

FCC TEST REPORT (15.407)

REPORT NO.: RF121205E03A-1

MODEL NO.: WMC-AC01

FCC ID: RRK2012060056-1

RECEIVED: Jan. 13, 2013

TESTED: Jan. 13 to 29, 2013

ISSUED: Apr. 26, 2013

APPLICANT: Alpha Networks Inc.

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

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TEST LOCATION (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen,
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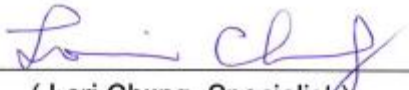
RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF121205E03A-1	Original release	Apr. 26, 2013

1. CERTIFICATION

PRODUCT: Wireless AC Module
BRAND NAME: Alpha
MODEL NO.: WMC-AC01
TEST SAMPLE: R&D SAMPLE
APPLICANT: Alpha Networks Inc.
TESTED: Jan. 13 to 29, 2013
STANDARDS: FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10-2009

The above equipment (Model: WMC-AC01) 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:** Apr. 26, 2013
(Lori Chung, Specialist)

APPROVED BY : , **DATE:** Apr. 26, 2013
(May Chen, Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 5GHz, 5260~5320MHz, 5500~5580MHz & 5660~5700MHz

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 -21.01dB at 9.20313MHz
15.407(b/1/2/3) (b)(5)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 5117.15MHz & 5100.00MHz & 5457.00MHz & 5460.00MHz
15.407(a/1/2/3)	Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	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 not a standard connector.

NOTE:

1. This report is prepared for FCC Class II change. (Add DFS band: 5260~5320MHz & 5500~5580MHz & 5660~5700MHz).
2. The DFS report 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	2.98 dB
Radiated emissions (30MHz-1GHz)	5.59 dB
Radiated emissions (1GHz -6GHz)	3.56 dB
Radiated emissions (6GHz -18GHz)	4.10 dB
Radiated emissions (18GHz -40GHz)	4.24 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless AC Module
MODEL NO.	WMC-AC01
POWER SUPPLY	DC 3.3V or 5V from host equipment
MODULATION TYPE	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only.
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
OPERATING FREQUENCY	802.11a/n/ac: 5.26 ~ 5.32GHz, 5.50 ~ 5.58GHz, 5.66GHz ~ 5.70GHz
NUMBER OF CHANNEL	12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 5 for 802.11n (HT40), 802.11ac (VHT40) 2 for 802.11ac (VHT80)
MAXIMUM OUTPUT POWER	802.11a: 145.719mW 802.11n (HT20): 159.813mW 802.11n (HT40): 240.954mW 802.11ac (VHT80): 144.825mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	NA

NOTE:

1. This report is prepared for FCC Class II. The difference compared with the Report No.: RF121205E03-1 design is as the following:

u Add DFS band <5250~5350MHz & 5500~5580MHz & 5660~5700MHz>

u Add one new antenna set as below following table:

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

Original								
Set 1								
Transmitter Circuit	Brand	Model name	Antenna Type	Gain (dBi) (Exclude cable loss)	Cable Loss (dB)	Net Gain (dBi)	Connector Type	Cable Length(mm)
Chain (0)	WHA YU	C037-511226-A	PCB	4	0.416	3.584	I-PEX	80
Chain (1)	WHA YU	C037-511226-A	PCB	4	0.416	3.584	I-PEX	80
Chain (2)	WHA YU	C037-511226-A	PCB	4	0.416	3.584	I-PEX	80
Set 2								
Transmitter Circuit	Brand	Model name	Antenna Type	Gain (dBi) (Exclude cable loss)	Cable Loss (dB)	Net Gain (dBi)	Connector Type	Cable Length(mm)
Chain (0)	WHA YU	C037-511225-A	PCB	4	0.572	3.428	I-PEX	110
Chain (1)	WHA YU	C037-511225-A	PCB	4	0.572	3.428	I-PEX	110
Chain (2)	WHA YU	C037-511225-A	PCB	4	0.572	3.428	I-PEX	110
Set 3								
Transmitter Circuit	Brand	Model name	Antenna Type	Gain (dBi) (Exclude cable loss)	Cable Loss (dB)	Net Gain (dBi)	Connector Type	Cable Length(mm)
Chain (0)	WHA YU	SSR-30247	PCB	4	0.18	3.82	I-PEX	50
Chain (1)	WHA YU	SSR-30247	PCB	4	0.18	3.82	I-PEX	50
Chain (2)	WHA YU	SSR-30247	PCB	4	0.18	3.82	I-PEX	50
Newly								
Set 4								
Transmitter Circuit	Brand	Model name	Antenna Type	Gain (dBi) (Exclude cable loss)	Cable Loss (dB)	Net Gain (dBi)	Connector Type	Cable Length(mm)
Chain (0)	WHA YU	C037-511226-A	PCB	4	0.416	3.584	I-PEX	80
Chain (1)	WHA YU	C037-511225-A	PCB	4	0.572	3.428	I-PEX	110
Chain (2)	WHA YU	C037-511225-A	PCB	4	0.572	3.428	I-PEX	110

Antenna (Set 3) was chosen for final test.

2. The EUT incorporates a MIMO function without beam forming.

MODULATION MODE	TX/RX FUNCTION
802.11a	3TX/3RX
802.11n (HT20)	3TX/3RX
802.11n (HT40)	3TX/3RX
802.11ac (VHT20)	3TX/3RX
802.11ac (VHT40)	3TX/3RX
802.11ac (VHT80)	3TX/3RX

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

3. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.
4. When the EUT operating in 802.11ac, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 9.
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 ~ 5350MHz band:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

CHANNEL	FREQUENCY
54	5270 MHz
62	5310 MHz

1 channels are provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
58	5290 MHz

Operated in 5470MHz ~ 5600MHz & 5650MHz ~ 5725MHz bands:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	116	5580 MHz
104	5520 MHz	132	5660 MHz
108	5540 MHz	136	5680 MHz
112	5560 MHz	140	5700 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	134	5670 MHz
110	5550 MHz		

1 channel is provided for 802.11ac (VHT80):

CHANNEL	FREQUENCY
106	5530 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

Note: The test Configuration was defined by the applicant requirement.

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)
802.11n (HT20)	52 to 140	132	OFDM	BPSK	6.5

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)
802.11n (HT20)	52 to 140	132	OFDM	BPSK	6.5

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	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6
802.11n (HT20)	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6.5
802.11n (HT40)	54 to 134	54, 62, 102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)	58 to 106	58, 106	OFDM	BPSK	87.8

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	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6
802.11n (HT20)	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6.5
802.11n (HT40)	54 to 134	54, 62, 102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)	58 to 106	58, 106	OFDM	BPSK	87.8

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	22deg. C, 54%RH	120Vac, 60Hz	Jason Huang
RE<1G	19deg. C, 74%RH	120Vac, 60Hz	Amos Chuang
RE ³ 1G	20deg. C, 70%RH 23deg. C, 69%RH	120Vac, 60Hz	Amos Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Amos Chuang

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 D01 General UNII Test Procedures

662911 D01 Multiple Transmitter Output

ANSI C63.10-2009

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

3.4 DUTY CYCLE OF TEST SIGNAL

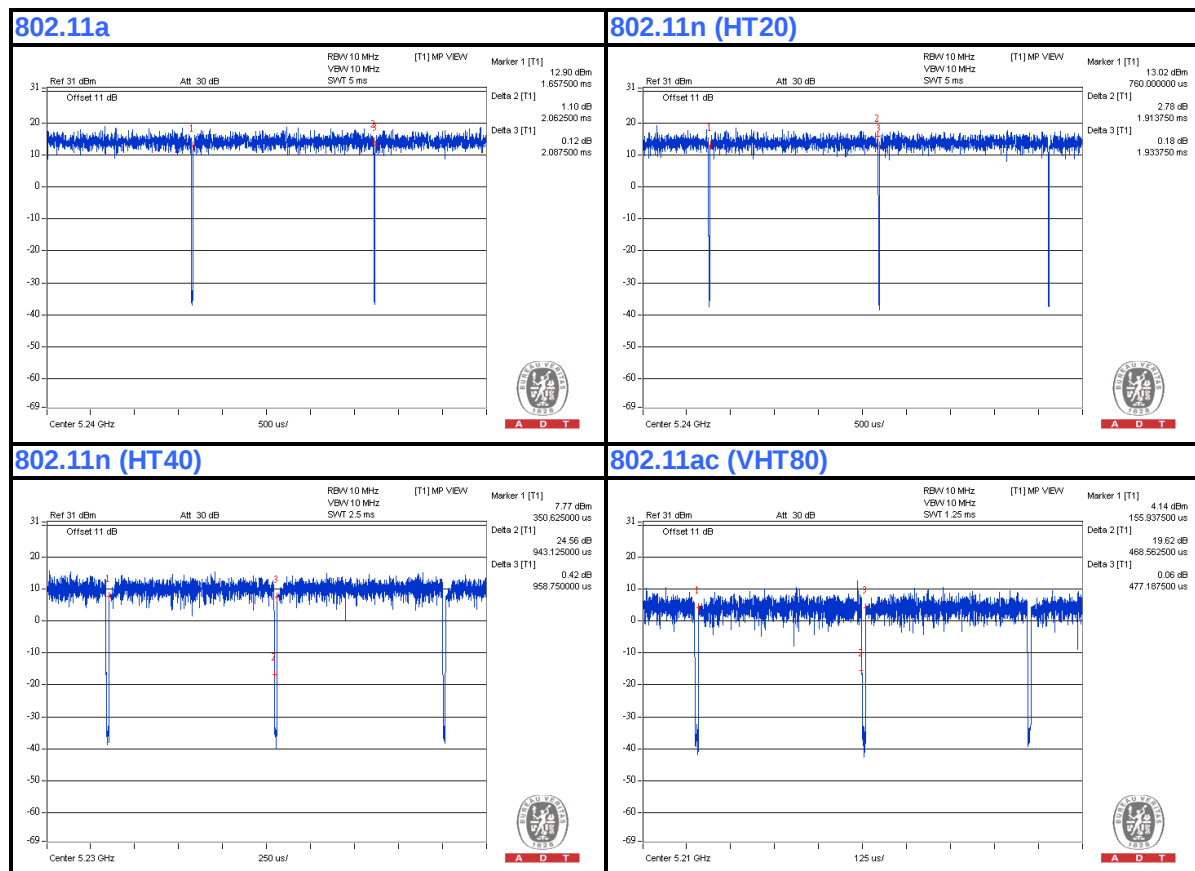
Duty cycle of test signal is > 98 %, duty factor is not required.

802.11a: Duty cycle = 2.063 ms/2.088 ms = 0.988

802.11n (HT20): Duty cycle = 1.914 ms/1.934 ms = 0.989

802.11n (HT40): Duty cycle = 0.943 ms/0.959 ms = 0.983

802.11ac (VHT80): Duty cycle = 0.469 ms/0.477 ms = 0.983





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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.

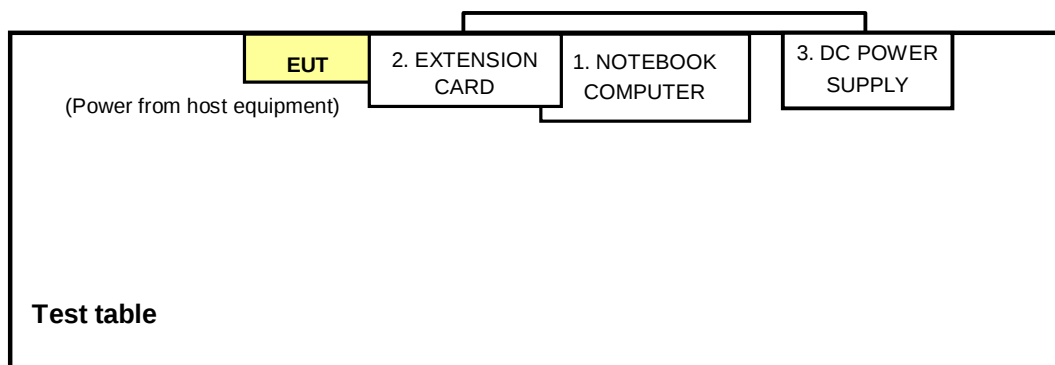
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-7016 6-5CA-0448	PIW632500516610
2	EXTENSION CARD	Alpha	NA	NA	NA
3	DC POWER SUPPLY	Topward	6603D	795558	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	DC line, 1.5m x2

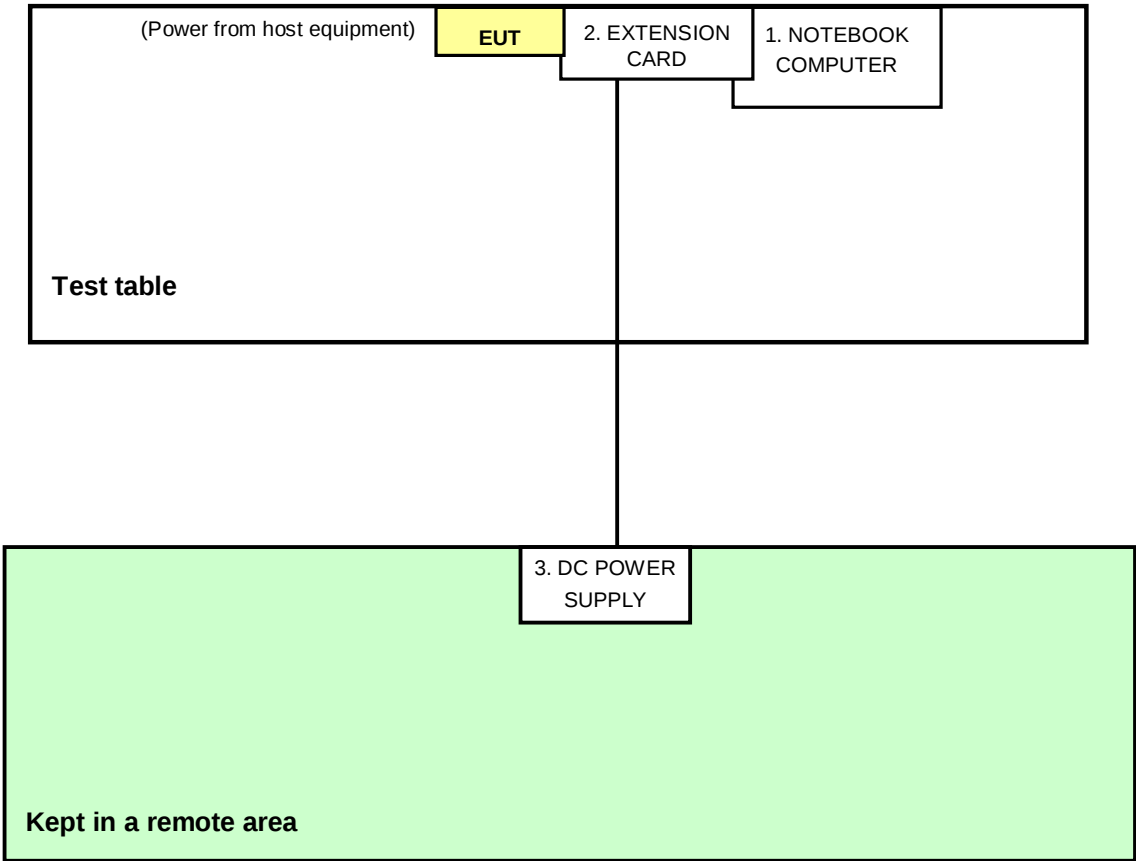
NOTE: All power cords of the above support units are non shielded (1.8m).

3.6 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission test:



For other test items:



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 12, 2012	Mar.11, 2013
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 06, 2012	Sep. 05, 2013
Line-Impedance Stabilization Network (for Peripheral)	ENV216	100072	June 08,2012	June 07,2013
RF Cable (JYEBAO)	5DFB	COCCAB-001	Aug. 28, 2012	Aug. 27, 2013
50 ohms Terminator	50	EMC-3	Sep. 25, 2012	Sep. 24, 2013
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: Jan. 17, 2013

4.1.3 TEST PROCEDURES

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

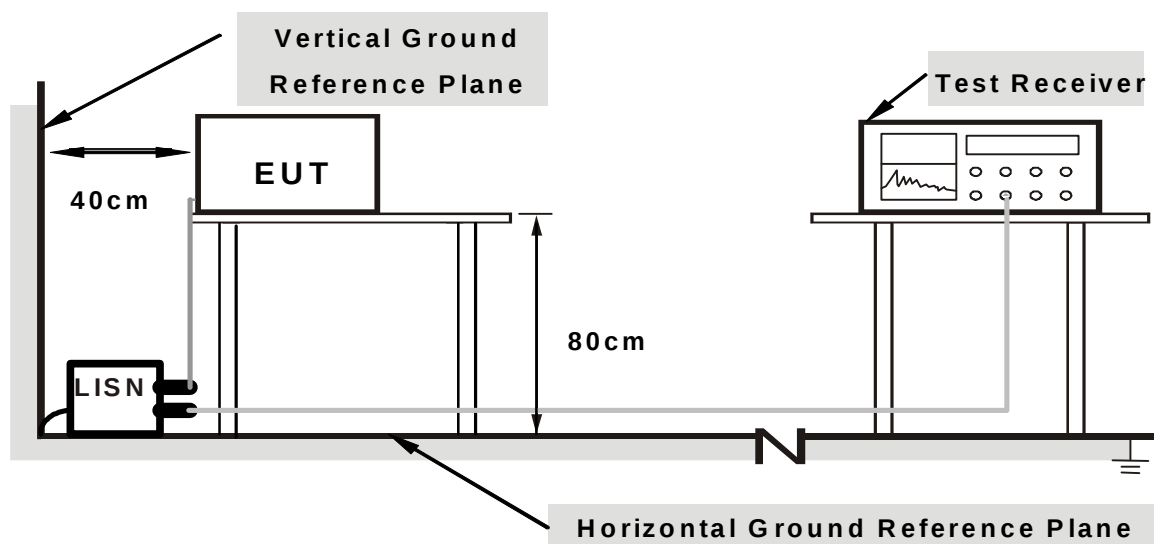
NOTE:

- 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. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “Mtool 1.0.0.8” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

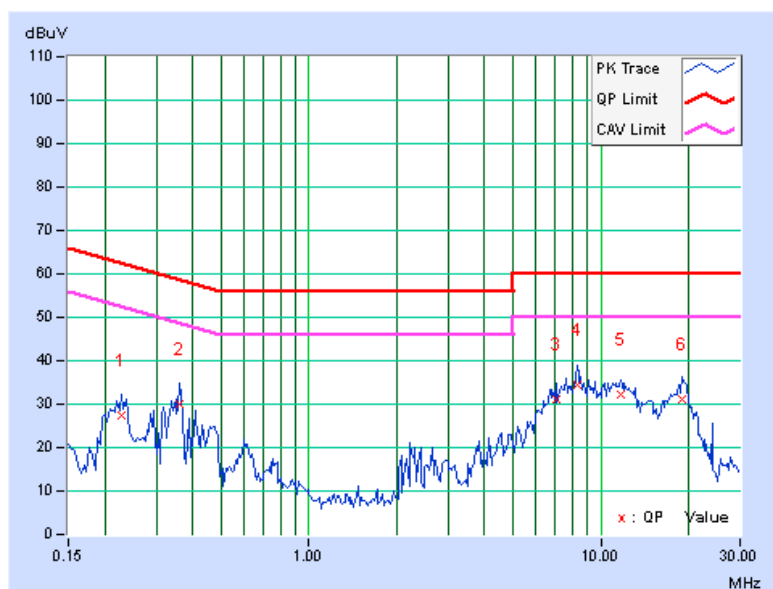
4.1.7 TEST RESULTS

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.22812	0.13	27.36	15.16	27.49	15.29	62.52	52.52	-35.03	-37.23
2	0.36094	0.15	30.00	21.33	30.15	21.48	58.71	48.71	-28.55	-27.22
3	7.07813	0.42	30.83	22.12	31.25	22.54	60.00	50.00	-28.75	-27.46
4	8.28906	0.48	33.90	26.03	34.38	26.51	60.00	50.00	-25.62	-23.49
5	11.75391	0.62	31.61	25.44	32.23	26.06	60.00	50.00	-27.77	-23.94
6	19.01953	0.88	30.28	24.83	31.16	25.71	60.00	50.00	-28.84	-24.29

REMARKS:

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

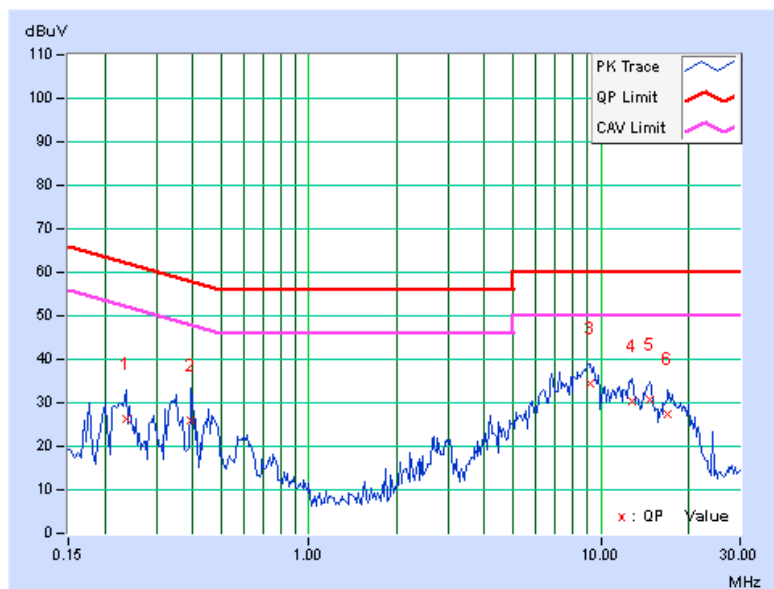


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.23594	0.11	26.11	14.04	26.22	14.15	62.24	52.24	-36.02	-38.09
2	0.39609	0.15	25.77	12.13	25.92	12.28	57.93	47.93	-32.02	-35.66
3	9.20313	0.40	33.94	28.59	34.34	28.99	60.00	50.00	-25.66	-21.01
4	12.81641	0.48	29.86	23.45	30.34	23.93	60.00	50.00	-29.66	-26.07
5	14.76953	0.52	30.16	23.72	30.68	24.24	60.00	50.00	-29.32	-25.76
6	17.02344	0.55	26.84	23.83	27.39	24.38	60.00	50.00	-32.61	-25.62

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.

4.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
	FIELD STRENGTH AT 3m (dBμV/m)	
	PK	AV
	74	54
√	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m)
	PK	PK
	-27	68.3

NOTE:

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

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



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4.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer Agilent	E4446A	MY48250254	July 09, 2012	July 08, 2013
Pre-Selector Agilent	N9039A	MY46520311	July 09, 2012	July 08, 2013
Signal Generator Agilent	N5181A	MY49060517	July 09, 2012	July 08, 2013
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-03	Nov. 14, 2012	Nov. 13, 2013
Pre-Amplifier Agilent	8449B	3008A02578	June 26, 2012	June 25, 2013
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 14, 2012	Nov. 13, 2013
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-360	Apr. 09, 2012	Apr. 08, 2013
Horn_Antenna AISI	AIH.8018	0000320091110	Nov. 19, 2012	Nov. 18, 2013
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Oct. 12, 2012	Oct. 11, 2013
RF Cable	NA	RF104-201 RF104-203 RF104-204	Dec. 25, 2012	Dec. 24, 2013
RF Cable	NA	CHGCAB_001	Oct. 06, 2012	Oct. 05, 2013
Software	ADT_Radiated _V8.7.05	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. 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: Jan. 13 to 25, 2013

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.

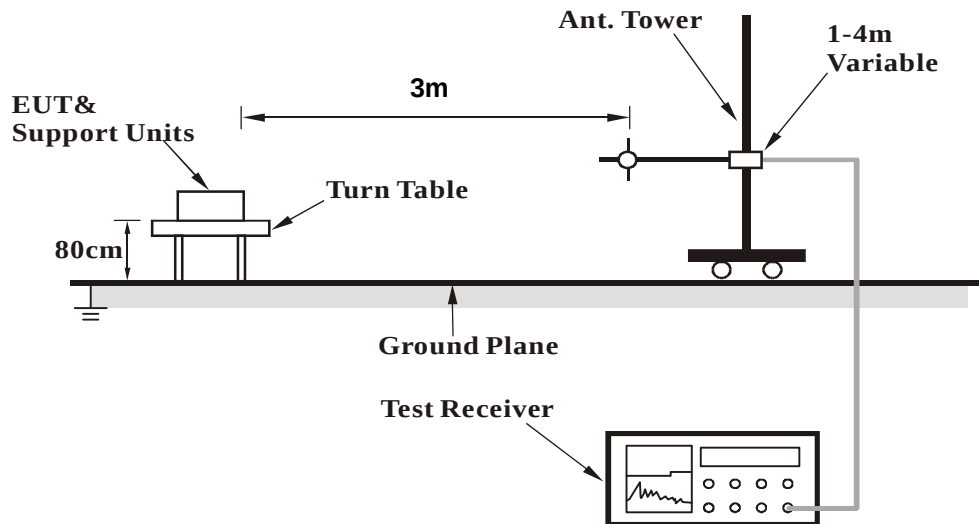
NOTE:

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 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. 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



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

802.11n (HT20)

CHANNEL	TX Channel 132	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	50.69	34.4 QP	40.0	-5.6	1.50 H	208	20.32	14.06
2	67.00	33.9 QP	40.0	-6.1	1.02 H	100	20.99	12.94
3	250.00	35.9 QP	46.0	-10.1	1.73 H	77	22.56	13.35
4	350.00	38.4 QP	46.0	-7.6	2.02 H	167	21.82	16.58
5	500.00	37.8 QP	46.0	-8.2	1.59 H	64	17.42	20.39
6	608.00	35.9 QP	46.0	-10.1	1.33 H	101	13.10	22.76
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	43.00	31.7 QP	40.0	-8.3	1.53 V	221	17.64	14.05
2	200.00	40.4 QP	43.5	-3.1	1.22 V	338	29.20	11.16
3	365.00	39.0 QP	46.0	-7.1	1.31 V	286	21.99	16.96
4	450.00	35.6 QP	46.0	-10.5	1.15 V	196	16.41	19.14
5	600.00	42.3 QP	46.0	-3.7	1.69 V	149	19.66	22.66
6	800.00	42.6 QP	46.0	-3.4	1.11 V	94	16.66	25.92

REMARKS:

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

ABOVE 1GHz DATA

802.11a

CHANNEL	TX Channel 52	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	5060.00	59.9 PK	74.0	-14.1	1.11 H	283	19.67	40.23
2	5060.00	48.2 AV	54.0	-5.8	1.11 H	283	7.97	40.23
3	5100.00	62.1 PK	74.0	-11.9	1.11 H	283	21.77	40.33
4	5100.00	52.3 AV	54.0	-1.7	1.11 H	283	11.97	40.33
5	*5260.00	119.9 PK			1.11 H	283	78.94	40.96
6	*5260.00	109.7 AV			1.11 H	283	68.74	40.96
7	#5478.00	63.3 PK	68.3	-5.0	1.11 H	283	21.71	41.59
8	#10520.00	60.4 PK	68.3	-7.9	1.56 H	132	12.67	47.73
9	15780.00	66.3 PK	74.0	-7.7	1.29 H	231	13.76	52.54
10	15780.00	52.5 AV	54.0	-1.5	1.29 H	231	-0.04	52.54
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	5060.00	58.2 PK	74.0	-15.8	1.02 V	172	17.97	40.23
2	5060.00	47.3 AV	54.0	-6.7	1.02 V	172	7.07	40.23
3	5100.00	61.9 PK	74.0	-12.1	1.02 V	172	21.57	40.33
4	5100.00	48.7 AV	54.0	-5.3	1.02 V	172	8.37	40.33
5	*5260.00	115.6 PK			1.00 V	171	74.64	40.96
6	*5260.00	106.4 AV			1.00 V	171	65.44	40.96
7	#5478.00	61.4 PK	68.3	-6.9	1.02 V	172	19.81	41.59
8	#10520.00	61.8 PK	68.3	-6.5	1.31 V	56	14.07	47.73
9	15780.00	64.4 PK	74.0	-9.6	1.21 V	186	11.86	52.54
10	15780.00	51.1 AV	54.0	-2.9	1.21 V	186	-1.44	52.54

REMARKS:

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



A D T

CHANNEL	TX Channel 60	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	59.9 PK	74.0	-14.1	1.17 H	272	19.35	40.55
2	5150.00	48.9 AV	54.0	-5.1	1.17 H	272	8.35	40.55
3	*5300.00	115.1 PK			1.17 H	272	74.02	41.08
4	*5300.00	105.4 AV			1.17 H	272	64.32	41.08
5	5384.00	64.5 PK	74.0	-9.5	1.17 H	272	23.30	41.20
6	5384.00	53.2 AV	54.0	-0.8	1.17 H	272	12.00	41.20
7	10600.00	60.3 PK	74.0	-13.7	1.52 H	133	12.54	47.76
8	10600.00	48.9 AV	54.0	-5.1	1.52 H	133	1.14	47.76
9	15900.00	66.1 PK	74.0	-7.9	1.25 H	233	13.16	52.94
10	15900.00	52.2 AV	54.0	-1.8	1.25 H	233	-0.74	52.94
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	59.5 PK	74.0	-14.5	1.00 V	171	18.95	40.55
2	5150.00	48.6 AV	54.0	-5.4	1.00 V	171	8.05	40.55
3	*5300.00	114.2 PK			1.00 V	171	73.12	41.08
4	*5300.00	104.1 AV			1.00 V	171	63.02	41.08
5	5384.00	63.8 PK	74.0	-10.2	1.00 V	171	22.60	41.20
6	5384.00	53.0 AV	54.0	-1.0	1.00 V	171	11.80	41.20
7	10600.00	61.9 PK	74.0	-12.1	1.34 V	80	14.14	47.76
8	10600.00	49.2 AV	54.0	-4.8	1.34 V	80	1.44	47.76
9	15900.00	64.5 PK	74.0	-9.5	1.26 V	194	11.56	52.94
10	15900.00	51.3 AV	54.0	-2.7	1.26 V	194	-1.64	52.94

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 64	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	5098.33	60.1 PK	74.0	-13.9	1.17 H	272	19.77	40.33
2	5098.33	50.2 AV	54.0	-3.8	1.17 H	272	9.87	40.33
3	*5320.00	114.1 PK			1.17 H	272	72.99	41.11
4	*5320.00	104.8 AV			1.17 H	272	63.69	41.11
5	5394.18	63.1 PK	74.0	-10.9	1.17 H	272	21.89	41.21
6	5394.18	53.1 AV	54.0	-0.9	1.17 H	272	11.89	41.21
7	10640.00	59.6 PK	74.0	-14.4	1.57 H	132	11.72	47.88
8	10640.00	48.4 AV	54.0	-5.6	1.57 H	132	0.52	47.88
9	15960.00	66.3 PK	74.0	-7.7	1.28 H	219	13.53	52.77
10	15960.00	52.1 AV	54.0	-1.9	1.28 H	219	-0.67	52.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5098.33	59.6 PK	74.0	-14.4	1.00 V	171	19.27	40.33
2	5098.33	48.3 AV	54.0	-5.7	1.00 V	171	7.97	40.33
3	*5320.00	113.8 PK			1.00 V	171	72.69	41.11
4	*5320.00	103.7 AV			1.00 V	171	62.59	41.11
5	5394.18	62.8 PK	74.0	-11.2	1.00 V	171	21.59	41.21
6	5394.18	53.0 AV	54.0	-1.0	1.00 V	171	11.79	41.21
7	10640.00	62.5 PK	74.0	-11.5	1.34 V	95	14.62	47.88
8	10640.00	49.7 AV	54.0	-4.3	1.34 V	95	1.82	47.88
9	15960.00	63.9 PK	74.0	-10.1	1.21 V	194	11.13	52.77
10	15960.00	50.8 AV	54.0	-3.2	1.21 V	194	-1.97	52.77

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	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	5413.42	63.9 PK	74.0	-10.1	1.17 H	272	22.62	41.28
2	5413.42	53.3 AV	54.0	-0.7	1.17 H	272	12.02	41.28
3	*5500.00	114.0 PK			1.17 H	272	72.30	41.70
4	*5500.00	103.6 AV			1.17 H	272	61.90	41.70
5	11000.00	60.5 PK	74.0	-13.5	1.48 H	142	11.53	48.97
6	11000.00	49.1 AV	54.0	-4.9	1.48 H	142	0.13	48.97
7	#16500.00	66.5 PK	68.3	-1.8	1.26 H	241	12.11	54.39
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	5413.42	62.2 PK	74.0	-11.8	1.10 V	104	20.92	41.28
2	5413.42	53.0 AV	54.0	-1.0	1.10 V	104	11.72	41.28
3	*5500.00	112.8 PK			1.10 V	104	71.10	41.70
4	*5500.00	102.5 AV			1.10 V	104	60.80	41.70
5	11000.00	61.9 PK	74.0	-12.1	1.34 V	85	12.93	48.97
6	11000.00	49.2 AV	54.0	-4.8	1.34 V	85	0.23	48.97
7	#16500.00	64.1 PK	68.3	-4.2	1.22 V	199	9.71	54.39

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).
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 116	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	5117.15	63.5 PK	74.0	-10.5	1.17 H	272	22.79	40.71
2	5117.15	53.5 AV	54.0	-0.5	1.17 H	272	12.79	40.71
3	#5464.65	63.6 PK	68.3	-4.7	1.17 H	272	21.77	41.83
4	*5580.00	114.1 PK			1.17 H	272	71.89	42.21
5	*5580.00	104.2 AV			1.17 H	272	61.99	42.21
6	#5734.60	63.6 PK	68.3	-4.7	1.17 H	272	20.94	42.66
7	11160.00	60.3 PK	74.0	-13.7	1.52 H	142	11.47	48.83
8	11160.00	48.8 AV	54.0	-5.2	1.52 H	142	-0.03	48.83
9	#16740.00	66.6 PK	68.3	-1.7	1.21 H	233	12.28	54.32
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	5117.15	60.5 PK	74.0	-13.5	1.10 V	104	19.79	40.71
2	5117.15	49.2 AV	54.0	-4.8	1.10 V	104	8.49	40.71
3	#5464.65	61.4 PK	68.3	-6.9	1.10 V	104	19.57	41.83
4	*5580.00	111.7 PK			1.10 V	104	69.49	42.21
5	*5580.00	102.1 AV			1.10 V	104	59.89	42.21
6	#5734.60	61.7 PK	68.3	-6.6	1.10 V	104	19.04	42.66
7	11160.00	61.4 PK	74.0	-12.6	1.08 V	96	12.57	48.83
8	11160.00	49.3 AV	54.0	-4.7	1.08 V	96	0.47	48.83
9	#16740.00	61.7 PK	68.3	-6.6	1.32 V	69	7.38	54.32

REMARKS:

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

CHANNEL	TX Channel 132	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	#5464.03	65.2 PK	68.3	-3.1	1.14 H	295	23.37	41.83
2	*5660.00	116.2 PK			1.14 H	295	73.74	42.46
3	*5660.00	106.9 AV			1.14 H	295	64.44	42.46
4	#5734.20	67.3 PK	68.3	-1.0	1.14 H	295	24.65	42.65
5	11320.00	60.6 PK	74.0	-13.4	1.52 H	141	11.43	49.17
6	11320.00	49.5 AV	54.0	-4.5	1.52 H	141	0.33	49.17
7	#16980.00	66.4 PK	68.3	-1.9	1.32 H	248	11.59	54.81
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	#5464.03	60.8 PK	68.3	-7.5	1.03 V	351	18.97	41.83
2	*5660.00	114.8 PK			1.03 V	351	72.34	42.46
3	*5660.00	105.3 AV			1.03 V	351	62.84	42.46
4	#5734.20	65.4 PK	68.3	-2.9	1.03 V	351	22.75	42.65
5	11320.00	61.6 PK	74.0	-12.4	1.15 V	117	12.43	49.17
6	11320.00	48.9 AV	54.0	-5.1	1.15 V	117	-0.27	49.17
7	#16980.00	62.3 PK	68.3	-6.0	1.33 V	75	7.49	54.81

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).
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 140	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	*5700.00	113.8 PK			1.17 H	272	71.20	42.60
2	*5700.00	104.2 AV			1.17 H	272	61.60	42.60
3	#5725.00	65.6 PK	68.3	-2.7	1.17 H	272	22.96	42.64
4	#5770.00	65.7 PK	68.3	-2.6	1.17 H	272	22.99	42.71
5	11400.00	60.2 PK	74.0	-13.8	1.42 H	137	11.22	48.98
6	11400.00	49.0 AV	54.0	-5.0	1.42 H	137	0.02	48.98
7	#17100.00	66.4 PK	68.3	-1.9	1.24 H	234	11.30	55.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	113.2 PK			1.03 V	351	70.60	42.60
2	*5700.00	103.1 AV			1.03 V	351	60.50	42.60
3	#5725.00	64.2 PK	68.3	-4.1	1.03 V	351	21.56	42.64
4	#5770.00	63.5 PK	68.3	-4.8	1.03 V	351	20.79	42.71
5	11400.00	61.7 PK	74.0	-12.3	1.06 V	120	12.72	48.98
6	11400.00	48.8 AV	54.0	-5.2	1.06 V	120	-0.18	48.98
7	#17100.00	62.3 PK	68.3	-6.0	1.32 V	100	7.20	55.10

REMARKS:

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

802.11n (HT20)

CHANNEL	TX Channel 52	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	63.9 PK	74.0	-10.1	1.17 H	272	23.57	40.33
2	5100.00	53.5 AV	54.0	-0.5	1.17 H	272	13.17	40.33
3	*5260.00	119.7 PK			1.17 H	272	78.74	40.96
4	*5260.00	109.5 AV			1.17 H	272	68.54	40.96
5	5418.75	63.8 PK	74.0	-10.2	1.17 H	272	22.49	41.31
6	5418.75	52.8 AV	54.0	-1.2	1.17 H	272	11.49	41.31
7	#10520.00	56.6 PK	68.3	-11.7	1.56 H	145	8.87	47.73
8	15780.00	60.2 PK	74.0	-13.8	1.23 H	231	7.66	52.54
9	15780.00	51.6 AV	54.0	-2.4	1.23 H	231	-0.94	52.54
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	61.7 PK	74.0	-12.3	1.03 V	172	21.15	40.55
2	5150.00	49.4 AV	54.0	-4.6	1.03 V	172	8.85	40.55
3	*5260.00	115.9 PK			1.00 V	171	74.94	40.96
4	*5260.00	105.8 AV			1.00 V	171	64.84	40.96
5	5418.75	61.2 PK	74.0	-12.8	1.03 V	173	19.89	41.31
6	5418.75	49.1 AV	54.0	-4.9	1.03 V	173	7.79	41.31
7	#10520.00	56.9 PK	68.3	-11.4	1.11 V	121	9.17	47.73
8	15780.00	62.5 PK	74.0	-11.5	1.31 V	100	9.96	52.54
9	15780.00	51.3 AV	54.0	-2.7	1.31 V	100	-1.24	52.54

REMARKS:

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

CHANNEL	TX Channel 60	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	*5300.00	112.9 PK			1.17 H	272	71.82	41.08
2	*5300.00	104.3 AV			1.17 H	272	63.22	41.08
3	5380.63	63.9 PK	74.0	-10.1	1.17 H	272	22.71	41.19
4	5380.63	53.4 AV	54.0	-0.6	1.17 H	272	12.21	41.19
5	10600.00	56.4 PK	74.0	-17.6	1.59 H	152	8.64	47.76
6	10600.00	46.6 AV	54.0	-7.4	1.59 H	152	-1.16	47.76
7	15900.00	60.1 PK	74.0	-13.9	1.19 H	238	7.16	52.94
8	15900.00	51.3 AV	54.0	-2.7	1.19 H	238	-1.64	52.94
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	*5300.00	112.0 PK			1.00 V	172	70.92	41.08
2	*5300.00	102.3 AV			1.00 V	172	61.22	41.08
3	5380.63	63.9 PK	74.0	-10.1	1.09 V	170	22.71	41.19
4	5380.63	53.3 AV	54.0	-0.7	1.09 V	170	12.11	41.19
5	10600.00	56.4 PK	74.0	-17.6	1.12 V	131	8.64	47.76
6	10600.00	46.5 AV	54.0	-7.5	1.12 V	131	-1.26	47.76
7	15900.00	62.4 PK	74.0	-11.6	1.32 V	121	9.46	52.94
8	15900.00	51.2 AV	54.0	-2.8	1.32 V	121	-1.74	52.94

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 64	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	5098.83	63.8 PK	74.0	-10.2	1.15 H	272	23.47	40.33
2	5098.83	53.4 AV	54.0	-0.6	1.15 H	272	13.07	40.33
3	*5320.00	114.8 PK			1.15 H	272	73.69	41.11
4	*5320.00	105.5 AV			1.15 H	272	64.39	41.11
5	5399.00	61.5 PK	74.0	-12.5	1.15 H	272	20.28	41.22
6	5399.00	52.9 AV	54.0	-1.1	1.15 H	272	11.68	41.22
7	10640.00	56.9 PK	74.0	-17.1	1.63 H	144	9.02	47.88
8	10640.00	47.0 AV	54.0	-7.0	1.63 H	144	-0.88	47.88
9	15960.00	60.3 PK	74.0	-13.7	1.13 H	236	7.53	52.77
10	15960.00	51.5 AV	54.0	-2.5	1.13 H	236	-1.27	52.77
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5098.83	60.0 PK	74.0	-14.0	1.12 V	174	19.67	40.33
2	5098.83	49.4 AV	54.0	-4.6	1.12 V	174	9.07	40.33
3	*5320.00	114.3 PK			1.09 V	174	73.19	41.11
4	*5320.00	103.6 AV			1.09 V	174	62.49	41.11
5	5399.00	64.2 PK	74.0	-9.8	1.09 V	174	22.98	41.22
6	5399.00	53.0 AV	54.0	-1.0	1.09 V	174	11.78	41.22
7	10640.00	56.7 PK	74.0	-17.3	1.13 V	137	8.82	47.88
8	10640.00	46.9 AV	54.0	-7.1	1.13 V	137	-0.98	47.88
9	15960.00	62.6 PK	74.0	-11.4	1.30 V	124	9.83	52.77
10	15960.00	51.3 AV	54.0	-2.7	1.30 V	124	-1.47	52.77

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	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	5417.30	65.5 PK	74.0	-8.5	1.17 H	272	24.20	41.30
2	5417.30	53.4 AV	54.0	-0.6	1.17 H	272	12.10	41.30
3	*5500.00	118.3 PK			1.17 H	272	76.60	41.70
4	*5500.00	109.3 AV			1.17 H	272	67.60	41.70
5	11000.00	56.1 PK	74.0	-17.9	1.56 H	154	7.13	48.97
6	11000.00	46.2 AV	54.0	-7.8	1.56 H	154	-2.77	48.97
7	#16500.00	60.0 PK	68.3	-8.3	1.22 H	244	5.61	54.39
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	5426.72	62.0 PK	74.0	-12.0	1.06 V	175	20.65	41.35
2	5426.72	51.2 AV	54.0	-2.8	1.06 V	175	9.85	41.35
3	*5500.00	118.2 PK			1.06 V	175	76.50	41.70
4	*5500.00	108.4 AV			1.06 V	175	66.70	41.70
5	11000.00	55.7 PK	74.0	-18.3	1.15 V	118	6.73	48.97
6	11000.00	46.1 AV	54.0	-7.9	1.15 V	118	-2.87	48.97
7	#16500.00	62.5 PK	68.3	-5.8	1.31 V	135	8.11	54.39

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).
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 116	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	5114.00	61.1 PK	74.0	-12.9	1.16 H	294	20.41	40.69
2	5114.00	51.4 AV	54.0	-2.6	1.16 H	294	10.71	40.69
3	*5580.00	117.2 PK			1.16 H	294	74.99	42.21
4	*5580.00	107.3 AV			1.16 H	294	65.09	42.21
5	#5812.00	67.6 PK	68.3	-0.7	1.16 H	294	24.79	42.81
6	11160.00	55.7 PK	74.0	-18.3	1.56 H	165	6.87	48.83
7	11160.00	46.2 AV	54.0	-7.8	1.56 H	165	-2.63	48.83
8	#16740.00	59.5 PK	68.3	-8.8	1.22 H	237	5.18	54.32
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	5116.00	59.4 PK	74.0	-14.6	1.04 V	177	18.70	40.70
2	5116.00	50.8 AV	54.0	-3.2	1.04 V	177	10.10	40.70
3	5456.00	60.5 PK	74.0	-13.5	1.04 V	177	18.71	41.79
4	5456.00	50.9 AV	54.0	-3.1	1.04 V	177	9.11	41.79
5	*5580.00	114.5 PK			1.04 V	177	72.29	42.21
6	*5580.00	105.2 AV			1.04 V	177	62.99	42.21
7	11160.00	56.1 PK	74.0	-17.9	1.17 V	140	7.27	48.83
8	11160.00	46.3 AV	54.0	-7.7	1.17 V	140	-2.53	48.83
9	#16740.00	62.5 PK	68.3	-5.8	1.29 V	125	8.18	54.32

REMARKS:

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

CHANNEL	TX Channel 132	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	5417.28	61.7 PK	74.0	-12.3	1.14 H	295	20.10	41.60
2	5417.28	52.3 AV	54.0	-1.7	1.14 H	295	10.70	41.60
3	*5660.00	123.1 PK			1.14 H	295	80.64	42.46
4	*5660.00	110.6 AV			1.14 H	295	68.14	42.46
5	#5737.00	67.3 PK	68.3	-1.0	1.14 H	295	24.64	42.66
6	11320.00	56.1 PK	74.0	-17.9	1.59 H	161	6.93	49.17
7	11320.00	46.1 AV	54.0	-7.9	1.59 H	161	-3.07	49.17
8	#16980.00	59.7 PK	68.3	-8.6	1.14 H	223	4.89	54.81
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	5417.28	62.4 PK	74.0	-11.6	1.01 V	177	20.80	41.60
2	5417.28	48.8 AV	54.0	-5.2	1.01 V	177	7.20	41.60
3	*5660.00	114.5 PK			1.01 V	172	72.04	42.46
4	*5660.00	105.3 AV			1.01 V	172	62.84	42.46
5	#5737.00	67.2 PK	68.3	-1.1	1.01 V	177	24.54	42.66
6	11320.00	56.7 PK	74.0	-17.3	1.06 V	143	7.53	49.17
7	11320.00	46.8 AV	54.0	-7.2	1.06 V	143	-2.37	49.17
8	#16980.00	62.6 PK	68.3	-5.7	1.34 V	135	7.79	54.81

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).
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 140	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	5457.00	60.2 PK	74.0	-13.8	1.33 H	291	18.41	41.79
2	5457.00	50.1 AV	54.0	-3.9	1.33 H	291	8.31	41.79
3	*5700.00	115.3 PK			1.33 H	291	72.70	42.60
4	*5700.00	105.3 AV			1.33 H	291	62.70	42.60
5	#5725.00	67.4 PK	68.3	-0.9	1.33 H	291	24.76	42.64
6	11400.00	56.9 PK	74.0	-17.1	1.65 H	137	7.92	48.98
7	11400.00	46.9 AV	54.0	-7.1	1.65 H	137	-2.08	48.98
8	#17100.00	59.9 PK	68.3	-8.4	1.20 H	238	4.80	55.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5457.00	60.9 PK	74.0	-13.1	1.02 V	173	19.11	41.79
2	5457.00	48.8 AV	54.0	-5.2	1.02 V	173	7.01	41.79
3	*5700.00	114.1 PK			1.02 V	173	71.50	42.60
4	*5700.00	104.1 AV			1.02 V	173	61.50	42.60
5	#5725.00	67.3 PK	68.3	-1.0	1.02 V	173	24.66	42.64
6	11400.00	56.4 PK	74.0	-17.6	1.10 V	132	7.42	48.98
7	11400.00	46.2 AV	54.0	-7.8	1.10 V	132	-2.78	48.98
8	#17100.00	62.2 PK	68.3	-6.1	1.33 V	108	7.10	55.10

REMARKS:

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

802.11n (HT40)

CHANNEL	TX Channel 54	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	59.6 PK	74.0	-14.4	1.11 H	283	19.05	40.55
2	5150.00	47.4 AV	54.0	-6.6	1.11 H	283	6.85	40.55
3	*5270.00	112.9 PK			1.11 H	283	71.91	40.99
4	*5270.00	103.3 AV			1.11 H	283	62.31	40.99
5	5355.00	63.1 PK	74.0	-10.9	1.11 H	283	21.94	41.16
6	5355.00	53.4 AV	54.0	-0.6	1.11 H	283	12.24	41.16
7	#5709.00	61.9 PK	68.3	-6.4	1.11 H	283	19.59	42.31
8	#10540.00	55.4 PK	68.3	-12.9	1.55 H	159	7.66	47.74
9	15810.00	60.6 PK	74.0	-13.4	1.23 H	237	8.03	52.57
10	15810.00	50.7 AV	54.0	-3.3	1.23 H	237	-1.87	52.57
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.6 PK	74.0	-13.4	1.00 V	173	20.05	40.55
2	5150.00	48.1 AV	54.0	-5.9	1.00 V	173	7.55	40.55
3	*5270.00	112.1 PK			1.00 V	173	71.11	40.99
4	*5270.00	100.8 AV			1.00 V	173	59.81	40.99
5	5355.00	62.8 PK	74.0	-11.2	1.00 V	173	21.64	41.16
6	5355.00	52.9 AV	54.0	-1.1	1.00 V	173	11.74	41.16
7	#5709.00	61.5 PK	68.3	-6.8	1.00 V	173	19.19	42.31
8	#10540.00	56.1 PK	68.3	-12.2	1.10 V	134	8.36	47.74
9	15810.00	62.4 PK	74.0	-11.6	1.36 V	109	9.83	52.57
10	15810.00	50.9 AV	54.0	-3.1	1.36 V	109	-1.67	52.57

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
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 62	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	*5310.00	113.3 PK			1.10 H	283	71.91	41.39
2	*5310.00	103.9 AV			1.10 H	283	62.51	41.39
3	5385.00	66.1 PK	74.0	-7.9	1.10 H	283	24.60	41.50
4	5385.00	53.4 AV	54.0	-0.6	1.10 H	283	11.90	41.50
5	#5752.00	60.5 PK	68.3	-7.8	1.10 H	283	17.82	42.68
6	10620.00	56.6 PK	74.0	-17.4	1.51 H	145	8.68	47.92
7	10620.00	46.7 AV	54.0	-7.3	1.51 H	145	-1.22	47.92
8	15930.00	60.2 PK	74.0	-13.8	1.24 H	228	7.09	53.11
9	15930.00	50.9 AV	54.0	-3.1	1.24 H	228	-2.21	53.11
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	*5310.00	112.9 PK			1.00 V	171	71.51	41.39
2	*5310.00	102.0 AV			1.00 V	171	60.61	41.39
3	5350.00	65.3 PK	74.0	-8.7	1.00 V	171	23.85	41.45
4	5350.00	52.1 AV	54.0	-1.9	1.00 V	171	10.65	41.45
5	#5752.00	60.1 PK	68.3	-8.2	1.00 V	171	17.42	42.68
6	10620.00	56.1 PK	74.0	-17.9	1.05 V	127	8.18	47.92
7	10620.00	46.9 AV	54.0	-7.1	1.05 V	127	-1.02	47.92
8	15930.00	61.1 PK	74.0	-12.9	1.35 V	122	7.99	53.11
9	15930.00	50.8 AV	54.0	-3.2	1.35 V	122	-2.31	53.11

REMARKS:

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

CHANNEL	TX Channel 102	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	5434.00	63.2 PK	74.0	-10.8	1.05 H	282	21.82	41.38
2	5434.00	53.4 AV	54.0	-0.6	1.05 H	282	12.02	41.38
3	#5470.00	67.5 PK	68.3	-0.8	1.05 H	282	25.94	41.56
4	*5510.00	111.1 PK			1.05 H	282	69.37	41.73
5	*5510.00	101.5 AV			1.05 H	282	59.77	41.73
6	11020.00	56.4 PK	74.0	-17.6	1.52 H	143	7.46	48.94
7	11020.00	46.4 AV	54.0	-7.6	1.52 H	143	-2.54	48.94
8	#16530.00	60.0 PK	68.3	-8.3	1.23 H	225	5.28	54.72
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	5434.00	62.3 PK	74.0	-11.7	1.06 V	355	20.92	41.38
2	5434.00	51.7 AV	54.0	-2.3	1.06 V	355	10.32	41.38
3	#5470.00	65.5 PK	68.3	-2.8	1.06 V	355	23.94	41.56
4	*5510.00	109.2 PK			1.06 V	355	67.47	41.73
5	*5510.00	99.7 AV			1.06 V	355	57.97	41.73
6	11020.00	55.9 PK	74.0	-18.1	1.09 V	131	6.96	48.94
7	11020.00	47.0 AV	54.0	-7.0	1.09 V	131	-1.94	48.94
8	#16530.00	61.7 PK	68.3	-6.6	1.33 V	123	6.98	54.72

REMARKS:

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

CHANNEL	TX Channel 110	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	5457.00	63.1 PK	74.0	-10.9	1.19 H	304	21.61	41.49
2	5457.00	53.5 AV	54.0	-0.5	1.19 H	304	12.01	41.49
3	#5462.00	66.2 PK	68.3	-2.1	1.19 H	304	24.68	41.52
4	*5550.00	113.1 PK			1.19 H	304	71.27	41.83
5	*5550.00	103.2 AV			1.19 H	304	61.37	41.83
6	11100.00	56.5 PK	74.0	-17.5	1.49 H	142	7.69	48.81
7	11100.00	46.4 AV	54.0	-7.6	1.49 H	142	-2.41	48.81
8	#16650.00	60.2 PK	68.3	-8.1	1.25 H	241	5.15	55.05
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	5457.00	62.5 PK	74.0	-11.5	1.06 V	355	21.01	41.49
2	5457.00	53.0 AV	54.0	-1.0	1.06 V	355	11.51	41.49
3	#5462.00	65.2 PK	68.3	-3.1	1.06 V	355	23.68	41.52
4	*5550.00	112.4 PK			1.06 V	355	70.57	41.83
5	*5550.00	102.1 AV			1.06 V	355	60.27	41.83
6	11100.00	56.3 PK	74.0	-17.7	1.04 V	121	7.49	48.81
7	11100.00	47.3 AV	54.0	-6.7	1.04 V	121	-1.51	48.81
8	#16650.00	61.3 PK	68.3	-7.0	1.38 V	111	6.25	55.05

REMARKS:

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

CHANNEL	TX Channel 134	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	111.5 PK			1.17 H	323	69.00	42.50
2	*5670.00	101.8 AV			1.17 H	323	59.30	42.50
3	#5725.00	66.5 PK	68.3	-1.8	1.17 H	323	23.86	42.64
4	11340.00	56.7 PK	74.0	-17.3	1.48 H	138	7.58	49.12
5	11340.00	47.0 AV	54.0	-7.0	1.48 H	138	-2.12	49.12
6	#17010.00	60.1 PK	68.3	-8.2	1.28 H	240	5.24	54.86
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	110.5 PK			1.06 V	355	68.00	42.50
2	*5670.00	99.3 AV			1.06 V	355	56.80	42.50
3	#5725.00	66.1 PK	68.3	-2.2	1.06 V	355	23.46	42.64
4	11340.00	56.5 PK	74.0	-17.5	1.05 V	125	7.38	49.12
5	11340.00	47.2 AV	54.0	-6.8	1.05 V	125	-1.92	49.12
6	#17010.00	61.0 PK	68.3	-7.3	1.36 V	137	6.14	54.86

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 58	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	68.0 PK	74.0	-6.0	1.17 H	272	27.45	40.55
2	5150.00	53.2 AV	54.0	-0.8	1.17 H	272	12.65	40.55
3	*5290.00	116.2 PK			1.17 H	272	75.15	41.05
4	*5290.00	104.7 AV			1.17 H	272	63.65	41.05
5	#5877.00	61.8 PK	68.3	-6.5	1.17 H	272	19.02	42.78
6	#10580.00	56.3 PK	68.3	-12.0	1.52 H	140	8.55	47.75
7	15870.00	60.1 PK	74.0	-13.9	1.26 H	240	7.28	52.82
8	15870.00	50.7 AV	54.0	-3.3	1.26 H	240	-2.12	52.82
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	62.9 PK	74.0	-11.1	1.14 V	282	22.35	40.55
2	5150.00	48.6 AV	54.0	-5.4	1.14 V	282	8.05	40.55
3	*5290.00	113.7 PK			1.14 V	282	72.65	41.05
4	*5290.00	101.1 AV			1.14 V	282	60.05	41.05
5	#5877.00	62.4 PK	68.3	-5.9	1.14 V	282	19.62	42.78
6	#10580.00	57.1 PK	68.3	-11.2	1.09 V	128	9.35	47.75
7	15870.00	61.3 PK	74.0	-12.7	1.30 V	137	8.48	52.82
8	15870.00	51.3 AV	54.0	-2.7	1.30 V	137	-1.52	52.82

REMARKS:

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



A D T

CHANNEL	TX Channel 106	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	4915.56	59.9 PK	74.0	-14.1	1.20 H	281	20.09	39.81
2	4915.56	52.2 AV	54.0	-1.8	1.20 H	281	12.39	39.81
3	5460.00	60.3 PK	74.0	-13.7	1.20 H	281	18.79	41.51
4	5460.00	53.5 AV	54.0	-0.5	1.20 H	281	11.99	41.51
5	*5530.00	110.5 PK			1.20 H	281	68.72	41.78
6	*5530.00	98.6 AV			1.20 H	281	56.82	41.78
7	11060.00	56.7 PK	74.0	-17.3	1.45 H	132	7.83	48.87
8	#16590.00	60.7 PK	68.3	-7.6	1.27 H	222	5.32	55.38
9	#16590.00	51.2 AV	54.0	-2.8	1.27 H	222	-4.18	55.38
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	4915.56	60.4 PK	74.0	-13.6	1.00 V	332	20.59	39.81
2	4915.56	53.4 AV	54.0	-0.6	1.00 V	332	13.59	39.81
3	5460.00	61.2 PK	74.0	-12.8	1.00 V	332	19.69	41.51
4	5460.00	52.9 AV	54.0	-1.1	1.00 V	332	11.39	41.51
5	*5530.00	103.3 PK			1.00 V	332	61.52	41.78
6	*5530.00	95.2 AV			1.00 V	332	53.42	41.78
7	11060.00	56.3 PK	74.0	-17.7	1.00 V	133	7.43	48.87
8	#16590.00	60.9 PK	68.3	-7.4	1.36 V	121	5.52	55.38
9	#16590.00	50.7 AV	54.0	-3.3	1.36 V	121	-4.68	55.38

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).
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

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.47 – 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

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

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

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

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 $NANT \geq 5$.

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



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4.3.2 TEST INSTRUMENTS

FOR POWER OUTPUT MEASUREMENT (802.11a, 802.11n (HT20), 802.11n (HT40))

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 10, 2012	May 09, 2013
Power Sensor	MA2411B	0738172	May 10, 2012	May 09, 2013

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 : Jan. 29, 2013

FOR POWER OUTPUT MEASUREMENT (802.11ac (VHT80))

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

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 : Jan. 14, 2013

FOR 26dB OCCUPIED BANDWIDTH

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

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 : Jan. 14, 2013

4.3.3 TEST PROCEDURE

FOR POWER OUTPUT MEASUREMENT (802.11a, 802.11n (HT20), 802.11n (HT40))

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power sensor. Record the power level.

FOR POWER OUTPUT MEASUREMENT (802.11ac (VHT80))

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent) ; Set video trigger (duty cycle < 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

FOR 26dB OCCUPIED BANDWIDTH

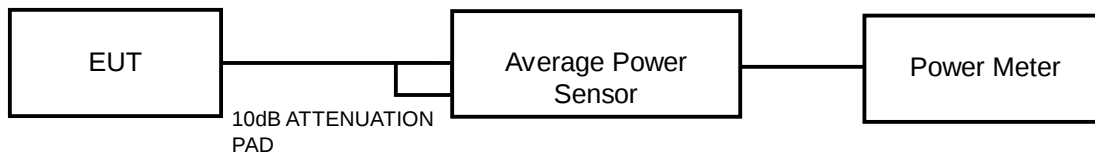
1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW $>$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement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

4.3.4 DEVIATION FROM TEST STANDARD

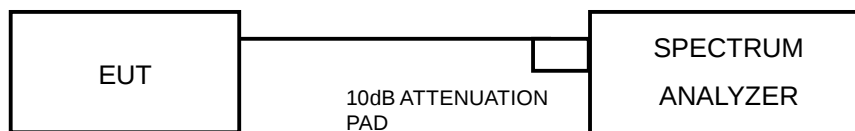
No deviation

4.3.5 TEST SETUP

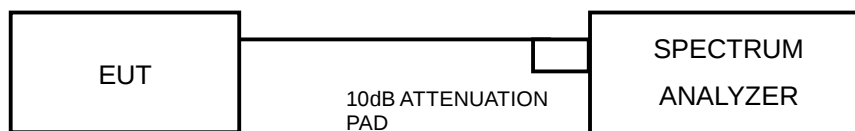
FOR POWER OUTPUT MEASUREMENT (802.11a, 802.11n (HT20), 802.11n (HT40))



FOR POWER OUTPUT MEASUREMENT (802.11ac (VHT80))



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

POWER OUTPUT:

802.11a

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	16.45	16.45	16.45	132.471	21.22	24	PASS
60	5300	15.10	15.04	15.37	98.709	19.94	24	PASS
64	5320	15.00	15.10	15.24	97.402	19.89	24	PASS
100	5500	16.90	16.21	16.92	139.965	21.46	24	PASS
116	5580	17.07	16.42	17.07	145.719	21.64	24	PASS
132	5660	17.10	16.20	17.00	143.092	21.56	24	PASS
140	5700	17.00	16.33	17.10	144.359	21.59	24	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	16.43	16.91	17.12	144.568	21.60	24	PASS
60	5300	13.44	13.05	13.47	64.497	18.10	24	PASS
64	5320	14.24	14.11	14.49	80.428	19.05	24	PASS
100	5500	15.47	14.74	15.50	100.503	20.02	24	PASS
116	5580	17.41	16.40	17.37	153.309	21.86	24	PASS
132	5660	17.60	16.75	17.40	159.813	22.04	24	PASS
140	5700	15.90	15.30	15.91	111.783	20.48	24	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
54	5270	16.64	16.53	16.91	140.201	21.47	24	PASS
62	5310	16.30	16.21	16.46	128.700	21.10	24	PASS
102	5510	15.10	14.86	15.21	96.168	19.83	24	PASS
110	5550	19.40	18.37	19.24	239.749	23.80	24	PASS
134	5670	19.37	18.41	19.30	240.954	23.82	24	PASS

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
58	5290	16.85	16.60	17.05	144.825	21.61	24	PASS
106	5530	12.48	12.24	12.86	53.770	17.31	24	PASS

26dB OCCUPIED BANDWIDTH:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
52	5260	19.43	19.28	19.64
60	5300	19.55	19.56	19.72
64	5320	19.63	19.53	19.53
100	5500	19.43	19.53	19.67
116	5580	19.63	19.61	19.85
132	5660	20.02	19.39	20.13
140	5700	19.80	19.85	20.00

802.11n (HT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
52	5260	19.87	19.86	19.80
60	5300	20.01	19.95	19.75
64	5320	20.05	19.83	19.86
100	5500	19.98	19.92	19.96
116	5580	19.93	19.91	19.96
132	5660	20.01	20.11	19.95
140	5700	19.98	19.93	19.88

802.11n (HT40)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
54	5270	40.76	40.06	40.32
62	5310	40.77	40.15	40.21
102	5510	40.55	40.16	40.27
110	5550	44.06	40.08	40.33
134	5670	41.02	40.21	40.78

802.11ac (VHT80)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
58	5290	82.47	81.86	81.69
106	5530	82.03	81.50	81.83

4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25GHz	4dBm
5.25 ~ 5.35GHz	11dBm
5.47 ~ 5.725GHz	11dBm
5.725 ~ 5.825GHz	17dBm

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

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 : Jan. 14, 2013

4.4.3 TEST PROCEDURES

Using method SA-1

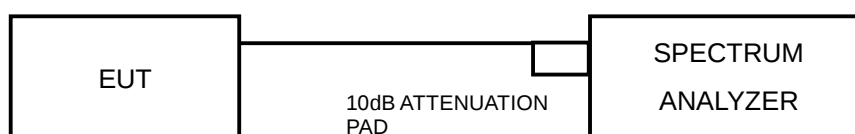
Set span to encompass the entire emission bandwidth (EBW) of the signal.

1. Set RBW = 30 KHz, Set VBW $\geq$ 1 MHz, Detector = RMS
2. Set Channel power measure = 1MHz
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

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

802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
56	5280	3.54	3.50	3.12	8.16	8.41	PASS
60	5300	1.97	2.27	1.86	6.81	8.41	PASS
64	5320	2.04	1.69	2.15	6.74	8.41	PASS
100	5500	3.80	3.00	3.59	8.25	8.41	PASS
116	5580	3.64	2.87	3.79	8.22	8.41	PASS
132	5660	3.50	2.62	3.92	8.15	8.41	PASS
140	5700	3.62	2.63	3.68	8.11	8.41	PASS

- NOTE:**
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $3.82\text{dBi} + 10\log(3) = 8.59\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.59-6) = 8.41\text{dBm}$.

802.11n (HT20)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
56	5280	2.48	3.33	4.35	8.23	8.41	PASS
60	5300	-0.65	-0.19	-0.10	4.46	8.41	PASS
64	5320	0.13	0.95	0.93	5.46	8.41	PASS
100	5500	1.52	0.86	2.20	6.33	8.41	PASS
116	5580	3.27	2.43	3.67	7.92	8.41	PASS
132	5660	3.95	2.41	4.13	8.33	8.41	PASS
140	5700	1.97	1.52	2.74	6.88	8.41	PASS

- NOTE:**
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $3.82\text{dBi} + 10\log(3) = 8.59\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.59-6) = 8.41\text{dBm}$.

802.11n (HT40)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
54	5270	0.19	-0.16	0.36	4.91	8.41	PASS
62	5310	-0.25	0.14	0.09	4.77	8.41	PASS
102	5510	-1.30	-1.47	-1.27	3.43	8.41	PASS
110	5550	3.07	2.03	2.95	7.48	8.41	PASS
134	5670	2.73	2.14	2.96	7.39	8.41	PASS

- NOTE:**
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $3.82\text{dBi} + 10\log(3) = 8.59\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.59-6) = 8.41\text{dBm}$.

802.11ac (VHT80)

CHANNEL	FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
58	5290	-0.62	-0.10	-0.31	4.43	8.41	PASS
106	5530	-4.67	-5.08	-4.23	0.13	8.41	PASS

- NOTE:**
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $3.82\text{dBi} + 10\log(3) = 8.59\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.59-6) = 8.41\text{dBm}$.

4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Shall not exceed 13 dB

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

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 : Jan. 14, 2013

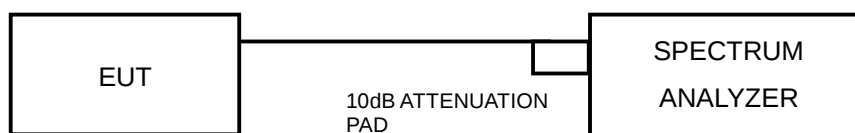
4.5.3 TEST PROCEDURE

1. Set RBW = 1 MHz, VBW $\geq$ 3 MHz, Detector = peak.
2. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak search function to find the peak of the spectrum.
4. Measure the PPSD.
5. Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

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

4.5.7 TEST RESULTS

802.11a

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/F AIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
52	5260	11.40	11.41	12.33	3.54	3.50	3.12	7.86	7.91	9.21	13	PASS
60	5300	10.35	10.24	10.90	1.97	2.27	1.86	8.38	7.97	9.04	13	PASS
64	5320	10.42	9.92	11.15	2.04	1.69	2.15	8.38	8.23	9.00	13	PASS
100	5500	11.83	10.98	12.66	3.80	3.00	3.59	8.03	7.98	9.07	13	PASS
116	5580	11.75	11.21	12.70	3.64	2.87	3.79	8.11	8.34	8.91	13	PASS
132	5660	11.51	11.15	12.46	3.50	2.62	3.92	8.01	8.53	8.54	13	PASS
140	5700	11.63	11.78	12.50	3.62	2.63	3.68	8.01	9.15	8.82	13	PASS

802.11n (HT20)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/F AIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
52	5260	12.15	13.40	13.70	2.48	3.33	4.35	9.67	10.07	9.35	13	PASS
60	5300	8.71	9.93	9.65	-0.65	-0.19	-0.10	9.36	10.12	9.75	13	PASS
64	5320	9.87	11.15	11.00	0.13	0.95	0.93	9.74	10.20	10.07	13	PASS
100	5500	10.76	11.08	11.78	1.52	0.86	2.20	9.24	10.22	9.58	13	PASS
116	5580	12.92	12.68	13.80	3.27	2.43	3.67	9.65	10.25	10.13	13	PASS
132	5660	12.97	13.31	13.55	3.95	2.41	4.13	9.02	10.90	9.42	13	PASS
140	5700	10.89	11.99	12.05	1.97	1.52	2.74	8.92	10.47	9.31	13	PASS

802.11n (HT40)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/F AIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
54	5270	9.41	10.94	10.42	0.19	-0.16	0.36	9.22	11.10	10.06	13	PASS
62	5310	9.60	10.51	10.33	-0.25	0.14	0.09	9.85	10.37	10.24	13	PASS
102	5510	7.64	9.40	8.61	-1.30	-1.47	-1.27	8.94	10.87	9.88	13	PASS
110	5550	12.30	12.16	12.83	3.07	2.03	2.95	9.23	10.13	9.88	13	PASS
134	5670	11.92	12.77	12.72	2.73	2.14	2.96	9.19	10.63	9.76	13	PASS

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/F AIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
58	5290	8.97	10.36	10.30	-0.62	-0.10	-0.31	9.59	10.46	10.61	13	PASS
106	5530	5.62	5.68	6.04	-4.67	-5.08	-4.23	10.29	10.76	10.27	13	PASS

4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100037	Nov. 01, 2012	Oct. 31, 2013

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 : Jan. 14, 2013

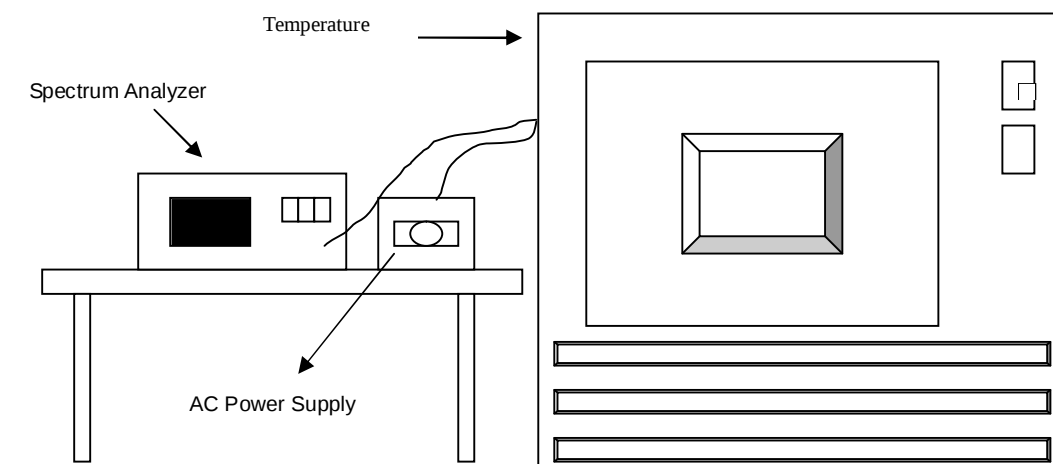
4.6.3 TEST PROCEDURE

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.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

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



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4.6.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	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)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
50	120	5320.0047	0.8835	5320.0075	1.4098	5320.0076	1.4286	5320.0011	0.2068
40	120	5319.9809	-3.5902	5319.9827	-3.2519	5319.987	-2.4436	5319.9872	-2.4060
30	120	5319.9846	-2.8947	5319.99	-1.8797	5319.9858	-2.6692	5319.9948	-0.9774
20	120	5319.9983	-0.3195	5319.9936	-1.2030	5319.9954	-0.8647	5319.9975	-0.4699
10	120	5319.994	-1.1278	5319.9975	-0.4699	5319.999	-0.1880	5319.9984	-0.3008
0	120	5319.9927	-1.3722	5319.9916	-1.5789	5319.9895	-1.9737	5319.9934	-1.2406
-10	120	5320.0242	4.5489	5320.0291	5.4699	5320.0265	4.9812	5320.0257	4.8308
-20	120	5319.9763	-4.4549	5319.9764	-4.4361	5319.9775	-4.2293	5319.9785	-4.0414
-30	120	5319.9915	-1.5977	5319.9848	-2.8571	5319.9904	-1.8045	5319.9845	-2.9135

FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	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)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
20	138	5319.9977	-0.4323	5319.9943	-1.0714	5319.9943	-1.0714	5319.9969	-0.5827
	120	5319.9983	-0.3195	5319.9936	-1.2030	5319.9954	-0.8647	5319.9975	-0.4699
	102	5319.9994	-0.1128	5319.9943	-1.0714	5319.9947	-0.9962	5319.9972	-0.5263

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 Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom 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 – REFERENCE ONLY FOR OUTPUT POWER OF VHT80

7.1 TRANSMIT POWER MEASUREMENT

7.1.1 LIMITS OF TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.47 – 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

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

Per KDB 662911 D01 Multiple Transmitter Output v01r02 Method of conducted output power measurement on IEEE 802.11 devices,

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

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 $NANT \geq 5$.

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

7.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Power Meter	ML2495A	0824006	May 10, 2012	May 09, 2013
Power Sensor	MA2411B	0738172	May 10, 2012	May 09, 2013

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 : Jan. 29, 2013

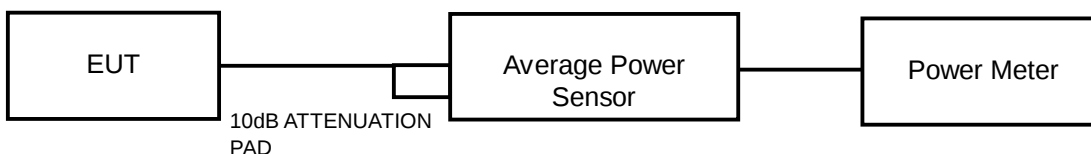
7.1.3 TEST PROCEDURE

The average power sensor was used on the output port of the EUT. A power meter was used to read the response of the average power sensor. Record the power level.

7.1.4 DEVIATION FROM TEST STANDARD

No deviation

7.1.5 TEST SETUP



7.1.6 EUT OPERATING CONDITIONS

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

7.1.7 TEST RESULTS

802.11ac (VHT80)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
58	5290	19.20	18.91	19.37	247.477	23.94	24	PASS
106	5530	14.86	14.52	15.13	91.518	19.62	24	PASS



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8.APPENDIX B - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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

--- END ---