

# FCC TEST REPORT (15.247)

## IC TEST REPORT (RSS-210 Issue 8 (2010-12))

**REPORT NO.:** RF140217C18 R1

**MODEL NO.:** PCE4502AN

**FCC ID:** TVE-120502

**IC:** 7280B-120502

**RECEIVED:** Feb. 17, 2014

**TESTED:** Feb. 19 ~ Feb. 25, 2014

**ISSUED:** Mar. 05, 2014

**APPLICANT:** Fortinet Inc.

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140217C18	Original release	Feb. 26, 2014
RF140217C18 R1	Updated report title on page 1	Mar. 05, 2014



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## 1. CERTIFICATION

**PRODUCT:** 802.11 ac Module

**MODEL NO.:** PCE4502AN

**BRAND:** Fortinet

**APPLICANT:** Fortinet Inc.

**TESTED:** Feb. 19 ~ Feb. 25, 2014

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)

Canada RSS-210 Issue 8 (2010-12)

Canada RSS-Gen Issue 3 (2010-12)

ANSI C63.10-2009

The above equipment (model: PCE4502AN) 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 :** Pettie Chen , **DATE :** Mar. 05, 2014  
Pettie Chen / Senior Specialist

**APPROVED BY :** Ken Liu , **DATE :** Mar. 05, 2014  
Ken Liu / Senior Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247); RSS-210; RSS-Gen				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15C	Canada Standard			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.86dB at 0.15391MHz.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	PASS	Meet the requirement of limit.
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.1dB at 5725.00MHz.
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.4 (4)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	-	Antenna Requirement	PASS	For PIFA antenna: No antenna connector is used. For Dipole antenna: Antenna connector is RSMA not a standard connector.

### 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	802.11 ac Module
<b>MODEL NO.</b>	PCE4502AN
<b>POWER SUPPLY</b>	5Vdc (host equipment)
<b>MODULATION TYPE</b>	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only.
<b>MODULATION TECHNOLOGY</b>	OFDM
<b>TRANSFER RATE</b>	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 866.7Mbps
<b>OPERATING FREQUENCY</b>	5745 ~ 5825MHz
<b>NUMBER OF CHANNEL</b>	802.11a, 802.11n (20MHz), 802.11ac (20MHz): 5 802.11n (40MHz), 802.11ac (40MHz): 2 802.11ac (80MHz): 1
<b>OUTPUT POWER</b>	295.227mW
<b>ANTENNA TYPE</b>	PIFA antenna with 5.5dBi & 6dBi gain Dipole antenna with 4dBi gain
<b>ANTENNA CONNECTOR</b>	For PIFA antenna: NA For Dipole antenna: RSMA
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	NA

#### NOTE:

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

MODULATION MODE	TX FUNCTION
802.11a	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX
802.11ac (20MHz)	2TX
802.11ac (40MHz)	2TX
802.11ac (80MHz)	2TX

\* 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 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 5.0GHz (5745 ~ 5825MHz):

5 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (80MHz):

CHANNEL	FREQUENCY
155	5775MHz



### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

#### FOR 5.0GHz (5745 ~ 5825MHz):

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	For PIFA antenna
B	√	√	√	-	For Dipole antenna

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

**RE<1G**: Radiated Emission below 1GHz

**PLC**: Power Line Conducted Emission

**APCM**: Antenna Port Conducted Measurement

#### NOTE:

The antenna position of EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.

NOTE: "-" means no effect.

#### 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A, B	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A, B	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A, B	802.11ac (80MHz)	155	155	OFDM	BPSK	65.0

#### 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11ac (80MHz)	155	155	OFDM	BPSK	65.0

#### 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11ac (80MHz)	155	155	OFDM	BPSK	65.0

### **BANDEDGE MEASUREMENT:**

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	65.0

### **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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (80MHz)	155	155	OFDM	BPSK	65.0

### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Sun Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Sun Lin
PLC	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Edward Lin

### 3.3 DUTY CYCLE OF TEST SIGNAL

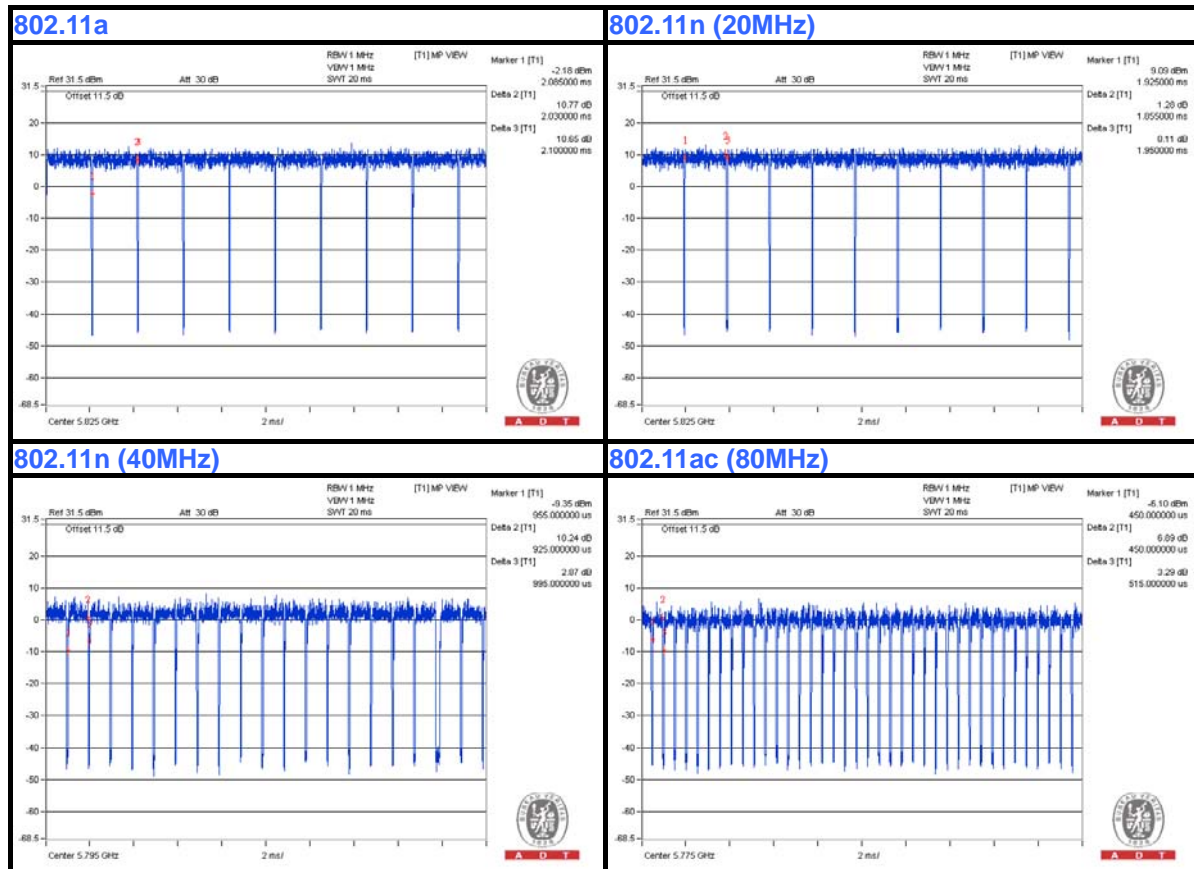
Duty cycle of test signal is < 98%

**802.11a:** Duty cycle =  $2.03/2.1 = 0.967$ , Duty factor =  $10 * \log(1/0.967) = 0.16$

**802.11n (20MHz):** Duty cycle =  $1.855/1.950 = 0.951$ , Duty factor =  $10 * \log(1/0.951) = 0.218$

**802.11n (40MHz):** Duty cycle =  $925.0/995.0 = 0.930$ , Duty factor =  $10 * \log(1/0.930) = 0.315$

**802.11ac (80MHz):** Duty cycle =  $450.0/515.0 = 0.874$ , Duty factor =  $10 * \log(1/0.874) = 0.585$



### 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.

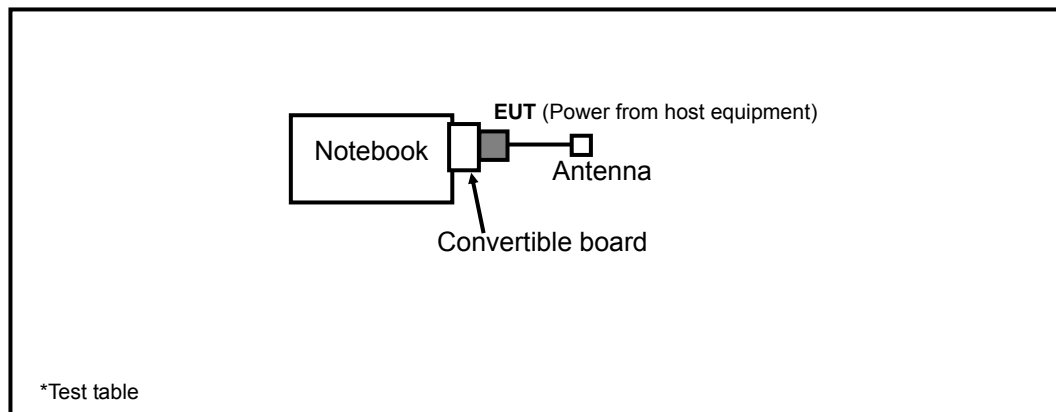
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5420	33MLMQ1	FCC DoC Approved
2	Convertible board	NA	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 2 was provided by client.

#### 3.4.1 CONFIGURATION OF SYSTEM UNDER TEST





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### **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 C (15.247)**

**Canada RSS-210 Issue 8 (2010-12)**

**Canada RSS-Gen Issue 3 (2010-12)**

**558074 D01 DTS Meas Guidance v03r01**

**662911 D01 Multiple Transmitter Output v02**

**ANSI C63.10-2009**

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

## 4. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION 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.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Feb. 11, 2014	Feb. 10, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Mar. 22, 2013	Mar. 21, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01911	Aug. 22, 2013	Aug. 21, 2014
Preamplifier Agilent	8447D	2944A10638	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable Worken	5D-FB	Cable-HYCH9-01	Aug. 11, 2013	Aug. 10, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2013	Oct. 17, 2014
High Speed Peak Power Meter	ML2495A	0842014	Apr. 28, 2013	Apr. 27, 2014
Power Sensor	MA2411B	0738404	Apr. 28, 2013	Apr. 27, 2014

- 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 9.
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 215374.
5. The IC Site Registration No. is IC 7450F-9.

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

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

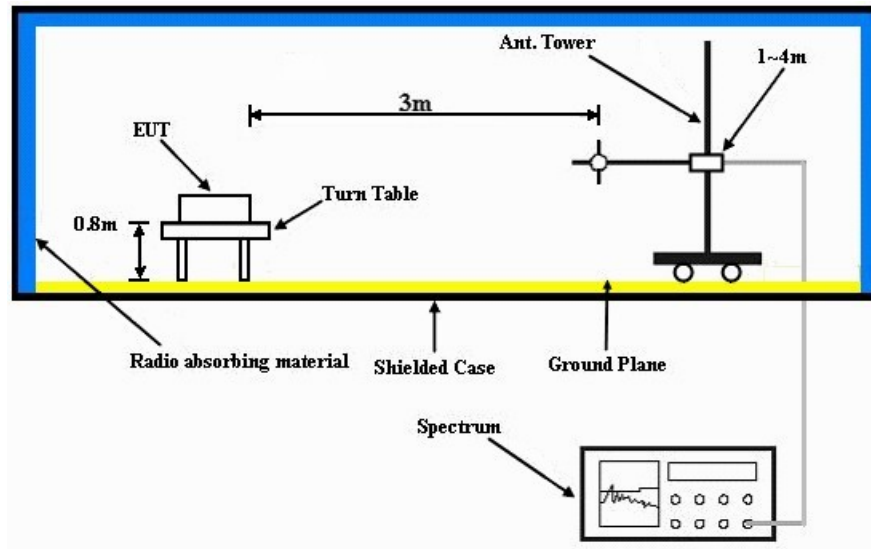
#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

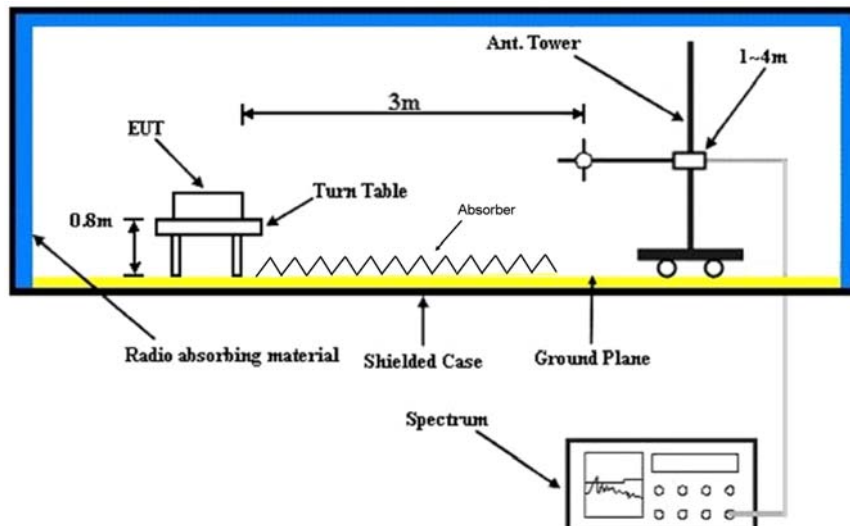


#### 4.1.5 TEST SETUP

##### Frequency range 30MHz~1GHz



##### Frequency range above 1GHz



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



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#### 4.1.6 EUT OPERATING CONDITIONS

- a. Plugged EUT into notebook via Convertible board and placed on the testing table.
- b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.



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#### 4.1.7 TEST RESULTS

##### ABOVE 1GHz DATA :

##### 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	#5725.00	74.5 PK	87.2	-12.7	1.00 H	237	34.20	40.30
2	#5725.00	62.5 AV	75.2	-12.7	1.00 H	237	22.20	40.30
3	*5745.00	107.2 PK			1.02 H	234	66.90	40.30
4	*5745.00	95.2 AV			1.02 H	234	54.90	40.30
5	11490.00	61.1 PK	74.0	-12.9	1.48 H	52	45.20	15.90
6	11490.00	48.2 AV	54.0	-5.8	1.48 H	52	32.30	15.90
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	#5725.00	83.2 PK	94.4	-11.2	1.01 V	8	42.90	40.30
2	#5725.00	71.0 AV	82.2	-11.2	1.01 V	8	30.70	40.30
3	*5745.00	114.4 PK			1.01 V	15	74.10	40.30
4	*5745.00	102.2 AV			1.01 V	15	61.90	40.30
5	11490.00	62.6 PK	74.0	-11.4	1.05 V	248	46.70	15.90
6	11490.00	48.5 AV	54.0	-5.5	1.05 V	248	32.60	15.90

##### 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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	106.5 PK			1.00 H	241	66.20	40.30
2	*5785.00	94.5 AV			1.00 H	241	54.20	40.30
3	11570.00	61.4 PK	74.0	-12.6	1.52 H	67	45.50	15.90
4	11570.00	48.8 AV	54.0	-5.2	1.52 H	67	32.90	15.90
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	*5785.00	113.8 PK			1.00 V	8	73.50	40.30
2	*5785.00	101.7 AV			1.00 V	8	61.40	40.30
3	11570.00	62.4 PK	74.0	-11.6	1.09 V	257	46.50	15.90
4	11570.00	48.8 AV	54.0	-5.2	1.09 V	257	32.90	15.90

**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)  
– 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 limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	106.9 PK			1.00 H	232	66.40	40.50
2	*5825.00	95.0 AV			1.00 H	232	54.50	40.50
3	#5850.00	61.1 PK	86.9	-25.8	1.00 H	234	20.60	40.50
4	#5850.00	49.2 AV	75.0	-25.8	1.00 H	234	8.70	40.50
5	11650.00	61.8 PK	74.0	-12.2	1.52 H	62	45.90	15.90
6	11650.00	48.4 AV	54.0	-5.6	1.52 H	62	32.50	15.90
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	*5745.00	114.2 PK			1.00 V	4	73.90	40.30
2	*5745.00	102.4 AV			1.00 V	4	62.10	40.30
3	#5850.00	65.6 PK	94.2	-28.6	1.00 V	8	25.10	40.50
4	#5850.00	53.8 AV	82.4	-28.6	1.00 V	8	13.30	40.50
5	11650.00	62.8 PK	74.0	-11.2	1.01 V	262	46.90	15.90
6	11650.00	48.8 AV	54.0	-5.2	1.01 V	262	32.90	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	#5725.00	70.6 PK	84.1	-13.5	1.00 H	331	30.30	40.30
2	#5725.00	58.4 AV	71.9	-13.5	1.00 H	331	18.10	40.30
3	*5745.00	104.1 PK			1.00 H	331	63.80	40.30
4	*5745.00	91.9 AV			1.00 H	331	51.60	40.30
5	11490.00	63.1 PK	74.0	-10.9	1.39 H	117	47.20	15.90
6	11490.00	50.1 AV	54.0	-3.9	1.39 H	117	34.20	15.90
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	#5725.00	79.7 PK	93.8	-14.1	1.18 V	152	39.40	40.30
2	#5725.00	67.6 AV	81.7	-14.1	1.18 V	152	27.30	40.30
3	*5745.00	113.8 PK			1.00 V	184	73.50	40.30
4	*5745.00	101.7 AV			1.00 V	184	61.40	40.30
5	11490.00	62.2 PK	74.0	-11.8	1.52 V	220	46.30	15.90
6	11490.00	50.3 AV	54.0	-3.7	1.52 V	220	34.40	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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			1.01 H	324	62.60	40.30
2	*5785.00	90.4 AV			1.01 H	324	50.10	40.30
3	11570.00	63.4 PK	74.0	-10.6	1.41 H	125	47.50	15.90
4	11570.00	50.5 AV	54.0	-3.5	1.41 H	125	34.60	15.90
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	*5785.00	112.4 PK			1.00 V	191	72.10	40.30
2	*5785.00	99.9 AV			1.00 V	191	59.60	40.30
3	11570.00	66.4 PK	74.0	-7.6	1.56 V	29	50.50	15.90
4	11570.00	52.4 AV	54.0	-1.6	1.56 V	29	36.50	15.90

**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)  
– 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 limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	103.0 PK			1.02 H	347	62.50	40.50
2	*5825.00	91.4 AV			1.02 H	347	50.90	40.50
3	#5850.00	54.8 PK	83.0	-28.2	1.00 H	341	14.30	40.50
4	#5850.00	43.2 AV	71.4	-28.2	1.00 H	341	2.70	40.50
5	11650.00	61.9 PK	74.0	-12.1	1.47 H	124	46.00	15.90
6	11650.00	50.5 AV	54.0	-3.5	1.47 H	124	34.60	15.90
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	*5825.00	111.2 PK			1.00 V	178	70.70	40.50
2	*5825.00	99.0 AV			1.00 V	178	58.50	40.50
3	#5850.00	62.0 PK	91.2	-29.2	1.08 V	195	21.50	40.50
4	#5850.00	49.8 AV	79.0	-29.2	1.08 V	195	9.30	40.50
5	11650.00	67.9 PK	74.0	-6.1	1.14 V	75	52.00	15.90
6	11650.00	52.8 AV	54.0	-1.2	1.14 V	75	36.90	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.





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## 802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	#5725.00	72.8 PK	86.7	-13.9	1.00 H	237	32.50	40.30
2	#5725.00	61.0 AV	74.9	-13.9	1.00 H	237	20.70	40.30
3	*5745.00	106.7 PK			1.00 H	238	66.40	40.30
4	*5745.00	94.9 AV			1.00 H	238	54.60	40.30
5	11490.00	61.8 PK	74.0	-12.2	1.52 H	48	45.90	15.90
6	11490.00	48.6 AV	54.0	-5.4	1.52 H	48	32.70	15.90
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	#5725.00	82.7 PK	93.8	-11.1	1.00 V	18	42.40	40.30
2	#5725.00	71.1 AV	82.2	-11.1	1.00 V	18	30.80	40.30
3	*5745.00	113.8 PK			1.00 V	12	73.50	40.30
4	*5745.00	102.2 AV			1.00 V	12	61.90	40.30
5	11490.00	62.2 PK	74.0	-11.8	1.02 V	258	46.30	15.90
6	11490.00	48.8 AV	54.0	-5.2	1.02 V	258	32.90	15.90

## 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)  
– 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 limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	106.4 PK			1.04 H	241	66.10	40.30
2	*5785.00	93.9 AV			1.04 H	241	53.60	40.30
3	11570.00	62.6 PK	74.0	-11.4	1.52 H	48	46.70	15.90
4	11570.00	48.9 AV	54.0	-5.1	1.52 H	48	33.00	15.90
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	*5785.00	114.4 PK			1.02 V	7	74.10	40.30
2	*5785.00	102.4 AV			1.02 V	7	62.10	40.30
3	11570.00	61.4 PK	74.0	-12.6	1.12 V	292	45.50	15.90
4	11570.00	48.2 AV	54.0	-5.8	1.12 V	292	32.30	15.90

**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)  
– 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 limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	105.9 PK			1.04 H	234	65.40	40.50
2	*5825.00	93.7 AV			1.04 H	234	53.20	40.50
3	#5850.00	63.7 PK	85.9	-22.2	1.04 H	235	23.20	40.50
4	#5850.00	51.5 AV	73.7	-22.2	1.04 H	235	11.00	40.50
5	11650.00	62.3 PK	74.0	-11.7	1.48 H	52	46.40	15.90
6	11650.00	48.9 AV	54.0	-5.1	1.48 H	52	33.00	15.90
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	*5825.00	114.2 PK			1.00 V	5	73.70	40.50
2	*5825.00	102.2 AV			1.00 V	5	61.70	40.50
3	#5850.00	71.5 PK	94.2	-22.7	1.00 V	12	31.00	40.50
4	#5850.00	59.5 AV	82.2	-22.7	1.00 V	12	19.00	40.50
5	11650.00	61.8 PK	74.0	-12.2	1.08 V	277	45.90	15.90
6	11650.00	48.4 AV	54.0	-5.6	1.08 V	277	32.50	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	#5725.00	77.4 PK	84.6	-7.2	1.02 H	186	37.10	40.30
2	#5725.00	65.8 AV	73.0	-7.2	1.02 H	186	25.50	40.30
3	*5745.00	104.6 PK			1.00 H	204	64.30	40.30
4	*5745.00	93.0 AV			1.00 H	204	52.70	40.30
5	11490.00	61.1 PK	74.0	-12.9	1.05 H	221	45.20	15.90
6	11490.00	49.5 AV	54.0	-4.5	1.05 H	221	33.60	15.90
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	#5725.00	86.9 PK	94.1	-7.2	1.02 V	186	46.60	40.30
2	#5725.00	76.1 AV	83.3	-7.2	1.02 V	186	35.80	40.30
3	*5745.00	114.1 PK			1.00 V	225	73.80	40.30
4	*5745.00	103.3 AV			1.00 V	225	63.00	40.30
5	11490.00	63.4 PK	74.0	-10.6	1.40 V	21	47.50	15.90
6	11490.00	50.2 AV	54.0	-3.8	1.40 V	21	34.30	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	104.5 PK			1.00 H	205	64.20	40.30
2	*5785.00	93.4 AV			1.00 H	205	53.10	40.30
3	11570.00	60.5 PK	74.0	-13.5	1.32 H	55	44.60	15.90
4	11570.00	49.1 AV	54.0	-4.9	1.32 H	55	33.20	15.90
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	*5785.00	114.3 PK			1.00 V	187	74.00	40.30
2	*5785.00	103.2 AV			1.00 V	187	62.90	40.30
3	11570.00	62.5 PK	74.0	-11.5	1.32 V	204	46.60	15.90
4	11570.00	50.5 AV	54.0	-3.5	1.32 V	204	34.60	15.90

**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)  
– 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 limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	102.8 PK			1.09 H	47	62.30	40.50
2	*5825.00	92.0 AV			1.09 H	47	51.50	40.50
3	#5850.00	59.9 PK	82.8	-22.9	1.00 H	343	19.40	40.50
4	#5850.00	49.1 AV	72.0	-22.9	1.00 H	343	8.60	40.50
5	11650.00	59.5 PK	74.0	-14.5	1.62 H	95	43.60	15.90
6	11650.00	48.1 AV	54.0	-5.9	1.62 H	95	32.20	15.90
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	*5825.00	111.2 PK			1.00 V	175	70.70	40.50
2	*5825.00	100.8 AV			1.00 V	175	60.30	40.50
3	#5850.00	68.3 PK	91.2	-22.9	1.00 V	343	27.80	40.50
4	#5850.00	57.9 AV	80.8	-22.9	1.00 V	343	17.40	40.50
5	11650.00	62.9 PK	74.0	-11.1	1.06 V	334	47.00	15.90
6	11650.00	50.1 AV	54.0	-3.9	1.06 V	334	34.20	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

## 802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	#5725.00	81.9 PK	83.5	-1.6	1.00 H	238	41.60	40.30
2	#5725.00	71.9 AV	73.5	-1.6	1.00 H	238	31.60	40.30
3	*5755.00	103.5 PK			1.00 H	239	63.20	40.30
4	*5755.00	93.5 AV			1.00 H	239	53.20	40.30
5	11510.00	61.1 PK	74.0	-12.9	1.58 H	47	45.20	15.90
6	11510.00	48.1 AV	54.0	-5.9	1.58 H	47	32.20	15.90
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	#5725.00	86.7 PK	90.4	-3.7	1.00 V	327	46.40	40.30
2	#5725.00	76.4 AV	80.1	-3.7	1.00 V	327	36.10	40.30
3	*5755.00	110.4 PK			1.00 V	328	70.10	40.30
4	*5755.00	100.1 AV			1.00 V	328	59.80	40.30
5	11510.00	61.1 PK	74.0	-12.9	1.05 V	264	45.20	15.90
6	11510.00	47.6 AV	54.0	-6.4	1.05 V	264	31.70	15.90

## 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)  
– 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 limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	102.8 PK			1.00 H	236	62.40	40.40
2	*5795.00	93.1 AV			1.00 H	236	52.70	40.40
3	#5850.00	55.4 PK	82.8	-27.4	1.02 H	234	14.90	40.50
4	#5850.00	45.7 AV	73.1	-27.4	1.02 H	234	5.20	40.50
5	11590.00	60.3 PK	74.0	-13.7	1.52 H	48	44.50	15.80
6	11590.00	48.6 AV	54.0	-5.4	1.52 H	48	32.80	15.80
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	110.7 PK			1.00 V	18	70.30	40.40
2	*5795.00	101.0 AV			1.00 V	18	60.60	40.40
3	#5850.00	64.9 PK	90.7	-25.8	1.04 V	22	24.40	40.50
4	#5850.00	55.2 AV	81.0	-25.8	1.04 V	22	14.70	40.50
5	11590.00	61.5 PK	74.0	-12.5	1.04 V	285	45.70	15.80
6	11590.00	48.2 AV	54.0	-5.8	1.04 V	285	32.40	15.80

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)  
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.





A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	#5725.00	76.4 PK	78.6	-2.2	1.00 H	42	36.10	40.30
2	#5725.00	66.0 AV	68.2	-2.2	1.00 H	42	25.70	40.30
3	*5755.00	98.6 PK			1.00 H	45	58.30	40.30
4	*5755.00	88.2 AV			1.00 H	45	47.90	40.30
5	11510.00	61.1 PK	74.0	-12.9	1.52 H	66	45.20	15.90
6	11510.00	47.5 AV	54.0	-6.5	1.52 H	66	31.60	15.90
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	#5725.00	86.6 PK	88.8	-2.2	1.00 V	42	46.30	40.30
2	#5725.00	75.9 AV	78.1	-2.2	1.00 V	42	35.60	40.30
3	*5755.00	108.8 PK			1.00 V	202	68.50	40.30
4	*5755.00	98.1 AV			1.00 V	202	57.80	40.30
5	11510.00	62.8 PK	74.0	-11.2	1.02 V	41	46.90	15.90
6	11510.00	49.5 AV	54.0	-4.5	1.02 V	41	33.60	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	99.9 PK			1.00 H	205	59.50	40.40
2	*5795.00	89.4 AV			1.00 H	205	49.00	40.40
3	#5850.00	55.2 PK	79.9	-24.7	1.00 H	342	14.70	40.50
4	#5850.00	44.7 AV	69.4	-24.7	1.00 H	342	4.20	40.50
5	11590.00	61.2 PK	74.0	-12.8	1.05 H	205	45.40	15.80
6	11590.00	48.0 AV	54.0	-6.0	1.05 H	205	32.20	15.80
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	109.9 PK			1.00 V	187	69.50	40.40
2	*5795.00	99.9 AV			1.00 V	187	59.50	40.40
3	#5850.00	65.2 PK	89.9	-24.7	1.00 V	342	24.70	40.50
4	#5850.00	55.2 AV	79.9	-24.7	1.00 V	342	14.70	40.50
5	11590.00	62.0 PK	74.0	-12.0	1.52 V	55	46.20	15.80
6	11590.00	49.4 AV	54.0	-4.6	1.52 V	55	33.60	15.80

**REMARKS:**

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)  
– Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " \* ": Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

## 802.11ac (80MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	#5725.00	77.5 PK	82.0	-4.5	1.00 H	168	37.20	40.30
2	#5725.00	66.9 AV	71.4	-4.5	1.00 H	168	26.60	40.30
3	*5775.00	102.0 PK			1.02 H	235	61.70	40.30
4	*5775.00	91.4 AV			1.02 H	235	51.10	40.30
5	#5850.00	66.2 PK	82.0	-15.8	1.00 H	232	25.70	40.50
6	#5850.00	55.6 AV	71.4	-15.8	1.00 H	232	15.10	40.50
7	#11550.00	61.1 PK	82.0	-20.9	1.48 H	62	45.20	15.90
8	#11550.00	48.5 AV	71.4	-22.9	1.48 H	62	32.60	15.90
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	#5725.00	87.7 PK	90.1	-2.4	1.00 V	19	47.40	40.30
2	#5725.00	76.1 AV	78.5	-2.4	1.00 V	19	35.80	40.30
3	*5775.00	110.1 PK			1.02 V	12	69.80	40.30
4	*5775.00	98.5 AV			1.02 V	12	58.20	40.30
5	#5850.00	77.4 PK	90.1	-12.7	1.00 V	14	36.90	40.50
6	#5850.00	65.8 AV	78.5	-12.7	1.00 V	14	25.30	40.50
7	#11550.00	61.4 PK	90.1	-28.7	1.08 V	267	45.50	15.90
8	#11550.00	48.4 AV	78.5	-30.1	1.08 V	267	32.50	15.90

## 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)  
– 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 limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	#5725.00	77.2 PK	78.3	-1.1	1.00 H	189	36.90	40.30
2	#5725.00	66.7 AV	67.8	-1.1	1.00 H	189	26.40	40.30
3	*5775.00	98.3 PK			1.00 H	204	58.00	40.30
4	*5775.00	87.8 AV			1.00 H	204	47.50	40.30
5	#5850.00	72.7 PK	78.3	-5.6	1.00 H	177	32.20	40.50
6	#5850.00	62.2 AV	67.8	-5.6	1.00 H	177	21.70	40.50
7	#11550.00	61.1 PK	78.3	-17.2	1.52 H	117	45.20	15.90
8	#11550.00	48.1 AV	67.8	-19.7	1.52 H	117	32.20	15.90
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	#5725.00	87.1 PK	88.2	-1.1	1.00 V	189	46.80	40.30
2	#5725.00	77.0 AV	78.1	-1.1	1.00 V	189	36.70	40.30
3	*5775.00	108.2 PK			1.00 V	188	67.90	40.30
4	*5775.00	98.1 AV			1.00 V	188	57.80	40.30
5	#5850.00	52.6 PK	88.2	-35.6	1.00 V	177	12.10	40.50
6	#5850.00	72.5 AV	78.1	-5.6	1.00 V	177	32.00	40.50
7	#11550.00	62.8 PK	88.2	-25.4	1.62 V	341	46.90	15.90
8	#11550.00	49.5 AV	78.1	-28.6	1.62 V	341	33.60	15.90

**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)  
– 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 limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

## BELOW 1GHz WORST-CASE DATA : 802.11ac (80MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27deg. C, 69%RH	TESTED BY	Sun Lin
TEST MODE	A		

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	144.46	34.8 QP	43.5	-8.7	1.25 H	219	48.20	-13.40
2	220.12	36.8 QP	46.0	-9.2	2.00 H	11	52.90	-16.10
3	299.66	43.8 QP	46.0	-2.2	2.00 H	177	55.70	-11.90
4	336.52	30.1 QP	46.0	-15.9	1.00 H	333	41.20	-11.10
5	431.58	30.4 QP	46.0	-15.6	1.00 H	272	39.30	-8.90
6	666.32	34.8 QP	46.0	-11.2	1.50 H	40	39.80	-5.00
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	31.29	34.4 QP	40.0	-5.6	1.08 V	128	50.60	-16.20
2	62.98	27.6 QP	40.0	-12.4	1.24 V	8	41.90	-14.30
3	134.76	29.2 QP	43.5	-14.3	1.00 V	11	43.70	-14.50
4	299.66	32.6 QP	46.0	-13.4	1.00 V	138	44.50	-11.90
5	431.58	31.3 QP	46.0	-14.7	1.00 V	164	40.20	-8.90
6	575.14	27.8 QP	46.0	-18.2	1.00 V	254	34.40	-6.60

## REMARKS:

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 155	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27deg. C, 69%RH	TESTED BY	Sun Lin
TEST MODE	B		

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	144.46	36.6 QP	43.5	-6.9	1.24 H	15	50.00	-13.40
2	299.66	43.9 QP	46.0	-2.1	2.00 H	195	55.80	-11.90
3	336.52	35.2 QP	46.0	-10.8	1.00 H	355	46.30	-11.10
4	551.86	34.8 QP	46.0	-11.2	1.24 H	53	42.00	-7.20
5	664.38	33.6 QP	46.0	-12.4	1.24 H	232	38.60	-5.00
6	780.78	31.6 QP	46.0	-14.4	1.00 H	72	34.30	-2.70
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	32.48	35.8 QP	40.0	-4.2	1.05 V	296	52.20	-16.40
2	64.92	29.8 QP	40.0	-10.2	1.00 V	124	44.70	-14.90
3	144.46	32.4 QP	43.5	-11.1	1.00 V	262	45.80	-13.40
4	297.72	34.5 QP	46.0	-11.5	2.00 V	291	46.50	-12.00
5	431.58	36.1 QP	46.0	-9.9	1.50 V	190	45.00	-8.90
6	524.70	35.4 QP	46.0	-10.6	2.00 V	214	42.90	-7.50

**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)  
– 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 OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:** 1. The lower limit shall apply at the transition frequencies.  
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.  
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. The test was performed in HwaYa Shielded Room 1.  
 3. The VCCI Site Registration No. is C-2040.

#### 4.2.3 TEST PROCEDURES

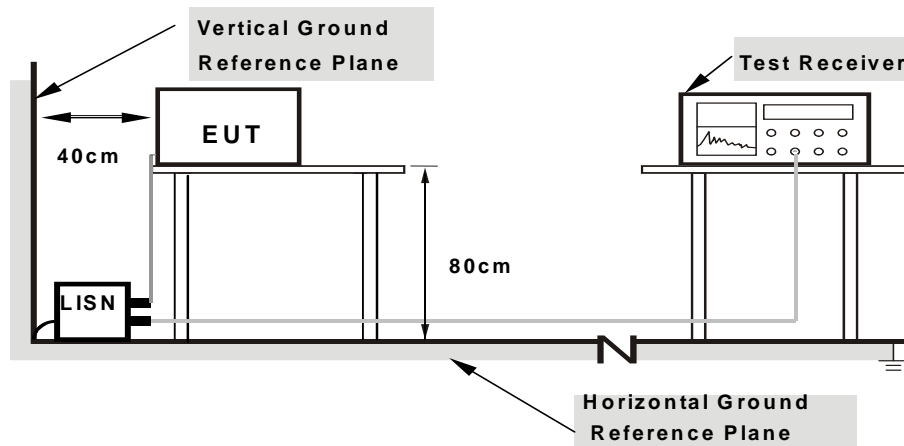
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.2.5 TEST SETUP



- Note:**
- Support units were connected to second LISN.
  - 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 item 4.1.6.



## 4.2.7 TEST RESULTS

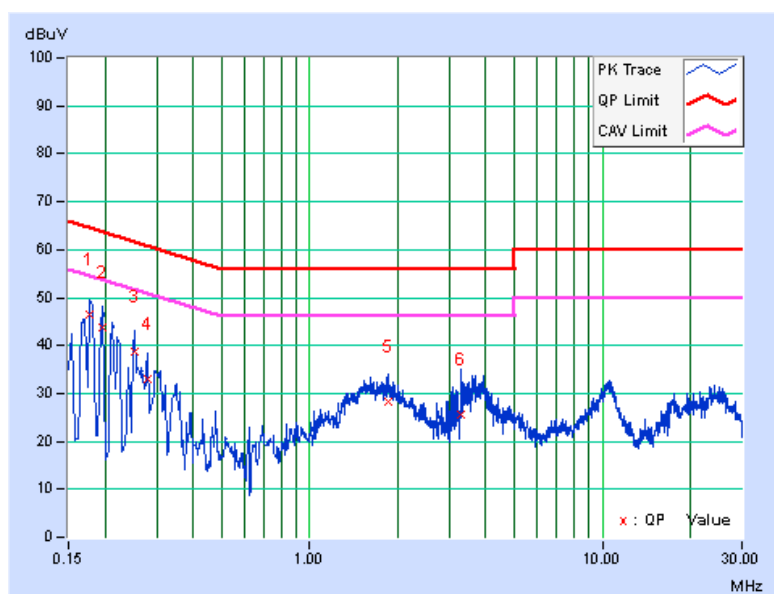
### CONDUCTED WORST-CASE DATA : 802.11ac (80MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17737	0.08	46.50	31.38	46.58	31.46	64.61	54.61	-18.03	-23.15
2	0.19692	0.08	43.59	22.76	43.67	22.84	63.74	53.74	-20.07	-30.90
3	0.25166	0.08	38.65	25.48	38.73	25.56	61.70	51.70	-22.97	-26.14
4	0.27903	0.08	32.98	20.64	33.06	20.72	60.84	50.84	-27.78	-30.12
5	1.86649	0.12	28.31	23.06	28.43	23.18	56.00	46.00	-27.57	-22.82
6	3.27409	0.17	25.33	14.22	25.50	14.39	56.00	46.00	-30.50	-31.61

#### 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.

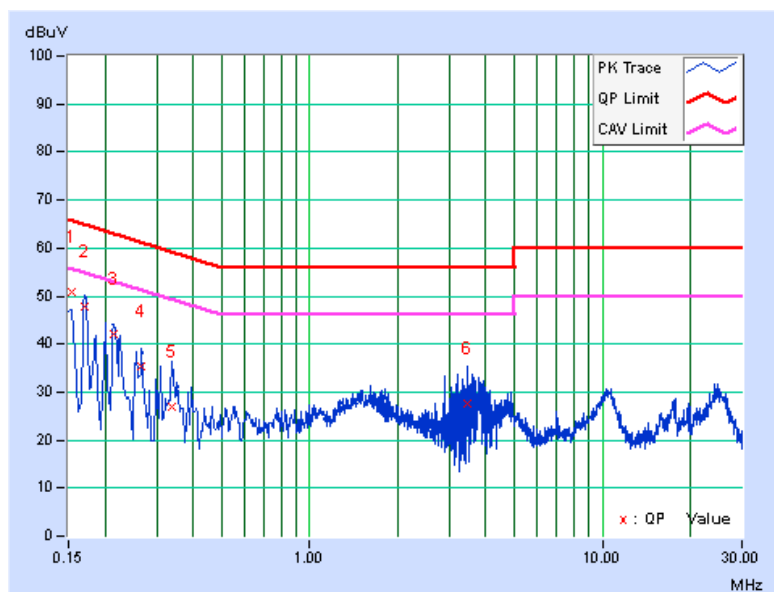


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.08	50.85	29.30	50.93	29.38	65.79	55.79	-14.86	-26.41
2	0.16967	0.08	47.58	33.29	47.66	33.37	64.98	54.98	-17.32	-21.61
3	0.21282	0.08	42.06	28.79	42.14	28.87	63.09	53.09	-20.95	-24.22
4	0.26730	0.08	35.44	25.24	35.52	25.32	61.20	51.20	-25.68	-25.88
5	0.33768	0.09	26.69	16.66	26.78	16.75	59.26	49.26	-32.48	-32.51
6	3.44222	0.17	27.38	14.74	27.55	14.91	56.00	46.00	-28.45	-31.09

#### 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.

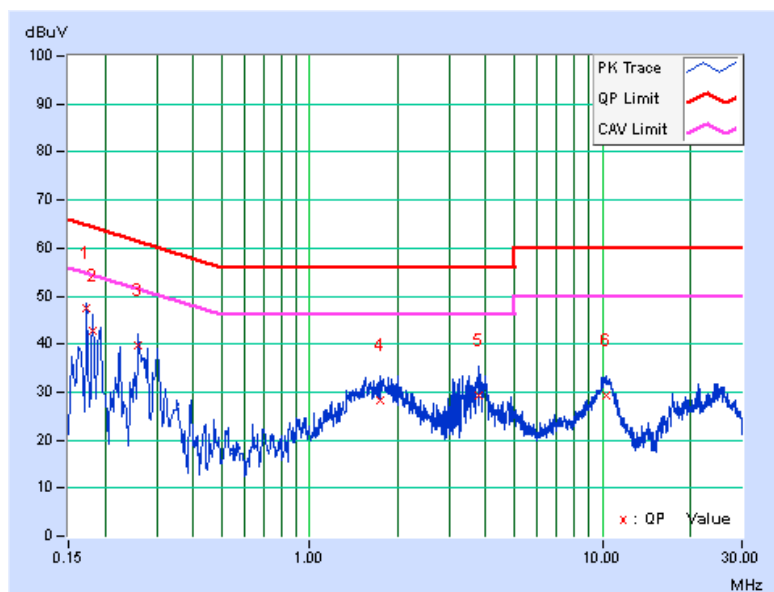


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17346	0.07	47.30	33.84	47.37	33.91	64.79	54.79	-17.42	-20.88
2	0.18128	0.08	42.63	26.45	42.71	26.53	64.43	54.43	-21.72	-27.90
3	0.25948	0.08	39.74	29.87	39.82	29.95	61.45	51.45	-21.63	-21.50
4	1.73339	0.12	28.16	23.06	28.28	23.18	56.00	46.00	-27.72	-22.82
5	3.78239	0.18	28.98	19.59	29.16	19.77	56.00	46.00	-26.84	-26.23
6	10.27299	0.41	29.03	23.71	29.44	24.12	60.00	50.00	-30.56	-25.88

#### 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.

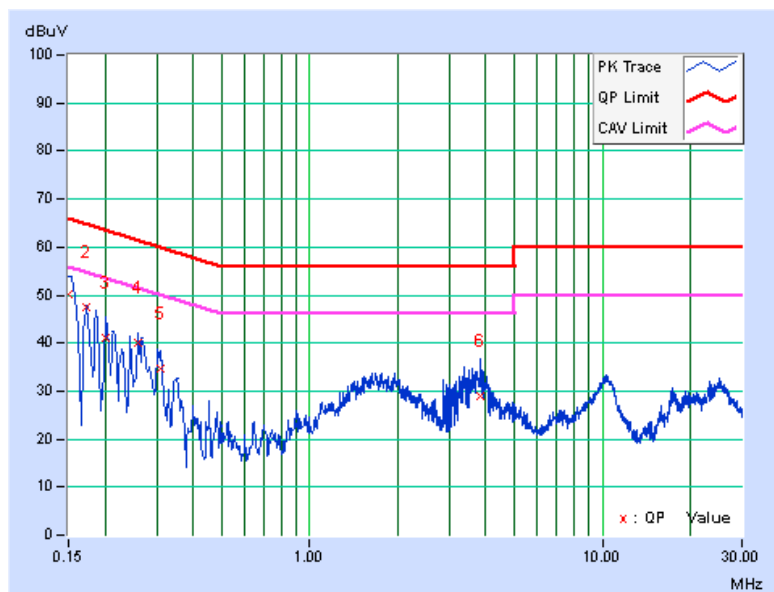


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.08	49.96	27.61	50.04	27.69	66.00	56.00	-15.96	-28.31
2	0.17328	0.08	47.45	34.00	47.53	34.08	64.80	54.80	-17.27	-20.72
3	0.20084	0.08	40.88	19.34	40.96	19.42	63.58	53.58	-22.62	-34.16
4	0.25948	0.08	39.94	30.95	40.02	31.03	61.45	51.45	-21.43	-20.42
5	0.31021	0.09	34.67	25.39	34.76	25.48	59.96	49.96	-25.21	-24.49
6	3.84104	0.18	28.86	19.56	29.04	19.74	56.00	46.00	-26.96	-26.26

# 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.

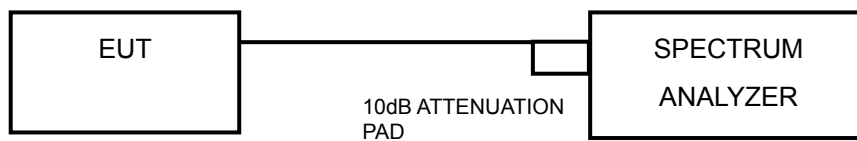


### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

#### 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

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

#### 4.3.5 DEVIATION FROM TEST 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 RESULTS

##### 802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	15.93	15.76	0.5	PASS
157	5785	15.75	16.34	0.5	PASS
165	5825	16.06	16.33	0.5	PASS

##### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.93	16.11	0.5	PASS
157	5785	16.30	16.96	0.5	PASS
165	5825	16.13	16.93	0.5	PASS

##### 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	35.78	35.79	0.5	PASS
159	5795	35.73	35.20	0.5	PASS

##### 802.11ac (80MHz)

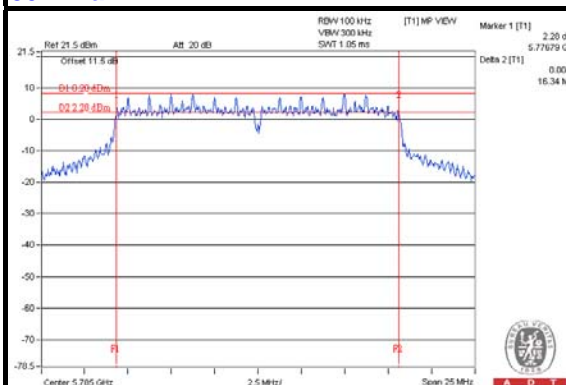
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
155	5775	63.02	68.51	0.5	PASS



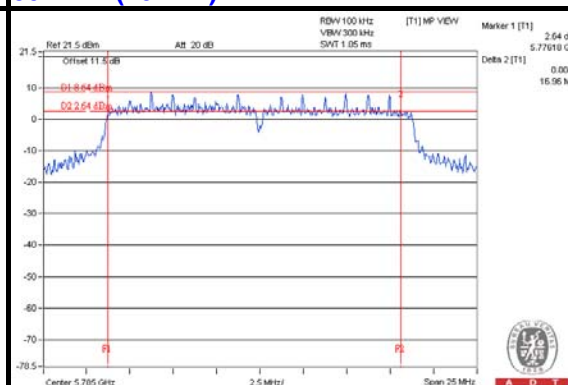
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## SPECTRUM PLOT OF WORST VALUE

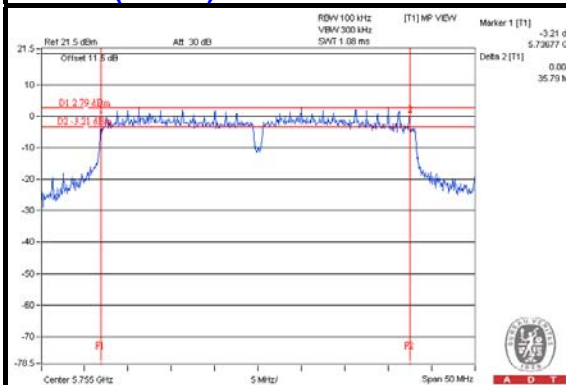
802.11a



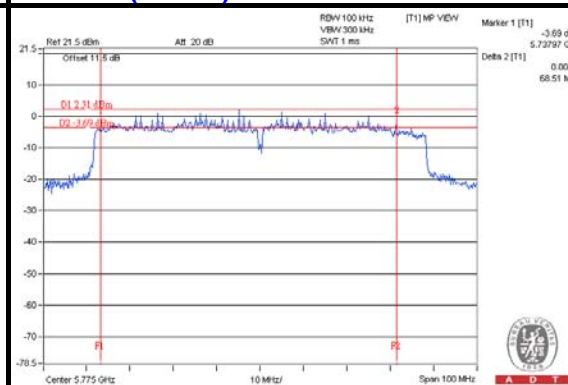
802.11n (20MHz)



802.11n (40MHz)

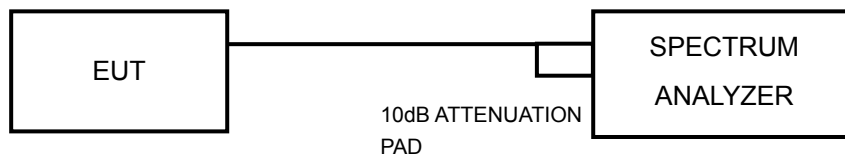


802.11ac (80MHz)



## 4.4 OCCUPIED BANDWIDTH MEASUREMENT

### 4.4.1 TEST SETUP



### 4.4.2 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.4.3 TEST PROCEDURE

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 1 MHz 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.

### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

### 4.4.5 EUT OPERATING CONDITIONS

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



#### 4.4.6 TEST RESULTS

##### 802.11a

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
149	5745	18.96	17.39	PASS
157	5785	19.20	19.00	PASS
165	5825	18.00	19.50	PASS

##### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
149	5745	19.92	18.24	PASS
157	5785	22.00	21.20	PASS
165	5825	19.60	22.30	PASS

##### 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
151	5755	38.60	37.20	PASS
159	5795	37.83	38.33	PASS

##### 802.11ac (80MHz)

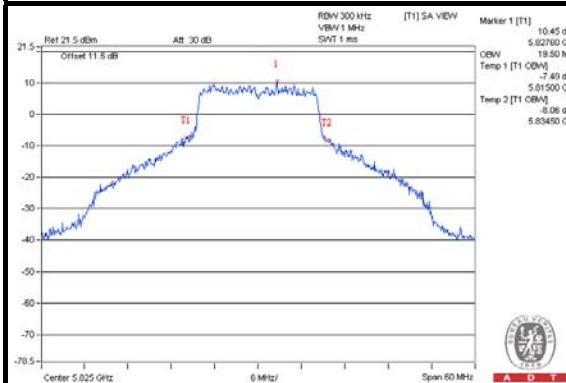
CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
155	5775	81.48	77.84	PASS



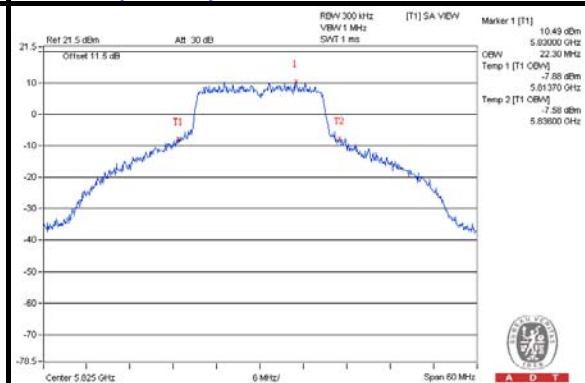
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## SPECTRUM PLOT OF WORST VALUE

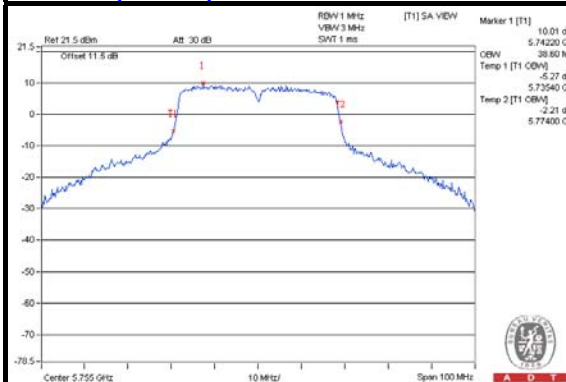
802.11a



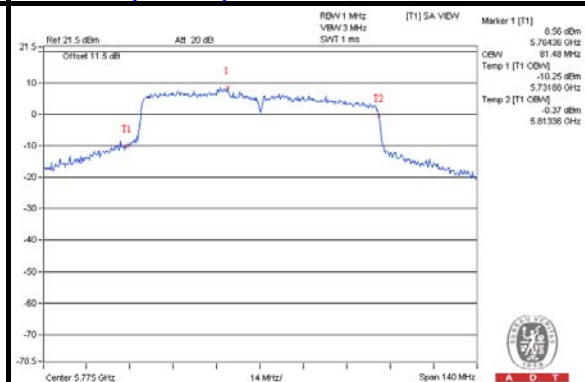
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



## 4.5 CONDUCTED OUTPUT POWER

### 4.5.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 5725 –5850 MHz bands: 1 Watt (30dBm)

Per KDB 662911 D01 Multiple Transmitter Output v02 Method of conducted output power measurement on IEEE 802.11 devices,

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

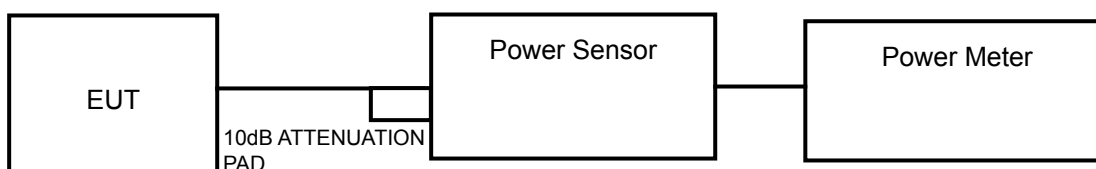
Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any NANT;

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

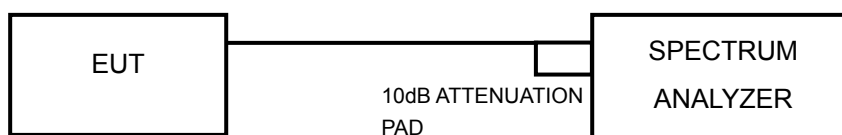
For power measurements on all other devices: Array Gain =  $10 \log(NANT/NSS)$  dB.

### 4.5.2 TEST SETUP

For 802.11a, 802.11n (20MHz), 802.11n (40MHz)



For 802.11ac (80MHz)



### 4.5.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 TEST PROCEDURES

#### **For 802.11a, 802.11n (20MHz), 802.11n (40MHz)**

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 (80MHz)**

Method SA-1

##### **Peak**

- 1) Set the RBW  $\geq$  DTS bandwidth.
- 2) Set VBW  $\geq 3 \times$  RBW.
- 3) Set span  $\geq$  RBW.
- 4) Sweep time = auto couple.
- 5) Detector = peak.
- 6) Trace mode = max hold.
- 7) Allow trace to fully stabilize.
- 8) Use peak marker function to determine the peak amplitude level.

##### **Average**

- 1) Set the analyzer span to a minimum of 1.5 times the EBW.
- 2) Set the RBW = 1 MHz.
- 3) Set the VBW = 3 MHz.
- 4) Number of measurement points in the sweep .  $2 \times (\text{span}/\text{RBW})$ .
- 5) Sweep time = auto couple.
- 6) Detector = power averaging (RMS) or sample.
- 7) Employ trace averaging in power averaging (RMS) mode over a minimum of 100 traces.
- 8) Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges.



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#### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

## 4.5.7 TEST RESULTS

### FOR PEAK POWER

#### 802.11a

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	21.96	20.77	276.435	24.42	30	PASS
157	5785	21.34	20.51	248.604	23.96	30	PASS
165	5825	20.71	20.45	228.678	23.59	30	PASS

#### 802.11n (20MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	22.07	21.01	287.248	24.58	30	PASS
157	5785	21.51	20.82	262.360	24.19	30	PASS
165	5825	21.18	20.75	250.070	23.98	30	PASS

#### 802.11n (40MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	21.71	20.36	256.895	24.10	30	PASS
159	5795	21.42	20.61	253.756	24.04	30	PASS

#### 802.11ac (80MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
155	5775	22.28	21.01	295.227	24.70	30	PASS



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## FOR AVERAGE POWER

## 802.11a

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	19.28	17.62	142.533	21.54
157	5785	18.49	17.41	125.713	20.99
165	5825	17.47	17.42	111.055	20.46

## 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
149	5745	19.69	17.91	154.913	21.90
157	5785	18.72	17.84	135.287	21.31
165	5825	18.24	18.21	132.903	21.24

## 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
151	5755	18.58	16.64	118.243	20.73
159	5795	18.47	17.76	130.011	21.14

## 802.11ac (80MHz)

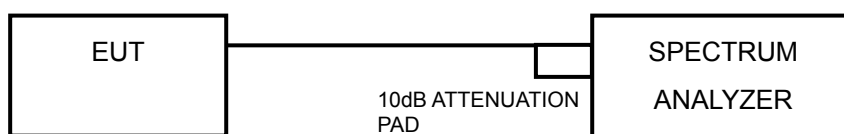
CHANNEL	FREQUENCY (MHz)	AVG. POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)
		CHAIN 0	CHAIN 1		
155	5775	19.78	18.38	163.925	22.15

## 4.6 POWER SPECTRAL DENSITY MEASUREMENT

### 4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 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.

- Set the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

### 4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.6.6 EUT OPERATING CONDITION

Same as item 4.3.6.



## 4.6.7 TEST RESULTS

### 802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-6.48	3.01	-3.47	5.24	PASS
	157	5785	-6.75	3.01	-3.74	5.24	PASS
	165	5825	-6.79	3.01	-3.78	5.24	PASS
1	149	5745	-7.04	3.01	-4.03	5.24	PASS
	157	5785	-7.30	3.01	-4.29	5.24	PASS
	165	5825	-6.31	3.01	-3.30	5.24	PASS

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.76\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8-(8.76-6) = 5.24\text{dBm}$ .

### 802.11n (20MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	-6.53	3.01	-3.52	5.24	PASS
	157	5785	-5.20	3.01	-2.19	5.24	PASS
	165	5825	-6.38	3.01	-3.37	5.24	PASS
1	149	5745	-7.45	3.01	-4.44	5.24	PASS
	157	5785	-5.72	3.01	-2.71	5.24	PASS
	165	5825	-5.45	3.01	-2.44	5.24	PASS

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.76\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8-(8.76-6) = 5.24\text{dBm}$ .

### 802.11n (40MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	-10.23	3.01	-7.22	5.24	PASS
	159	5795	-11.08	3.01	-8.07	5.24	PASS
1	151	5755	-11.32	3.01	-8.31	5.24	PASS
	159	5795	-10.10	3.01	-7.09	5.24	PASS

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.76\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8-(8.76-6) = 5.24\text{dBm}$ .

### 802.11ac (80MHz)

TX chain	Channel	Freq. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	155	5775	-11.32	3.01	-8.31	5.24	PASS
1	155	5775	-12.21	3.01	-9.20	5.24	PASS

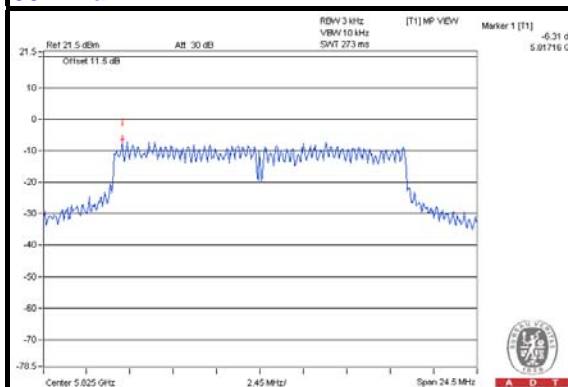
**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 8.76\text{dBi} > 6\text{dBi}$ , so the power density limit shall be reduced to  $8-(8.76-6) = 5.24\text{dBm}$ .



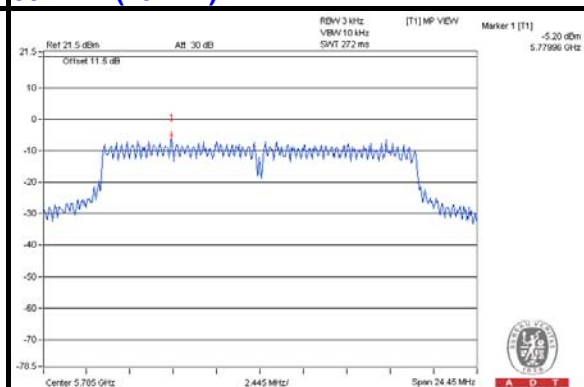
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## SPECTRUM PLOT OF WORST VALUE

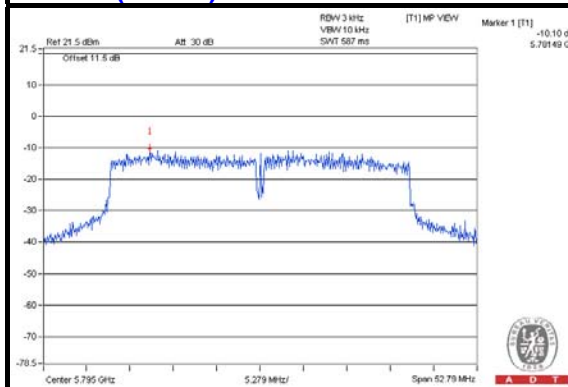
802.11a



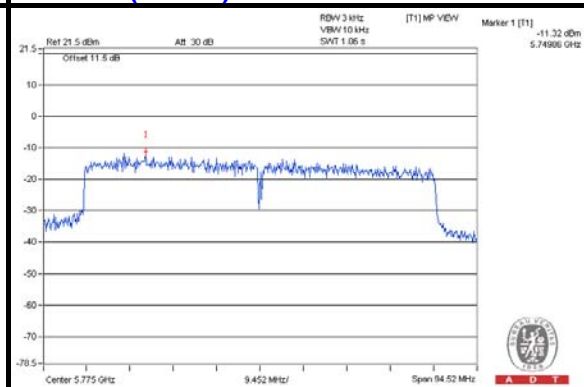
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)

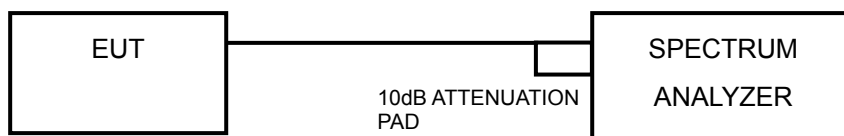


## 4.7 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

### 4.7.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.7.2 TEST SETUP



### 4.7.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.7.4 TEST PROCEDURE

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

#### MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Ensure that the number of measurement points  $\geq$  span/RBW
4. According to measurement points to set differ measurement span.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.



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#### 4.7.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

#### 4.7.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding  $10\log(N)$  since the limit is relative emission limit.

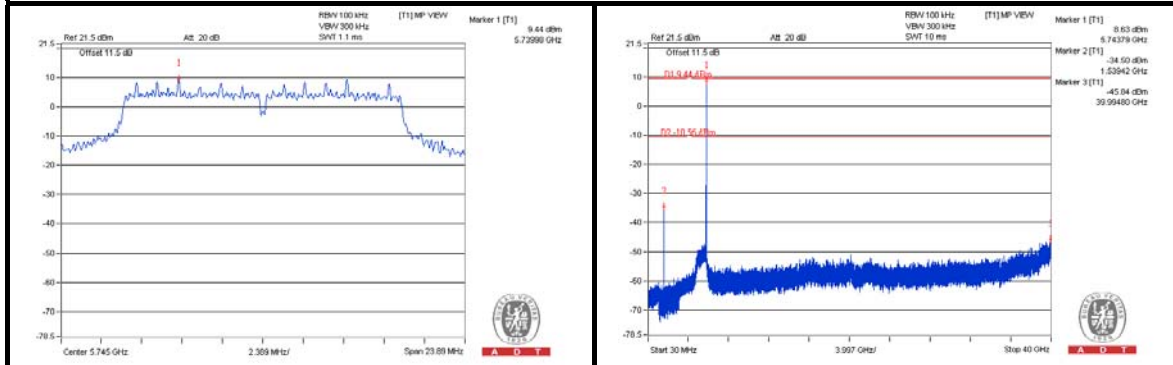
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



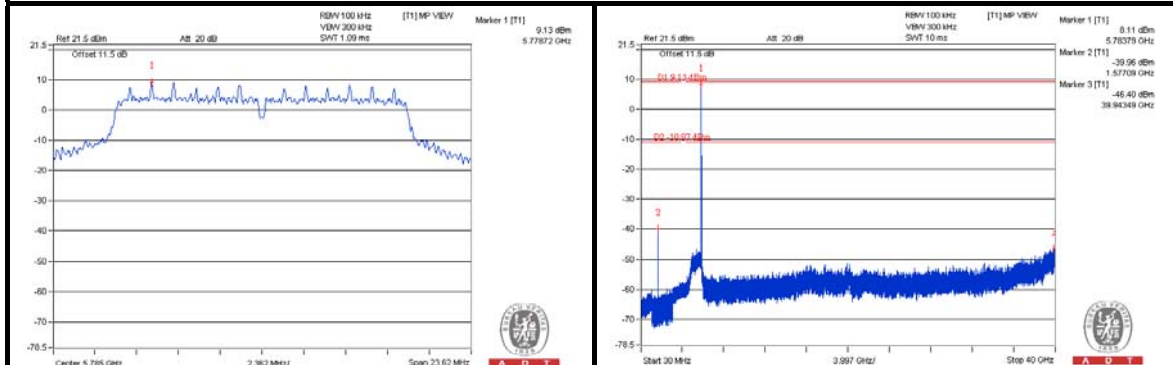
A D T

802.11a  
CHAIN 0

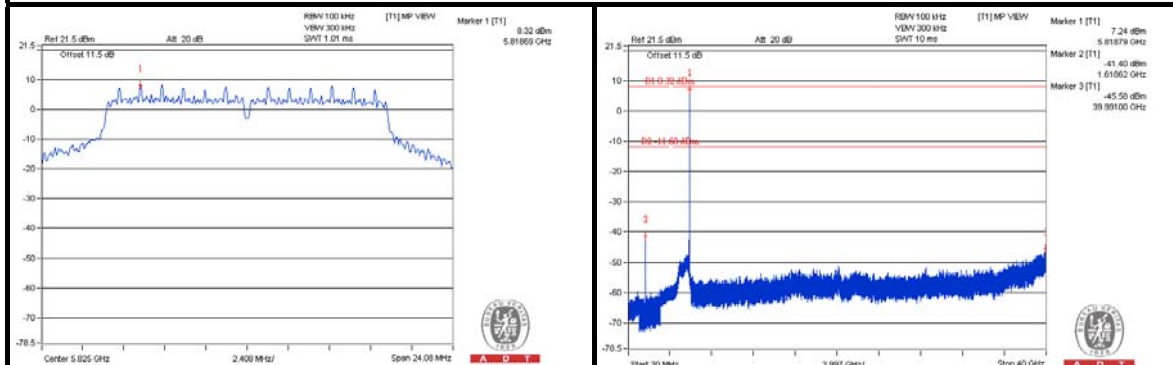
### CH 149



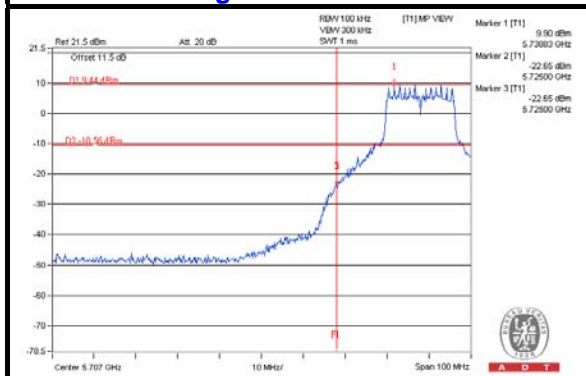
### CH 157



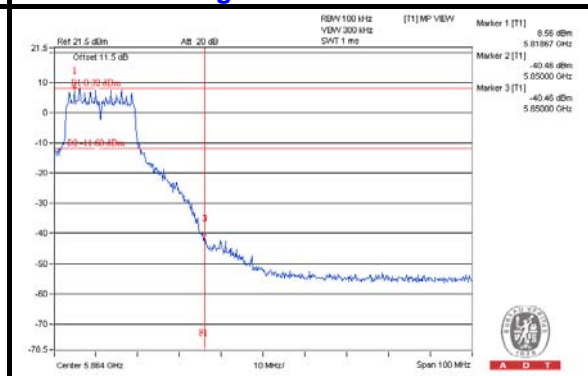
### CH 165



### CH 149 Band edge



### CH 165 Band edge

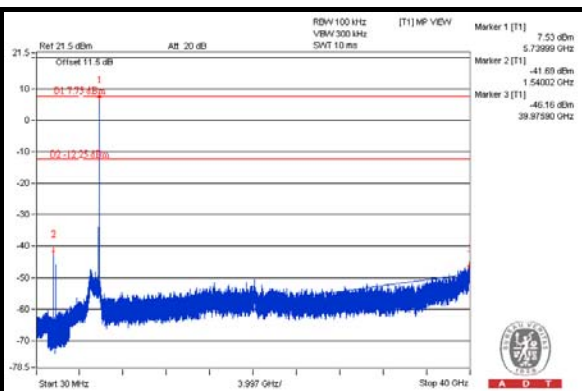
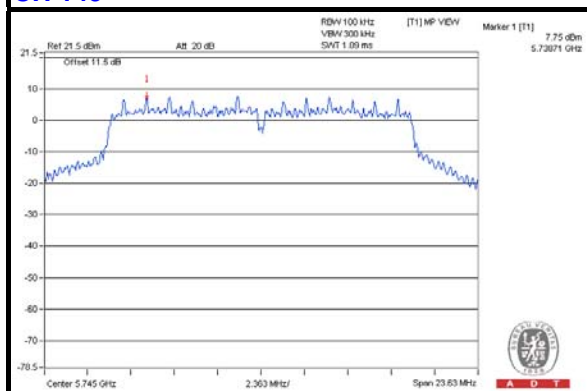




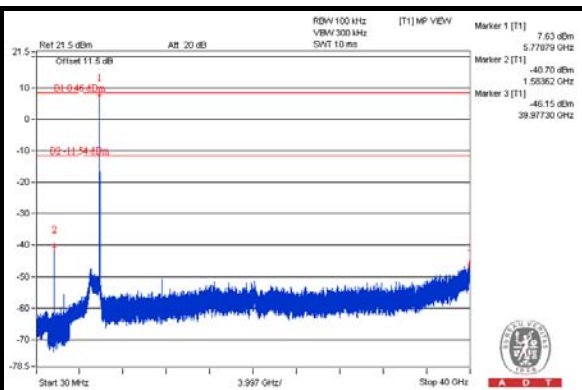
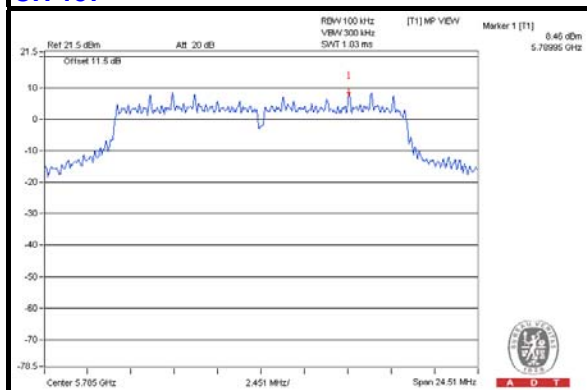
A D T

## CHAIN 1

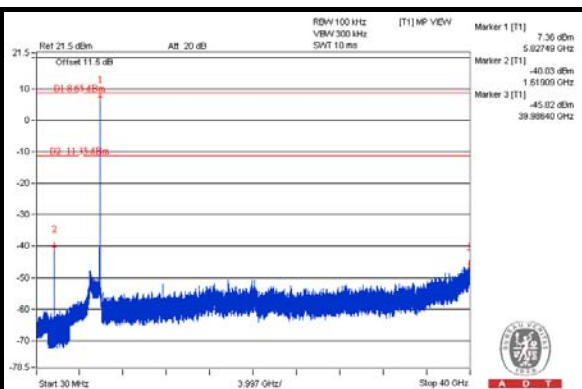
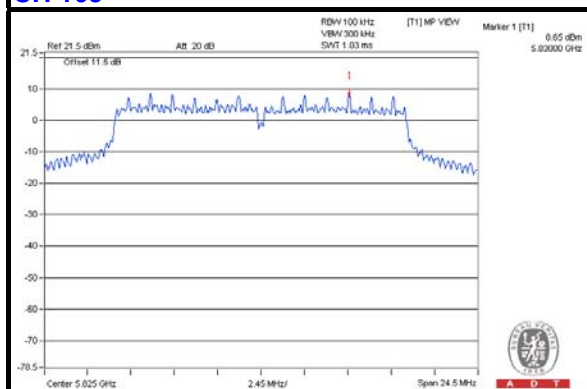
## CH 149



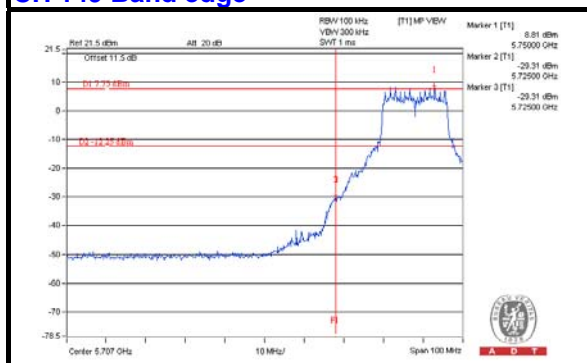
## CH 157



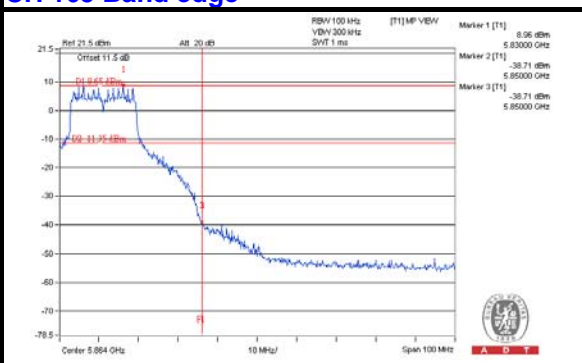
## CH 165



## CH 149 Band edge



## CH 165 Band edge



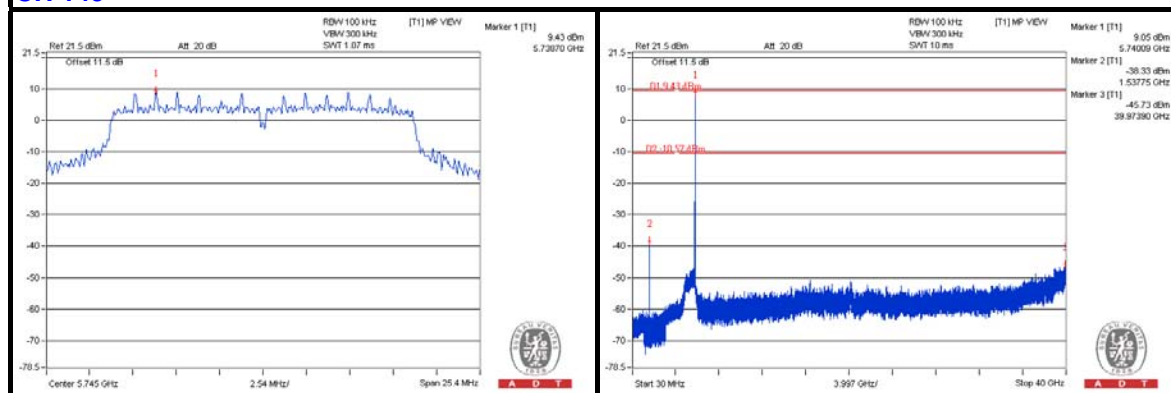


A D T

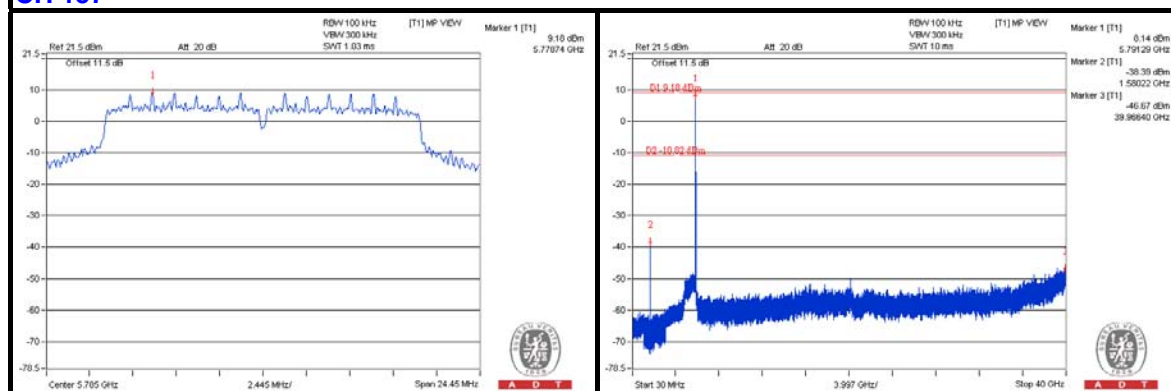
802.11n (20MHz)

CHAIN 0

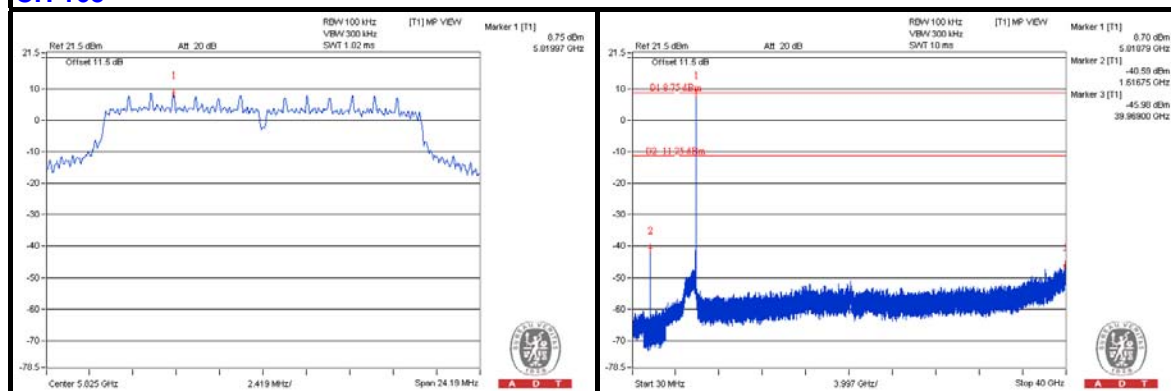
CH 149



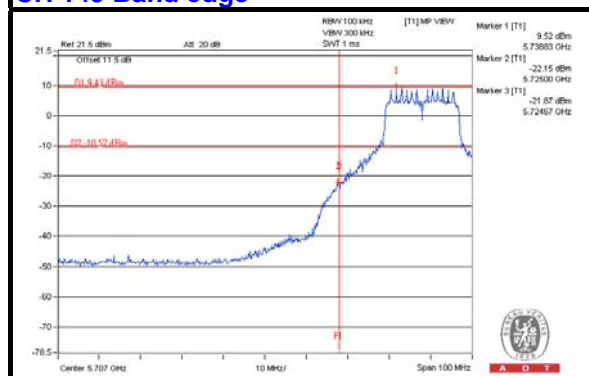
CH 157



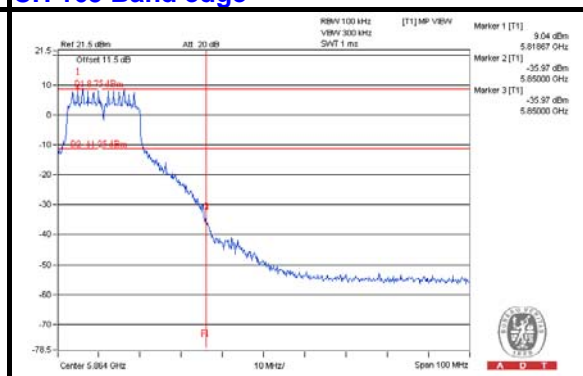
CH 165



CH 149 Band edge



CH 165 Band edge



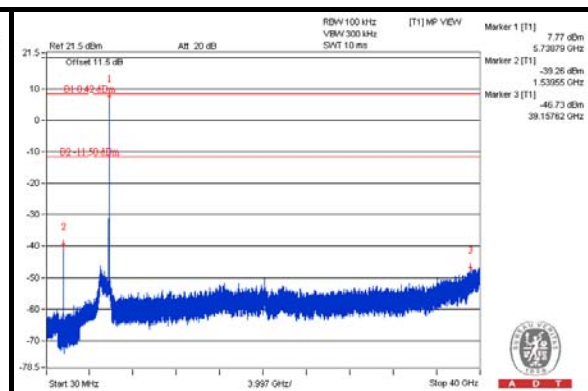
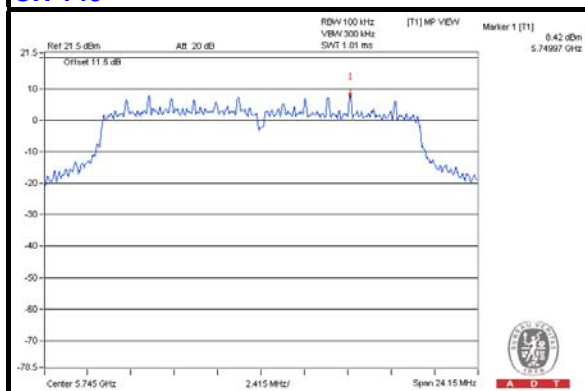




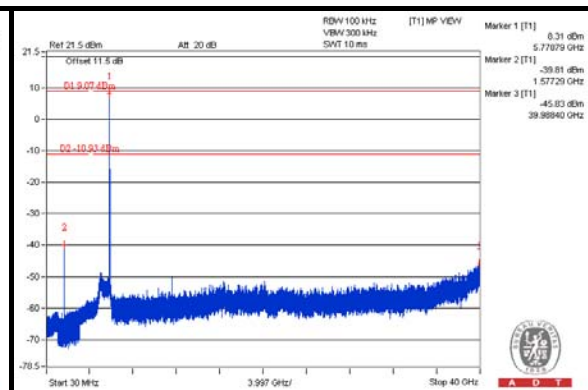
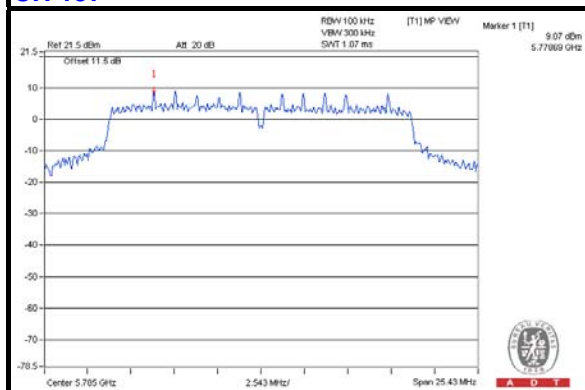
A D T

## CHAIN 1

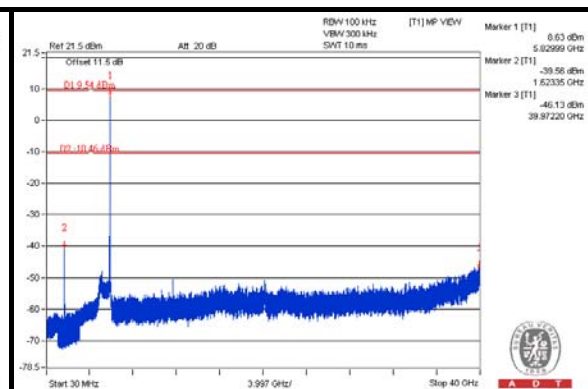
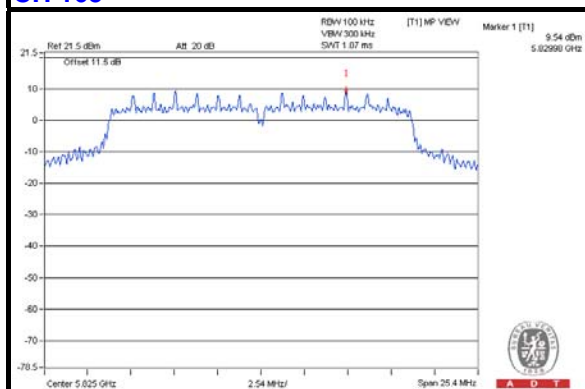
## CH 149



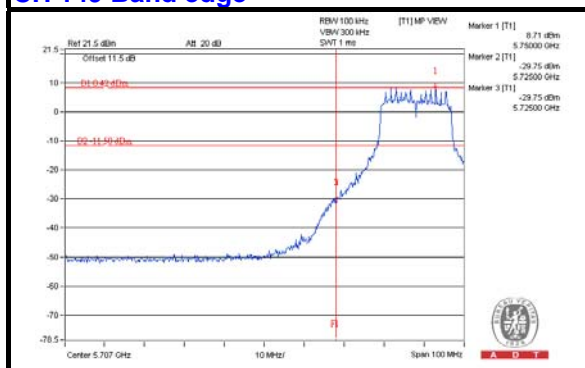
## CH 157



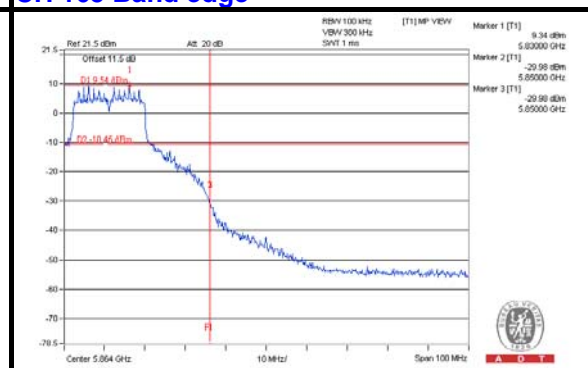
## CH 165



## CH 149 Band edge



## CH 165 Band edge





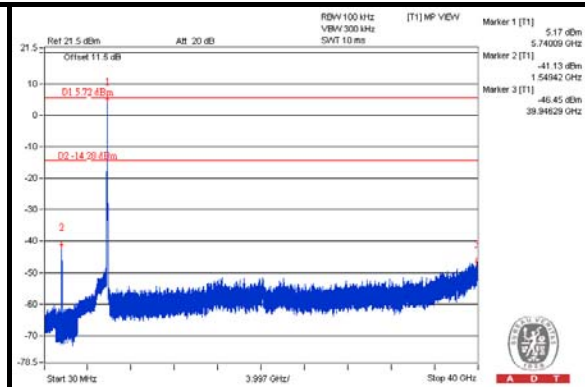
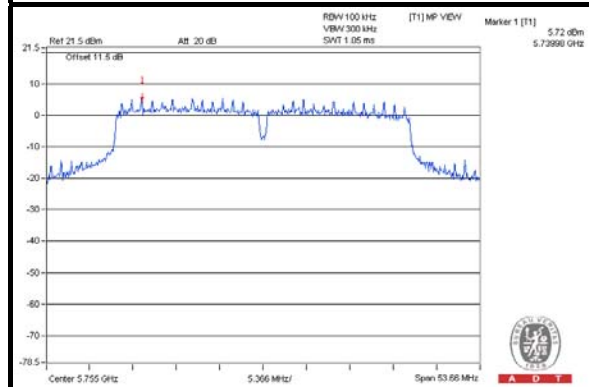


A D T

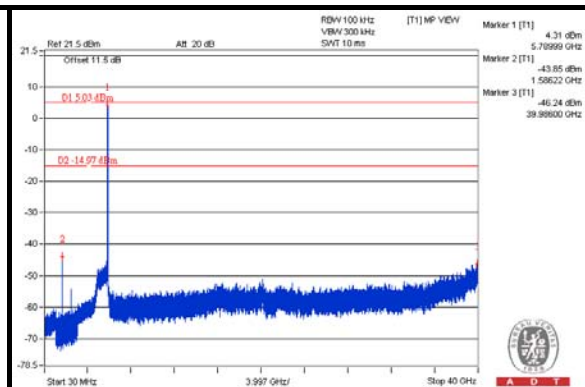
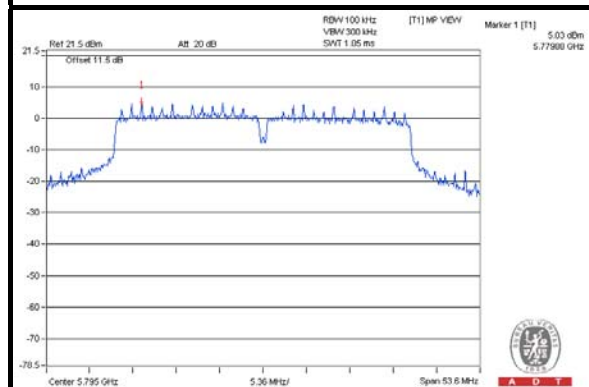
802.11n (40MHz)

CHAIN 0

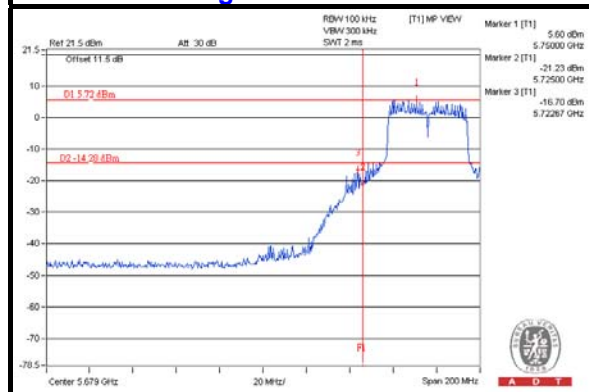
CH 151



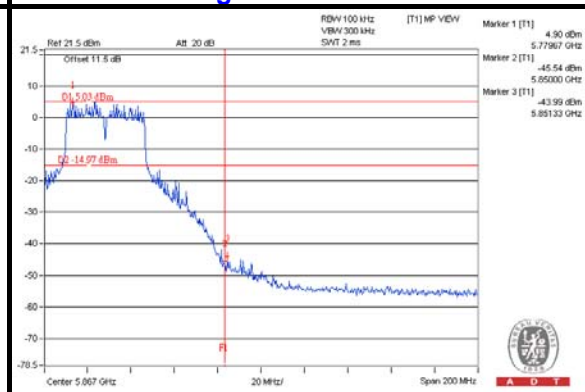
CH 159



CH 151 Band edge



CH 159 Band edge

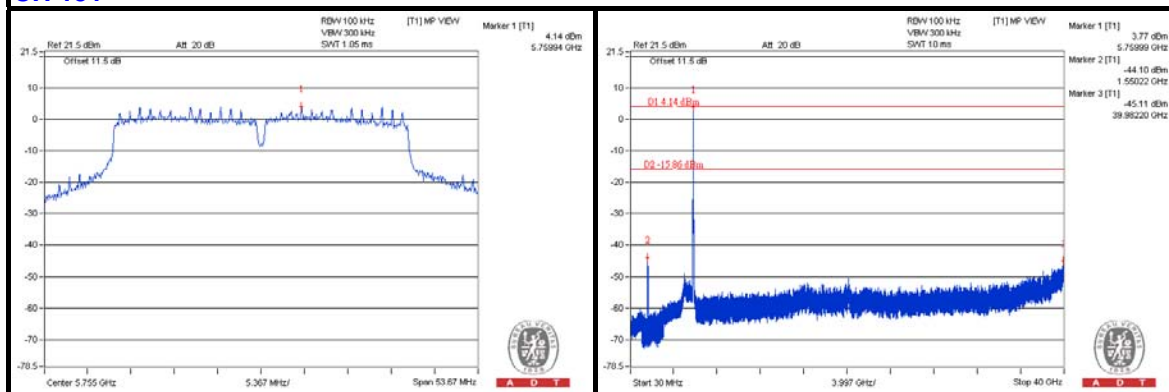




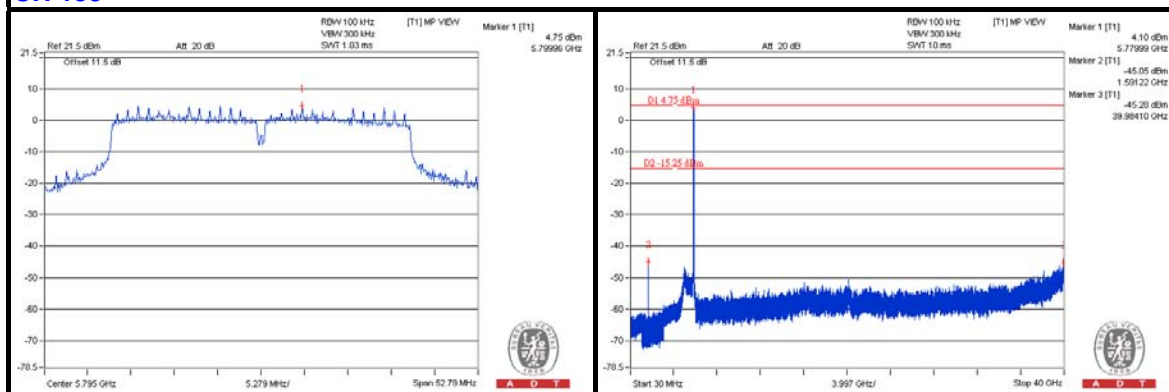
A D T

## CHAIN 1

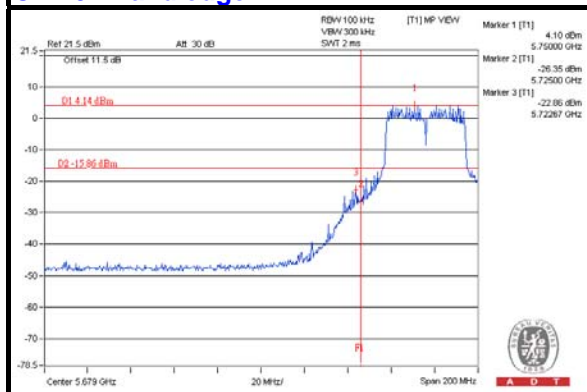
### CH 151



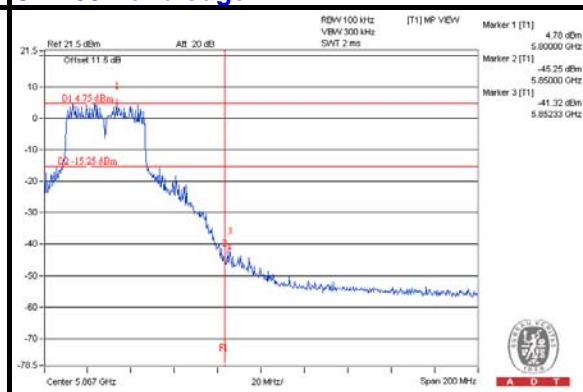
### CH 159



### CH 151 Band edge



### CH 159 Band edge



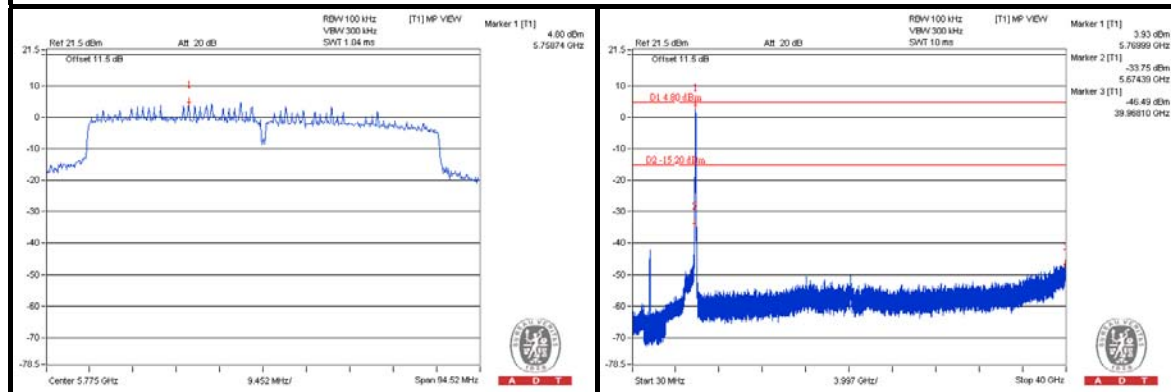


A D T

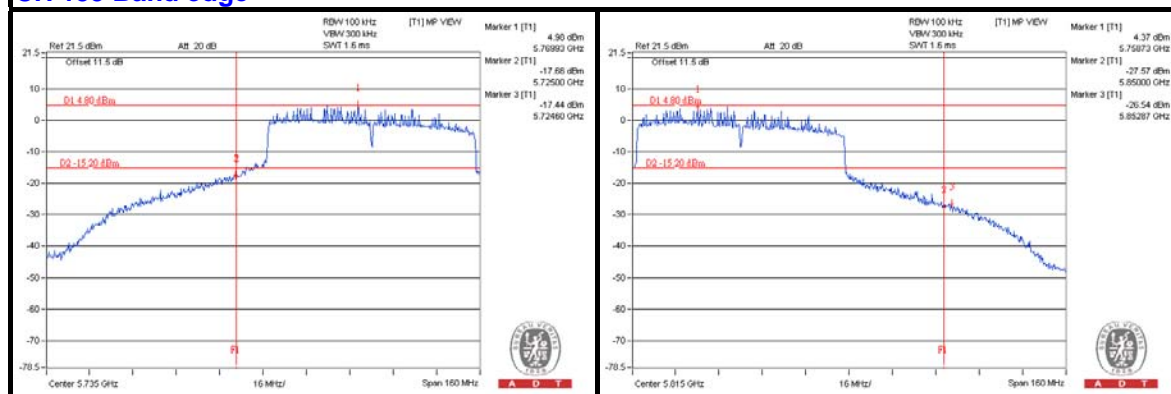
802.11ac (80MHz)

CHAIN 0

CH 155



CH 155 Band edge

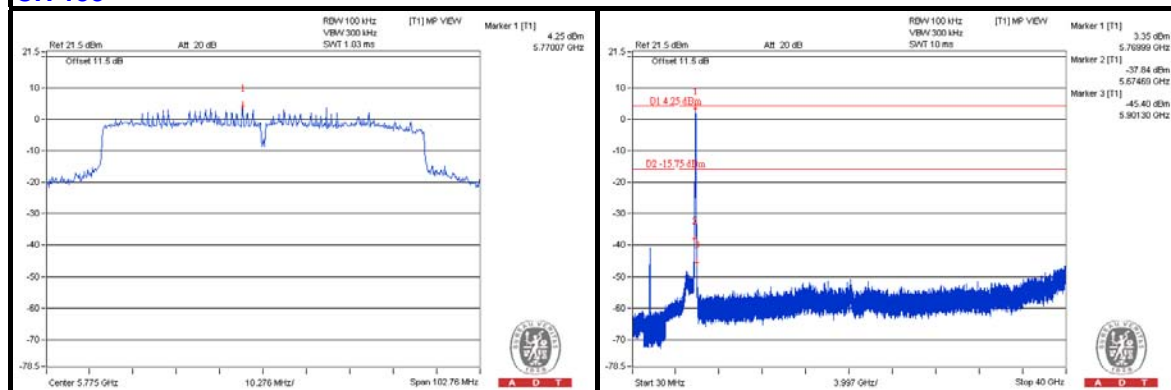




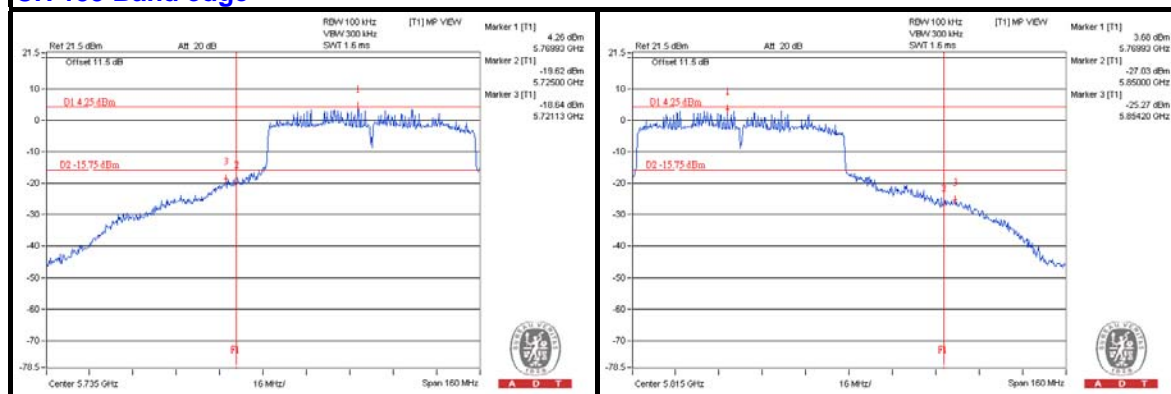
A D T

## CHAIN 1

### CH 155



### CH 155 Band edge





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## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## 6. INFORMATION ON THE TESTING LABORATORIES

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

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

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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



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## **7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

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

**---END---**