FCC Test Report

Report No.:	RF150709C20-1
FCC ID:	RSL-TQ4400E
Test Model:	AT-TQ4400e
Received Date:	Jul. 09, 2015
Test Date:	Aug. 05 ~ Sep. 25, 2015
Issued Date:	Oct. 05, 2015
Applicant:	Allied Telesis K.K.
Address:	2nd. TOC Bldg. 7-21-11 Nishi-Gotanda, Shinagawa-ku, Tokyo Japan, 141-0031
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.)

Table of Contents

Release Control Record 4

1 Certificate of Conformity 5

2 Summary of Test Results 6

2.1 Measurement Uncertainty 6
2.2 Modification Record 6

3 General Information 7

3.1 General Description of EUT 7
3.2 Description of Test Modes 9
3.2.1 Test Mode Applicability and Tested Channel Detail 10
3.3 Duty Cycle of Test Signal 12
3.4 Description of Support Units 14
3.4.1 Configuration of System under Test 14
3.5 General Description of Applied Standard 15

4 Test Types and Results 16

4.1 Radiated Emission and Bandedge Measurement 16
4.1.1 Limits of Radiated Emission and Bandedge Measurement 16
4.1.2 Test Instruments 17
4.1.3 Test Procedure 18
4.1.4 Deviation from Test Standard 18
4.1.5 Test Setup 19
4.1.6 EUT Operating Conditions 20
4.1.7 Test Results 21
4.2 Conducted Emission Measurement 40
4.2.1 Limits of Conducted Emission Measurement 40
4.2.2 Test Instruments 40
4.2.3 Test Procedure 41
4.2.4 Deviation from Test Standard 41
4.2.5 Test Setup 41
4.2.6 EUT Operating Conditions 41
4.2.7 Test Results 42
4.3 Transmit Power Measurement 44
4.3.1 Limits of Transmit Power Measurement 44
4.3.2 Test Setup 44
4.3.3 Test Instruments 44
4.3.4 Test Procedure 45
4.3.5 Deviation fromTest Standard 45
4.3.6 EUT Operating Conditions 45
4.3.7 Test Result 46
4.4 Peak Power Spectral Density Measurement 52
4.4.1 Limits of Peak Power Spectral Density Measurement 52
4.4.2 Test Setup 52
4.4.3 Test Instruments 52
4.4.4 Test Procedure 52
4.4.5 Deviation from Test Standard 53
4.4.6 EUT Operating Condition 53
4.4.7 Test Results 54
4.5 Frequency Stability 60
4.5.1 Limits of Frequency Stability Measurement 60
4.5.2 Test Setup 60
4.5.3 Test Instruments 60
4.5.4 Test Procedure 60
4.5.5 Deviation from Test Standard 60
4.5.6 EUT Operating Condition 60

4.5.7 Test Results 61
4.6 6dB Bandwidth Measurement 62
4.6.1 Limits of 6dB Bandwidth Measurement 62
4.6.2 Test Setup 62
4.6.3 Test Instruments 62
4.6.4 Test Procedure 62
4.6.5 Deviation from Test Standard 62
4.6.6 EUT Operating Condition 62
4.6.7 Test Results 63
5 Pictures of Test Arrangements 65
Appendix – Information on the Testing Laboratories 66

Release Control Record

Issue No.	Description	Date Issued
RF150709C20-1	Original release.	Oct. 05, 2015

1 Certificate of Conformity

Product:	Outdoor Wireless Access Point
Brand:	Allied Telesis
Test Model:	AT-TQ4400e
Sample Status:	Engineering sample
Applicant:	Allied Telesis K.K.
Test Date:	Aug. 05 ~ Sep. 25, 2015
Standard:	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:** Oct. 05, 2015

Ivy Lin / Specialist

Approved by : _____ , **Date:** Oct. 05, 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
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -12.10dB at 0.50001MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 59.06MHz.
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(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is 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	Allied Telesis
Test Model	AT-TQ4400e
Status of EUT	Engineering sample
Power Supply Rating	48Vdc (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 300.0Mbps 802.11ac: up to 867.0Mbps
Operating Frequency	5180 ~ 5240MHz & 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz: 129.758mW 5745 ~ 5825MHz: 190.023mW
Antenna Type	Dipole antenna with 7.0dBi gain
Antenna Connector	N-Type (The device is professionally installed)
Accessory Device	N/A
Data Cable Supplied	1.75m non-shielded ground line without core

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	Data Rate (MCS)	TX & RX Function	
802.11a	6 ~ 54Mbps	2TX (CDD)	2RX
802.11n (HT20)	MCS 0 ~ 15	2TX (CDD)	2RX
802.11n (HT40)	MCS 0 ~ 15	2TX (CDD)	2RX
802.11ac (VHT20)	MCS 0 ~ 8	2TX (CDD)	2RX
802.11ac (VHT40)	MCS 0 ~ 9	2TX (CDD)	2RX
802.11ac (VHT80)	MCS 0 ~ 9	2TX (CDD)	2RX

*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)

2. The EUT uses following adapter and PoE.

Adapter supplied PoE (Support unit only)	
Brand	Powertron Electronics Corp.
Model	PA1024-4DU
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	48Vdc, 0.38A, 18.24W Max
Power Line	1.8m power cable with 1 core attached on adapter

PoE (Support unit only)	
Brand	EnGenius
Model	EPE-24GR
Power Rating	48Vdc

3. The EUT will install at outdoor area, the highest antenna gain from the horizon above 30 degrees as below, for more detail information please refer to antenna specification and user manual

Antenna	Antenna gain	Antenna install degree
Dipole	-2.3339 dBi	

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	97.5
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	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)
-	802.11n (HT20)	5180-5320 5745-5825	36 to 64 149 to 165	165	OFDM	BPSK	7.2

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)
-	802.11n (HT20)	5180-5320 5745-5825	36 to 64 149 to 165	165	OFDM	BPSK	7.2

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	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	97.5
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	97.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (POE)	TESTED BY
RE≥1G	18deg. C, 70%RH	48Vdc	Nick Hsu, Jones Chang
RE<1G	18deg. C, 70%RH	48Vdc	Nick Hsu
PLC	18deg. C, 70%RH	48Vdc	Nick Hsu
APCM	25deg. C, 60%RH	48Vdc	Leo Tsai

3.3 Duty Cycle of Test Signal

U-NII-1 Band

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

802.11a: Duty cycle = 2.053/2.093 =0.981

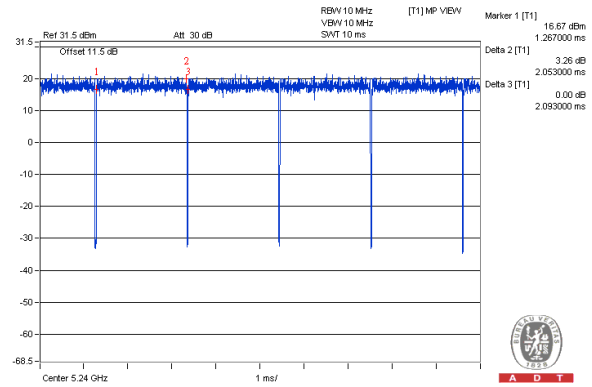
802.11n (HT20): Duty cycle = 1.913/1.950 =0.981

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

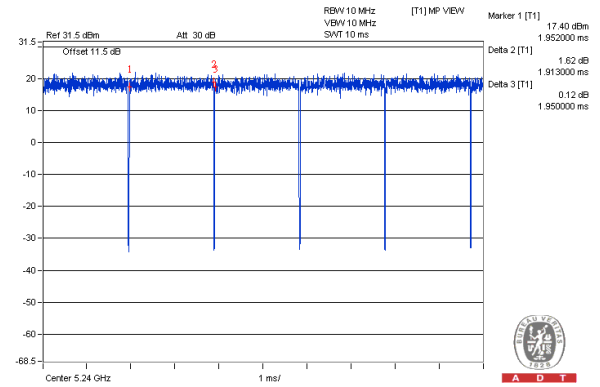
802.11n (HT40): Duty cycle = 0.919/0.992 =0.926, Duty factor = 10 * log(1/0.926) = 0.33

802.11ac (VHT80): Duty cycle = 0.455/0.495 =0.919, Duty factor = 10 * log(1/0.919) = 0.37

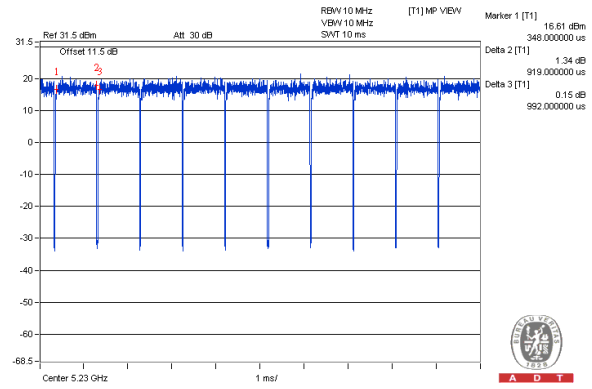
802.11a



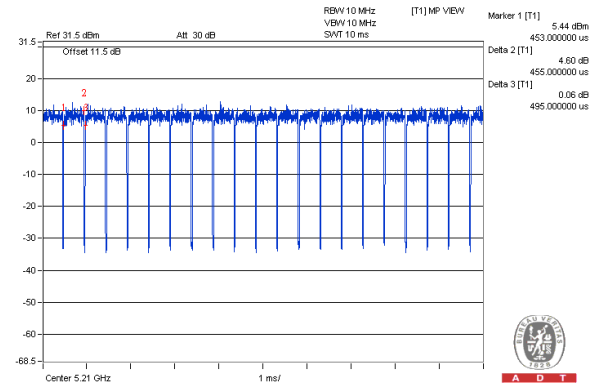
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



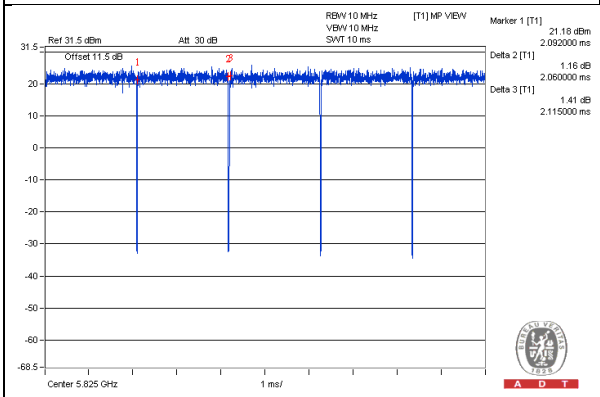
U-NII-3 Band

Duty cycle of test signal is ≥ 98 %, duty factor is not required.
802.11n (HT20): Duty cycle = 1.912/1.947 =0.982

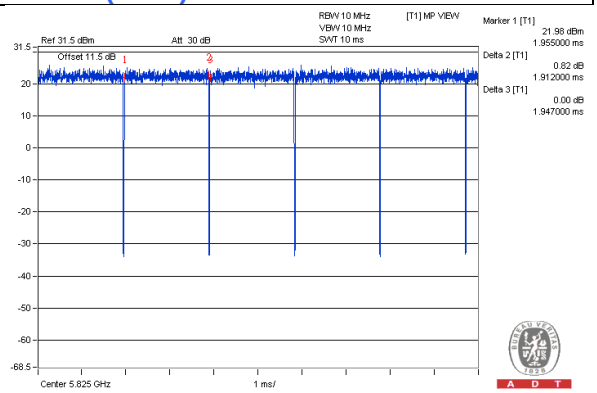
Duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = 2.060/2.115 =0.974, Duty factor = 10 * log(1/0.974) = 0.11
802.11n (HT40): Duty cycle = 0.937/0.982 =0.954, Duty factor = 10 * log(1/0.954) = 0.20
802.11ac (VHT80): Duty cycle = 0.450/0.493 =0.913, Duty factor = 10 * log(1/0.913) = 0.40

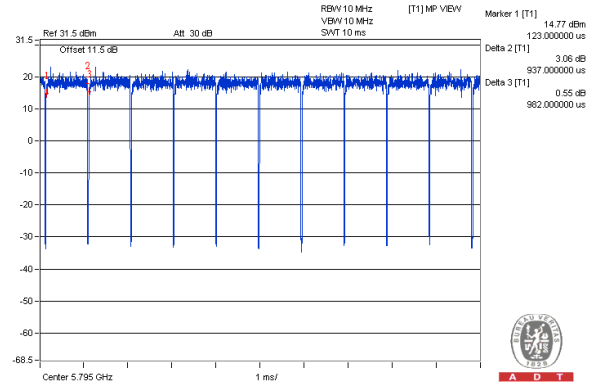
802.11a



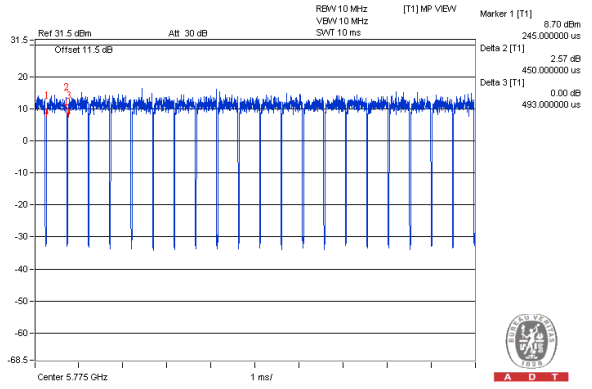
802.11n (HT20)



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.

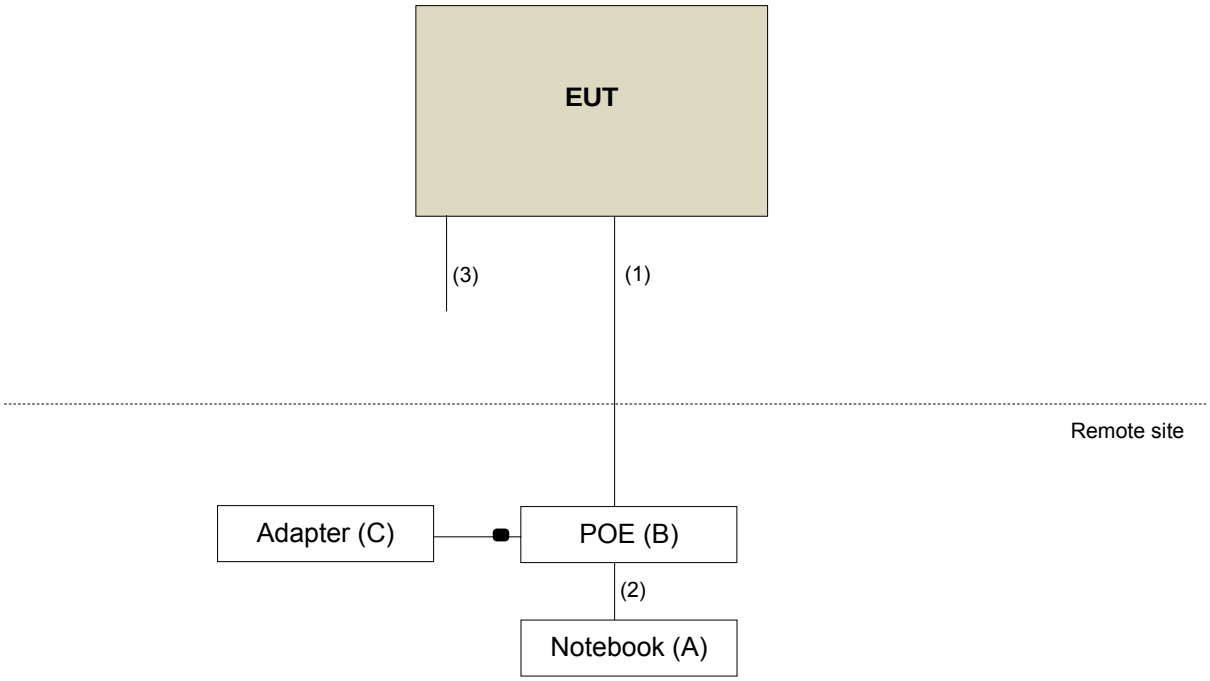
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	PoE	EnGenius	EPE-24GR	NA	NA	Provided by the manufacturer
C.	Adapter	Powertron Electronics Corp.	PA1024-4DU	NA	NA	Provided by the manufacturer

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	5	N	0	-
2.	RJ45 cable	1	1.8	N	0	-
3.	Ground line	1	1.75	N	0	Accessory

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
789033 D02 General UNII Test Procedure New Rules v01
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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.

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

NOTE:

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

LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

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

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

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 08, 2015	Jul. 07, 2016
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
Loop Antenna R&S	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2016
Preamplifier Agilent	8447D	2944A10738	Oct.18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
			Aug. 22, 2015	Aug. 21, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03(214378)	Aug. 22, 2014	Aug. 21, 2015
			Aug. 22, 2015	Aug. 21, 2016
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03(309224+ 12738)	Aug. 22, 2014	Aug. 21, 2015
			Aug. 22, 2015	Aug. 21, 2016
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
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The calibration interval of the loop antenna is 24 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 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 Procedure

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:

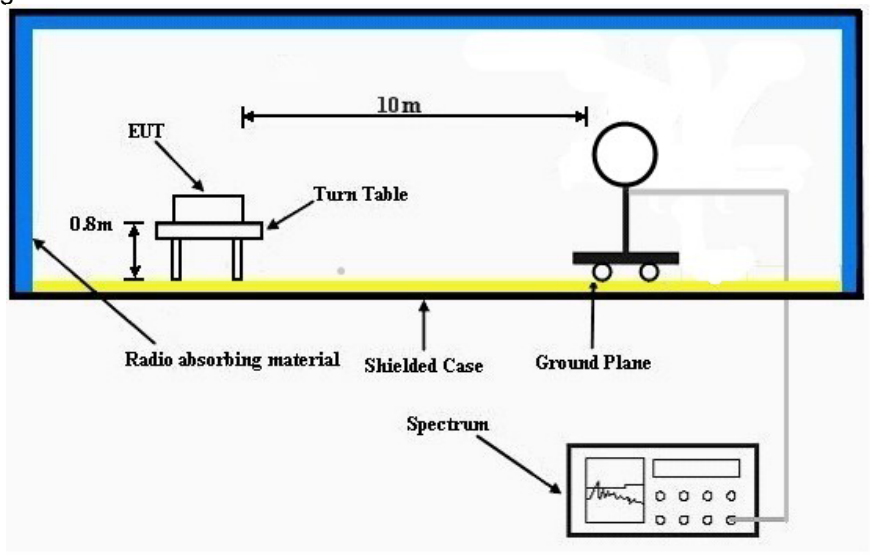
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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

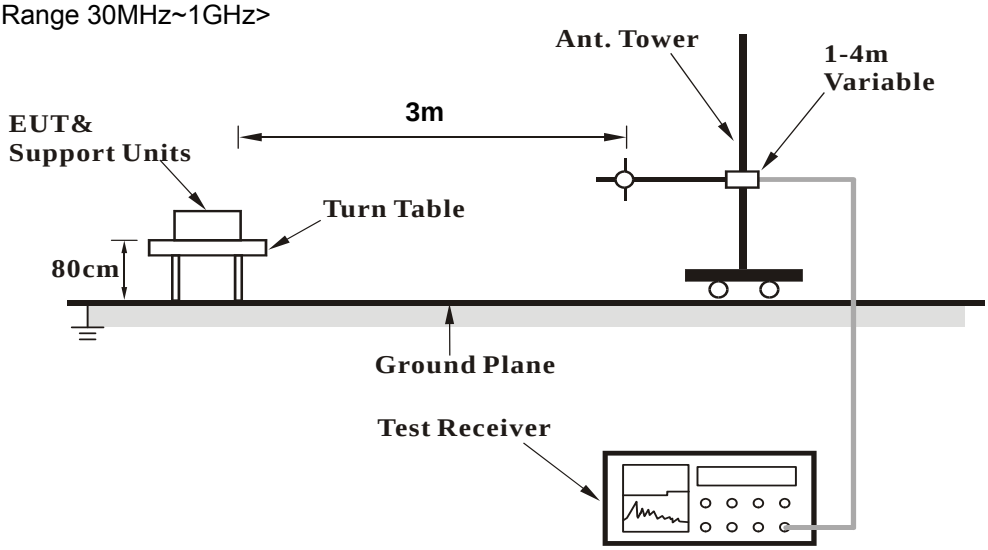
No deviation.

4.1.5 Test Setup

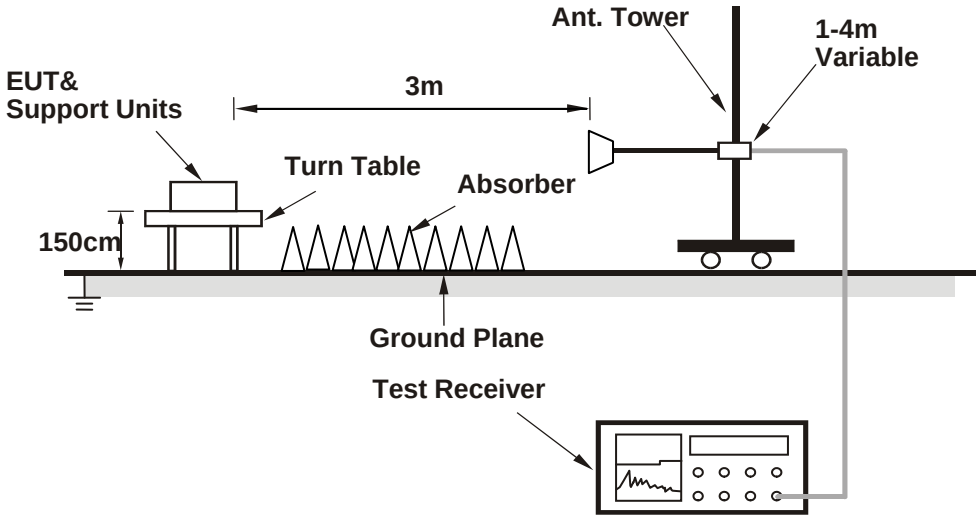
<Frequency Range below 30MHz>



<Frequency Range 30MHz~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 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	56.3 PK	74.0	-17.7	1.09 H	179	50.50	5.80
2	5100.00	43.8 AV	54.0	-10.2	1.09 H	179	38.00	5.80
3	*5180.00	100.0 PK			1.00 H	128	60.50	39.50
4	*5180.00	91.2 AV			1.00 H	128	51.70	39.50
5	#10360.00	59.8 PK	74.0	-14.2	1.18 H	106	41.40	18.40
6	#10360.00	47.3 AV	54.0	-6.7	1.18 H	106	28.90	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5100.00	64.0 PK	74.0	-10.0	2.08 V	253	58.20	5.80
2	5100.00	52.1 AV	54.0	-1.9	2.08 V	253	46.30	5.80
3	*5180.00	116.6 PK			1.87 V	83	77.10	39.50
4	*5180.00	107.5 AV			1.87 V	83	68.00	39.50
5	#10360.00	59.8 PK	74.0	-14.2	1.38 V	45	41.40	18.40
6	#10360.00	47.4 AV	54.0	-6.6	1.38 V	45	29.00	18.40

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5122.00	59.2 PK	74.0	-14.8	1.58 H	135	53.20	6.00
2	5122.00	46.4 AV	54.0	-7.6	1.58 H	135	40.40	6.00
3	*5200.00	99.9 PK			1.68 H	139	60.30	39.60
4	*5200.00	90.1 AV			1.68 H	139	50.50	39.60
5	#10400.00	60.7 PK	74.0	-13.3	1.22 H	33	42.20	18.50
6	#10400.00	47.6 AV	54.0	-6.4	1.22 H	33	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	5122.00	63.2 PK	74.0	-10.8	2.04 V	69	57.20	6.00
2	5122.00	53.0 AV	54.0	-1.0	2.04 V	69	47.00	6.00
3	*5200.00	114.2 PK			2.00 V	113	74.60	39.60
4	*5200.00	104.8 AV			2.00 V	113	65.20	39.60
5	#10400.00	61.0 PK	74.0	-13.0	1.61 V	103	42.50	18.50
6	#10400.00	47.9 AV	54.0	-6.1	1.61 V	103	29.40	18.50

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.9 PK	74.0	-16.1	1.40 H	176	51.90	6.00
2	5150.00	45.6 AV	54.0	-8.4	1.40 H	176	39.60	6.00
3	*5240.00	99.9 PK			1.54 H	137	60.30	39.60
4	*5240.00	90.1 AV			1.54 H	137	50.50	39.60
5	5350.00	59.1 PK	74.0	-14.9	1.50 H	320	53.00	6.10
6	5350.00	46.5 AV	54.0	-7.5	1.50 H	320	40.40	6.10
7	#10480.00	60.9 PK	74.0	-13.1	1.32 H	201	41.90	19.00
8	#10480.00	47.9 AV	54.0	-6.1	1.32 H	201	28.90	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	5078.00	62.1 PK	74.0	-11.9	1.99 V	101	56.30	5.80
2	5078.00	51.0 AV	54.0	-3.0	1.99 V	101	45.20	5.80
3	*5240.00	114.8 PK			1.90 V	102	75.20	39.60
4	*5240.00	105.3 AV			1.90 V	102	65.70	39.60
5	5400.00	64.0 PK	74.0	-10.0	2.04 V	116	57.70	6.30
6	5400.00	52.8 AV	54.0	-1.2	2.04 V	116	46.50	6.30
7	#5480.00	64.1 PK	68.2	-4.1	2.00 V	115	57.70	6.40
8	#10480.00	61.7 PK	74.0	-12.3	1.68 V	277	42.70	19.00
9	#10480.00	48.8 AV	54.0	-5.2	1.68 V	277	29.80	19.00

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) 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	#5714.00	58.8 PK	74.0	-15.2	1.35 H	299	52.00	6.80
2	#5714.00	46.8 AV	54.0	-7.2	1.35 H	299	40.00	6.80
3	#5722.00	64.6 PK	78.2	-13.6	1.38 H	202	57.80	6.80
4	#5725.00	56.9 PK	78.2	-21.3	1.38 H	202	50.10	6.80
5	*5745.00	101.9 PK			1.11 H	188	61.50	40.40
6	*5745.00	93.1 AV			1.11 H	188	52.70	40.40
7	11490.00	60.4 PK	74.0	-13.6	1.22 H	222	42.00	18.40
8	11490.00	47.6 AV	54.0	-6.4	1.22 H	222	29.20	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5583.00	66.3 PK	68.2	-1.9	1.98 V	195	59.70	6.60
2	#5722.00	76.6 PK	78.2	-1.6	1.96 V	15	69.80	6.80
3	#5725.00	62.6 PK	78.2	-15.6	1.96 V	15	55.80	6.80
4	*5745.00	114.0 PK			1.52 V	214	73.60	40.40
5	*5745.00	104.2 AV			1.52 V	214	63.80	40.40
6	11490.00	60.9 PK	74.0	-13.1	1.48 V	251	42.50	18.40
7	11490.00	47.7 AV	54.0	-6.3	1.48 V	251	29.30	18.40

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) 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	*5785.00	102.9 PK			1.09 H	146	62.40	40.50
2	*5785.00	93.6 AV			1.09 H	146	53.10	40.50
3	11570.00	60.4 PK	74.0	-13.6	1.26 H	176	42.00	18.40
4	11570.00	47.3 AV	54.0	-6.7	1.26 H	176	28.90	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5623.00	66.4 PK	68.2	-1.8	1.95 V	193	59.70	6.70
2	*5785.00	114.1 PK			2.14 V	218	73.60	40.50
3	*5785.00	103.8 AV			2.14 V	218	63.30	40.50
4	11570.00	60.5 PK	74.0	-13.5	1.70 V	192	42.10	18.40
5	11570.00	47.7 AV	54.0	-6.3	1.70 V	192	29.30	18.40

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) 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	*5825.00	102.3 PK			1.12 H	145	61.80	40.50
2	*5825.00	93.1 AV			1.12 H	145	52.60	40.50
3	#5850.00	55.9 PK	78.2	-22.3	1.22 H	148	49.00	6.90
4	#5853.00	62.0 PK	78.2	-16.2	1.22 H	148	55.00	7.00
5	#5861.00	57.8 PK	74.0	-16.2	1.24 H	200	50.80	7.00
6	#5861.00	46.9 AV	54.0	-7.1	1.24 H	200	39.90	7.00
7	11650.00	60.6 PK	74.0	-13.4	1.18 H	245	41.70	18.90
8	11650.00	47.5 AV	54.0	-6.5	1.18 H	245	28.60	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	#5663.00	66.3 PK	68.2	-1.9	1.98 V	223	59.50	6.80
2	*5825.00	116.4 PK			2.32 V	195	75.90	40.50
3	*5825.00	106.7 AV			2.32 V	195	66.20	40.50
4	#5850.00	59.1 PK	78.2	-19.1	2.50 V	68	52.20	6.90
5	#5853.00	69.4 PK	78.2	-8.8	2.50 V	68	62.40	7.00
6	#5986.00	62.6 PK	68.2	-5.6	2.66 V	255	55.50	7.10
7	11650.00	61.6 PK	74.0	-12.4	1.89 V	290	42.70	18.90
8	11650.00	48.5 AV	54.0	-5.5	1.89 V	290	29.60	18.90

REMARKS:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5020.00	55.9 PK	74.0	-18.1	1.02 H	132	50.20	5.70
2	5020.00	43.7 AV	54.0	-10.3	1.02 H	132	38.00	5.70
3	*5180.00	100.4 PK			1.09 H	148	60.90	39.50
4	*5180.00	90.9 AV			1.09 H	148	51.40	39.50
5	5420.00	57.1 PK	74.0	-16.9	1.10 H	150	50.80	6.30
6	5420.00	44.7 AV	54.0	-9.3	1.10 H	150	38.40	6.30
7	#10360.00	59.6 PK	74.0	-14.4	1.03 H	214	41.20	18.40
8	#10360.00	47.0 AV	54.0	-7.0	1.03 H	214	28.60	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5020.00	61.6 PK	74.0	-12.4	1.97 V	300	55.90	5.70
2	5020.00	51.0 AV	54.0	-3.0	1.97 V	300	45.30	5.70
3	*5180.00	115.8 PK			1.91 V	305	76.30	39.50
4	*5180.00	106.2 AV			1.91 V	305	66.70	39.50
5	5420.00	61.4 PK	74.0	-12.6	1.85 V	308	55.10	6.30
6	5420.00	51.2 AV	54.0	-2.8	1.85 V	308	44.90	6.30
7	#10360.00	60.2 PK	74.0	-13.8	1.77 V	253	41.80	18.40
8	#10360.00	47.2 AV	54.0	-6.8	1.77 V	253	28.80	18.40

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5122.00	56.9 PK	74.0	-17.1	1.65 H	66	50.90	6.00
2	5122.00	45.6 AV	54.0	-8.4	1.65 H	66	39.60	6.00
3	*5200.00	99.8 PK			1.71 H	138	60.20	39.60
4	*5200.00	89.2 AV			1.71 H	138	49.60	39.60
5	#10400.00	60.5 PK	74.0	-13.5	1.44 H	289	42.00	18.50
6	#10400.00	47.4 AV	54.0	-6.6	1.44 H	289	28.90	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	5122.00	62.8 PK	74.0	-11.2	2.04 V	64	56.80	6.00
2	5122.00	51.1 AV	54.0	-2.9	2.04 V	64	45.10	6.00
3	*5200.00	113.2 PK			2.00 V	105	73.60	39.60
4	*5200.00	104.4 AV			2.00 V	105	64.80	39.60
5	5360.00	64.6 PK	74.0	-9.4	2.08 V	300	58.50	6.10
6	5360.00	52.2 AV	54.0	-1.8	2.08 V	300	46.10	6.10
7	#10400.00	60.9 PK	74.0	-13.1	1.80 V	200	42.40	18.50
8	#10400.00	47.8 AV	54.0	-6.2	1.80 V	200	29.30	18.50

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.3 PK	74.0	-15.7	1.48 H	212	52.30	6.00
2	5150.00	46.6 AV	54.0	-7.4	1.48 H	212	40.60	6.00
3	*5240.00	100.4 PK			1.50 H	139	60.80	39.60
4	*5240.00	89.9 AV			1.50 H	139	50.30	39.60
5	5350.00	56.0 PK	74.0	-18.0	1.39 H	69	49.90	6.10
6	5350.00	44.9 AV	54.0	-9.1	1.39 H	69	38.80	6.10
7	#10480.00	60.5 PK	74.0	-13.5	1.40 H	202	41.50	19.00
8	#10480.00	47.6 AV	54.0	-6.4	1.40 H	202	28.60	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	5080.00	61.5 PK	74.0	-12.5	1.80 V	102	55.70	5.80
2	5080.00	50.6 AV	54.0	-3.4	1.80 V	102	44.80	5.80
3	*5240.00	116.2 PK			1.90 V	104	76.60	39.60
4	*5240.00	100.2 AV			1.90 V	104	60.60	39.60
5	5400.00	63.8 PK	74.0	-10.2	2.03 V	226	57.50	6.30
6	5400.00	52.4 AV	54.0	-1.6	2.03 V	226	46.10	6.30
7	#5480.00	63.9 PK	68.2	-4.3	1.99 V	114	57.50	6.40
8	#10480.00	61.0 PK	74.0	-13.0	1.77 V	129	42.00	19.00
9	#10480.00	48.3 AV	54.0	-5.7	1.77 V	129	29.30	19.00

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) 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	#5714.00	61.4 PK	74.0	-12.6	1.16 H	19	54.60	6.80
2	#5714.00	49.4 AV	54.0	-4.6	1.16 H	19	42.60	6.80
3	#5722.00	66.4 PK	78.2	-11.8	1.23 H	177	59.60	6.80
4	#5725.00	58.6 PK	78.2	-19.6	1.23 H	177	51.80	6.80
5	*5745.00	99.4 PK			1.22 H	186	59.00	40.40
6	*5745.00	90.0 AV			1.22 H	186	49.60	40.40
7	11490.00	60.3 PK	74.0	-13.7	1.03 H	122	41.90	18.40
8	11490.00	46.9 AV	54.0	-7.1	1.03 H	122	28.50	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5583.00	66.3 PK	68.2	-1.9	2.01 V	220	59.70	6.60
2	#5722.00	76.8 PK	78.2	-1.4	2.00 V	212	70.00	6.80
3	#5725.00	66.0 PK	78.2	-12.2	2.00 V	212	59.20	6.80
4	*5745.00	112.5 PK			1.94 V	215	72.10	40.40
5	*5745.00	101.9 AV			1.94 V	215	61.50	40.40
6	11490.00	60.6 PK	74.0	-13.4	1.73 V	222	42.20	18.40
7	11490.00	47.3 AV	54.0	-6.7	1.73 V	222	28.90	18.40

REMARKS:

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

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Peak (PK) 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	*5785.00	103.8 PK			1.08 H	145	63.30	40.50
2	*5785.00	94.3 AV			1.08 H	145	53.80	40.50
3	11570.00	59.8 PK	74.0	-14.2	1.19 H	170	41.40	18.40
4	11570.00	46.9 AV	54.0	-7.1	1.19 H	170	28.50	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5623.00	66.3 PK	68.2	-1.9	1.99 V	193	59.60	6.70
2	*5785.00	116.0 PK			2.21 V	196	75.50	40.50
3	*5785.00	104.5 AV			2.21 V	196	64.00	40.50
4	11570.00	61.0 PK	74.0	-13.0	1.90 V	239	42.60	18.40
5	11570.00	47.7 AV	54.0	-6.3	1.90 V	239	29.30	18.40

REMARKS:

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

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Peak (PK) 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	*5825.00	102.6 PK			1.09 H	145	62.10	40.50
2	*5825.00	93.0 AV			1.09 H	145	52.50	40.50
3	#5850.00	56.6 PK	78.2	-21.6	1.29 H	211	49.70	6.90
4	#5853.00	61.6 PK	78.2	-16.6	1.29 H	211	54.60	7.00
5	#5861.00	57.5 PK	74.0	-16.5	1.13 H	177	50.50	7.00
6	#5861.00	47.3 AV	54.0	-6.7	1.13 H	177	40.30	7.00
7	11650.00	60.6 PK	74.0	-13.4	1.05 H	299	41.70	18.90
8	11650.00	47.4 AV	54.0	-6.6	1.05 H	299	28.50	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	#5663.00	66.3 PK	68.2	-1.9	1.99 V	193	59.50	6.80
2	*5825.00	114.2 PK			2.28 V	183	73.70	40.50
3	*5825.00	103.6 AV			2.28 V	183	63.10	40.50
4	#5850.00	58.9 PK	78.2	-19.3	2.48 V	217	52.00	6.90
5	#5853.00	75.1 PK	78.2	-3.1	2.48 V	217	68.10	7.00
6	#5986.00	64.4 PK	68.2	-3.8	2.52 V	226	57.30	7.10
7	11650.00	61.1 PK	74.0	-12.9	1.80 V	177	42.20	18.90
8	11650.00	48.2 AV	54.0	-5.8	1.80 V	177	29.30	18.90

REMARKS:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.2 PK	74.0	-15.8	1.50 H	189	52.20	6.00
2	5150.00	46.1 AV	54.0	-7.9	1.50 H	189	40.10	6.00
3	*5190.00	97.4 PK			1.50 H	136	57.90	39.50
4	*5190.00	86.4 AV			1.50 H	136	46.90	39.50
5	#10380.00	60.1 PK	74.0	-13.9	1.23 H	321	41.60	18.50
6	#10380.00	46.9 AV	54.0	-7.1	1.23 H	321	28.40	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	5150.00	71.1 PK	74.0	-2.9	1.95 V	106	65.10	6.00
2	5150.00	52.1 AV	54.0	-1.9	1.95 V	106	46.10	6.00
3	*5190.00	111.0 PK			1.75 V	108	71.50	39.50
4	*5190.00	101.1 AV			1.75 V	108	61.60	39.50
5	#10380.00	60.6 PK	74.0	-13.4	1.65 V	136	42.10	18.50
6	#10380.00	47.4 AV	54.0	-6.6	1.65 V	136	28.90	18.50

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.6 PK	74.0	-17.4	1.48 H	222	50.60	6.00
2	5150.00	45.0 AV	54.0	-9.0	1.48 H	222	39.00	6.00
3	*5230.00	98.5 PK			1.48 H	133	58.90	39.60
4	*5230.00	88.1 AV			1.48 H	133	48.50	39.60
5	#10460.00	60.6 PK	74.0	-13.4	1.28 H	100	41.70	18.90
6	#10460.00	47.2 AV	54.0	-6.8	1.28 H	100	28.30	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	5150.00	63.6 PK	74.0	-10.4	2.02 V	94	57.60	6.00
2	5150.00	52.6 AV	54.0	-1.4	2.02 V	94	46.60	6.00
3	*5230.00	114.0 PK			1.83 V	115	74.40	39.60
4	*5230.00	104.0 AV			1.83 V	115	64.40	39.60
5	#10460.00	61.1 PK	74.0	-12.9	1.56 V	126	42.20	18.90
6	#10460.00	47.7 AV	54.0	-6.3	1.56 V	126	28.80	18.90

REMARKS:

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

CHANNEL	TX Channel 151	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	#5714.90	59.8 PK	74.0	-14.2	1.16 H	154	53.00	6.80
2	#5714.90	45.0 AV	54.0	-9.0	1.16 H	154	38.20	6.80
3	#5722.90	65.7 PK	78.2	-12.5	1.08 H	155	58.90	6.80
4	#5725.00	49.3 PK	78.2	-28.9	1.05 H	157	42.50	6.80
5	*5755.00	97.0 PK			1.00 H	155	56.50	40.50
6	*5755.00	87.6 AV			1.00 H	155	47.10	40.50
7	11510.00	58.9 PK	74.0	-15.1	1.08 H	78	40.60	18.30
8	11510.00	46.1 AV	54.0	-7.9	1.08 H	78	27.80	18.30
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	#5714.90	69.5 PK	74.0	-4.5	1.80 V	308	62.70	6.80
2	#5714.90	52.2 AV	54.0	-1.8	1.80 V	308	45.40	6.80
3	#5722.90	77.0 PK	78.2	-1.2	1.81 V	306	70.20	6.80
4	#5725.00	57.0 PK	78.2	-21.2	1.78 V	315	50.20	6.80
5	*5755.00	108.0 PK			1.77 V	312	67.50	40.50
6	*5755.00	99.2 AV			1.77 V	312	58.70	40.50
7	11510.00	58.2 PK	74.0	-15.8	1.61 V	240	39.90	18.30
8	11510.00	45.9 AV	54.0	-8.1	1.61 V	240	27.60	18.30

REMARKS:

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

CHANNEL	TX Channel 159	DETECTOR FUNCTION	Peak (PK) 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	*5795.00	97.9 PK			1.00 H	152	57.40	40.50
2	*5795.00	88.8 AV			1.00 H	152	48.30	40.50
3	#5850.00	45.5 PK	78.2	-32.7	1.07 H	146	38.60	6.90
4	#5852.10	58.5 PK	78.2	-19.7	1.05 H	152	51.50	7.00
5	#5860.10	57.4 PK	74.0	-16.6	1.12 H	126	50.40	7.00
6	#5860.10	45.3 AV	54.0	-8.7	1.12 H	126	38.30	7.00
7	11590.00	59.0 PK	74.0	-15.0	1.04 H	211	40.50	18.50
8	11590.00	46.4 AV	54.0	-7.6	1.04 H	211	27.90	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	*5795.00	110.0 PK			2.03 V	120	69.50	40.50
2	*5795.00	99.5 AV			2.03 V	120	59.00	40.50
3	#5850.00	51.4 PK	78.2	-26.8	1.10 V	307	44.50	6.90
4	#5852.10	68.7 PK	78.2	-9.5	1.21 V	310	61.70	7.00
5	#5860.10	68.0 PK	74.0	-6.0	1.07 V	309	61.00	7.00
6	#5860.10	52.3 AV	54.0	-1.7	1.07 V	309	45.30	7.00
7	11590.00	59.0 PK	74.0	-15.0	1.88 V	54	40.50	18.50
8	11590.00	46.6 AV	54.0	-7.4	1.88 V	54	28.10	18.50

REMARKS:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.6 PK	74.0	-14.4	1.58 H	89	53.60	6.00
2	5150.00	47.1 AV	54.0	-6.9	1.58 H	89	41.10	6.00
3	*5210.00	91.1 PK			1.61 H	136	51.50	39.60
4	*5210.00	81.2 AV			1.61 H	136	41.60	39.60
5	#10420.00	59.9 PK	74.0	-14.1	1.30 H	33	41.30	18.60
6	#10420.00	46.6 AV	54.0	-7.4	1.30 H	33	28.00	18.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.5 PK	74.0	-8.5	1.95 V	98	59.50	6.00
2	5150.00	52.1 AV	54.0	-1.9	1.95 V	98	46.10	6.00
3	*5210.00	105.5 PK			1.91 V	113	65.90	39.60
4	*5210.00	96.1 AV			1.91 V	113	56.50	39.60
5	#5788.00	62.8 PK	68.2	-5.4	2.23 V	77	55.90	6.90
6	#10420.00	60.1 PK	74.0	-13.9	1.63 V	123	41.50	18.60
7	#10420.00	47.1 AV	54.0	-6.9	1.63 V	123	28.50	18.60

REMARKS:

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

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) 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	#5714.90	57.0 PK	74.0	-17.0	1.18 H	153	50.20	6.80
2	#5714.90	45.0 AV	54.0	-9.0	1.18 H	153	38.20	6.80
3	#5722.90	56.2 PK	78.2	-22.0	1.25 H	166	49.40	6.80
4	#5725.00	44.6 PK	78.2	-33.6	1.15 H	150	37.80	6.80
5	*5775.00	92.3 PK			1.00 H	153	51.80	40.50
6	*5775.00	83.1 AV			1.00 H	153	42.60	40.50
7	#5850.00	45.3 PK	78.2	-32.9	1.05 H	149	38.40	6.90
8	#5852.10	58.2 PK	78.2	-20.0	1.19 H	158	51.20	7.00
9	#5860.10	58.4 PK	74.0	-15.6	1.10 H	150	51.40	7.00
10	#5860.10	44.9 AV	54.0	-9.1	1.10 H	150	37.90	7.00
11	11550.00	58.6 PK	74.0	-15.4	1.04 H	97	40.20	18.40
12	11550.00	47.1 AV	54.0	-6.9	1.04 H	97	28.70	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	69.9 PK	74.0	-4.1	2.25 V	93	63.10	6.80
2	#5714.90	52.9 AV	54.0	-1.1	2.25 V	93	46.10	6.80
3	#5722.90	72.8 PK	78.2	-5.4	2.19 V	94	66.00	6.80
4	#5725.00	55.4 PK	78.2	-22.8	2.18 V	93	48.60	6.80
5	*5775.00	105.6 PK			2.26 V	84	65.10	40.50
6	*5775.00	95.5 AV			2.26 V	84	55.00	40.50
7	#5850.00	47.8 PK	78.2	-30.4	1.00 V	95	40.90	6.90
8	#5852.10	63.5 PK	78.2	-14.7	1.00 V	126	56.50	7.00
9	#5860.10	62.8 PK	74.0	-11.2	1.01 V	136	55.80	7.00
10	#5860.10	47.7 AV	54.0	-6.3	1.01 V	136	40.70	7.00
11	11550.00	58.6 PK	74.0	-15.4	1.82 V	94	40.20	18.40
12	11550.00	47.0 AV	54.0	-7.0	1.82 V	94	28.60	18.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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: 802.11n (20MHz)

CHANNEL	TX Channel 165	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	27.4 QP	40.0	-12.6	2.00 H	104	42.80	-15.40
2	57.12	30.8 QP	40.0	-9.2	2.00 H	290	45.60	-14.80
3	99.89	35.0 QP	43.5	-8.5	2.00 H	261	53.90	-18.90
4	140.72	24.7 QP	43.5	-18.8	2.00 H	278	39.30	-14.60
5	255.44	21.0 QP	46.0	-25.0	1.00 H	135	35.20	-14.20
6	323.49	25.8 QP	46.0	-20.2	1.00 H	145	37.50	-11.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.51	35.7 QP	40.0	-4.3	1.00 V	288	50.90	-15.20
2	**59.06**	**39.0 QP**	**40.0**	**-1.0**	**1.00 V**	**6**	**53.80**	**-14.80**
3	68.29	35.6 QP	40.0	-4.4	1.00 V	30	51.60	-16.00
4	99.89	30.6 QP	43.5	-12.9	1.99 V	207	49.50	-18.90
5	140.72	29.1 QP	43.5	-14.4	1.00 V	6	43.70	-14.60
6	323.49	26.1 QP	46.0	-19.9	1.49 V	151	37.80	-11.70

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCS 30	100288	Apr. 27, 2015	Apr. 26, 2016
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	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. 21, 2015	Jul. 20, 2016
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 Procedure

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

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

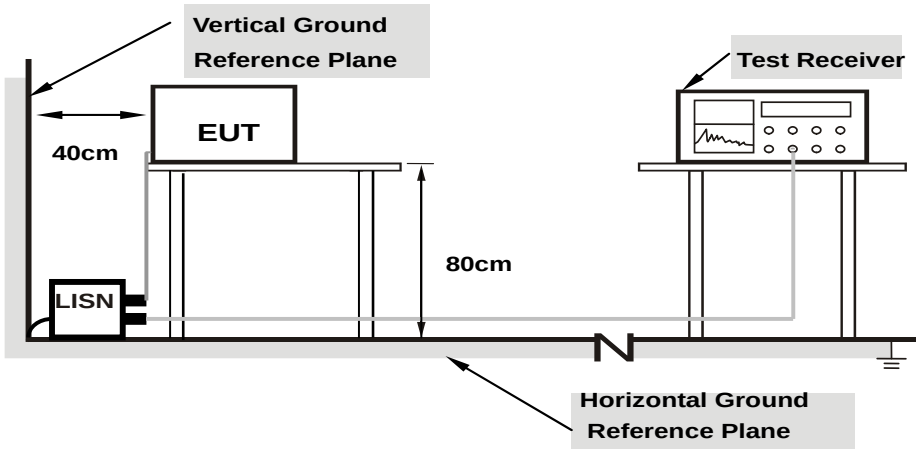
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: 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.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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.

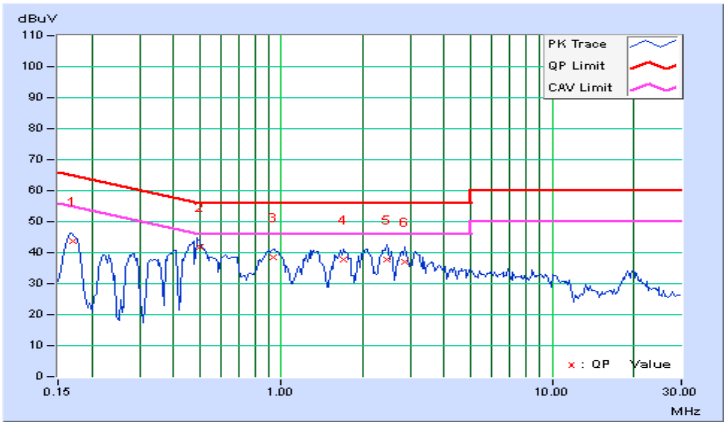
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [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	0.16945	9.94	33.77	26.62	43.71	36.56	64.99	54.99	-21.28	-18.43
2	**0.50001**	**9.97**	**32.02**	**23.93**	**41.99**	**33.90**	**56.00**	**46.00**	**-14.01**	**-12.10**
3	0.93761	10.05	28.57	18.78	38.62	28.83	56.00	46.00	-17.38	-17.17
4	1.70703	10.13	27.65	17.61	37.78	27.74	56.00	46.00	-18.22	-18.26
5	2.44141	10.18	27.61	18.41	37.79	28.59	56.00	46.00	-18.21	-17.41
6	2.85156	10.20	26.88	18.20	37.08	28.40	56.00	46.00	-18.92	-17.60

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.

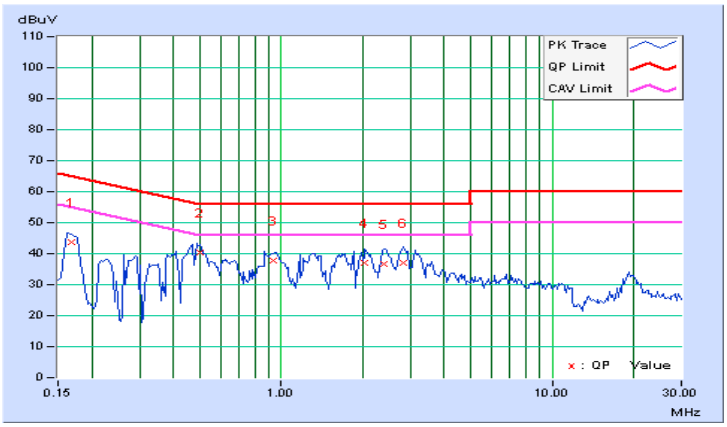


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16817	9.96	33.82	25.65	43.78	35.61	65.05	55.05	-21.27	-19.44
2	0.50156	10.01	30.48	22.31	40.49	32.32	56.00	46.00	-15.51	-13.68
3	0.93706	10.07	27.54	18.29	37.61	28.36	56.00	46.00	-18.39	-17.64
4	2.03906	10.20	26.94	17.07	37.14	27.27	56.00	46.00	-18.86	-18.73
5	2.40234	10.22	26.61	17.37	36.83	27.59	56.00	46.00	-19.17	-18.41
6	2.80859	10.24	26.98	17.81	37.22	28.05	56.00	46.00	-18.78	-17.95

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 Measurement

4.3.1 Limits of Transmit Power Measurement

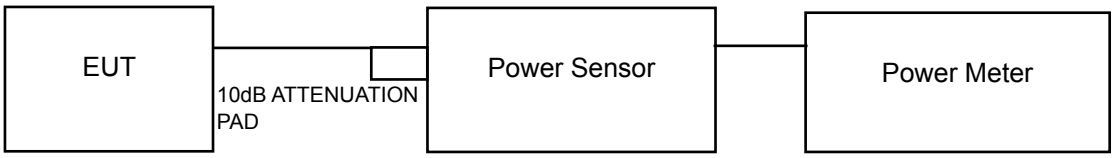
Operation Band	EUT Category		LIMIT
U-NII-1	√	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client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

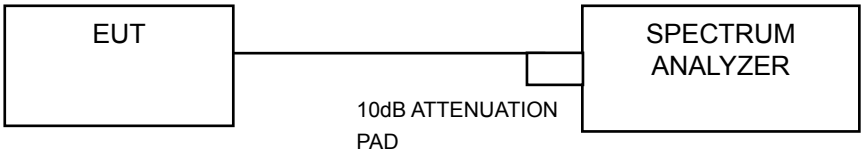
*B is the 26 dB emission bandwidth in megahertz

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

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

4.3.2 Test Setup





4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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)

1) Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
2) Set sweep trigger to “free run”.
3) Set RBW = 1 MHz.
4) Set VBW ≥ 3 MHz
5) Number of points in sweep ≥ 2 Span / RBW.
6) Sweep time ≤ (number of points in sweep) * T
7) Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
8) Detector = RMS.
9) Trace mode = max hold.
10) 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:

For U-NII-1 Band (Outdoor Access Point)

802.11a

Chan.	Freq. (MHz)	Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	17.49	17.11	107.509	20.31	29.00	-2.3339	17.98	21.00	Pass
40	5200	14.41	14.21	53.969	17.32	29.00	-2.3339	14.99	21.00	Pass
48	5240	14.71	14.50	57.764	17.62	29.00	-2.3339	15.29	21.00	Pass

Note:
Gain = 7.00 dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.
Gain = -2.3339dBi (above 30 degrees from the horizon),
EIRP = conducted power +(-2.3339dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11n (HT20)

Chan.	Freq. (MHz)	Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
36	5180	18.42	17.80	**129.758**	21.13	29.00	-2.3339	18.80	21.00	Pass
40	5200	15.19	14.82	63.376	18.02	29.00	-2.3339	15.69	21.00	Pass
48	5240	15.37	14.78	64.496	18.10	29.00	-2.3339	15.77	21.00	Pass

Note:
Gain = 7.00 dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.
Gain = -2.3339dBi (above 30 degrees from the horizon),
EIRP = conducted power +(-2.3339dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11n (HT40)

Chan.	Freq. (MHz)	Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
38	5190	15.69	15.20	70.181	18.46	29.00	-2.3339	16.13	21.00	Pass
46	5230	17.13	16.96	101.301	20.06	29.00	-2.3339	17.73	21.00	Pass

Note:
Gain = 7.00 dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.
Gain = -2.3339dBi (above 30 degrees from the horizon),
EIRP = conducted power +(-2.3339dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

802.11ac (VHT80)

Chan.	Freq. (MHz)	Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Gain (dBi)	EIRP (dBm)	EIRP limit (dBm)	Pass / Fail
		Chain 0	Chain 1							
42	5210	12.03	12.08	32.103	15.07	29.00	-2.3339	12.74	21.00	Pass

Note:
Gain = 7.00 dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.
Gain = -2.3339dBi (above 30 degrees from the horizon),
EIRP = conducted power +(-2.3339dBi) + array gain = (0 dB (i.e., no array gain) for $N_{ANT} \leq 4$).

For U-NII-3 Band

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	18.31	17.98	130.57	21.16	29.00	Pass
157	5785	18.43	18.19	135.58	21.32	29.00	Pass
165	5825	19.10	18.81	157.316	21.97	29.00	Pass

Note: Gain =7.00dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.

802.11n (HT20)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
149	5745	17.96	17.36	116.967	20.68	29.00	Pass
157	5785	19.28	18.93	162.886	22.12	29.00	Pass
165	5825	19.93	19.62	**190.023**	22.79	29.00	Pass

Note: Gain =7.00dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.

802.11n (HT40)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
151	5755	17.39	16.74	102.034	20.09	29.00	Pass
159	5795	18.74	18.19	140.734	21.48	29.00	Pass

Note: Gain =7.00dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
155	5775	15.33	15.24	67.539	18.30	29.00	Pass

Note: Gain =7.00dBi > 6dBi, so the power limit shall be reduced to 30-(7.00-6) = 29.00dBm.

26dB BANDWIDTH:

802.11a

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	20.55	20.62	Pass
40	5200	20.36	20.53	Pass
48	5240	20.51	20.51	Pass

802.11n (HT20)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	20.92	20.46	Pass
40	5200	20.84	20.63	Pass
48	5240	20.75	20.44	Pass

802.11n (HT40)

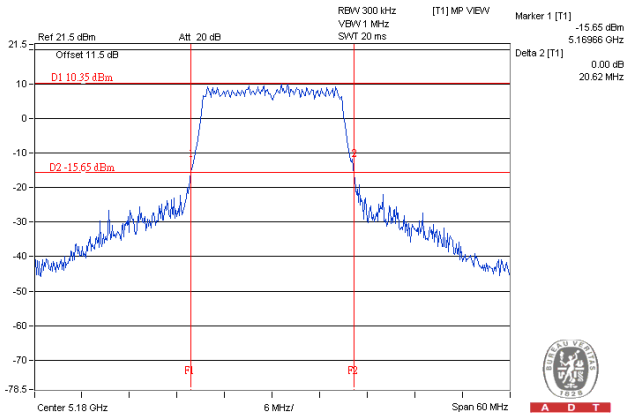
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	41.48	41.07	Pass
46	5230	41.78	41.01	Pass

802.11ac (VHT80)

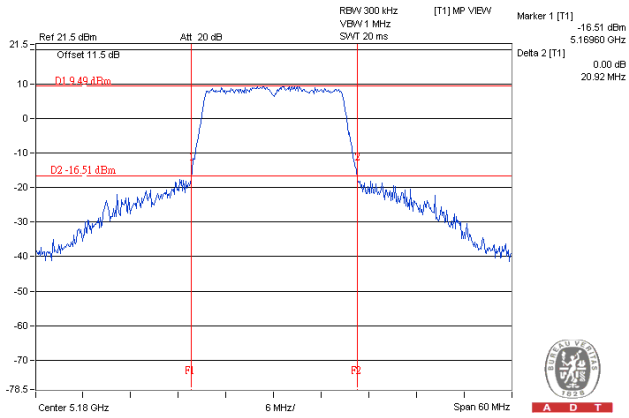
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	83.22	82.42	Pass

SPECTRUM PLOT OF WORST VALUE

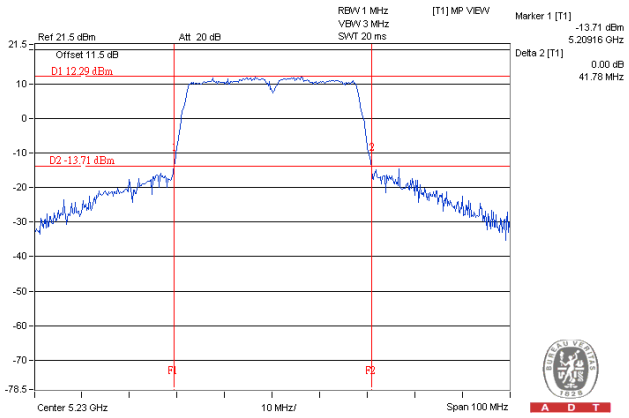
802.11a



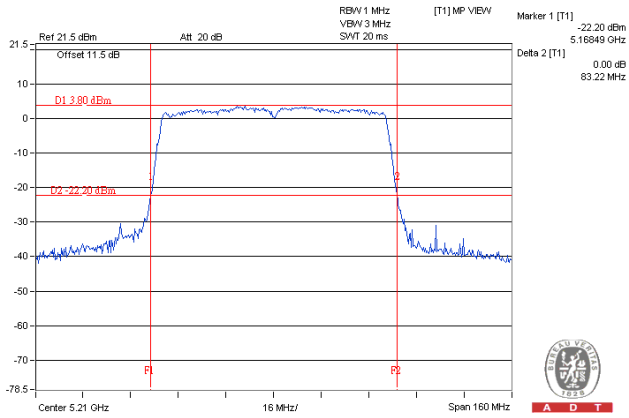
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



Occupied Bandwidth:

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	16.80	18.00	Pass
40	5200	16.80	17.88	Pass
48	5240	16.80	16.68	Pass
149	5745	16.80	16.68	Pass
157	5785	16.92	16.68	Pass
165	5825	16.68	16.80	Pass

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	17.88	17.88	Pass
40	5200	17.88	17.76	Pass
48	5240	17.88	17.88	Pass
149	5745	17.76	17.88	Pass
157	5785	17.88	17.88	Pass
165	5825	17.88	17.88	Pass

802.11n (HT40)

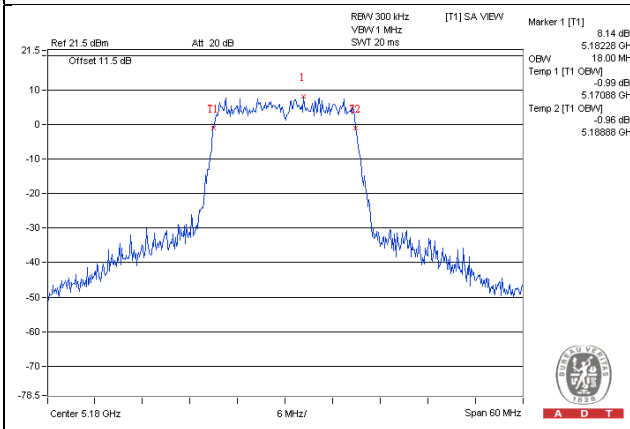
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	36.60	36.72	Pass
46	5230	36.72	36.72	Pass
151	5755	36.60	36.60	Pass
159	5795	36.72	36.60	Pass

802.11ac (VHT80)

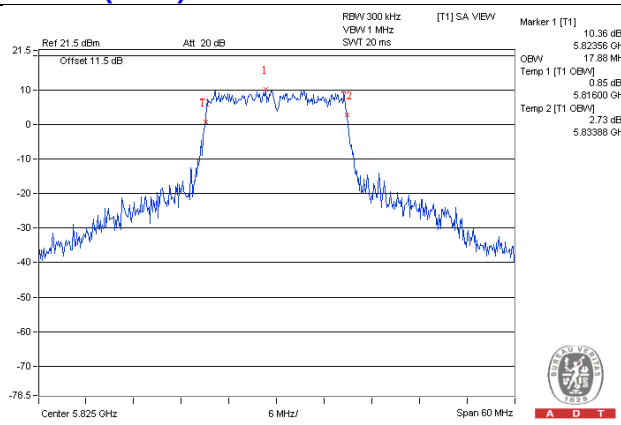
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	75.88	75.88	Pass
155	5775	75.88	75.88	Pass

SPECTRUM PLOT OF WORST VALUE

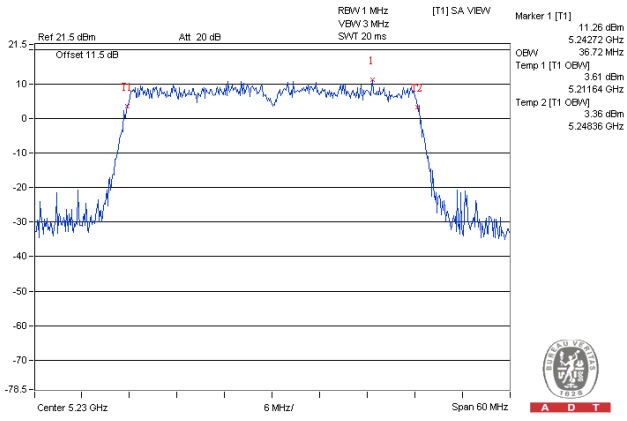
802.11a



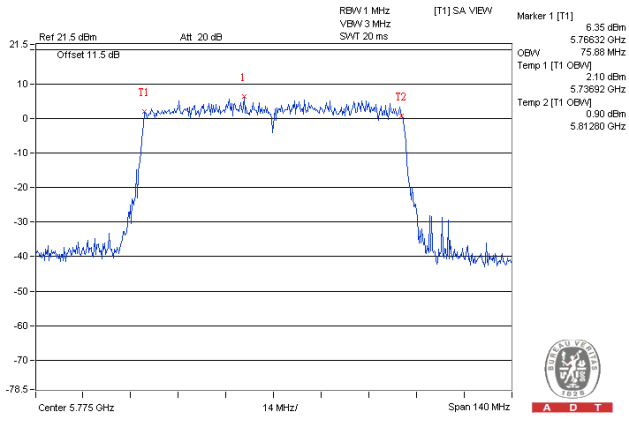
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

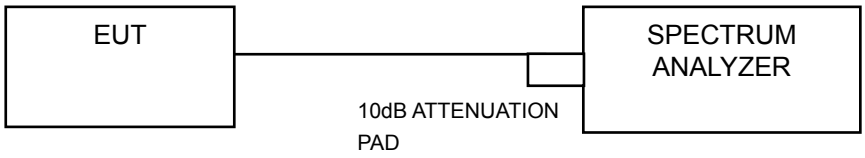


4.4 Peak Power Spectral Density Measurement

4.4.1 Limits of Peak Power Spectral Density Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For U-NII-1 band:

802.11a & 802.11n (HT20)

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

802.11n (HT40) & 802.11ac (VHT80)

Using method SA-2 alternative
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3) Set Channel power measure = 1MHz
4) Sweep time =20ms.
5) Perform a single sweep.
6) Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	4.39	3.78	7.11	12.99	Pass
40	5200	1.79	1.34	4.58	12.99	Pass
48	5240	1.63	1.59	4.62	12.99	Pass

NOTE:
1. Directional gain = 7.00dBi + 10log(2) = 10.01dBi > 6dBi, so the power density limit shall be reduced to 17-(10.01-6) = 12.99dBm.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD (dBm)		Total PSD (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1			
36	5180	4.94	4.62	7.87	12.99	Pass
40	5200	1.85	1.70	4.86	12.99	Pass
48	5240	2.07	1.76	5.00	12.99	Pass

NOTE:
1. Directional gain = 7.00dBi + 10log(2) = 10.01dBi > 6dBi, so the power density limit shall be reduced to 17-(10.01-6) = 12.99dBm.

802.11n (HT40)

Chan.	Freq. (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					
38	5190	-0.86	-1.04	2.07	0.33	2.40	12.99	Pass
46	5230	1.06	0.77	3.93	0.33	4.26	12.99	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 = 7.00dBi + 10log(2) = 10.01dBi > 6dBi, so the power density limit shall be reduced to 17-(10.01-6) = 12.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

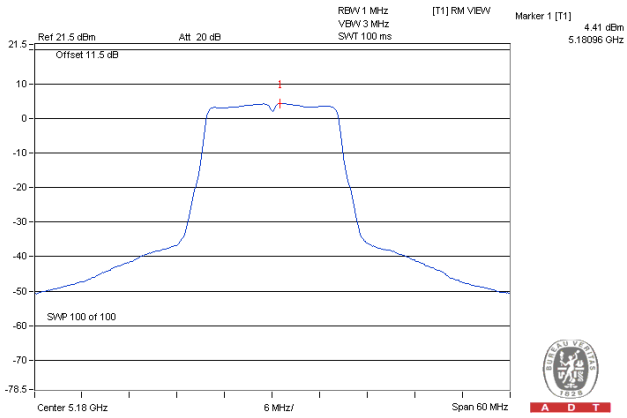
802.11ac (VHT80)

Chan.	Freq. (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					
42	5210	-7.53	-7.35	-4.43	0.37	-4.06	12.99	Pass

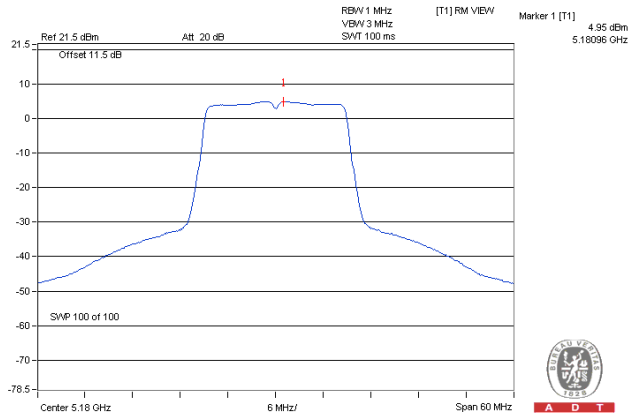
NOTE:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 7.00dBi + 10log(2) = 10.01dBi > 6dBi, so the power density limit shall be reduced to 17-(10.01-6) = 12.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

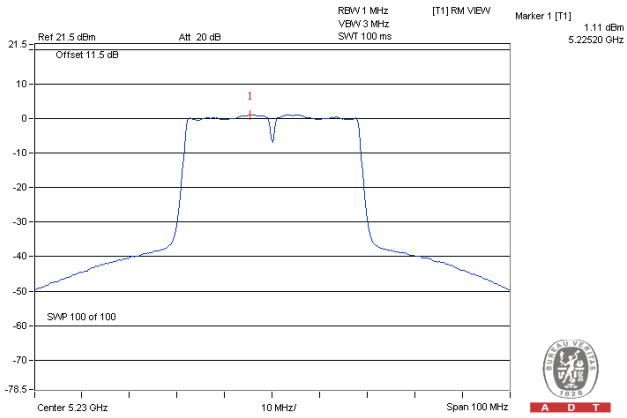
802.11a / CH 36 / Chain 0



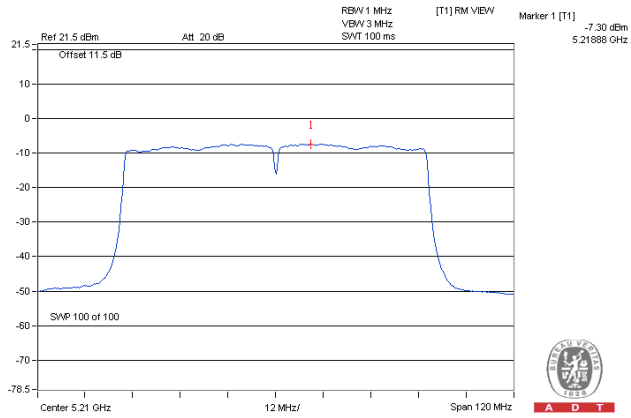
802.11n (HT20) / CH 36 / Chain 0



802.11n (HT40) / CH 46 / Chain 0



802.11ac (VHT80) / CH 42 / Chain 1



For U-NII-3 Band

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-2.51	-0.29	3.01	0.11	2.83	25.99	Pass
	157	5785	-2.36	-0.14	3.01	0.11	2.98	25.99	Pass
	165	5825	-1.87	0.35	3.01	0.11	3.47	25.99	Pass
1	149	5745	-3.36	-1.14	3.01	0.11	1.98	25.99	Pass
	157	5785	-3.44	-1.22	3.01	0.11	1.90	25.99	Pass
	165	5825	-2.79	-0.57	3.01	0.11	2.55	25.99	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 = 7.00dBi + 10log(3) = 10.01 dBi > 6dBi, so the power density limit shall be reduced to 30-(10.01-6) = 25.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-3.36	-1.14	3.01	1.87	25.99	Pass
	157	5785	-2.02	0.20	3.01	3.21	25.99	Pass
	165	5825	-1.44	0.78	3.01	3.79	25.99	Pass
1	149	5745	-4.44	-2.22	3.01	0.79	25.99	Pass
	157	5785	-3.06	-0.84	3.01	2.17	25.99	Pass
	165	5825	-2.55	-0.33	3.01	2.68	25.99	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 = 7.00dBi + 10log(3) = 10.01 dBi > 6dBi, so the power density limit shall be reduced to 30-(10.01-6) = 25.99dBm.

802.11n (HT40)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-7.27	-5.05	3.01	0.20	-1.84	25.99	Pass
	159	5795	-6.06	-3.84	3.01	0.20	-0.63	25.99	Pass
1	151	5755	-8.30	-6.08	3.01	0.20	-2.87	25.99	Pass
	159	5795	-7.21	-4.99	3.01	0.20	-1.78	25.99	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 = 7.00dBi + 10log(3) = 10.01 dBi > 6dBi, so the power density limit shall be reduced to 30-(10.01-6) = 25.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

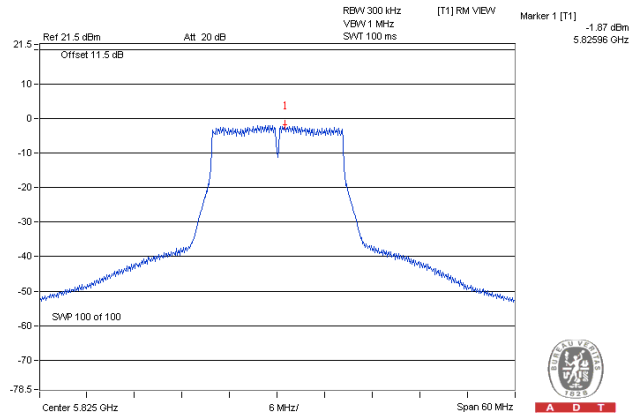
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Duty factor	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-12.51	-10.29	3.01	0.40	-6.88	25.99	Pass
1	155	5775	-13.20	-10.98	3.01	0.40	-7.57	25.99	Pass

NOTE:

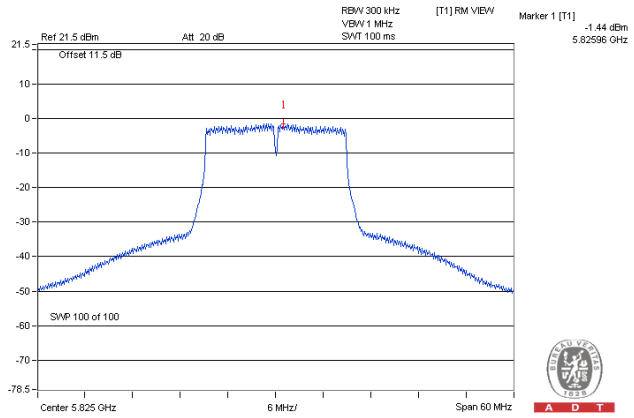
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 7.00dBi + 10log(3) = 10.01 dBi > 6dBi, so the power density limit shall be reduced to 30-(10.01-6) = 25.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

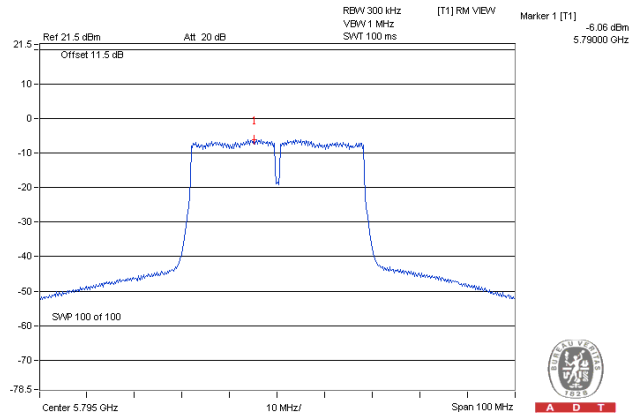
802.11a



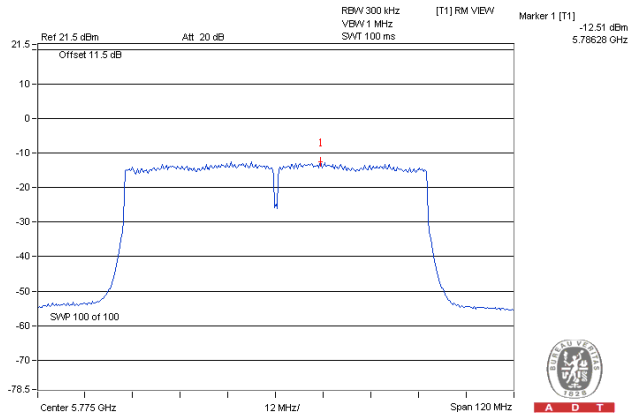
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

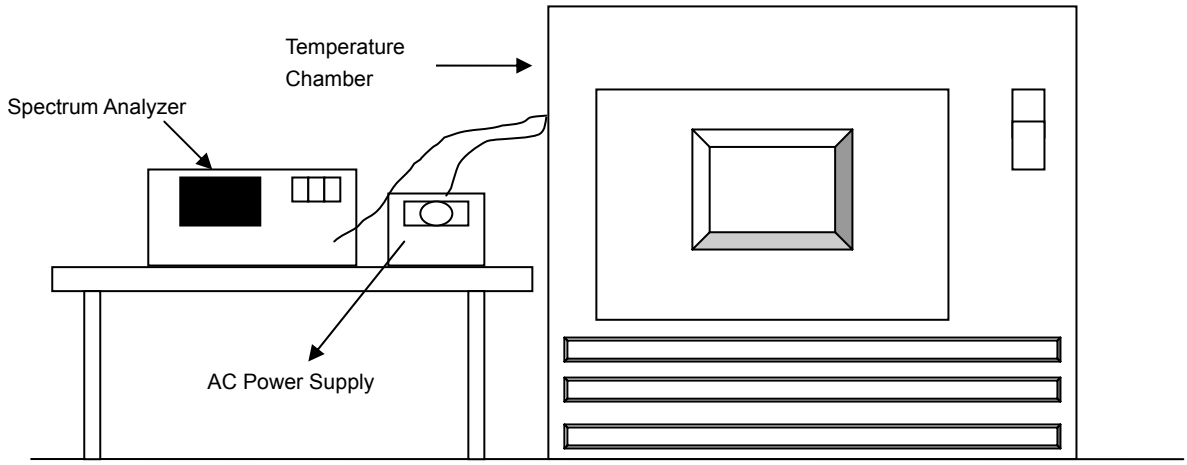


4.5 Frequency Stability

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 DC 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: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5180.0118	0.00023	5180.0149	0.00029	5180.0115	0.00022	5180.0124	0.00024
40	120	5179.9802	-0.00038	5179.9816	-0.00036	5179.9846	-0.00030	5179.9853	-0.00028
30	120	5179.9813	-0.00036	5179.9822	-0.00034	5179.9801	-0.00038	5179.9807	-0.00037
20	120	5179.9982	-0.00003	5179.9985	-0.00003	5179.9977	-0.00004	5179.9972	-0.00005
10	120	5180.0196	0.00038	5180.0226	0.00044	5180.0225	0.00043	5180.0206	0.00040
0	120	5180.0189	0.00036	5180.0179	0.00035	5180.0146	0.00028	5180.0176	0.00034
-10	120	5179.9833	-0.00032	5179.9812	-0.00036	5179.9797	-0.00039	5179.9823	-0.00034
-20	120	5180.0052	0.00010	5180.0072	0.00014	5180.0046	0.00009	5180.0041	0.00008
-30	120	5180.0235	0.00045	5180.0223	0.00043	5180.0189	0.00036	5180.0220	0.00042

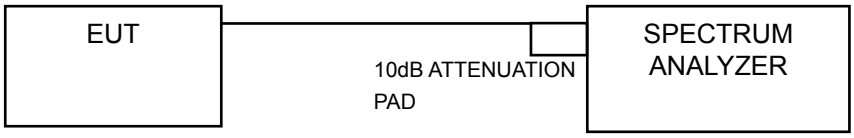
FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
TEMP. (℃)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5179.9991	-0.00002	5179.9976	-0.00005	5179.9973	-0.00005	5179.9963	-0.00007
	120	5179.9982	-0.00003	5179.9985	-0.00003	5179.9977	-0.00004	5179.9972	-0.00005
	102	5179.9979	-0.00004	5179.9985	-0.00003	5179.9987	-0.00003	5179.9964	-0.00007

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.41	16.46	0.5	Pass
157	5785	16.41	16.44	0.5	Pass
165	5825	16.43	16.44	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.65	17.68	0.5	Pass
157	5785	17.63	17.68	0.5	Pass
165	5825	17.63	17.66	0.5	Pass

802.11n (HT40)

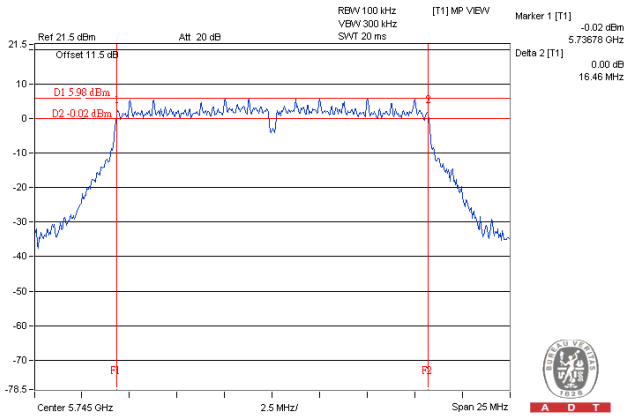
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.42	36.46	0.5	Pass
159	5795	36.44	36.48	0.5	Pass

802.11ac (VHT80)

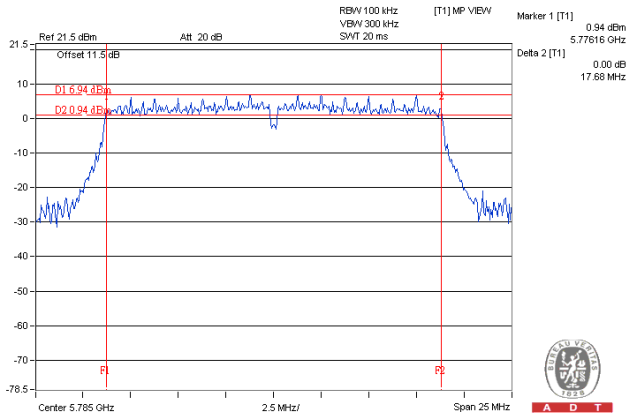
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.97	76.42	0.5	Pass

SPECTRUM PLOT OF WORST VALUE

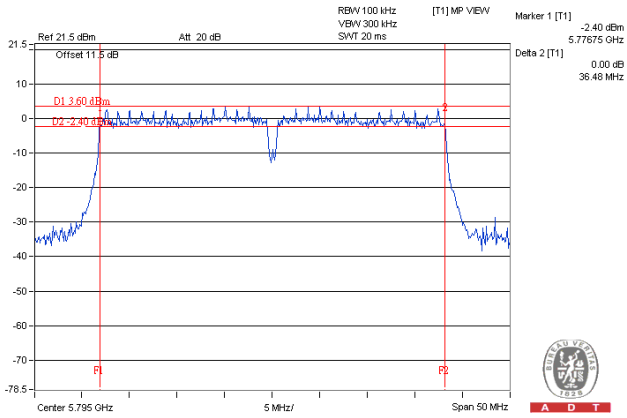
802.11a



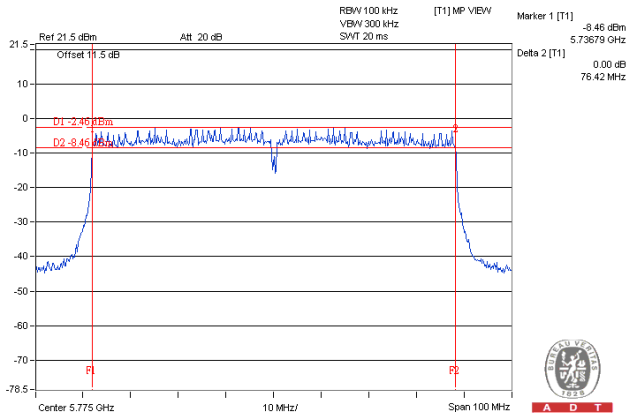
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



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:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

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

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

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---