



FCC TEST REPORT (15.407)

REPORT NO.: RF140530C09-2
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
(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,
New Taipei City, Taiwan (R.O.C)

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140530C09-2	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 E (Section 15.407)**
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 E (SECTION 15.407)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.63dB at 15.29297MHz.
15.407(b/1/2/3) (b)(6)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.92dB at 5725MHz.
15.407(a/1/2)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	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 $k = 2$.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	ASUS Tablet
MODEL NO.	T100TAF / H100TAF / Y100TAF / R104TAF
POWER SUPPLY	3.85Vdc (Battery) 9 Vdc / 5Vdc (Adapter or host equipment)
MODULATION TYPE	64QAM, 16QAM, QPSK, BPSK
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to MCS7
OPERATING FREQUENCY	5180 ~ 5240MHz, 5260 ~ 5320MHz, 5500 ~ 5700MHz
NUMBER OF CHANNEL	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5260 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (20MHz) 3 for 802.11n (40MHz)
OUTPUT POWER	15.07 mW for 5180 ~ 5240MHz 15.45 mW for 5260 ~ 5320MHz 16.56 mW for 5500 ~ 5700MHz
ANTENNA TYPE	PIFA antenna with 2.46dBi gain (5180 ~ 5240MHz) PIFA antenna with 2.12dBi gain (5260 ~ 5320MHz) PIFA antenna with 2.24dBi gain (5500 ~ 5700MHz)
ANTENNA CONNECTOR	NA
DATA CABLE	Refer to Note as below
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	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.

3.2 DESCRIPTION OF TEST MODES

WLAN 5180 ~ 5240MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

FOR 5260 ~ 5320MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

WLAN 5500 ~ 5700MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500MHz	116	5580MHz
104	5520MHz	132	5660MHz
108	5540MHz	136	5680MHz
112	5560MHz	140	5700MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510MHz	134	5670MHz
110	5550MHz		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE $<$ 1G	PLC	APCM	
-	√	√	√	√	-

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 EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane** for 5180 ~ 5240MHz, **X-plane** for 5260 ~ 5320MHz, and **Y-plane** for 5500 ~ 5700MHz.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	BPSK	MCS0
	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	MCS0
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
	802.11n (20MHz)		100 to 140	100, 116, 140	OFDM	BPSK	MCS0
	802.11n (40MHz)		102 to 134	102, 110, 134	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	5500-5700	100 to 140	140	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	5500-5700	100 to 140	140	OFDM	BPSK	MCS0



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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 48	OFDM	BPSK	6.0
	802.11n (20MHz)		36 to 48	36, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
-	802.11a	5260-5320	52 to 64	52, 64	OFDM	BPSK	6.0
	802.11n (20MHz)		52 to 64	52, 64	OFDM	BPSK	MCS0
	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	MCS0
-	802.11a	5500-5700	100 to 140	100, 140	OFDM	BPSK	6.0
	802.11n (20MHz)		100 to 140	100, 140	OFDM	BPSK	MCS0
	802.11n (40MHz)		102 to 134	102, 134	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	BPSK	MCS0
	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	MCS0
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
	802.11n (20MHz)		100 to 140	100, 116, 140	OFDM	BPSK	MCS0
	802.11n (40MHz)		102 to 134	102, 110, 134	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

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.

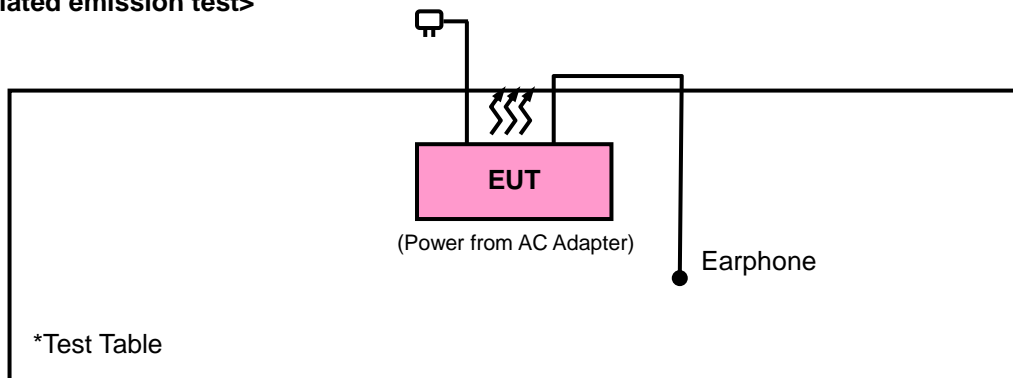
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Earphone	N/A	N/A	N/A	N/A

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

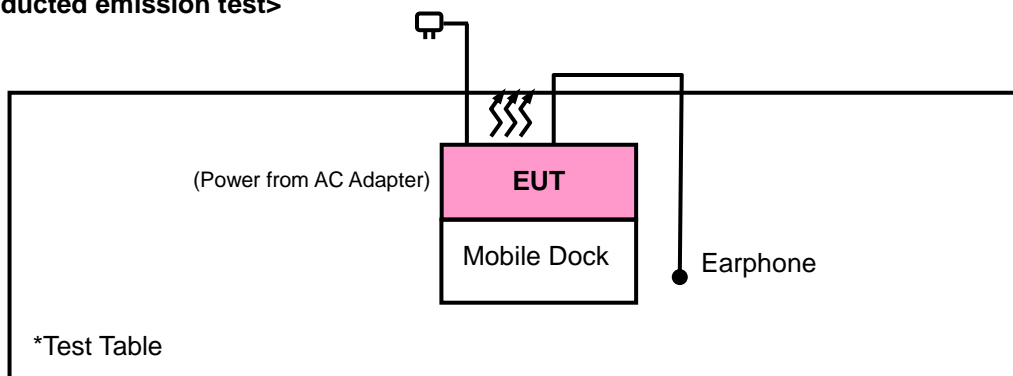
NOTE: All power cords of the above support units are non shielded (1.8m).

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

<Radiated emission test>



<Conducted emission test>





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3.4 DUTY CYCLE TEST SIGNAL

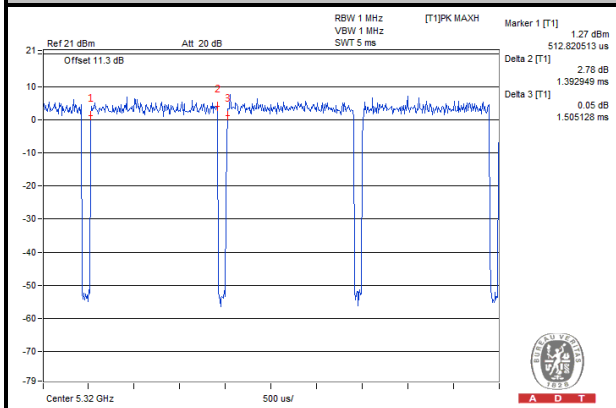
MODULATION TYPE: BPSK

802.11a: Duty cycle = 1.392/1.505 = 0.925, Duty factor = $10 * \log(1/0.925) = 0.34$

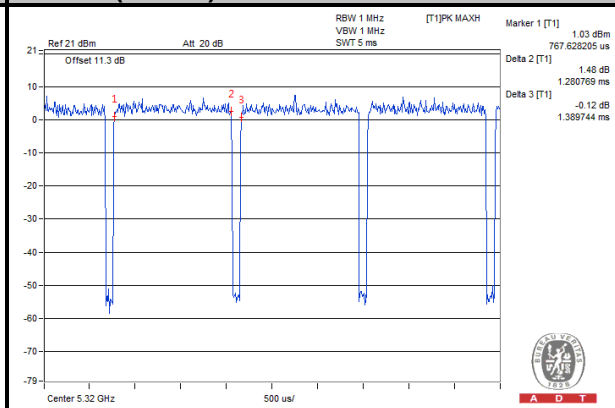
802.11n (20MHz): Duty cycle = 1.28/1.389 = 0.922, Duty factor = $10 * \log(1/0.922) = 0.35$

802.11n (40MHz): Duty cycle = 633/739 = 0.857, Duty factor = $10 * \log(1/0.857) = 0.67$

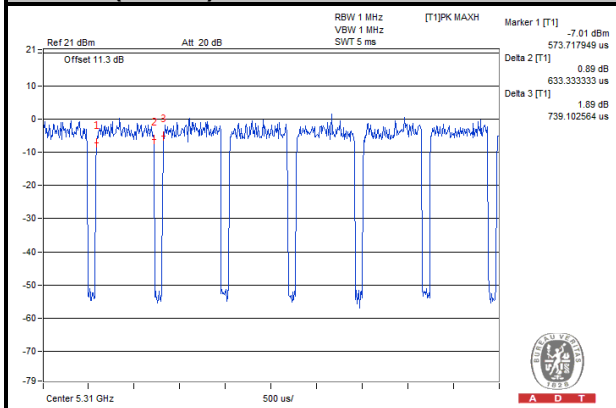
802.11a



802.11n (20MHz)



802.11n (40MHz)





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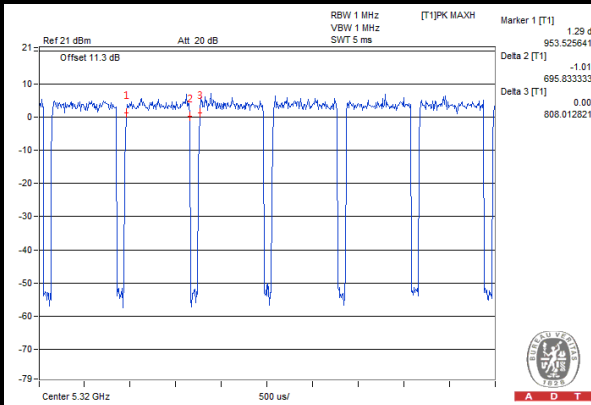
MODULATION TYPE: QPSK

802.11a: Duty cycle = $695/808 = 0.86$, Duty factor = $10 * \log(1/0.86) = 0.66$

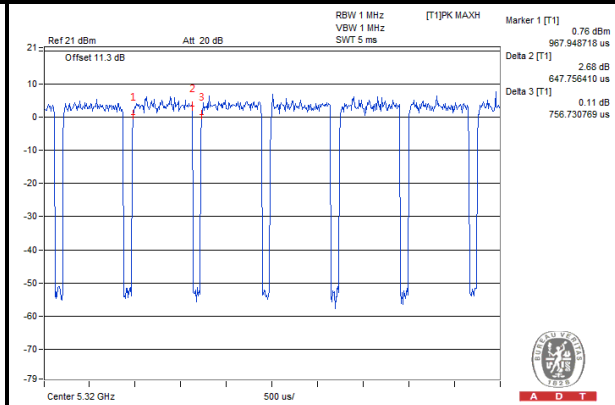
802.11n (20MHz): Duty cycle = $647/756 = 0.856$, Duty factor = $10 * \log(1/0.856) = 0.68$

802.11n (40MHz): Duty cycle = $322/431 = 0.747$, Duty factor = $10 * \log(1/0.747) = 1.27$

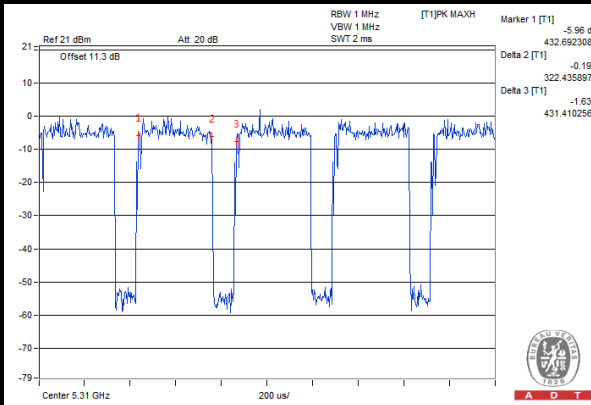
802.11a



802.11n (20MHz)



802.11n (40MHz)





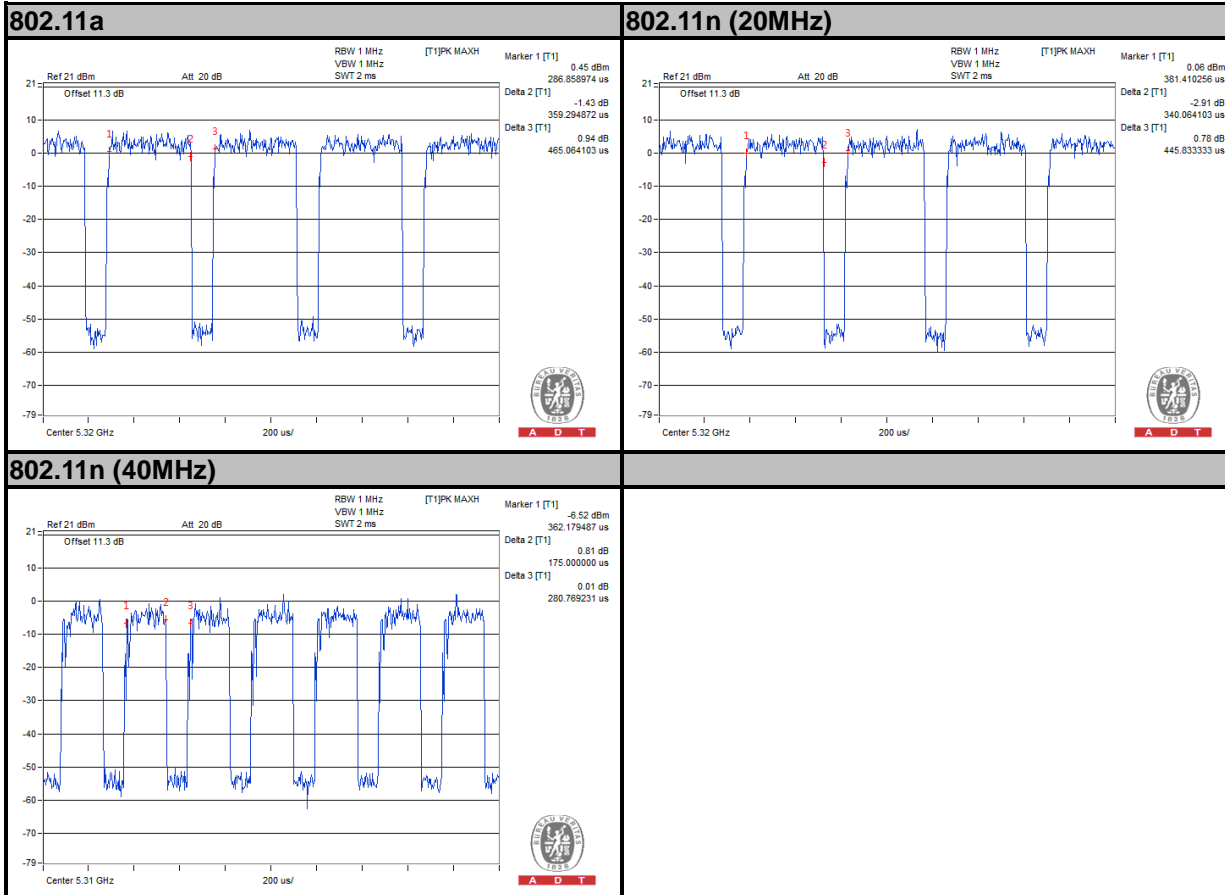
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MODULATION TYPE: 16QAM

802.11a: Duty cycle = $359/465 = 0.772$, Duty factor = $10 * \log(1/0.772) = 1.12$

802.11n (20MHz): Duty cycle = $340/445 = 0.764$, Duty factor = $10 * \log(1/0.764) = 1.17$

802.11n (40MHz): Duty cycle = $175/280 = 0.625$, Duty factor = $10 * \log(1/0.625) = 2.04$





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MODULATION TYPE: 64QAM

802.11a: Duty cycle = 183/291 = 0.629, Duty factor = $10 * \log(1/0.629) = 2.01$

802.11n (20MHz): Duty cycle = 176/282 = 0.624, Duty factor = $10 * \log(1/0.624) = 2.05$

802.11n (40MHz): Duty cycle = 98/203 = 0.483, Duty factor = $10 * \log(1/0.483) = 3.16$



3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart E (15.407)

KDB 789033 D01 General UNII Test Procedures v01r03

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

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

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

NOTE:

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

4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
	FIELD STRENGTH AT 3m (dBµV/m)	
	PK	AV
	74	54
	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBµV/m)
√	PK	PK
	-27	68.3

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

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



4.1.3 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.

4.1.4 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 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

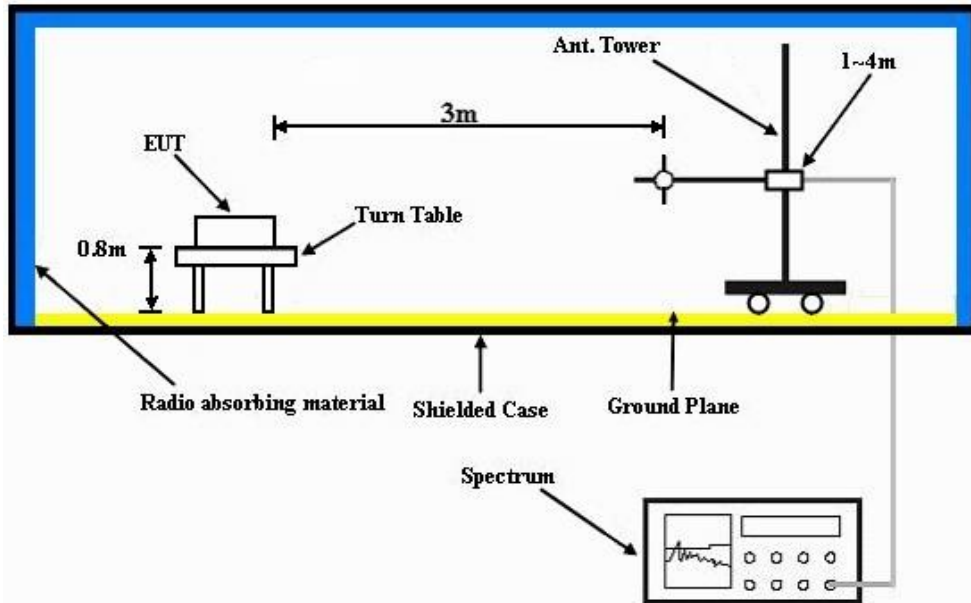
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency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

4.1.5 DEVIATION FROM TEST STANDARD

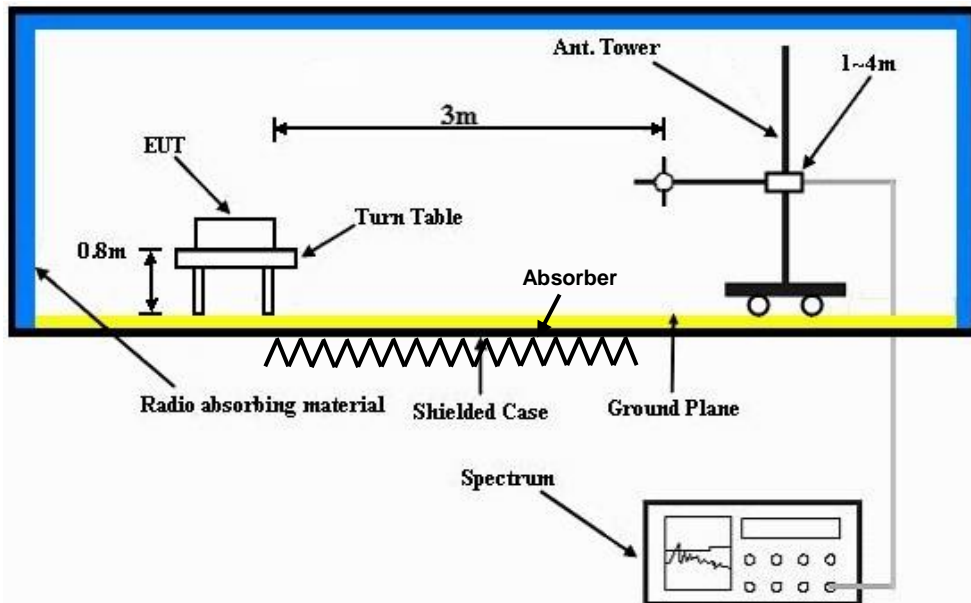
No deviation.

4.1.6 TEST SETUP

Frequency Range 30MHz ~ 1GHz



Frequency Range above 1GHz



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

4.1.7 EUT OPERATING CONDITIONS

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



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4.1.8 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	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
5150	46.81	38.56	54	-7.19	34.12	8.13	34	123	160	Average
5150	65.38	57.13	74	-8.62	34.12	8.13	34	123	160	Peak
5180	95.3	86.99			34.15	8.16	34	123	160	Average
5180	103.01	94.7			34.15	8.16	34	123	160	Peak
5420	42.83	34.06	54	-11.17	34.33	8.48	34.04	123	160	Average
5420	58.41	49.64	74	-15.59	34.33	8.48	34.04	123	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
5144	48.36	40.11	54	-5.64	34.12	8.13	34	100	145	Average
5144	68.11	59.86	74	-5.89	34.12	8.13	34	100	145	Peak
5180	96.86	88.55			34.15	8.16	34	100	145	Average
5180	104.01	95.7			34.15	8.16	34	100	145	Peak
5358	42.87	34.24	54	-11.13	34.28	8.38	34.03	100	145	Average
5358	57.01	48.38	74	-16.99	34.28	8.38	34.03	100	145	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5180MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 44	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
5096	42.79	34.63	54	-11.21	34.08	8.07	33.99	133	162	Average
5096	57.84	49.68	74	-16.16	34.08	8.07	33.99	133	162	Peak
5220	95.08	86.69			34.17	8.22	34	133	162	Average
5220	102.98	94.59			34.17	8.22	34	133	162	Peak
5376	42.79	34.13	54	-11.21	34.29	8.41	34.04	133	162	Average
5376	57.38	48.72	74	-16.62	34.29	8.41	34.04	133	162	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
5016	42.95	34.94	54	-11.05	34.01	7.97	33.97	108	142	Average
5016	57.35	49.34	74	-16.65	34.01	7.97	33.97	108	142	Peak
5220	96.43	88.04			34.17	8.22	34	108	142	Average
5220	103.88	95.49			34.17	8.22	34	108	142	Peak
5442	42.95	34.16	54	-11.05	34.35	8.48	34.04	108	142	Average
5442	57.6	48.81	74	-16.4	34.35	8.48	34.04	108	142	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5220MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	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
5118	42.66	34.46	54	-11.34	34.09	8.1	33.99	133	161	Average
5118	57.6	49.4	74	-16.4	34.09	8.1	33.99	133	161	Peak
5240	94.55	86.11			34.19	8.26	34.01	133	161	Average
5240	102.31	93.87			34.19	8.26	34.01	133	161	Peak
5422	43.16	34.39	54	-10.84	34.33	8.48	34.04	133	161	Average
5422	57.84	49.07	74	-16.16	34.33	8.48	34.04	133	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
5064	42.58	34.48	54	-11.42	34.05	8.03	33.98	107	151	Average
5064	57.19	49.09	74	-16.81	34.05	8.03	33.98	107	151	Peak
5240	96.28	87.84			34.19	8.26	34.01	107	151	Average
5240	103.41	94.97			34.19	8.26	34.01	107	151	Peak
5458	43.11	34.29	54	-10.89	34.36	8.51	34.05	107	151	Average
5458	58.81	49.99	74	-15.19	34.36	8.51	34.05	107	151	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5240MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 52	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
5108	42.72	34.52	54	-11.28	34.09	8.1	33.99	156	110	Average
5108	56.85	48.65	74	-17.15	34.09	8.1	33.99	156	110	Peak
5260	98.85	90.39			34.21	8.26	34.01	156	110	Average
5260	106.09	97.63			34.21	8.26	34.01	156	110	Peak
5350	44.25	35.62	54	-9.75	34.28	8.38	34.03	156	110	Average
5350	57.78	49.15	74	-16.22	34.28	8.38	34.03	156	110	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
5082	42.51	34.35	54	-11.49	34.07	8.07	33.98	114	318	Average
5082	56.71	48.55	74	-17.29	34.07	8.07	33.98	114	318	Peak
5260	92.76	84.3			34.21	8.26	34.01	114	318	Average
5260	99.74	91.28			34.21	8.26	34.01	114	318	Peak
5458	42.94	34.12	54	-11.06	34.36	8.51	34.05	114	318	Average
5458	57.1	48.28	74	-16.9	34.36	8.51	34.05	114	318	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5260MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	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
5038	42.58	34.51	54	-11.42	34.04	8	33.97	167	87	Average
5038	56.99	48.92	74	-17.01	34.04	8	33.97	167	87	Peak
5300	99.1	90.56			34.24	8.32	34.02	167	87	Average
5300	105.99	97.45			34.24	8.32	34.02	167	87	Peak
5350	46.52	37.89	54	-7.48	34.28	8.38	34.03	167	87	Average
5350	62.04	53.41	74	-11.96	34.28	8.38	34.03	167	87	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
5122	42.53	34.33	54	-11.47	34.09	8.1	33.99	139	316	Average
5122	57.92	49.72	74	-16.08	34.09	8.1	33.99	139	316	Peak
5300	92.93	84.39			34.24	8.32	34.02	139	316	Average
5300	100.75	92.21			34.24	8.32	34.02	139	316	Peak
5442	43.59	34.8	54	-10.41	34.35	8.48	34.04	139	316	Average
5442	58.22	49.43	74	-15.78	34.35	8.48	34.04	139	316	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 64	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
5122	42.54	34.34	54	-11.46	34.09	8.1	33.99	168	88	Average
5122	57.25	49.05	74	-16.75	34.09	8.1	33.99	168	88	Peak
5320	99.07	90.49			34.25	8.35	34.02	168	88	Average
5320	105.5	96.92			34.25	8.35	34.02	168	88	Peak
5350	47.43	38.8	54	-6.57	34.28	8.38	34.03	168	88	Average
5350	63.44	54.81	74	-10.56	34.28	8.38	34.03	168	88	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
5044	42.38	34.32	54	-11.62	34.04	8	33.98	140	315	Average
5044	56.98	48.92	74	-17.02	34.04	8	33.98	140	315	Peak
5320	92.54	83.96			34.25	8.35	34.02	140	315	Average
5320	99.53	90.95			34.25	8.35	34.02	140	315	Peak
5356	43.77	35.14	54	-10.23	34.28	8.38	34.03	140	315	Average
5356	57.67	49.04	74	-16.33	34.28	8.38	34.03	140	315	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5320MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	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
5454	46.39	37.57	54	-7.61	34.36	8.51	34.05	100	142	Average
5454	57.67	48.85	74	-16.33	34.36	8.51	34.05	100	142	Peak
5470	57.2	48.37	68.3	-11.1	34.37	8.51	34.05	100	142	Peak
5500	92.5	83.58			34.4	8.57	34.05	100	142	Average
5500	99.05	90.13			34.4	8.57	34.05	100	142	Peak
5725	55.76	46.6	68.3	-12.54	34.62	8.65	34.11	100	142	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
5458	47.73	38.91	54	-6.27	34.36	8.51	34.05	100	319	Average
5458	58.3	49.48	74	-15.7	34.36	8.51	34.05	100	319	Peak
5470	65.95	57.12	68.3	-2.35	34.37	8.51	34.05	100	319	Peak
5500	98.5	89.58			34.4	8.57	34.05	100	319	Average
5500	105.74	96.82			34.4	8.57	34.05	100	319	Peak
5725	54.72	45.56	68.3	-13.58	34.62	8.65	34.11	100	319	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5500MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	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
5348	46.19	37.56	54	-7.81	34.28	8.38	34.03	106	142	Average
5348	56.91	48.28	74	-17.09	34.28	8.38	34.03	106	142	Peak
5470	55.98	47.15	68.3	-12.32	34.37	8.51	34.05	106	142	Peak
5580	93.59	84.6			34.47	8.6	34.08	106	142	Average
5580	100.06	91.07			34.47	8.6	34.08	106	142	Peak
5725	54.98	45.82	68.3	-13.32	34.62	8.65	34.11	106	142	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
5400	46.29	37.57	54	-7.71	34.32	8.44	34.04	106	279	Average
5400	57.78	49.06	74	-16.22	34.32	8.44	34.04	106	279	Peak
5470	55.48	46.65	68.3	-12.82	34.37	8.51	34.05	106	279	Peak
5580	99.59	90.6			34.47	8.6	34.08	106	279	Average
5580	106.63	97.64			34.47	8.6	34.08	106	279	Peak
5725	55.51	46.35	68.3	-12.79	34.62	8.65	34.11	106	279	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5580MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	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
5356	45.19	36.56	54	-8.81	34.28	8.38	34.03	102	161	Average
5356	57.14	48.51	74	-16.86	34.28	8.38	34.03	102	161	Peak
5470	56.17	47.34	68.3	-12.13	34.37	8.51	34.05	102	161	Peak
5700	90.46	81.33			34.59	8.64	34.1	102	161	Average
5700	97.42	88.29			34.59	8.64	34.1	102	161	Peak
5725	57.06	47.9	68.3	-11.24	34.62	8.65	34.11	102	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
5350	45.9	37.27	54	-8.1	34.28	8.38	34.03	108	201	Average
5350	56.87	48.24	74	-17.13	34.28	8.38	34.03	108	201	Peak
5470	57.2	48.37	68.3	-11.1	34.37	8.51	34.05	108	201	Peak
5700	97.76	88.63			34.59	8.64	34.1	108	201	Average
5700	105.49	96.36			34.59	8.64	34.1	108	201	Peak
5725	62.69	53.53	68.3	-5.61	34.62	8.65	34.11	108	201	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5700MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	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
5142	44.4	36.14	54	-9.6	34.12	8.13	33.99	122	162	Average
5142	56.96	48.7	74	-17.04	34.12	8.13	33.99	122	162	Peak
5180	94.88	86.57			34.15	8.16	34	122	162	Average
5180	101.42	93.11			34.15	8.16	34	122	162	Peak
5396	42.83	34.11	54	-11.17	34.32	8.44	34.04	122	162	Average
5396	57.69	48.97	74	-16.31	34.32	8.44	34.04	122	162	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
5140	46.1	37.84	54	-7.9	34.12	8.13	33.99	100	144	Average
5140	63.13	54.87	74	-10.87	34.12	8.13	33.99	100	144	Peak
5180	96.37	88.06			34.15	8.16	34	100	144	Average
5180	102.61	94.3			34.15	8.16	34	100	144	Peak
5428	42.9	34.13	54	-11.1	34.33	8.48	34.04	100	144	Average
5428	57.49	48.72	74	-16.51	34.33	8.48	34.04	100	144	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5180MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 44	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
5146	43.02	34.77	54	-10.98	34.12	8.13	34	134	161	Average
5146	56.85	48.6	74	-17.15	34.12	8.13	34	134	161	Peak
5220	94.72	86.33			34.17	8.22	34	134	161	Average
5220	102.06	93.67			34.17	8.22	34	134	161	Peak
5452	43.05	34.23	54	-10.95	34.36	8.51	34.05	134	161	Average
5452	57.94	49.12	74	-16.06	34.36	8.51	34.05	134	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
5058	43.09	34.99	54	-10.91	34.05	8.03	33.98	108	142	Average
5058	57.14	49.04	74	-16.86	34.05	8.03	33.98	108	142	Peak
5220	95.27	86.88			34.17	8.22	34	108	142	Average
5220	102.89	94.5			34.17	8.22	34	108	142	Peak
5448	43.01	34.18	54	-10.99	34.36	8.51	34.04	108	142	Average
5448	57.3	48.47	74	-16.7	34.36	8.51	34.04	108	142	Peak

REMARKS:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5220MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	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
5044	42.46	34.4	54	-11.54	34.04	8	33.98	132	161	Average
5044	57.84	49.78	74	-16.16	34.04	8	33.98	132	161	Peak
5240	94.49	86.05			34.19	8.26	34.01	132	161	Average
5240	101.68	93.24			34.19	8.26	34.01	132	161	Peak
5444	43.21	34.42	54	-10.79	34.35	8.48	34.04	132	161	Average
5444	58.34	49.55	74	-15.66	34.35	8.48	34.04	132	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
5142	42.74	34.48	54	-11.26	34.12	8.13	33.99	105	157	Average
5142	57.75	49.49	74	-16.25	34.12	8.13	33.99	105	157	Peak
5240	96.11	87.67			34.19	8.26	34.01	105	157	Average
5240	102.59	94.15			34.19	8.26	34.01	105	157	Peak
5372	43.53	34.86	54	-10.47	34.29	8.41	34.03	105	157	Average
5372	57.31	48.64	74	-16.69	34.29	8.41	34.03	105	157	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5240MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 52	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
5104	42.57	34.41	54	-11.43	34.08	8.07	33.99	156	110	Average
5104	57.48	49.32	74	-16.52	34.08	8.07	33.99	156	110	Peak
5260	98.13	89.47			-500	8.66	-500	156	110	Average
5260	105.65	96.99			-500	8.66	-500	156	110	Peak
5444	44.26	35.47	54	-9.74	34.35	8.48	34.04	156	110	Average
5444	57.78	48.99	74	-16.22	34.35	8.48	34.04	156	110	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
5042	42.35	34.29	54	-11.65	34.04	8	33.98	128	316	Average
5042	57.49	49.43	74	-16.51	34.04	8	33.98	128	316	Peak
5260	92.37	83.91			34.21	8.26	34.01	128	316	Average
5260	99.63	91.17			34.21	8.26	34.01	128	316	Peak
5362	42.79	34.15	54	-11.21	34.29	8.38	34.03	128	316	Average
5362	57.32	48.68	74	-16.68	34.29	8.38	34.03	128	316	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5260MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	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
5048	42.36	34.3	54	-11.64	34.04	8	33.98	166	86	Average
5048	57.05	48.99	74	-16.95	34.04	8	33.98	166	86	Peak
5300	98.99	90.45			34.24	8.32	34.02	166	86	Average
5300	106.05	97.51			34.24	8.32	34.02	166	86	Peak
5350	47.12	38.49	54	-6.88	34.28	8.38	34.03	166	86	Average
5350	62.57	53.94	74	-11.43	34.28	8.38	34.03	166	86	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
5112	42.63	34.43	54	-11.37	34.09	8.1	33.99	140	316	Average
5112	58	49.8	74	-16	34.09	8.1	33.99	140	316	Peak
5300	92.99	84.45			34.24	8.32	34.02	140	316	Average
5300	100.33	91.79			34.24	8.32	34.02	140	316	Peak
5430	43.61	34.82	54	-10.39	34.35	8.48	34.04	140	316	Average
5430	57.77	48.98	74	-16.23	34.35	8.48	34.04	140	316	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 64	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
5072	42.51	34.39	54	-11.49	34.07	8.03	33.98	167	88	Average
5072	56.62	48.5	74	-17.38	34.07	8.03	33.98	167	88	Peak
5320	98.85	90.27			34.25	8.35	34.02	167	88	Average
5320	105.61	97.03			34.25	8.35	34.02	167	88	Peak
5350	47.62	38.99	54	-6.38	34.28	8.38	34.03	167	88	Average
5350	60.95	52.32	74	-13.05	34.28	8.38	34.03	167	88	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
5042	42.33	34.27	54	-11.67	34.04	8	33.98	140	315	Average
5042	56.85	48.79	74	-17.15	34.04	8	33.98	140	315	Peak
5320	92.19	83.61			34.25	8.35	34.02	140	315	Average
5320	99.97	91.39			34.25	8.35	34.02	140	315	Peak
5350	43.66	35.03	54	-10.34	34.28	8.38	34.03	140	315	Average
5350	61.02	52.39	74	-12.98	34.28	8.38	34.03	140	315	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5320MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	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
5444	46.34	37.55	54	-7.66	34.35	8.48	34.04	100	142	Average
5444	57.99	49.2	74	-16.01	34.35	8.48	34.04	100	142	Peak
5470	61.19	52.36	68.3	-7.11	34.37	8.51	34.05	100	142	Peak
5500	91.83	82.91			34.4	8.57	34.05	100	142	Average
5500	98.28	89.36			34.4	8.57	34.05	100	142	Peak
5725	56.65	47.49	68.3	-11.65	34.62	8.65	34.11	100	142	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
5456	48.76	39.94	54	-5.24	34.36	8.51	34.05	101	335	Average
5456	58.92	50.1	74	-15.08	34.36	8.51	34.05	101	335	Peak
5470	66.06	57.23	68.3	-2.24	34.37	8.51	34.05	101	335	Peak
5500	96.65	87.73			34.4	8.57	34.05	101	335	Average
5500	104.86	95.94			34.4	8.57	34.05	101	335	Peak
5725	57.17	48.01	68.3	-11.13	34.62	8.65	34.11	101	335	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5500MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	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
5460	46.39	37.57	54	-7.61	34.36	8.51	34.05	107	144	Average
5460	56.78	47.96	74	-17.22	34.36	8.51	34.05	107	144	Peak
5470	55.74	46.91	68.3	-12.56	34.37	8.51	34.05	107	144	Peak
5580	91.97	82.98			34.47	8.6	34.08	107	144	Average
5580	98.51	89.52			34.47	8.6	34.08	107	144	Peak
5725	56.19	47.03	68.3	-12.11	34.62	8.65	34.11	107	144	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
5366	46.2	37.56	54	-7.8	34.29	8.38	34.03	106	257	Average
5366	56.99	48.35	74	-17.01	34.29	8.38	34.03	106	257	Peak
5470	55.88	47.05	68.3	-12.42	34.37	8.51	34.05	106	257	Peak
5580	99.93	90.94			34.47	8.6	34.08	106	257	Average
5580	106.87	97.88			34.47	8.6	34.08	106	257	Peak
5725	56.74	47.58	68.3	-11.56	34.62	8.65	34.11	106	257	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5580MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	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
5410	45.27	36.55	54	-8.73	34.32	8.44	34.04	103	161	Average
5410	58.12	49.4	74	-15.88	34.32	8.44	34.04	103	161	Peak
5470	55.11	46.28	68.3	-13.19	34.37	8.51	34.05	103	161	Peak
5700	91.09	81.96			34.59	8.64	34.1	103	161	Average
5700	98.61	89.48			34.59	8.64	34.1	103	161	Peak
5725	56.84	47.68	68.3	-11.46	34.62	8.65	34.11	103	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
5428	46.33	37.56	54	-7.67	34.33	8.48	34.04	106	324	Average
5428	57.42	48.65	74	-16.58	34.33	8.48	34.04	106	324	Peak
5470	57.38	48.55	68.3	-10.92	34.37	8.51	34.05	106	324	Peak
5700	97.76	88.63			34.59	8.64	34.1	106	324	Average
5700	105.24	96.11			34.59	8.64	34.1	106	324	Peak
5725	67.38	58.22	68.3	-0.92	34.62	8.65	34.11	106	324	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5700MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	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
5150	46.1	37.85	54	-7.9	34.12	8.13	34	122	160	Average
5150	58.12	49.87	74	-15.88	34.12	8.13	34	122	160	Peak
5190	91.74	83.4			34.15	8.19	34	122	160	Average
5190	99.1	90.76			34.15	8.19	34	122	160	Peak
5460	43.34	34.52	54	-10.66	34.36	8.51	34.05	122	160	Average
5460	57.4	48.58	74	-16.6	34.36	8.51	34.05	122	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
5150	48.85	40.6	54	-5.15	34.12	8.13	34	100	144	Average
5150	59.68	51.43	74	-14.32	34.12	8.13	34	100	144	Peak
5190	93.05	84.71			34.15	8.19	34	100	144	Average
5190	100.42	92.08			34.15	8.19	34	100	144	Peak
5452	43.51	34.69	54	-10.49	34.36	8.51	34.05	100	144	Average
5452	57.45	48.63	74	-16.55	34.36	8.51	34.05	100	144	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5190MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	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
5140	43.45	35.19	54	-10.55	34.12	8.13	33.99	134	161	Average
5140	56.76	48.5	74	-17.24	34.12	8.13	33.99	134	161	Peak
5230	91.56	83.16			34.19	8.22	34.01	134	161	Average
5230	98.24	89.84			34.19	8.22	34.01	134	161	Peak
5368	43.47	34.8	54	-10.53	34.29	8.41	34.03	134	161	Average
5368	57.51	48.84	74	-16.49	34.29	8.41	34.03	134	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
5022	43.21	35.18	54	-10.79	34.03	7.97	33.97	106	156	Average
5022	57.11	49.08	74	-16.89	34.03	7.97	33.97	106	156	Peak
5230	93.57	85.17			34.19	8.22	34.01	106	156	Average
5230	100.4	92			34.19	8.22	34.01	106	156	Peak
5424	43.74	34.97	54	-10.26	34.33	8.48	34.04	106	156	Average
5424	57.86	49.09	74	-16.14	34.33	8.48	34.04	106	156	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5230MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 54	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
5128	43.01	34.79	54	-10.99	34.11	8.1	33.99	167	86	Average
5128	56.25	48.03	74	-17.75	34.11	8.1	33.99	167	86	Peak
5270	95.94	87.45			34.21	8.29	34.01	167	86	Average
5270	102.52	94.03			34.21	8.29	34.01	167	86	Peak
5366	47.5	38.86	54	-6.5	34.29	8.38	34.03	167	86	Average
5366	59.39	50.75	74	-14.61	34.29	8.38	34.03	167	86	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
5042	42.75	34.69	54	-11.25	34.04	8	33.98	114	318	Average
5042	57.37	49.31	74	-16.63	34.04	8	33.98	114	318	Peak
5270	89.4	80.91			34.21	8.29	34.01	114	318	Average
5270	97.35	88.86			34.21	8.29	34.01	114	318	Peak
5436	43.58	34.79	54	-10.42	34.35	8.48	34.04	114	318	Average
5436	57.82	49.03	74	-16.18	34.35	8.48	34.04	114	318	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5270MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 62	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
5132	43.12	34.9	54	-10.88	34.11	8.1	33.99	168	88	Average
5132	57.42	49.2	74	-16.58	34.11	8.1	33.99	168	88	Peak
5310	95.63	87.08			34.25	8.32	34.02	168	88	Average
5310	102.85	94.3			34.25	8.32	34.02	168	88	Peak
5364	48.96	40.32	54	-5.04	34.29	8.38	34.03	168	88	Average
5364	62.52	53.88	74	-11.48	34.29	8.38	34.03	168	88	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
5062	42.83	34.73	54	-11.17	34.05	8.03	33.98	140	315	Average
5062	57.01	48.91	74	-16.99	34.05	8.03	33.98	140	315	Peak
5310	90.06	81.51			34.25	8.32	34.02	140	315	Average
5310	97.23	88.68			34.25	8.32	34.02	140	315	Peak
5378	44.41	35.73	54	-9.59	34.31	8.41	34.04	140	315	Average
5378	57.28	48.6	74	-16.72	34.31	8.41	34.04	140	315	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5310MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 102	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
5446	46.39	37.56	54	-7.61	34.36	8.51	34.04	100	142	Average
5446	56.82	47.99	74	-17.18	34.36	8.51	34.04	100	142	Peak
5470	56.95	48.12	68.3	-11.35	34.37	8.51	34.05	100	142	Peak
5510	89.5	80.59			34.4	8.57	34.06	100	142	Average
5510	96.57	87.66			34.4	8.57	34.06	100	142	Peak
5725	55.97	46.81	68.3	-12.33	34.62	8.65	34.11	100	142	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
5448	46.77	37.94	54	-7.23	34.36	8.51	34.04	101	341	Average
5448	57.58	48.75	74	-16.42	34.36	8.51	34.04	101	341	Peak
5470	62.93	54.1	68.3	-5.37	34.37	8.51	34.05	101	341	Peak
5510	95.09	86.18			34.4	8.57	34.06	101	341	Average
5510	102.57	93.66			34.4	8.57	34.06	101	341	Peak
5725	57.72	48.56	68.3	-10.58	34.62	8.65	34.11	101	341	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5510MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 110	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
5356	46.19	37.56	54	-7.81	34.28	8.38	34.03	100	141	Average
5356	57.42	48.79	74	-16.58	34.28	8.38	34.03	100	141	Peak
5470	56.62	47.79	68.3	-11.68	34.37	8.51	34.05	100	141	Peak
5550	88.9	79.93			34.45	8.59	34.07	100	141	Average
5550	95.71	86.74			34.45	8.59	34.07	100	141	Peak
5725	55.59	46.43	68.3	-12.71	34.62	8.65	34.11	100	141	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
5448	47.42	38.59	54	-6.58	34.36	8.51	34.04	100	319	Average
5448	58.33	49.5	74	-15.67	34.36	8.51	34.04	100	319	Peak
5470	57.69	48.86	68.3	-10.61	34.37	8.51	34.05	100	319	Peak
5550	95.57	86.6			34.45	8.59	34.07	100	319	Average
5550	102.76	93.79			34.45	8.59	34.07	100	319	Peak
5725	56.61	47.45	68.3	-11.69	34.62	8.65	34.11	100	319	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5550MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 134	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
5424	45.33	36.56	54	-8.67	34.33	8.48	34.04	123	142	Average
5424	57.2	48.43	74	-16.8	34.33	8.48	34.04	123	142	Peak
5470	55.2	46.37	68.3	-13.1	34.37	8.51	34.05	123	142	Peak
5670	88.73	79.63			34.57	8.63	34.1	123	142	Average
5670	95.59	86.49			34.57	8.63	34.1	123	142	Peak
5725	56.8	47.64	68.3	-11.5	34.62	8.65	34.11	123	142	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
5430	46.35	37.56	54	-7.65	34.35	8.48	34.04	124	319	Average
5430	57.37	48.58	74	-16.63	34.35	8.48	34.04	124	319	Peak
5470	56.04	47.21	68.3	-12.26	34.37	8.51	34.05	124	319	Peak
5670	95.77	86.67			34.57	8.63	34.1	124	319	Average
5670	102.4	93.3			34.57	8.63	34.1	124	319	Peak
5725	56.59	47.43	68.3	-11.71	34.62	8.65	34.11	124	319	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5670MHz: Fundamental frequency.
- 5470MHz & 5725MHz: Out of restricted band



A D T

BELOW 1GHz WORST-CASE DATA:

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	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
30.27	26.96	40.94	40	-13.04	17.55	0.74	32.27	114	269	Peak
116.94	21.12	43.17	43.5	-22.38	8.92	1.28	32.25	152	178	Peak
165.27	21.37	41.75	43.5	-22.13	10.36	1.52	32.26	168	312	Peak
363.7	19.47	32.98	46	-26.53	16.34	2.26	32.11	174	314	Peak
730.5	24.98	30.57	46	-21.02	23.37	3.16	32.12	126	119	Peak
925.1	28.67	30.23	46	-17.33	26.2	3.53	31.29	163	247	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	36.05	50.38	40	-3.95	17.19	0.74	32.26	164	234	Peak
48.9	20.8	43.98	40	-19.2	8.14	0.9	32.22	179	143	Peak
134.76	14.85	36.47	43.5	-28.65	9.25	1.38	32.25	199	246	Peak
629	23.32	30.46	46	-22.68	22.1	2.93	32.17	185	235	Peak
666.8	27.27	33.38	46	-18.73	22.97	3.05	32.13	136	145	Peak
972	28.7	29.9	54	-25.3	25.88	3.67	30.75	156	219	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 μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE:

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

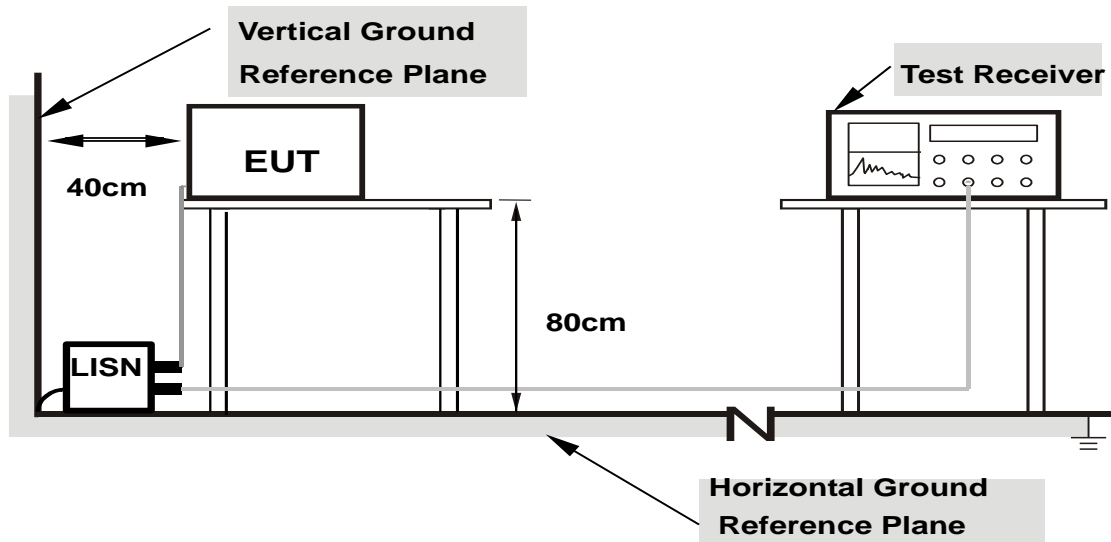
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

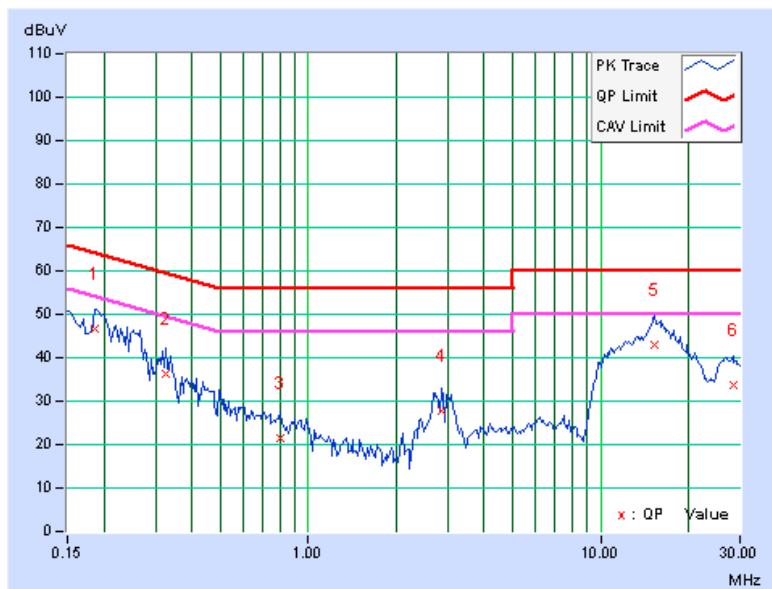
CONDUCTED WORST-CASE DATA :

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	0.18516	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
5	15.29297	0.53	42.32	36.84	42.85	37.37	60.00	50.00	-17.15	-12.63
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

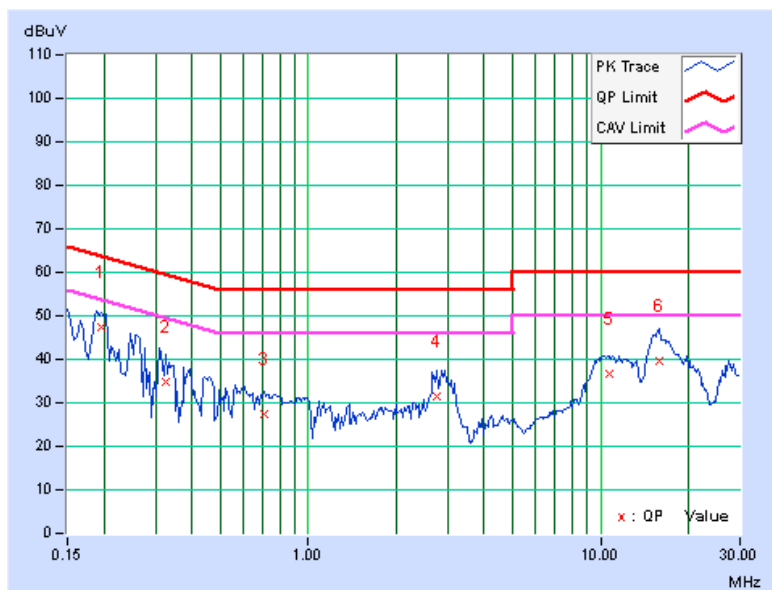


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.19687	0.28	47.11	33.56	47.39	33.84	63.74
2	0.32578	0.29	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



4.3 PEAK TRANSMIT POWER MEASUREMENT

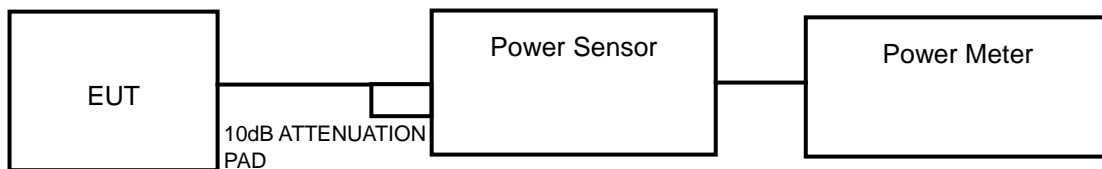
4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB

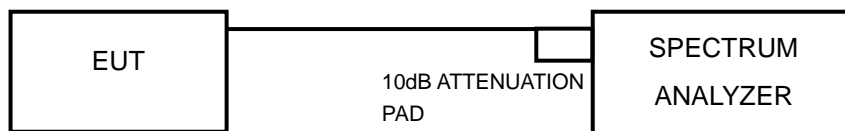
NOTE: Where B is the 26dB emission bandwidth in MHz.

4.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



FOR 26dB BANDWIDTH



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.3.4 TEST PROCEDURE

FOR AVERAGE POWER MEASUREMENT

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

FOR 26dB BANDWIDTH

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

4.3.5 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 specific channel frequencies individually.



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4.3.7 TEST RESULTS

POWER OUTPUT

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	15.03	11.77	16.82	PASS
44	5220	14.96	11.75	16.82	PASS
48	5240	15.07	11.78	16.82	PASS
52	5260	15.21	11.82	23.80	PASS
60	5300	15.28	11.84	23.81	PASS
64	5320	15.45	11.89	23.81	PASS
100	5500	14.00	11.46	23.82	PASS
116	5580	14.93	11.74	23.82	PASS
140	5700	16.56	12.19	23.86	PASS

NOTE:

For 5180~5240MHz:

1. $4\text{dBm} + 10\log(19.15) = 16.82\text{dBm} < 17\text{dBm}$.
2. $4\text{dBm} + 10\log(19.15) = 16.82\text{dBm} < 17\text{dBm}$.
3. $4\text{dBm} + 10\log(19.15) = 16.82\text{dBm} < 17\text{dBm}$.

For 5260~5700MHz:

1. $11\text{dBm} + 10\log(19.05) = 23.80\text{dBm} < 24\text{dBm}$.
2. $11\text{dBm} + 10\log(19.09) = 23.81\text{dBm} < 24\text{dBm}$.
3. $11\text{dBm} + 10\log(19.09) = 23.81\text{dBm} < 24\text{dBm}$.
4. $11\text{dBm} + 10\log(19.15) = 23.82\text{dBm} < 24\text{dBm}$.
5. $11\text{dBm} + 10\log(19.14) = 23.82\text{dBm} < 24\text{dBm}$.
6. $11\text{dBm} + 10\log(19.31) = 23.86\text{dBm} < 24\text{dBm}$.



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802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	14.59	11.64	16.91	PASS
44	5220	14.89	11.73	16.89	PASS
48	5240	14.83	11.71	16.91	PASS
52	5260	14.96	11.75	23.91	PASS
60	5300	14.93	11.74	23.90	PASS
64	5320	15.00	11.76	23.91	PASS
100	5500	14.16	11.51	23.90	PASS
116	5580	14.66	11.66	23.89	PASS
140	5700	16.11	12.07	23.91	PASS

NOTE:

For 5180~5240MHz:

1. $4\text{dBm} + 10\log(19.56) = 16.91\text{dBm} < 17\text{dBm}$.
2. $4\text{dBm} + 10\log(19.46) = 16.89\text{dBm} < 17\text{dBm}$.
3. $4\text{dBm} + 10\log(19.55) = 16.91\text{dBm} < 17\text{dBm}$.

For 5260~5700MHz:

1. $11\text{dBm} + 10\log(19.53) = 23.91\text{dBm} < 24\text{dBm}$.
2. $11\text{dBm} + 10\log(19.49) = 23.90\text{dBm} < 24\text{dBm}$.
3. $11\text{dBm} + 10\log(19.56) = 23.91\text{dBm} < 24\text{dBm}$.
4. $11\text{dBm} + 10\log(19.48) = 23.90\text{dBm} < 24\text{dBm}$.
5. $11\text{dBm} + 10\log(19.47) = 23.89\text{dBm} < 24\text{dBm}$.
6. $11\text{dBm} + 10\log(19.54) = 23.91\text{dBm} < 24\text{dBm}$.



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802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	12.27	10.89	17	PASS
46	5230	12.22	10.87	17	PASS
54	5270	12.45	10.95	24	PASS
62	5310	12.71	11.04	24	PASS
102	5510	13.30	11.24	24	PASS
110	5550	12.71	11.04	24	PASS
134	5670	13.68	11.36	24	PASS

NOTE:

For 5180~5240MHz:

1. $4\text{dBm} + 10\log(40.99) = 20.13\text{dBm} > 17\text{dBm}$.
2. $4\text{dBm} + 10\log(40.91) = 20.12\text{dBm} > 17\text{dBm}$.

For 5260~5700MHz:

1. $11\text{dBm} + 10\log(40.95) = 27.12\text{dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(41.08) = 27.14\text{dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(41.42) = 27.17\text{dBm} > 24\text{dBm}$.
4. $11\text{dBm} + 10\log(41.12) = 27.14\text{dBm} > 24\text{dBm}$.
5. $11\text{dBm} + 10\log(40.96) = 27.12\text{dBm} > 24\text{dBm}$.



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26dB BANDWIDTH

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	19.15	PASS
44	5220	19.15	PASS
48	5240	19.15	PASS
52	5260	19.05	PASS
60	5300	19.09	PASS
64	5320	19.09	PASS
100	5500	19.15	PASS
116	5580	19.14	PASS
140	5700	19.31	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	19.56	PASS
44	5220	19.46	PASS
48	5240	19.55	PASS
52	5260	19.53	PASS
60	5300	19.49	PASS
64	5320	19.56	PASS
100	5500	19.48	PASS
116	5580	19.47	PASS
140	5700	19.54	PASS

802.11n (40MHz)

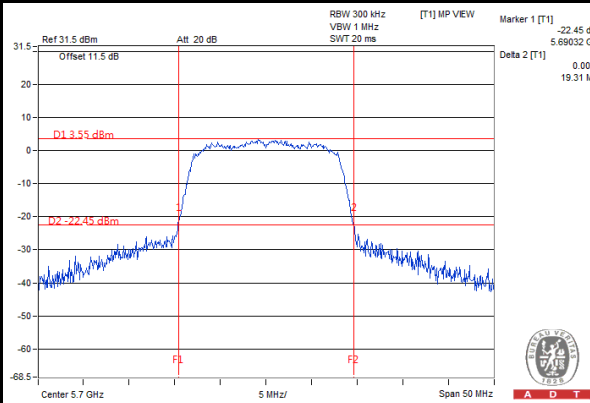
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
38	5190	40.99	PASS
46	5230	40.91	PASS
54	5270	40.95	PASS
62	5310	41.08	PASS
102	5510	41.42	PASS
110	5550	41.12	PASS
134	5670	40.96	PASS



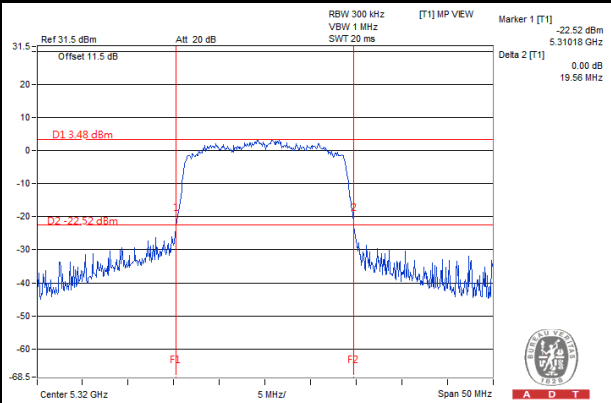
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SPECTRUM PLOT OF WORST VALUE

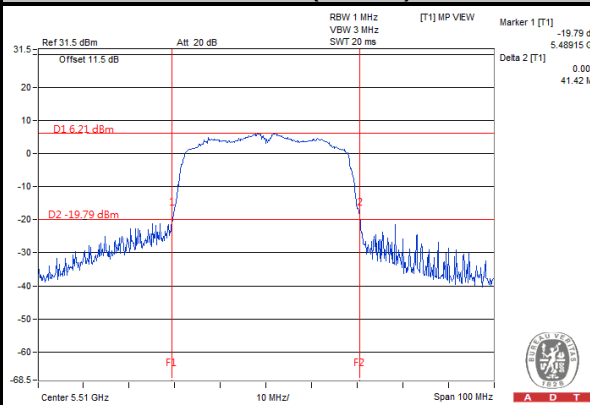
802.11a



802.11n (20MHz)



802.11n (40MHz)

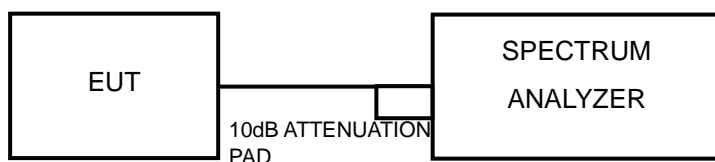


4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	4dBm
5.250 ~ 5.350GHz	11dBm
5.470 ~ 5.725GHz	11dBm

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.4.4 TEST PROCEDURES

Using method SA-2 alternative

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
- 3) Sweep time = 4second.
- 4) Perform a single sweep.
- 5) Record the max value and add 10 log (1/duty cycle)

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.

4.4.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	-0.48	0.34	-0.14	4	PASS
44	5220	-0.33	0.34	0.01	4	PASS
48	5240	-0.32	0.34	0.02	4	PASS
52	5260	-0.04	0.34	0.30	11	PASS
60	5300	0.11	0.34	0.45	11	PASS
64	5320	0.16	0.34	0.50	11	PASS
100	5500	1.07	0.34	1.41	11	PASS
116	5580	0.44	0.34	0.78	11	PASS
140	5700	0.35	0.34	0.69	11	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	-0.80	0.35	-0.45	4	PASS
44	5220	-0.57	0.35	-0.22	4	PASS
48	5240	-0.52	0.35	-0.17	4	PASS
52	5260	-0.27	0.35	0.08	11	PASS
60	5300	-0.25	0.35	0.10	11	PASS
64	5320	-0.10	0.35	0.25	11	PASS
100	5500	0.47	0.35	0.82	11	PASS
116	5580	0.03	0.35	0.38	11	PASS
140	5700	0.11	0.35	0.46	11	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

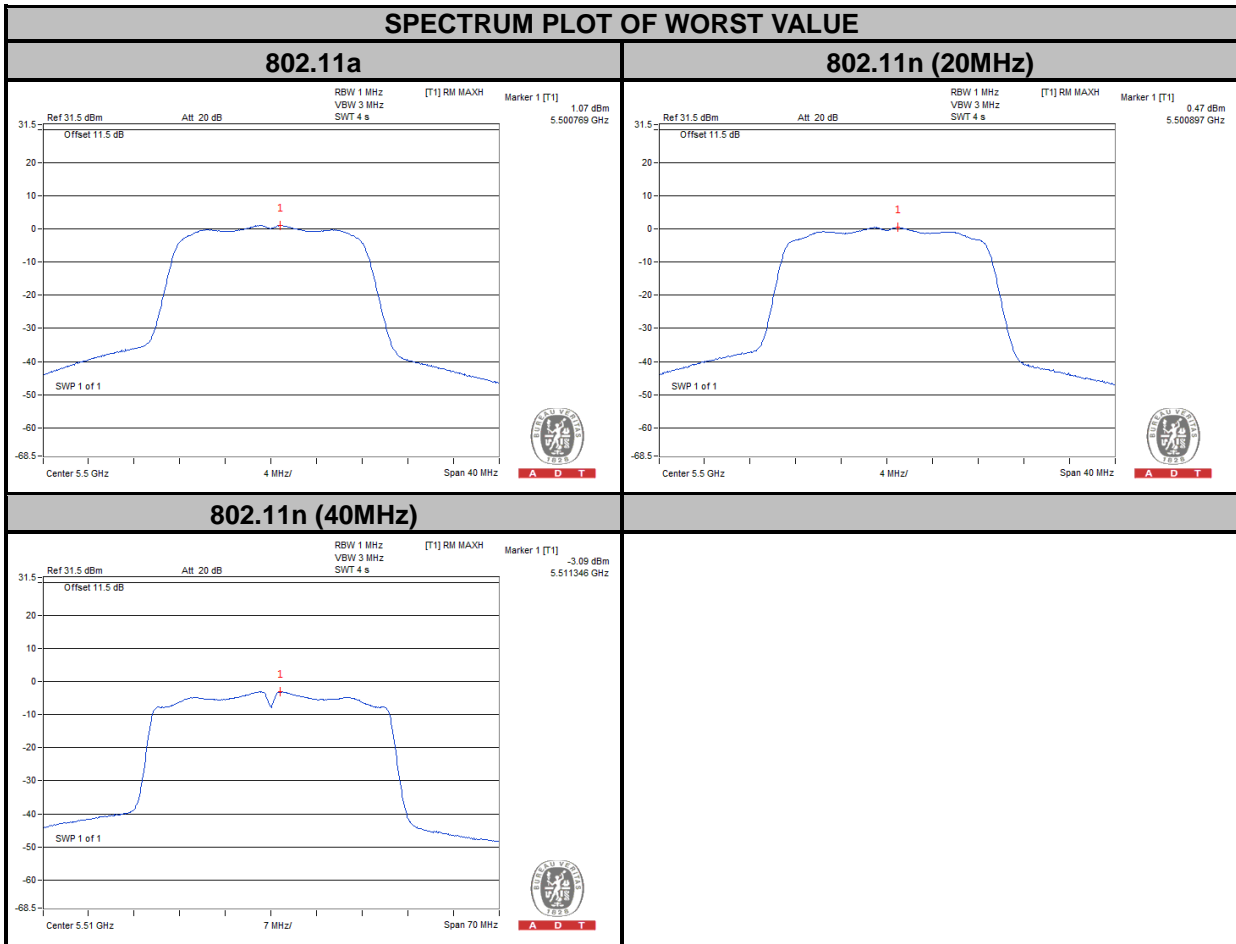


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802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
38	5190	-4.45	0.67	-3.78	4	PASS
46	5230	-4.26	0.67	-3.59	4	PASS
54	5270	-3.98	0.67	-3.31	11	PASS
62	5310	-3.85	0.67	-3.18	11	PASS
102	5510	-3.09	0.67	-2.42	11	PASS
110	5550	-3.62	0.67	-2.95	11	PASS
134	5670	-3.41	0.67	-2.74	11	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

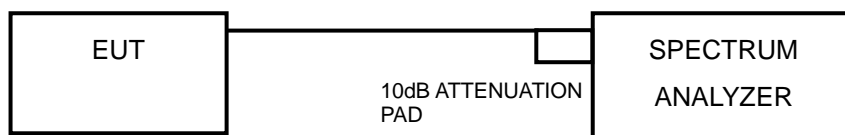


4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

Shall not exceed 13 dB.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.5.4 TEST PROCEDURE

- Set the RBW = 1 kHz, VBW \geq 3 MHz, Detector = peak.
- Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
- Use the peak search function to find the peak of the spectrum.
- Measure the PPSD.
- Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.
Find the worst channel and modulation mode as above test procedure, and follow KDB 789033 D01 General UNII Test Procedures v01r03 and repeat step 1 to 5 for final testing of each modulation mode on a single channel (all modulation types) in a single operating band to compliance with the peak excursion requirement.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

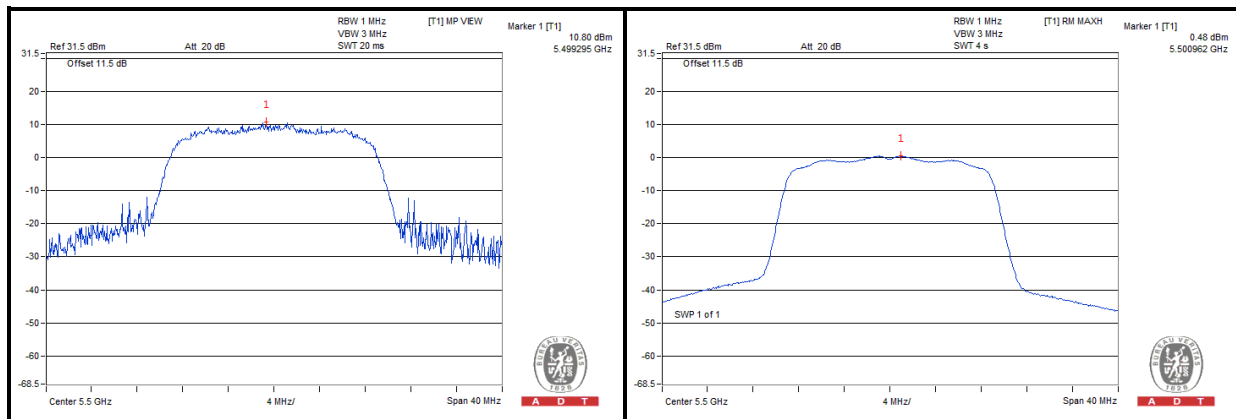
4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6.

4.5.7 TEST RESULTS

MODULATION MODE	MODULATION TYPE	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)	PPSD WITHOUT DUTY FACTOR (dBm)	PPSD WITH DUTY FACTOR (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS/FAIL
802.11a	BPSK	5500	10.30	1.07	1.41	8.89	13	PASS
	QPSK		11.00	0.79	1.44	9.56	13	PASS
	16QAM		10.83	0.41	1.53	9.30	13	PASS
	64QAM		10.72	-0.35	1.68	9.04	13	PASS
802.11n (20MHz)	BPSK	5500	10.09	0.47	0.82	9.27	13	PASS
	QPSK		10.80	0.48	1.16	9.64	13	PASS
	16QAM		10.77	0.05	1.23	9.54	13	PASS
	64QAM		10.76	-0.65	1.39	9.37	13	PASS
802.11n (40MHz)	BPSK	5310	5.95	-3.41	-2.74	8.69	13	PASS
	QPSK		6.24	-4.15	-2.89	9.13	13	PASS
	16QAM		6.42	-4.90	-2.85	9.27	13	PASS
	64QAM		6.98	-5.81	-2.63	9.61	13	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

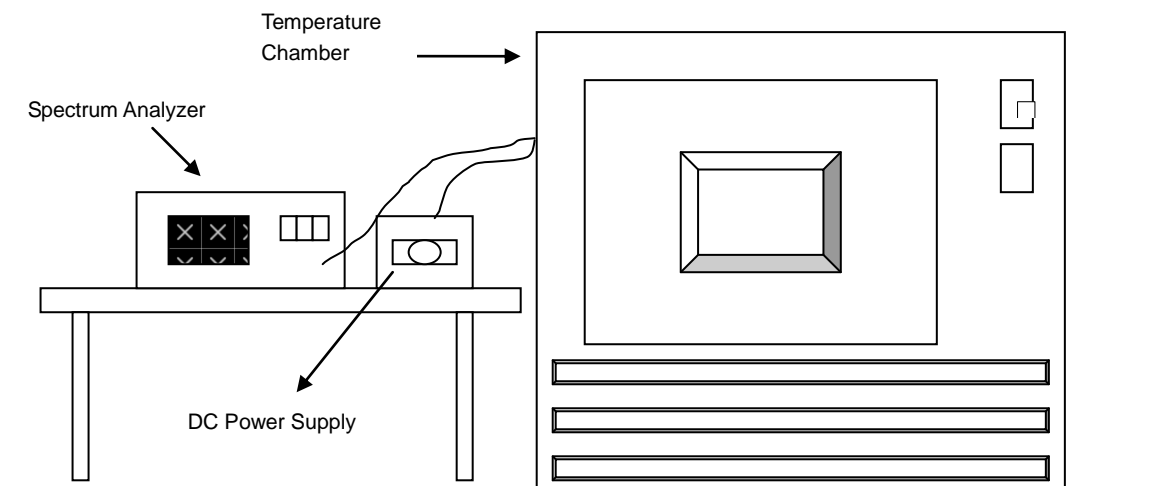


4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency of the carrier signal shall be maintained within band of operation.

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.6.4 TEST PROCEDURE

- a. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- b. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
- c. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

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



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4.6.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
50	3.85	5320.041889	7.874	5320.041526	7.806	5320.041970	7.889	5320.041636	7.826
40	3.85	5320.041897	7.875	5320.041823	7.861	5320.042074	7.909	5320.041598	7.819
30	3.85	5320.043355	8.149	5320.043300	8.139	5320.043170	8.115	5320.043393	8.157
20	3.85	5320.044216	8.311	5320.044106	8.291	5320.044258	8.319	5320.043984	8.268
10	3.85	5320.045619	8.575	5320.045762	8.602	5320.045527	8.558	5320.045467	8.546
0	3.85	5320.043897	8.251	5320.044012	8.273	5320.044158	8.300	5320.044090	8.288
-10	3.85	5320.042247	7.941	5320.042216	7.935	5320.042543	7.997	5320.042784	8.042
-20	3.85	5320.042014	7.897	5320.042326	7.956	5320.042217	7.936	5320.041899	7.876

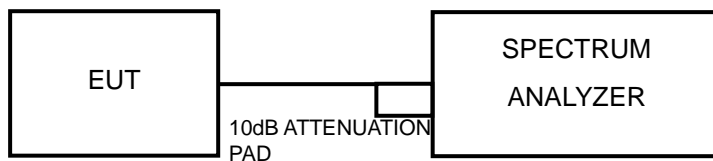
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	3.6	5320.043739	8.222	5320.043411	8.160	5320.043826	8.238	5320.043270	8.133
	3.85	5320.044216	8.311	5320.044106	8.291	5320.044258	8.319	5320.043984	8.268
	4.35	5320.045289	8.513	5320.045280	8.511	5320.045307	8.516	5320.045217	8.499

4.7 20dBc BANDWIDTH MEASUREMENT

4.7.1 LIMITS OF 20dBc BANDWIDTH MEASUREMENT

20dBc point shall not overlap in 5150~5700MHz.

4.7.2 TEST SETUP



4.7.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.7.4 TEST PROCEDURES

789033 D01 General UNII Test Procedures v01r03

Emission bandwidth

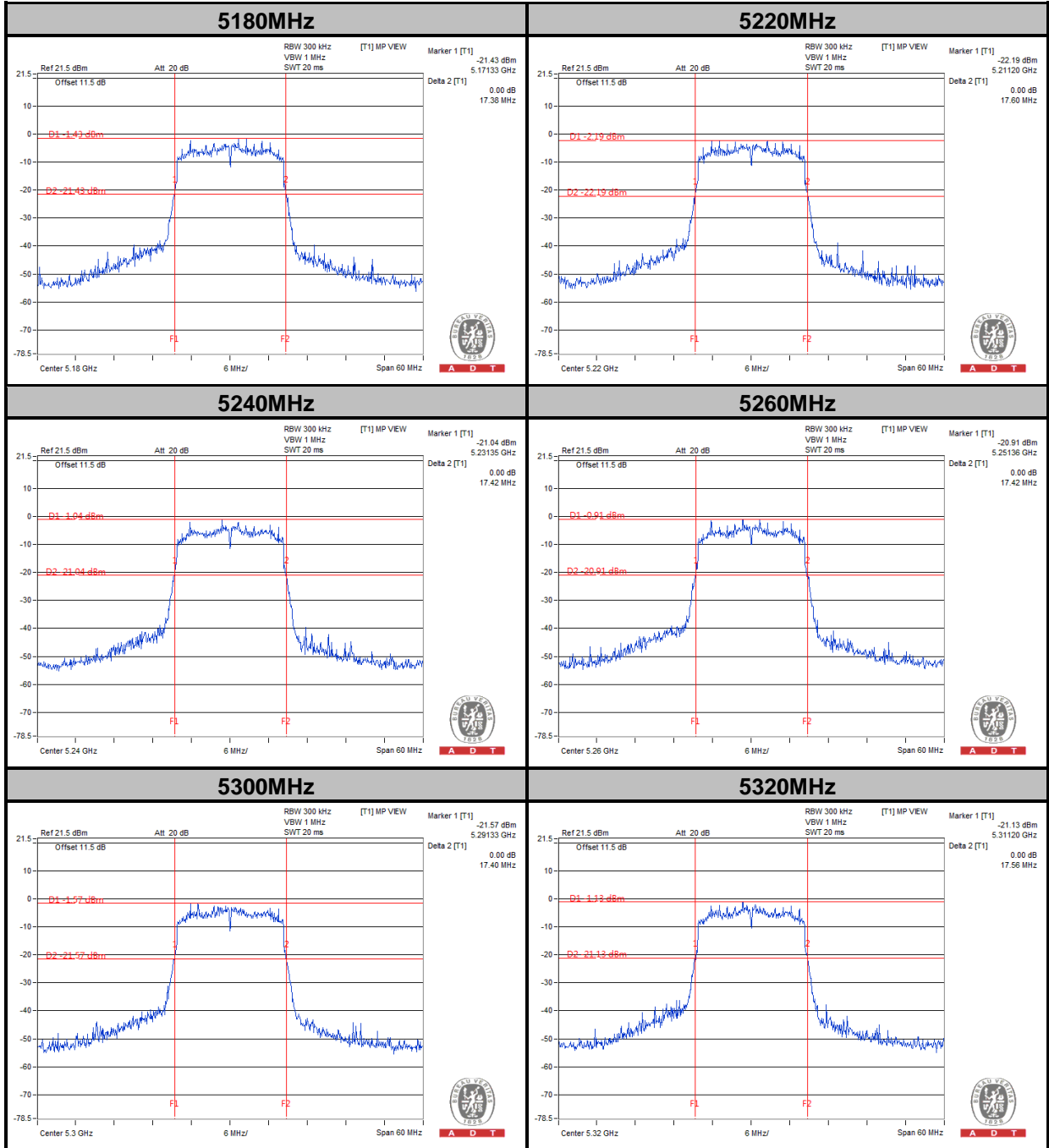
- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak
- 4) Trace mode = max hold.
- 5) Measurement the maximum width of the emission that is 20dB down from the peak of the emission. Compare this with RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.



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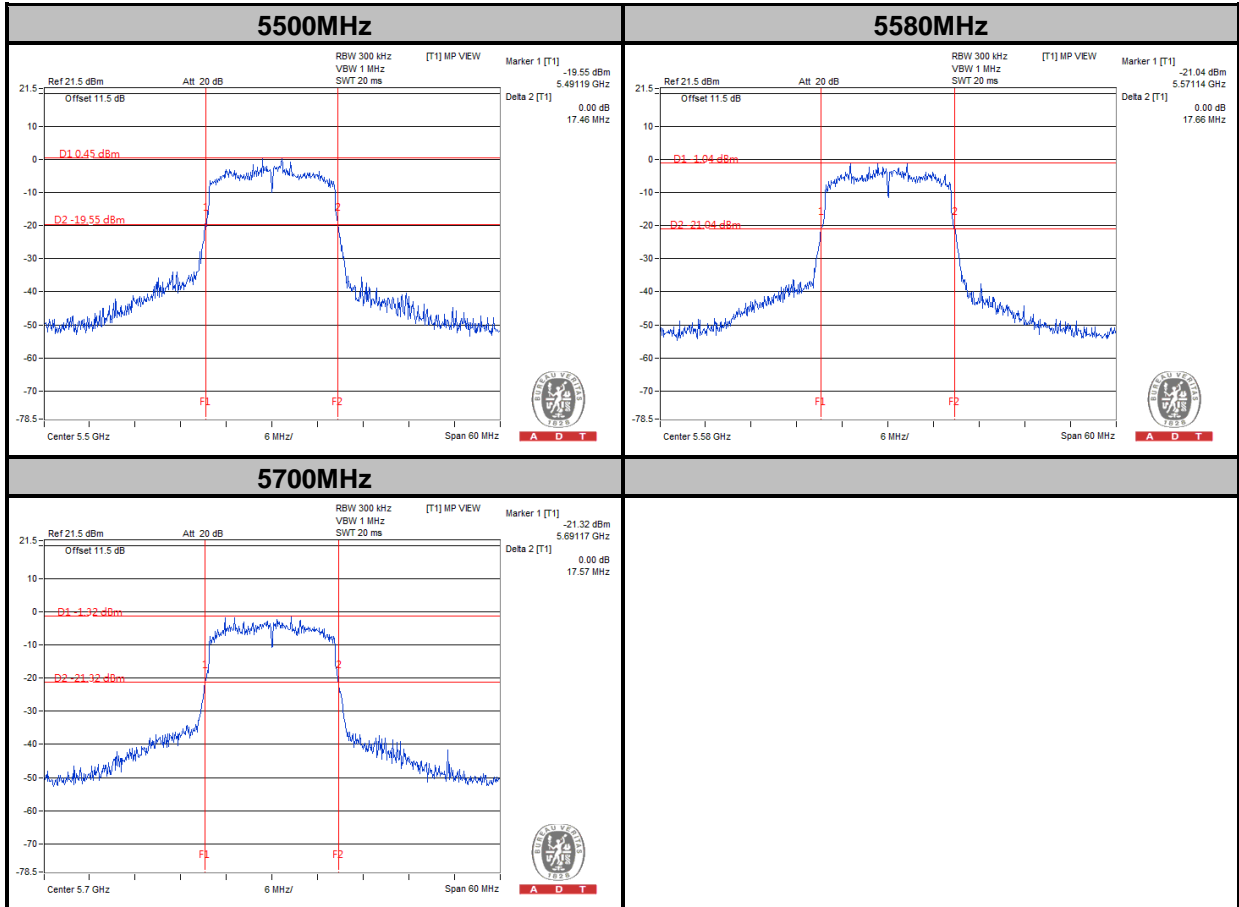
4.7.5 TEST RESULTS

802.11a





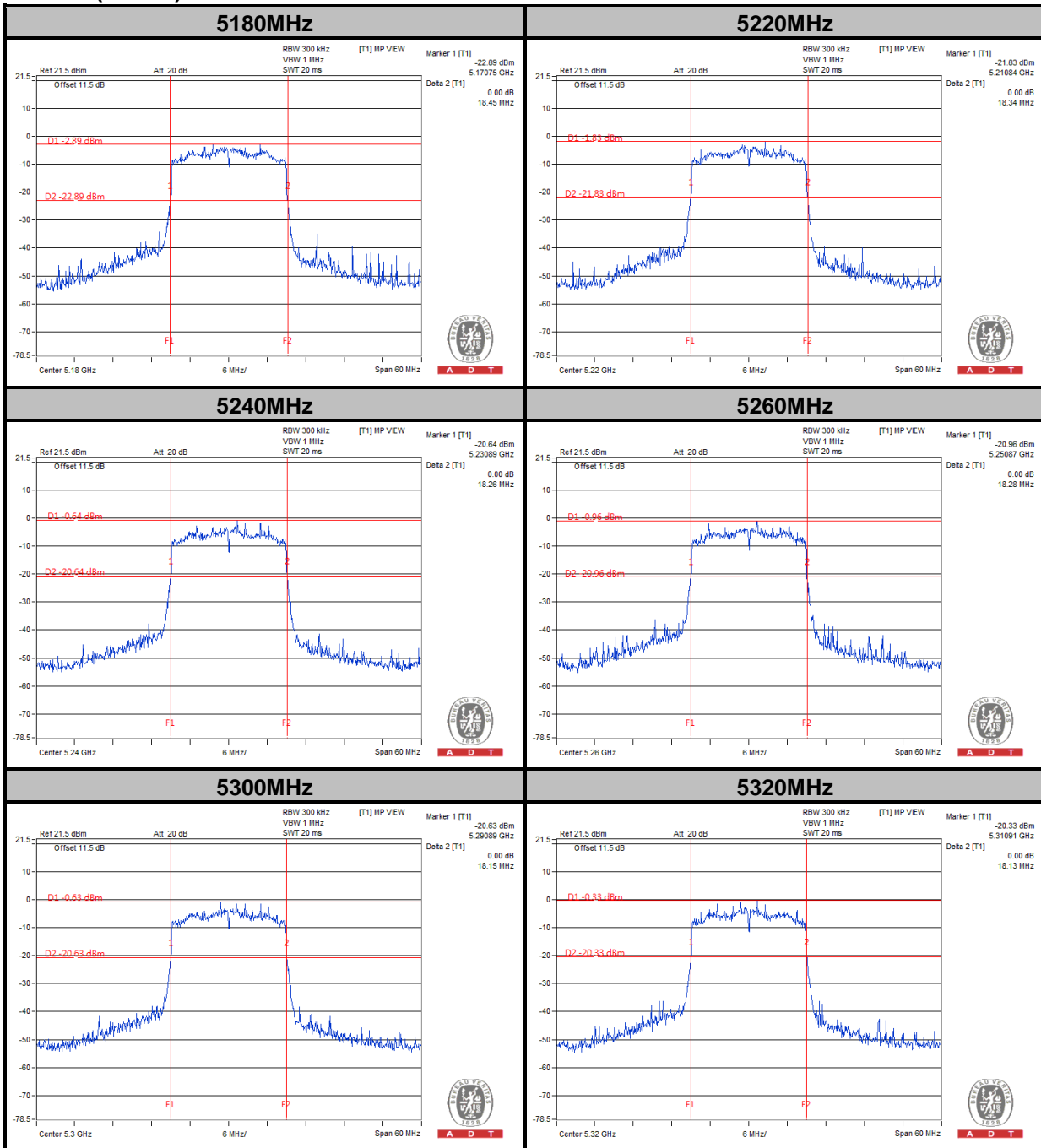
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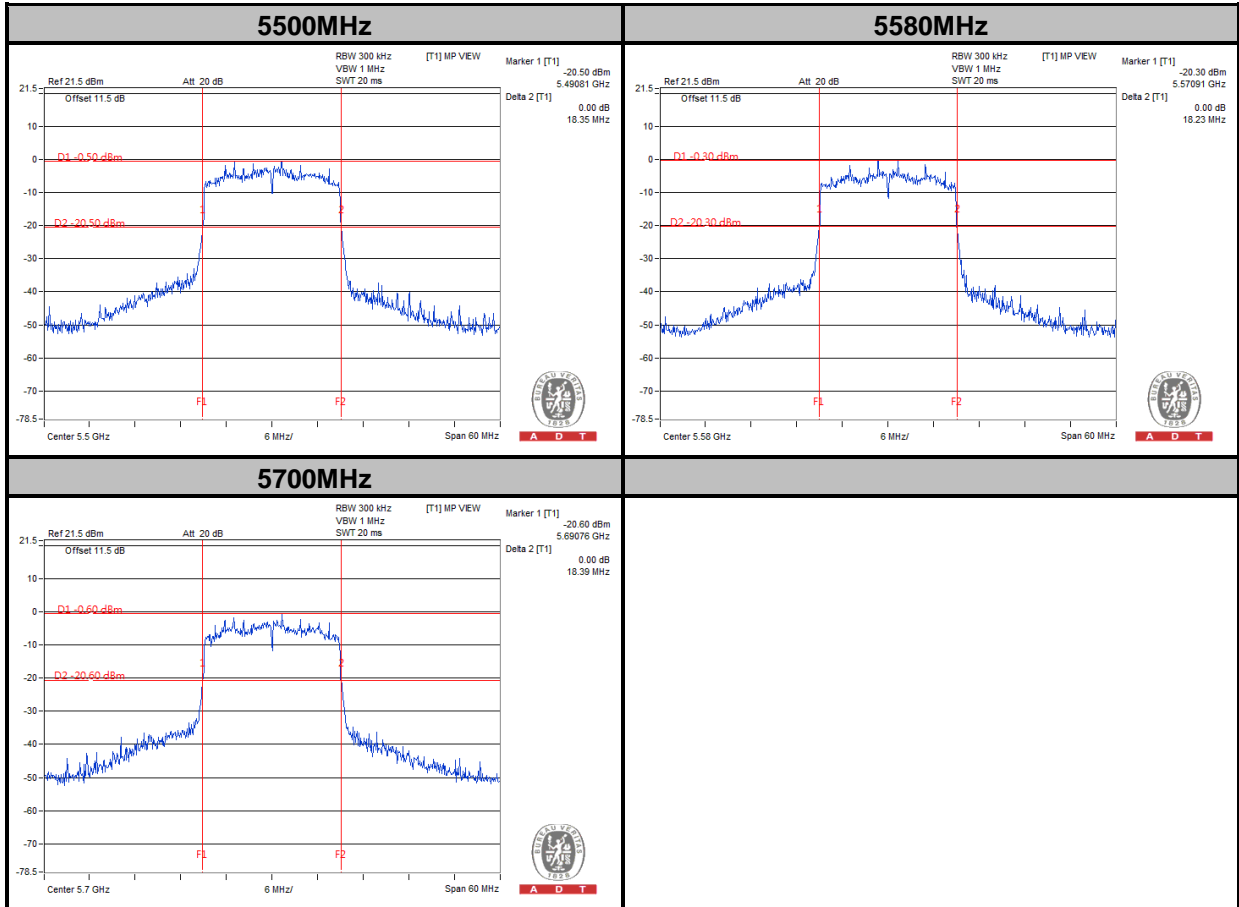
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802.11n (20MHz)





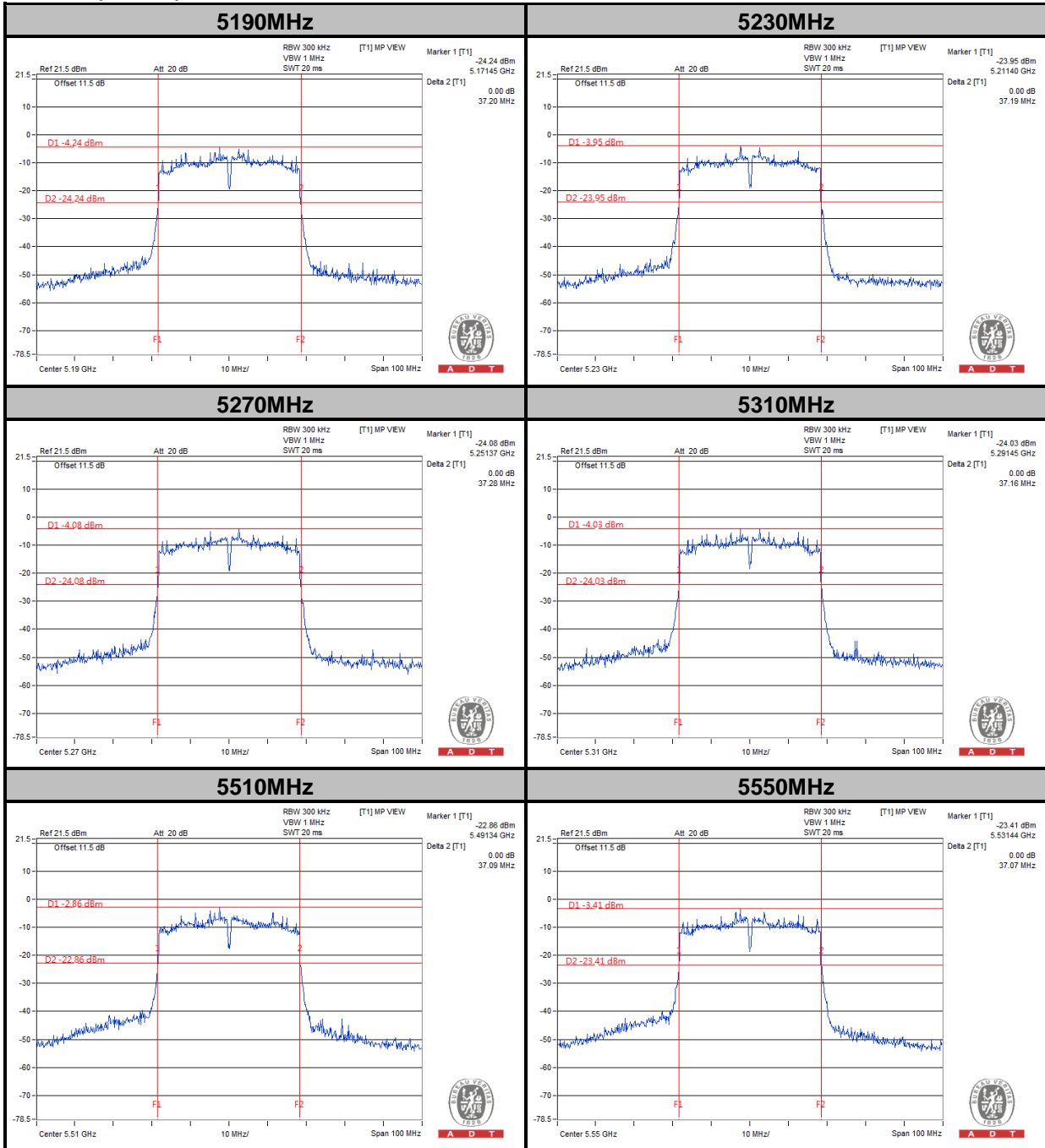
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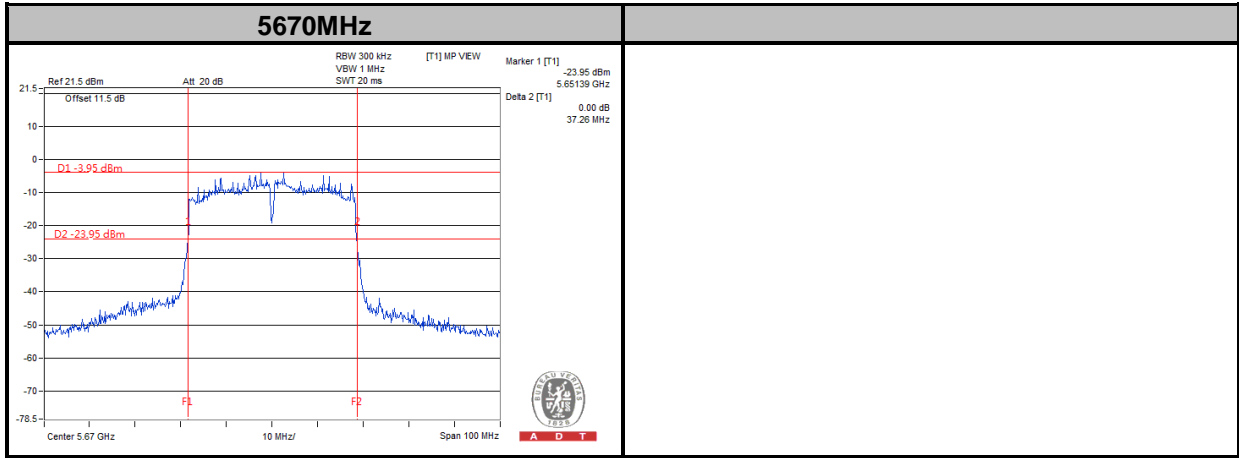
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802.11n (40MHz)





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5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



6. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



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7. 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---