

FCC TEST REPORT (15.407)

REPORT NO.: RF140714E01B-1

MODEL NO.: AT-TQ4600

FCC ID: RSL-TQ4600

RECEIVED: July 24, 2014

TESTED: July 29 to Sep. 16, 2014

ISSUED: Dec. 25, 2014

APPLICANT: Allied Telesis R&D Center K.K.

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140714E01B-1	Original release	Dec. 25, 2014



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1. CERTIFICATION

PRODUCT: Access Point
BRAND NAME:  Allied Telesis™
MODEL NO.: AT-TQ4600
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Allied Telesis R&D Center K.K.
TESTED: July 29 to Sep. 16, 2014
STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.10-2009

The above equipment (Model: AT-TQ4600) 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. 25, 2014
(Elsie Hsu, Specialist)

APPROVED BY :  , **DATE:** Dec. 25, 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 -10.31dB at 0.15000MHz
15.407 (b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.1dB at 5350.00MHz and 5455.00MHz
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(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 report is prepared for FCC class II change. (Add DFS band: 5250~5350MHz 5470~5725MHz)
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	2.86 dB
Radiated emissions (30MHz-1GHz)	5.37 dB
Radiated emissions (1GHz -6GHz)	3.72 dB
Radiated emissions (6GHz -18GHz)	4.00 dB
Radiated emissions (18GHz -40GHz)	4.11 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Access Point
MODEL NO.	AT-TQ4600
POWER SUPPLY	DC12V from power adapter or DC 48V from PoE
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
MODULATION TECHNOLOGY	DSSS,OFDM
TRANSFER RATE	802.11a: up to 54Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps
OPERATING FREQUENCY	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: 129.524mW 802.11ac (VHT20): 129.643mW 802.11ac (VHT40): 129.452mW 802.11ac (VHT80): 64.832mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ASSOCIATED DEVICES	Adapter x 1 (Option)

NOTE:

1. This report is prepared for FCC Class II. The difference compared with the Report No.: RF140714E01A-1 R2 design is as the following:

u Add DFS band <5250~5350MHz & 5470~5725MHz>

2. 2.4GHz and 5GHz technology can transmit at same time.
3. The EUT could be supplied with a power adapter as following table:

Brand	Model No.	Spec.
Elementech	AU12412030	Input: 100-240V, 0.6A, 50/60Hz Output: 12.0V, 2A DC output cable(1.8m, unshielded)

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

The antennas provided to the EOI, please refer to the following table.

For 2.4GHz used						
No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type
1	Chain (0)	Aristotle	RFA-02-G133-70B-110R	PIFA	3.1	i-pex(MHF)
2	Chain (1)		RFA-02-G133-70B-58		3.17	
3	Chain (2)		RFA-02-G133-70B-180		1.75	
For 5GHz used						
No.	Transmitter Circuit	Brand	Model	Antenna Type	Antenna Gain(dBi) Including cable loss	Connector type
1	Chain (0)	Aristotle	RFA-05-G134-70-230C	PIFA	2.65	i-pex(MHF)
2	Chain (1)		RFA-05-G134-70-105C		4.15	
3	Chain (2)		RFA-05-G134-70-75C		4.04	

5. The EUT incorporates a MIMO function without beamforming.

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

*For 1TX mode will fix transmission on Chain (0).

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)

6. In original report, the EUT was pre-tested in chamber under the following modes:

Test Mode	Description
Mode A	Adapter mode
Mode B	PoE mode

From the above modes, the spurious emission worse case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

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

3.2 DESCRIPTION OF TEST MODES

Operated in 5250 ~ 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	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

1 channel is 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	
1	√	√	√	√	PoE Mode
2	√	-	-	-	Adapter Mode

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz
RE ≥ 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement

NOTE: In original report, the EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane**.

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)
802.11ac (VHT20)	52 to 140	140	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)
802.11ac (VHT20)	52 to 140	140	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
802.11ac (VHT20)	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6.5
802.11ac (VHT40)	54 to 134	54, 62, 102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)	58 to 106	58, 106	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	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6
802.11ac (VHT20)	52 to 140	52, 60, 64, 100, 116, 132, 140	OFDM	BPSK	6.5
802.11ac (VHT40)	54 to 134	54, 62, 102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)	58 to 106	58, 106	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	22deg. C, 72%RH	120Vac, 60Hz (SYSTEM)	Andy Ho
RE ³ 1G	20deg. C, 60%RH 22deg. C, 66%RH 21deg. C, 66%RH 23deg. C, 69%RH	120Vac, 60Hz (SYSTEM)	Robert Cheng
APCM	25deg. C, 60%RH	120Vac, 60Hz (SYSTEM)	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 $\geq 98\%$, duty factor is not required.

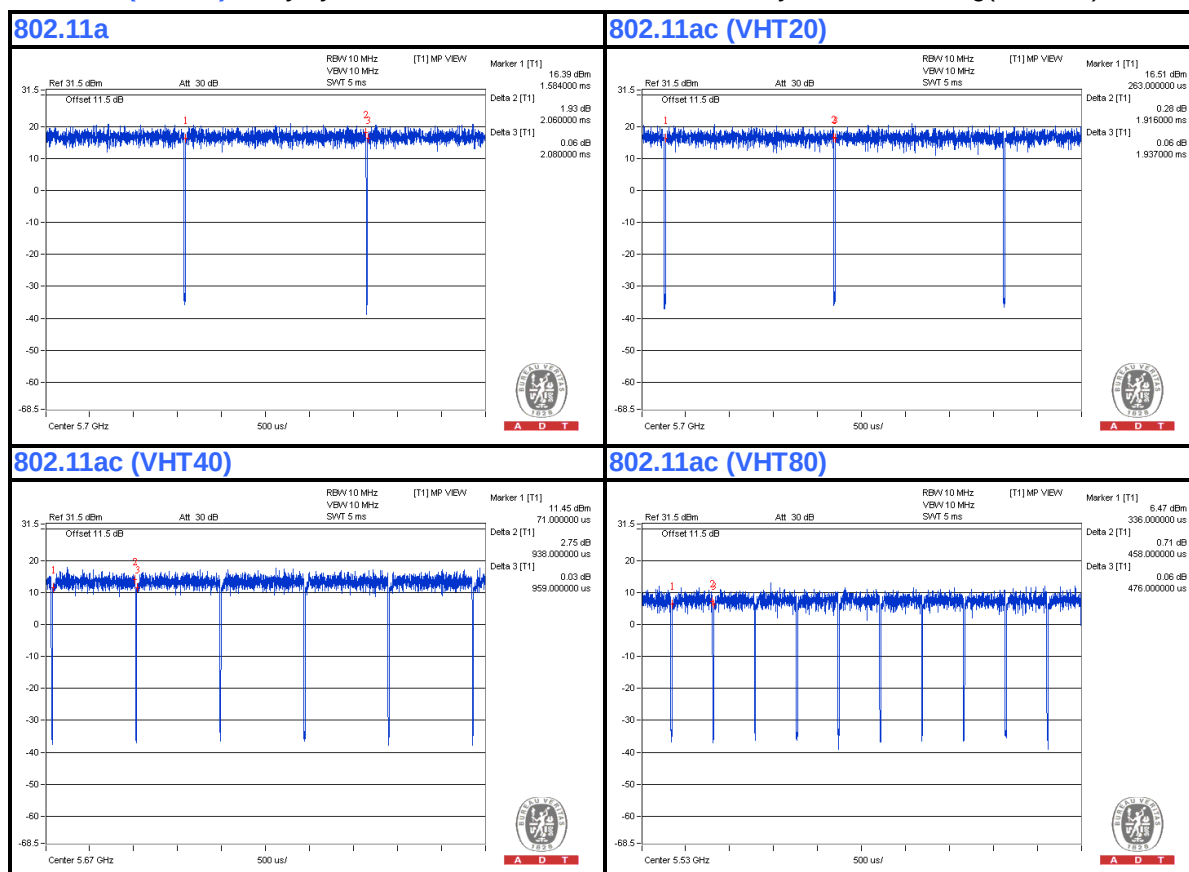
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = 2.06 ms/2.08 ms = 0.99

802.11ac (VHT20): Duty cycle = 1.916 ms/1.937 ms = 0.989

802.11ac (VHT40): Duty cycle = 0.938 ms/0.959 ms = 0.978, Duty factor = $10 * \log(1/0.978) = 0.10$

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



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	NOTEBOOK COMPUTER	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
B	PoE	Power Dsine	PD-3501G/AC	NA	NA	Supplied by Client

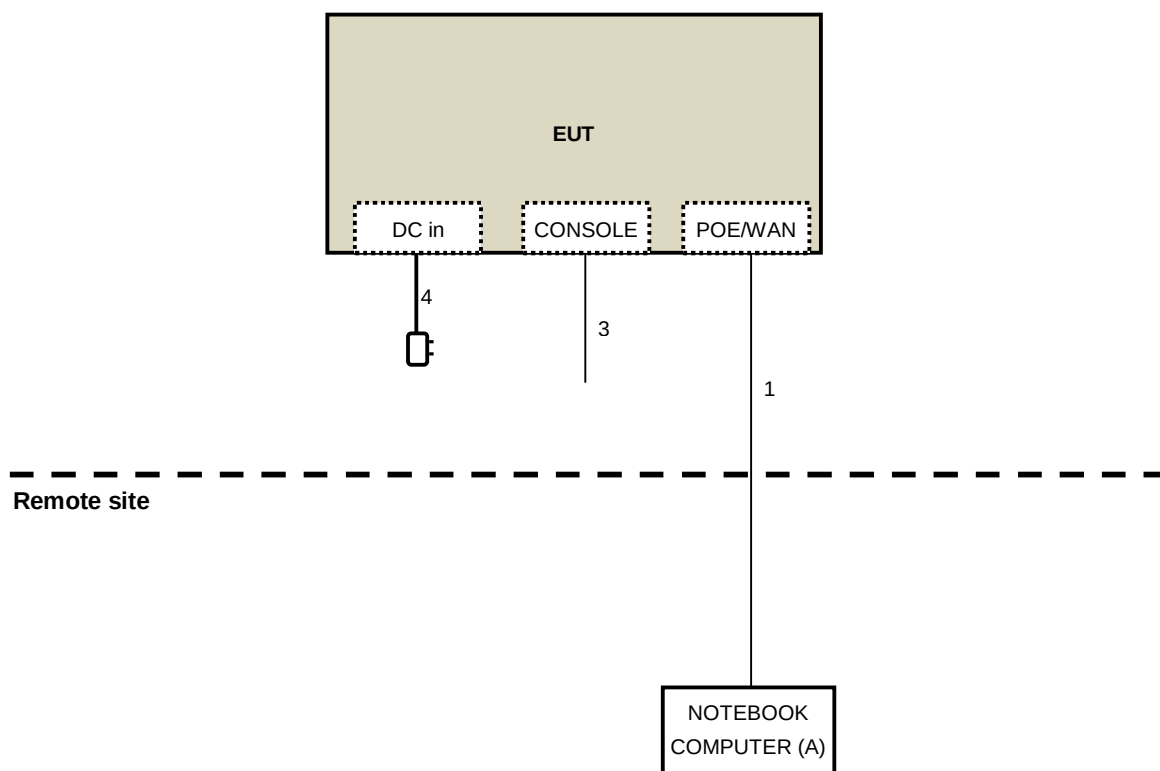
NOTE:

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

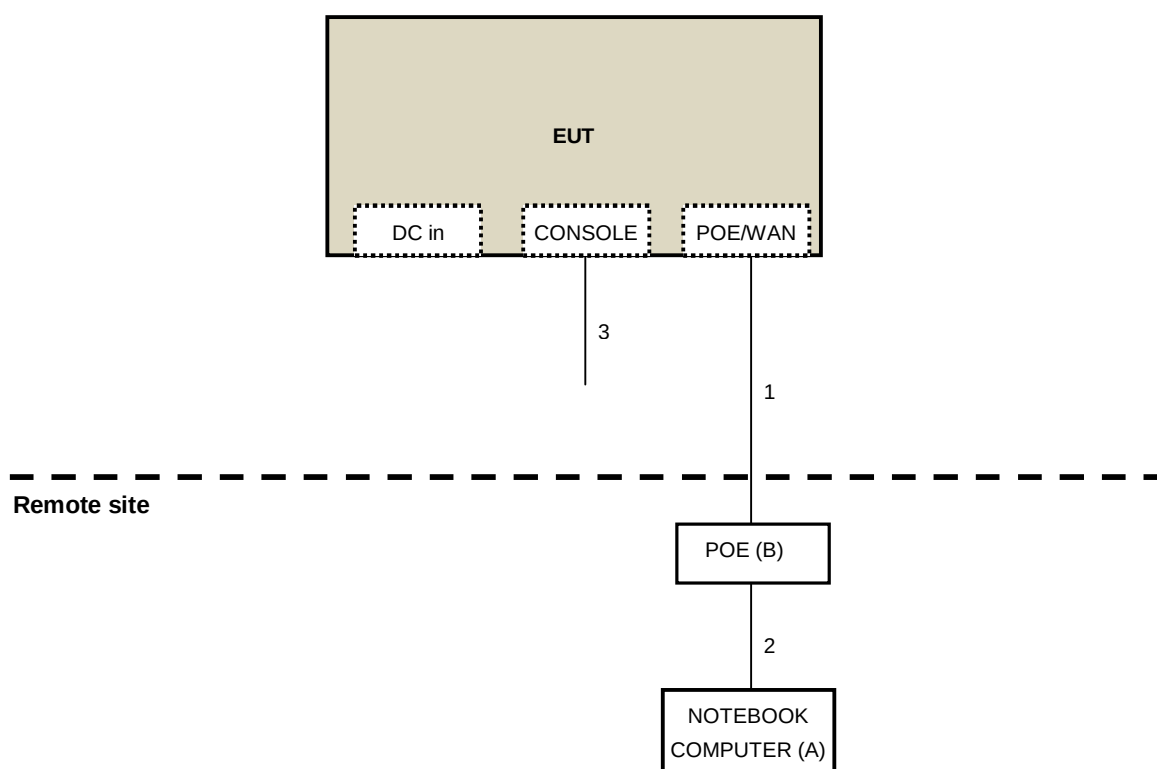
No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1.	RJ45	1	10	No	0	Provided by Lab
2.	RJ45	1	3	No	0	Provided by Lab
3.	RJ45 to RS-232	1	1.5	No	0	Provided by Lab
4.	DC	1	1.8	No	0	Supplied by Client

3.6 CONFIGURATION OF SYSTEM UNDER TEST

For Adapter Mode:



For PoE Mode:



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)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	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 ROHDE & SCHWARZ	ESCS 30	100375	Apr. 29, 2014	Apr. 28, 2015
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK8127	8127-522	Sep. 12, 2013	Sep. 11, 2014
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: Aug. 05, 2014

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.

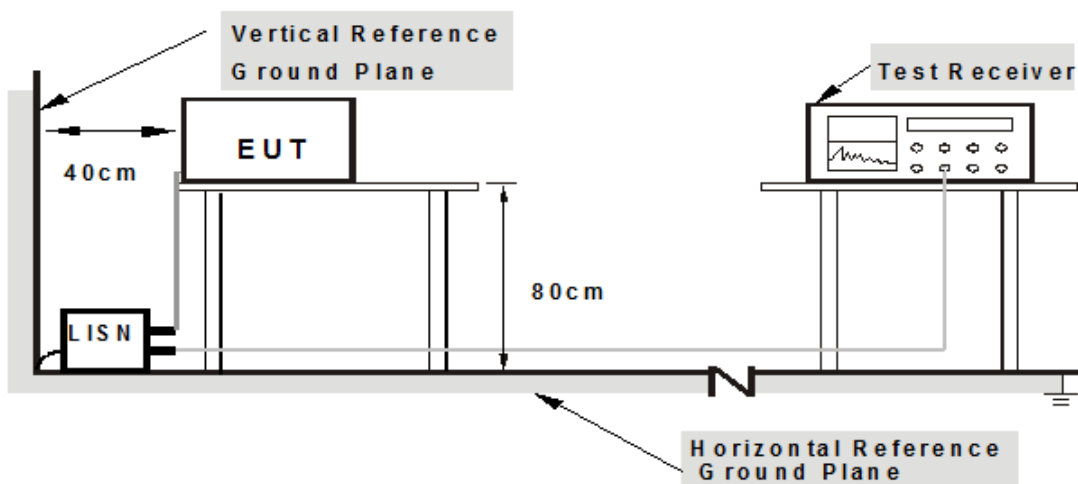
NOTE:

- 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.



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4.1.6 EUT OPERATING CONDITIONS

1. Turn on the power of all equipment.
2. The support unit A (Notebook Computer) runs "Mtool.exe [V1.0.0.10]" program to enable EUT under transmission/receiving condition continuously at specific channel frequency.

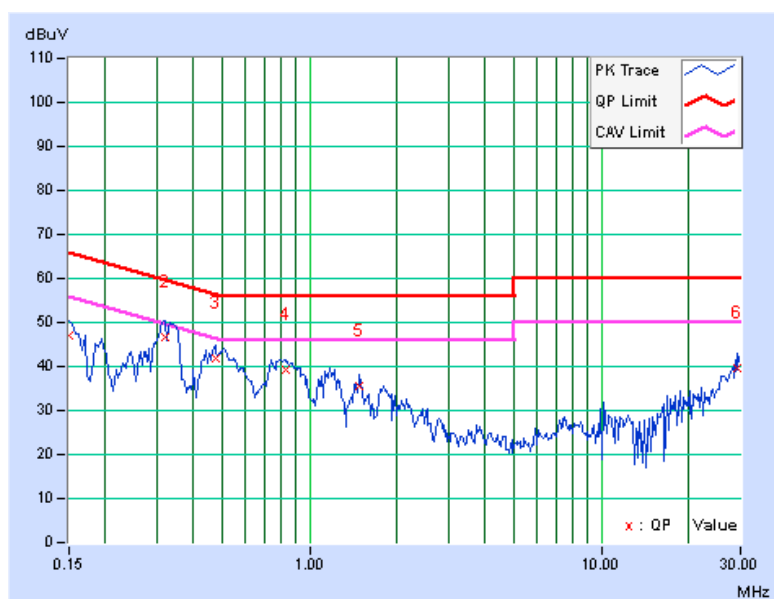
4.1.7 TEST RESULTS (MODE 1)

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	0.15000	0.07	47.07	37.75	47.14	37.82	66.00	56.00	-18.86	-18.18
2	0.32188	0.08	46.64	34.43	46.72	34.51	59.66	49.66	-12.94	-15.15
3	0.47422	0.09	41.79	34.77	41.88	34.86	56.44	46.44	-14.55	-11.57
4	0.82578	0.12	39.01	32.16	39.13	32.28	56.00	46.00	-16.87	-13.72
5	1.48438	0.15	35.41	28.67	35.56	28.82	56.00	46.00	-20.44	-17.18
6	29.14453	0.97	38.54	38.46	39.51	39.43	60.00	50.00	-20.49	-10.57

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

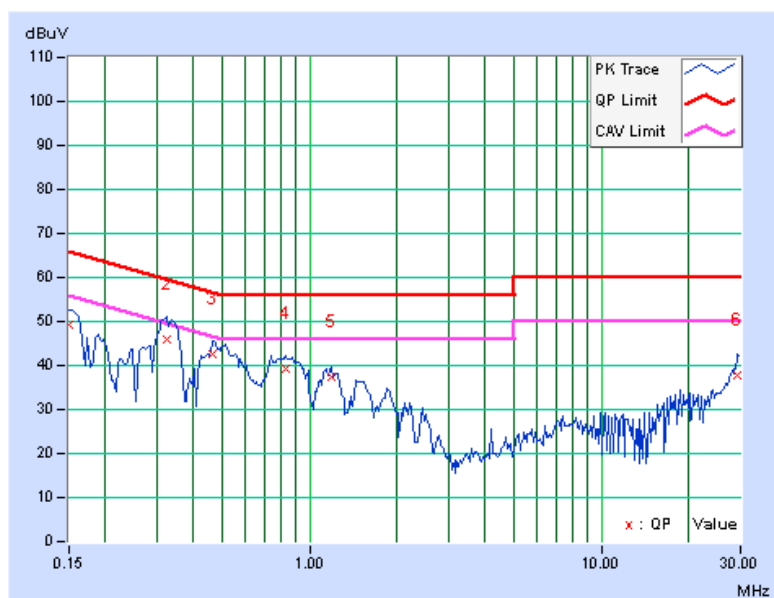


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	49.03	36.74	49.11	36.82	66.00	56.00	-16.89	-19.18
2	0.32578	0.08	45.68	30.76	45.76	30.84	59.56	49.56	-13.80	-18.72
3	0.46641	0.09	42.48	35.72	42.57	35.81	56.58	46.58	-14.00	-10.76
4	0.82969	0.12	39.29	32.30	39.41	32.42	56.00	46.00	-16.59	-13.58
5	1.19141	0.14	37.16	29.65	37.30	29.79	56.00	46.00	-18.70	-16.21
6	29.39322	0.97	36.63	36.19	37.60	37.16	60.00	50.00	-22.40	-12.84

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



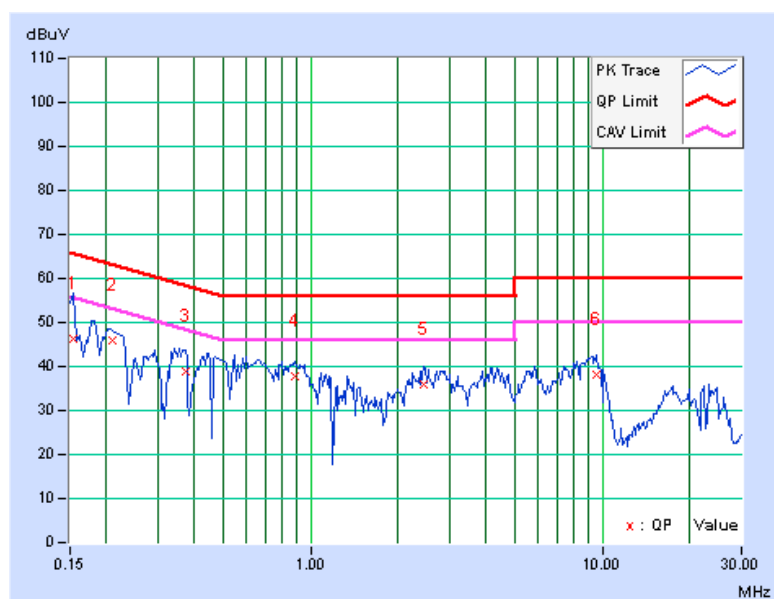
4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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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	0.15391	0.07	46.28	32.22	46.35	32.29	65.79	55.79	-19.44	-23.50
2	0.20920	0.07	45.91	34.56	45.98	34.63	63.24	53.24	-17.26	-18.61
3	0.37266	0.09	38.66	22.45	38.75	22.54	58.44	48.44	-19.69	-25.90
4	0.88438	0.12	37.84	26.81	37.96	26.93	56.00	46.00	-18.04	-19.07
5	2.44531	0.19	35.87	24.76	36.06	24.95	56.00	46.00	-19.94	-21.05
6	9.51563	0.43	37.84	29.26	38.27	29.69	60.00	50.00	-21.73	-20.31

REMARKS:

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

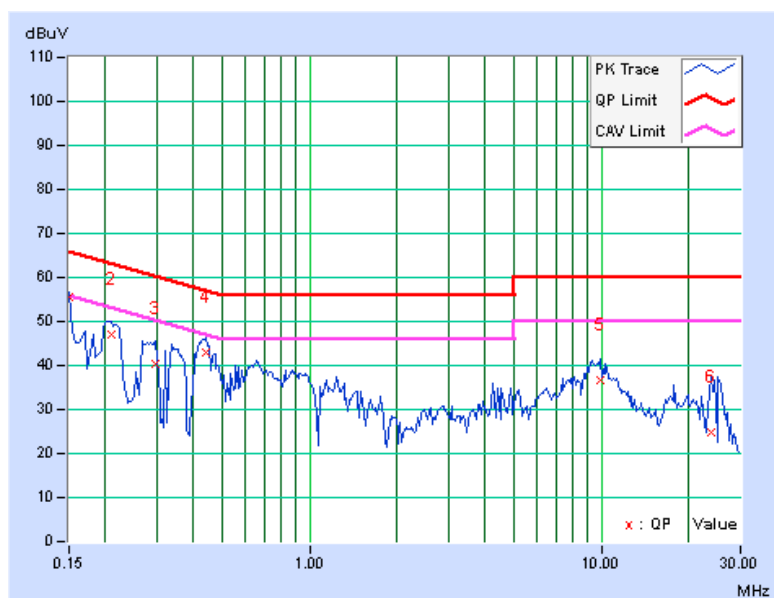


PHASE	Neutral (N)	DETECTOR FUNCTION	Quasi-Peak (QP) / Average (AV)
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor [dB]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	55.61	39.92	55.69	40.00	66.00	56.00	-10.31	-16.00
2	0.20859	0.07	47.12	36.69	47.19	36.76	63.26	53.26	-16.07	-16.50
3	0.29844	0.08	40.22	24.62	40.30	24.70	60.29	50.29	-19.99	-25.59
4	0.44297	0.09	42.83	29.90	42.92	29.99	57.01	47.01	-14.08	-17.01
5	9.98047	0.45	36.24	27.01	36.69	27.46	60.00	50.00	-23.31	-22.54
6	23.66797	0.80	24.14	11.21	24.94	12.01	60.00	50.00	-35.06	-37.99

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 BANDEGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEGE 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:

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

4.2.3 TEST INSTRUMENTS

For Below 1GHz:

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
Spectrum Analyzer Agilent	E4446A	MY48250253	Aug. 28, 2013	Aug. 27, 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.
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: July 29, 2014



A D T

For Above 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
MXE EMI Receiver Agilent	N9038A	MY50010156	Aug. 11, 2014	Aug. 10, 2015
Pre-Amplifier Mini-Circuits	ZFL-1000VH2 B	AMP-ZFL-04	Nov. 13, 2013	Nov. 12, 2014
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Feb. 27, 2014	Feb. 26, 2015
RF Cable	NA	CHHCAB_001	Oct. 06, 2013	Oct. 05, 2014
Horn_Antenna AISI	AIH.8018	0000220091110	Aug. 26, 2014	Aug. 25, 2015
Pre-Amplifier Agilent	8449B	3008A01923	Oct. 29, 2013	Oct. 28, 2014
RF Cable	NA	131206 131215 SNMY23685/4	Jan. 17, 2014	Jan. 16, 2015
Spectrum Analyzer R&S	FSV40	100964	July 05, 2014	July 04, 2015
Pre-Amplifier SPACEK LABS	SLKKa-48-6	9K16	Nov. 13, 2013	Nov. 12, 2014
Horn_Antenna SCHWARZBECK	BBHA 9170	9170-424	Aug. 26, 2014	Aug. 25, 2015
RF Cable	NA	RF104-121 RF104-204	Dec. 12, 2013	Dec. 11, 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.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
- 3 The test was performed in 966 Chamber No. H.
4. The FCC Site Registration No. is 797305.
- 5 The CANADA Site Registration No. is IC 7450H-3.
- 6 Tested Date: Sep. 10, 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:

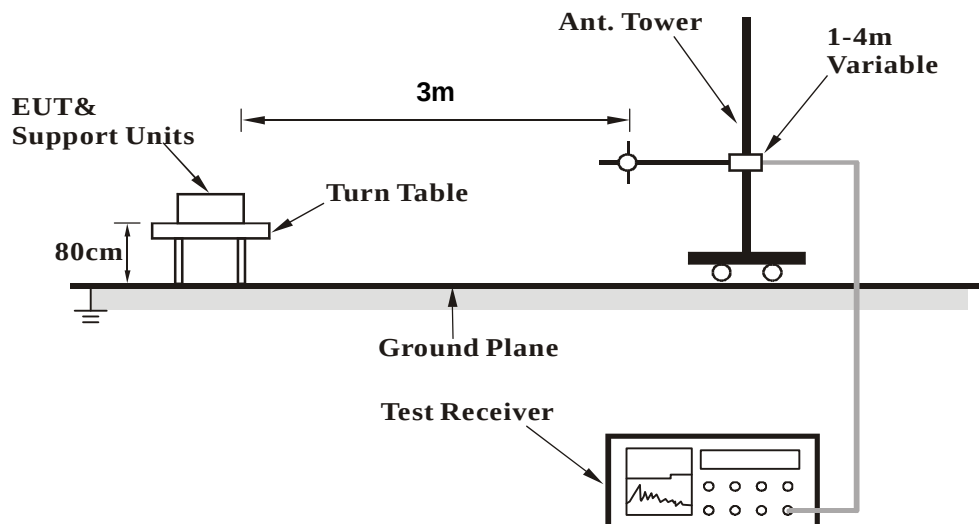
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.5 DEVIATION FROM TEST STANDARD

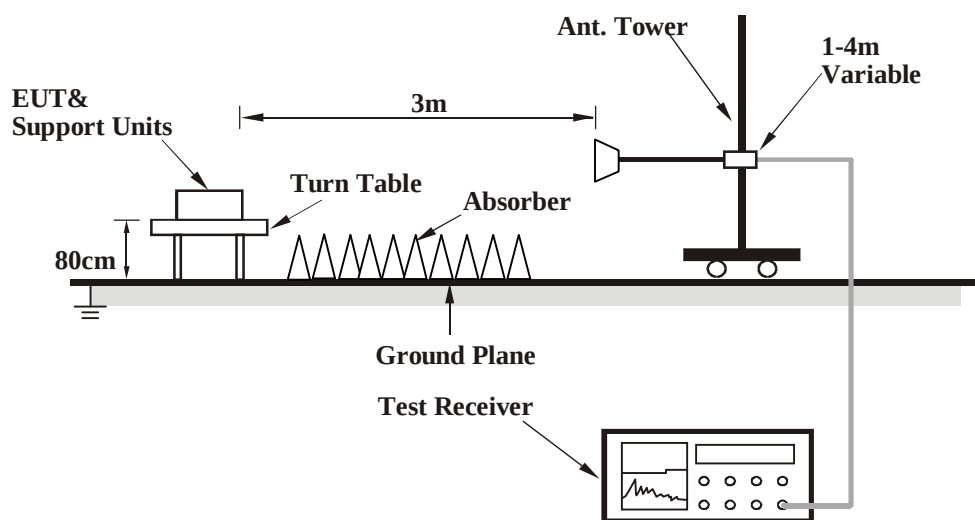
No deviation

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

802.11ac (VHT20)

CHANNEL	TX Channel 140	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	69.87	33.0 QP	40.0	-7.0	2.00 H	204	48.44	-15.48
2	104.98	36.4 QP	43.5	-7.1	2.00 H	82	53.42	-16.99
3	227.49	37.9 QP	46.0	-8.1	1.50 H	247	53.98	-16.05
4	258.58	36.7 QP	46.0	-9.3	1.50 H	302	50.69	-13.99
5	800.08	37.8 QP	46.0	-8.2	1.00 H	223	39.24	-1.41
6	860.85	36.7 QP	46.0	-9.3	1.50 H	118	37.41	-0.69
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	38.05	34.5 QP	40.0	-5.5	1.00 V	146	48.41	-13.92
2	69.89	35.0 QP	40.0	-5.0	1.00 V	163	50.46	-15.48
3	107.94	34.9 QP	43.5	-8.6	2.00 V	203	51.43	-16.51
4	200.04	33.7 QP	43.5	-9.8	1.00 V	269	49.98	-16.30
5	266.05	37.7 QP	46.0	-8.3	2.00 V	118	51.30	-13.63
6	644.54	37.4 QP	46.0	-8.6	1.50 V	164	41.47	-4.08

REMARKS:

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

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	*5260.00	113.7 PK			1.43 H	139	109.31	4.39
2	*5260.00	103.8 AV			1.43 H	139	99.41	4.39
3	5376.00	53.1 PK	74.0	-20.9	1.66 H	303	48.51	4.59
4	5376.00	41.2 AV	54.0	-12.8	1.66 H	303	36.61	4.59
5	#10520.00	55.1 PK	74.0	-18.9	1.04 H	65	44.73	10.37
6	#10520.00	41.4 AV	54.0	-12.6	1.04 H	65	31.03	10.37
7	15780.00	59.5 PK	74.0	-14.5	1.11 H	140	44.78	14.72
8	15780.00	48.0 AV	54.0	-6.0	1.11 H	140	33.28	14.72
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	*5260.00	119.0 PK			1.00 V	197	114.61	4.39
2	*5260.00	108.1 AV			1.00 V	197	103.71	4.39
3	5376.00	56.2 PK	74.0	-17.8	1.00 V	191	51.61	4.59
4	5376.00	45.6 AV	54.0	-8.4	1.00 V	191	41.01	4.59
5	#10520.00	57.1 PK	74.0	-16.9	1.29 V	161	46.73	10.37
6	#10520.00	43.0 AV	54.0	-11.0	1.29 V	161	32.63	10.37
7	15780.00	60.9 PK	74.0	-13.1	1.09 V	313	46.18	14.72
8	15780.00	48.2 AV	54.0	-5.8	1.09 V	313	33.48	14.72

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) – 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 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	110.6 PK			1.48 H	154	106.24	4.36
2	*5300.00	102.1 AV			1.48 H	154	97.74	4.36
3	5376.00	57.5 PK	74.0	-16.5	1.69 H	316	52.91	4.59
4	5376.00	46.1 AV	54.0	-7.9	1.69 H	316	41.51	4.59
5	10600.00	54.5 PK	74.0	-19.5	1.02 H	60	43.82	10.68
6	10600.00	41.0 AV	54.0	-13.0	1.02 H	60	30.32	10.68
7	15900.00	60.5 PK	74.0	-13.5	1.13 H	125	45.45	15.05
8	15900.00	48.3 AV	54.0	-5.7	1.13 H	125	33.25	15.05
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	*5300.00	115.9 PK			1.23 V	176	111.54	4.36
2	*5300.00	106.4 AV			1.23 V	176	102.04	4.36
3	5376.00	60.6 PK	74.0	-13.4	1.23 V	176	56.01	4.59
4	5376.00	50.6 AV	54.0	-3.4	1.23 V	176	46.01	4.59
5	10600.00	57.6 PK	74.0	-16.4	1.26 V	161	46.92	10.68
6	10600.00	43.2 AV	54.0	-10.8	1.26 V	161	32.52	10.68
7	15900.00	60.9 PK	74.0	-13.1	1.12 V	344	45.85	15.05
8	15900.00	48.4 AV	54.0	-5.6	1.12 V	344	33.35	15.05

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) – 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.



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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	*5320.00	111.4 PK			1.46 H	157	106.98	4.42
2	*5320.00	102.6 AV			1.46 H	157	98.18	4.42
3	5350.00	53.1 PK	74.0	-20.9	1.64 H	298	48.59	4.51
4	5350.00	42.4 AV	54.0	-11.6	1.64 H	298	37.89	4.51
5	5396.00	57.7 PK	74.0	-16.3	1.58 H	324	53.04	4.66
6	5396.00	46.2 AV	54.0	-7.8	1.58 H	324	41.54	4.66
7	10640.00	54.3 PK	74.0	-19.7	1.03 H	76	43.67	10.63
8	10640.00	40.6 AV	54.0	-13.4	1.03 H	76	29.97	10.63
9	15960.00	60.5 PK	74.0	-13.5	1.15 H	110	45.53	14.97
10	15960.00	48.3 AV	54.0	-5.7	1.15 H	110	33.33	14.97

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	*5320.00	116.7 PK			1.36 V	265	112.28	4.42
2	*5320.00	106.9 AV			1.36 V	265	102.48	4.42
3	5350.00	56.2 PK	74.0	-17.8	1.03 V	196	51.69	4.51
4	5350.00	46.8 AV	54.0	-7.2	1.03 V	196	42.29	4.51
5	5396.00	60.8 PK	74.0	-13.2	1.11 V	177	56.14	4.66
6	5396.00	50.7 AV	54.0	-3.3	1.11 V	177	46.04	4.66
7	10640.00	57.1 PK	74.0	-16.9	1.29 V	148	46.47	10.63
8	10640.00	42.9 AV	54.0	-11.1	1.29 V	148	32.27	10.63
9	15960.00	61.3 PK	74.0	-12.7	1.10 V	352	46.33	14.97
10	15960.00	48.6 AV	54.0	-5.4	1.10 V	352	33.63	14.97

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.

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	5420.00	58.2 PK	74.0	-15.8	1.32 H	273	53.56	4.64
2	5420.00	46.9 AV	54.0	-7.1	1.32 H	273	42.26	4.64
3	*5500.00	111.2 PK			1.44 H	151	106.61	4.59
4	*5500.00	102.4 AV			1.44 H	151	97.81	4.59
5	11000.00	54.4 PK	74.0	-19.6	1.05 H	60	43.55	10.85
6	11000.00	40.4 AV	54.0	-13.6	1.05 H	60	29.55	10.85
7	#16500.00	59.0 PK	74.0	-15.0	1.11 H	108	42.01	16.99
8	#16500.00	47.0 AV	54.0	-7.0	1.11 H	108	30.01	16.99
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	5420.00	61.3 PK	74.0	-12.7	1.21 V	165	56.66	4.64
2	5420.00	51.4 AV	54.0	-2.6	1.21 V	165	46.76	4.64
3	*5500.00	116.4 PK			1.39 V	270	111.81	4.59
4	*5500.00	106.6 AV			1.39 V	270	102.01	4.59
5	11000.00	56.4 PK	74.0	-17.6	1.24 V	121	45.55	10.85
6	11000.00	42.6 AV	54.0	-11.4	1.24 V	121	31.75	10.85
7	#16500.00	61.2 PK	74.0	-12.8	1.12 V	349	44.21	16.99
8	#16500.00	48.7 AV	54.0	-5.3	1.12 V	349	31.71	16.99

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 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	5112.00	58.1 PK	74.0	-15.9	1.31 H	259	53.94	4.16
2	5112.00	46.0 AV	54.0	-8.0	1.31 H	259	41.84	4.16
3	*5580.00	111.1 PK			1.42 H	149	106.22	4.88
4	*5580.00	102.5 AV			1.42 H	149	97.62	4.88
5	#5810.00	55.1 PK	68.2	-13.1	1.55 H	252	50.13	4.97
6	11160.00	53.8 PK	74.0	-20.2	1.04 H	88	43.08	10.72
7	11160.00	40.2 AV	54.0	-13.8	1.04 H	88	29.48	10.72
8	#16740.00	60.2 PK	68.2	-8.0	1.12 H	97	42.32	17.88
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	5112.00	60.9 PK	74.0	-13.1	1.10 V	129	56.74	4.16
2	5112.00	50.5 AV	54.0	-3.5	1.10 V	129	46.34	4.16
3	*5580.00	116.4 PK			1.35 V	277	111.52	4.88
4	*5580.00	106.8 AV			1.35 V	277	101.92	4.88
5	#5810.00	65.7 PK	68.2	-2.5	1.59 V	172	60.73	4.97
6	11160.00	56.7 PK	74.0	-17.3	1.30 V	132	45.98	10.72
7	11160.00	42.8 AV	54.0	-11.2	1.30 V	132	32.08	10.72
8	#16740.00	60.8 PK	68.2	-7.4	1.07 V	333	42.92	17.88

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 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	#5192.00	60.6 PK	68.2	-7.6	1.28 H	259	56.19	4.41
2	*5660.00	111.3 PK			1.42 H	159	106.37	4.93
3	*5660.00	102.6 AV			1.42 H	159	97.67	4.93
4	#5744.00	55.8 PK	68.2	-12.4	1.49 H	257	50.87	4.93
5	11320.00	53.2 PK	74.0	-20.8	1.03 H	65	42.39	10.81
6	11320.00	39.4 AV	54.0	-14.6	1.03 H	65	28.59	10.81
7	#16980.00	60.4 PK	68.2	-7.8	1.07 H	103	42.06	18.34
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	#5192.00	62.4 PK	68.2	-5.8	1.03 V	194	57.99	4.41
2	*5660.00	116.6 PK			1.32 V	275	111.67	4.93
3	*5660.00	106.9 AV			1.32 V	275	101.97	4.93
4	#5744.00	66.2 PK	68.2	-2.0	1.79 V	173	61.27	4.93
5	11320.00	57.0 PK	74.0	-17.0	1.25 V	139	46.19	10.81
6	11320.00	42.9 AV	54.0	-11.1	1.25 V	139	32.09	10.81
7	#16980.00	60.6 PK	68.2	-7.6	1.06 V	334	42.26	18.34

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.



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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	#5229.00	60.9 PK	68.2	-7.3	1.27 H	266	56.49	4.41
2	*5700.00	108.9 PK			1.44 H	148	103.99	4.91
3	*5700.00	100.8 AV			1.44 H	148	95.89	4.91
4	#5773.00	54.9 PK	68.2	-13.3	1.49 H	246	49.96	4.94
5	11400.00	52.9 PK	74.0	-21.1	1.04 H	60	42.27	10.63
6	11400.00	39.1 AV	54.0	-14.9	1.04 H	60	28.47	10.63
7	#17100.00	60.0 PK	68.2	-8.2	1.05 H	90	41.45	18.55
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	#5229.00	62.7 PK	68.2	-5.5	1.02 V	195	58.29	4.41
2	*5700.00	114.1 PK			1.03 V	198	109.19	4.91
3	*5700.00	105.1 AV			1.03 V	198	100.19	4.91
4	#5773.00	65.3 PK	68.2	-2.9	1.66 V	173	60.36	4.94
5	11400.00	57.5 PK	74.0	-16.5	1.23 V	138	46.87	10.63
6	11400.00	43.0 AV	54.0	-11.0	1.23 V	138	32.37	10.63
7	#17100.00	61.0 PK	68.2	-7.2	1.13 V	357	42.45	18.55

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 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	*5260.00	112.0 PK			1.42 H	142	107.61	4.39
2	*5260.00	102.8 AV			1.42 H	142	98.41	4.39
3	5370.00	53.8 PK	74.0	-20.2	1.68 H	308	49.23	4.57
4	5370.00	40.1 AV	54.0	-13.9	1.68 H	308	35.53	4.57
5	#10520.00	52.2 PK	74.0	-21.8	1.08 H	57	41.83	10.37
6	#10520.00	38.9 AV	54.0	-15.1	1.08 H	57	28.53	10.37
7	15780.00	59.3 PK	74.0	-14.7	1.06 H	82	44.58	14.72
8	15780.00	46.6 AV	54.0	-7.4	1.06 H	82	31.88	14.72
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	*5260.00	117.2 PK			1.03 V	195	112.81	4.39
2	*5260.00	107.0 AV			1.03 V	195	102.61	4.39
3	5370.00	55.5 PK	74.0	-18.5	1.02 V	199	50.93	4.57
4	5370.00	44.1 AV	54.0	-9.9	1.02 V	199	39.53	4.57
5	#10520.00	56.9 PK	74.0	-17.1	1.30 V	146	46.53	10.37
6	#10520.00	42.6 AV	54.0	-11.4	1.30 V	146	32.23	10.37
7	15780.00	61.1 PK	74.0	-12.9	1.11 V	345	46.38	14.72
8	15780.00	48.3 AV	54.0	-5.7	1.11 V	345	33.58	14.72

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) – 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 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	110.7 PK			1.39 H	143	106.34	4.36
2	*5300.00	102.0 AV			1.39 H	143	97.64	4.36
3	5380.00	58.7 PK	74.0	-15.3	1.71 H	313	54.10	4.60
4	5380.00	46.5 AV	54.0	-7.5	1.71 H	313	41.90	4.60
5	10600.00	52.6 PK	74.0	-21.4	1.03 H	31	41.92	10.68
6	10600.00	38.9 AV	54.0	-15.1	1.03 H	31	28.22	10.68
7	15900.00	59.8 PK	74.0	-14.2	1.01 H	87	44.75	15.05
8	15900.00	46.8 AV	54.0	-7.2	1.01 H	87	31.75	15.05
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	*5300.00	115.9 PK			1.34 V	265	111.54	4.36
2	*5300.00	106.3 AV			1.34 V	265	101.94	4.36
3	5380.00	60.3 PK	74.0	-13.7	1.02 V	136	55.70	4.60
4	5380.00	50.3 AV	54.0	-3.7	1.02 V	136	45.70	4.60
5	10600.00	56.3 PK	74.0	-17.7	1.17 V	136	45.62	10.68
6	10600.00	42.6 AV	54.0	-11.4	1.17 V	136	31.92	10.68
7	15900.00	61.0 PK	74.0	-13.0	1.12 V	352	45.95	15.05
8	15900.00	48.4 AV	54.0	-5.6	1.12 V	352	33.35	15.05

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) – 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.

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	5100.00	56.2 PK	74.0	-17.8	1.45 H	189	52.07	4.13
2	5100.00	49.5 AV	54.0	-4.5	1.45 H	189	45.37	4.13
3	*5320.00	111.0 PK			1.42 H	141	106.58	4.42
4	*5320.00	102.4 AV			1.42 H	141	97.98	4.42
5	5400.00	57.7 PK	74.0	-16.3	1.67 H	141	53.04	4.66
6	5400.00	49.0 AV	54.0	-5.0	1.67 H	141	44.34	4.66
7	10640.00	52.4 PK	74.0	-21.6	1.08 H	33	41.77	10.63
8	10640.00	38.8 AV	54.0	-15.2	1.08 H	33	28.17	10.63
9	15960.00	58.7 PK	74.0	-15.3	1.03 H	84	43.73	14.97
10	15960.00	45.7 AV	54.0	-8.3	1.03 H	84	30.73	14.97
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	55.3 PK	74.0	-18.7	1.71 V	196	51.17	4.13
2	5100.00	51.4 AV	54.0	-2.6	1.71 V	196	47.27	4.13
3	*5320.00	116.2 PK			1.39 V	277	111.78	4.42
4	*5320.00	106.6 AV			1.39 V	277	102.18	4.42
5	5400.00	60.3 PK	74.0	-13.7	1.22 V	150	55.64	4.66
6	5400.00	50.7 AV	54.0	-3.3	1.22 V	150	46.04	4.66
7	10640.00	56.3 PK	74.0	-17.7	1.20 V	148	45.67	10.63
8	10640.00	42.4 AV	54.0	-11.6	1.20 V	148	31.77	10.63
9	15960.00	61.0 PK	74.0	-13.0	1.03 V	339	46.03	14.97
10	15960.00	48.4 AV	54.0	-5.6	1.03 V	339	33.43	14.97

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.

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	5421.00	58.3 PK	74.0	-15.7	1.64 H	155	53.66	4.64
2	5421.00	49.4 AV	54.0	-4.6	1.64 H	155	44.76	4.64
3	*5500.00	111.7 PK			1.47 H	137	107.11	4.59
4	*5500.00	102.9 AV			1.47 H	137	98.31	4.59
5	11000.00	52.3 PK	74.0	-21.7	1.10 H	47	41.45	10.85
6	11000.00	38.8 AV	54.0	-15.2	1.10 H	47	27.95	10.85
7	#16500.00	58.6 PK	74.0	-15.4	1.08 H	88	41.61	16.99
8	#16500.00	45.7 AV	54.0	-8.3	1.08 H	88	28.71	16.99
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	5421.00	60.9 PK	74.0	-13.1	1.10 V	178	56.26	4.64
2	5421.00	51.4 AV	54.0	-2.6	1.10 V	178	46.76	4.64
3	*5500.00	116.8 PK			1.17 V	175	112.21	4.59
4	*5500.00	107.0 AV			1.17 V	175	102.41	4.59
5	11000.00	56.6 PK	74.0	-17.4	1.21 V	150	45.75	10.85
6	11000.00	42.7 AV	54.0	-11.3	1.21 V	150	31.85	10.85
7	#16500.00	61.0 PK	74.0	-13.0	1.06 V	312	44.01	16.99
8	#16500.00	48.7 AV	54.0	-5.3	1.06 V	312	31.71	16.99

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 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	60.0 PK	74.0	-14.0	1.03 H	162	55.82	4.18
2	5114.00	49.5 AV	54.0	-4.5	1.03 H	162	45.32	4.18
3	*5580.00	109.4 PK			1.49 H	122	104.52	4.88
4	*5580.00	100.3 AV			1.49 H	122	95.42	4.88
5	#5812.00	62.0 PK	68.2	-6.2	1.59 H	157	57.03	4.97
6	11160.00	52.6 PK	74.0	-21.4	1.03 H	44	41.88	10.72
7	11160.00	39.0 AV	54.0	-15.0	1.03 H	44	28.28	10.72
8	#16740.00	59.1 PK	68.2	-9.1	1.05 H	44	41.22	17.88
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	5114.00	61.6 PK	74.0	-12.4	1.04 V	153	57.42	4.18
2	5114.00	51.3 AV	54.0	-2.7	1.04 V	153	47.12	4.18
3	*5580.00	114.5 PK			1.37 V	258	109.62	4.88
4	*5580.00	104.4 AV			1.37 V	258	99.52	4.88
5	#5812.00	63.4 PK	68.2	-4.8	1.60 V	158	58.43	4.97
6	11160.00	56.0 PK	74.0	-18.0	1.08 V	133	45.28	10.72
7	11160.00	42.2 AV	54.0	-11.8	1.08 V	133	31.48	10.72
8	#16740.00	60.6 PK	68.2	-7.6	1.08 V	302	42.72	17.88

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 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	*5660.00	109.7 PK			1.45 H	145	104.77	4.93
2	*5660.00	100.6 AV			1.45 H	145	95.67	4.93
3	#5737.00	63.7 PK	68.2	-4.5	1.08 H	163	58.78	4.92
4	11320.00	51.9 PK	74.0	-22.1	1.06 H	49	41.09	10.81
5	11320.00	38.5 AV	54.0	-15.5	1.06 H	49	27.69	10.81
6	#16980.00	57.9 PK	68.2	-10.3	1.03 H	90	39.56	18.34
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	*5660.00	114.8 PK			1.33 V	277	109.87	4.93
2	*5660.00	104.6 AV			1.33 V	277	99.67	4.93
3	#5737.00	64.9 PK	68.2	-3.3	1.13 V	167	59.98	4.92
4	11320.00	55.8 PK	74.0	-18.2	1.21 V	140	44.99	10.81
5	11320.00	42.1 AV	54.0	-11.9	1.21 V	140	31.29	10.81
6	#16980.00	61.2 PK	68.2	-7.0	1.00 V	349	42.86	18.34

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 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	110.1 PK			1.43 H	147	105.19	4.91
2	*5700.00	100.2 AV			1.43 H	147	95.29	4.91
3	#5780.00	64.3 PK	68.2	-3.9	1.06 H	152	59.37	4.93
4	11400.00	51.5 PK	74.0	-22.5	1.06 H	50	40.87	10.63
5	11400.00	38.3 AV	54.0	-15.7	1.06 H	50	27.67	10.63
6	#17100.00	57.5 PK	68.2	-10.7	1.04 H	89	38.95	18.55
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	115.2 PK			1.13 V	168	110.29	4.91
2	*5700.00	104.3 AV			1.13 V	168	99.39	4.91
3	#5780.00	65.4 PK	68.2	-2.8	1.13 V	178	60.47	4.93
4	11400.00	55.4 PK	74.0	-18.6	1.19 V	125	44.77	10.63
5	11400.00	41.7 AV	54.0	-12.3	1.19 V	125	31.07	10.63
6	#17100.00	60.4 PK	68.2	-7.8	1.04 V	358	41.85	18.55

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 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	*5270.00	110.6 PK			1.45 H	148	106.22	4.38
2	*5270.00	100.6 AV			1.45 H	148	96.22	4.38
3	5356.00	60.7 PK	74.0	-13.3	1.45 H	148	56.16	4.54
4	5356.00	49.5 AV	54.0	-4.5	1.45 H	148	44.96	4.54
5	#10540.00	51.3 PK	74.0	-22.7	1.01 H	51	40.85	10.45
6	#10540.00	37.9 AV	54.0	-16.1	1.01 H	51	27.45	10.45
7	15810.00	57.8 PK	74.0	-16.2	1.06 H	75	43.02	14.78
8	15810.00	45.8 AV	54.0	-8.2	1.06 H	75	31.02	14.78
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	*5270.00	115.6 PK			1.00 V	194	111.22	4.38
2	*5270.00	104.7 AV			1.00 V	194	100.32	4.38
3	5356.00	61.8 PK	74.0	-12.2	1.00 V	194	57.26	4.54
4	5356.00	51.1 AV	54.0	-2.9	1.00 V	194	46.56	4.54
5	#10540.00	55.9 PK	74.0	-18.1	1.15 V	126	45.45	10.45
6	#10540.00	42.2 AV	54.0	-11.8	1.15 V	126	31.75	10.45
7	15810.00	61.6 PK	74.0	-12.4	1.01 V	337	46.82	14.78
8	15810.00	49.0 AV	54.0	-5.0	1.01 V	337	34.22	14.78

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 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	104.1 PK			1.40 H	150	99.71	4.39
2	*5310.00	96.1 AV			1.40 H	150	91.71	4.39
3	5350.00	70.8 PK	74.0	-3.2	1.40 H	150	66.29	4.51
4	5350.00	51.2 AV	54.0	-2.8	1.40 H	150	46.69	4.51
5	10620.00	51.1 PK	74.0	-22.9	1.02 H	49	40.45	10.65
6	10620.00	37.9 AV	54.0	-16.1	1.02 H	49	27.25	10.65
7	15930.00	57.4 PK	74.0	-16.6	1.06 H	85	42.39	15.01
8	15930.00	45.0 AV	54.0	-9.0	1.06 H	85	29.99	15.01
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	108.9 PK			1.00 V	197	104.51	4.39
2	*5310.00	100.2 AV			1.00 V	197	95.81	4.39
3	5350.00	72.1 PK	74.0	-1.9	1.00 V	197	67.59	4.51
4	5350.00	52.8 AV	54.0	-1.2	1.00 V	197	48.29	4.51
5	10620.00	55.7 PK	74.0	-18.3	1.18 V	138	45.05	10.65
6	10620.00	42.1 AV	54.0	-11.9	1.18 V	138	31.45	10.65
7	15930.00	60.7 PK	74.0	-13.3	1.01 V	352	45.69	15.01
8	15930.00	48.8 AV	54.0	-5.2	1.01 V	352	33.79	15.01

REMARKS:

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

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	#5470.00	68.0 PK	74.0	-6.0	1.39 H	158	63.39	4.61
2	#5470.00	51.1 AV	54.0	-2.9	1.39 H	158	46.49	4.61
3	*5510.00	103.4 PK			1.39 H	158	98.77	4.63
4	*5510.00	93.8 AV			1.39 H	158	89.17	4.63
5	11020.00	51.4 PK	74.0	-22.6	1.01 H	48	40.58	10.82
6	11020.00	38.1 AV	54.0	-15.9	1.01 H	48	27.28	10.82
7	#16530.00	58.1 PK	74.0	-15.9	1.00 H	87	41.06	17.04
8	#16530.00	45.8 AV	54.0	-8.2	1.00 H	87	28.76	17.04
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	#5470.00	69.4 PK	74.0	-4.6	1.22 V	193	64.79	4.61
2	#5470.00	52.8 AV	54.0	-1.2	1.22 V	193	48.19	4.61
3	*5510.00	108.2 PK			1.22 V	193	103.57	4.63
4	*5510.00	97.9 AV			1.22 V	193	93.27	4.63
5	11020.00	55.7 PK	74.0	-18.3	1.16 V	135	44.88	10.82
6	11020.00	41.9 AV	54.0	-12.1	1.16 V	135	31.08	10.82
7	#16530.00	61.6 PK	74.0	-12.4	1.01 V	339	44.56	17.04
8	#16530.00	49.2 AV	54.0	-4.8	1.01 V	339	32.16	17.04

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 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	#5465.00	61.1 PK	74.0	-12.9	1.36 H	145	56.48	4.62
2	#5465.00	50.0 AV	54.0	-4.0	1.36 H	145	45.38	4.62
3	*5550.00	106.1 PK			1.39 H	157	101.33	4.77
4	*5550.00	97.8 AV			1.39 H	157	93.03	4.77
5	11100.00	50.7 PK	74.0	-23.3	1.11 H	57	40.01	10.69
6	11100.00	37.3 AV	54.0	-16.7	1.11 H	57	26.61	10.69
7	#16650.00	57.2 PK	74.0	-16.8	1.06 H	102	39.79	17.41
8	#16650.00	45.3 AV	54.0	-8.7	1.06 H	102	27.89	17.41
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	#5465.00	62.4 PK	74.0	-11.6	1.08 V	197	57.78	4.62
2	#5465.00	51.6 AV	54.0	-2.4	1.08 V	197	46.98	4.62
3	*5550.00	110.9 PK			1.19 V	172	106.13	4.77
4	*5550.00	101.9 AV			1.19 V	172	97.13	4.77
5	11100.00	55.1 PK	74.0	-18.9	1.15 V	146	44.41	10.69
6	11100.00	41.4 AV	54.0	-12.6	1.15 V	146	30.71	10.69
7	#16650.00	60.7 PK	74.0	-13.3	1.04 V	355	43.29	17.41
8	#16650.00	48.3 AV	54.0	-5.7	1.04 V	355	30.89	17.41

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 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	107.2 PK			1.50 H	182	102.27	4.93
2	*5670.00	97.2 AV			1.50 H	182	92.27	4.93
3	#5755.00	65.8 PK	74.0	-8.2	1.34 H	157	60.87	4.93
4	#5755.00	49.9 AV	54.0	-4.1	1.34 H	157	44.97	4.93
5	11340.00	50.3 PK	74.0	-23.7	1.11 H	49	39.54	10.76
6	11340.00	37.0 AV	54.0	-17.0	1.11 H	49	26.24	10.76
7	#17010.00	57.7 PK	74.0	-16.3	1.03 H	66	39.33	18.37
8	#17010.00	45.7 AV	54.0	-8.3	1.03 H	66	27.33	18.37
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	112.1 PK			1.16 V	168	107.17	4.93
2	*5670.00	101.2 AV			1.16 V	168	96.27	4.93
3	#5755.00	67.1 PK	74.0	-6.9	1.01 V	198	62.17	4.93
4	#5755.00	51.5 AV	54.0	-2.5	1.01 V	198	46.57	4.93
5	11340.00	56.0 PK	74.0	-18.0	1.22 V	133	45.24	10.76
6	11340.00	42.4 AV	54.0	-11.6	1.22 V	133	31.64	10.76
7	#17010.00	61.0 PK	74.0	-13.0	1.02 V	339	42.63	18.37
8	#17010.00	48.7 AV	54.0	-5.3	1.02 V	339	30.33	18.37

REMARKS:

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

802.11ac (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	*5290.00	102.6 PK			1.55 H	192	98.23	4.37
2	*5290.00	93.3 AV			1.55 H	192	88.93	4.37
3	5350.00	68.8 PK	74.0	-5.2	1.55 H	192	64.29	4.51
4	5350.00	51.3 AV	54.0	-2.7	1.55 H	192	46.79	4.51
5	#10580.00	50.6 PK	74.0	-23.4	1.02 H	40	39.99	10.61
6	#10580.00	37.2 AV	54.0	-16.8	1.02 H	40	26.59	10.61
7	15870.00	57.7 PK	74.0	-16.3	1.00 H	45	42.74	14.96
8	15870.00	45.5 AV	54.0	-8.5	1.00 H	45	30.54	14.96
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	*5290.00	107.5 PK			1.00 V	196	103.13	4.37
2	*5290.00	97.3 AV			1.00 V	196	92.93	4.37
3	5350.00	70.1 PK	74.0	-3.9	1.00 V	196	65.59	4.51
4	5350.00	52.9 AV	54.0	-1.1	1.00 V	196	48.39	4.51
5	#10580.00	56.0 PK	74.0	-18.0	1.18 V	125	45.39	10.61
6	#10580.00	42.6 AV	54.0	-11.4	1.18 V	125	31.99	10.61
7	15870.00	60.6 PK	74.0	-13.4	1.08 V	347	45.64	14.96
8	15870.00	48.0 AV	54.0	-6.0	1.08 V	347	33.04	14.96

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 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	5455.00	67.5 PK	74.0	-6.5	1.49 H	200	62.87	4.63
2	5455.00	51.3 AV	54.0	-2.7	1.49 H	200	46.67	4.63
3	*5530.00	100.0 PK			1.61 H	183	95.30	4.70
4	*5530.00	90.2 AV			1.61 H	183	85.50	4.70
5	11060.00	50.7 PK	74.0	-23.3	1.08 H	22	39.95	10.75
6	11060.00	37.2 AV	54.0	-16.8	1.08 H	22	26.45	10.75
7	#16590.00	56.2 PK	74.0	-17.8	1.02 H	53	39.04	17.16
8	#16590.00	44.3 AV	54.0	-9.7	1.02 H	53	27.14	17.16
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	5455.00	68.8 PK	74.0	-5.2	1.58 V	197	64.17	4.63
2	5455.00	52.9 AV	54.0	-1.1	1.58 V	197	48.27	4.63
3	*5530.00	104.9 PK			1.20 V	197	100.20	4.70
4	*5530.00	94.1 AV			1.20 V	197	89.40	4.70
5	11060.00	56.5 PK	74.0	-17.5	1.12 V	148	45.75	10.75
6	11060.00	42.8 AV	54.0	-11.2	1.12 V	148	32.05	10.75
7	#16590.00	60.6 PK	74.0	-13.4	1.03 V	330	43.44	17.16
8	#16590.00	48.9 AV	54.0	-5.1	1.03 V	330	31.74	17.16

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 $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	---		1 Watt (30 dBm)

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 $NANT \leq 4$;

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.

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. 11, 2014

FOR 26dB OCCUPIED BANDWIDTH

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 08, 2014	May 07, 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. 11, 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

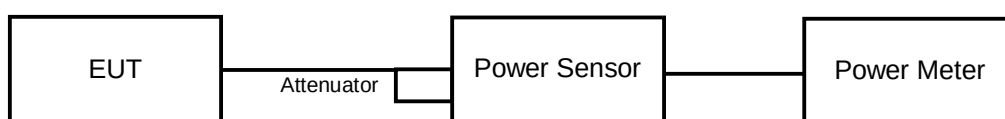
1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement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

4.3.4 DEVIATION FROM TEST STANDARD

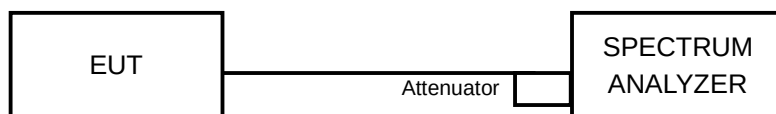
No deviation

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

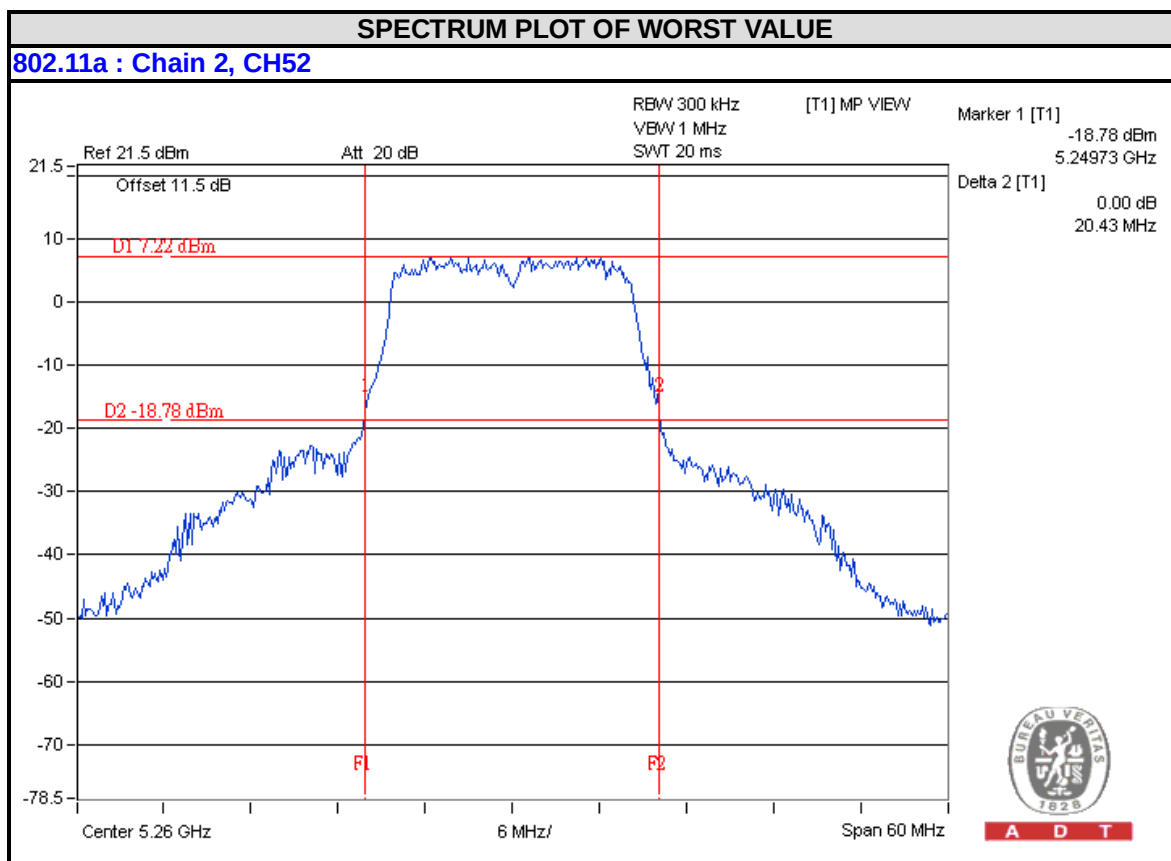
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	16.03	16.56	16.11	126.209	21.01	24.00	PASS
60	5300	15.91	16.47	16.08	123.906	20.93	24.00	PASS
64	5320	15.88	16.50	16.07	123.852	20.93	24.00	PASS
100	5500	16.11	16.58	16.31	129.087	21.11	24.00	PASS
116	5580	16.07	16.55	16.31	128.4	21.09	24.00	PASS
132	5660	16.08	16.62	16.34	129.524	21.12	24.00	PASS
140	5700	16.04	16.63	16.35	129.357	21.12	24.00	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
52	5260	20.67	21.24	20.43
60	5300	20.67	21.30	20.49
64	5320	20.72	20.61	20.43
100	5500	20.77	20.61	20.67
116	5580	20.55	20.57	20.53
132	5660	20.60	20.66	20.52
140	5700	20.59	20.53	20.49

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	20.43	24.1 > 24
60	5300	20.49	24.11 > 24
64	5320	20.43	24.1 > 24
100	5500	20.61	24.14 > 24
116	5580	20.53	24.12 > 24
132	5660	20.52	24.12 > 24
140	5700	20.49	24.11 > 24



802.11ac (VHT20)

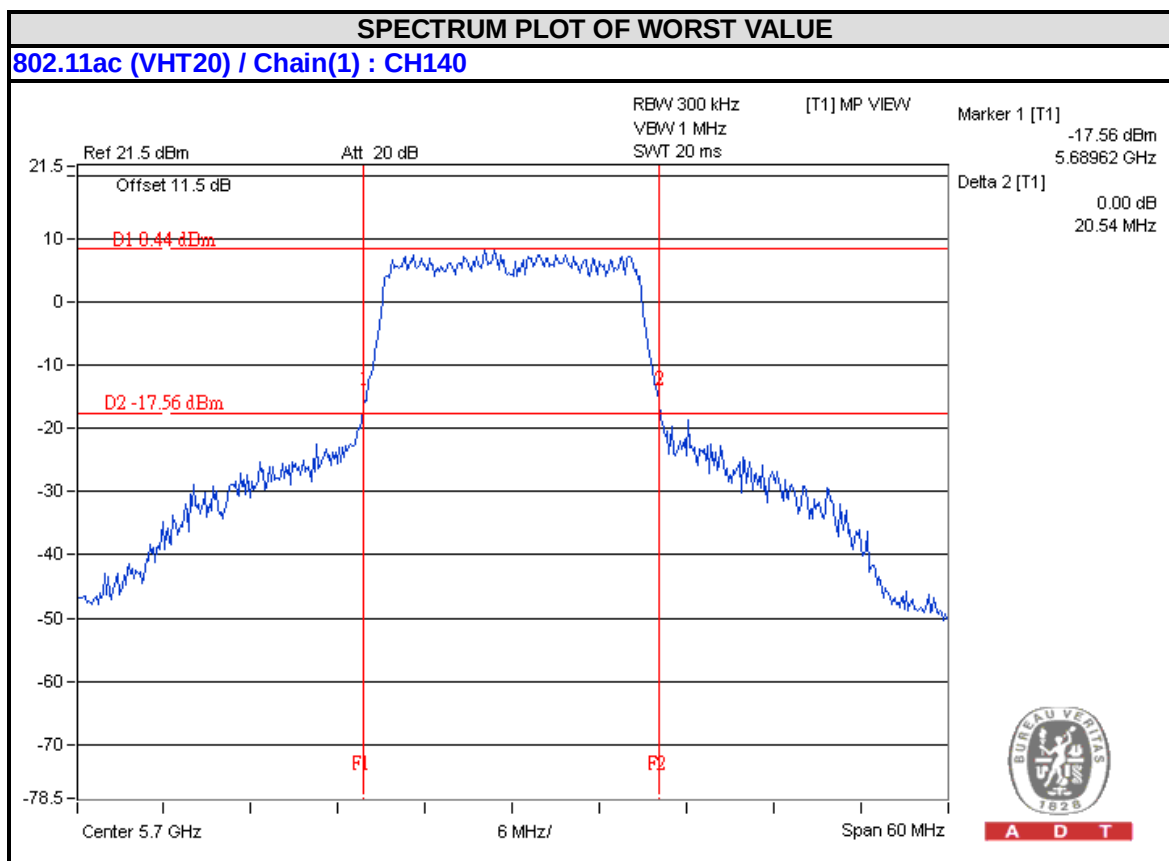
CHANNEL	FREQUENCY (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	15.98	16.53	16.11	125.438	20.98	24.00	PASS
60	5300	15.89	16.49	15.96	122.827	20.89	24.00	PASS
64	5320	15.91	16.48	15.97	122.994	20.90	24.00	PASS
100	5500	16.02	16.57	16.28	127.85	21.07	24.00	PASS
116	5580	16.01	16.56	16.37	128.543	21.09	24.00	PASS
132	5660	15.97	16.57	16.41	128.683	21.10	24.00	PASS
140	5700	16.05	16.62	16.38	129.643	21.13	24.00	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
52	5260	23.07	20.71	20.78
60	5300	21.00	21.43	20.93
64	5320	20.78	20.82	21.86
100	5500	20.96	20.69	20.81
116	5580	21.11	20.67	20.99
132	5660	21.33	20.88	20.88
140	5700	20.79	20.54	20.72

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < UNII Band 2~3>			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	20.71	24.16 > 24
60	5300	20.93	24.2 > 24
64	5320	20.78	24.17 > 24
100	5500	20.69	24.15 > 24
116	5580	20.67	24.15 > 24
132	5660	20.88	24.19 > 24
140	5700	20.54	24.12 > 24



802.11ac (VHT40)

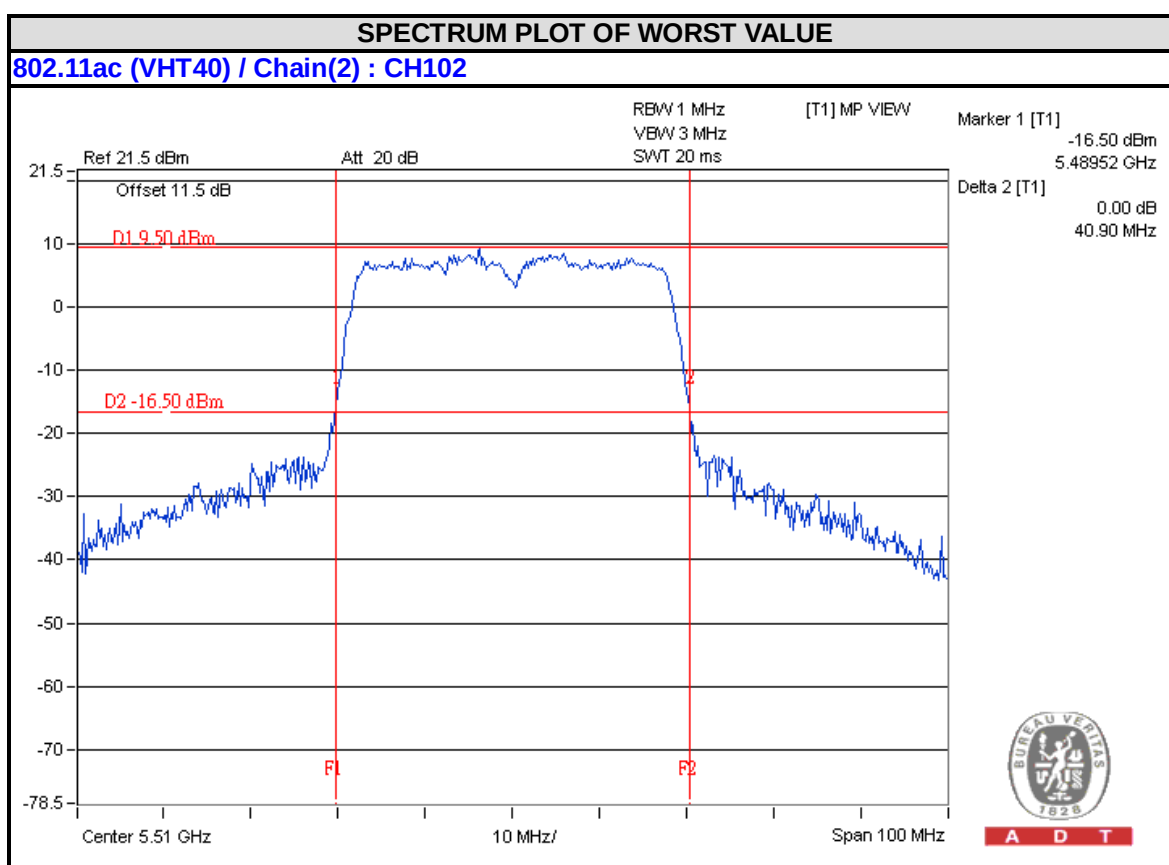
CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
54	5270	16.07	16.57	16.14	126.967	21.04	24.00	PASS
62	5310	13.94	14.41	14.23	78.865	18.97	24.00	PASS
102	5510	13.06	13.58	13.42	65.012	18.13	24.00	PASS
110	5550	16.08	16.58	16.32	128.905	21.10	24.00	PASS
134	5670	16.07	16.65	16.31	129.452	21.12	24.00	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
54	5270	47.47	49.88	49.50
62	5310	41.67	41.03	41.06
102	5510	41.50	41.31	40.90
110	5550	41.80	44.89	41.52
134	5670	41.73	46.29	42.67

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	47.47	27.76 > 24
62	5310	41.03	27.13 > 24
102	5510	40.90	27.11 > 24
110	5550	41.52	27.18 > 24
134	5670	41.73	27.2 > 24



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	13.19	13.58	13.26	64.832	18.12	24.00	PASS
106	5530	12.62	12.97	12.57	56.168	17.49	24.00	PASS

26dB OCCUPIED BANDWIDTH:

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		
		CHAIN 0	CHAIN 1	CHAIN 2
58	5290	83.36	82.03	82.26
106	5530	82.71	82.49	81.87

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

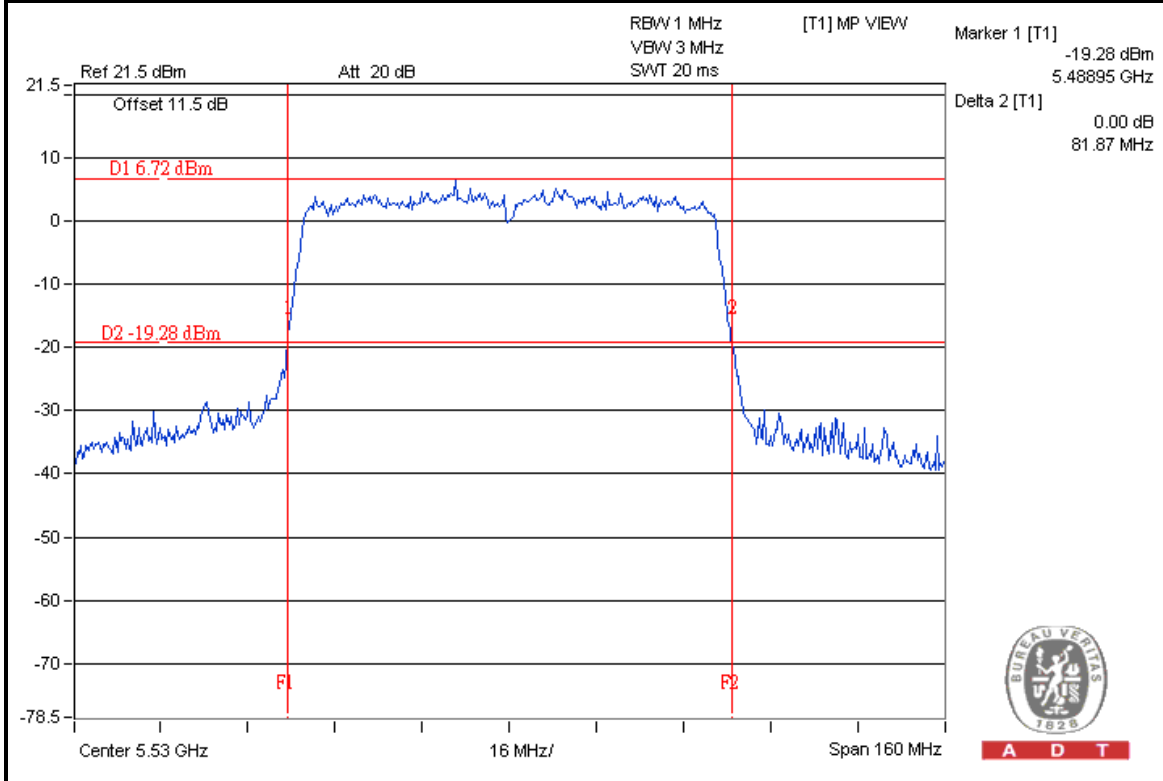
Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	82.03	30.13 > 24
106	5530	81.87	30.13 > 24



A D T

SPECTRUM PLOT OF WORST VALUE

802.11ac (VHT80) / Chain(2) : CH106



A D T



A D T

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	FSP 40	100060	May 08, 2014	May 07, 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. 11, 2014

4.4.3 TEST PROCEDURES

802.11a, 802.11ac (VHT20)

※U-NII-2A & U-NII-2C:

Using method SA-1

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

802.11ac (VHT40), 802.11ac (VHT80)

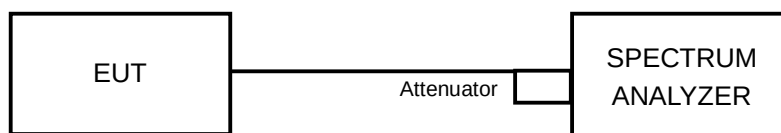
※For U-NII-2A & U-NII-2C:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/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-2A & U-NII-2C:
802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
52	5260	1.79	2.88	1.52	6.88	8.59	PASS
60	5300	2.22	3.15	2.23	7.33	8.59	PASS
64	5320	2.19	3.32	2.13	7.35	8.59	PASS
100	5500	1.98	3.29	3.59	7.78	8.59	PASS
116	5580	2.62	3.39	2.73	7.70	8.59	PASS
132	5660	1.94	1.81	2.94	7.03	8.59	PASS
140	5700	1.91	2.11	3.07	7.16	8.59	PASS

NOTE: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.41-6) = 8.59\text{dBm}$.

802.11ac (VHT20)

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS/FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
52	5260	1.50	2.58	1.71	6.73	8.59	PASS
60	5300	1.64	2.88	2.08	7.00	8.59	PASS
64	5320	1.71	2.92	2.28	7.10	8.59	PASS
100	5500	2.27	2.91	3.25	7.60	8.59	PASS
116	5580	1.98	2.84	3.11	7.44	8.59	PASS
132	5660	1.50	2.03	2.23	6.70	8.59	PASS
140	5700	1.69	1.97	2.56	6.86	8.59	PASS

NOTE: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.41-6) = 8.59\text{dBm}$.

802.11ac (VHT40)

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				
52	5260	-1.47	0.08	-1.18	0.10	4.06	8.59	PASS
62	5310	-3.74	-2.20	-2.66	0.10	2.05	8.59	PASS
102	5510	-3.22	-2.77	-2.72	0.10	1.97	8.59	PASS
110	5550	-0.35	0.26	0.02	0.10	4.85	8.59	PASS
134	5670	-1.56	-1.20	-0.54	0.10	3.79	8.59	PASS

- NOTE:**
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.41-6) = 8.59\text{dBm}$.
 3. Refer to section 3.4 for duty cycle spectrum plot.

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				
58	5290	-7.85	-6.35	-6.89	0.17	-2.05	8.59	PASS

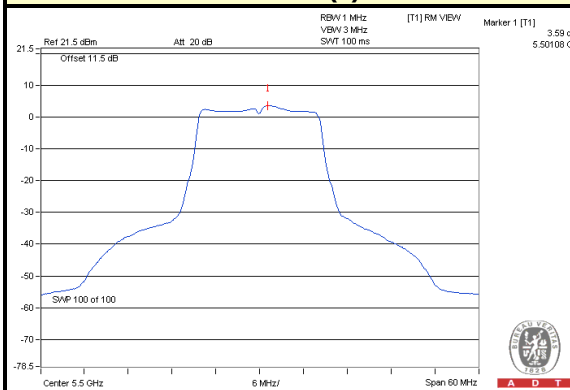
- NOTE:**
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
 2. Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.41\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(8.41-6) = 8.59\text{dBm}$.
 3. Refer to section 3.4 for duty cycle spectrum plot.



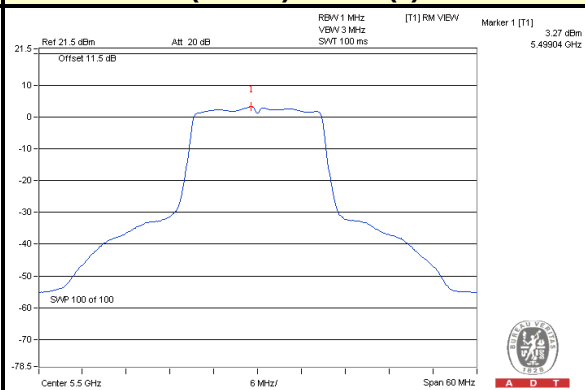
A D T

SPECTRUM PLOT OF WORST VALUE

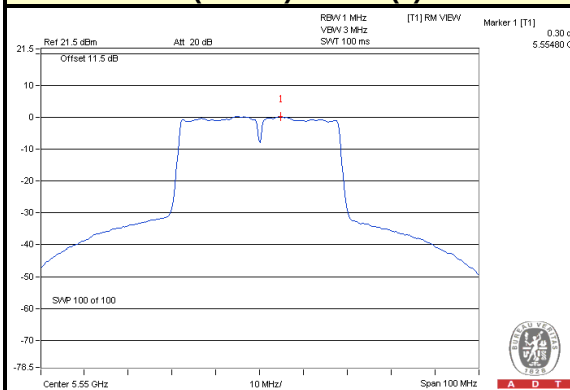
802.11a / Chain(2) : CH100



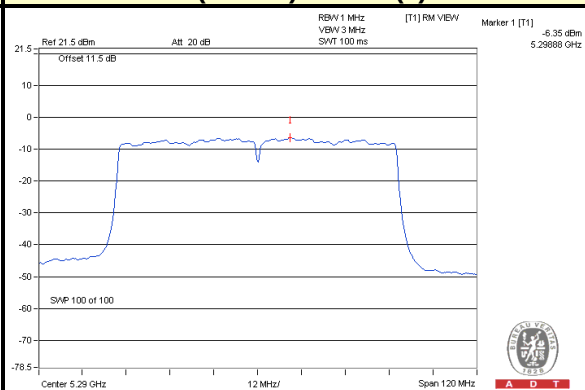
802.11ac (VHT20) / Chain(2) : CH100



802.11ac (VHT40) / Chain(1) : CH110



802.11ac (VHT80) / Chain(1) : CH58



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	FSP 40	100060	May 08, 2014	May 07, 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. 11, 2014

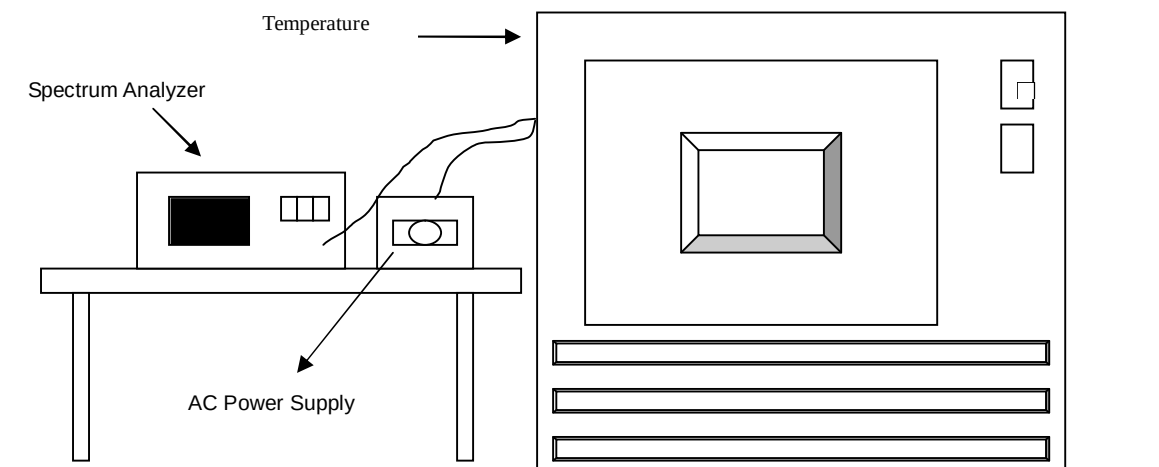
4.5.3 TEST PROCEDURE

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

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)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120	5320.0119	0.00022	5320.0123	0.00023	5320.0085	0.00016	5320.0097	0.00018
40	120	5319.9874	-0.00024	5319.9874	-0.00024	5319.9886	-0.00021	5319.9864	-0.00026
30	120	5320.02	0.00038	5320.0186	0.00035	5320.0199	0.00037	5320.0203	0.00038
20	120	5320.0081	0.00015	5320.0047	0.00009	5320.0037	0.00007	5320.0057	0.00011
10	120	5320.0082	0.00015	5320.0064	0.00012	5320.007	0.00013	5320.0074	0.00014
0	120	5319.9799	-0.00038	5319.9844	-0.00029	5319.9797	-0.00038	5319.9834	-0.00031
-10	120	5320.0104	0.00020	5320.0131	0.00025	5320.0151	0.00028	5320.0121	0.00023
-20	120	5320.0221	0.00042	5320.0196	0.00037	5320.0193	0.00036	5320.019	0.00036
-30	120	5320.0218	0.00041	5320.0234	0.00044	5320.0243	0.00046	5320.0245	0.00046

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)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	138	5320.009	0.00017	5320.0038	0.00007	5320.0042	0.00008	5320.0066	0.00012
	120	5320.0081	0.00015	5320.0047	0.00009	5320.0037	0.00007	5320.0057	0.00011
	102	5320.0071	0.00013	5320.0046	0.00009	5320.0045	0.00008	5320.0064	0.00012

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

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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.



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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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