



# FCC TEST REPORT (15.247)

**REPORT NO.:** RF140530C09-1  
**MODEL NO.:** T100TAF / H100TAF / Y100TAF / R104TAF  
**FCC ID:** MSQ-T100TAF  
**RECEIVED:** May 30, 2014  
**TESTED:** Jun. 13, 2014 ~ Jun. 26, 2014  
**ISSUED:** Jul. 03, 2014

**APPLICANT:** ASUSTeK COMPUTER 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
RF140530C09-1	Original release	Jul. 03, 2014



## 1. CERTIFICATION

**PRODUCT:** ASUS Tablet  
**MODEL NO.:** T100TAF / H100TAF / Y100TAF / R104TAF  
**BRAND:** ASUS  
**APPLICANT:** ASUSTeK COMPUTER INC.  
**TESTED:** Jun. 13, 2014 ~ Jun. 26, 2014  
**TEST SAMPLE:** Identical Prototype  
**STANDARDS:** **FCC Part 15, Subpart C (Section 15.247)**  
ANSI C63.10-2009

The above equipment (model: T100TAF / H100TAF / Y100TAF / R104TAF) 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 :** Vera Huang , **DATE :** Jul. 03, 2014  
Vera Huang / Specialist

**APPROVED BY :** Sam chen , **DATE :** Jul. 03, 2014  
Sam Chen / Senior Project Engineer

## 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)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.63dB at 15.29297MHz.
15.205 & 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.29dB at 2490MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

### 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  $k = 2$ .



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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	ASUS Tablet
<b>MODEL NO.</b>	T100TAF / H100TAF / Y100TAF / R104TAF
<b>POWER SUPPLY</b>	3.85Vdc (Battery) 9 Vdc / 5Vdc (Adapter or host equipment)
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11a: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
<b>OPERATING FREQUENCY</b>	<b>2.4GHz:</b> 2412 ~ 2462MHz <b>5.0GHz:</b> 5745 ~ 5825MHz
<b>NUMBER OF CHANNEL</b>	<b>2.4GHz:</b> 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) <b>5.0GHz:</b> 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
<b>OUTPUT POWER</b>	183.65mW for 2412 ~ 2462MHz 144.88mW for 5745 ~ 5825MHz
<b>ANTENNA TYPE</b>	<b>2.4GHz:</b> PIFA antenna with 0.33dBi gain <b>5.0GHz:</b> PIFA antenna with 1.98dBi gain
<b>ANTENNA CONNECTOR</b>	NA
<b>DATA CABLE</b>	Refer to Note as below
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	Refer to Note as below

**Note:**

1. All models are listed as below.

Brand	Model	Difference
ASUS	T100TAF	All models are electrically identical, different model names are for marketing purpose.
	H100TAF	
	Y100TAF	
	R104TAF	





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2. The following accessories are support units only.

Product	Brand	Model	Description
Mobile Dock	Asus	T100T Mobile Dock2, H100T Mobile Dock2, Y100T Mobile Dock2, R104T Mobile Dock2	All models are electrically identical, different model names are for marketing purpose.
HDD 1 for Mobile Dock	HGST	HTS545050A7E680	SATA3, 500G, 5400R
HDD 2 for Mobile Dock	WD	WD5000LPVX	SATA3, 500G, 5400R
HDD 3 for Mobile Dock	TOSHIBA	MQ01ABF050	SATA3, 500G, 5400R

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter 1	ASUS	AD2022320	I/P: 100-240Vac, 50/60Hz, 0.5A O/P: 5Vdc, 2A or 9Vdc, 2A
Adapter 2	ASUS	AD2022M20	I/P: 100-240Vac, 50/60Hz, 0.5A O/P: 9Vdc, 2A
Adapter 3	ASUS	W12-010N3A	I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5Vdc, 2A
Adapter 4	ASUS	AD897320	I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5Vdc, 2A
Adapter 5	ASUS	AD835M1	I/P: 100-240Vac, 50/60Hz, 0.3A O/P: 5Vdc, 2A
Battery 1	ASUS	C12N1320	3.85Vdc, 31Wh Manufacturer: CELXP ENERGY CORP
Battery 2	ASUS	C12N1320	3.85Vdc, 31Wh Manufacturer: SIMPLO TECHNOLOGY CO LTD
Battery 3	ASUS	C12N1320	3.8Vdc, 31Wh Manufacturer: LG CHEMICAL LTD
USB Cable	ASUS	L65U2009-CS-B	0.85m shielded cable w/o core
CPU	Intel	Z3735F/G	1.3G, FCBGA ( 592Pin)
eMMC 1	HYNIX	H26M52103FMR	16G FBGA153
eMMC 2	HYNIX	H26M64103EMR	32G FBGA153
eMMC 3	HYNIX	H26M78103CCR	64G FBGA153
LCD Panel	AUO	B101XAN02.1	TFT10.1' HD GLARE SL-B LED
Front Camera (2M)	LITEON	4SF211N2	--
Rear Camera (5M)	CHICONY	CJAD53320003871LH	--
MainBoard	ASUS	T100TAF MAIN BOARD	--
WLAN + BT Module	AMPAK	AP6234ANS	Chip factory: BROADCOM / BCM43340XKUBC
GPS Module	BROADCOM	BCM4752IFBG	--

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



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### 3.2 DESCRIPTION OF TEST MODES

#### FOR 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

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

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz



### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

#### WLAN 2.4GHz:

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

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

#### RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

#### 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)
-	802.11b	1 to 11	11	DSSS	DBPSK	1.0

#### POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	11	DSSS	DBPSK	1.0



**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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

**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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

**Test CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Harry Hsueh
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Harry Hsueh
PLC	25deg. C, 65%RH	120Vac, 60Hz	Peter Weng
APCM	25deg. C, 65%RH	120Vac, 60Hz	Howard Kao



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**WLAN 5.0GHz (5745 ~ 5825MHz):**

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

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

**RADIATED EMISSION TEST (ABOVE 1GHz):**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

**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)
-	802.11a	149 to 165	149	OFDM	BPSK	6.0

**POWER LINE CONDUCTED EMISSION TEST:**

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149	OFDM	BPSK	6.0



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### **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)
-	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	MCS0
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

### **ANTENNA PORT CONDUCTED MEASUREMENT:**

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

### **Test CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Harry Hsueh
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Harry Hsueh
PLC	25deg. C, 65%RH	120Vac, 60Hz	Peter Weng
APCM	25deg. C, 65%RH	120Vac, 60Hz	Howard Kao

### 3.3 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.

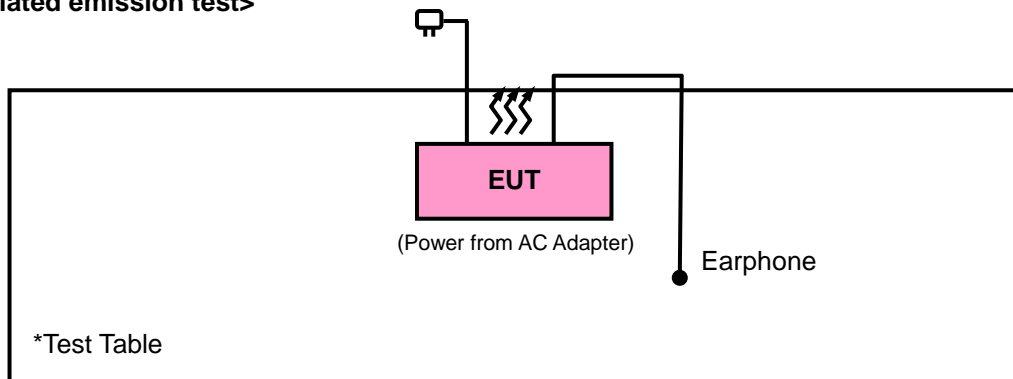
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Earphone	N/A	N/A	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

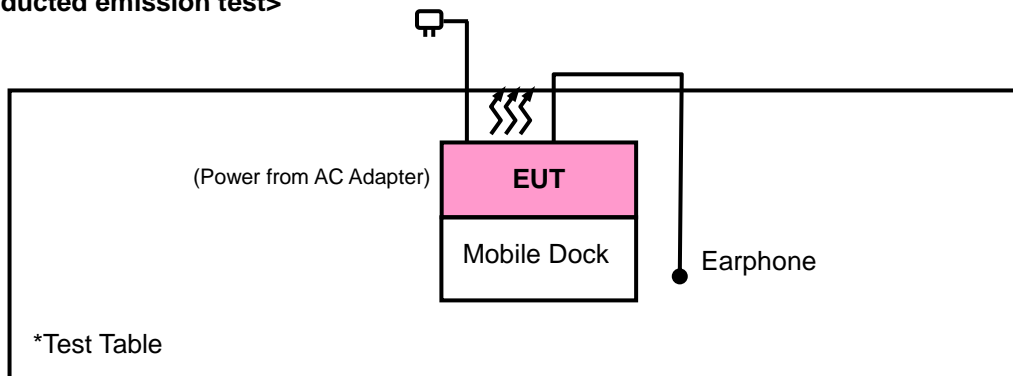
**NOTE:** All power cords of the above support units are non shielded (1.8m).

#### 3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

<Radiated emission test>



<Conducted emission test>





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### 3.4 DUTY CYCLE TEST SIGNAL

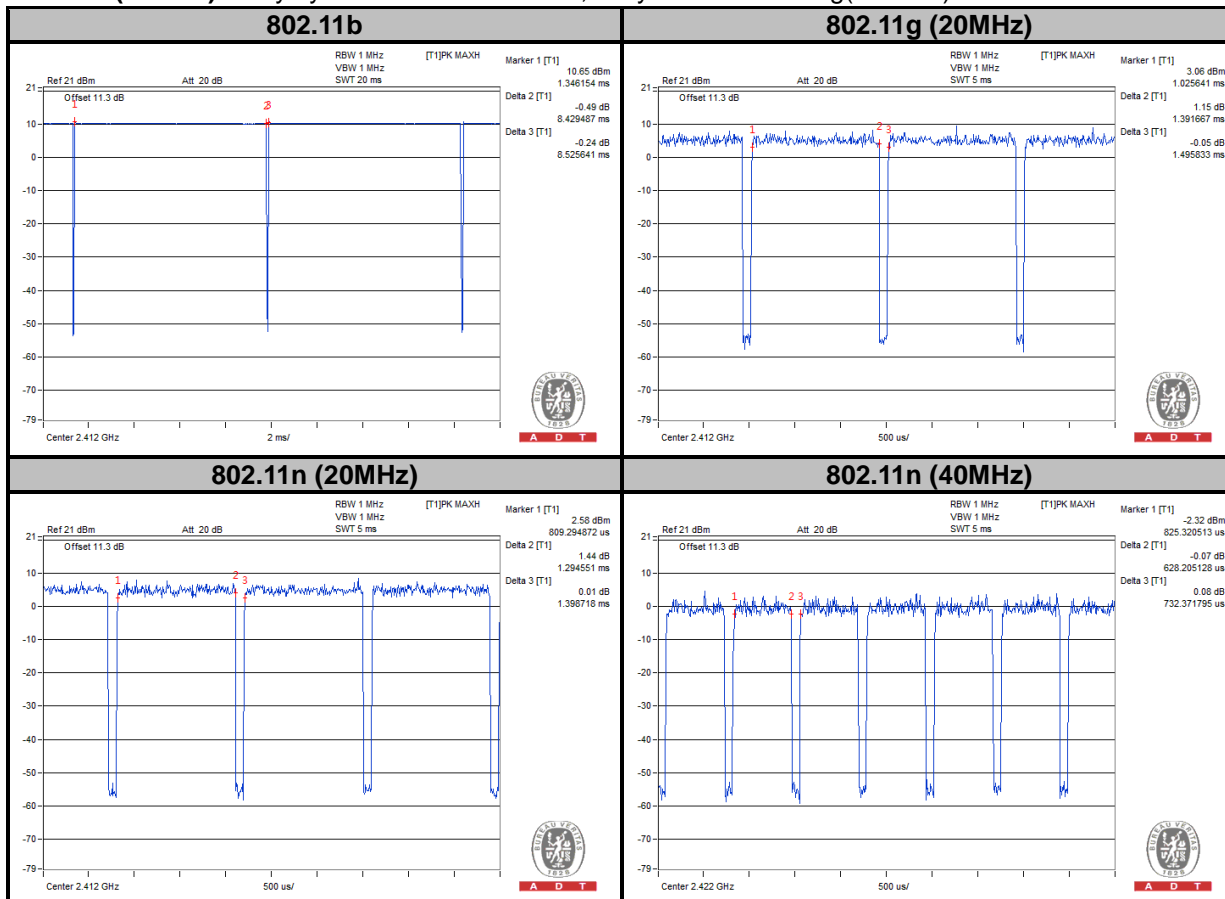
#### WLAN 2.4GHz

**802.11b:** Duty cycle of test signal is > 98 %

**802.11g:** Duty cycle =  $1.391/1.495 = 0.93$ , Duty factor =  $10 * \log(1/0.93) = 0.32$

**802.11n (20MHz):** Duty cycle =  $1.294/1.398 = 0.926$ , Duty factor =  $10 * \log(1/0.926) = 0.33$

**802.11n (40MHz):** Duty cycle =  $628/732 = 0.858$ , Duty factor =  $10 * \log(1/0.858) = 0.67$







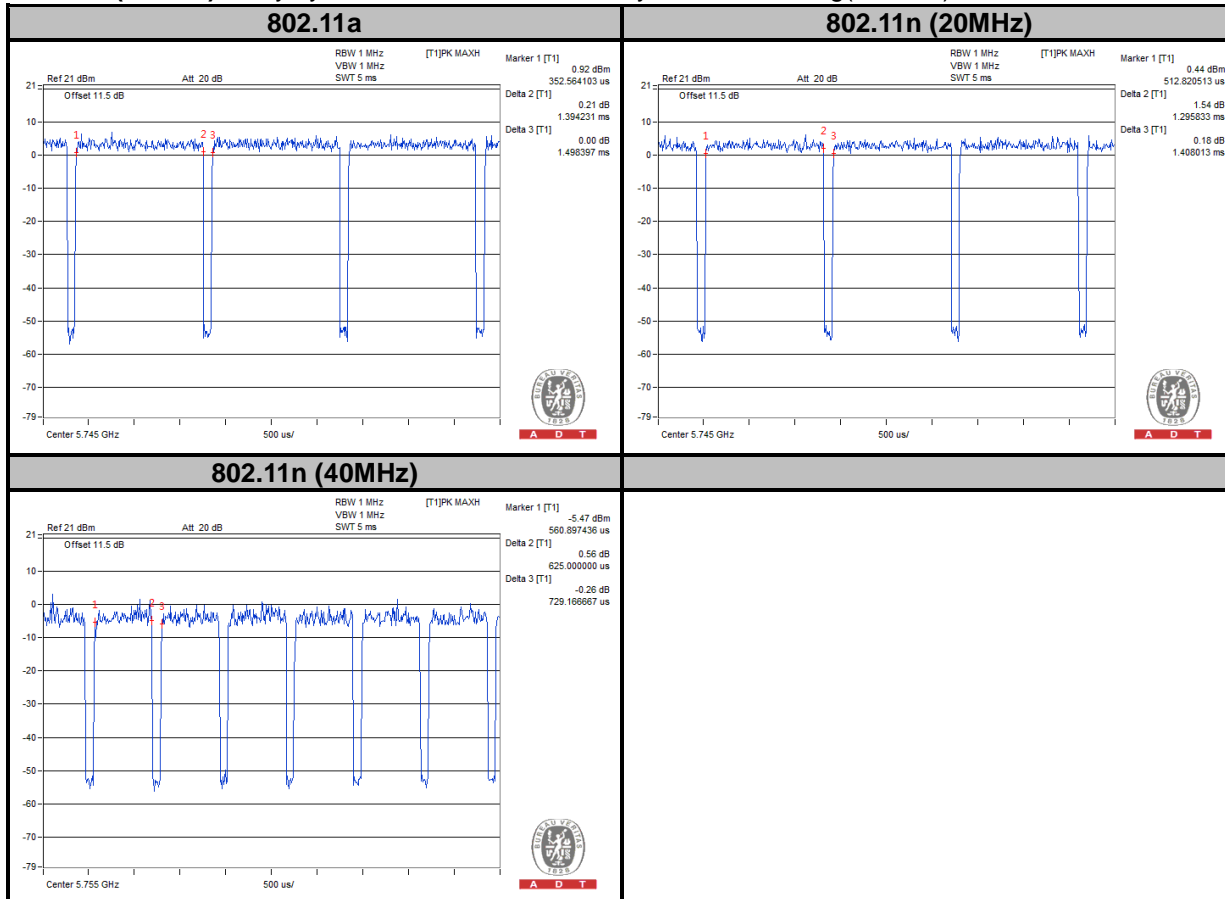
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### 5745MHz ~ 5825MHz

**802.11a:** Duty cycle = 1.394/1.498 = 0.931, Duty factor =  $10 * \log(1/0.931) = 0.31$

**802.11n (20MHz):** Duty cycle = 1.295/1.408 = 0.92, Duty factor =  $10 * \log(1/0.92) = 0.36$

**802.11n (40MHz):** Duty cycle = 625/729 = 0.857, Duty factor =  $10 * \log(1/0.857) = 0.67$



### 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)**

**558074 D01 DTS Meas Guidance v03r01**

**ANSI C63.10-2009**

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 (FOR 2.4GHz BAND)

### 4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

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



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#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100412	Sep. 13, 2013	Sep. 12, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 21, 2013	Dec. 20, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 27, 2014	Feb. 26, 2015
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D- 209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 18, 2013	Dec. 17, 2014
Loop Antenna	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 2016
Preamplifier EMCI	EMC 012645	980115	Dec. 26, 2013	Dec. 25, 2014
Preamplifier EMCI	EMC 184045	980116	Jan. 13, 2014	Jan. 12, 2015
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2013	Dec. 26, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2013	Oct. 17, 2014
RF signal cable Worken	RG-213	NA	Nov. 07, 2013	Nov. 06, 2014
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Power Meter	ML2495A	1232002	Aug. 23, 2013	Aug. 22, 2014
Power Sensor	MA2411B	1207325	Aug. 23, 2013	Aug. 22, 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. The test was performed in HwaYa Chamber 10.
  4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  5. The FCC Site Registration No. is 690701.
  6. The IC Site Registration No. is IC 7450F-10.

#### 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. Height of receiving 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 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:**

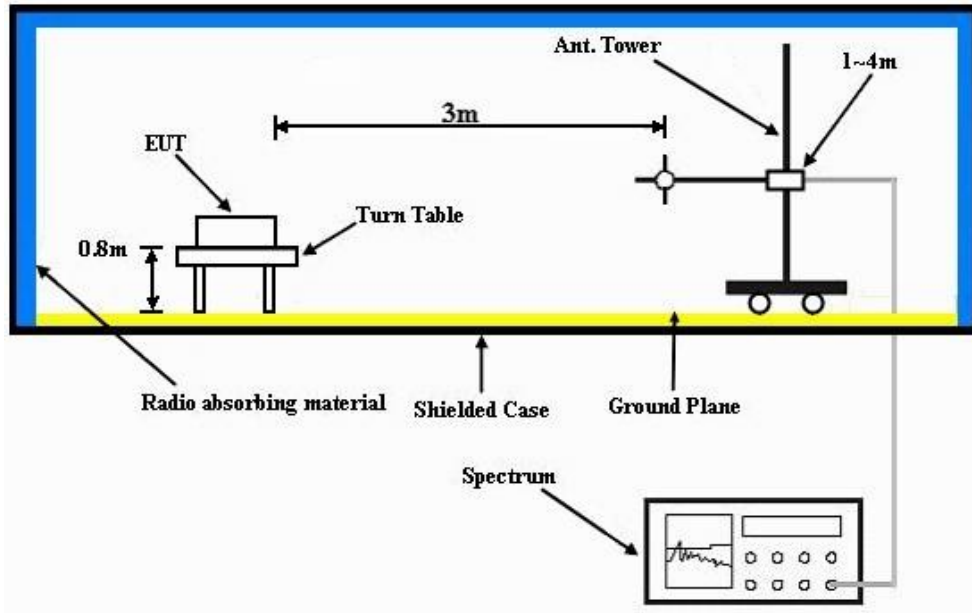
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

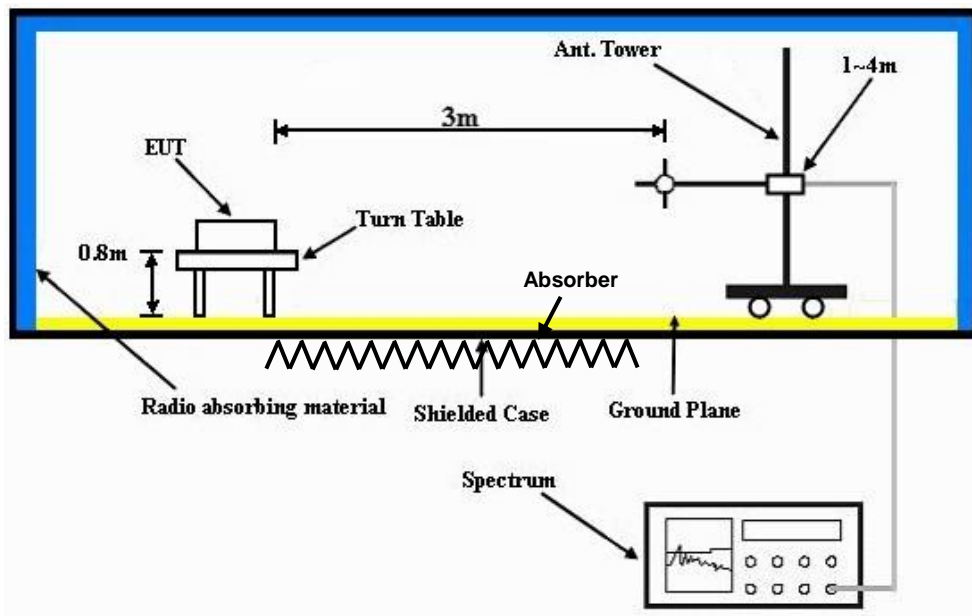
No deviation.

**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).

**4.1.6 EUT OPERATING CONDITIONS**

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.



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**4.1.7 TEST RESULTS**

**ABOVE 1GHz WORST-CASE DATA**

**802.11b**

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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	42.72	40.99	54	-11.28	31.8	5.4	35.47	116	188	Average
2390	58.58	56.85	74	-15.42	31.8	5.4	35.47	116	188	Peak
2412	106.5	104.73			31.81	5.43	35.47	116	188	Average
2412	109.46	107.69			31.81	5.43	35.47	116	188	Peak
2496	41.96	39.94	54	-12.04	31.9	5.53	35.41	116	188	Average
2496	57.2	55.18	74	-16.8	31.9	5.53	35.41	116	188	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	42.76	41.05	54	-11.24	31.8	5.4	35.49	101	97	Average
2386	58.13	56.42	74	-15.87	31.8	5.4	35.49	101	97	Peak
2412	105.47	103.7			31.81	5.43	35.47	101	97	Average
2412	108.18	106.41			31.81	5.43	35.47	101	97	Peak
2484	40.91	38.95	54	-13.09	31.88	5.5	35.42	101	97	Average
2484	55.89	53.93	74	-18.11	31.88	5.5	35.42	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2358	39.69	38.06	54	-14.31	31.76	5.37	35.5	116	188	Average
2358	54.79	53.16	74	-19.21	31.76	5.37	35.5	116	188	Peak
2437	107.88	106.03			31.85	5.46	35.46	116	188	Average
2437	110.06	108.21			31.85	5.46	35.46	116	188	Peak
2484	40.95	38.99	54	-13.05	31.88	5.5	35.42	116	188	Average
2484	55.68	53.72	74	-18.32	31.88	5.5	35.42	116	188	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2358	39.65	38.02	54	-14.35	31.76	5.37	35.5	101	100	Average
2358	55.24	53.61	74	-18.76	31.76	5.37	35.5	101	100	Peak
2437	105.91	104.06			31.85	5.46	35.46	101	100	Average
2437	108.11	106.26			31.85	5.46	35.46	101	100	Peak
2486	40.65	38.66	54	-13.35	31.88	5.53	35.42	101	100	Average
2486	55.69	53.7	74	-18.31	31.88	5.53	35.42	101	100	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2378	40.71	39.05	54	-13.29	31.78	5.37	35.49	113	187	Average
2378	55.34	53.68	74	-18.66	31.78	5.37	35.49	113	187	Peak
2462	107.6	105.67			31.87	5.5	35.44	113	187	Average
2462	110.23	108.3			31.87	5.5	35.44	113	187	Peak
<b>2490</b>	<b>52.71</b>	<b>50.7</b>	<b>54</b>	<b>-1.29</b>	<b>31.9</b>	<b>5.53</b>	<b>35.42</b>	<b>113</b>	<b>187</b>	<b>Average</b>
2490	60.6	58.59	74	-13.4	31.9	5.53	35.42	113	187	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2368	39.65	38.01	54	-14.35	31.76	5.37	35.49	101	99	Average
2368	55.77	54.13	74	-18.23	31.76	5.37	35.49	101	99	Peak
2462	105.49	103.56			31.87	5.5	35.44	101	99	Average
2462	108.07	106.14			31.87	5.5	35.44	101	99	Peak
2486	45.31	43.32	54	-8.69	31.88	5.53	35.42	101	99	Average
2486	57.06	55.07	74	-16.94	31.88	5.53	35.42	101	99	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462MHz: Fundamental frequency.





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802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	47.06	45.33	54	-6.94	31.8	5.4	35.47	111	136	Average
2390	69.31	67.58	74	-4.69	31.8	5.4	35.47	111	136	Peak
2412	100.37	98.6			31.81	5.43	35.47	111	136	Average
2412	108.13	106.36			31.81	5.43	35.47	111	136	Peak
2484	40.95	38.99	54	-13.05	31.88	5.5	35.42	111	136	Average
2484	56.98	55.02	74	-17.02	31.88	5.5	35.42	111	136	Peak

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	47.9	46.17	54	-6.1	31.8	5.4	35.47	101	97	Average
2390	68.3	66.57	74	-5.7	31.8	5.4	35.47	101	97	Peak
2412	98.77	97			31.81	5.43	35.47	101	97	Average
2412	106.69	104.92			31.81	5.43	35.47	101	97	Peak
2488	41	38.99	54	-13	31.9	5.53	35.42	101	97	Average
2488	55.83	53.82	74	-18.17	31.9	5.53	35.42	101	97	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2384	40.7	39.01	54	-13.3	31.78	5.4	35.49	111	160	Average
2384	55.71	54.02	74	-18.29	31.78	5.4	35.49	111	160	Peak
2437	100.84	98.99			31.85	5.46	35.46	111	160	Average
2437	108.28	106.43			31.85	5.46	35.46	111	160	Peak
2483.5	47.95	45.99	54	-6.05	31.88	5.5	35.42	111	160	Average
2483.5	61.01	59.05	74	-12.99	31.88	5.5	35.42	111	160	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	41.76	40.03	54	-12.24	31.8	5.4	35.47	101	97	Average
2390	58.37	56.64	74	-15.63	31.8	5.4	35.47	101	97	Peak
2437	98.84	96.99			31.85	5.46	35.46	101	97	Average
2437	106.34	104.49			31.85	5.46	35.46	101	97	Peak
2500	40.96	38.94	54	-13.04	31.9	5.53	35.41	101	97	Average
2500	56.68	54.66	74	-17.32	31.9	5.53	35.41	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2382	41.7	40.01	54	-12.3	31.78	5.4	35.49	113	161	Average
2382	52.4	50.71	74	-21.6	31.78	5.4	35.49	113	161	Peak
2462	100.89	98.96			31.87	5.5	35.44	113	161	Average
2462	108.47	106.54			31.87	5.5	35.44	113	161	Peak
2483.5	51.91	49.95	54	-2.09	31.88	5.5	35.42	113	161	Average
2483.5	72.19	70.23	74	-1.81	31.88	5.5	35.42	113	161	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2376	40.71	39.05	54	-13.29	31.78	5.37	35.49	143	103	Average
2376	55.61	53.95	74	-18.39	31.78	5.37	35.49	143	103	Peak
2462	98.89	96.96			31.87	5.5	35.44	143	103	Average
2462	106.7	104.77			31.87	5.5	35.44	143	103	Peak
2483.5	49.91	47.95	54	-4.09	31.88	5.5	35.42	143	103	Average
2483.5	67.2	65.24	74	-6.8	31.88	5.5	35.42	143	103	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462MHz: Fundamental frequency.



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## 802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	47.19	45.46	54	-6.81	31.8	5.4	35.47	113	188	Average
2390	69.35	67.62	74	-4.65	31.8	5.4	35.47	113	188	Peak
2412	100.81	99.04			31.81	5.43	35.47	113	188	Average
2412	107.99	106.22			31.81	5.43	35.47	113	188	Peak
2494	46.33	44.31	54	-7.67	31.9	5.53	35.41	113	188	Average
2494	58.5	56.48	74	-15.5	31.9	5.53	35.41	113	188	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	47.65	45.92	54	-6.35	31.8	5.4	35.47	101	97	Average
2390	67.47	65.74	74	-6.53	31.8	5.4	35.47	101	97	Peak
2412	99.37	97.6			31.81	5.43	35.47	101	97	Average
2412	106.8	105.03			31.81	5.43	35.47	101	97	Peak
2492	44	41.98	54	-10	31.9	5.53	35.41	101	97	Average
2492	56.82	54.8	74	-17.18	31.9	5.53	35.41	101	97	Peak

## REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	40.76	39.05	54	-13.24	31.8	5.4	35.49	113	159	Average
2388	56.09	54.38	74	-17.91	31.8	5.4	35.49	113	159	Peak
2437	100.88	99.03			31.85	5.46	35.46	113	159	Average
2437	108.2	106.35			31.85	5.46	35.46	113	159	Peak
2488	47.35	45.34	54	-6.65	31.9	5.53	35.42	113	159	Average
2488	62.51	60.5	74	-11.49	31.9	5.53	35.42	113	159	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	41.72	39.99	54	-12.28	31.8	5.4	35.47	101	97	Average
2390	57.56	55.83	74	-16.44	31.8	5.4	35.47	101	97	Peak
2437	99.44	97.59			31.85	5.46	35.46	101	97	Average
2437	106.52	104.67			31.85	5.46	35.46	101	97	Peak
2492	42.55	40.53	54	-11.45	31.9	5.53	35.41	101	97	Average
2492	56.81	54.79	74	-17.19	31.9	5.53	35.41	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2382	40.7	39.01	54	-13.3	31.78	5.4	35.49	113	159	Average
2382	55.51	53.82	74	-18.49	31.78	5.4	35.49	113	159	Peak
2462	99.93	98			31.87	5.5	35.44	113	159	Average
2462	107.82	105.89			31.87	5.5	35.44	113	159	Peak
2486	50.65	48.66	54	-3.35	31.88	5.53	35.42	113	159	Average
2486	68.82	66.83	74	-5.18	31.88	5.53	35.42	113	159	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2382	40.75	39.06	54	-13.25	31.78	5.4	35.49	101	97	Average
2382	56.24	54.55	74	-17.76	31.78	5.4	35.49	101	97	Peak
2462	98.48	96.55			31.87	5.5	35.44	101	97	Average
2462	105.97	104.04			31.87	5.5	35.44	101	97	Peak
2483.5	45.24	43.28	54	-8.76	31.88	5.5	35.42	101	97	Average
2483.5	60.36	58.4	74	-13.64	31.88	5.5	35.42	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462MHz: Fundamental frequency.



A D T

**802.11n (40MHz)**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	50.16	48.45	54	-3.84	31.8	5.4	35.49	113	188	Average
2386	68.78	67.07	74	-5.22	31.8	5.4	35.49	113	188	Peak
2422	98.85	97.05			31.83	5.43	35.46	113	188	Average
2422	105.96	104.16			31.83	5.43	35.46	113	188	Peak
2498	44.29	42.27	54	-9.71	31.9	5.53	35.41	113	188	Average
2498	58.53	56.51	74	-15.47	31.9	5.53	35.41	113	188	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	50.37	48.64	54	-3.63	31.8	5.4	35.47	101	97	Average
2390	65.42	63.69	74	-8.58	31.8	5.4	35.47	101	97	Peak
2422	97.12	95.32			31.83	5.43	35.46	101	97	Average
2422	104.46	102.66			31.83	5.43	35.46	101	97	Peak
2486	43.98	41.99	54	-10.02	31.88	5.53	35.42	101	97	Average
2486	55.49	53.5	74	-18.51	31.88	5.53	35.42	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2422MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	45.76	44.03	54	-8.24	31.8	5.4	35.47	113	157	Average
2390	60.44	58.71	74	-13.56	31.8	5.4	35.47	113	157	Peak
2437	99.84	97.99			31.85	5.46	35.46	113	157	Average
2437	106.51	104.66			31.85	5.46	35.46	113	157	Peak
2486	50.51	48.52	54	-3.49	31.88	5.53	35.42	113	157	Average
2486	68.55	66.56	74	-5.45	31.88	5.53	35.42	113	157	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	46.09	44.36	54	-7.91	31.8	5.4	35.47	101	97	Average
2390	60.16	58.43	74	-13.84	31.8	5.4	35.47	101	97	Peak
2437	96.88	95.03			31.85	5.46	35.46	101	97	Average
2437	104.62	102.77			31.85	5.46	35.46	101	97	Peak
2483.5	49.24	47.28	54	-4.76	31.88	5.5	35.42	101	97	Average
2483.5	61.68	59.72	74	-12.32	31.88	5.5	35.42	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2380	42.67	41.01	54	-11.33	31.78	5.37	35.49	113	157	Average
2380	56.26	54.6	74	-17.74	31.78	5.37	35.49	113	157	Peak
2452	97.17	95.3			31.85	5.46	35.44	113	157	Average
2452	104.05	102.18			31.85	5.46	35.44	113	157	Peak
2483.5	52.04	50.08	54	-1.96	31.88	5.5	35.42	113	157	Average
2483.5	66.64	64.68	74	-7.36	31.88	5.5	35.42	113	157	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	41.72	40.01	54	-12.28	31.8	5.4	35.49	101	97	Average
2388	56.41	54.7	74	-17.59	31.8	5.4	35.49	101	97	Peak
2452	94.84	92.97			31.85	5.46	35.44	101	97	Average
2452	102.21	100.34			31.85	5.46	35.44	101	97	Peak
2490	47.33	45.32	54	-6.67	31.9	5.53	35.42	101	97	Average
2490	60.51	58.5	74	-13.49	31.9	5.53	35.42	101	97	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2452MHz: Fundamental frequency.



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**BELOW 1GHz WORST-CASE DATA:**

**802.11b**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30.81	27.65	41.98	40	-12.35	17.19	0.74	32.26	150	164	Peak
116.4	20.53	42.54	43.5	-22.97	8.96	1.28	32.25	147	258	Peak
170.4	20.1	40.78	43.5	-23.4	10.04	1.52	32.24	134	314	Peak
586.3	21.28	30.05	46	-24.72	20.6	2.82	32.19	162	214	Peak
702.5	24.87	30.71	46	-21.13	23.14	3.11	32.09	191	218	Peak
920.2	28.37	30.21	46	-17.63	25.96	3.53	31.33	169	351	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30.81	36.73	51.06	40	-3.27	17.19	0.74	32.26	114	132	Peak
88.05	17.41	39.31	43.5	-26.09	8.8	1.11	31.81	172	230	Peak
171.75	15.64	36.29	43.5	-27.86	10.07	1.52	32.24	108	271	Peak
525.4	21.3	30.05	46	-24.7	20.7	2.7	32.15	169	351	Peak
666.8	28.15	34.26	46	-17.85	22.97	3.05	32.13	134	201	Peak
982.5	28.92	29.91	54	-25.08	25.86	3.72	30.57	173	116	Peak

**REMARKS:** Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

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 (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
  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	100288	Nov. 17, 2013	Nov. 16, 2014
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 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 2.
  3. The VCCI Site Registration No. is C-2047.

#### 4.2.3 TEST PROCEDURES

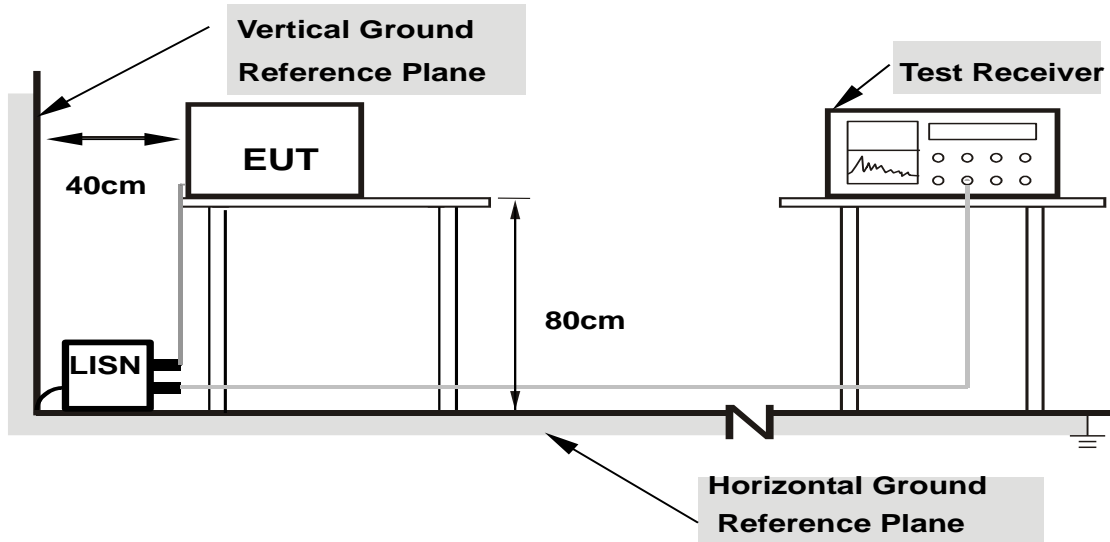
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

**NOTE:** 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:**
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 section 4.1.6.

4.2.7 TEST RESULTS

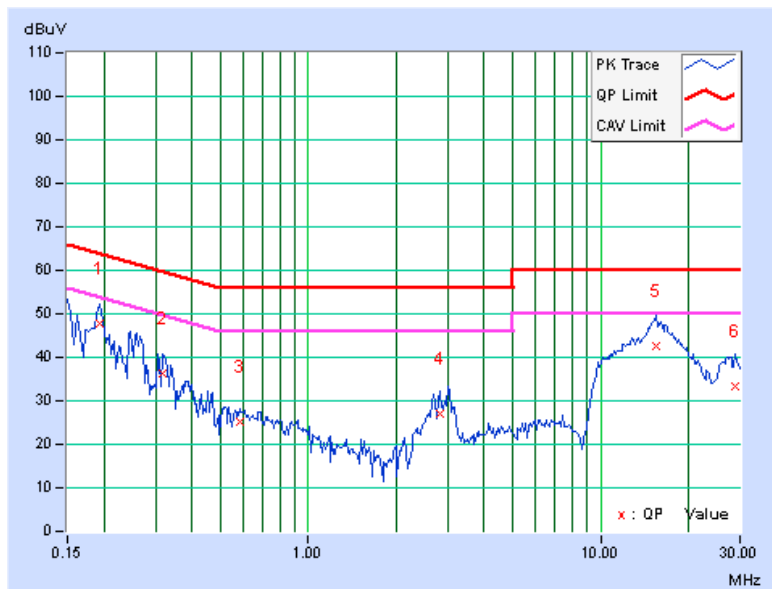
CONDUCTED WORST-CASE DATA :

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19297	0.28	47.34	34.68	47.62	34.96	63.91	53.91	-16.29	-18.95
2	0.31797	0.29	35.99	20.23	36.28	20.52	59.76	49.76	-23.48	-29.24
3	0.58359	0.31	24.94	13.18	25.25	13.49	56.00	46.00	-30.75	-32.51
4	2.82813	0.39	26.72	14.60	27.11	14.99	56.00	46.00	-28.89	-31.01
<b>5</b>	<b>15.48828</b>	<b>0.54</b>	<b>42.18</b>	<b>35.42</b>	<b>42.72</b>	<b>35.96</b>	<b>60.00</b>	<b>50.00</b>	<b>-17.28</b>	<b>-14.04</b>
6	28.88281	0.46	32.91	27.55	33.37	28.01	60.00	50.00	-26.63	-21.99

REMARKS:

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

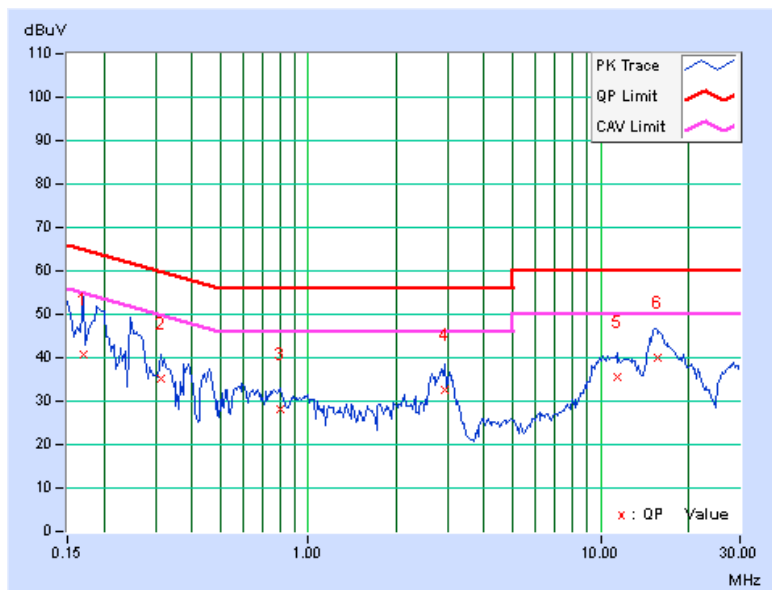


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.16953	0.27	40.31	16.95	40.58	17.22	64.98
2	0.31406	0.29	35.07	19.21	35.36	19.50	59.86	49.86	-24.50	-30.36
3	0.80625	0.33	28.00	15.52	28.33	15.85	56.00	46.00	-27.67	-30.15
4	2.94922	0.40	32.28	19.31	32.68	19.71	56.00	46.00	-23.32	-26.29
5	11.37891	0.53	34.98	26.96	35.51	27.49	60.00	50.00	-24.49	-22.51
6	15.64453	0.57	39.48	32.55	40.05	33.12	60.00	50.00	-19.95	-16.88

**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

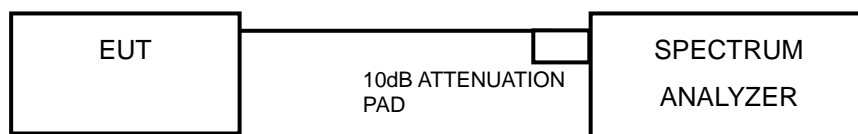


## 4.3 6dB BANDWIDTH MEASUREMENT

### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

### 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.





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#### 4.3.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	7.61	0.5	PASS
6	2437	7.61	0.5	PASS
11	2462	8.09	0.5	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.14	0.5	PASS
6	2437	15.14	0.5	PASS
11	2462	15.34	0.5	PASS

##### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.16	0.5	PASS
6	2437	15.16	0.5	PASS
11	2462	15.13	0.5	PASS

##### 802.11n (40MHz)

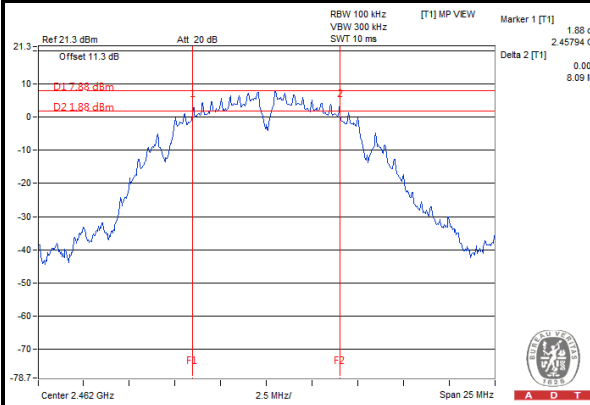
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.15	0.5	PASS
6	2437	35.17	0.5	PASS
6	2452	35.13	0.5	PASS



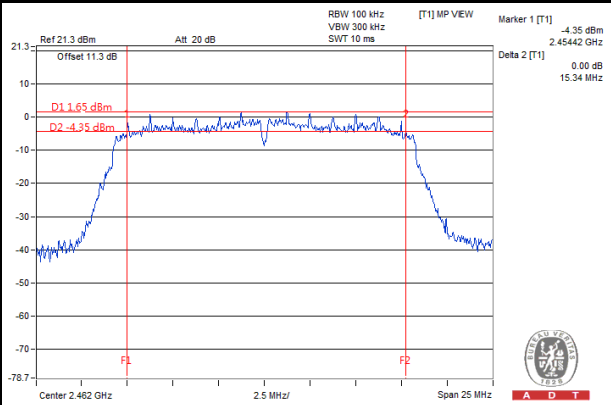
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### SPECTRUM PLOT OF WORST VALUE

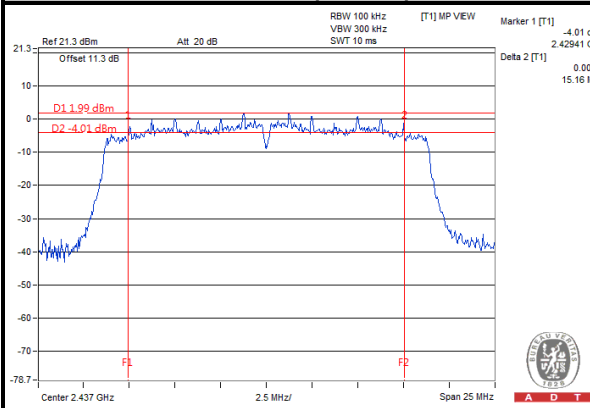
#### 802.11b



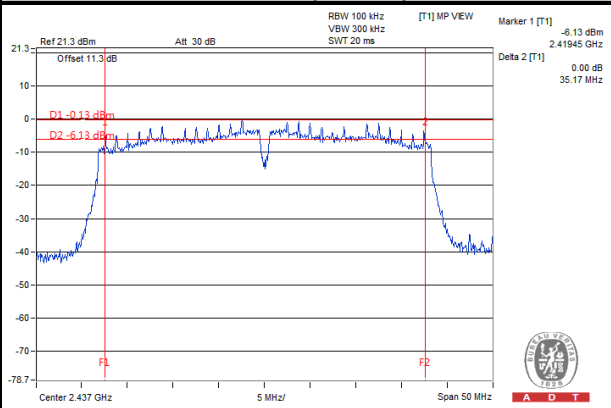
#### 802.11g



#### 802.11n (20MHz)



#### 802.11n (40MHz)

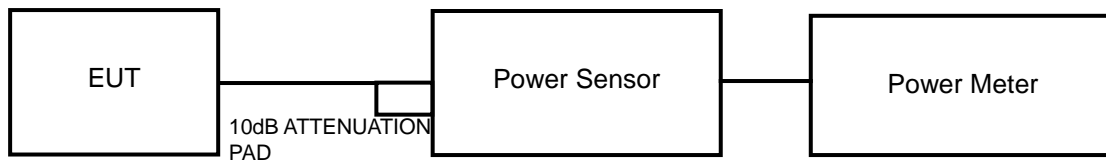


## 4.4 CONDUCTED OUTPUT POWER

### 4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

### 4.4.2 TEST SETUP



### 4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.4.4 TEST PROCEDURES

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

### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.4.6 EUT OPERATING CONDITIONS

Same as section 4.3.6.



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#### 4.4.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	75.68	18.79	30	PASS
6	2437	77.62	18.90	30	PASS
11	2462	83.37	19.21	30	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	163.68	22.14	30	PASS
6	2437	177.42	22.49	30	PASS
11	2462	183.65	22.64	30	PASS

##### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
1	2412	172.58	22.37	30	PASS
6	2437	167.11	22.23	30	PASS
11	2462	143.88	21.58	30	PASS

##### 802.11n (40MHz)

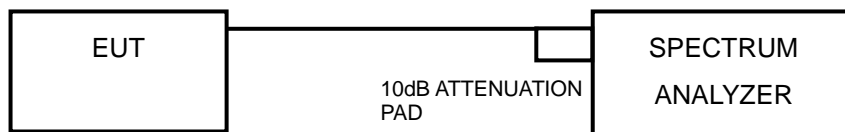
CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
3	2422	163.68	22.14	30	PASS
6	2437	177.01	22.48	30	PASS
9	2452	129.72	21.13	30	PASS

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 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

- 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.

### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.5.6 EUT OPERATING CONDITION

Same as section 4.3.6.



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#### 4.5.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-6.67	8	PASS
6	2437	-4.79	8	PASS
11	2462	-6.36	8	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-12.56	8	PASS
6	2437	-12.08	8	PASS
11	2462	-12.21	8	PASS

##### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
1	2412	-13.76	8	PASS
6	2437	-12.96	8	PASS
11	2462	-11.99	8	PASS

##### 802.11n (40MHz)

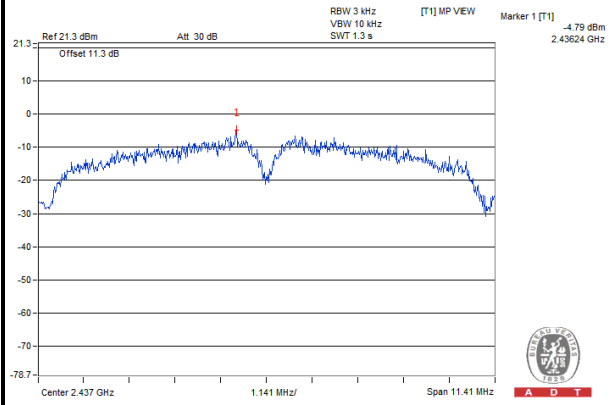
CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
3	2422	-13.94	8	PASS
6	2437	-14.38	8	PASS
9	2452	-14.33	8	PASS



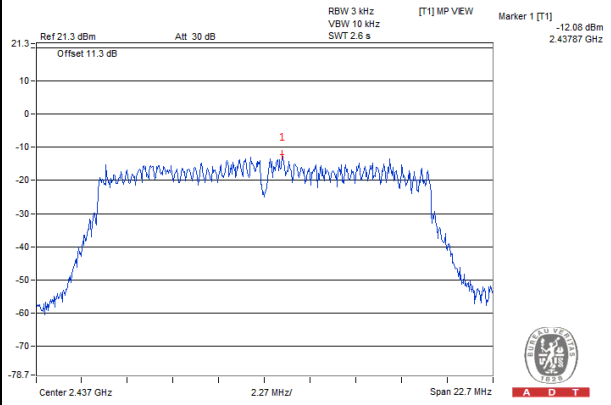
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### SPECTRUM PLOT OF WORST VALUE

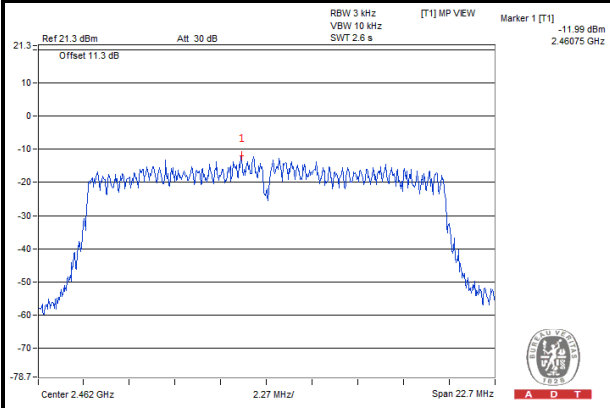
#### 802.11b



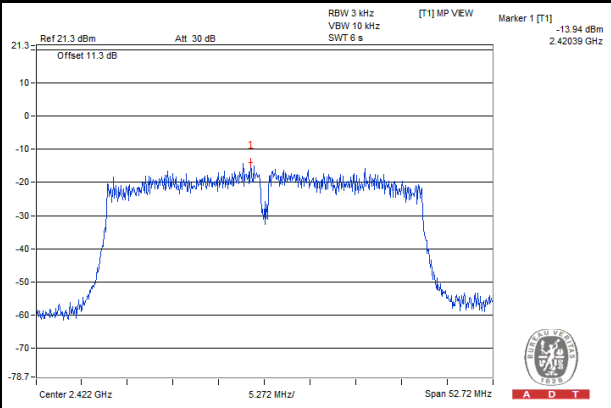
#### 802.11g



#### 802.11n (20MHz)



#### 802.11n (40MHz)

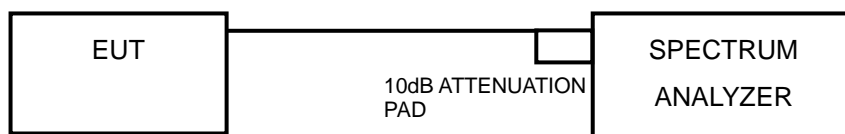


## 4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

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

### 4.6.2 TEST SETUP



### 4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 TEST PROCEDURE

#### 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.

### 4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.6.6 EUT OPERATING CONDITION

Same as section 4.3.6.



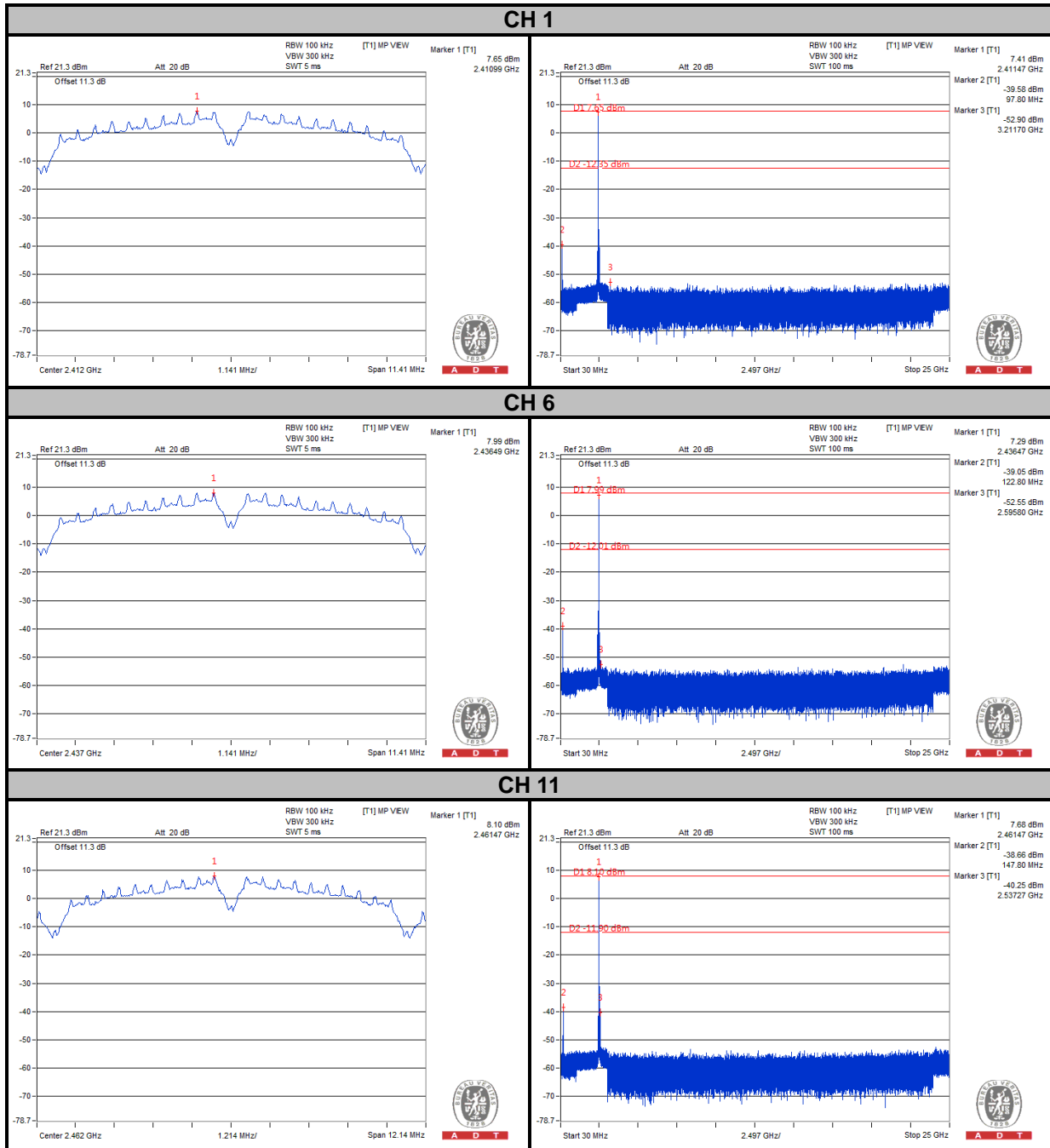


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### 4.6.7 TEST RESULTS

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

#### 802.11b

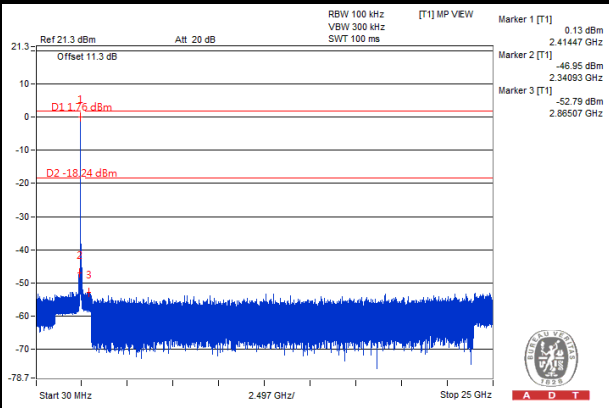
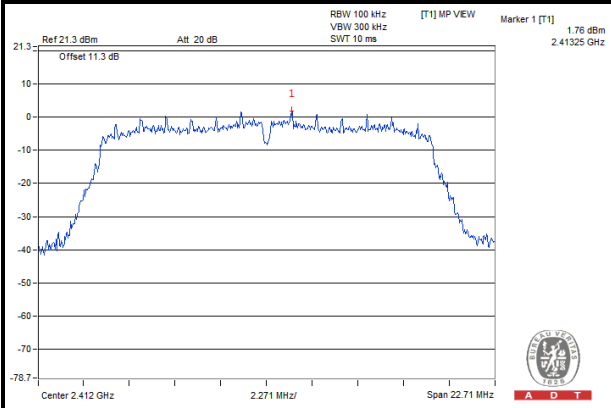




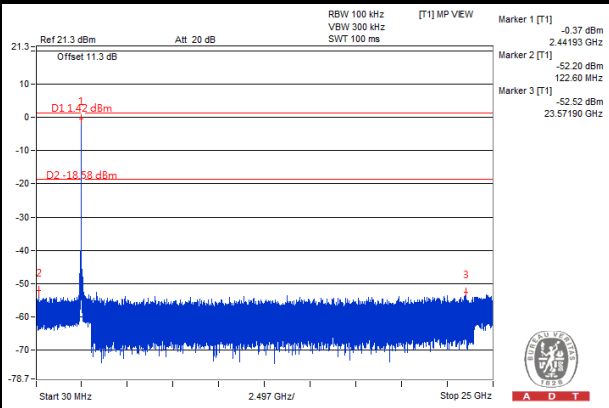
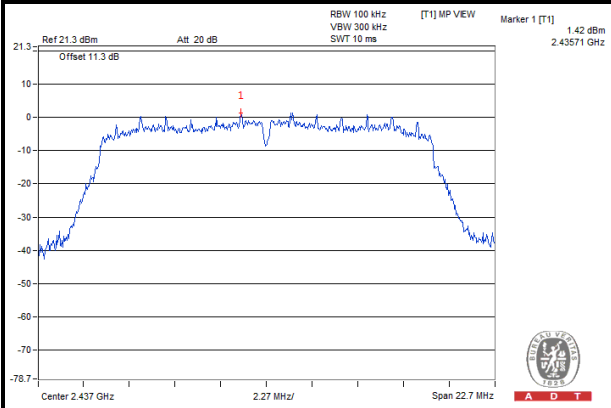
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### 802.11g

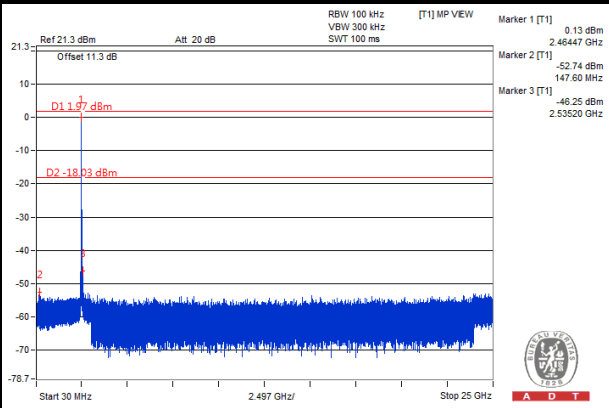
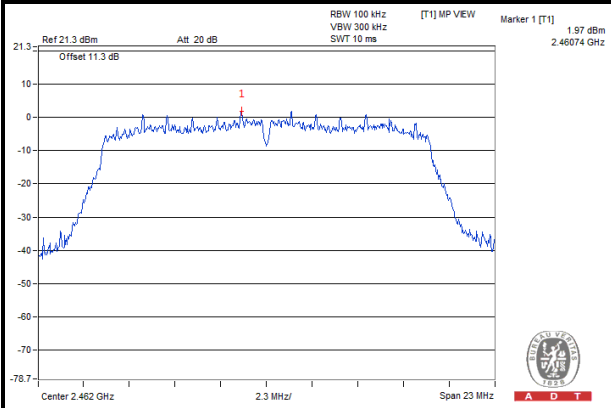
#### CH 1



#### CH 6



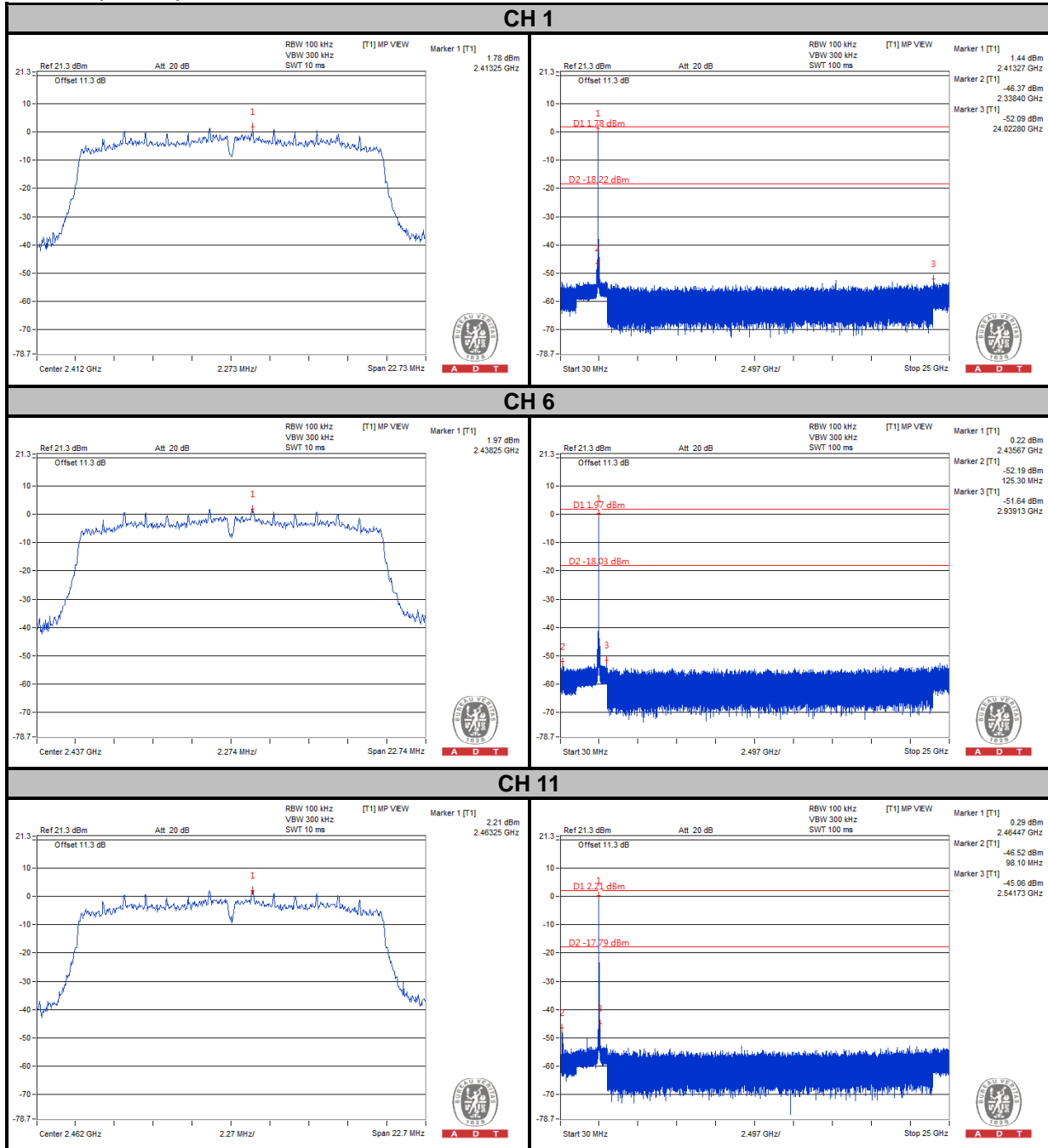
#### CH 11





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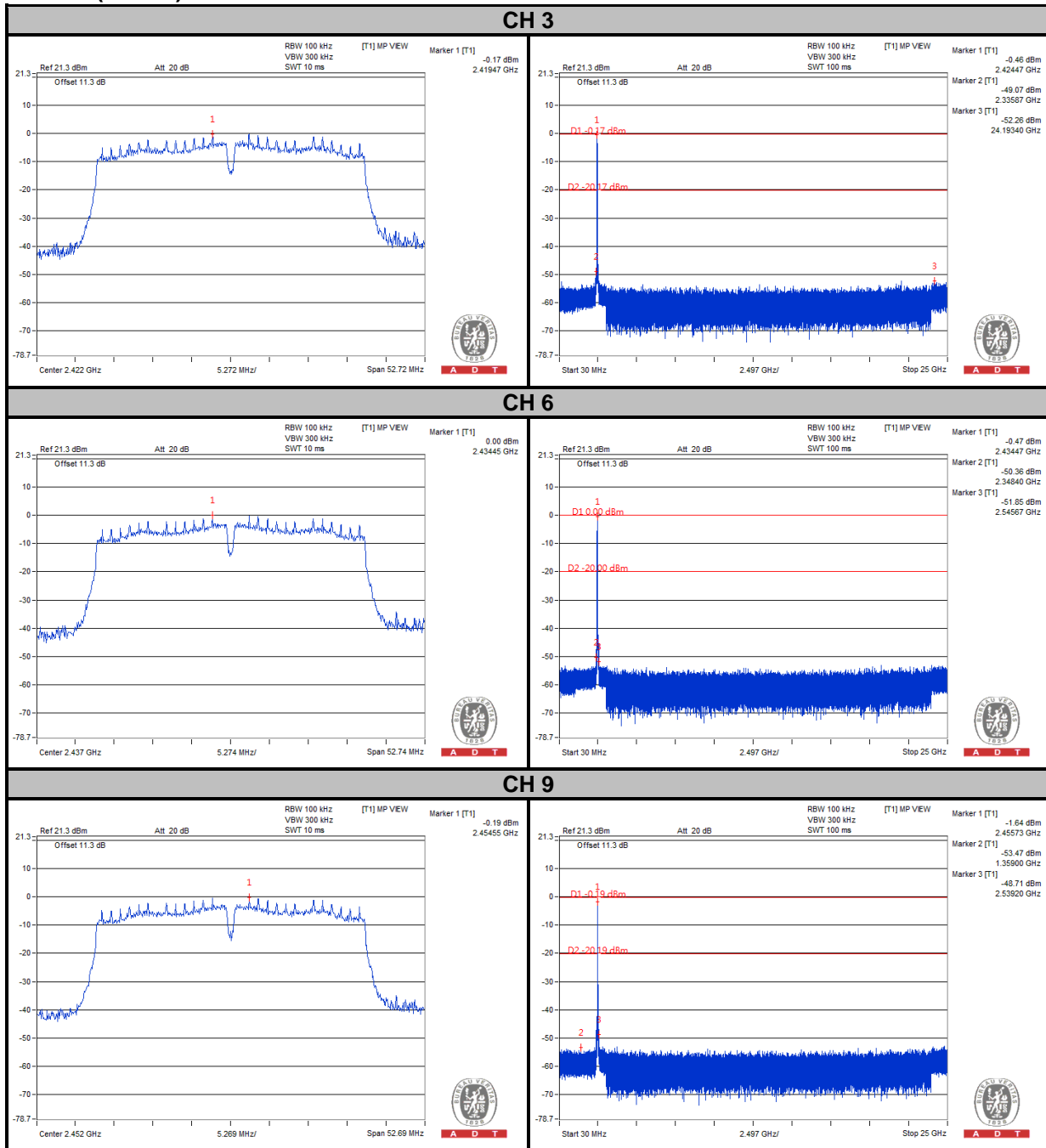
### 802.11n (20MHz)





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### 802.11n (40MHz)



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

### 5.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

#### 5.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

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



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### **5.1.2 TEST INSTRUMENTS**

Same as section 4.1.2.

### **5.1.3 TEST PROCEDURES**

Same as section 4.1.3.

### **5.1.4 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.1.5 TEST SETUP**

Same as section 4.1.5.

### **5.1.6 EUT OPERATING CONDITIONS**

Same as section 4.1.6.



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5.1.7 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA :

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	50.17	41.01	69.87	-19.7	34.62	8.65	34.11	100	322	Average
5725	60.99	51.83	77.75	-16.76	34.62	8.65	34.11	100	322	Peak
5745	89.87	80.68			34.64	8.66	34.11	100	322	Average
5745	97.75	88.56			34.64	8.66	34.11	100	322	Peak
5850	47.01	37.71	69.87	-22.86	34.74	8.7	34.14	100	322	Average
5850	56.14	46.84	77.75	-21.61	34.74	8.7	34.14	100	322	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	53.08	43.92	76.54	-23.46	34.62	8.65	34.11	110	263	Average
5725	72.02	62.86	84.17	-12.15	34.62	8.65	34.11	110	263	Peak
5745	96.54	87.35			34.64	8.66	34.11	110	263	Average
5745	104.17	94.98			34.64	8.66	34.11	110	263	Peak
5850	46.97	37.67	76.54	-29.57	34.74	8.7	34.14	110	263	Average
5850	54.78	45.48	84.17	-29.39	34.74	8.7	34.14	110	263	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	45.84	36.68	69.88	-24.04	34.62	8.65	34.11	100	322	Average
5725	55.9	46.74	76.93	-21.03	34.62	8.65	34.11	100	322	Peak
5785	89.88	80.65			34.68	8.68	34.13	100	322	Average
5785	96.93	87.7			34.68	8.68	34.13	100	322	Peak
5850	45.96	36.66	69.88	-23.92	34.74	8.7	34.14	100	322	Average
5850	54.66	45.36	76.93	-22.27	34.74	8.7	34.14	100	322	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	48.86	39.7	77.57	-28.71	34.62	8.65	34.11	110	263	Average
5725	58.01	48.85	84.29	-26.28	34.62	8.65	34.11	110	263	Peak
5785	97.57	88.34			34.68	8.68	34.13	110	263	Average
5785	104.29	95.06			34.68	8.68	34.13	110	263	Peak
5850	46.66	37.36	77.57	-30.91	34.74	8.7	34.14	110	263	Average
5850	56.51	47.21	84.29	-27.78	34.74	8.7	34.14	110	263	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band





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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	45.8	36.64	69.94	-24.14	34.62	8.65	34.11	100	321	Average
5725	56.65	47.49	76.89	-20.24	34.62	8.65	34.11	100	321	Peak
5825	89.94	80.65			34.73	8.69	34.13	100	321	Average
5825	96.89	87.6			34.73	8.69	34.13	100	321	Peak
5850	47.97	38.67	69.94	-21.97	34.74	8.7	34.14	100	321	Average
5850	57.5	48.2	76.89	-19.39	34.74	8.7	34.14	100	321	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	46.8	37.64	75.54	-28.74	34.62	8.65	34.11	110	263	Average
5725	57.28	48.12	83.25	-25.97	34.62	8.65	34.11	110	263	Peak
5825	95.54	86.25			34.73	8.69	34.13	110	263	Average
5825	103.25	93.96			34.73	8.69	34.13	110	263	Peak
5850	51.01	41.71	75.54	-24.53	34.74	8.7	34.14	110	263	Average
5850	59.07	49.77	83.25	-24.18	34.74	8.7	34.14	110	263	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	48.84	39.68	69.16	-20.32	34.62	8.65	34.11	100	321	Average
5725	60.45	51.29	76.49	-16.04	34.62	8.65	34.11	100	321	Peak
5745	89.16	79.97			34.64	8.66	34.11	100	321	Average
5745	96.49	87.3			34.64	8.66	34.11	100	321	Peak
5850	46.97	37.67	69.16	-22.19	34.74	8.7	34.14	100	321	Average
5850	55.15	45.85	76.49	-21.34	34.74	8.7	34.14	100	321	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	53.13	43.97	76.83	-23.7	34.62	8.65	34.11	110	263	Average
5725	64.22	55.06	83.97	-19.75	34.62	8.65	34.11	110	263	Peak
5745	96.83	87.64			34.64	8.66	34.11	110	263	Average
5745	103.97	94.78			34.64	8.66	34.11	110	263	Peak
5850	46.01	36.71	76.83	-30.82	34.74	8.7	34.14	110	263	Average
5850	57.18	47.88	83.97	-26.79	34.74	8.7	34.14	110	263	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	45.84	36.68	68.21	-22.37	34.62	8.65	34.11	100	321	Average
5725	56.04	46.88	75.76	-19.72	34.62	8.65	34.11	100	321	Peak
5785	88.21	78.98			34.68	8.68	34.13	100	321	Average
5785	95.76	86.53			34.68	8.68	34.13	100	321	Peak
5850	46.97	37.67	68.21	-21.24	34.74	8.7	34.14	100	321	Average
5850	55.72	46.42	75.76	-20.04	34.74	8.7	34.14	100	321	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	45.84	36.68	76.98	-31.14	34.62	8.65	34.11	120	263	Average
5725	56.68	47.52	83.95	-27.27	34.62	8.65	34.11	120	263	Peak
5785	96.98	87.75			34.68	8.68	34.13	120	263	Average
5785	103.95	94.72			34.68	8.68	34.13	120	263	Peak
5850	46.01	36.71	76.98	-30.97	34.74	8.7	34.14	120	263	Average
5850	56.61	47.31	83.95	-27.34	34.74	8.7	34.14	120	263	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	45.8	36.64	69.94	-24.14	34.62	8.65	34.11	100	320	Average
5725	56.69	47.53	76.51	-19.82	34.62	8.65	34.11	100	320	Peak
5825	89.94	80.65			34.73	8.69	34.13	100	320	Average
5825	96.51	87.22			34.73	8.69	34.13	100	320	Peak
5850	47.03	37.73	69.94	-22.91	34.74	8.7	34.14	100	320	Average
5850	56.47	47.17	76.51	-20.04	34.74	8.7	34.14	100	320	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	46.8	37.64	75.92	-29.12	34.62	8.65	34.11	120	263	Average
5725	55.36	46.2	83.72	-28.36	34.62	8.65	34.11	120	263	Peak
5825	95.92	86.63			34.73	8.69	34.13	120	263	Average
5825	103.72	94.43			34.73	8.69	34.13	120	263	Peak
5850	50.01	40.71	75.92	-25.91	34.74	8.7	34.14	120	263	Average
5850	64.17	54.87	83.72	-19.55	34.74	8.7	34.14	120	263	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	47.8	38.64	65.84	-18.04	34.62	8.65	34.11	100	321	Average
5725	57.16	48	72.51	-15.35	34.62	8.65	34.11	100	321	Peak
5755	85.84	76.63			34.66	8.66	34.11	100	321	Average
5755	92.51	83.3			34.66	8.66	34.11	100	321	Peak
5850	46.66	37.36	65.84	-19.18	34.74	8.7	34.14	100	321	Average
5850	56.09	46.79	72.51	-16.42	34.74	8.7	34.14	100	321	Peak

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	54.36	45.2	73.18	-18.82	34.62	8.65	34.11	111	263	Average
5725	65.68	56.52	80.51	-14.83	34.62	8.65	34.11	111	263	Peak
5755	93.18	83.97			34.66	8.66	34.11	111	263	Average
5755	100.51	91.3			34.66	8.66	34.11	111	263	Peak
5850	45.97	36.67	73.18	-27.21	34.74	8.7	34.14	111	263	Average
5850	57.16	47.86	80.51	-23.35	34.74	8.7	34.14	111	263	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5755MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	46.8	37.64	64.9	-18.1	34.62	8.65	34.11	100	321	Average
5725	55.33	46.17	72.38	-17.05	34.62	8.65	34.11	100	321	Peak
5795	84.9	75.66			34.69	8.68	34.13	100	321	Average
5795	92.38	83.14			34.69	8.68	34.13	100	321	Peak
5850	45.97	36.67	64.9	-18.93	34.74	8.7	34.14	100	321	Average
5850	55.87	46.57	72.38	-16.51	34.74	8.7	34.14	100	321	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	46.8	37.64	73.9	-27.1	34.62	8.65	34.11	110	263	Average
5725	55.97	46.81	80.56	-24.59	34.62	8.65	34.11	110	263	Peak
5795	93.9	84.66			34.69	8.68	34.13	110	263	Average
5795	100.56	91.32			34.69	8.68	34.13	110	263	Peak
5850	49.01	39.71	73.9	-24.89	34.74	8.7	34.14	110	263	Average
5850	58.86	49.56	80.56	-21.7	34.74	8.7	34.14	110	263	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5795MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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**BELOW 1GHz WORST-CASE DATA :**

**802.11a**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Harry Hsueh

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30.81	26.7	41.03	40	-13.3	17.19	0.74	32.26	162	342	Peak
117.48	21.02	43.11	43.5	-22.48	8.88	1.28	32.25	174	241	Peak
274.08	16.26	32.74	46	-29.74	13.7	1.94	32.12	196	215	Peak
514.9	21.71	31.01	46	-24.29	20.13	2.7	32.13	175	169	Peak
728.4	25.3	30.86	46	-20.7	23.4	3.16	32.12	142	321	Peak
944.7	28.8	30.13	46	-17.2	26.2	3.62	31.15	136	286	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
<b>30.54</b>	<b>35.81</b>	<b>50.02</b>	<b>40</b>	<b>-4.19</b>	<b>17.31</b>	<b>0.74</b>	<b>32.26</b>	<b>164</b>	<b>152</b>	<b>Peak</b>
117.21	16.91	39	43.5	-26.59	8.88	1.28	32.25	129	320	Peak
174.72	16.49	36.94	43.5	-27.01	10.18	1.61	32.24	181	76	Peak
463.1	18.79	29.91	46	-27.21	18.45	2.56	32.13	169	234	Peak
666.8	28.21	34.32	46	-17.79	22.97	3.05	32.13	106	326	Peak
946.8	29.31	30.62	46	-16.69	26.2	3.62	31.13	148	94	Peak

**REMARKS:** Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor

Margin value = Emission level – Limit value

## 5.2 CONDUCTED EMISSION MEASUREMENT

### 5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

### 5.2.2 TEST INSTRUMENTS

Same as section 4.2.2.

### 5.2.3 TEST PROCEDURES

Same as section 4.2.3.

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.2.5 TEST SETUP

Same as section 4.2.5.

### 5.2.6 EUT OPERATING CONDITIONS

Same as section 4.1.6.



5.2.7 TEST RESULTS

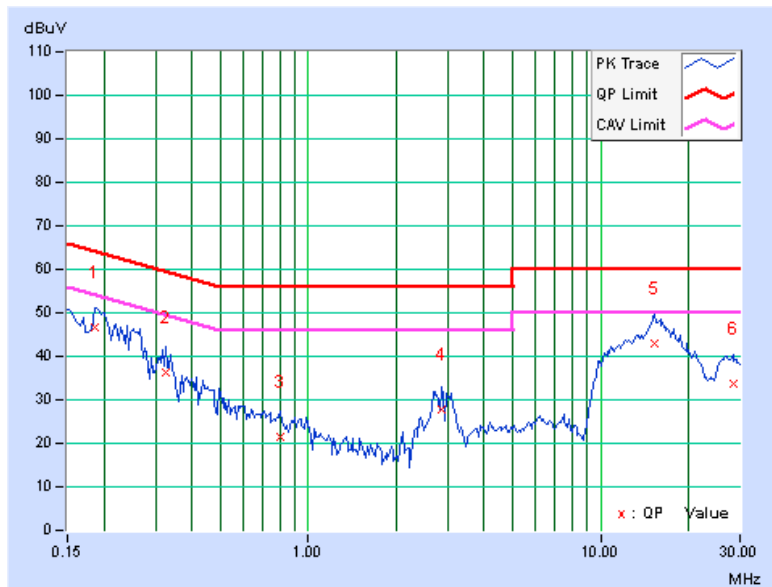
CONDUCTED WORST-CASE DATA :

PHASE	Line 1	6dB BANDWIDTH	9kHz
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No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]		[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.18516	0.28	46.43	29.19	46.71	29.47	64.25	54.25	-17.55	-24.79
2	0.32578	0.29	35.83	20.47	36.12	20.76	59.56	49.56	-23.44	-28.80
3	0.80625	0.33	21.30	9.45	21.63	9.78	56.00	46.00	-34.37	-36.22
4	2.85156	0.39	27.47	15.88	27.86	16.27	56.00	46.00	-28.14	-29.73
<b>5</b>	<b>15.29297</b>	<b>0.53</b>	<b>42.32</b>	<b>36.84</b>	<b>42.85</b>	<b>37.37</b>	<b>60.00</b>	<b>50.00</b>	<b>-17.15</b>	<b>-12.63</b>
6	28.35156	0.47	33.35	27.93	33.82	28.40	60.00	50.00	-26.18	-21.60

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





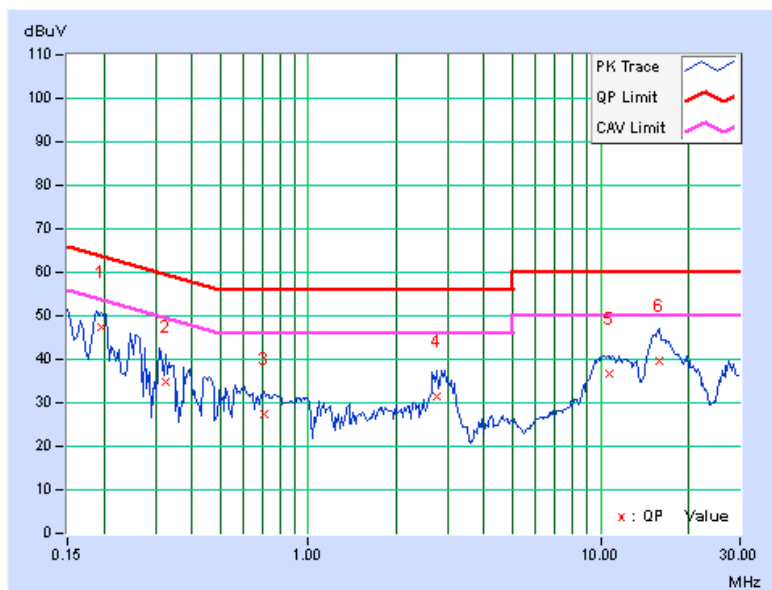
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PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.19687	0.28	47.11	33.56	47.39	33.84	63.74
2	0.32578	0.29	34.71	20.67	35.00	20.96	59.56	49.56	-24.56	-28.60
3	0.70859	0.32	27.25	12.94	27.57	13.26	56.00	46.00	-28.43	-32.74
4	2.75000	0.40	31.12	18.46	31.52	18.86	56.00	46.00	-24.48	-27.14
5	10.65234	0.53	36.16	29.37	36.69	29.90	60.00	50.00	-23.31	-20.10
6	15.79297	0.58	39.00	32.44	39.58	33.02	60.00	50.00	-20.42	-16.98

**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





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## **5.3 6dB BANDWIDTH MEASUREMENT**

### **5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT**

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

### **5.3.2 TEST SETUP**

Same as section 4.3.2.

### **5.3.3 TEST INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.3.4 TEST PROCEDURE**

Same as section 4.3.4.

### **5.3.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.3.6 EUT OPERATING CONDITIONS**

Same as section 4.3.6.



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### 5.3.7 TEST RESULTS

#### 802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	15.16	0.5	PASS
157	5785	15.16	0.5	PASS
165	5825	15.16	0.5	PASS

#### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	15.16	0.5	PASS
157	5785	15.16	0.5	PASS
165	5825	15.16	0.5	PASS

#### 802.11n (40MHz)

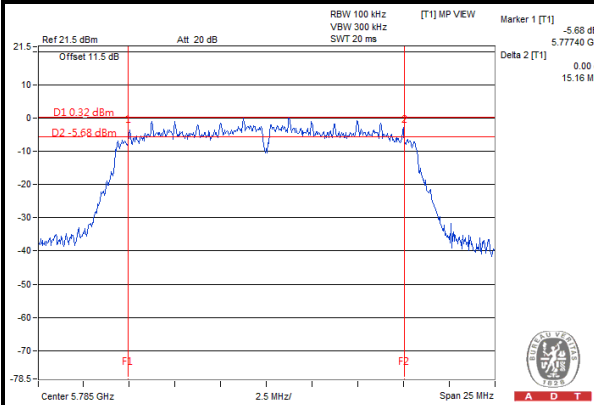
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	35.18	0.5	PASS
159	5795	35.14	0.5	PASS



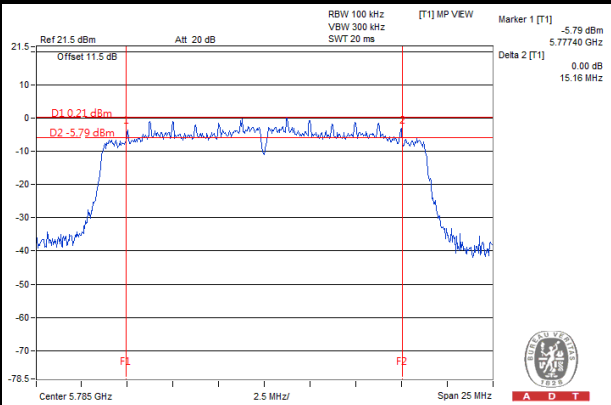
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### SPECTRUM PLOT OF WORST VALUE

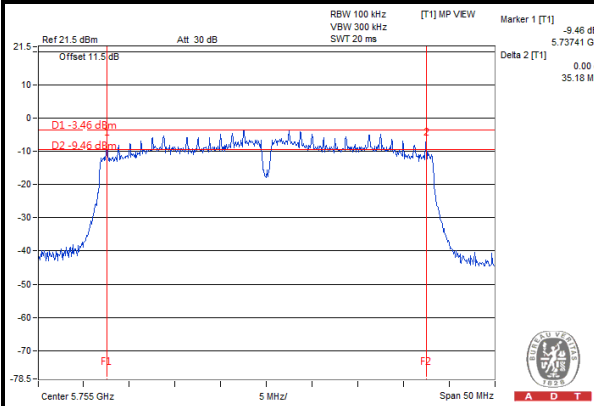
#### 802.11a



#### 802.11n (20MHz)



#### 802.11n (40MHz)



## **5.4 MAXIMUM OUTPUT POWER**

### **5.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT**

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

### **5.4.2 TEST SETUP**

Same as section 4.4.2.

### **5.4.3 INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.4.4 TEST PROCEDURES**

Same as section 4.4.4.

### **5.4.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.4.6 EUT OPERATING CONDITIONS**

Same as section 4.3.6.



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## 5.4.7 TEST RESULTS

### 802.11a

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
149	5745	144.88	21.61	30	PASS
157	5785	139.00	21.43	30	PASS
165	5825	143.22	21.56	30	PASS

### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
149	5745	140.28	21.47	30	PASS
157	5785	133.05	21.24	30	PASS
165	5825	127.06	21.04	30	PASS

### 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS / FAIL
151	5755	121.90	20.86	30	PASS
159	5795	116.95	20.68	30	PASS



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## **5.5 POWER SPECTRAL DENSITY MEASUREMENT**

### **5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT**

The Maximum of Power Spectral Density Measurement is 8dBm.

### **5.5.2 TEST SETUP**

Same as section 4.5.2.

### **5.5.3 TEST INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.5.4 TEST PROCEDURE.**

Same as section 4.5.4.

### **5.5.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.5.6 EUT OPERATING CONDITION**

Same as section 4.3.6.





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## 5.5.7 TEST RESULTS

### 802.11a

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
149	5745	-13.91	8	PASS
157	5785	-14.26	8	PASS
165	5825	-13.94	8	PASS

### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
149	5745	-13.82	8	PASS
157	5785	-14.80	8	PASS
165	5825	-14.11	8	PASS

### 802.11n (40MHz)

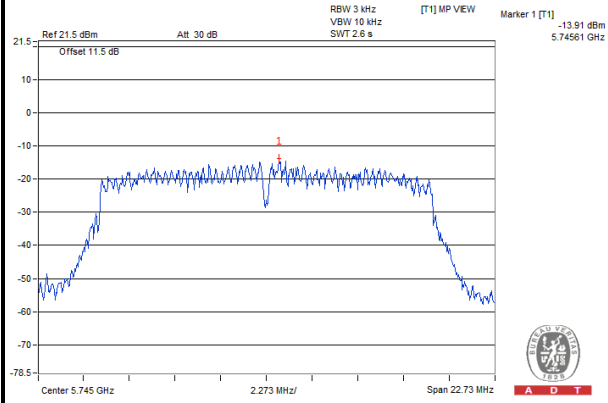
CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	LIMIT (dBm/3kHz)	PASS / FAIL
151	5755	-17.78	8	PASS
159	5795	-17.28	8	PASS



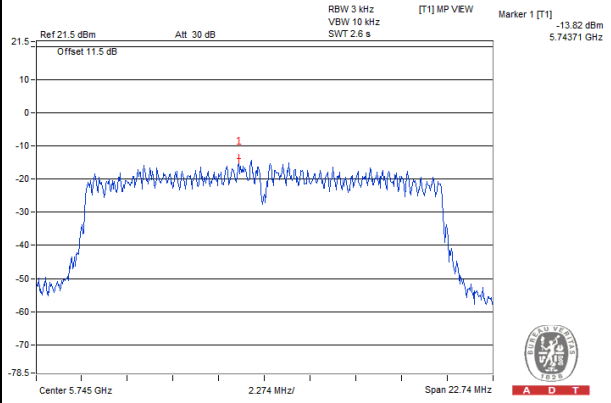
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### SPECTRUM PLOT OF WORST VALUE

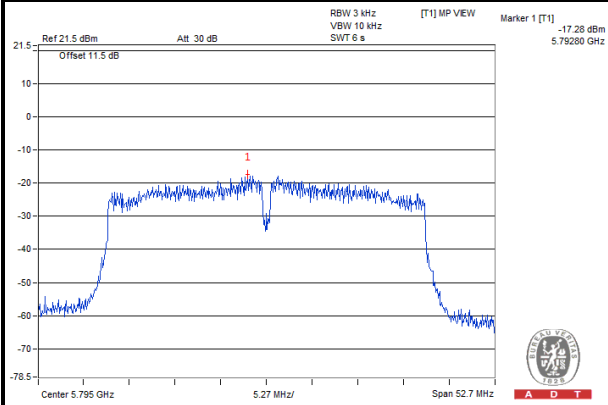
#### 802.11a



#### 802.11n (20MHz)



#### 802.11n (40MHz)



## **5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT**

### **5.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT**

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

### **5.6.2 TEST SETUP**

Same as section 4.6.2.

### **5.6.3 TEST INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.6.4 TEST PROCEDURE**

Same as section 4.6.4

### **5.6.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.6.6 EUT OPERATING CONDITION**

Same as section 4.3.6

### **5.6.7 TEST RESULTS**

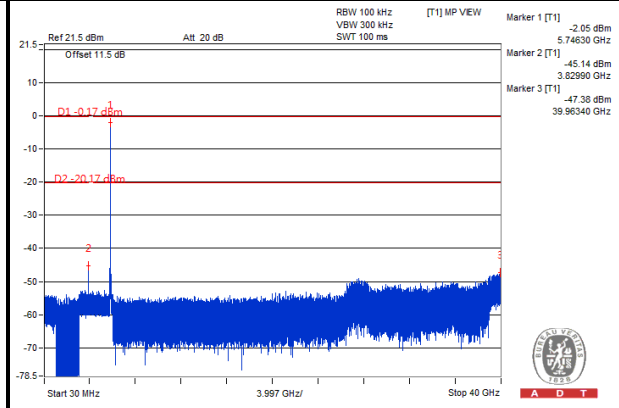
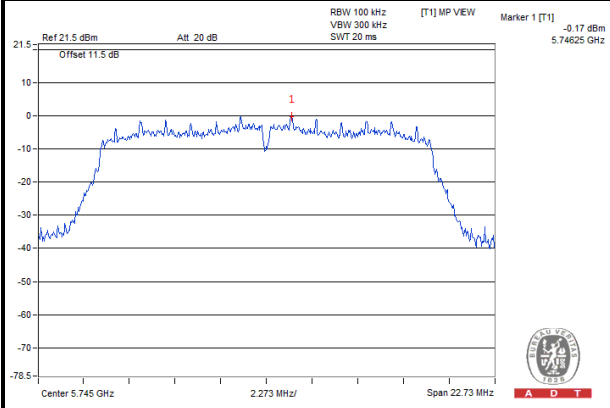
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



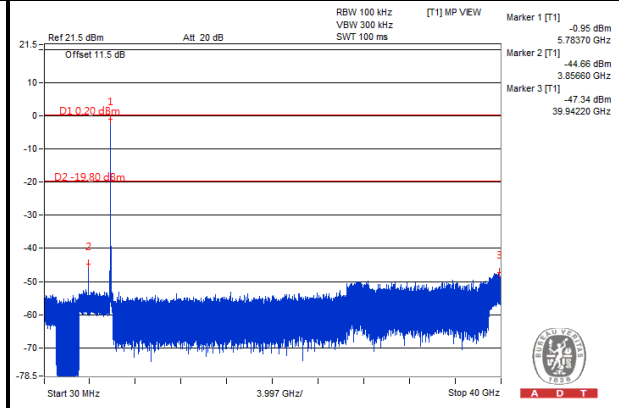
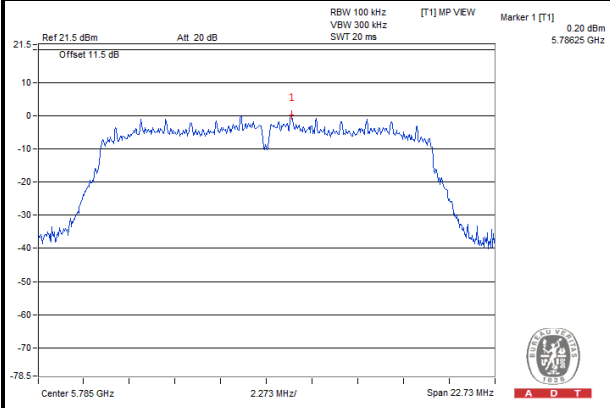
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802.11a

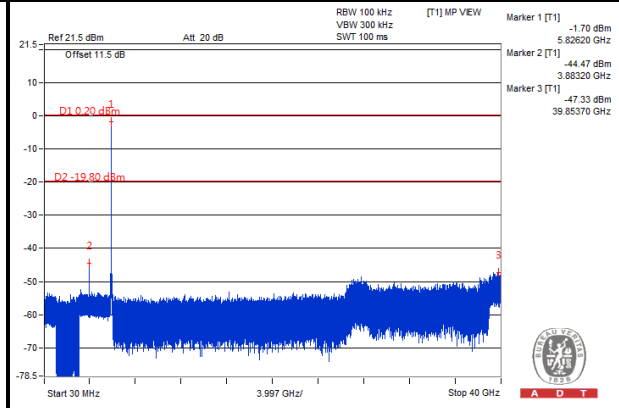
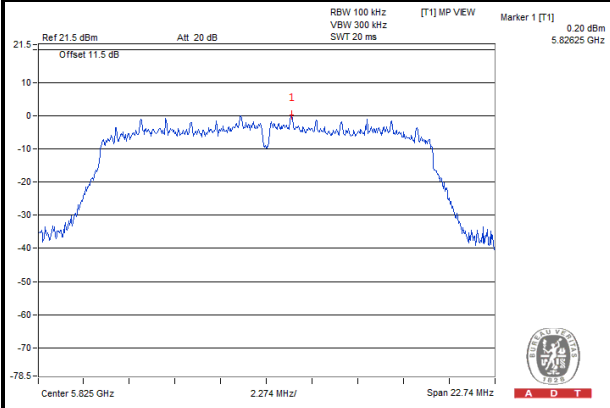
### CH 149



### CH 157



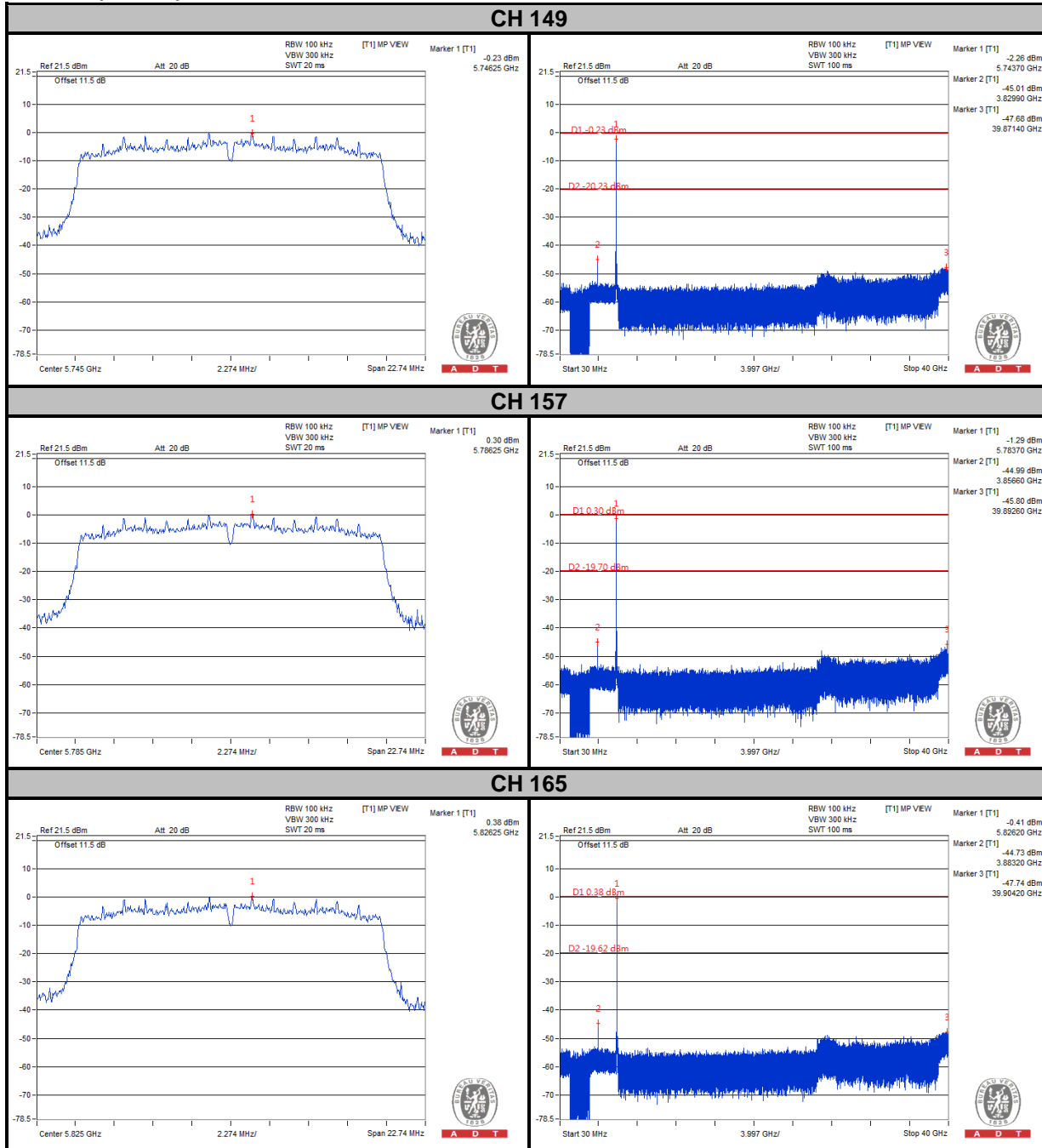
### CH 165





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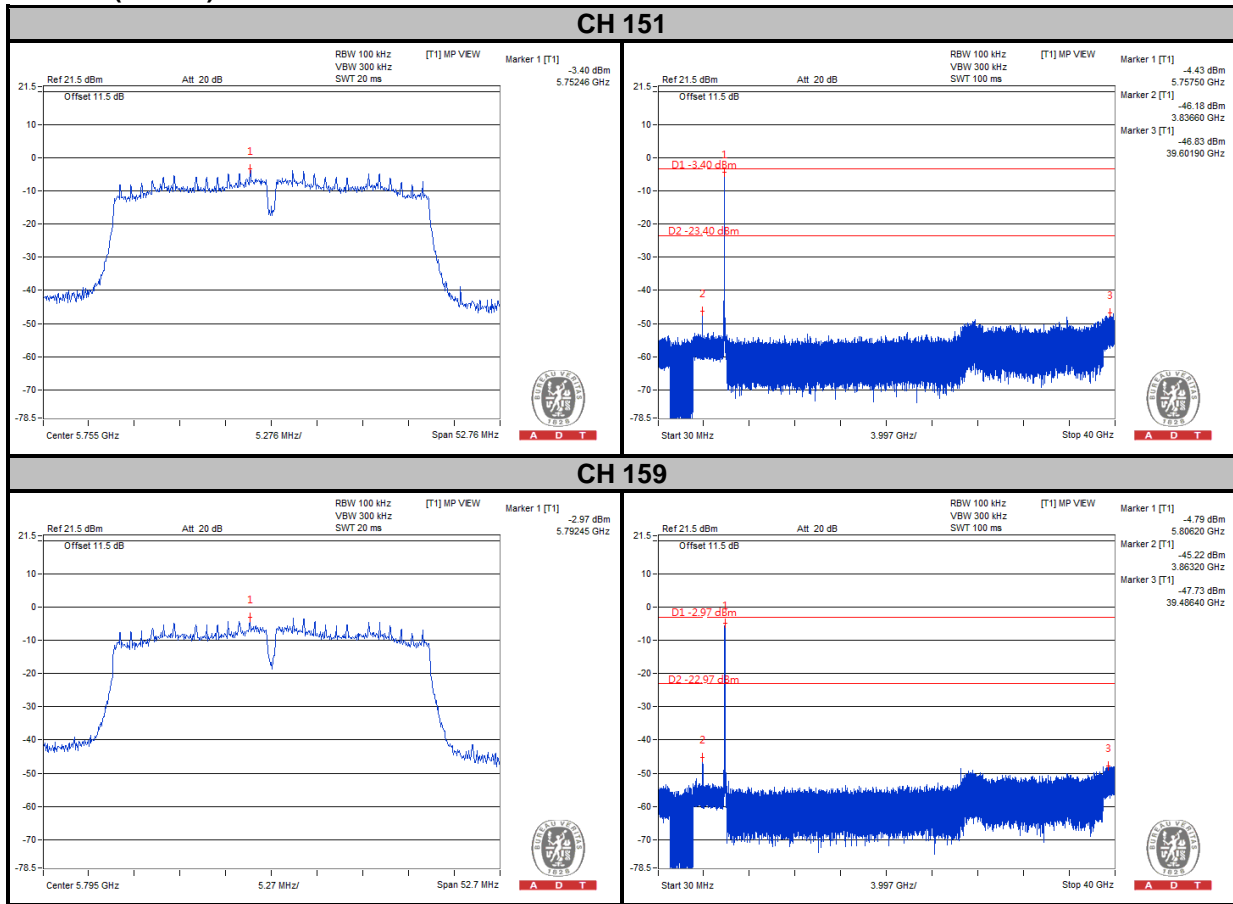
### 802.11n (20MHz)





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### 802.11n (40MHz)





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## 6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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

No any modifications are made to the EUT by the lab during the test.

---END---