FCC Test Report

Report No.:	RF150507C23A
FCC ID:	HDCBSAP2135
Test Model:	BSAP 2135
Received Date:	Apr. 17, 2015
Test Date:	Apr. 17 ~ Jun 05, 2015
Issued Date:	Jun 16, 2015
Applicant:	Adtran
Address:	901 Explorer Boulevard, Huntsville Alabama, United States, 35806-2807
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF150507C23A	Original release.	Jun 16, 2015

1 Certificate of Conformity

Product:	Outdoor Wireless Access Point
Brand:	Adtran
Test Model:	BSAP 2135
Sample Status:	Engineering sample
Applicant:	Adtran
Test Date:	Apr. 17 ~ Jun 05, 2015
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Jun 16, 2015
Polly Chien / Specialist

Approved by : _____ , **Date:** Jun 16, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.207 15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -11.67dB at 6.02761MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.5dB at 5350.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is N-Type. (The device is professionally installed)

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Outdoor Wireless Access Point
Brand	Adtran
Test Model	BSAP 2135
Status of EUT	Engineering sample
Power Supply Rating	56Vdc (POE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps 802.11ac: up to 1300Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5700MHz
Number of Channel	5260 ~ 5320MHz: 4 for 802.11a, 802.11n (HT20) , 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 3 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5260 ~ 5320MHz: 229.498mW 5500 ~ 5700MHz: 248.356mW
Antenna Type	Dipole antenna with 4.77dBi gain
Antenna Connector	N-Type (The device is professionally installed)
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change.
2. This report is issued as a supplementary report of BV ADT report no.: RF150507C23-1. The difference compared with the original report is adding 5.26GHz to 5.32GHz and 5.50GHz to 5.70GHz by software.
3. The EUT incorporates a MIMO function. Physically, the EUT provides 3 completed transmitters and 3 receivers.

Modulation Mode	TX FUNCTION
802.11a	3TX
802.11n (HT20)	3TX
802.11n (HT40)	3TX
802.11ac (VHT20)	3TX
802.11ac (VHT40)	3TX
802.11ac (VHT80)	3TX

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

4. The EUT consumes power from the following POE. (For support unit)

POE	
Brand	PHIHONG
Model	POE36U-1AT-R
Input Power	100-240Vac, 50-60Hz, 1.0A
Output Power	56Vdc, 0.6A

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

FOR 5500 ~ 5700MHz

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	5530MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

Radiated Emission Test (Above 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	15.0
-	802.11ac (VHT80)		58	58	OFDM	BPSK	97.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
-	802.11ac (VHT80)		106	106	OFDM	BPSK	97.5

Radiated Emission Test (Below 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5260-5320	52 to 64	52	OFDM	BPSK	6.0
		5500-5700	100 to 140		OFDM	BPSK	6.0

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.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5260-5320	52 to 64	52	OFDM	BPSK	6.0
		5500-5700	100 to 140		OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	15.0
-	802.11ac (VHT80)		58	58	OFDM	BPSK	87.8
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
-	802.11ac (VHT80)		106	106	OFDM	BPSK	87.8

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	20deg. C, 68%RH	120Vac, 60Hz	Jones Chang
RE<1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
PLC	20deg. C, 70%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Antony Lee

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor is required

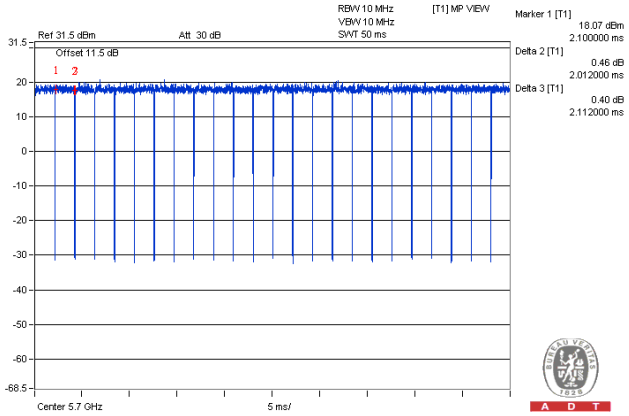
802.11a: Duty cycle = 2.012/2.112 = 0.953, Duty factor = 10 * log(1/0.953) = 0.21

802.11n (HT20): Duty cycle = 1.825/1.962 = 0.930, Duty factor = 10 * log(1/0.930) = 0.32

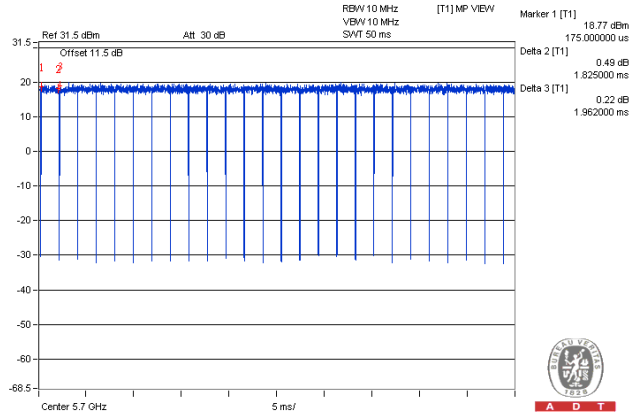
802.11n (HT40): Duty cycle = 0.862/1.037 = 0.831, Duty factor = 10 * log(1/0.831) = 0.80

802.11ac (VHT80): Duty cycle = 0.412/0.525 = 0.785, Duty factor = 10 * log(1/0.785) = 1.05

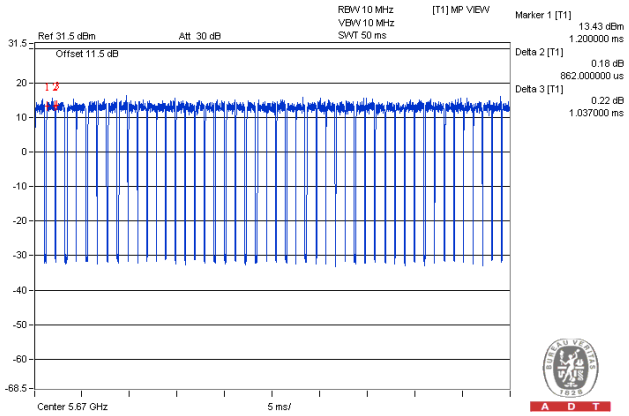
802.11a



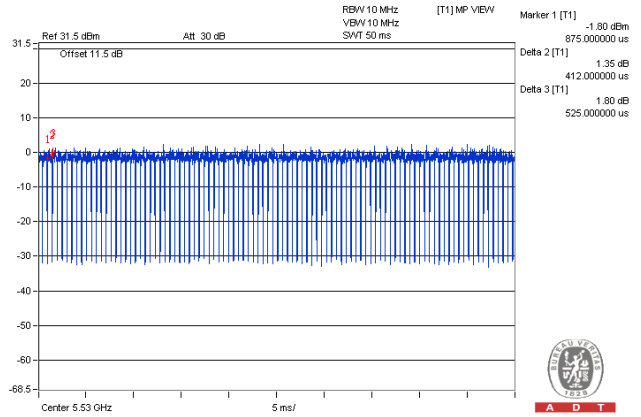
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

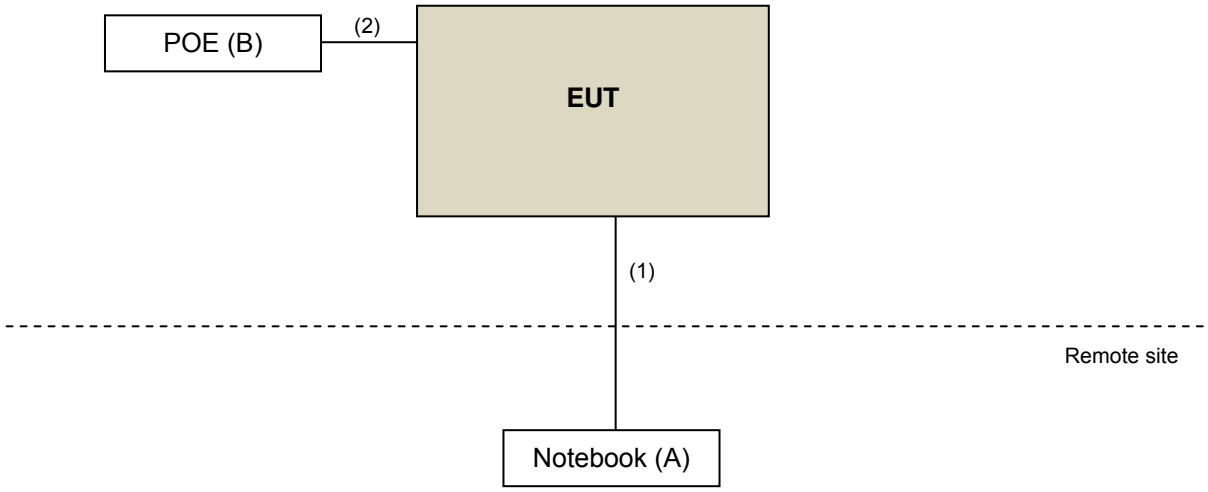
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	POE	PHIHONG	POE36U-1AT-R	NA	NA	Provided by manufacturer.

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 cable	1	3	N	0	-
2.	RJ45 cable	1	1.8	N	0	-

3.4.1 Configuration of System under Test



3.5 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 Procedure New Rules v01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) [*1] PK:-17 (dBm/MHz) [*2]	PK: 68.2(dBμV/m) [*1] PK:78.2 (dBμV/m) [*2]

NOTE: [*1] beyond 10MHz of the band edge [*2] within 10 MHz of band edge

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Aug. 29, 2014	Aug. 28, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	9120D	209	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 22, 2014	Aug. 21, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
High Speed Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 09, 2014	Jun. 08, 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. The test was performed in HwaYa Chamber 3.

3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 988962.

5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

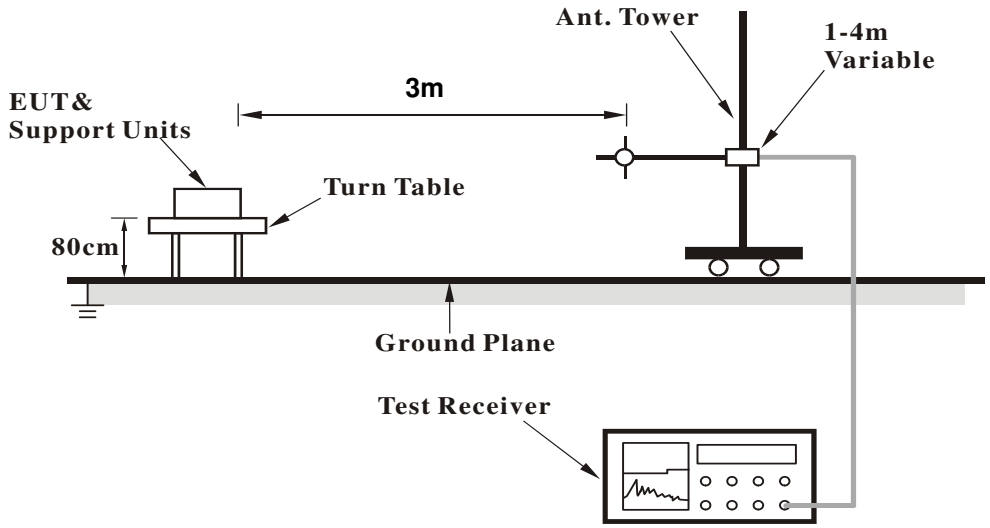
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

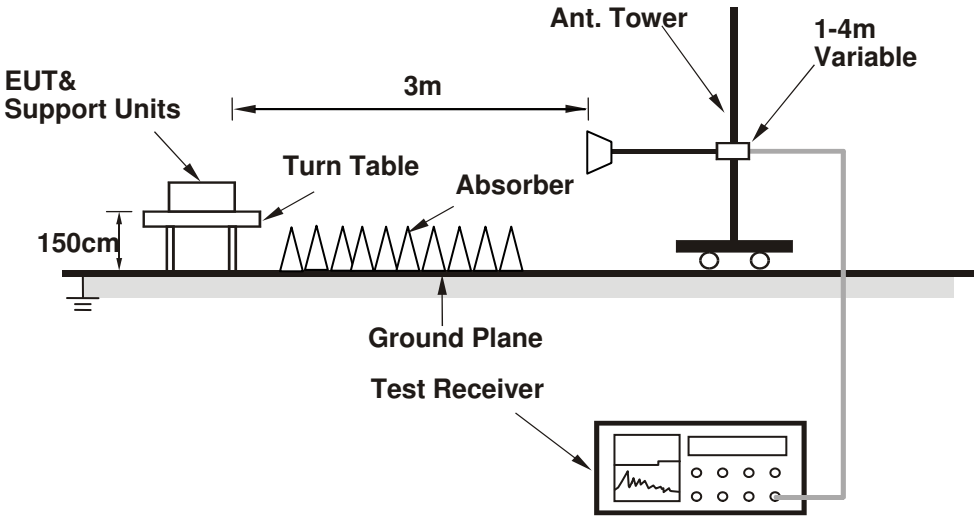
No deviation.

4.1.5 Test Set Up

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz Data

802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	61.3 PK	74.0	-12.7	1.35 H	353	55.50	5.80
2	5100.00	49.2 AV	54.0	-4.8	1.35 H	353	43.40	5.80
3	*5260.00	120.7 PK			1.85 H	351	81.00	39.70
4	*5260.00	110.2 AV			1.85 H	351	70.50	39.70
5	#10520.00	61.1 PK	74.0	-12.9	1.40 H	188	41.90	19.20
6	#10520.00	48.1 AV	54.0	-5.9	1.40 H	188	28.90	19.20
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	56.6 PK	74.0	-17.4	1.40 V	259	50.80	5.80
2	5100.00	45.1 AV	54.0	-8.9	1.40 V	259	39.30	5.80
3	*5260.00	106.5 PK			1.52 V	74	66.80	39.70
4	*5260.00	96.1 AV			1.52 V	74	56.40	39.70
5	#10520.00	60.8 PK	74.0	-13.2	1.00 V	338	41.60	19.20
6	#10520.00	47.7 AV	54.0	-6.3	1.00 V	338	28.50	19.20

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	119.0 PK			1.00 H	349	79.30	39.70
2	*5300.00	108.4 AV			1.00 H	349	68.70	39.70
3	10600.00	61.6 PK	74.0	-12.4	1.56 H	76	42.50	19.10
4	10600.00	48.4 AV	54.0	-5.6	1.56 H	76	29.30	19.10
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	*5300.00	104.1 PK			1.11 V	359	64.40	39.70
2	*5300.00	93.3 AV			1.11 V	359	53.60	39.70
3	10600.00	61.1 PK	74.0	-12.9	1.00 V	283	42.00	19.10
4	10600.00	48.1 AV	54.0	-5.9	1.00 V	283	29.00	19.10

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	122.2 PK			1.16 H	348	82.50	39.70
2	*5320.00	112.0 AV			1.16 H	348	72.30	39.70
3	**5350.00**	**72.5 PK**	**74.0**	**-1.5**	**1.54 H**	**350**	**66.40**	**6.10**
4	5350.00	49.6 AV	54.0	-4.4	1.54 H	350	43.50	6.10
5	10640.00	59.9 PK	74.0	-14.1	1.35 H	172	41.00	18.90
6	10640.00	47.0 AV	54.0	-7.0	1.35 H	172	28.10	18.90
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	106.6 PK			1.55 V	77	66.90	39.70
2	*5320.00	96.2 AV			1.55 V	77	56.50	39.70
3	5350.00	58.0 PK	74.0	-16.0	1.57 V	333	51.90	6.10
4	5350.00	46.2 AV	54.0	-7.8	1.57 V	333	40.10	6.10
5	10640.00	59.8 PK	74.0	-14.2	1.13 V	298	40.90	18.90
6	10640.00	46.9 AV	54.0	-7.1	1.13 V	298	28.00	18.90

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	69.1 PK	74.0	-4.9	1.79 H	345	62.70	6.40
2	5460.00	47.9 AV	54.0	-6.1	1.79 H	345	41.50	6.40
3	#5470.00	72.2 PK	74.0	-1.8	1.83 H	354	65.80	6.40
4	#5470.00	49.2 AV	54.0	-4.8	1.83 H	354	42.80	6.40
5	*5500.00	119.7 PK			1.00 H	345	79.70	40.00
6	*5500.00	109.8 AV			1.00 H	345	69.80	40.00
7	11000.00	59.4 PK	74.0	-14.6	1.26 H	239	39.80	19.60
8	11000.00	46.4 AV	54.0	-7.6	1.26 H	239	26.80	19.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.3 PK	74.0	-16.7	1.51 V	110	50.90	6.40
2	5460.00	46.4 AV	54.0	-7.6	1.51 V	110	40.00	6.40
3	#5470.00	59.1 PK	74.0	-14.9	1.30 V	80	52.70	6.40
4	#5470.00	47.9 AV	54.0	-6.1	1.30 V	80	41.50	6.40
5	*5500.00	104.4 PK			1.26 V	78	64.40	40.00
6	*5500.00	93.7 AV			1.26 V	78	53.70	40.00
7	11000.00	61.4 PK	74.0	-12.6	1.06 V	29	41.80	19.60
8	11000.00	48.4 AV	54.0	-5.6	1.06 V	29	28.80	19.60

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	118.7 PK			1.67 H	336	78.60	40.10
2	*5580.00	108.6 AV			1.67 H	336	68.50	40.10
3	11160.00	60.5 PK	74.0	-13.5	1.64 H	77	41.30	19.20
4	11160.00	47.2 AV	54.0	-6.8	1.64 H	77	28.00	19.20
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	*5580.00	103.9 PK			1.20 V	182	63.80	40.10
2	*5580.00	92.8 AV			1.20 V	182	52.70	40.10
3	11160.00	60.8 PK	74.0	-13.2	1.04 V	279	41.60	19.20
4	11160.00	47.7 AV	54.0	-6.3	1.04 V	279	28.50	19.20

Remark:

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	116.7 PK			1.88 H	336	76.40	40.30
2	*5700.00	106.4 AV			1.88 H	336	66.10	40.30
3	#5725.00	70.9 PK	74.0	-3.1	1.32 H	337	64.10	6.80
4	#5725.00	52.3 AV	54.0	-1.7	1.32 H	337	45.50	6.80
5	11400.00	60.8 PK	74.0	-13.2	1.24 H	240	42.30	18.50
6	11400.00	47.6 AV	54.0	-6.4	1.24 H	240	29.10	18.50
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	102.6 PK			1.20 V	14	62.30	40.30
2	*5700.00	92.6 AV			1.20 V	14	52.30	40.30
3	#5725.00	57.6 PK	74.0	-16.4	1.26 V	22	50.80	6.80
4	#5725.00	46.3 AV	54.0	-7.7	1.26 V	22	39.50	6.80
5	11400.00	60.0 PK	74.0	-14.0	1.14 V	40	41.50	18.50
6	11400.00	46.6 AV	54.0	-7.4	1.14 V	40	28.10	18.50

Remark:

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.

802.11n (HT20)

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	60.8 PK	74.0	-13.2	1.77 H	350	55.00	5.80
2	5100.00	48.9 AV	54.0	-5.1	1.77 H	350	43.10	5.80
3	*5260.00	120.0 PK			1.82 H	350	80.30	39.70
4	*5260.00	110.1 AV			1.82 H	350	70.40	39.70
5	#10520.00	61.4 PK	74.0	-12.6	1.49 H	188	42.20	19.20
6	#10520.00	47.8 AV	54.0	-6.2	1.49 H	188	28.60	19.20
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	58.0 PK	74.0	-16.0	1.49 V	87	52.20	5.80
2	5100.00	45.3 AV	54.0	-8.7	1.49 V	87	39.50	5.80
3	*5260.00	106.5 PK			1.53 V	72	66.80	39.70
4	*5260.00	95.8 AV			1.53 V	72	56.10	39.70
5	#10520.00	61.1 PK	74.0	-12.9	1.19 V	22	41.90	19.20
6	#10520.00	47.4 AV	54.0	-6.6	1.19 V	22	28.20	19.20

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	120.1 PK			1.74 H	349	80.40	39.70
2	*5300.00	110.5 AV			1.74 H	349	70.80	39.70
3	10600.00	61.5 PK	74.0	-12.5	1.66 H	179	42.40	19.10
4	10600.00	48.4 AV	54.0	-5.6	1.66 H	179	29.30	19.10
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	*5300.00	105.4 PK			1.52 V	75	65.70	39.70
2	*5300.00	95.0 AV			1.52 V	75	55.30	39.70
3	10600.00	61.2 PK	74.0	-12.8	1.26 V	119	42.10	19.10
4	10600.00	48.0 AV	54.0	-6.0	1.26 V	119	28.90	19.10

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	117.6 PK			1.51 H	346	77.90	39.70
2	*5320.00	107.7 AV			1.51 H	346	68.00	39.70
3	5350.00	71.8 PK	74.0	-2.2	1.52 H	343	65.70	6.10
4	5350.00	48.9 AV	54.0	-5.1	1.52 H	343	42.80	6.10
5	10640.00	61.3 PK	74.0	-12.7	1.31 H	139	42.40	18.90
6	10640.00	48.1 AV	54.0	-5.9	1.31 H	139	29.20	18.90
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	105.8 PK			1.59 V	66	66.10	39.70
2	*5320.00	95.2 AV			1.59 V	66	55.50	39.70
3	5350.00	58.6 PK	74.0	-15.4	1.50 V	272	52.50	6.10
4	5350.00	47.5 AV	54.0	-6.5	1.50 V	272	41.40	6.10
5	10640.00	61.0 PK	74.0	-13.0	1.01 V	77	42.10	18.90
6	10640.00	47.7 AV	54.0	-6.3	1.01 V	77	28.80	18.90

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	66.2 PK	74.0	-7.8	1.80 H	343	59.80	6.40
2	5460.00	45.3 AV	54.0	-8.7	1.80 H	343	38.90	6.40
3	#5470.00	72.2 PK	74.0	-1.8	1.80 H	343	65.80	6.40
4	#5470.00	46.4 AV	54.0	-7.6	1.80 H	343	40.00	6.40
5	*5500.00	117.2 PK			2.07 H	341	77.20	40.00
6	*5500.00	106.8 AV			2.07 H	341	66.80	40.00
7	11000.00	58.8 PK	74.0	-15.2	1.21 H	241	39.20	19.60
8	11000.00	46.2 AV	54.0	-7.8	1.21 H	241	26.60	19.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	56.0 PK	74.0	-18.0	1.21 V	11	49.60	6.40
2	5460.00	43.8 AV	54.0	-10.2	1.21 V	11	37.40	6.40
3	#5470.00	56.2 PK	74.0	-17.8	1.30 V	24	49.80	6.40
4	#5470.00	43.4 AV	54.0	-10.6	1.30 V	24	37.00	6.40
5	*5500.00	102.2 PK			1.00 V	252	62.20	40.00
6	*5500.00	92.3 AV			1.00 V	252	52.30	40.00
7	11000.00	59.2 PK	74.0	-14.8	1.06 V	114	39.60	19.60
8	11000.00	46.9 AV	54.0	-7.1	1.06 V	114	27.30	19.60

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	116.7 PK			1.10 H	339	76.60	40.10
2	*5580.00	106.5 AV			1.10 H	339	66.40	40.10
3	11160.00	58.4 PK	74.0	-15.6	1.15 H	54	39.20	19.20
4	11160.00	44.8 AV	54.0	-9.2	1.15 H	54	25.60	19.20
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	*5580.00	104.2 PK			1.13 V	183	64.10	40.10
2	*5580.00	94.0 AV			1.13 V	183	53.90	40.10
3	11160.00	57.3 PK	74.0	-16.7	1.42 V	65	38.10	19.20
4	11160.00	44.3 AV	54.0	-9.7	1.42 V	65	25.10	19.20

Remark:

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	116.5 PK			1.90 H	337	76.20	40.30
2	*5700.00	106.0 AV			1.90 H	337	65.70	40.30
3	#5725.00	68.1 PK	74.0	-5.9	1.65 H	334	61.30	6.80
4	#5725.00	52.2 AV	54.0	-1.8	1.65 H	334	45.40	6.80
5	11400.00	58.6 PK	74.0	-15.4	1.18 H	53	40.10	18.50
6	11400.00	45.2 AV	54.0	-8.8	1.18 H	53	26.70	18.50
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	103.2 PK			1.00 V	189	62.90	40.30
2	*5700.00	93.7 AV			1.00 V	189	53.40	40.30
3	#5725.00	58.3 PK	74.0	-15.7	1.10 V	186	51.50	6.80
4	#5725.00	45.3 AV	54.0	-8.7	1.10 V	186	38.50	6.80
5	11400.00	58.5 PK	74.0	-15.5	1.00 V	57	40.00	18.50
6	11400.00	45.7 AV	54.0	-8.3	1.00 V	57	27.20	18.50

Remark:

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.

802.11n (HT40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	60.5 PK	74.0	-13.5	1.38 H	355	54.70	5.80
2	5100.00	49.2 AV	54.0	-4.8	1.38 H	355	43.40	5.80
3	*5270.00	116.1 PK			1.66 H	352	76.40	39.70
4	*5270.00	106.0 AV			1.66 H	352	66.30	39.70
5	#10540.00	61.2 PK	74.0	-12.8	1.56 H	359	42.00	19.20
6	#10540.00	48.4 AV	54.0	-5.6	1.56 H	359	29.20	19.20
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	57.4 PK	74.0	-16.6	1.55 V	143	51.60	5.80
2	5100.00	46.2 AV	54.0	-7.8	1.55 V	143	40.40	5.80
3	*5270.00	103.2 PK			1.55 V	72	63.50	39.70
4	*5270.00	93.0 AV			1.55 V	72	53.30	39.70
5	#10540.00	60.7 PK	74.0	-13.3	1.16 V	35	41.50	19.20
6	#10540.00	47.4 AV	54.0	-6.6	1.16 V	35	28.20	19.20

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	114.0 PK			1.34 H	346	74.30	39.70
2	*5310.00	104.7 AV			1.34 H	346	65.00	39.70
3	5350.00	64.2 PK	74.0	-9.8	1.43 H	351	58.10	6.10
4	**5350.00**	**52.5 AV**	**54.0**	**-1.5**	**1.43 H**	**351**	**46.40**	**6.10**
5	10620.00	60.3 PK	74.0	-13.7	1.24 H	204	41.30	19.00
6	10620.00	47.8 AV	54.0	-6.2	1.24 H	204	28.80	19.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	97.2 PK			1.67 V	82	57.50	39.70
2	*5310.00	86.7 AV			1.67 V	82	47.00	39.70
3	5350.00	56.8 PK	74.0	-17.2	1.51 V	33	50.70	6.10
4	5350.00	45.9 AV	54.0	-8.1	1.51 V	33	39.80	6.10
5	10620.00	60.3 PK	74.0	-13.7	1.24 V	204	41.30	19.00
6	10620.00	47.8 AV	54.0	-6.2	1.24 V	204	28.80	19.00

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	64.9 PK	74.0	-9.1	1.90 H	346	58.50	6.40
2	5460.00	47.3 AV	54.0	-6.7	1.90 H	346	40.90	6.40
3	#5470.00	63.5 PK	74.0	-10.5	2.03 H	0	57.10	6.40
4	#5470.00	52.4 AV	54.0	-1.6	2.03 H	0	46.00	6.40
5	*5510.00	110.7 PK			1.70 H	341	70.70	40.00
6	*5510.00	100.8 AV			1.70 H	341	60.80	40.00
7	11020.00	59.2 PK	74.0	-14.8	1.27 H	253	39.80	19.40
8	11020.00	46.9 AV	54.0	-7.1	1.27 H	253	27.50	19.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.4 PK	74.0	-16.6	1.05 V	106	51.00	6.40
2	5460.00	45.6 AV	54.0	-8.4	1.05 V	106	39.20	6.40
3	#5470.00	58.3 PK	74.0	-15.7	1.24 V	243	51.90	6.40
4	#5470.00	45.5 AV	54.0	-8.5	1.24 V	243	39.10	6.40
5	*5510.00	96.8 PK			1.00 V	356	56.80	40.00
6	*5510.00	87.2 AV			1.00 V	356	47.20	40.00
7	11020.00	58.4 PK	74.0	-15.6	1.08 V	86	39.00	19.40
8	11020.00	45.7 AV	54.0	-8.3	1.08 V	86	26.30	19.40

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	115.5 PK			1.79 H	339	75.40	40.10
2	*5550.00	106.0 AV			1.79 H	339	65.90	40.10
3	11100.00	58.6 PK	74.0	-15.4	1.46 H	239	39.70	18.90
4	11100.00	46.8 AV	54.0	-7.2	1.46 H	239	27.90	18.90
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	*5550.00	102.1 PK			1.15 V	182	62.00	40.10
2	*5550.00	92.1 AV			1.15 V	182	52.00	40.10
3	11100.00	58.6 PK	74.0	-15.4	1.00 V	116	39.70	18.90
4	11100.00	46.8 AV	54.0	-7.2	1.00 V	116	27.90	18.90

Remark:

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	114.5 PK			2.06 H	338	74.30	40.20
2	*5670.00	104.7 AV			2.06 H	338	64.50	40.20
3	#5725.00	64.1 PK	74.0	-9.9	1.54 H	341	57.30	6.80
4	#5725.00	47.8 AV	54.0	-6.2	1.54 H	341	41.00	6.80
5	11340.00	57.9 PK	74.0	-16.1	1.14 H	243	38.70	19.20
6	11340.00	45.9 AV	54.0	-8.1	1.14 H	243	26.70	19.20
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	101.5 PK			1.00 V	183	61.30	40.20
2	*5670.00	92.4 AV			1.00 V	183	52.20	40.20
3	#5725.00	57.1 PK	74.0	-16.9	1.13 V	133	50.30	6.80
4	#5725.00	45.4 AV	54.0	-8.6	1.13 V	133	38.60	6.80
5	11340.00	58.4 PK	74.0	-15.6	1.09 V	111	39.20	19.20
6	11340.00	45.9 AV	54.0	-8.1	1.09 V	111	26.70	19.20

Remark:

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5290.00	102.0 PK			1.43 H	348	62.30	39.70
2	*5290.00	92.3 AV			1.43 H	348	52.60	39.70
3	5350.00	64.5 PK	74.0	-9.5	1.15 H	352	58.40	6.10
4	5350.00	52.4 AV	54.0	-1.6	1.15 H	352	46.30	6.10
5	#10580.00	61.7 PK	74.0	-12.3	1.26 H	136	42.40	19.30
6	#10580.00	48.6 AV	54.0	-5.4	1.26 H	136	29.30	19.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5290.00	85.7 PK			1.41 V	84	46.00	39.70
2	*5290.00	76.2 AV			1.41 V	84	36.50	39.70
3	5350.00	59.3 PK	74.0	-14.7	1.49 V	65	53.20	6.10
4	5350.00	47.7 AV	54.0	-6.3	1.49 V	65	41.60	6.10
5	#10580.00	61.2 PK	74.0	-12.8	1.16 V	186	41.90	19.30
6	#10580.00	48.0 AV	54.0	-6.0	1.16 V	186	28.70	19.30

Remark:

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) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.7 PK	74.0	-16.3	1.53 H	310	51.30	6.40
2	5460.00	46.0 AV	54.0	-8.0	1.53 H	310	39.60	6.40
3	#5470.00	63.6 PK	74.0	-10.4	2.02 H	333	57.20	6.40
4	#5470.00	52.2 AV	54.0	-1.8	2.02 H	333	45.80	6.40
5	*5530.00	97.9 PK			1.99 H	334	57.90	40.00
6	*5530.00	87.8 AV			1.99 H	334	47.80	40.00
7	11060.00	58.9 PK	74.0	-15.1	1.22 H	184	39.70	19.20
8	11060.00	46.9 AV	54.0	-7.1	1.22 H	184	27.70	19.20
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	5460.00	57.9 PK	74.0	-16.1	1.03 V	56	51.50	6.40
2	5460.00	46.0 AV	54.0	-8.0	1.03 V	56	39.60	6.40
3	#5470.00	57.6 PK	74.0	-16.4	1.14 V	115	51.20	6.40
4	#5470.00	45.4 AV	54.0	-8.6	1.14 V	115	39.00	6.40
5	*5530.00	84.3 PK			1.14 V	182	44.30	40.00
6	*5530.00	74.6 AV			1.14 V	182	34.60	40.00
7	11060.00	59.1 PK	74.0	-14.9	1.16 V	208	39.90	19.20
8	11060.00	47.0 AV	54.0	-7.0	1.16 V	208	27.80	19.20

Remark:

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

Below 1GHz worst-case data

802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	37.68	32.3 QP	40.0	-7.7	1.50 H	100	47.60	-15.30
2	57.12	32.3 QP	40.0	-7.7	2.00 H	137	46.90	-14.60
3	78.51	34.4 QP	40.0	-5.6	2.00 H	274	52.60	-18.20
4	113.50	30.0 QP	43.5	-13.5	1.50 H	135	47.10	-17.10
5	183.50	33.0 QP	43.5	-10.5	1.50 H	102	48.80	-15.80
6	249.60	30.4 QP	46.0	-15.6	1.00 H	122	44.80	-14.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	38.02	38.0 QP	40.0	-2.0	1.00 V	176	53.30	-15.30
2	62.95	38.1 QP	40.0	-1.9	1.00 V	353	53.30	-15.20
3	76.56	33.1 QP	40.0	-6.9	1.00 V	186	50.50	-17.40
4	113.50	30.6 QP	43.5	-12.9	1.00 V	209	47.70	-17.10
5	156.28	29.5 QP	43.5	-14.0	1.00 V	118	43.50	-14.00
6	185.44	27.4 QP	43.5	-16.1	1.00 V	181	43.40	-16.00

Remark:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Apr. 27, 2015	Apr. 26, 2016
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2014	Dec. 29, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 10, 2014	Jul. 09, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 2.
3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

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

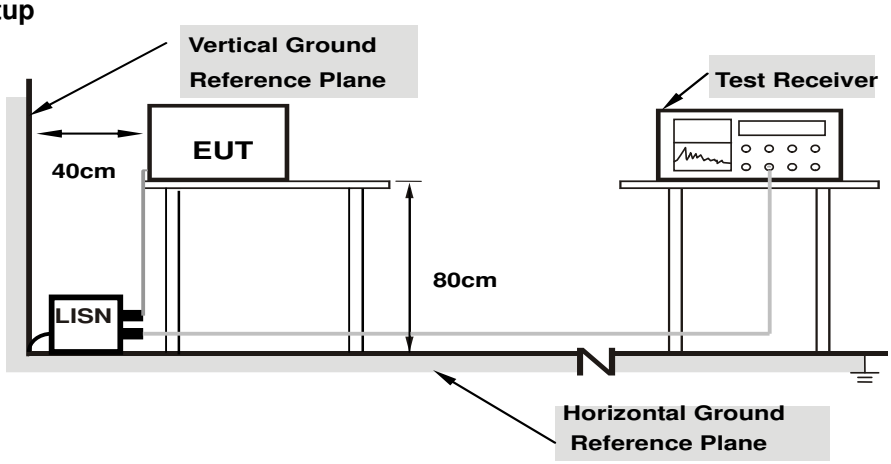
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

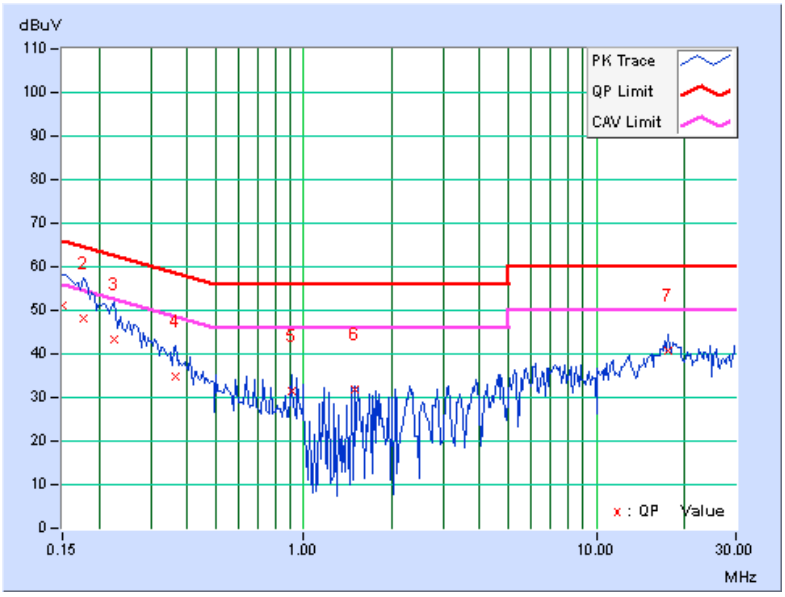
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.16	50.85	21.75	51.01	21.91	66.00	56.00	-14.99	-34.09
2	0.17734	0.17	48.12	37.43	48.29	37.60	64.61	54.61	-16.32	-17.01
3	0.22422	0.17	43.00	33.54	43.17	33.71	62.66	52.66	-19.49	-18.95
4	0.36484	0.18	34.70	32.58	34.88	32.76	58.62	48.62	-23.74	-15.86
5	0.90781	0.22	31.29	31.09	31.51	31.31	56.00	46.00	-24.49	-14.69
6	1.49609	0.25	31.63	31.56	31.88	31.81	56.00	46.00	-24.12	-14.19
7	17.56613	0.58	40.17	37.13	40.75	37.71	60.00	50.00	-19.25	-12.29

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.

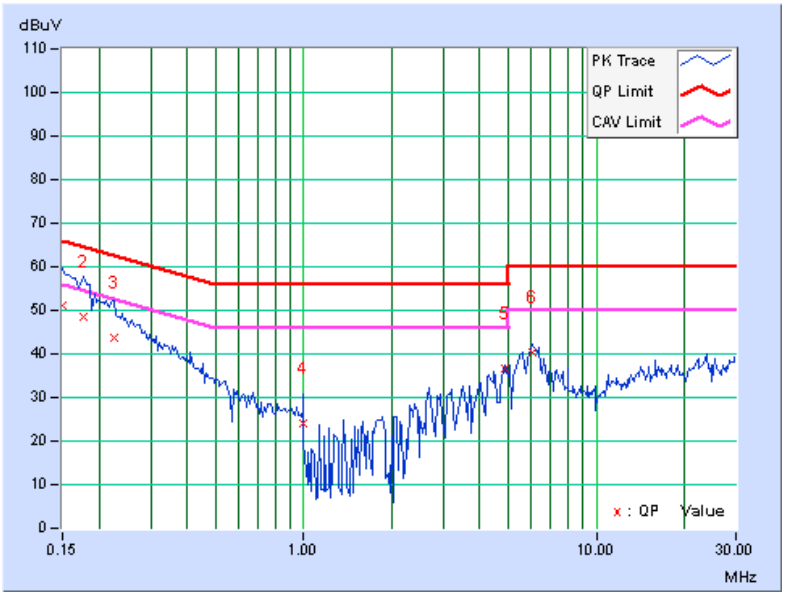


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.17	51.08	21.87	51.25	22.04	66.00	56.00	-14.75	-33.96
2	0.17734	0.18	48.44	37.90	48.62	38.08	64.61	54.61	-15.99	-16.53
3	0.22422	0.18	43.53	33.48	43.71	33.66	62.66	52.66	-18.95	-19.00
4	0.99766	0.24	23.90	22.08	24.14	22.32	56.00	46.00	-31.86	-23.68
5	4.89459	0.40	36.27	32.68	36.67	33.08	56.00	46.00	-19.33	-12.92
6	**6.02761**	**0.43**	**40.09**	**37.90**	**40.52**	**38.33**	**60.00**	**50.00**	**-19.48**	**-11.67**

Remarks:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

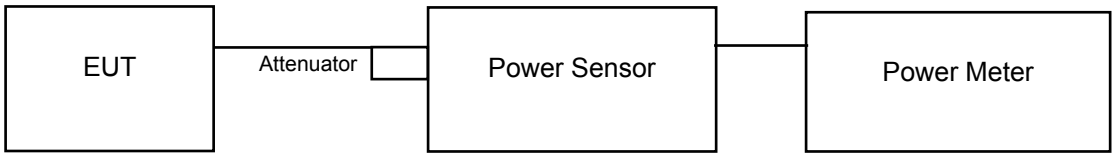
Operation Band	EUT Category		LIMIT
U-NII-1	---	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	---	Fixed point-to-point Access Point	1 Watt (30 dBm)
	---	Indoor Access Point	1 Watt (30 dBm)
	---	Mobile and Portable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

*B is the 26 dB emission bandwidth in megahertz

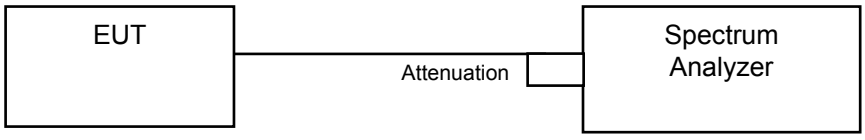
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

For 802.11a, 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40)



For 802.11ac (VHT80)



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

For 802.11a, 802.11n (HT20), 802.11n (HT40)

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 802.11ac (VHT80)

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz.
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW.
f. Sweep time ≤ (number of points in sweep) * T
g. Detector = RMS.
h. Trace mode = max hold.
i. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

FOR OCCUPIED BANDWIDTH

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 300 kHz RBW and 1MHz VBW. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	15.43	16.02	16.44	118.963	20.75	24.00	Pass
60	5300	15.63	15.44	16.24	113.627	20.55	24.00	Pass
64	5320	15.74	15.37	16.25	114.102	20.57	24.00	Pass
100	5500	15.21	15.43	16.58	113.602	20.55	24.00	Pass
116	5580	16.28	15.71	16.32	122.556	20.88	24.00	Pass
140	5700	14.26	16.01	16.85	114.988	20.61	24.00	Pass

Note:

Chain 0

1. 11dBm + 10log(22.81) = 24.58 dBm > 24dBm.
2. 11dBm + 10log(24.99) = 24.98 dBm > 24dBm.
3. 11dBm + 10log(25.43) = 25.05 dBm > 24dBm.
4. 11dBm + 10log(25.50) = 25.07 dBm > 24dBm.
5. 11dBm + 10log(24.86) = 24.96 dBm > 24dBm.
6. 11dBm + 10log(23.97) = 24.80 dBm > 24dBm.

Chain 1

1. 11dBm + 10log(23.50) = 24.71 dBm > 24dBm.
2. 11dBm + 10log(22.02) = 24.43 dBm > 24dBm.
3. 11dBm + 10log(24.06) = 24.81 dBm > 24dBm.
4. 11dBm + 10log(24.42) = 24.88 dBm > 24dBm.
5. 11dBm + 10log(23.70) = 24.75 dBm > 24dBm.
6. 11dBm + 10log(23.38) = 24.69 dBm > 24dBm.

Chain 2

1. 11dBm + 10log(24.16) = 24.83 dBm > 24dBm.
2. 11dBm + 10log(23.90) = 24.78 dBm > 24dBm.
3. 11dBm + 10log(23.52) = 24.71 dBm > 24dBm.
4. 11dBm + 10log(24.15) = 24.83 dBm > 24dBm.
5. 11dBm + 10log(25.35) = 25.04 dBm > 24dBm.
6. 11dBm + 10log(24.17) = 24.83 dBm > 24dBm.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	15.21	15.33	16.23	109.284	20.39	24.00	Pass
60	5300	15.36	15.51	16.52	114.794	20.60	24.00	Pass
64	5320	15.34	15.62	16.42	114.526	20.59	24.00	Pass
100	5500	15.62	15.43	15.88	110.115	20.42	24.00	Pass
116	5580	16.02	16.32	15.64	119.493	20.77	24.00	Pass
140	5700	15.74	15.00	16.03	109.207	20.38	24.00	Pass

Note:

Chain 0

1. 11dBm + 10log(23.55) = 24.72 dBm > 24dBm.
2. 11dBm + 10log(25.36) = 25.04 dBm > 24dBm.
3. 11dBm + 10log(24.97) = 24.97 dBm > 24dBm.
4. 11dBm + 10log(24.06) = 24.81 dBm > 24dBm.
5. 11dBm + 10log(25.03) = 24.98 dBm > 24dBm.
6. 11dBm + 10log(22.33) = 24.49 dBm > 24dBm.

Chain 1

1. 11dBm + 10log(22.80) = 24.58 dBm > 24dBm.
2. 11dBm + 10log(22.33) = 24.49 dBm > 24dBm.
3. 11dBm + 10log(22.59) = 24.54 dBm > 24dBm.
4. 11dBm + 10log(25.57) = 25.08 dBm > 24dBm.
5. 11dBm + 10log(25.07) = 24.99 dBm > 24dBm.
6. 11dBm + 10log(24.64) = 24.92 dBm > 24dBm.

Chain 2

1. 11dBm + 10log(25.69) = 25.10 dBm > 24dBm.
2. 11dBm + 10log(25.30) = 25.03 dBm > 24dBm.
3. 11dBm + 10log(24.90) = 24.96 dBm > 24dBm.
4. 11dBm + 10log(24.88) = 24.96 dBm > 24dBm.
5. 11dBm + 10log(25.63) = 25.09 dBm > 24dBm.
6. 11dBm + 10log(25.08) = 24.99 dBm > 24dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
54	5270	18.70	18.55	19.23	**229.498**	23.61	24.00	Pass
62	5310	13.57	13.45	14.10	70.586	18.49	24.00	Pass
102	5510	13.51	14.03	14.78	77.793	18.91	24.00	Pass
110	5550	18.15	19.57	19.66	**248.356**	23.95	24.00	Pass
134	5670	17.36	19.33	19.02	219.953	23.42	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log(48.93) = 27.90 dBm > 24dBm.
2. 11dBm + 10log(49.59) = 27.95 dBm > 24dBm.
3. 11dBm + 10log(49.38) = 27.94 dBm > 24dBm.
4. 11dBm + 10log(48.09) = 27.82 dBm > 24dBm.
5. 11dBm + 10log(47.70) = 27.79 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(47.52) = 27.79 dBm > 24dBm.
2. 11dBm + 10log(45.91) = 27.62 dBm > 24dBm.
3. 11dBm + 10log(47.95) = 27.81 dBm > 24dBm.
4. 11dBm + 10log(48.52) = 27.86 dBm > 24dBm.
5. 11dBm + 10log(47.63) = 27.78 dBm > 24dBm.

Chain 2
1. 11dBm + 10log(48.08) = 27.82 dBm > 24dBm.
2. 11dBm + 10log(48.83) = 27.89 dBm > 24dBm.
3. 11dBm + 10log(48.91) = 27.89 dBm > 24dBm.
4. 11dBm + 10log(47.93) = 27.81 dBm > 24dBm.
5. 11dBm + 10log(49.04) = 27.91 dBm > 24dBm.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
58	5290	5.06	5.22	5.81	10.344	10.15	24.00	Pass
106	5530	3.84	4.97	4.45	8.348	9.22	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log(91.54) = 30.62 dBm > 24dBm.
2. 11dBm + 10log(91.82) = 30.63 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(94.12) = 30.74 dBm > 24dBm.
2. 11dBm + 10log(92.69) = 30.67 dBm > 24dBm.

Chain 2
1. 11dBm + 10log(97.42) = 30.89 dBm > 24dBm.
2. 11dBm + 10log(93.99) = 30.73 dBm > 24dBm.

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	22.81	23.50	24.16	Pass
60	5300	24.99	22.02	23.90	Pass
64	5320	25.43	24.06	23.52	Pass
100	5500	25.50	24.42	24.15	Pass
116	5580	24.86	23.70	25.35	Pass
140	5700	23.97	23.38	24.17	Pass

802.11n (HT20)

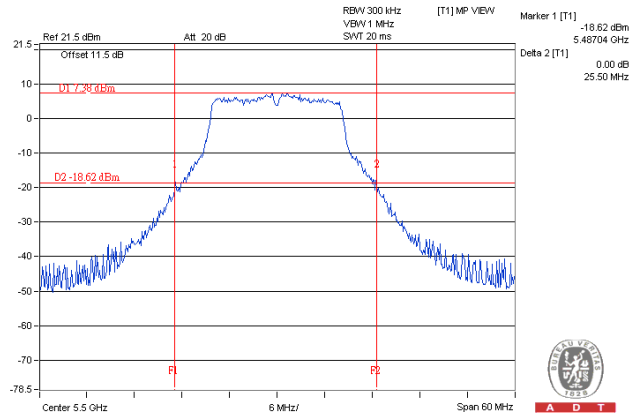
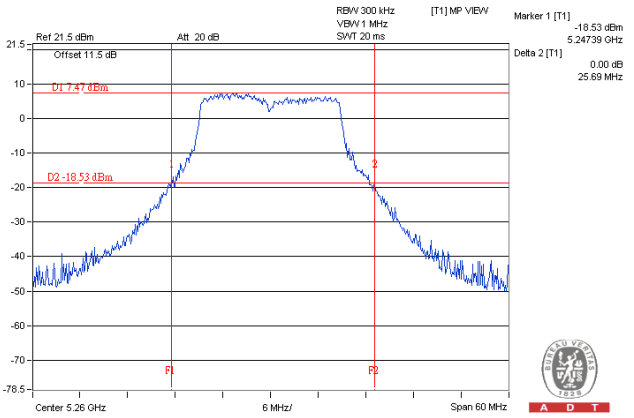
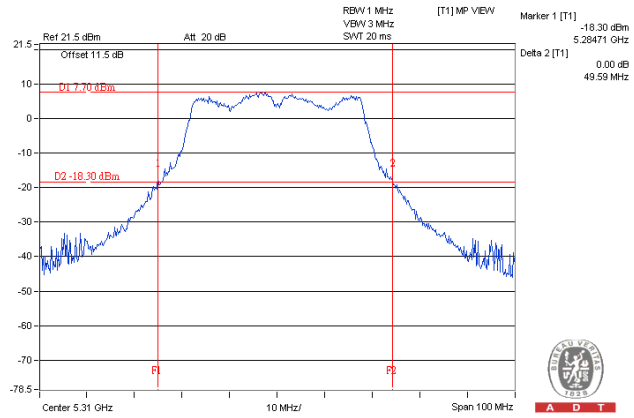
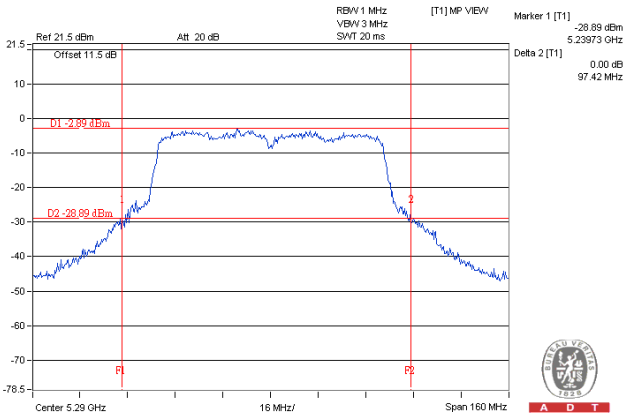
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	23.55	22.80	25.69	Pass
60	5300	25.36	22.33	25.30	Pass
64	5320	24.97	22.59	24.90	Pass
100	5500	24.06	25.57	24.88	Pass
116	5580	25.03	25.07	25.63	Pass
140	5700	22.33	24.64	25.08	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
54	5270	48.93	47.52	48.08	Pass
62	5310	49.59	45.91	48.83	Pass
102	5510	49.38	47.95	48.91	Pass
110	5550	48.09	48.52	47.93	Pass
134	5670	47.70	47.63	49.04	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
58	5290	91.54	94.12	97.42	Pass
106	5530	91.82	92.69	93.99	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Occupied Bandwidth:

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	16.80	16.80	17.04	Pass
60	5300	17.04	16.68	16.80	Pass
64	5320	17.04	17.16	16.80	Pass
100	5500	17.16	16.92	16.92	Pass
116	5580	16.92	16.92	16.92	Pass
140	5700	16.92	16.68	17.04	Pass

802.11n (HT20)

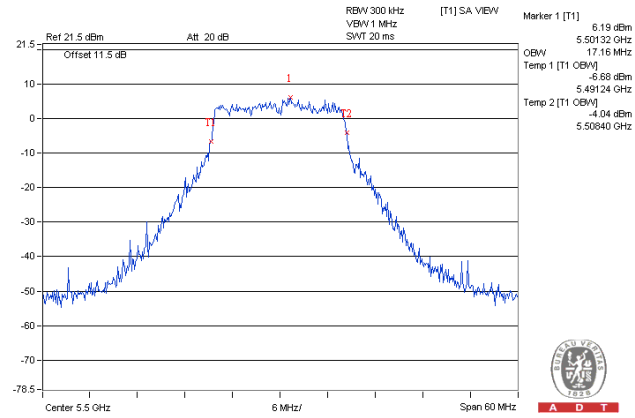
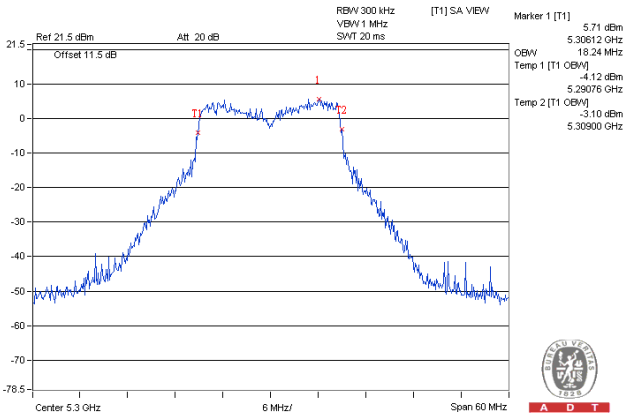
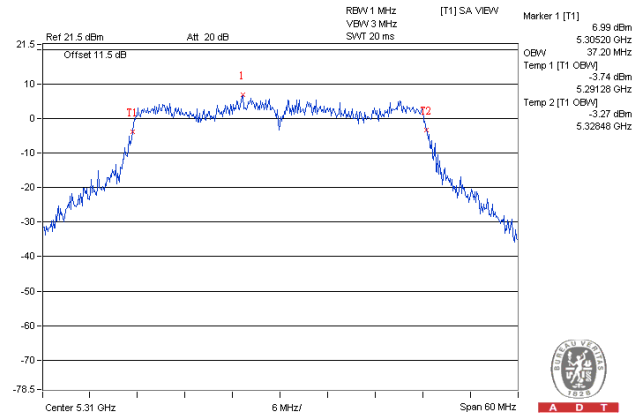
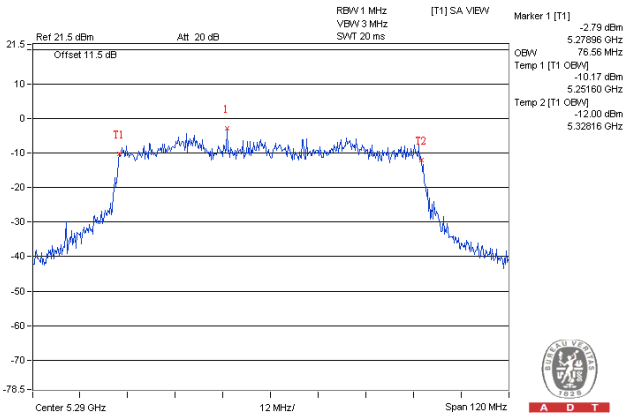
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	17.76	17.64	18.00	Pass
60	5300	18.24	17.52	18.12	Pass
64	5320	18.24	17.52	18.12	Pass
100	5500	17.76	18.00	18.00	Pass
116	5580	18.00	18.12	18.00	Pass
140	5700	17.64	17.76	18.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
54	5270	36.96	36.36	36.72	Pass
62	5310	37.20	36.36	36.60	Pass
102	5510	37.08	36.96	36.96	Pass
110	5550	37.08	36.84	37.08	Pass
134	5670	36.72	36.84	36.96	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
58	5290	76.56	76.32	76.08	Pass
106	5530	75.84	76.08	76.32	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

EUT MAXIMUM CONDUCTED POWER

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	118.963	20.75
5470~5725	122.556	20.88

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	114.794	20.60
5470~5725	119.493	20.77

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	229.498	23.61
5470~5725	248.356	23.95

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	10.344	10.15
5470~5725	8.348	9.22

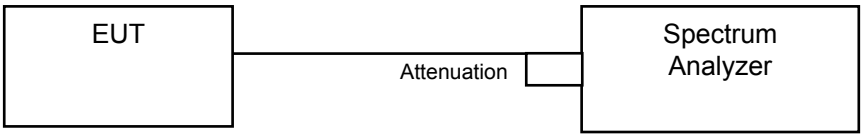
NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedures

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

b. Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

d. Sweep time = auto, trigger set to “free run”.

e. Trace average at least 100 traces in power averaging mode.

f. Record the max value and add 10 log (1/duty cycle)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11a

Channel	Frequency (MHz)	PSD (dBm)			Total PSD W/O Duty Factor (dBm)	Duty Factor	Total PSD With Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
52	5260	2.51	2.48	2.37	7.22	0.21	7.43	7.46	Pass
60	5300	2.22	2.22	2.56	7.11	0.21	7.32	7.46	Pass
64	5320	2.31	2.31	2.71	7.22	0.21	7.43	7.46	Pass
100	5500	2.48	2.42	2.33	7.18	0.21	7.39	7.46	Pass
116	5580	2.11	2.11	2.29	6.94	0.21	7.15	7.46	Pass
140	5700	2.16	2.49	2.23	7.07	0.21	7.28	7.46	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 = 4.77dBi + 10log(3) = 9.54dBi > 6dBi, so the power density limit shall be reduced to 11-(9.54-6) = 7.46dBm.

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

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm)			Total PSD W/O Duty Factor (dBm)	Duty Factor	Total PSD With Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
52	5260	2.12	2.27	2.20	6.97	0.32	7.29	7.46	Pass
60	5300	2.01	2.47	2.24	7.02	0.32	7.34	7.46	Pass
64	5320	2.45	2.50	1.79	7.03	0.32	7.35	7.46	Pass
100	5500	2.15	2.22	2.46	7.06	0.32	7.38	7.46	Pass
116	5580	2.22	1.97	2.13	6.88	0.32	7.20	7.46	Pass
140	5700	2.24	2.22	2.34	7.04	0.32	7.36	7.46	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 = 4.77dBi + 10log(3) = 9.54dBi > 6dBi, so the power density limit shall be reduced to 11-(9.54-6) = 7.46dBm.

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

802.11n (HT40)

Channel	Frequency (MHz)	PSD (dBm)			Total PSD W/O Duty Factor (dBm)	Duty Factor	Total PSD With Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
54	5270	1.80	1.50	1.11	6.25	0.80	7.05	7.46	Pass
62	5310	-3.83	-3.03	-3.56	1.31	0.80	2.11	7.46	Pass
102	5510	-4.43	-4.85	-3.29	0.64	0.80	1.44	7.46	Pass
110	5550	0.17	0.82	1.80	5.76	0.80	6.56	7.46	Pass
134	5670	-2.19	-1.17	1.28	4.33	0.80	5.13	7.46	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 = 4.77dBi + 10log(3) = 9.54dBi > 6dBi, so the power density limit shall be reduced to 11-(9.54-6) = 7.46dBm.

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

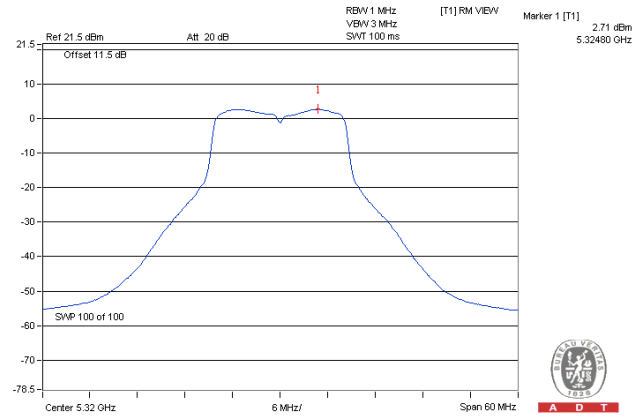
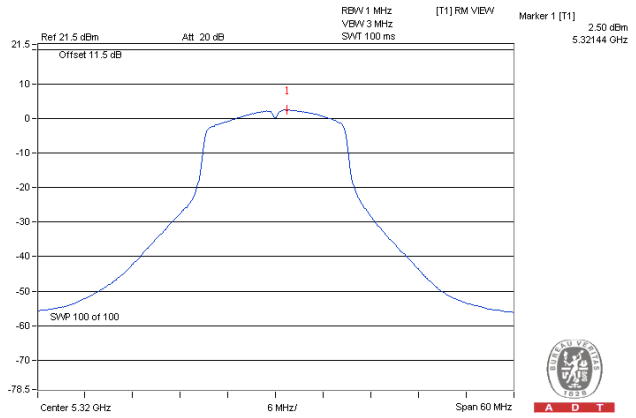
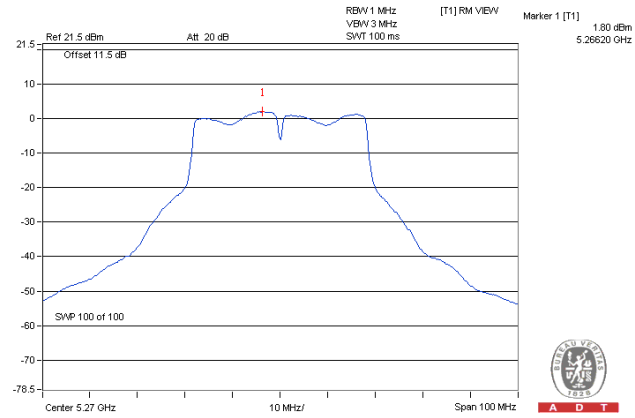
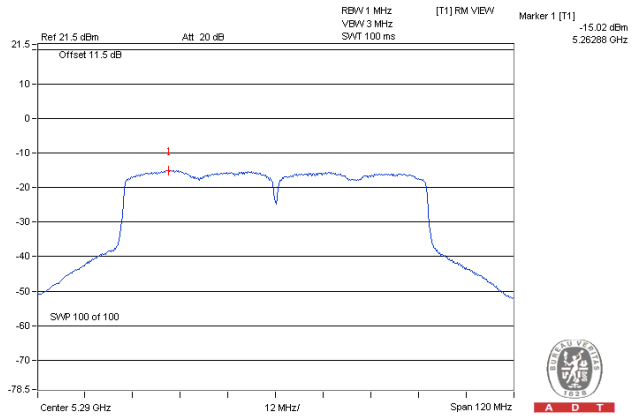
802.11ac (VHT80)

Channel	Frequency (MHz)	PSD (dBm)			Total PSD W/O Duty Factor (dBm)	Duty Factor	Total PSD With Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
58	5290	-15.53	-15.67	-15.02	-10.62	1.05	-9.57	7.46	Pass
106	5530	-17.02	-17.60	-16.79	-12.35	1.05	-11.30	7.46	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 = 4.77dBi + 10log(3) = 9.54dBi > 6dBi, so the power density limit shall be reduced to 11-(9.54-6) = 7.46dBm.

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

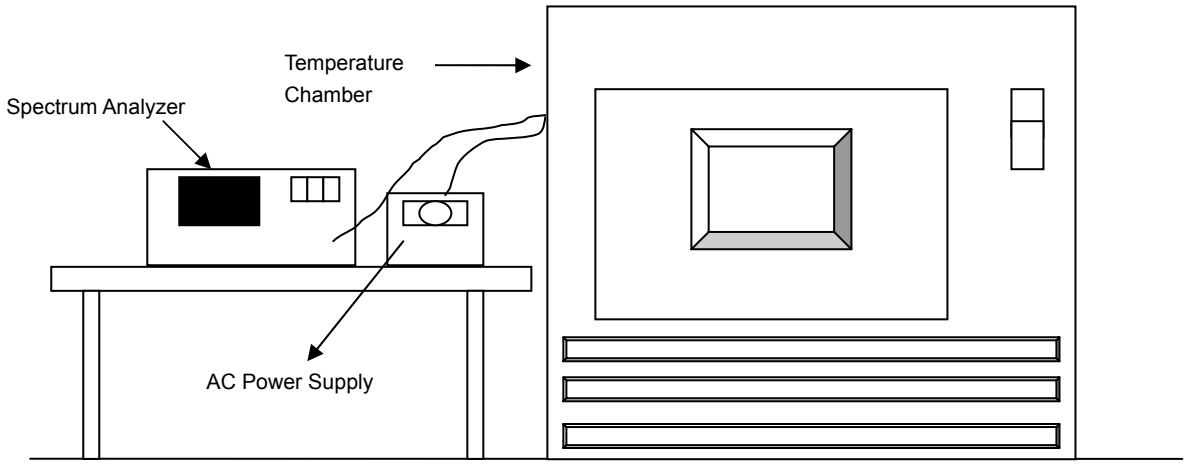
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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 Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.

e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

Frequemcy Stability Versus Temp.									
Operating Frequency: 5320MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5320.0092	0.00017	5320.013	0.00024	5320.0089	0.00017	5320.0085	0.00016
40	120	5319.9888	-0.00021	5319.9883	-0.00022	5319.9888	-0.00021	5319.9901	-0.00019
30	120	5320.0071	0.00013	5320.0099	0.00019	5320.011	0.00021	5320.007	0.00013
20	120	5319.9847	-0.00029	5319.9888	-0.00021	5319.9869	-0.00025	5319.9852	-0.00028
10	120	5319.9801	-0.00037	5319.9801	-0.00037	5319.9796	-0.00038	5319.9811	-0.00036
0	120	5320.0253	0.00048	5320.0247	0.00046	5320.0222	0.00042	5320.0262	0.00049
-10	120	5320.0163	0.00031	5320.0168	0.00032	5320.0165	0.00031	5320.0153	0.00029
-20	120	5320.0068	0.00013	5320.0069	0.00013	5320.0046	0.00009	5320.0039	0.00007
-30	120	5319.9975	-0.00005	5319.9992	-0.00002	5319.9988	-0.00002	5319.9952	-0.00009

Frequemcy Stability Versus Temp.									
Operating Frequency: 5320MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5319.9856	-0.00027	5319.9886	-0.00021	5319.9876	-0.00023	5319.9858	-0.00027
	120	5319.9847	-0.00029	5319.9888	-0.00021	5319.9869	-0.00025	5319.9852	-0.00028
	102	5319.9853	-0.00028	5319.9889	-0.00021	5319.9859	-0.00027	5319.9845	-0.00029

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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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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