44	-29.78

REMARKS:

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

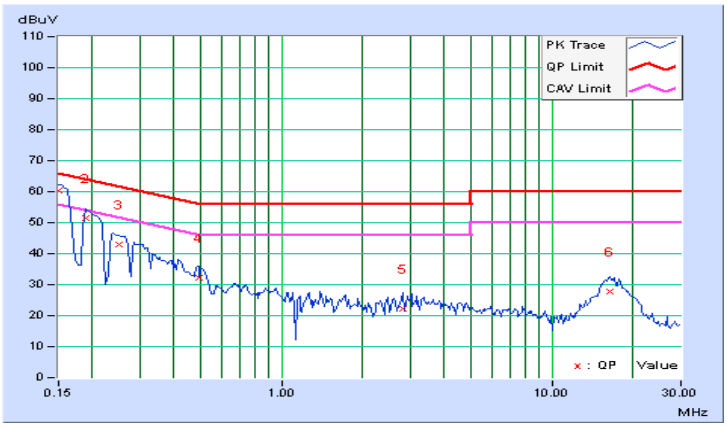


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**0.08**	**60.22**	**47.22**	**60.30**	**47.30**	**66.00**	**56.00**	**-5.70**	**-8.70**
2	0.18906	0.08	51.42	37.25	51.50	37.33	64.08	54.08	-12.58	-16.75
3	0.25156	0.09	42.91	28.53	43.00	28.62	61.71	51.71	-18.71	-23.09
4	0.49375	0.10	32.08	19.30	32.18	19.40	56.10	46.10	-23.92	-26.70
5	2.81250	0.19	22.20	14.84	22.39	15.03	56.00	46.00	-33.61	-30.97
6	16.37500	0.64	27.05	21.81	27.69	22.45	60.00	50.00	-32.31	-27.55

REMARKS:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

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

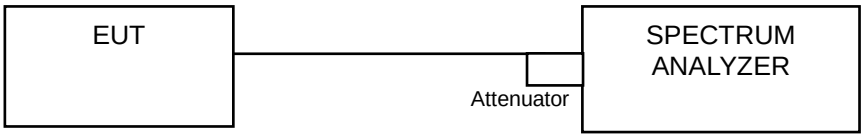
*B is the 26 dB emission bandwidth in megahertz

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

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

CDD MODE

POWER OUTPUT:

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	116.145	20.65	30	Pass
40	5200	181.552	22.59	30	Pass
48	5240	152.757	21.84	30	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	17.95	17.71	18.47	191.7	22.83	30	Pass
40	5200	21.17	21.09	21.55	402.336	26.05	30	Pass
48	5240	21.14	20.67	21.09	375.227	25.74	30	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	13.58	13.37	14.45	72.391	18.60	30	Pass
46	5230	22.40	21.75	23.12	528.52	27.23	30	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	12.14	12.57	13.68	57.775	17.62	30	Pass

Beamforming MODE

POWER OUTPUT:

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	16.27	15.58	17.52	134.999	21.30	27.37	Pass
40	5200	16.17	15.68	17.28	131.839	21.20	27.37	Pass
48	5240	15.45	15.20	16.75	115.503	20.63	27.37	Pass

NOTE: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power limit shall be reduced to 30-(8.63-6)”

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	12.07	11.84	13.34	52.959	17.24	27.37	Pass
46	5230	17.45	17.38	18.75	185.281	22.68	27.37	Pass

NOTE: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power limit shall be reduced to 30-(8.63-6)”

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	11.26	11.05	12.92	45.689	16.60	27.37	Pass

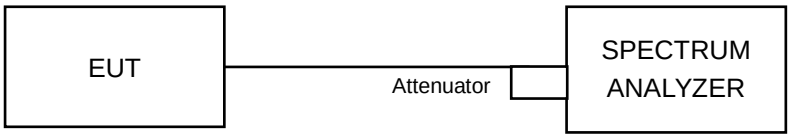
NOTE: Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power limit shall be reduced to 30-(8.63-6)”

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

For 802.11a & 802.11ac (VHT20):

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 802.11ac (VHT40) & 802.11ac (VHT80):

Using method SA-2

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

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

802.11a

Channel	Frequency (MHz)	PSD (dBm)	Maximum Limit (dBm)	Pass/Fail
36	5180	5.81	17	Pass
40	5200	8.06	17	Pass
48	5240	6.97	17	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
36	5180	4.54	3.17	3.10	8.43	14.37	Pass
40	5200	8.30	6.93	6.94	12.21	14.37	Pass
48	5240	8.46	6.88	7.03	12.29	14.37	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 17-(8.63-6) = 14.37dBm.

802.11ac (VHT40)

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				
38	5190	-2.71	-4.74	-4.90	0.10	0.87	14.37	Pass
46	5230	5.87	3.89	4.50	0.10	9.70	14.37	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 17-(8.63-6) = 14.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80):

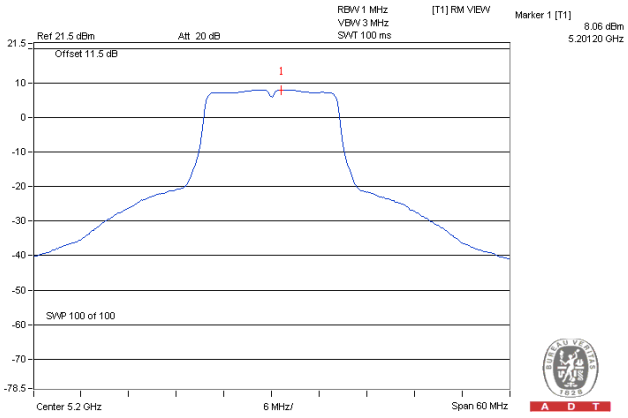
Chan.	Chan. Freq. (MHz)	PSD w/o duty factor (dBm)			Duty factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	-6.60	-8.72	-9.43	0.23	-3.07	14.37	Pass

NOTE:

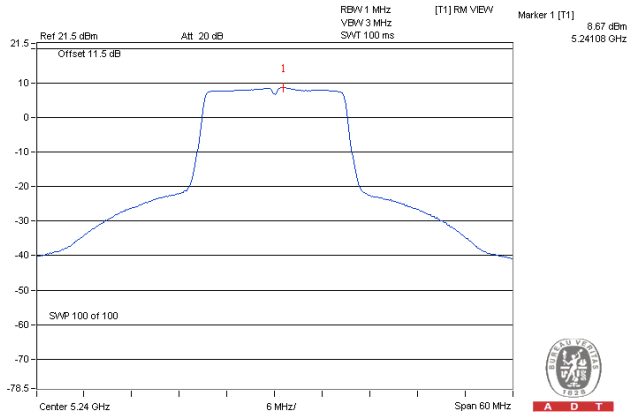
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$)^2 / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 17-(8.63-6) = 14.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

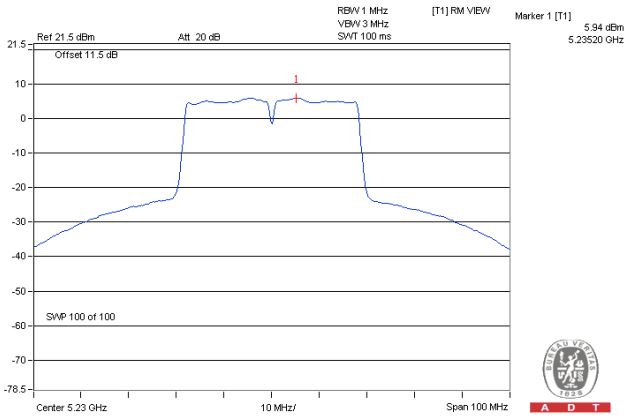
802.11a – CH 40



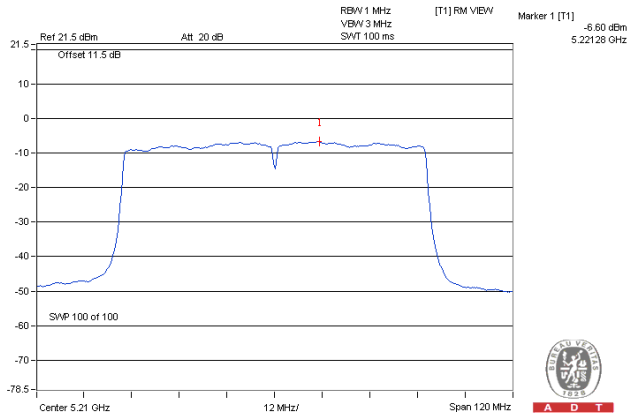
802.11ac (VHT20) – Chain 0: CH 48



802.11ac (VHT40) – Chain 0: CH 46



802.11ac (VHT80) – Chain 0: CH 42



Beamforming MODE

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm)			Total Power Density (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2			
36	5180	1.35	1.46	1.50	6.21	14.37	Pass
40	5200	1.66	1.14	2.78	6.69	14.37	Pass
48	5240	1.06	0.79	2.25	6.19	14.37	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 17-(8.63-6) = 14.37dBm.

802.11ac (VHT40)

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				
38	5190	-5.48	-5.72	-4.17	0.10	-0.20	14.37	Pass
46	5230	0.40	0.06	1.25	0.10	5.47	14.37	Pass

NOTE:

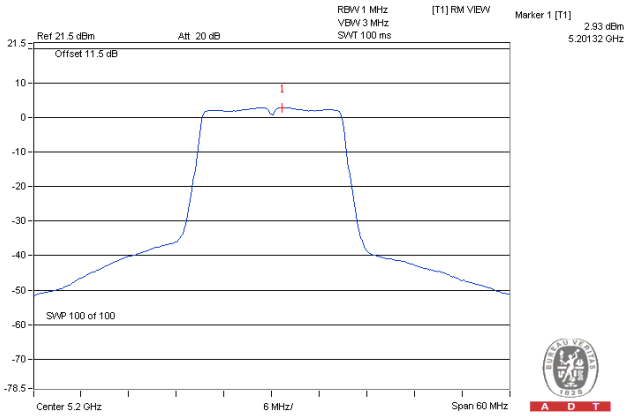
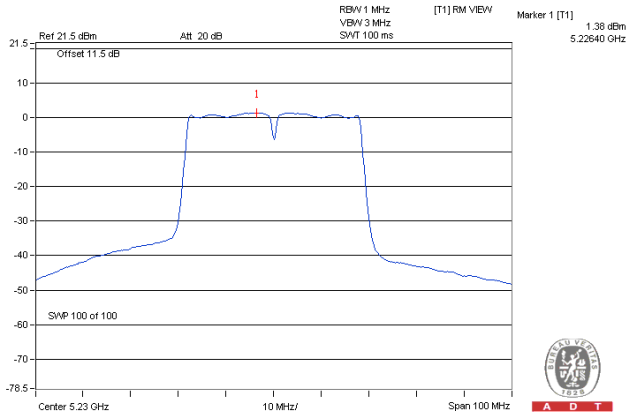
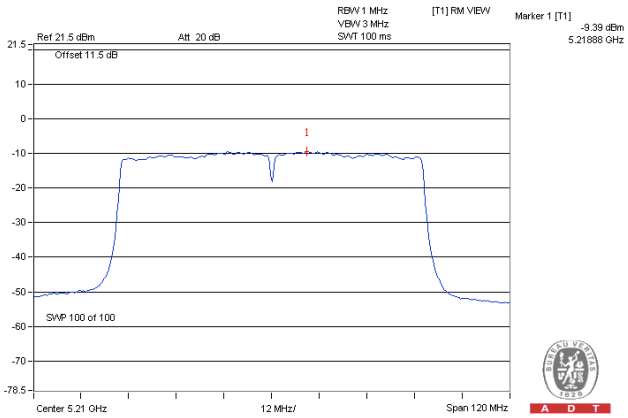
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 17-(8.63-6) = 14.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80):

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				
42	5210	-10.16	-9.39	-9.92	0.23	-4.81	14.37	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 3] = 8.63dBi > 6dBi , so the power density limit shall be reduced to 17-(8.63-6) = 14.37dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

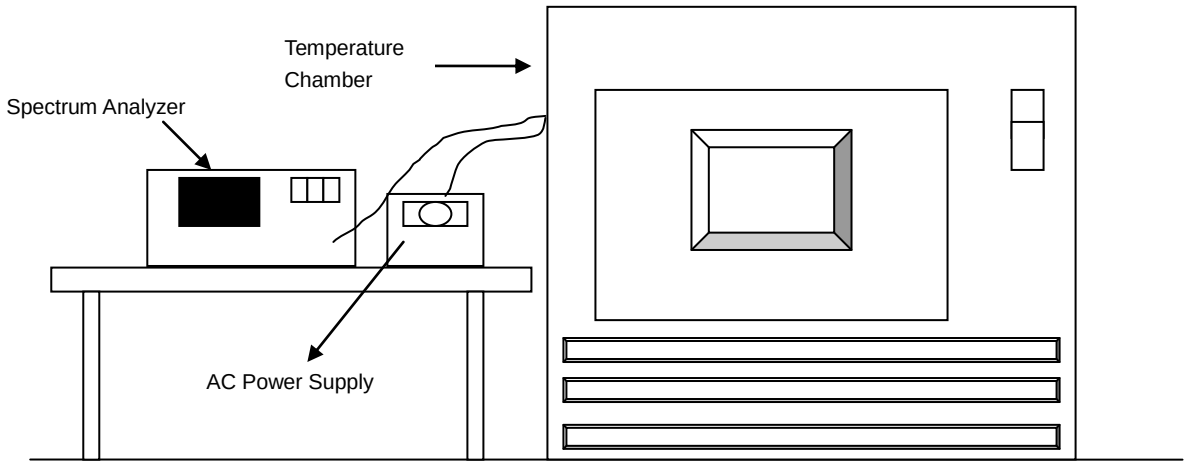
Spectrum Plot of Worst Value	
802.11ac (VHT20) – Chain 2: CH 40	**802.11ac (VHT40) – Chain 2: CH 46**
	
802.11ac (VHT80) – Chain 1: CH 42	
	

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

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

CDD MODE

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	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	5179.9993	-0.00001	5179.9986	-0.00003	5179.998	-0.00004	5179.9958	-0.00008
40	120	5180.0014	0.00003	5179.9989	-0.00002	5179.9981	-0.00004	5179.9988	-0.00002
30	120	5179.9846	-0.00030	5179.9866	-0.00026	5179.9852	-0.00029	5179.9867	-0.00026
20	120	5180.0049	0.00009	5180.0015	0.00003	5180.0043	0.00008	5180.005	0.00010
10	120	5179.9756	-0.00047	5179.9756	-0.00047	5179.9755	-0.00047	5179.9791	-0.00040
0	120	5180.0176	0.00034	5180.0187	0.00036	5180.0145	0.00028	5180.0193	0.00037
-10	120	5180.0196	0.00038	5180.0223	0.00043	5180.0212	0.00041	5180.0205	0.00040
-20	120	5180.0076	0.00015	5180.0046	0.00009	5180.0043	0.00008	5180.0038	0.00007
-30	120	5179.9774	-0.00044	5179.976	-0.00046	5179.975	-0.00048	5179.9764	-0.00046

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	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	5180.0049	0.00009	5180.0018	0.00003	5180.0043	0.00008	5180.0059	0.00011
	120	5180.0049	0.00009	5180.0015	0.00003	5180.0043	0.00008	5180.005	0.00010
	102	5180.004	0.00008	5180.0018	0.00003	5180.0043	0.00008	5180.0041	0.00008

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

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