FCC TEST REPORT (15.407)

REPORT NO.:	RF140812C13-1
TEST MODEL:	C7000BMX
SERIES MODEL:	C7000BMy-zzzzzz with this note “Where y = X if battery is used, and zzzzzz = a different service provider in the same/different country.
FCC ID:	PY314100252
RECEIVED:	Aug. 12, 2014
TESTED:	Sep. 17 to 23, 2014
ISSUED:	Dec. 10, 2014
APPLICANT:	NETGEAR INC.
ADDRESS:	350 East Plumeria Drive, San Jose CA 96134, USA
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.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140812C13-1	Original release	Dec. 10, 2014

1. CERTIFICATION

PRODUCT:	Wireless Cable Data Gateway
BRAND NAME:	NETGEAR
TEST MODEL:	C7000BMX
SERIES MODEL:	C7000BMy-zzzzzz with this note "Where y = X if battery is used, and zzzzzz = a different service provider in the same/different country.
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	NETGEAR INC.
TESTED:	Sep. 17 to 23, 2014
STANDARDS:	**FCC Part 15, Subpart E (Section 15.407)**
	ANSI C63.10-2009

The above equipment (Model: C7000BMX) 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:** Dec. 10, 2014

(Midoli Peng, Specialist)

Approved by : _____ , **Date:** Dec. 10, 2014

(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	**TEST TYPE**	**RESULT**	**REMARK**
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.41dB at 0.15781MHz
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 5663.00MHz & 5704.10MHz..
15.407(a/1/2/3)	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(MHF) not a standard connector.

NOTE: 1. The EUT was operating in 2.400 ~ 2.4835GHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 5.15~5.25GHz and 5.725~5.850GHz. For the 2.400 ~ 2.4835GHz 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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Conducted emissions	2.86 dB
Radiated emissions (30MHz-1GHz)	5.37 dB
Radiated emissions (1GHz -6GHz)	3.65 dB
Radiated emissions (6GHz -18GHz)	3.88 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Cable Data Gateway
TEST MODEL	C7000BMX
SERIES MODEL	C7000BMy-zzzzzz with this note “Where y = X if battery is used, and zzzzzz = a different service provider in the same/different country.
POWER SUPPLY	Internal power supply
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and 11n (BW20), 11n (BW40) mode of 2.4GHz Band
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** 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), 802.11n_256QAM(BW20) 7 for 802.11n (HT40), 802.11n_256QAM(BW40)
MAXIMUM OUTPUT POWER	**For 15.407** 802.11a: 607.881mW 802.11ac (VHT20): 603.665mW 802.11ac (VHT40): 184.445mW 802.11ac (VHT80): 33.403mW **For 15.247** 802.11b: 713.576mW 802.11g: 596.785mW 802.11n (HT20): 582.197mW 802.11n (HT40): 172.399mW

ANTENNA TYPE	Please see NOTE
DATA CABLE	RJ45 cable (Unshielded, 1.5m)
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

Note:

1. The EUT must be supplied with an internal power supply:

brand:	PEGATRON
Model:	UPM60N
Input:	100Vac~240Vac
Output:	12V/5A max.
Power Line:	AC cable (Unshielded, 2m)

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

2.4GHz antenna					
No.	**Transmitter Circuit**	**Gain (dBi) (Include cable loss)**	**Frequency range (GHz to GHz)**	**Antenna Type**	**Connecter Type**
1	0	2.07	2.4~2.4835	PIFA	i-pex(MHF)
2	1	2.07	2.4~2.4835	PIFA	i-pex(MHF)
3	2	2.07	2.4~2.4835	PIFA	i-pex(MHF)
5GHz antenna					
No.	**Transmitter Circuit**	**Gain (dBi) (Include cable loss)**	**Frequency range (GHz to GHz)**	**Antenna Type**	**Connecter Type**
4	0	3.33	5.15~5.25	PIFA	i-pex(MHF)
		3.32	5.25~5.35	PIFA	i-pex(MHF)
		3.29	5.47~5.725	PIFA	i-pex(MHF)
		3.28	5.725~5.850	PIFA	i-pex(MHF)
5	1	3.33	5.15~5.25	PIFA	i-pex(MHF)
		3.32	5.25~5.35	PIFA	i-pex(MHF)
		3.29	5.47~5.725	PIFA	i-pex(MHF)
		3.28	5.725~5.850	PIFA	i-pex(MHF)
6	2	3.33	5.15~5.25	PIFA	i-pex(MHF)
		3.32	5.25~5.35	PIFA	i-pex(MHF)
		3.29	5.47~5.725	PIFA	i-pex(MHF)
		3.28	5.725~5.850	PIFA	i-pex(MHF)

3. The EUT incorporates a MIMO function.

MODULATION MODE	DATA RATE (MCS)	TX & RX CONFIGURATION	
802.11b	1 ~ 11Mbps	3TX CDD	3RX
802.11g	6 ~ 54Mbps	3TX CDD	3RX
802.11n (HT20) 802.11n (HT40) (For 2.4GHz)	MCS 0~7	3TX CDD / beamforming	3RX
	MCS 8~15	3TX CDD / beamforming	3RX
	MCS 16~23	3TX / beamforming	3RX
802.11n (BW20) (For 2.4GHz)	MCS 0~8, Nss=1 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~8, Nss=2 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3 (256QAM)	3TX / beamforming	3RX
802.11n (BW40) (For 2.4GHz)	MCS 0~9, Nss=1 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=2 (256QAM)	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3 (256QAM)	3TX / beamforming	3RX
802.11a	6 ~ 54Mbps	3TX CDD	3RX
802.11n (HT20), 802.11n (HT40) (For 5GHz)	MCS 0~7	3TX CDD / beamforming	3RX
	MCS 8~15	3TX CDD / beamforming	3RX
	MCS 16~23	3TX / beamforming	3RX
802.11ac (VHT20) (For 5GHz)	MCS 0~8, Nss=1	3TX CDD / beamforming	3RX
	MCS 0~8, Nss=2	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3	3TX / beamforming	3RX
802.11ac (VHT40) 802.11ac (VHT80) (For 5GHz)	MCS 0~9, Nss=1	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=2	3TX CDD / beamforming	3RX
	MCS 0~9, Nss=3	3TX / beamforming	3RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz) and 802.11ac mode for 20MHz (40MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

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

3.2 DESCRIPTION OF TEST MODES

Operated in 5150 ~ 5250MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
42	5210 MHz

Operated in 5725 ~ 5850MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

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

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
155	5775 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **PLC:** Power Line Conducted Emission **RE < 1G:** Radiated Emission below 1GHz

RE ≥ 1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

POWER LINE CONDUCTED EMISSION TEST:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	38 to 46 & 151 to 159	48	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

☒ 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	38 to 46 & 151 to 159	48	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHz):

☒ 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	42 & 155	42, 155	OFDM	BPSK	29.3

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)	36 to 48 & 149 to 165	36, 40, 48, 149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)	38 to 46 & 151 to 159	38, 46, 151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)	42 & 155	42, 155	OFDM	BPSK	29.3

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	30deg. C, 70%RH	120Vac, 60Hz	Mike Hsieh
RE<1G	24deg. C, 70%RH	120Vac, 60Hz	Tim Ho
RE≥1G	23deg. C, 67%RH	120Vac, 60Hz	Gary Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz	James Chan

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart E (15.407)

789033 D02 General UNII Test Procedures New Rules 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.

3.4 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.

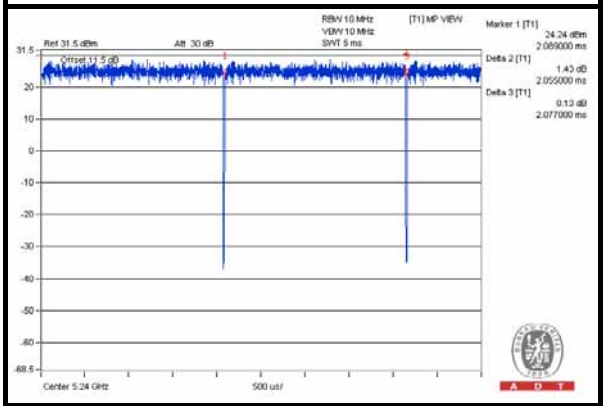
802.11a: Duty cycle = 2.055 ms/2.077 ms = 0.989

802.11ac(VHT20): Duty cycle = 1.916 ms/1.941 ms = 0.987

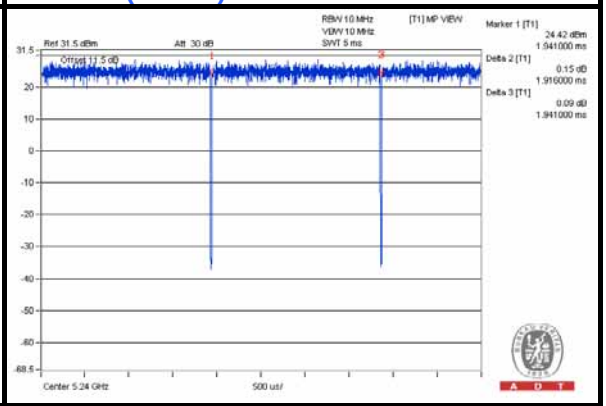
802.11ac(VHT40): Duty cycle = 0.943 ms/0.962 ms = 0.980

802.11ac(VHT80): Duty cycle = 0.461 ms/0.478 ms = 0.964, Duty factor = 10 * log(1/0.964) = 0.16

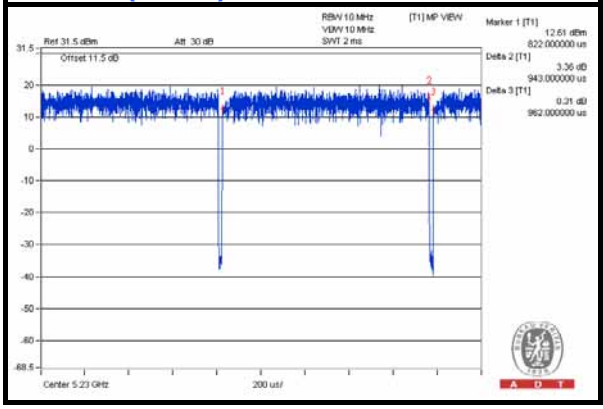
802.11a



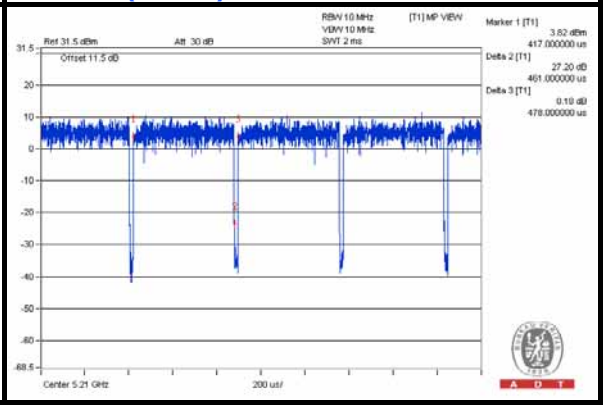
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.5 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.

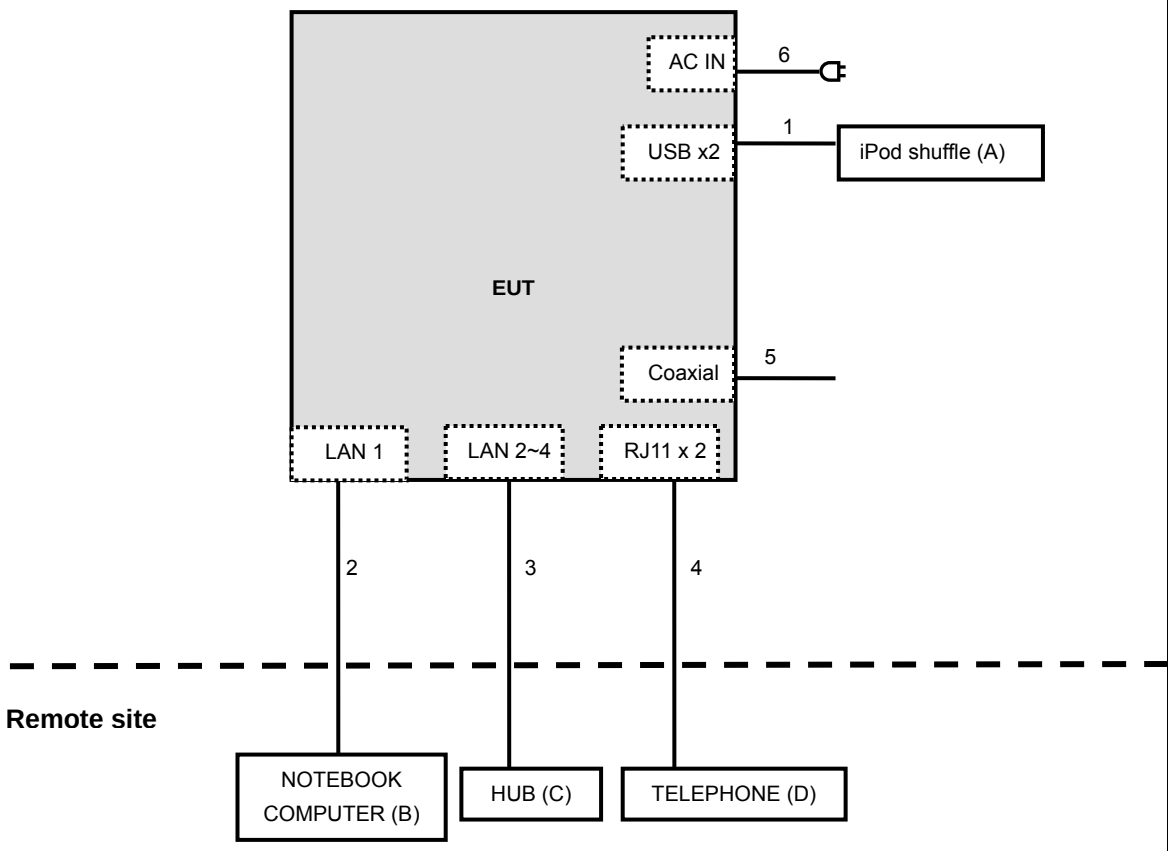
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
A	iPod shuffle	Apple	MD778TA/A	CC4JMCMXF4T1	NA	Provided by Lab
	iPod shuffle	Apple	MD778TA/A	CC4JMH7LF4T1	NA	Provided by Lab
B	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC	Provided by Lab
D	TELEPHONE	WONDER	WD-303	8C17DA02825	NA	Provided by Lab
	TELEPHONE	WONDER	WD-303	8C17DA02763	NA	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.	USB	2	0.1	Yes	0	Provided by Lab
2.	RJ-45	1	10	No	0	Provided by Lab
3.	RJ-45	3	10	No	0	Provided by Lab
4.	RJ-11	2	10	No	0	Provided by Lab
5.	Coaxial	1	10	No	0	Provided by Lab
6.	AC	1	2	No	0	Supplied by client

3.6 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 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 0.50 MHz.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 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. 13, 2013	Nov. 12, 2014
RF Cable (JYEBAO)	5DFB	COCCAB-001	Mar. 10 , 2014	Mar. 09, 2015
50 ohms Terminator	N/A	EMC-03	Sep. 24, 2013	Sep. 23, 2014
50 ohms Terminator	N/A	EMC-02	Oct. 01, 2013	Sep. 30, 2014
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: Sep. 19, 2014

4.1.3 TEST PROCEDURES

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

b. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

d. The frequency range from 150kHz to 30MHz was searched. Emission level under (Limit – 20dB) was not recorded.

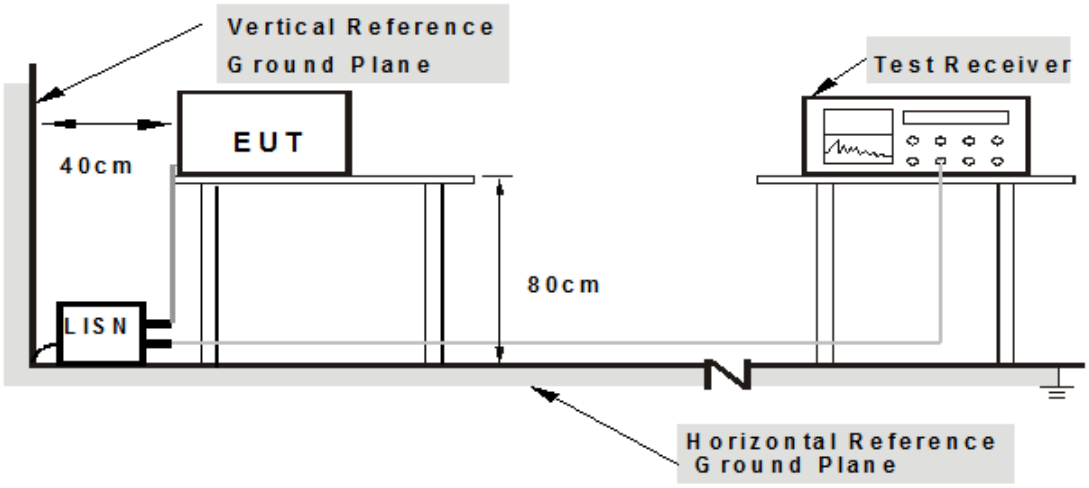
NOTE:

1. The resolution bandwidth of test receiver is 9kHz for Quasi-peak detection (QP) & Average detection (AV).

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support unit B) to act as communication partner.
3. The communication partner ran test program “Mtool.exe[2.0.1.1]” to enable EUT under transmission/receiving condition continuously.

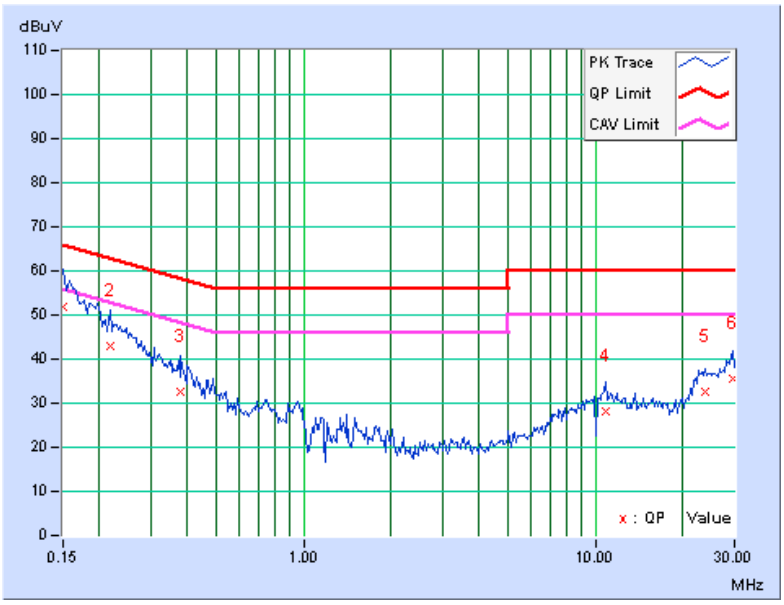
4.1.7 TEST RESULTS

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.07	51.61	36.11	51.68	36.18	66.00	56.00	-14.32	-19.82
2	0.21641	0.07	42.87	30.81	42.94	30.88	62.96	52.96	-20.01	-22.07
3	0.38047	0.09	32.62	25.30	32.71	25.39	58.27	48.27	-25.56	-22.88
4	10.79297	0.47	27.84	23.01	28.31	23.48	60.00	50.00	-31.69	-26.52
5	23.84766	0.82	31.93	26.72	32.75	27.54	60.00	50.00	-27.25	-22.46
6	29.59766	0.99	34.39	29.37	35.38	30.36	60.00	50.00	-24.62	-19.64

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

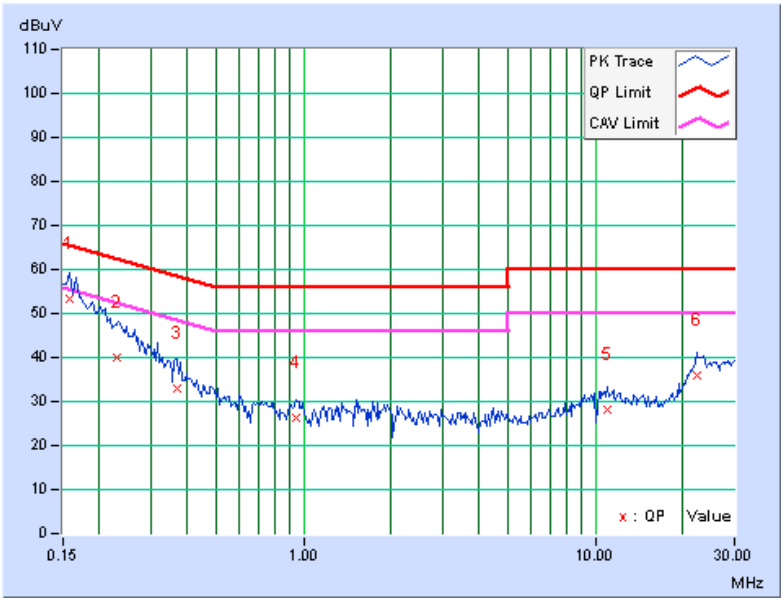


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15781**	**0.07**	**53.09**	**42.89**	**53.16**	**42.96**	**65.58**	**55.58**	**-12.41**	**-12.61**
2	0.22812	0.07	39.87	22.12	39.94	22.19	62.52	52.52	-22.58	-30.33
3	0.36875	0.09	32.85	21.84	32.94	21.93	58.53	48.53	-25.59	-26.60
4	0.93906	0.13	26.09	16.23	26.22	16.36	56.00	46.00	-29.78	-29.64
5	11.05078	0.48	27.51	22.70	27.99	23.18	60.00	50.00	-32.01	-26.82
6	22.39453	0.77	35.00	29.84	35.77	30.61	60.00	50.00	-24.23	-19.39

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 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 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.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures 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).

4.2.3 TEST INSTRUMENTS

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-1000VH2 B	AMP-ZFL-03	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Feb. 26, 2014	Feb. 25, 2015
RF Cable	NA	CHGCAB_001	Oct. 05, 2013	Oct. 04, 2014
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 18, 2013	Nov. 17, 2014
Pre-Amplifier Agilent	8449B	3008A02578	June 24, 2014	June 23, 2015
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 12, 2013	Dec. 11, 2014
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 08, 2013	Oct. 07, 2014
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.
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: Sep. 17 to 23, 2014

4.2.4 TEST PROCEDURES

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:

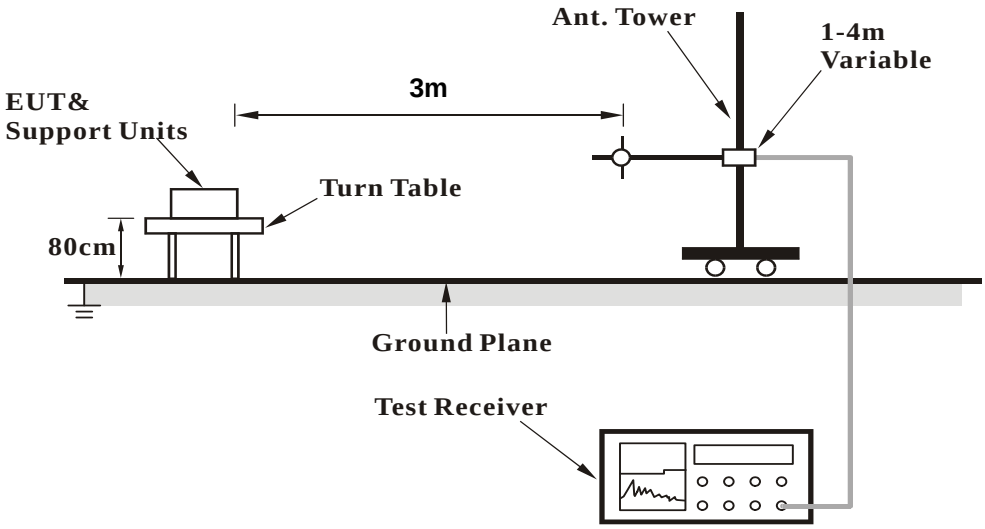
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. 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.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.2.5 DEVIATION FROM TEST STANDARD

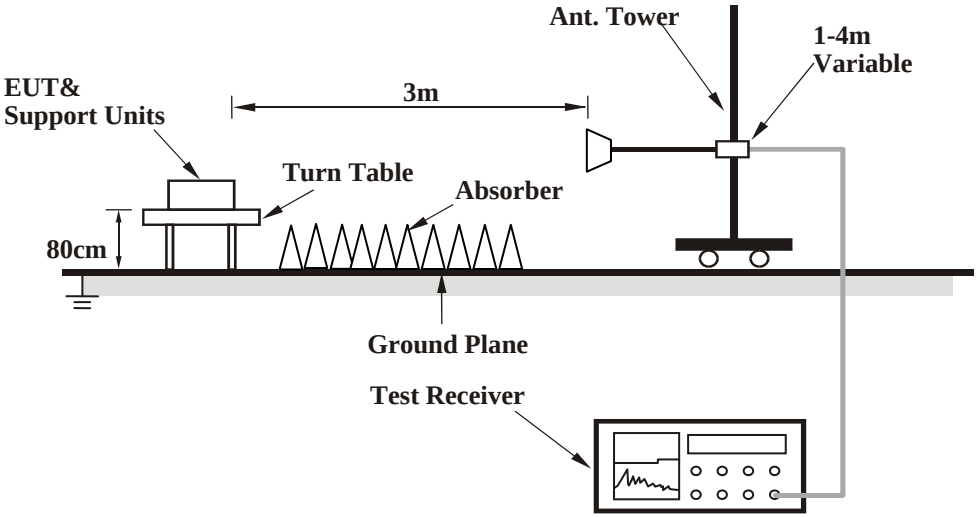
No deviation

4.2.6 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 48	**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	200.82	33.8 QP	43.5	-9.7	1.00 H	276	50.11	-16.34
2	375.03	41.9 QP	46.0	-4.2	1.00 H	307	52.08	-10.23
3	557.92	33.7 QP	46.0	-12.4	1.00 H	113	39.88	-6.23
4	625.00	37.4 QP	46.0	-8.6	1.00 H	93	41.83	-4.41
5	720.01	38.2 QP	46.0	-7.8	1.00 H	28	41.49	-3.26
6	799.99	42.7 QP	46.0	-3.3	1.00 H	72	44.12	-1.41
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	46.43	35.5 QP	40.0	-4.5	1.00 V	168	49.12	-13.61
2	103.87	32.8 QP	43.5	-10.7	1.00 V	65	49.95	-17.18
3	201.01	33.6 QP	43.5	-9.9	1.00 V	299	49.92	-16.35
4	374.98	41.8 QP	46.0	-4.3	1.00 V	334	51.99	-10.24
5	540.03	42.1 QP	46.0	-3.9	1.00 V	49	48.70	-6.59
6	875.02	39.9 QP	46.0	-6.1	1.00 V	279	40.37	-0.45

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

ABOVE 1GHz DATA

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	62.1 PK	74.0	-11.9	1.00 H	250	55.55	6.55
2	5100.00	51.3 AV	54.0	-2.7	1.00 H	250	44.75	6.55
3	*5180.00	113.9 PK			1.00 H	250	106.95	6.95
4	*5180.00	104.1 AV			1.00 H	250	97.15	6.95
5	5400.00	53.2 PK	74.0	-20.8	1.00 H	61	45.49	7.71
6	5400.00	42.3 AV	54.0	-11.7	1.00 H	61	34.59	7.71
7	#5611.00	53.8 PK	74.0	-20.2	1.10 H	253	45.57	8.23
8	#5611.00	42.5 AV	54.0	-11.5	1.10 H	253	34.27	8.23
9	#10360.00	55.4 PK	74.0	-18.6	1.00 H	360	42.29	13.11
10	#10360.00	42.4 AV	54.0	-11.6	1.00 H	360	29.29	13.11
11	15540.00	60.7 PK	74.0	-13.3	1.08 H	121	42.01	18.69
12	15540.00	48.2 AV	54.0	-5.8	1.08 H	121	29.51	18.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	63.8 PK	74.0	-10.2	1.00 V	180	57.25	6.55
2	5100.00	53.4 AV	54.0	-0.6	1.00 V	180	46.85	6.55
3	*5180.00	115.9 PK			1.00 V	215	108.95	6.95
4	*5180.00	106.4 AV			1.00 V	215	99.45	6.95
5	5400.00	56.9 PK	74.0	-17.1	1.30 V	233	49.19	7.71
6	5400.00	46.6 AV	54.0	-7.4	1.30 V	233	38.89	7.71
7	#5611.00	54.5 PK	74.0	-19.5	1.30 V	181	46.27	8.23
8	#5611.00	42.0 AV	54.0	-12.0	1.30 V	181	33.77	8.23
9	#10360.00	54.9 PK	74.0	-19.1	1.21 V	352	41.79	13.11
10	#10360.00	42.2 AV	54.0	-11.8	1.21 V	352	29.09	13.11
11	15540.00	60.8 PK	74.0	-13.2	1.00 V	189	42.11	18.69
12	15540.00	48.1 AV	54.0	-5.9	1.00 V	189	29.41	18.69

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	111.1 PK			1.05 H	249	104.05	7.05
2	*5200.00	101.3 AV			1.05 H	249	94.25	7.05
3	#10400.00	55.9 PK	74.0	-18.1	1.06 H	351	42.68	13.22
4	#10400.00	42.7 AV	54.0	-11.3	1.06 H	351	29.48	13.22
5	15600.00	60.9 PK	74.0	-13.1	1.14 H	131	42.20	18.70
6	15600.00	48.6 AV	54.0	-5.4	1.14 H	131	29.90	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5200.00	113.6 PK			1.00 V	265	106.55	7.05
2	*5200.00	103.6 AV			1.00 V	265	96.55	7.05
3	#10400.00	54.6 PK	74.0	-19.4	1.20 V	359	41.38	13.22
4	#10400.00	42.0 AV	54.0	-12.0	1.20 V	359	28.78	13.22
5	15600.00	60.1 PK	74.0	-13.9	1.00 V	204	41.40	18.70
6	15600.00	47.6 AV	54.0	-6.4	1.00 V	204	28.90	18.70

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
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	121.9 PK			1.11 H	246	114.74	7.16
2	*5240.00	111.7 AV			1.11 H	246	104.54	7.16
3	5404.00	61.4 PK	74.0	-12.6	1.11 H	246	53.68	7.72
4	5404.00	51.2 AV	54.0	-2.8	1.11 H	246	43.48	7.72
5	#10480.00	55.4 PK	74.0	-18.6	1.08 H	360	42.24	13.16
6	#10480.00	42.5 AV	54.0	-11.5	1.08 H	360	29.34	13.16
7	15720.00	60.5 PK	74.0	-13.5	1.17 H	138	42.10	18.40
8	15720.00	48.3 AV	54.0	-5.7	1.17 H	138	29.90	18.40
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	*5240.00	124.2 PK			1.02 V	261	117.04	7.16
2	*5240.00	114.1 AV			1.02 V	261	106.94	7.16
3	5404.00	63.8 PK	74.0	-10.2	1.19 V	262	56.08	7.72
4	5404.00	53.6 AV	54.0	-0.4	1.19 V	262	45.88	7.72
5	#10480.00	55.4 PK	74.0	-18.6	1.21 V	360	42.24	13.16
6	#10480.00	42.6 AV	54.0	-11.4	1.21 V	360	29.44	13.16
7	15720.00	59.7 PK	74.0	-14.3	1.00 V	203	41.30	18.40
8	15720.00	48.2 AV	54.0	-5.8	1.00 V	203	29.80	18.40

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.

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	#5663.00	62.6 PK	68.2	-5.6	1.00 H	293	54.30	8.30
2	#5715.00	57.3 PK	68.2	-10.9	1.00 H	294	48.93	8.37
3	#5725.00	74.1 PK	78.2	-4.1	1.00 H	294	65.71	8.39
4	*5745.00	109.9 PK			1.00 H	294	101.48	8.42
5	*5745.00	100.6 AV			1.00 H	294	92.18	8.42
6	11490.00	55.2 PK	74.0	-18.8	1.06 H	360	40.85	14.35
7	11490.00	42.0 AV	54.0	-12.0	1.06 H	360	27.65	14.35
8	#17235.00	60.2 PK	68.2	-8.0	1.11 H	110	37.76	22.44
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	**#5663.00**	**68.1 PK**	**68.2**	**-0.1**	**1.12 V**	**254**	**59.80**	**8.30**
2	#5715.00	54.5 PK	68.2	-13.7	1.02 V	63	46.13	8.37
3	#5725.00	76.6 PK	78.2	-1.6	1.02 V	63	68.21	8.39
4	*5745.00	115.1 PK			1.02 V	63	106.68	8.42
5	*5745.00	105.1 AV			1.02 V	63	96.68	8.42
6	11490.00	54.9 PK	74.0	-19.1	1.16 V	343	40.55	14.35
7	11490.00	42.0 AV	54.0	-12.0	1.16 V	343	27.65	14.35
8	#17235.00	61.1 PK	68.2	-7.1	1.04 V	195	38.66	22.44

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	#5704.10	62.4 PK	68.2	-5.8	1.01 H	278	54.04	8.36
2	#5725.00	49.9 PK	78.2	-28.3	1.01 H	278	41.51	8.39
3	*5785.00	111.0 PK			1.01 H	278	102.51	8.49
4	*5785.00	100.6 AV			1.01 H	278	92.11	8.49
5	#5850.00	56.4 PK	78.2	-21.8	1.01 H	278	47.73	8.67
6	#5863.20	62.3 PK	68.2	-5.9	1.01 H	278	53.57	8.73
7	11570.00	55.2 PK	74.0	-18.8	1.08 H	360	40.89	14.31
8	11570.00	42.3 AV	54.0	-11.7	1.08 H	360	27.99	14.31
9	#17355.00	59.7 PK	68.2	-8.5	1.14 H	116	36.70	23.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**#5704.10**	**68.1 PK**	**68.2**	**-0.1**	**1.12 V**	**254**	**59.74**	**8.36**
2	#5725.00	54.5 PK	78.2	-23.7	1.00 V	65	46.11	8.39
3	*5785.00	115.5 PK			1.01 V	64	107.01	8.49
4	*5785.00	105.3 AV			1.01 V	64	96.81	8.49
5	#5850.00	61.3 PK	78.2	-16.9	1.00 V	64	52.63	8.67
6	#5863.20	68.0 PK	68.2	-0.2	1.00 V	63	59.27	8.73
7	11570.00	55.1 PK	74.0	-18.9	1.16 V	336	40.79	14.31
8	11570.00	42.4 AV	54.0	-11.6	1.16 V	336	28.09	14.31
9	#17355.00	61.3 PK	68.2	-6.9	1.08 V	197	38.30	23.00

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	110.1 PK			1.01 H	298	101.51	8.59
2	*5825.00	99.8 AV			1.01 H	298	91.21	8.59
3	#5850.00	58.7 PK	78.2	-19.5	1.01 H	298	50.03	8.67
4	#5904.00	63.0 PK	68.2	-5.2	1.01 H	298	54.13	8.87
5	11650.00	55.8 PK	74.0	-18.2	1.09 H	360	41.42	14.38
6	11650.00	42.4 AV	54.0	-11.6	1.09 H	360	28.02	14.38
7	#17475.00	60.3 PK	68.2	-7.9	1.06 H	107	37.00	23.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	115.3 PK			1.01 V	62	106.71	8.59
2	*5825.00	105.1 AV			1.01 V	62	96.51	8.59
3	#5850.00	64.3 PK	78.2	-13.9	1.01 V	62	55.63	8.67
4	#5904.00	67.9 PK	68.2	-0.3	1.00 V	62	59.03	8.87
5	11650.00	54.5 PK	74.0	-19.5	1.12 V	334	40.12	14.38
6	11650.00	41.7 AV	54.0	-12.3	1.12 V	334	27.32	14.38
7	#17475.00	61.1 PK	68.2	-7.1	1.09 V	196	37.80	23.30

REMARKS:

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

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	5100.00	69.9 PK	74.0	-4.1	1.03 H	230	63.35	6.55
2	5100.00	50.8 AV	54.0	-3.2	1.03 H	230	44.25	6.55
3	*5180.00	114.4 PK			1.03 H	230	107.45	6.95
4	*5180.00	104.7 AV			1.03 H	230	97.75	6.95
5	5395.80	56.7 PK	74.0	-17.3	1.03 H	230	49.00	7.70
6	5395.80	46.7 AV	54.0	-7.3	1.03 H	230	39.00	7.70
7	#10360.00	55.6 PK	74.0	-18.4	1.08 H	348	42.49	13.11
8	#10360.00	42.3 AV	54.0	-11.7	1.08 H	348	29.19	13.11
9	15540.00	60.6 PK	74.0	-13.4	1.14 H	115	41.91	18.69
10	15540.00	48.6 AV	54.0	-5.4	1.14 H	115	29.91	18.69
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	72.3 PK	74.0	-1.7	1.05 V	58	65.75	6.55
2	5100.00	53.7 AV	54.0	-0.3	1.05 V	58	47.15	6.55
3	*5180.00	117.2 PK			1.05 V	59	110.25	6.95
4	*5180.00	106.5 AV			1.05 V	59	99.55	6.95
5	5395.80	59.2 PK	74.0	-14.8	1.04 V	60	51.50	7.70
6	5395.80	49.1 AV	54.0	-4.9	1.04 V	60	41.40	7.70
7	#10360.00	55.9 PK	74.0	-18.1	1.19 V	360	42.79	13.11
8	#10360.00	43.0 AV	54.0	-11.0	1.19 V	360	29.89	13.11
9	15540.00	60.1 PK	74.0	-13.9	1.04 V	202	41.41	18.69
10	15540.00	48.4 AV	54.0	-5.6	1.04 V	202	29.71	18.69

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	111.0 PK			1.12 H	245	103.95	7.05
2	*5200.00	101.0 AV			1.12 H	245	93.95	7.05
3	#10400.00	55.7 PK	74.0	-18.3	1.09 H	352	42.48	13.22
4	#10400.00	42.7 AV	54.0	-11.3	1.09 H	352	29.48	13.22
5	15600.00	61.0 PK	74.0	-13.0	1.16 H	135	42.30	18.70
6	15600.00	48.8 AV	54.0	-5.2	1.16 H	135	30.10	18.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	*5200.00	113.6 PK			1.02 V	263	106.55	7.05
2	*5200.00	103.5 AV			1.02 V	263	96.45	7.05
3	#10400.00	54.9 PK	74.0	-19.1	1.17 V	358	41.68	13.22
4	#10400.00	42.2 AV	54.0	-11.8	1.17 V	358	28.98	13.22
5	15600.00	59.6 PK	74.0	-14.4	1.05 V	189	40.90	18.70
6	15600.00	48.0 AV	54.0	-6.0	1.05 V	189	29.30	18.70

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK)
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	5081.00	60.6 PK	74.0	-13.4	1.05 H	247	54.08	6.52
2	5081.00	51.6 AV	54.0	-2.4	1.05 H	247	45.08	6.52
3	*5240.00	121.6 PK			1.16 H	241	114.44	7.16
4	*5240.00	111.0 AV			1.16 H	241	103.84	7.16
5	5401.00	62.5 PK	74.0	-11.5	1.00 H	302	54.79	7.71
6	5401.00	53.1 AV	54.0	-0.9	1.00 H	302	45.39	7.71
7	5454.40	61.9 PK	74.0	-12.1	1.12 H	264	54.02	7.88
8	5454.40	51.2 AV	54.0	-2.8	1.12 H	264	43.32	7.88
9	#10480.00	55.8 PK	74.0	-18.2	1.06 H	338	42.64	13.16
10	#10480.00	42.3 AV	54.0	-11.7	1.06 H	338	29.14	13.16
11	15720.00	61.2 PK	74.0	-12.8	1.10 H	135	42.80	18.40
12	15720.00	48.8 AV	54.0	-5.2	1.10 H	135	30.40	18.40
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	5020.00	64.5 PK	74.0	-9.5	1.05 V	260	58.06	6.44
2	5020.00	53.5 AV	54.0	-0.5	1.05 V	260	47.06	6.44
3	5081.00	62.0 PK	74.0	-12.0	1.17 V	250	55.48	6.52
4	5081.00	53.0 AV	54.0	-1.0	1.17 V	250	46.48	6.52
5	*5240.00	123.7 PK			1.27 V	267	116.54	7.16
6	*5240.00	113.4 AV			1.27 V	267	106.24	7.16
7	5454.40	64.2 PK	74.0	-9.8	1.19 V	259	56.32	7.88
8	5454.40	53.2 AV	54.0	-0.8	1.19 V	259	45.32	7.88
9	#10480.00	54.6 PK	74.0	-19.4	1.14 V	360	41.44	13.16
10	#10480.00	42.2 AV	54.0	-11.8	1.14 V	360	29.04	13.16
11	15720.00	59.3 PK	74.0	-14.7	1.02 V	184	40.90	18.40
12	15720.00	47.6 AV	54.0	-6.4	1.02 V	184	29.20	18.40

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.

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	#5666.00	61.0 PK	68.2	-7.2	1.02 H	303	52.70	8.30
2	#5715.00	60.0 PK	68.2	-8.2	1.02 H	303	51.63	8.37
3	#5725.00	72.7 PK	78.2	-5.5	1.02 H	303	64.31	8.39
4	*5745.00	109.0 PK			1.02 H	303	100.58	8.42
5	*5745.00	98.9 AV			1.02 H	303	90.48	8.42
6	11490.00	55.7 PK	74.0	-18.3	1.10 H	360	41.35	14.35
7	11490.00	42.2 AV	54.0	-11.8	1.10 H	360	27.85	14.35
8	#17235.00	60.4 PK	68.2	-7.8	1.10 H	100	37.96	22.44
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	#5666.00	66.5 PK	68.2	-1.7	1.12 V	254	58.20	8.30
2	#5715.00	64.9 PK	68.2	-3.3	1.00 V	65	56.53	8.37
3	#5725.00	78.0 PK	78.2	-0.2	1.11 V	251	69.61	8.39
4	*5745.00	114.5 PK			1.11 V	251	106.08	8.42
5	*5745.00	104.2 AV			1.11 V	251	95.78	8.42
6	11490.00	54.7 PK	74.0	-19.3	1.11 V	354	40.35	14.35
7	11490.00	42.0 AV	54.0	-12.0	1.11 V	354	27.65	14.35
8	#17235.00	60.6 PK	68.2	-7.6	1.07 V	196	38.16	22.44

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	#5705.70	62.0 PK	68.2	-6.2	1.03 H	286	53.64	8.36
2	*5785.00	110.1 PK			1.03 H	286	101.61	8.49
3	*5785.00	99.0 AV			1.03 H	286	90.51	8.49
4	#5850.00	61.0 PK	78.2	-17.2	1.03 H	286	52.33	8.67
5	#5860.10	62.5 PK	68.2	-5.7	1.03 H	286	53.79	8.71
6	11570.00	54.8 PK	74.0	-19.2	1.07 H	360	40.49	14.31
7	11570.00	41.8 AV	54.0	-12.2	1.07 H	360	27.49	14.31
8	#17355.00	60.3 PK	68.2	-7.9	1.11 H	118	37.30	23.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5705.70	67.3 PK	68.2	-0.9	1.02 V	65	58.94	8.36
2	*5785.00	114.4 PK			1.00 V	68	105.91	8.49
3	*5785.00	103.6 AV			1.00 V	68	95.11	8.49
4	#5850.00	66.2 PK	78.2	-12.0	1.00 V	68	57.53	8.67
5	#5860.10	67.7 PK	68.2	-0.5	1.01 V	64	58.99	8.71
6	11570.00	55.0 PK	74.0	-19.0	1.16 V	356	40.69	14.31
7	11570.00	42.2 AV	54.0	-11.8	1.16 V	356	27.89	14.31
8	#17355.00	61.2 PK	68.2	-7.0	1.02 V	185	38.20	23.00

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	109.0 PK			1.02 H	305	100.41	8.59
2	*5825.00	98.3 AV			1.02 H	305	89.71	8.59
3	#5850.00	66.4 PK	78.2	-11.8	1.02 H	305	57.73	8.67
4	#5904.00	62.4 PK	68.2	-5.8	1.02 H	305	53.53	8.87
5	11650.00	55.4 PK	74.0	-18.6	1.06 H	360	41.02	14.38
6	11650.00	42.4 AV	54.0	-11.6	1.06 H	360	28.02	14.38
7	#17475.00	60.1 PK	68.2	-8.1	1.16 H	98	36.80	23.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	114.2 PK			1.00 V	64	105.61	8.59
2	*5825.00	103.3 AV			1.00 V	64	94.71	8.59
3	#5850.00	72.1 PK	78.2	-6.1	1.00 V	64	63.43	8.67
4	#5904.00	67.9 PK	68.2	-0.3	1.00 V	62	59.03	8.87
5	11650.00	54.5 PK	74.0	-19.5	1.21 V	354	40.12	14.38
6	11650.00	41.5 AV	54.0	-12.5	1.21 V	354	27.12	14.38
7	#17475.00	60.7 PK	68.2	-7.5	1.02 V	183	37.40	23.30

REMARKS:

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

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	65.7 PK	74.0	-8.3	1.12 H	251	58.90	6.80
2	5150.00	51.3 AV	54.0	-2.7	1.12 H	251	44.50	6.80
3	*5190.00	106.3 PK			1.12 H	251	99.30	7.00
4	*5190.00	96.2 AV			1.12 H	251	89.20	7.00
5	#10380.00	56.0 PK	74.0	-18.0	1.00 H	358	42.83	13.17
6	#10380.00	42.9 AV	54.0	-11.1	1.00 H	358	29.73	13.17
7	15570.00	60.8 PK	74.0	-13.2	1.10 H	139	42.11	18.69
8	15570.00	48.7 AV	54.0	-5.3	1.10 H	139	30.01	18.69
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	68.1 PK	74.0	-5.9	1.00 V	51	61.30	6.80
2	5150.00	53.5 AV	54.0	-0.5	1.00 V	51	46.70	6.80
3	*5190.00	108.1 PK			1.00 V	51	101.10	7.00
4	*5190.00	97.7 AV			1.00 V	51	90.70	7.00
5	#10380.00	55.4 PK	74.0	-18.6	1.16 V	360	42.23	13.17
6	#10380.00	42.7 AV	54.0	-11.3	1.16 V	360	29.53	13.17
7	15570.00	59.5 PK	74.0	-14.5	1.09 V	189	40.81	18.69
8	15570.00	47.6 AV	54.0	-6.4	1.09 V	189	28.91	18.69

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	5146.00	64.1 PK	74.0	-9.9	1.07 H	252	57.33	6.77
2	5146.00	52.0 AV	54.0	-2.0	1.07 H	252	45.23	6.77
3	*5230.00	102.5 PK			1.07 H	252	95.38	7.12
4	*5230.00	101.4 AV			1.07 H	252	94.28	7.12
5	#10460.00	56.0 PK	74.0	-18.0	1.08 H	341	42.82	13.18
6	#10460.00	43.0 AV	54.0	-11.0	1.08 H	341	29.82	13.18
7	15690.00	61.1 PK	74.0	-12.9	1.18 H	146	42.72	18.38
8	15690.00	48.7 AV	54.0	-5.3	1.18 H	146	30.32	18.38
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	5146.00	65.6 PK	74.0	-8.4	1.07 V	62	58.83	6.77
2	5146.00	53.8 AV	54.0	-0.2	1.07 V	62	47.03	6.77
3	*5230.00	104.5 PK			1.07 V	62	97.38	7.12
4	*5230.00	103.6 AV			1.07 V	62	96.48	7.12
5	#10460.00	54.8 PK	74.0	-19.2	1.14 V	349	41.62	13.18
6	#10460.00	41.9 AV	54.0	-12.1	1.14 V	349	28.72	13.18
7	15690.00	59.1 PK	74.0	-14.9	1.11 V	174	40.72	18.38
8	15690.00	47.6 AV	54.0	-6.4	1.11 V	174	29.22	18.38

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	66.4 PK	74.0	-7.6	1.06 H	281	58.03	8.37
2	#5715.00	48.8 AV	54.0	-5.2	1.06 H	281	40.43	8.37
3	#5725.00	71.1 PK	78.2	-7.1	1.06 H	281	62.71	8.39
4	*5755.00	105.7 PK			1.06 H	281	97.26	8.44
5	*5755.00	94.8 AV			1.06 H	281	86.36	8.44
6	11510.00	55.4 PK	74.0	-18.6	1.05 H	360	41.06	14.34
7	11510.00	42.3 AV	54.0	-11.7	1.05 H	360	27.96	14.34
8	#17265.00	59.9 PK	74.0	-14.1	1.05 H	98	37.22	22.68
9	#17265.00	47.8 AV	54.0	-6.2	1.05 H	98	25.12	22.68
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	71.1 PK	74.0	-2.9	1.01 V	251	62.73	8.37
2	#5715.00	53.5 AV	54.0	-0.5	1.01 V	251	45.13	8.37
3	#5725.00	75.8 PK	78.2	-2.4	1.01 V	251	67.41	8.39
4	*5755.00	110.2 PK			1.01 V	251	101.76	8.44
5	*5755.00	99.4 AV			1.01 V	251	90.96	8.44
6	11510.00	55.1 PK	74.0	-18.9	1.17 V	334	40.76	14.34
7	11510.00	42.0 AV	54.0	-12.0	1.17 V	334	27.66	14.34
8	#17265.00	60.8 PK	74.0	-13.2	1.03 V	195	38.12	22.68
9	#17265.00	47.9 AV	54.0	-6.1	1.03 V	195	25.22	22.68

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	59.8 PK	68.2	-8.4	1.01 H	290	51.43	8.37
2	#5725.00	62.3 PK	78.2	-15.9	1.01 H	290	53.91	8.39
3	*5795.00	108.8 PK			1.01 H	290	100.30	8.50
4	*5795.00	98.4 AV			1.01 H	290	89.90	8.50
5	#5850.00	63.9 PK	78.2	-14.3	1.01 H	290	55.23	8.67
6	#5879.00	62.6 PK	68.2	-5.6	1.01 H	290	53.82	8.78
7	11590.00	55.2 PK	74.0	-18.8	1.02 H	360	40.90	14.30
8	11590.00	42.3 AV	54.0	-11.7	1.02 H	360	28.00	14.30
9	#17385.00	60.8 PK	68.2	-7.4	1.16 H	122	37.77	23.03
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	65.2 PK	68.2	-3.0	1.02 V	68	56.83	8.37
2	#5725.00	67.2 PK	78.2	-11.0	1.00 V	65	58.81	8.39
3	*5795.00	114.4 PK			1.10 V	250	105.90	8.50
4	*5795.00	103.8 AV			1.10 V	250	95.30	8.50
5	#5850.00	68.9 PK	78.2	-9.3	1.00 V	65	60.23	8.67
6	#5879.00	67.8 PK	68.2	-0.4	1.02 V	231	59.02	8.78
7	11590.00	55.5 PK	74.0	-18.5	1.17 V	344	41.20	14.30
8	11590.00	42.4 AV	54.0	-11.6	1.17 V	344	28.10	14.30
9	#17385.00	60.8 PK	68.2	-7.4	1.05 V	183	37.77	23.03

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	65.7 PK	74.0	-8.3	1.08 H	265	58.90	6.80
2	5150.00	51.6 AV	54.0	-2.4	1.08 H	265	44.80	6.80
3	*5210.00	101.9 PK			1.08 H	265	94.84	7.06
4	*5210.00	90.6 AV			1.08 H	265	83.54	7.06
5	#5788.90	56.4 PK	74.0	-17.6	1.08 H	265	47.90	8.50
6	#5788.90	49.7 AV	54.0	-4.3	1.08 H	265	41.20	8.50
7	#10420.00	56.0 PK	74.0	-18.0	1.12 H	345	42.80	13.20
8	#10420.00	42.7 AV	54.0	-11.3	1.12 H	345	29.50	13.20
9	15630.00	61.2 PK	74.0	-12.8	1.13 H	116	42.60	18.60
10	15630.00	48.9 AV	54.0	-5.1	1.13 H	116	30.30	18.60
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	67.8 PK	74.0	-6.2	1.05 V	64	61.00	6.80
2	5150.00	53.5 AV	54.0	-0.5	1.05 V	64	46.70	6.80
3	*5210.00	103.9 PK			1.05 V	64	96.84	7.06
4	*5210.00	92.9 AV			1.05 V	64	85.84	7.06
5	#5788.90	58.2 PK	74.0	-15.8	1.24 V	0	49.70	8.50
6	#5788.90	51.6 AV	54.0	-2.4	1.24 V	0	43.10	8.50
7	#10420.00	55.2 PK	74.0	-18.8	1.19 V	360	42.00	13.20
8	#10420.00	42.4 AV	54.0	-11.6	1.19 V	360	29.20	13.20
9	15630.00	59.9 PK	74.0	-14.1	1.00 V	203	41.30	18.60
10	15630.00	48.5 AV	54.0	-5.5	1.00 V	203	29.90	18.60

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5715.00	64.7 PK	74.0	-9.3	1.06 H	299	56.33	8.37
2	#5715.00	48.9 AV	54.0	-5.1	1.06 H	299	40.53	8.37
3	#5725.00	68.4 PK	78.2	-9.8	1.06 H	299	60.01	8.39
4	*5775.00	100.1 PK			1.06 H	299	91.63	8.47
5	*5775.00	89.1 AV			1.06 H	299	80.63	8.47
6	#5850.00	63.2 PK	78.2	-15.0	1.06 H	299	54.53	8.67
7	#5860.00	58.0 PK	74.0	-16.0	1.06 H	299	49.29	8.71
8	#5860.00	44.7 AV	54.0	-9.3	1.06 H	299	35.99	8.71
9	11550.00	55.2 PK	74.0	-18.8	1.06 H	360	40.88	14.32
10	11550.00	42.1 AV	54.0	-11.9	1.06 H	360	27.78	14.32
11	#17325.00	60.1 PK	74.0	-13.9	1.06 H	124	37.12	22.98
12	#17325.00	47.6 AV	54.0	-6.4	1.06 H	124	24.62	22.98
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	69.7 PK	74.0	-4.3	1.00 V	252	61.33	8.37
2	#5715.00	53.7 AV	54.0	-0.3	1.00 V	252	45.33	8.37
3	#5725.00	73.3 PK	78.2	-4.9	1.00 V	252	64.91	8.39
4	*5775.00	105.1 PK			1.00 V	252	96.63	8.47
5	*5775.00	94.1 AV			1.00 V	252	85.63	8.47
6	#5850.00	68.2 PK	78.2	-10.0	1.00 V	252	59.53	8.67
7	#5860.00	62.7 PK	74.0	-11.3	1.00 V	252	53.99	8.71
8	#5860.00	49.5 AV	54.0	-4.5	1.00 V	252	40.79	8.71
9	11550.00	55.9 PK	74.0	-18.1	1.19 V	344	41.58	14.32
10	11550.00	42.5 AV	54.0	-11.5	1.19 V	344	28.18	14.32
11	#17325.00	61.0 PK	74.0	-13.0	1.04 V	180	38.02	22.98
12	#17325.00	48.5 AV	54.0	-5.5	1.04 V	180	25.52	22.98

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.

4.3 TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

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

Note: Where B is the 26dB emission bandwidth in MHz.

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

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

Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.3.2 TEST INSTRUMENTS

FOR POWER OUTPUT MEASUREMENT

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power meter Anritsu	ML2495A	1014008	Apr. 30, 2014	Apr. 29, 2015
Power sensor Anritsu	MA2411B	0917122	Apr. 30, 2014	Apr. 29, 2015

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. Tested date :Sep. 19, 2014

FOR 26dB OCCUPIED BANDWIDTH

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

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. Tested date :Sep. 19, 2014

4.3.3 TEST PROCEDURE

FOR POWER OUTPUT MEASUREMENT

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

FOR 26dB OCCUPIED BANDWIDTH

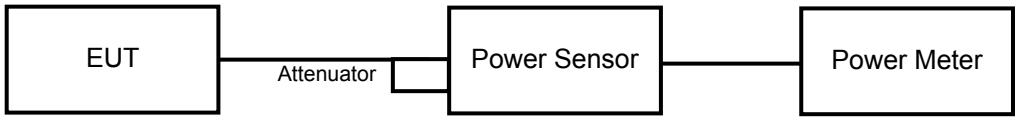
1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement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

4.3.4 DEVIATION FROM TEST STANDARD

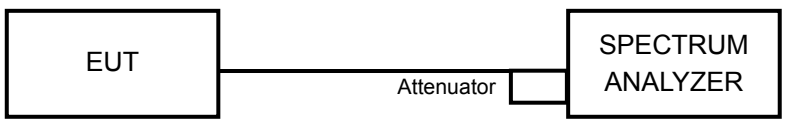
No deviation

4.3.5 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	15.59	15.92	16.00	115.119	20.61	27.90	PASS
40	5200	15.05	15.03	15.35	98.108	19.92	27.90	PASS
48	5240	23.03	23.03	23.14	607.881	27.84	27.90	PASS
149	5745	14.94	14.93	15.64	98.95	19.95	27.95	PASS
157	5785	15.24	15.66	16.20	111.92	20.49	27.95	PASS
165	5825	14.91	15.14	15.66	100.446	20.02	27.95	PASS

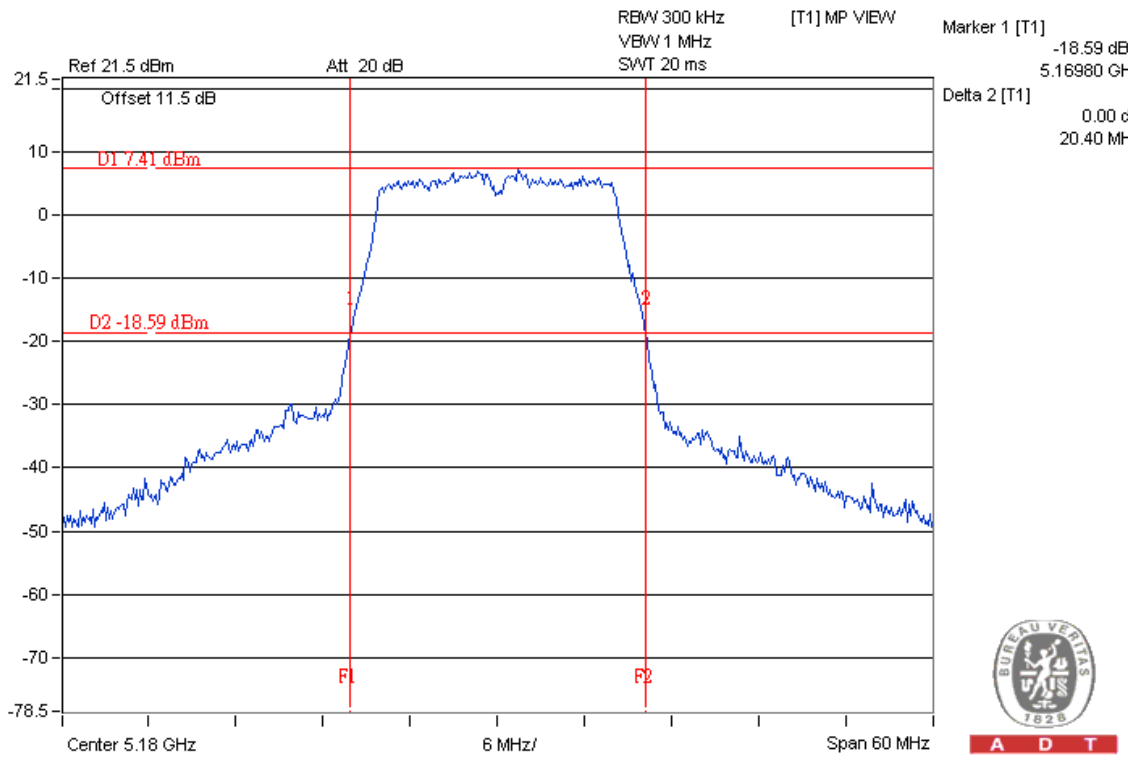
Note: 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.10-6)”
5725~5825MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.05-6)”.

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
36	5180	20.58	20.40	20.67
40	5200	20.50	20.42	20.58
48	5240	31.43	32.13	31.42

SPECTRUM PLOT OF WORST VALUE

802.11a / Chain(1) : CH36



802.11ac (VHT20)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	17.23	17.78	17.85	173.778	22.40	27.90	PASS
40	5200	15.01	14.57	15.03	92.18	19.65	27.90	PASS
48	5240	23.05	23.00	23.06	603.665	27.81	27.90	PASS
149	5745	14.55	14.78	15.48	93.889	19.73	27.95	PASS
157	5785	16.07	16.34	16.53	128.489	21.09	27.95	PASS
165	5825	14.98	15.39	15.78	103.915	20.17	27.95	PASS

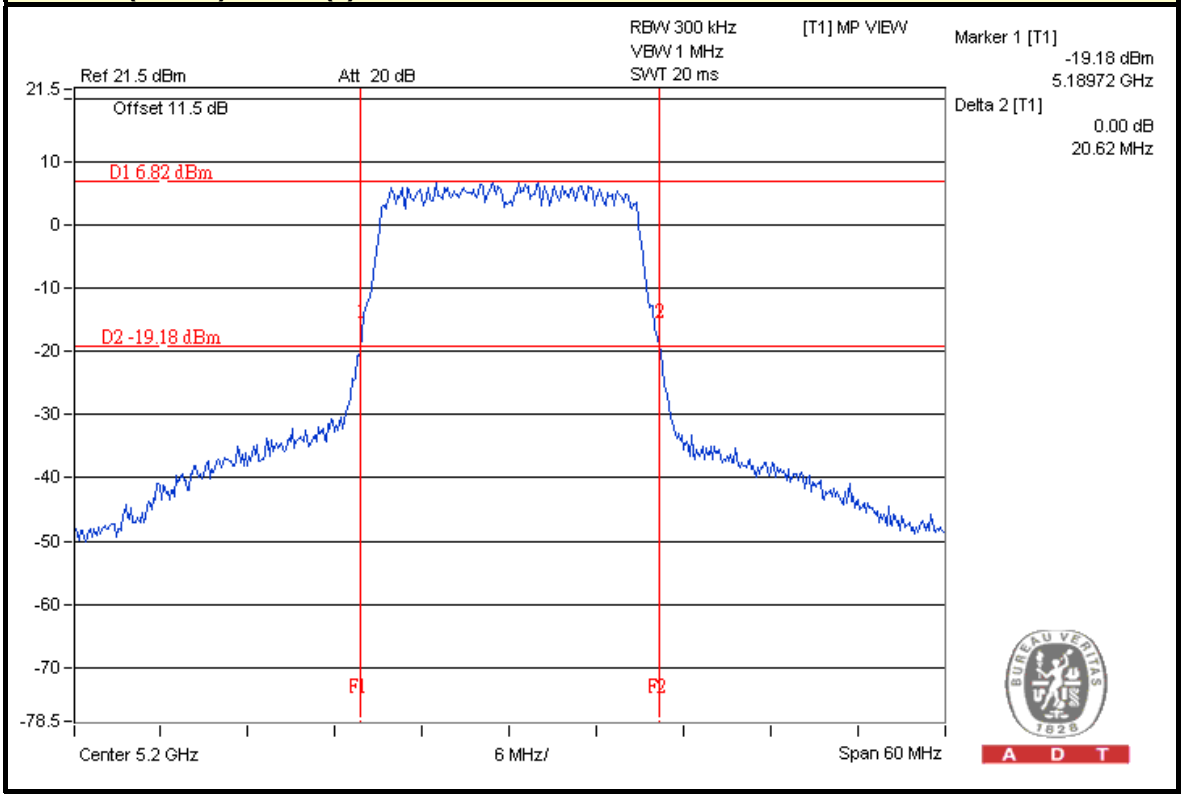
Note: 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.10-6)”
5725~5825MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.05-6)”.

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
36	5180	21.00	20.65	20.91
40	5200	20.88	20.62	20.91
48	5240	33.12	34.08	35.46

SPECTRUM PLOT OF WORST VALUE

802.11ac (VHT20) / Chain(1) : CH40



802.11ac (VHT40)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	12.83	12.78	12.69	56.732	17.54	27.90	PASS
46	5230	17.93	17.96	17.77	184.445	22.66	27.90	PASS
151	5755	12.22	12.29	13.05	53.799	17.31	27.95	PASS
159	5795	17.17	17.32	17.95	168.443	22.26	27.95	PASS

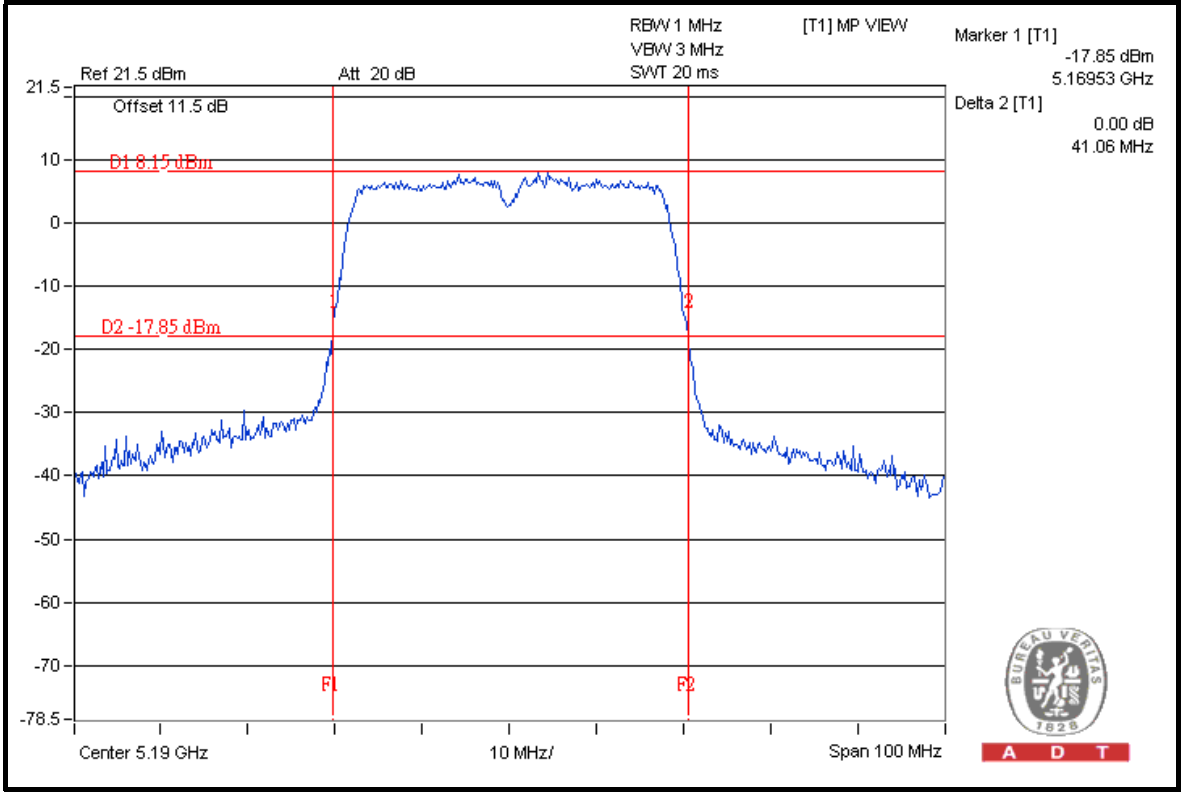
Note: 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.10-6)”
5725~5825MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.05-6)”.

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
38	5190	41.52	41.06	41.49
46	5230	41.33	41.15	41.53

SPECTRUM PLOT OF WORST VALUE

802.11ac (VHT40) / Chain(1) : CH38



802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
42	5210	10.23	10.54	10.62	33.403	15.24	27.90	PASS
155	5775	10.12	10.61	10.32	32.553	15.13	27.95	PASS

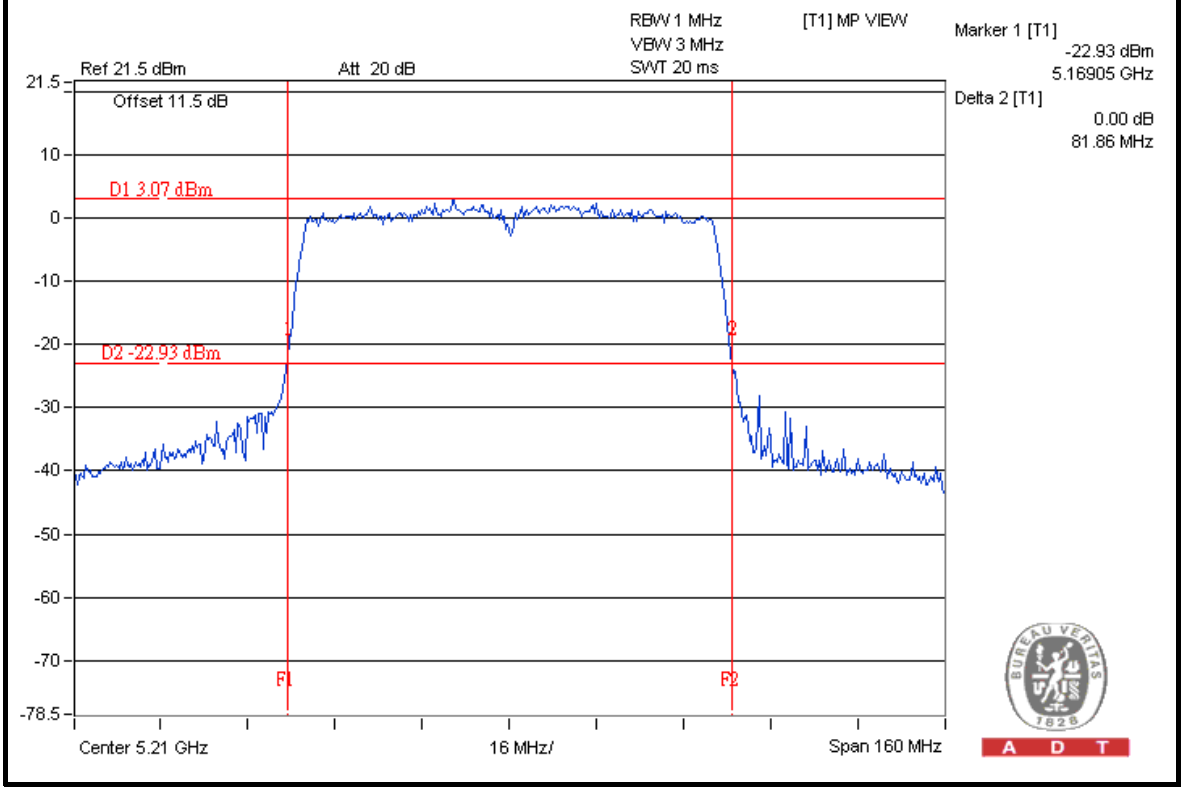
Note: 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.10-6)”
5725~5825MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power limit shall be reduced to “Determined Conducted Limit-(8.05-6)”.

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
42	5210	83.11	81.86	82.60

SPECTRUM PLOT OF WORST VALUE

802.11ac (VHT80) / Chain(1) : CH42



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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

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. Tested date :Sep. 19, 2014

4.4.3 TEST PROCEDURES

For 802.11a, 802.11ac(VHT20), 802.11ac(VHT40)

Using method SA-1

For U-NII-1:

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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
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

For 802.11ac(VHT80)

Using method SA-2

For U-NII-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 and add 10 log (1/duty cycle)

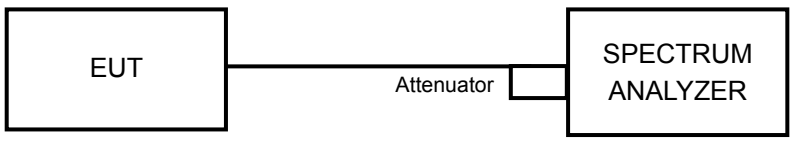
For U-NII-3:

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6

4.4.7 TEST RESULTS

For U-NII-1:

802.11a

CHAN.	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
36	5180	2.16	1.93	1.98	6.80	14.90	PASS
40	5200	2.22	2.20	2.08	6.94	14.90	PASS
48	5240	10.01	10.23	9.86	14.81	14.90	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. 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power density limit shall be reduced to 17-(8.10-6) =14.90dBm.

802.11ac (VHT20)

CHAN.	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
36	5180	3.55	3.26	3.45	8.19	14.90	PASS
40	5200	1.35	0.97	1.20	5.95	14.90	PASS
48	5240	9.83	9.97	9.69	14.60	14.90	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. 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power density limit shall be reduced to 17-(8.10-6) =14.90dBm.

802.11ac (VHT40)

CHAN.	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
38	5190	-3.20	-3.90	-3.38	1.29	14.90	PASS
46	5230	0.90	0.97	0.92	5.70	14.90	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. 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power density limit shall be reduced to 17-(8.10-6) =14.90dBm.

802.11ac (VHT80)

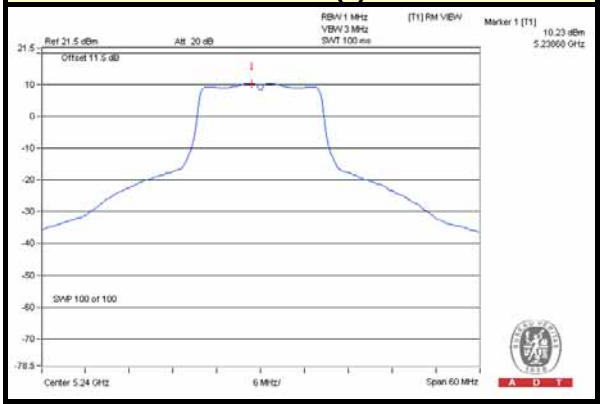
CHANNEL	CHANNEL FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)			DUTY FACTOR (dB)	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
42	5210	-8.29	-9.01	-8.40	0.16	-3.63	14.90	PASS

NOTE:

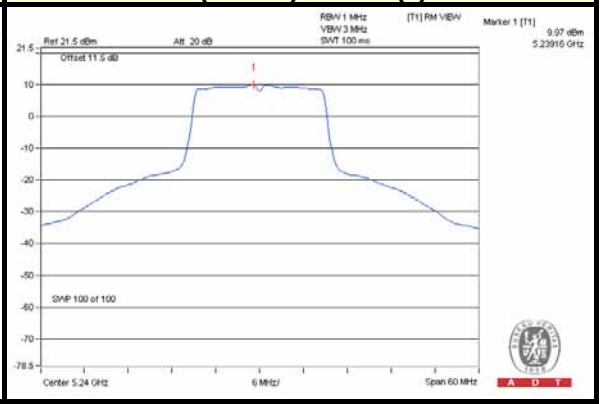
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. 5150~5250MHz: Directional gain = 3.33dBi + 10log(3) = 8.10dBi > 6dBi , so the power density limit shall be reduced to 17-(8.10-6) =14.90dBm.
3. Refer to section 3.4 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

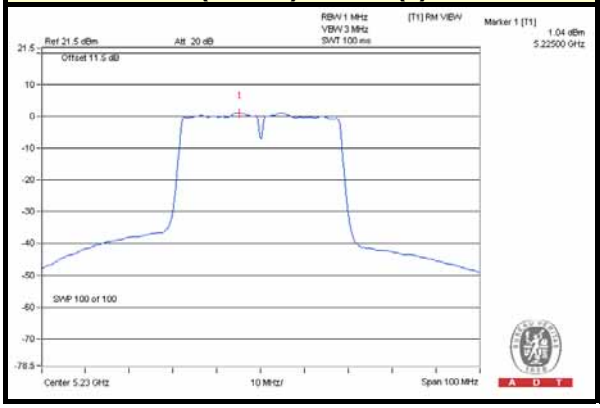
802.11a / Chain(1) : CH48



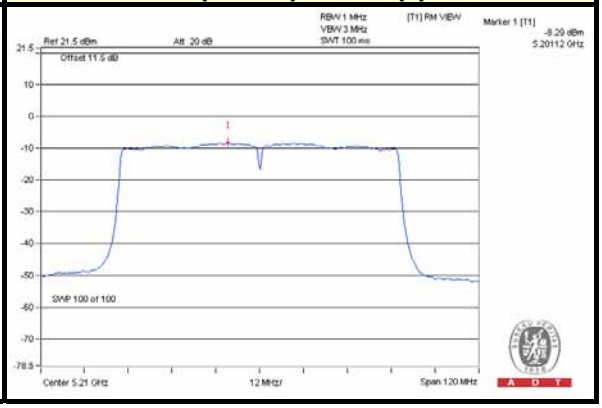
802.11ac (VHT20) / Chain(1) : CH48



802.11ac (VHT40) / Chain(1) : CH46



802.11ac (VHT80) / Chain(0) : CH42



For U-NII-3:

802.11a

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	149	5745	-8.81	-6.59	4.77	-1.82	27.95	PASS
	157	5785	-8.33	-6.11	4.77	-1.34	27.95	PASS
	165	5825	-8.93	-6.71	4.77	-1.94	27.95	PASS
1	149	5745	-8.37	-6.15	4.77	-1.38	27.95	PASS
	157	5785	-8.02	-5.80	4.77	-1.03	27.95	PASS
	165	5825	-8.62	-6.40	4.77	-1.63	27.95	PASS
2	149	5745	-9.22	-7.00	4.77	-2.23	27.95	PASS
	157	5785	-8.76	-6.54	4.77	-1.77	27.95	PASS
	165	5825	-9.25	-7.03	4.77	-2.26	27.95	PASS

NOTE: 1. 5725~5850MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) =27.95dBm.

802.11ac (VHT20)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	149	5745	-8.88	-6.66	4.77	-1.89	27.95	PASS
	157	5785	-7.84	-5.62	4.77	-0.85	27.95	PASS
	165	5825	-8.70	-6.48	4.77	-1.71	27.95	PASS
1	149	5745	-9.51	-7.29	4.77	-2.52	27.95	PASS
	157	5785	-8.25	-6.03	4.77	-1.26	27.95	PASS
	165	5825	-8.45	-6.23	4.77	-1.46	27.95	PASS
2	149	5745	-9.46	-7.24	4.77	-2.47	27.95	PASS
	157	5785	-8.20	-5.98	4.77	-1.21	27.95	PASS
	165	5825	-9.10	-6.88	4.77	-2.11	27.95	PASS

NOTE: 1. 5725~5850MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) =27.95dBm.

802.11ac (VHT40)

TX CHAIN	CHANNEL	FREQUENCY (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=3) dB	TOTAL PSD (dBm/500kHz)	LIMIT (dBm/500kHz)	PASS /FAIL
0	151	5755	-14.56	-12.34	4.77	-7.57	27.95	PASS
	159	5795	-9.86	-7.64	4.77	-2.87	27.95	PASS
1	151	5755	-14.42	-12.20	4.77	-7.43	27.95	PASS
	159	5795	-9.78	-7.56	4.77	-2.79	27.95	PASS
2	151	5755	-14.73	-12.51	4.77	-7.74	27.95	PASS
	159	5795	-9.72	-7.50	4.77	-2.73	27.95	PASS

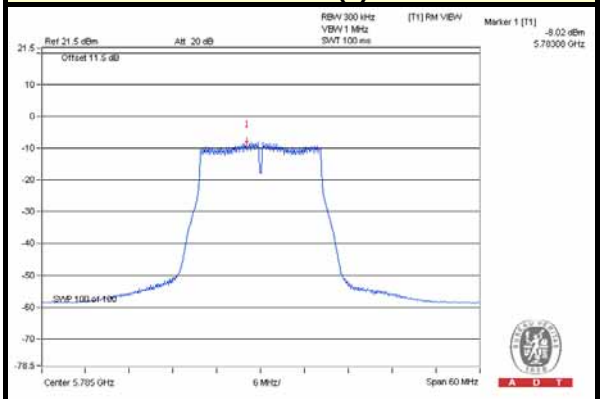
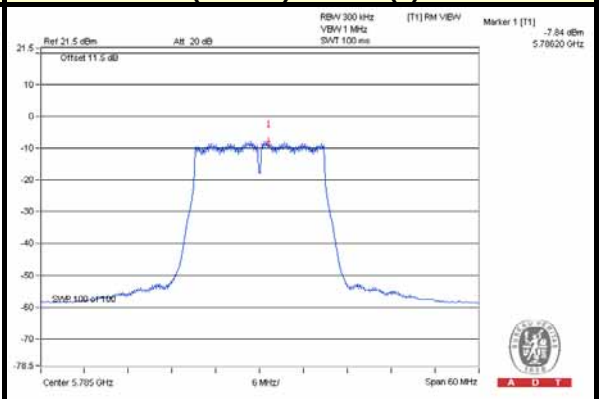
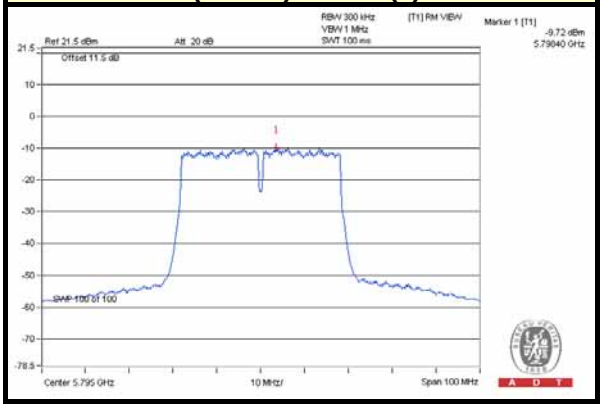
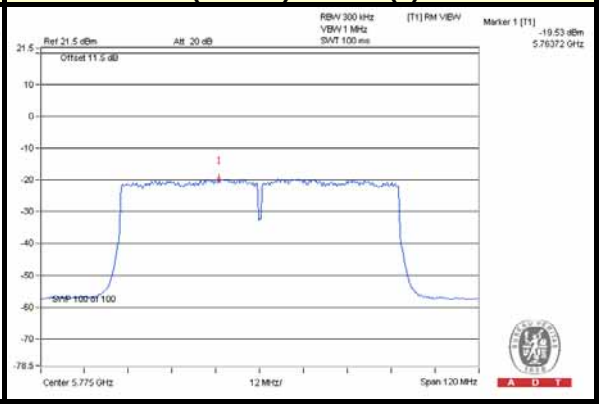
NOTE: 1. 5725~5850MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) =27.95dBm.

802.11ac (VHT80)

TX CHAIN	CHANNEL	FREQUENCY (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)					
0	155	5745	-19.54	-17.32	4.77	0.16	-12.39	27.95	PASS
1	155	5745	-19.53	-17.31	4.77	0.16	-12.38	27.95	PASS
2	155	5745	-19.99	-17.77	4.77	0.16	-12.84	27.95	PASS

NOTE: 1. 5725~5850MHz: Directional gain = 3.28dBi + 10log(3) = 8.05dBi > 6dBi , so the power density limit shall be reduced to 30-(8.05-6) =27.95dBm.

2. Refer to section 3.4 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(1) : CH157	**802.11ac (VHT20) / Chain(0) : CH157**
	
802.11ac (VHT40) / Chain(2) : CH159	**802.11ac (VHT80) / Chain(1) : CH155**
	

4.5 FREQUENCY STABILITY

4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015
Temperature & Humidity Chamber GIANTFORCE	GTH-150-40-SP-AR	MAA0812-008	Jan. 13, 2014	Jan. 12, 2015

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. Tested date :Sep. 19, 2014

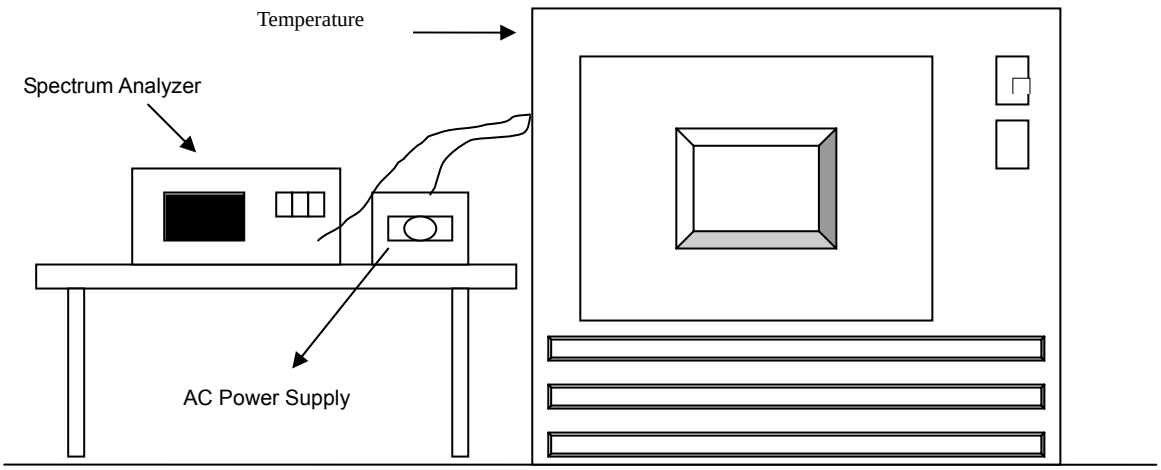
4.5.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. 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.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. 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.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

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

4.5.7 TEST RESULTS

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	5240.0125	0.00024	5240.0098	0.00019	5240.0108	0.00021	5240.0116	0.00022
40	120	5240.0226	0.00043	5240.0235	0.00045	5240.0201	0.00038	5240.0218	0.00042
30	120	5240.0045	0.00009	5240.0038	0.00007	5240.004	0.00008	5240.0056	0.00011
20	120	5240.0133	0.00025	5240.0153	0.00029	5240.012	0.00023	5240.0161	0.00031
10	120	5240.0033	0.00006	5240.0011	0.00002	5240.0033	0.00006	5240.0023	0.00004
0	120	5240.0208	0.00040	5240.0178	0.00034	5240.0176	0.00034	5240.0192	0.00037
-10	120	5239.9791	-0.00040	5239.9777	-0.00043	5239.982	-0.00034	5239.9804	-0.00037
-20	120	5239.9961	-0.00007	5239.9935	-0.00012	5239.9918	-0.00016	5239.9964	-0.00007
-30	120	5239.9883	-0.00022	5239.9886	-0.00022	5239.9887	-0.00022	5239.9892	-0.00021

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5240MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	5240.0133	0.00025	5240.0146	0.00028	5240.0126	0.00024	5240.0158	0.00030
	120	5240.0133	0.00025	5240.0153	0.00029	5240.012	0.00023	5240.0161	0.00031
	102	5240.0132	0.00025	5240.0145	0.00028	5240.0117	0.00022	5240.0153	0.00029

4.6 6dB BANDWIDTH MEASUREMENT

4.6.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSV 40	100964	July 05, 2014	July 04, 2015

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. Tested date :Sep. 19, 2014

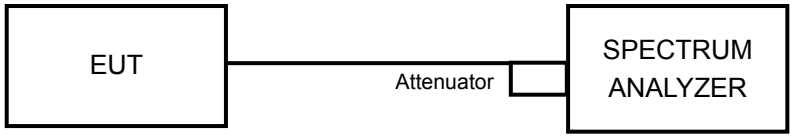
4.6.3 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 100kHz.
2. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. 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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITIONS

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

4.6.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	16.42	16.43	16.45	0.5	PASS
157	5785	16.44	16.45	16.43	0.5	PASS
165	5825	16.41	16.45	16.43	0.5	PASS

802.11ac (VHT20)

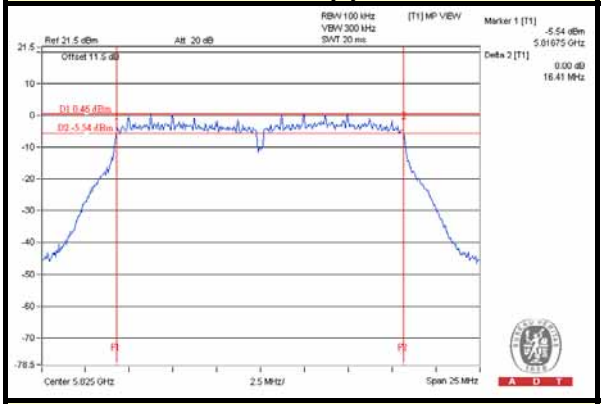
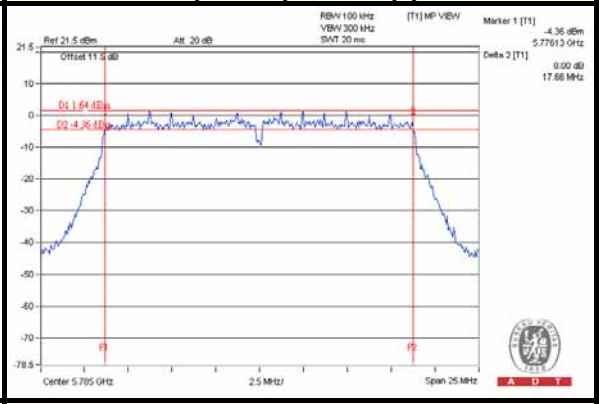
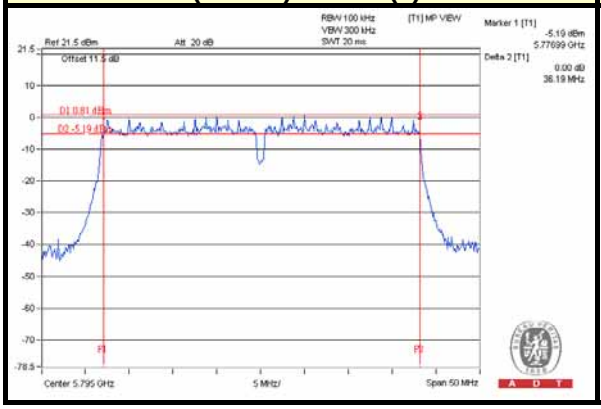
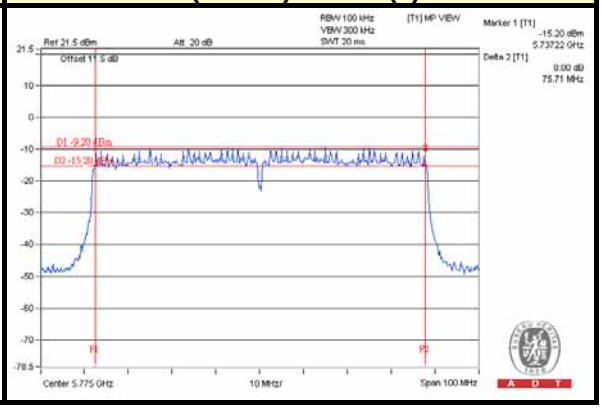
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
149	5745	17.68	17.69	17.67	0.5	PASS
157	5785	17.66	17.67	17.67	0.5	PASS
165	5825	17.67	17.67	17.67	0.5	PASS

802.11ac (VHT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
151	5755	36.43	36.49	36.28	0.5	PASS
159	5795	36.19	36.47	36.27	0.5	PASS

802.11ac (VHT80)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2		
155	5775	76.03	76.49	75.71	0.5	PASS

SPECTRUM PLOT OF WORST VALUE	
802.11a / Chain(0) : CH165	**802.11ac (VHT20) / Chain(0) : CH157**
	
802.11ac (VHT40) / Chain(0) : CH159	**802.11ac (VHT80) / Chain(2) : CH155**
	

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. 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: 886-2-26052943

Hsin Chu EMC/RF/Telecom Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab:
Tel: 886-3-3183232
Fax: 886-3-3270892

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.

7. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

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