

FCC TEST REPORT (15.407)

REPORT NO.: RF150518C08-3
MODEL NO.: SAV-CRU-0600, SAV-CRU-0601
FCC ID: ASU-CRU0600
RECEIVED: May 18, 2015
TESTED: Jun. 01, 2015 ~ Jun. 06, 2015
ISSUED: Jun. 18, 2015

APPLICANT: Savant Systems LLC

ADDRESS: 75 Perseverance Way Hyannis, MA 02635 USA

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

LAB ADDRESS: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist.,
New Taipei City, Taiwan (R.O.C)

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil., Kwei
Shan Dist., Taoyuan City 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1. CERTIFICATION	5
2. SUMMARY OF TEST RESULTS	6
2.1 MEASUREMENT UNCERTAINTY	6
3. GENERAL INFORMATION	7
3.1 GENERAL DESCRIPTION OF EUT	7
3.2 DESCRIPTION OF TEST MODES	9
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	10
3.3 DESCRIPTION OF SUPPORT UNITS	13
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	13
3.4 DUTY CYCLE TEST SIGNAL	14
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS	22
4. TEST TYPES AND RESULTS	23
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	23
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	23
4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	23
4.1.3 TEST INSTRUMENTS	24
4.1.4 TEST PROCEDURES	25
4.1.5 DEVIATION FROM TEST STANDARD	25
4.1.6 TEST SETUP	26
4.1.7 EUT OPERATING CONDITIONS	26
4.1.8 TEST RESULTS	27
4.2 CONDUCTED EMISSION MEASUREMENT	57
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	57
4.2.2 TEST INSTRUMENTS	57
4.2.3 TEST PROCEDURES	58
4.2.4 DEVIATION FROM TEST STANDARD	58
4.2.5 TEST SETUP	59
4.2.6 EUT OPERATING CONDITIONS	59
4.2.7 TEST RESULTS	60
4.3 TRANSMIT POWER MEASUREMENT	62
4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT	62
4.3.2 TEST SETUP	62
4.3.3 TEST INSTRUMENTS	62
4.3.4 TEST PROCEDURE	63
4.3.5 DEVIATION FROM TEST STANDARD	63
4.3.6 EUT OPERATING CONDITIONS	63
4.3.7 TEST RESULTS	64
4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT	66
4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	66
4.4.2 TEST SETUP	66
4.4.3 TEST INSTRUMENTS	66
4.4.4 TEST PROCEDURES	66
4.4.5 DEVIATION FROM TEST STANDARD	67
4.4.6 EUT OPERATING CONDITIONS	67
4.4.7 TEST RESULTS	68
4.5 FREQUENCY STABILITY	74
4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT	74
4.5.2 TEST SETUP	74
4.5.3 TEST INSTRUMENTS	74
4.5.4 TEST PROCEDURE	75
4.5.5 DEVIATION FROM TEST STANDARD	75



A D T

4.5.6	EUT OPERATING CONDITION.....	75
4.5.7	TEST RESULTS.....	76
4.6	6dB BANDWIDTH MEASUREMENT	77
4.6.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	77
4.6.2	TEST SETUP	77
4.6.3	TEST INSTRUMENTS	77
4.6.4	TEST PROCEDURE	77
4.6.5	DEVIATION FROM TEST STANDARD	77
4.6.6	EUT OPERATING CONDITIONS	77
4.6.7	TEST RESULTS.....	78
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	80
6.	INFORMATION ON THE TESTING LABORATORIES	81
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	82



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF150518C08-3	Original release	Jun. 18, 2015

1. CERTIFICATION

PRODUCT: Consumer Electornics
MODEL NO.: SAV-CRU-0600,SAV-CRU-0601
BRAND: Simple Host Controller
APPLICANT: Savant Systems LLC
TESTED: Jun. 01, 2015 ~ Jun. 06, 2015
TEST SAMPLE: Identical Prototype
STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.10-2013

The above equipment (model: SAV-CRU-0600,SAV-CRU-0601) 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 : Gina Liu , **DATE** : Jun. 18, 2015
Gina Liu / Specialist
APPROVED BY : Kay Wu , **DATE** : Jun. 18, 2015
Kay Wu / Supervisor

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 -24.36dB at 0.31432MHz.
15.407(b)(1/2/3) (b)(6)	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.02dB at 5356MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	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	Consumer Electronics
MODEL NO.	SAV-CRU-0600, SAV-CRU-0601
POWER SUPPLY	5.0Vdc (adapter)
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, 5745 ~ 5825MHz
NUMBER OF CHANNEL	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	30.34mW for 5180 ~ 5240MHz 30.20mW for 5745 ~ 5825MHz
ANTENNA TYPE	PIFA antenna with 2.48dBi gain (5180 ~ 5240MHz) PIFA antenna with 2.51dBi gain (5745 ~ 5825MHz)
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
Simple Host Controller	SAV-CRU-0600	All models are electrically identical, different model names are for marketing purpose.
	SAV-CRU-0601	

2. The EUT contains following accessory devices.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter 1	SIAN POWER DEVICES INC.	WB-10E05FU	I/P: 100-240Vac, 50/60Hz, 0.4A O/P: 5Vdc, 2A
Adapter 2	CUI INC.	SWI10-5-N-I38-C1	I/P: 90-264Vac, 50/60Hz, 0.3A O/P: 5Vdc, 2A
WLAN Chip	Qualcomm Atheros	QCA6234X	--

3. The EUT incorporates a MIMO function. Physically, the EUT provides three completed transmitters and three receivers.

MODULATION MODE	TX FUNCTION
802.11a	1TX
802.11n (20MHz)	1TX, 2TX
802.11n (40MHz)	1TX, 2TX

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

WLAN 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

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Chain 1
B	√	-	-	-	Chain 0
C	√	-	-	√	Chain 0 + Chain 1

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 **X-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
A, C	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
B				38			
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
B				149			
A, C	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n (40MHz)	5180-5240	38 to 46	38	OFDM	BPSK	MCS0
A	802.11n (20MHz)	5745-5825	149 to 165	149	OFDM	BPSK	MCS0

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11n (20MHz)	5180-5240	36 to 48	48	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)
A	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)		151 to 159	151, 159	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)
A	802.11a	5180-5240	36 to 48	36, 44, 48	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		36 to 48	36, 44, 48	OFDM	BPSK	MCS0
	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	MCS0
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)		151 to 159	151, 159	OFDM	BPSK	MCS0



A D T

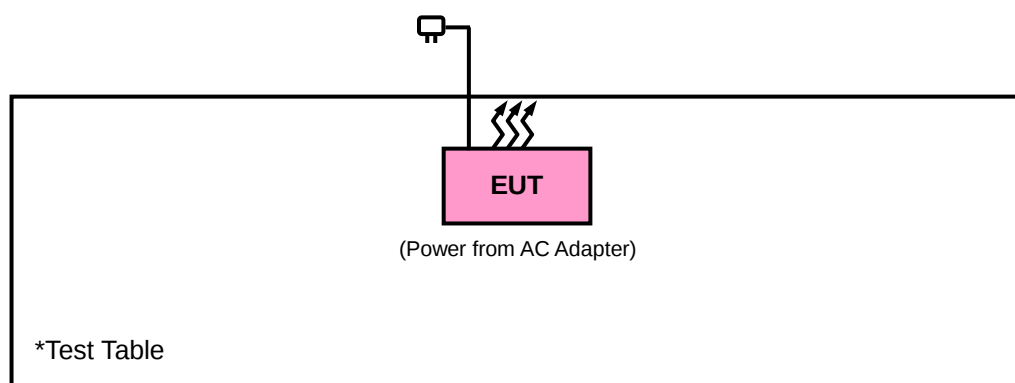
TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Hwa Chiang, Charles Hsiao, Will Chen
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Charles Hsiao
PLC	25deg. C, 65%RH	120Vac, 60Hz	Toby Tian
APCM	25deg. C, 65%RH	120Vac, 60Hz	Dylan Yang

3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



3.4 DUTY CYCLE TEST SIGNAL

MODE A

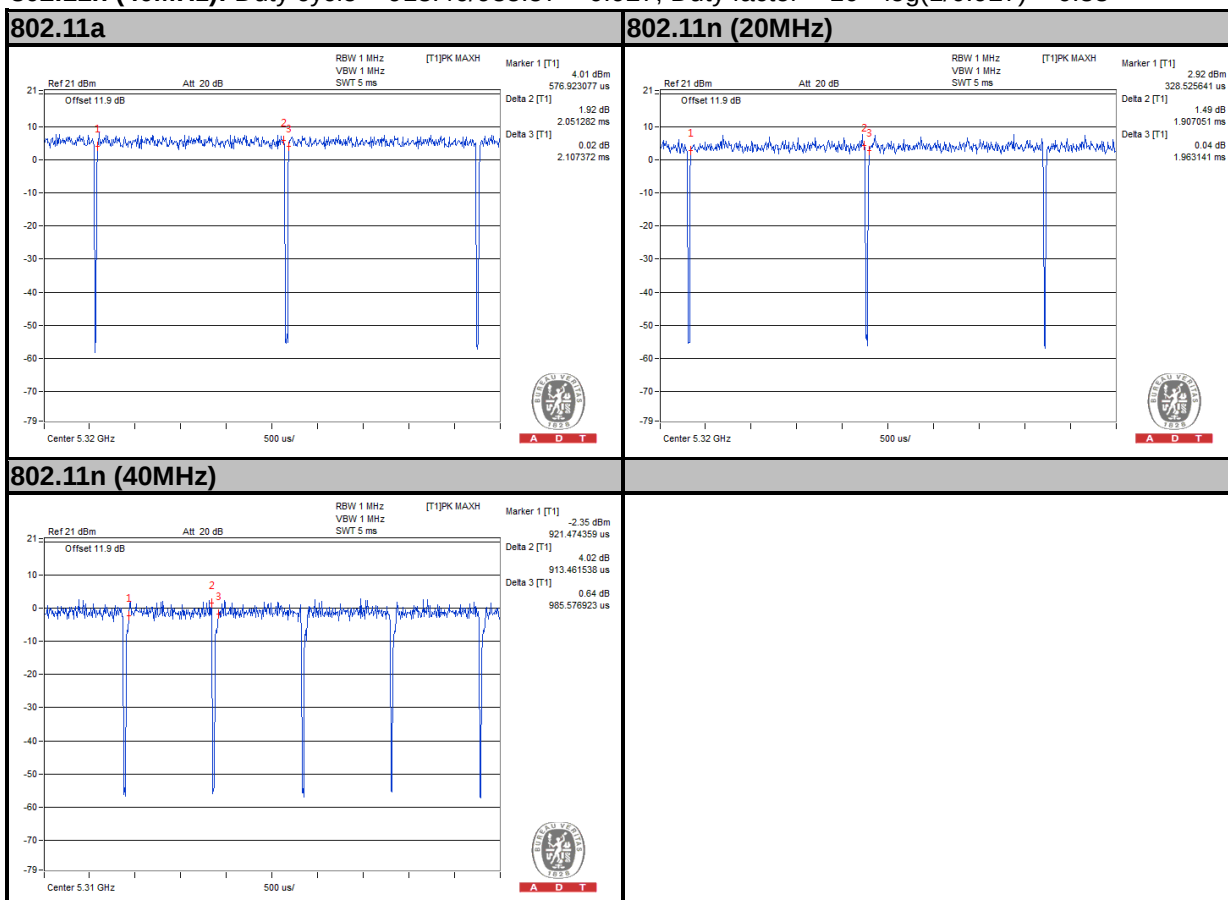
WLAN 5180 ~ 5240MHz

MODULATION TYPE: BPSK

802.11a: Duty cycle = $2.051/2.107 = 0.973$, Duty factor = $10 * \log(1/0.973) = 0.12$

802.11n (20MHz): Duty cycle = $1.907/1.963 = 0.971$, Duty factor = $10 * \log(1/0.971) = 0.13$

802.11n (40MHz): Duty cycle = $913.46/985.57 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$



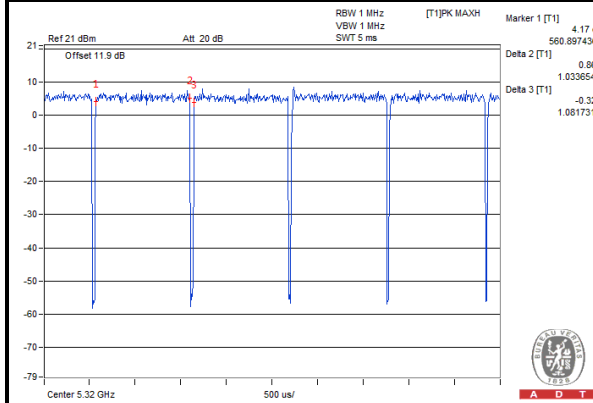
MODULATION TYPE: QPSK

802.11a: Duty cycle = $1.033/1.082 = 0.955$, Duty factor = $10 * \log(1/0.955) = 0.20$

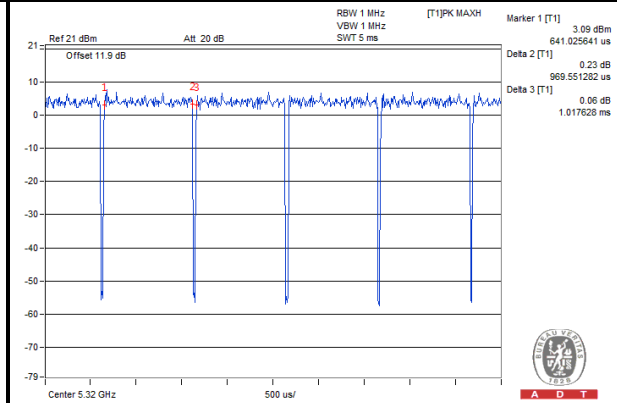
802.11n (20MHz): Duty cycle = $0.969/1.017 = 0.953$, Duty factor = $10 * \log(1/0.953) = 0.21$

802.11n (40MHz): Duty cycle = $456.73/528.84 = 0.864$, Duty factor = $10 * \log(1/0.864) = 0.64$

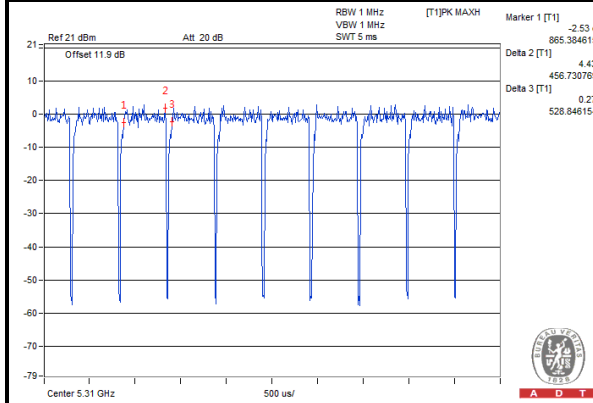
802.11a



802.11n (20MHz)



802.11n (40MHz)



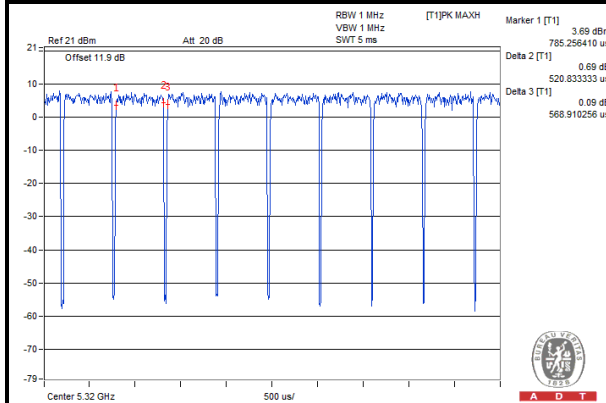
MODULATION TYPE: 16QAM

802.11a: Duty cycle = $520.83/568.91 = 0.915$, Duty factor = $10 * \log(1/0.915) = 0.38$

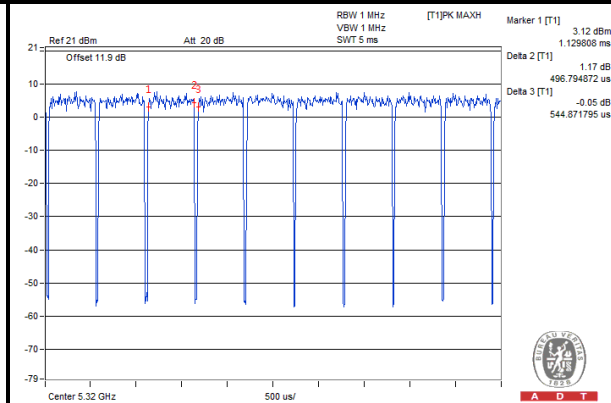
802.11n (20MHz): Duty cycle = $496.79/544.87 = 0.912$, Duty factor = $10 * \log(1/0.912) = 0.40$

802.11n (40MHz): Duty cycle = $230.77/302.88 = 0.762$, Duty factor = $10 * \log(1/0.762) = 1.18$

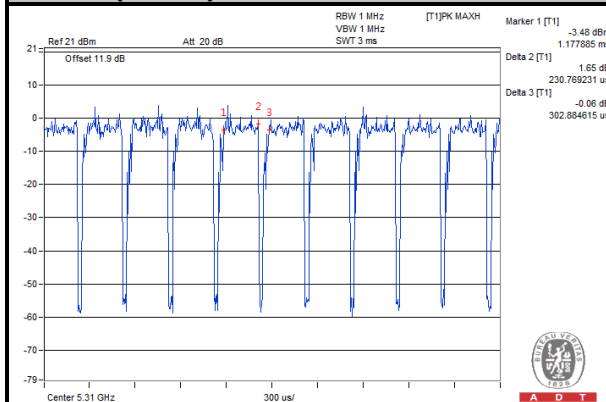
802.11a



802.11n (20MHz)



802.11n (40MHz)



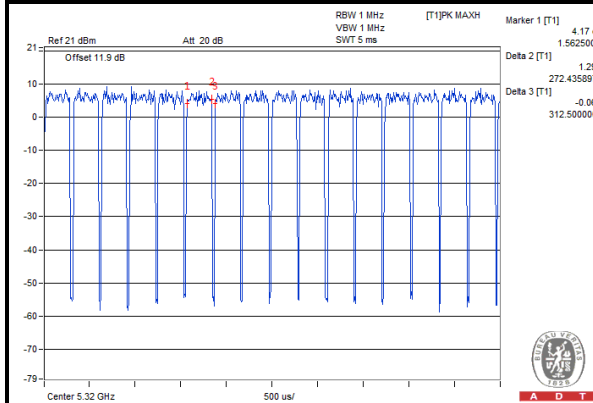
MODULATION TYPE: 64QAM

802.11a: Duty cycle = $272.43/312.5 = 0.872$, Duty factor = $10 * \log(1/0.872) = 0.60$

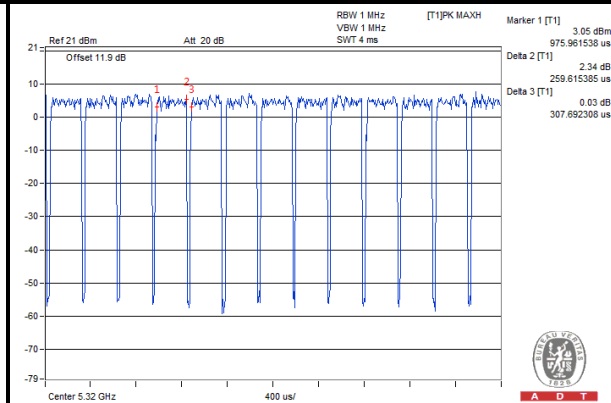
802.11n (20MHz): Duty cycle = $259.61/307.69 = 0.844$, Duty factor = $10 * \log(1/0.844) = 0.74$

802.11n (40MHz): Duty cycle = $115.38/190.70 = 0.605$, Duty factor = $10 * \log(1/0.605) = 2.18$

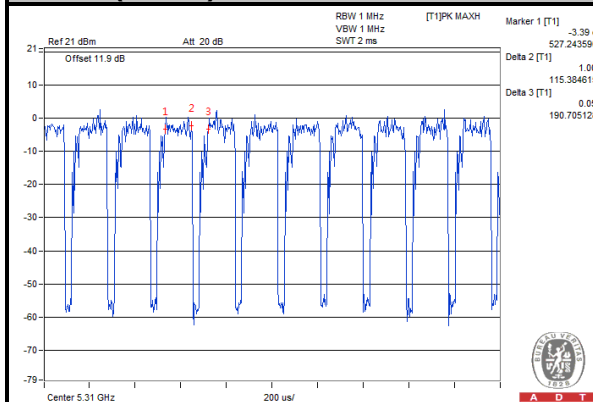
802.11a



802.11n (20MHz)



802.11n (40MHz)



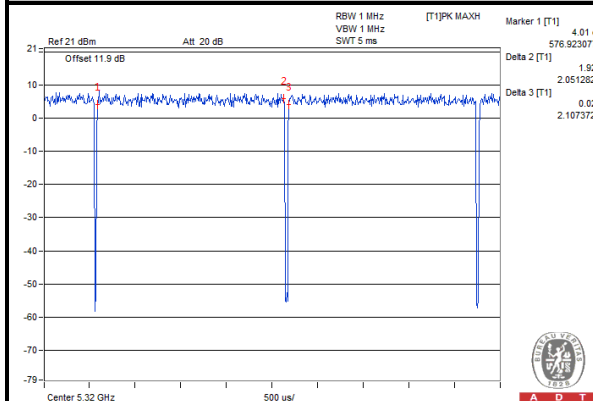
WLAN 5745 ~ 5825MHz

802.11a: Duty cycle = $2.051/2.107 = 0.973$, Duty factor = $10 * \log(1/0.973) = 0.12$

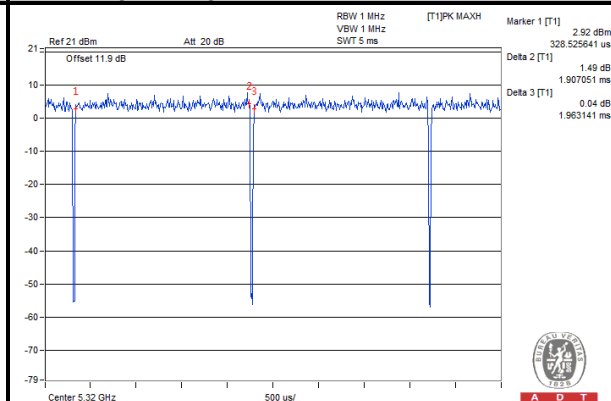
802.11n (20MHz): Duty cycle = $1.907/1.963 = 0.971$, Duty factor = $10 * \log(1/0.971) = 0.13$

802.11n (40MHz): Duty cycle = $913.46/985.57 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$

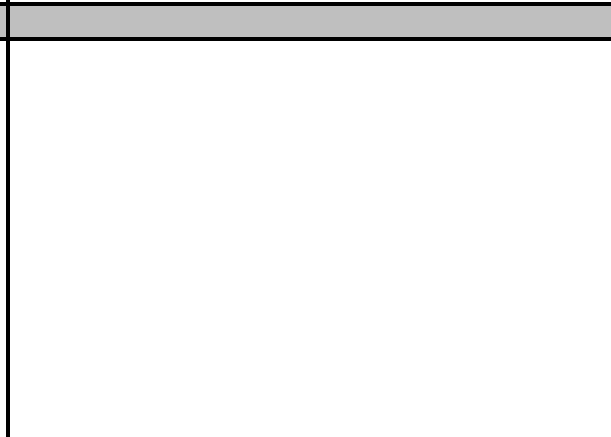
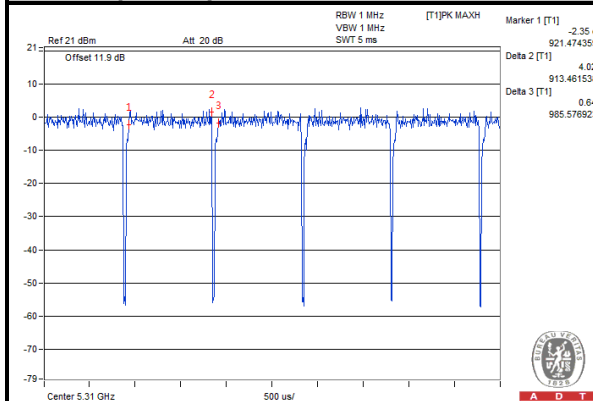
802.11a



802.11n (20MHz)



802.11n (40MHz)



MODE C

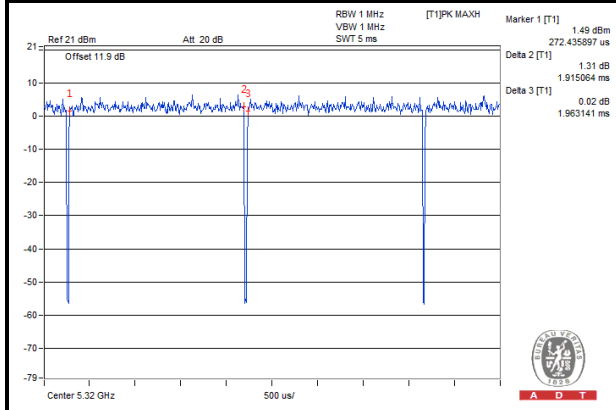
WLAN 5180 ~ 5240MHz

MODULATION TYPE: BPSK

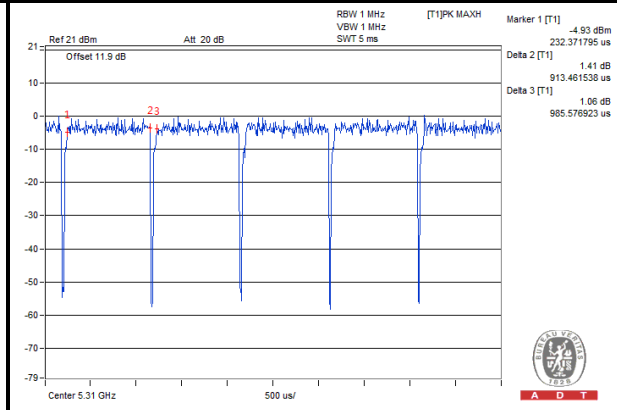
802.11n (20MHz): Duty cycle = $1.915/1.963 = 0.976$, Duty factor = $10 * \log(1/0.976) = 0.11$

802.11n (40MHz): Duty cycle = $913.46/985.57 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$

802.11n (20MHz)



802.11n (40MHz)

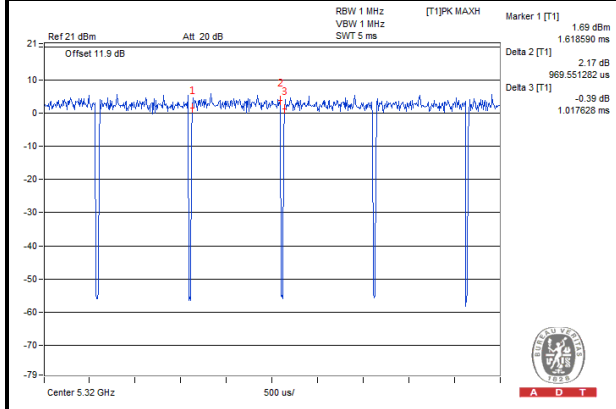


MODULATION TYPE: QPSK

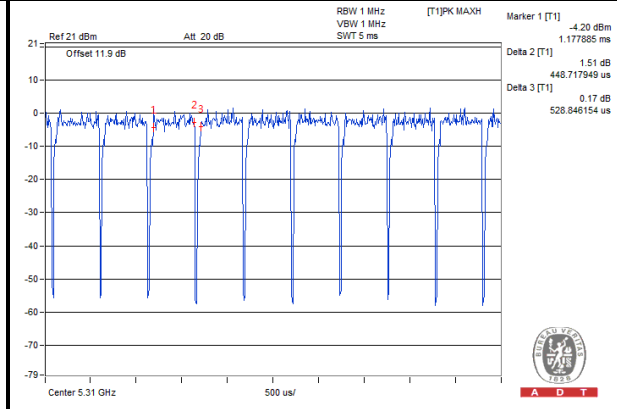
802.11n (20MHz): Duty cycle = $0.969/1.017 = 0.953$, Duty factor = $10 * \log(1/0.953) = 0.21$

802.11n (40MHz): Duty cycle = $448.71/528.84 = 0.848$, Duty factor = $10 * \log(1/0.848) = 0.71$

802.11n (20MHz)



802.11n (40MHz)

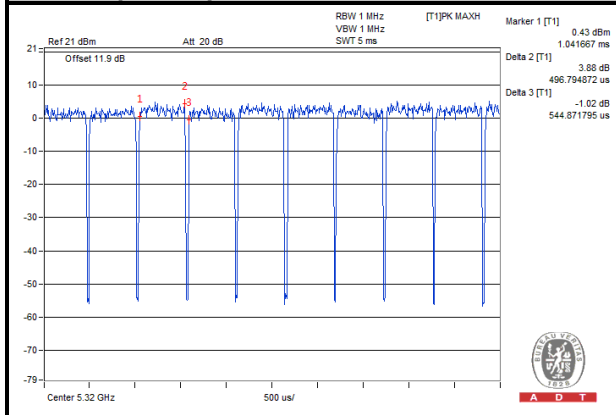


MODULATION TYPE: 16QAM

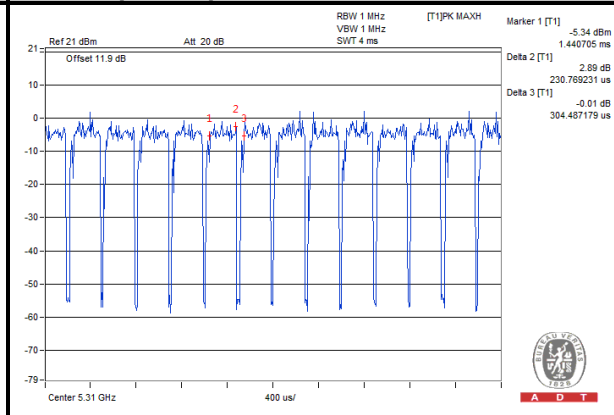
802.11n (20MHz): Duty cycle = $496.79/544.87 = 0.912$, Duty factor = $10 * \log(1/0.912) = 0.40$

802.11n (40MHz): Duty cycle = $230.77/304.48 = 0.758$, Duty factor = $10 * \log(1/0.758) = 1.20$

802.11n (20MHz)



802.11n (40MHz)

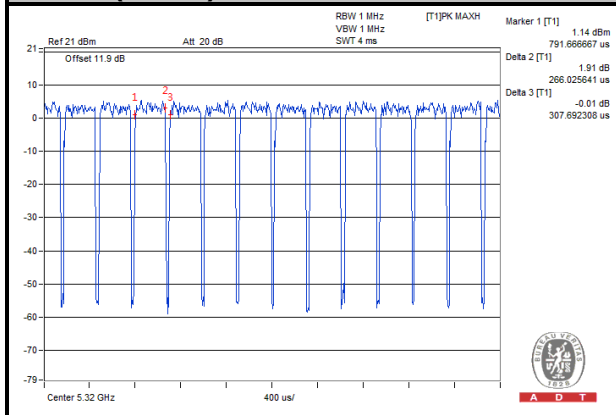


MODULATION TYPE: 64QAM

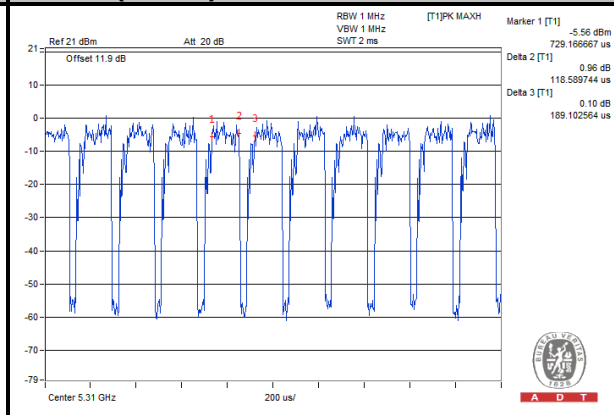
802.11n (20MHz): Duty cycle = $266.02/307.69 = 0.865$, Duty factor = $10 * \log(1/0.865) = 0.63$

802.11n (40MHz): Duty cycle = $118.59/189.10 = 0.627$, Duty factor = $10 * \log(1/0.627) = 2.03$

802.11n (20MHz)



802.11n (40MHz)

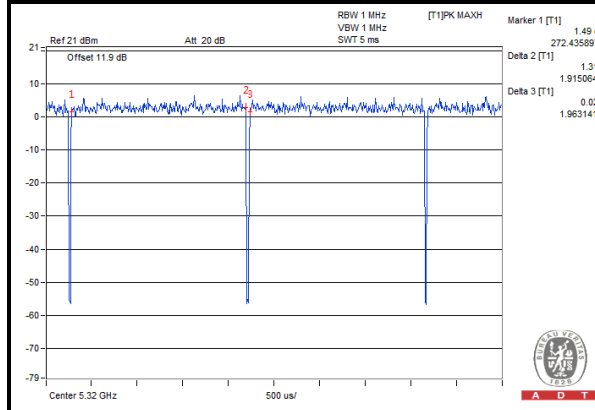


WLAN 5745 ~ 5825MHz

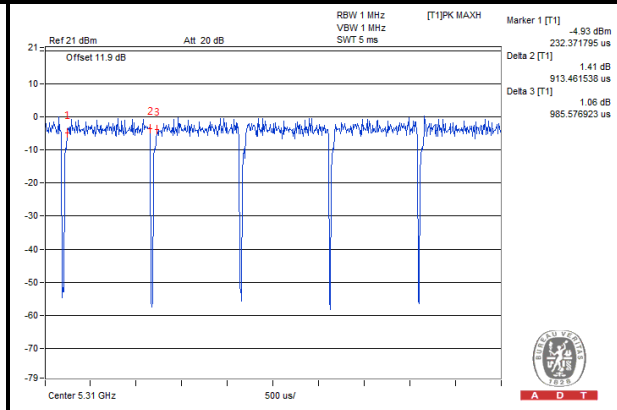
802.11n (20MHz): Duty cycle = $1.915/1.963 = 0.976$, Duty factor = $10 * \log(1/0.976) = 0.11$

802.11n (40MHz): Duty cycle = $913.46/985.57 = 0.927$, Duty factor = $10 * \log(1/0.927) = 0.33$

802.11n (20MHz)



802.11n (40MHz)





A D T

3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart E (15.407)

789033 D02 General UNII Test Procedures New Rules v01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

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

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

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

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

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver Agilent	N9038A	MY51210203	Jan.21, 2015	Jan.21, 2016
Spectrum Analyzer Agilent	N9010A	MY52220314	Sep.03, 2014	Sep.02, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 10, 2014	Dec. 09, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Feb. 04, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Feb. 09, 2015	Feb. 09, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Feb. 04, 2015	Feb. 04, 2016
Loop Antenna	EM-6879	269	Aug.13, 2014	Aug.12, 2015
Preamplifier EMCI	EMC 012645	980115	Dec. 12, 2014	Dec. 11, 2015
Preamplifier EMCI	EMC 184045	980116	Jan. 09, 2015	Jan. 08, 2016
Preamplifier EMCI	EMC 330H	980112	Dec. 27, 2014	Dec. 26, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 18, 2014	Oct. 17, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 18, 2014	Oct. 17, 2015
RF signal cable Worken	RG-213	NA	Nov. 07, 2014	Nov. 06, 2015
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
Bluetooth Tester	CBT	100980	Feb. 10, 2015	Feb. 09, 2016
Power Meter	ML2495A	1232002	Sep. 17, 2014	Sep. 16, 2015
Power Sensor	MA2411B	1207325	Sep. 17, 2014	Sep. 16, 2015

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The 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 (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The 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:

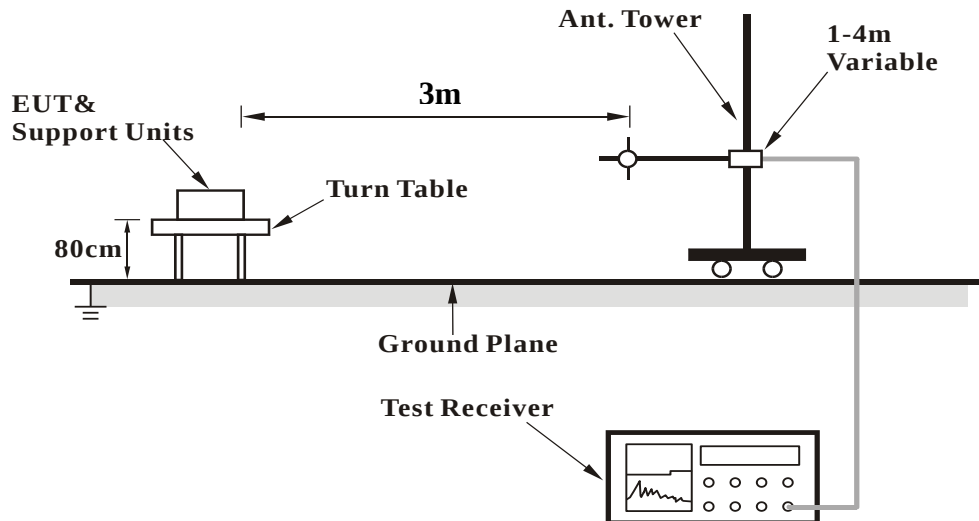
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency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

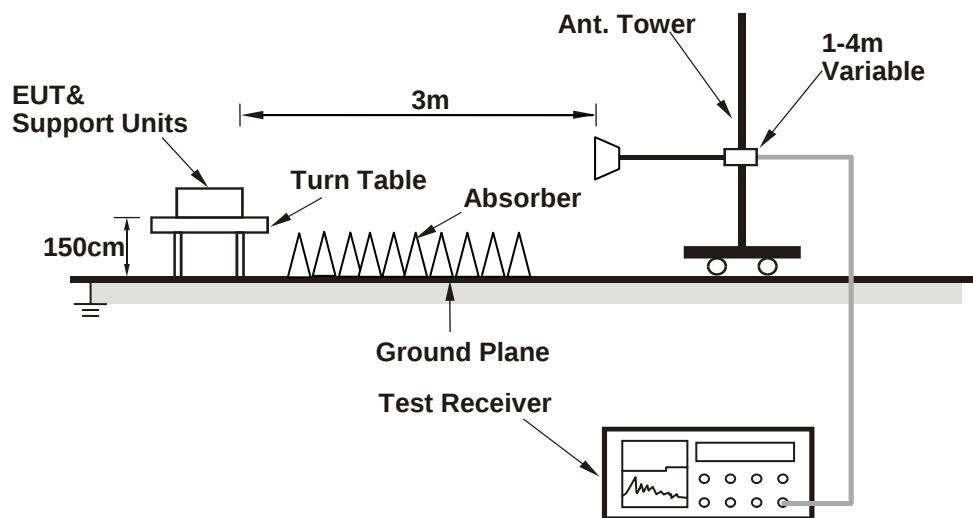
No deviation.

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.

4.1.8 TEST RESULTS

ABOVE 1GHz WORST-CASE DATA

MODE A

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	Hwa Chiang

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
5148	45.67	37.42	54	-8.33	34.12	8.13	34	220	306	Average
5148	58.88	50.63	74	-15.12	34.12	8.13	34	220	306	Peak
5180	104.51	96.2			34.15	8.16	34	220	306	Average
5180	112.19	103.88			34.15	8.16	34	220	306	Peak
5434	48.31	39.52	54	-5.69	34.35	8.48	34.04	220	306	Average
5434	59.27	50.48	74	-14.73	34.35	8.48	34.04	220	306	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
5070	47.66	39.56	54	-6.34	34.05	8.03	33.98	112	358	Average
5070	59.19	51.09	74	-14.81	34.05	8.03	33.98	112	358	Peak
5180	99.69	91.38			34.15	8.16	34	112	358	Average
5180	107.39	99.08			34.15	8.16	34	112	358	Peak
5460	46.91	38.09	54	-7.09	34.36	8.51	34.05	112	358	Average
5460	58.65	49.83	74	-15.35	34.36	8.51	34.05	112	358	Peak

REMARKS:

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

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	Hwa Chiang

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	49.14	40.98	54	-4.86	34.08	8.07	33.99	220	306	Average
5096	57.57	49.41	74	-16.43	34.08	8.07	33.99	220	306	Peak
5220	103.6	95.21			34.17	8.22	34	220	306	Average
5220	112.02	103.63			34.17	8.22	34	220	306	Peak
5434	51.5	42.71	54	-2.5	34.35	8.48	34.04	220	306	Average
5434	59	50.21	74	-15	34.35	8.48	34.04	220	306	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
5094	46.6	38.44	54	-7.4	34.08	8.07	33.99	112	357	Average
5094	57.33	49.17	74	-16.67	34.08	8.07	33.99	112	357	Peak
5220	99.15	90.76			34.17	8.22	34	112	357	Average
5220	107.45	99.06			34.17	8.22	34	112	357	Peak
5444	46.28	37.49	54	-7.72	34.35	8.48	34.04	112	357	Average
5444	58.16	49.37	74	-15.84	34.35	8.48	34.04	112	357	Peak

REMARKS:

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

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	Hwa Chiang

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
5148	49.43	41.18	54	-4.57	34.12	8.13	34	220	308	Average
5148	58.24	49.99	74	-15.76	34.12	8.13	34	220	308	Peak
5240	104.1	95.66			34.19	8.26	34.01	220	308	Average
5240	112.41	103.97			34.19	8.26	34.01	220	308	Peak
5356	51.98	43.35	54	-2.02	34.28	8.38	34.03	220	308	Average
5356	60.29	51.66	74	-13.71	34.28	8.38	34.03	220	308	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
5108	45.71	37.51	54	-8.29	34.09	8.1	33.99	118	357	Average
5108	58.12	49.92	74	-15.88	34.09	8.1	33.99	118	357	Peak
5240	99.9	91.46			34.19	8.26	34.01	118	357	Average
5240	107.48	99.04			34.19	8.26	34.01	118	357	Peak
5356	45.78	37.15	54	-8.22	34.28	8.38	34.03	118	357	Average
5356	58.55	49.92	74	-15.45	34.28	8.38	34.03	118	357	Peak

REMARKS:

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

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	Charles Hsiao

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
5714	57.49	48.34	68.2	-10.71	34.61	8.65	34.11	100	231	Peak
5724	76.61	67.45	78.2	-1.59	34.62	8.65	34.11	100	231	Peak
5745	98.01	88.82			34.64	8.66	34.11	100	231	Average
5745	105.9	96.71			34.64	8.66	34.11	100	231	Peak
5856	56.4	47.08	78.2	-21.8	34.76	8.7	34.14	100	231	Peak
5868	56.68	47.35	68.2	-11.52	34.76	8.71	34.14	100	231	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
5706	58.45	49.3	68.2	-9.75	34.61	8.65	34.11	107	297	Peak
5724	76.96	67.8	78.2	-1.24	34.62	8.65	34.11	107	297	Peak
5745	102.73	93.54			34.64	8.66	34.11	107	297	Average
5745	110.91	101.72			34.64	8.66	34.11	107	297	Peak
5858	57.46	48.14	78.2	-20.74	34.76	8.7	34.14	107	297	Peak
5870	58.12	48.79	68.2	-10.08	34.76	8.71	34.14	107	297	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5706MHz, 5714MHz, 5724MHz, 5856MHz, 5858MHz, 5868MHz & 5870MHz: Out of restricted band

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	Charles Hsiao

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
5710	57	47.85	68.2	-11.2	34.61	8.65	34.11	105	232	Peak
5722	56.54	47.38	78.2	-21.66	34.62	8.65	34.11	105	232	Peak
5785	99.48	90.25			34.68	8.68	34.13	105	232	Average
5785	107.46	98.23			34.68	8.68	34.13	105	232	Peak
5856	56.38	47.06	78.2	-21.82	34.76	8.7	34.14	105	232	Peak
5862	58.06	48.73	68.2	-10.14	34.76	8.71	34.14	105	232	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
5708	57.34	48.19	68.2	-10.86	34.61	8.65	34.11	107	297	Peak
5716	57.37	48.22	78.2	-20.83	34.61	8.65	34.11	107	297	Peak
5785	104.02	94.79			34.68	8.68	34.13	107	297	Average
5785	112.09	102.86			34.68	8.68	34.13	107	297	Peak
5860	57.22	47.9	78.2	-20.98	34.76	8.7	34.14	107	297	Peak
5862	56.55	47.22	68.2	-11.65	34.76	8.71	34.14	107	297	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5708MHz, 5710MHz, 5716MHz, 5722MHz, 5856MHz, 5860MHz, & 5862MHz: Out of restricted band

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	Charles Hsiao

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
5712	57.08	47.93	68.2	-11.12	34.61	8.65	34.11	118	231	Peak
5720	56.86	47.7	78.2	-21.34	34.62	8.65	34.11	118	231	Peak
5825	99.09	89.8			34.73	8.69	34.13	118	231	Average
5825	107.2	97.91			34.73	8.69	34.13	118	231	Peak
5852	67.54	58.24	78.2	-10.66	34.74	8.7	34.14	118	231	Peak
5862	57.67	48.34	68.2	-10.53	34.76	8.71	34.14	118	231	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
5714	57.68	48.53	68.2	-10.52	34.61	8.65	34.11	100	291	Peak
5718	57.78	48.62	78.2	-20.42	34.62	8.65	34.11	100	291	Peak
5825	104.94	95.65			34.73	8.69	34.13	100	291	Average
5825	112.45	103.16			34.73	8.69	34.13	100	291	Peak
5852	67.87	58.57	78.2	-10.33	34.74	8.7	34.14	100	291	Peak
5866	57.39	48.06	68.2	-10.81	34.76	8.71	34.14	100	291	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5712MHz, 5714MHz, 5718MHz, 5720MHz, 5852MHz, 5862MHz & 5866MHz: Out of restricted band

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	Hwa Chiang

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	49.65	41.49	54	-4.35	34.08	8.07	33.99	220	305	Average
5096	57.8	49.64	74	-16.2	34.08	8.07	33.99	220	305	Peak
5180	103	94.69			34.15	8.16	34	220	305	Average
5180	111.06	102.75			34.15	8.16	34	220	305	Peak
5356	52.85	44.22	54	-1.15	34.28	8.38	34.03	220	305	Average
5356	59.99	51.36	74	-14.01	34.28	8.38	34.03	220	305	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
5056	48.3	40.2	54	-5.7	34.05	8.03	33.98	113	358	Average
5056	58.35	50.25	74	-15.65	34.05	8.03	33.98	113	358	Peak
5180	99.01	90.7			34.15	8.16	34	113	358	Average
5180	106.74	98.43			34.15	8.16	34	113	358	Peak
5408	47.99	39.27	54	-6.01	34.32	8.44	34.04	113	358	Average
5408	57.68	48.96	74	-16.32	34.32	8.44	34.04	113	358	Peak

REMARKS:

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

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	Hwa Chiang

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
5084	50.13	41.97	54	-3.87	34.07	8.07	33.98	235	304	Average
5084	58.08	49.92	74	-15.92	34.07	8.07	33.98	235	304	Peak
5220	102.98	94.59			34.17	8.22	34	235	304	Average
5222	111.29	102.91			34.17	8.22	34.01	235	304	Peak
5356	52.65	44.02	54	-1.35	34.28	8.38	34.03	235	304	Average
5356	60.31	51.68	74	-13.69	34.28	8.38	34.03	235	304	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
5108	46.79	38.59	54	-7.21	34.09	8.1	33.99	112	356	Average
5108	57.14	48.94	74	-16.86	34.09	8.1	33.99	112	356	Peak
5220	98.72	90.33			34.17	8.22	34	112	356	Average
5220	106.61	98.22			34.17	8.22	34	112	356	Peak
5370	47.09	38.42	54	-6.91	34.29	8.41	34.03	112	356	Average
5370	57.37	48.7	74	-16.63	34.29	8.41	34.03	112	356	Peak

REMARKS:

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

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	Hwa Chiang

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
5148	49.7	41.45	54	-4.3	34.12	8.13	34	247	325	Average
5148	58.7	50.45	74	-15.3	34.12	8.13	34	247	325	Peak
5240	103.6	95.16			34.19	8.26	34.01	247	325	Average
5240	111.18	102.74			34.19	8.26	34.01	247	325	Peak
5408	52.94	44.22	54	-1.06	34.32	8.44	34.04	247	325	Average
5408	61.2	52.48	74	-12.8	34.32	8.44	34.04	247	325	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	45.33	37.23	54	-8.67	34.05	8.03	33.98	118	357	Average
5058	57.29	49.19	74	-16.71	34.05	8.03	33.98	118	357	Peak
5240	99.15	90.71			34.19	8.26	34.01	118	357	Average
5240	106.77	98.33			34.19	8.26	34.01	118	357	Peak
5440	46.72	37.93	54	-7.28	34.35	8.48	34.04	118	357	Average
5440	57.6	48.81	74	-16.4	34.35	8.48	34.04	118	357	Peak

REMARKS:

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

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	Charles Hsiao

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
5710	56.86	47.71	68.2	-11.34	34.61	8.65	34.11	100	231	Peak
5724	77.03	67.87	78.2	-1.17	34.62	8.65	34.11	100	231	Peak
5745	97.83	88.64			34.64	8.66	34.11	100	231	Average
5745	105.43	96.24			34.64	8.66	34.11	100	231	Peak
5860	57.54	48.22	78.2	-20.66	34.76	8.7	34.14	100	231	Peak
5868	57.78	48.45	68.2	-10.42	34.76	8.71	34.14	100	231	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
5714	57.67	48.52	68.2	-10.53	34.61	8.65	34.11	107	298	Peak
5724	77.2	68.04	78.2	-1	34.62	8.65	34.11	107	298	Peak
5745	102.54	93.35			34.64	8.66	34.11	107	298	Average
5745	110.9	101.71			34.64	8.66	34.11	107	298	Peak
5854	56.4	47.08	78.2	-21.8	34.76	8.7	34.14	107	298	Peak
5870	57.14	47.81	68.2	-11.06	34.76	8.71	34.14	107	298	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5710MHz, 5714MHz, 5724MHz, 5854MHz, 5860MHz, 5868MHz & 5870MHz: Out of restricted band

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	Charles Hsiao

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
5712	57.28	48.13	68.2	-10.92	34.61	8.65	34.11	105	232	Peak
5724	57.35	48.19	78.2	-20.85	34.62	8.65	34.11	105	232	Peak
5785	97.92	88.69			34.68	8.68	34.13	105	232	Average
5785	106	96.77			34.68	8.68	34.13	105	232	Peak
5852	57.16	47.86	78.2	-21.04	34.74	8.7	34.14	105	232	Peak
5870	57.93	48.6	68.2	-10.27	34.76	8.71	34.14	105	232	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
5712	57.28	48.13	68.2	-10.92	34.61	8.65	34.11	105	232	Peak
5724	57.35	48.19	78.2	-20.85	34.62	8.65	34.11	105	232	Peak
5785	97.92	88.69			34.68	8.68	34.13	105	232	Average
5785	106	96.77			34.68	8.68	34.13	105	232	Peak
5852	57.16	47.86	78.2	-21.04	34.74	8.7	34.14	105	232	Peak
5870	57.93	48.6	68.2	-10.27	34.76	8.71	34.14	105	232	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5712MHz, 5724MHz, 5852MHz & 5870MHz: Out of restricted band

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	Charles Hsiao

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
5712	56.93	47.78	68.2	-11.27	34.61	8.65	34.11	118	231	Peak
5718	57.23	48.07	78.2	-20.97	34.62	8.65	34.11	118	231	Peak
5825	98.28	88.99			34.73	8.69	34.13	118	231	Average
5825	106.14	96.85			34.73	8.69	34.13	118	231	Peak
5852	58.27	48.97	78.2	-19.93	34.74	8.7	34.14	118	231	Peak
5862	57.44	48.11	68.2	-10.76	34.76	8.71	34.14	118	231	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
5710	57.35	48.2	68.2	-10.85	34.61	8.65	34.11	100	291	Peak
5720	56.61	47.45	78.2	-21.59	34.62	8.65	34.11	100	291	Peak
5825	103.32	94.03			34.73	8.69	34.13	100	291	Average
5825	111.63	102.34			34.73	8.69	34.13	100	291	Peak
5852	61.4	52.1	78.2	-16.8	34.74	8.7	34.14	100	291	Peak
5868	57.67	48.34	68.2	-10.53	34.76	8.71	34.14	100	291	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5710MHz, 5712MHz, 5718MHz, 5720MHz, 5852MHz, 5862MHz & 5868MHz: Out of restricted band

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	Hwa Chiang

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	51.88	43.63	54	-2.12	34.12	8.13	34	240	325	Average
5150	59.81	51.56	74	-14.19	34.12	8.13	34	240	325	Peak
5190	101.62	93.28			34.15	8.19	34	240	325	Average
5190	109.93	101.59			34.15	8.19	34	240	325	Peak
5356	52.98	44.35	54	-1.02	34.28	8.38	34.03	240	325	Average
5356	60.6	51.97	74	-13.4	34.28	8.38	34.03	240	325	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	48.57	40.32	54	-5.43	34.12	8.13	34	119	359	Average
5150	58.31	50.06	74	-15.69	34.12	8.13	34	119	359	Peak
5190	97.26	88.92			34.15	8.19	34	119	359	Average
5190	104.84	96.5			34.15	8.19	34	119	359	Peak
5428	48.87	40.1	54	-5.13	34.33	8.48	34.04	119	359	Average
5428	57.69	48.92	74	-16.31	34.33	8.48	34.04	119	359	Peak

REMARKS:

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

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	Hwa Chiang

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
5088	49.44	41.28	54	-4.56	34.07	8.07	33.98	237	325	Average
5088	57.56	49.4	74	-16.44	34.07	8.07	33.98	237	325	Peak
5230	101.88	93.48			34.19	8.22	34.01	237	325	Average
5230	110.32	101.92			34.19	8.22	34.01	237	325	Peak
5460	52.92	44.1	54	-1.08	34.36	8.51	34.05	237	325	Average
5460	59.8	50.98	74	-14.2	34.36	8.51	34.05	237	325	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
5032	44.46	36.4	54	-9.54	34.03	8	33.97	118	357	Average
5032	56.86	48.8	74	-17.14	34.03	8	33.97	118	357	Peak
5230	97.65	89.25			34.19	8.22	34.01	118	357	Average
5230	105.88	97.48			34.19	8.22	34.01	118	357	Peak
5356	46.72	38.09	54	-7.28	34.28	8.38	34.03	118	357	Average
5356	58.93	50.3	74	-15.07	34.28	8.38	34.03	118	357	Peak

REMARKS:

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

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	Charles Hsiao

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
5714	65.49	56.34	68.2	-2.71	34.61	8.65	34.11	106	232	Peak
5724	75.16	66	78.2	-3.04	34.62	8.65	34.11	106	232	Peak
5755	97.84	88.63			34.66	8.66	34.11	106	232	Average
5755	105.6	96.39			34.66	8.66	34.11	106	232	Peak
5856	57.66	48.34	78.2	-20.54	34.76	8.7	34.14	106	232	Peak
5866	57.62	48.29	68.2	-10.58	34.76	8.71	34.14	106	232	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
5714	67.01	57.86	68.2	-1.19	34.61	8.65	34.11	100	297	Peak
5724	76.43	67.27	78.2	-1.77	34.62	8.65	34.11	100	297	Peak
5755	103.28	94.07			34.66	8.66	34.11	100	297	Average
5755	110.8	101.59			34.66	8.66	34.11	100	297	Peak
5852	56.23	46.93	78.2	-21.97	34.74	8.7	34.14	100	297	Peak
5866	57.68	48.35	68.2	-10.52	34.76	8.71	34.14	100	297	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5755MHz: Fundamental frequency.
- 5714MHz, 5724MHz, 5852MHz, 5856MHz & 5866MHz: Out of restricted band



A D T

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	Charles Hsiao

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
5710	55.94	46.79	68.2	-12.26	34.61	8.65	34.11	105	231	Peak
5716	56.59	47.44	78.2	-21.61	34.61	8.65	34.11	105	231	Peak
5795	98.23	88.99			34.69	8.68	34.13	105	231	Average
5795	106.28	97.04			34.69	8.68	34.13	105	231	Peak
5854	57.79	48.47	78.2	-20.41	34.76	8.7	34.14	105	231	Peak
5866	57.4	48.07	68.2	-10.8	34.76	8.71	34.14	105	231	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
5706	55.89	46.74	68.2	-12.31	34.61	8.65	34.11	107	297	Peak
5724	57.41	48.25	78.2	-20.79	34.62	8.65	34.11	107	297	Peak
5795	103.17	93.93			34.69	8.68	34.13	107	297	Average
5795	111.3	102.06			34.69	8.68	34.13	107	297	Peak
5852	56.77	47.47	78.2	-21.43	34.74	8.7	34.14	107	297	Peak
5866	56.98	47.65	68.2	-11.22	34.76	8.71	34.14	107	297	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5795MHz: Fundamental frequency.
- 5706MHz, 5710MHz, 5716MHz, 5724MHz, 5852MHz, 5854MHz & 5866MHz: Out of restricted band

MODE B

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	Charles Hsiao

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	52.37	44.12	54	-1.63	34.12	8.13	34	178	21	Average
5150	63.03	54.78	74	-10.97	34.12	8.13	34	178	21	Peak
5190	93.7	85.36			34.15	8.19	34	178	21	Average
5190	101.21	92.87			34.15	8.19	34	178	21	Peak
5410	43.66	34.94	54	-10.34	34.32	8.44	34.04	178	21	Average
5410	59.61	50.89	74	-14.39	34.32	8.44	34.04	178	21	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	51.25	43	54	-2.75	34.12	8.13	34	100	297	Average
5150	61.68	53.43	74	-12.32	34.12	8.13	34	100	297	Peak
5190	98.84	90.5			34.15	8.19	34	100	297	Average
5190	106.24	97.9			34.15	8.19	34	100	297	Peak
5458	43.67	34.85	54	-10.33	34.36	8.51	34.05	100	297	Average
5458	59.37	50.55	74	-14.63	34.36	8.51	34.05	100	297	Peak

REMARKS:

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

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	Will Chen

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
5708	57.36	48.21	68.2	-10.84	34.61	8.65	34.11	100	135	Peak
5724	70.51	61.35	78.2	-7.69	34.62	8.65	34.11	100	135	Peak
5745	97.3	88.11			34.64	8.66	34.11	100	135	Average
5745	104.75	95.56			34.64	8.66	34.11	100	135	Peak
5856	57.62	48.3	78.2	-20.58	34.76	8.7	34.14	100	135	Peak
5870	57.31	47.98	68.2	-10.89	34.76	8.71	34.14	100	135	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
5714	57.63	48.48	68.2	-10.57	34.61	8.65	34.11	115	317	Peak
5724	73.06	63.9	78.2	-5.14	34.62	8.65	34.11	115	317	Peak
5745	101.45	92.26			34.64	8.66	34.11	115	317	Average
5745	109.48	100.29			34.64	8.66	34.11	115	317	Peak
5860	57.45	48.13	78.2	-20.75	34.76	8.7	34.14	115	317	Peak
5862	57.35	48.02	68.2	-10.85	34.76	8.71	34.14	115	317	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5190MHz: Fundamental frequency.
- 5708MHz, 5714MHz, 5724MHz, 5756MHz, 5860MHz, 5862MHz & 5870MHz: Out of restricted band

MODE C

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	Hwa Chiang

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
5058	43.33	35.23	54	-10.67	34.05	8.03	33.98	104	245	Average
5058	57.09	48.99	74	-16.91	34.05	8.03	33.98	104	245	Peak
5180	100.44	92.13			34.15	8.16	34	104	245	Average
5180	108.85	100.54			34.15	8.16	34	104	245	Peak
5432	44.41	35.62	54	-9.59	34.35	8.48	34.04	104	245	Average
5432	57.28	48.49	74	-16.72	34.35	8.48	34.04	104	245	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
5092	43.57	35.4	54	-10.43	34.08	8.07	33.98	100	29	Average
5092	57.45	49.28	74	-16.55	34.08	8.07	33.98	100	29	Peak
5180	94.91	86.6			34.15	8.16	34	100	29	Average
5180	103.18	94.87			34.15	8.16	34	100	29	Peak
5456	43.62	34.8	54	-10.38	34.36	8.51	34.05	100	29	Average
5456	57.66	48.84	74	-16.34	34.36	8.51	34.05	100	29	Peak

REMARKS:

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

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	Hwa Chiang

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
5080	44.69	36.57	54	-9.31	34.07	8.03	33.98	103	242	Average
5080	57.58	49.46	74	-16.42	34.07	8.03	33.98	103	242	Peak
5220	100.31	91.92			34.17	8.22	34	103	242	Average
5220	108.57	100.18			34.17	8.22	34	103	242	Peak
5356	45.39	36.76	54	-8.61	34.28	8.38	34.03	103	242	Average
5356	57.82	49.19	74	-16.18	34.28	8.38	34.03	103	242	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
5084	43.55	35.39	54	-10.45	34.07	8.07	33.98	127	29	Average
5084	56.92	48.76	74	-17.08	34.07	8.07	33.98	127	29	Peak
5220	95.19	86.8			34.17	8.22	34	127	29	Average
5220	103.49	95.1			34.17	8.22	34	127	29	Peak
5458	44.15	35.33	54	-9.85	34.36	8.51	34.05	127	29	Average
5458	57.67	48.85	74	-16.33	34.36	8.51	34.05	127	29	Peak

REMARKS:

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

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	Hwa Chiang

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
5112	44.11	35.91	54	-9.89	34.09	8.1	33.99	103	245	Average
5112	57.2	49	74	-16.8	34.09	8.1	33.99	103	245	Peak
5240	101.19	92.75			34.19	8.26	34.01	103	245	Average
5240	108.71	100.27			34.19	8.26	34.01	103	245	Peak
5398	45.74	37.02	54	-8.26	34.32	8.44	34.04	103	245	Average
5398	58.13	49.41	74	-15.87	34.32	8.44	34.04	103	245	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
5090	42.98	34.81	54	-11.02	34.08	8.07	33.98	126	52	Average
5090	56.93	48.76	74	-17.07	34.08	8.07	33.98	126	52	Peak
5240	95.66	87.22			34.19	8.26	34.01	126	52	Average
5240	103.38	94.94			34.19	8.26	34.01	126	52	Peak
5428	43.46	34.69	54	-10.54	34.33	8.48	34.04	126	52	Average
5428	57.48	48.71	74	-16.52	34.33	8.48	34.04	126	52	Peak

REMARKS:

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

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	Charles Hsiao

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
5714	57.26	48.11	68.2	-10.94	34.61	8.65	34.11	100	237	Peak
5724	74.09	64.93	78.2	-4.11	34.62	8.65	34.11	100	238	Peak
5745	101.1	91.91			34.64	8.66	34.11	100	237	Average
5745	108.89	99.7			34.64	8.66	34.11	100	237	Peak
5860	56.59	47.27	78.2	-21.61	34.76	8.7	34.14	100	237	Peak
5868	57.14	47.81	68.2	-11.06	34.76	8.71	34.14	100	237	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
5712	57.67	48.52	68.2	-10.53	34.61	8.65	34.11	114	65	Peak
5724	72.65	63.49	78.2	-5.55	34.62	8.65	34.11	108	64	Peak
5745	95.4	86.21			34.64	8.66	34.11	114	65	Average
5745	103.03	93.84			34.64	8.66	34.11	114	65	Peak
5854	57.03	47.71	78.2	-21.17	34.76	8.7	34.14	114	65	Peak
5862	57.33	48	68.2	-10.87	34.76	8.71	34.14	114	65	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5710MHz, 5714MHz, 5724MHz, 5854MHz, 5860MHz, 5862MHz & 5868MHz: Out of restricted band

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	Charles Hsiao

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
5714	57.09	47.94	68.2	-11.11	34.61	8.65	34.11	100	237	Peak
5722	57	47.84	78.2	-21.2	34.62	8.65	34.11	100	237	Peak
5785	101.48	92.25			34.68	8.68	34.13	100	237	Average
5785	109.03	99.8			34.68	8.68	34.13	100	237	Peak
5860	57.11	47.79	78.2	-21.09	34.76	8.7	34.14	100	237	Peak
5870	57.17	47.84	68.2	-11.03	34.76	8.71	34.14	100	237	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
5706	56.93	47.78	68.2	-11.27	34.61	8.65	34.11	100	63	Peak
5722	57.54	48.38	78.2	-20.66	34.62	8.65	34.11	100	63	Peak
5785	95.36	86.13			34.68	8.68	34.13	100	63	Average
5785	103.37	94.14			34.68	8.68	34.13	100	63	Peak
5856	57.13	47.81	78.2	-21.07	34.76	8.7	34.14	100	63	Peak
5868	56.26	46.93	68.2	-11.94	34.76	8.71	34.14	100	63	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5706MHz, 5714MHz, 5722MHz, 5856MHz, 5860MHz, 5868MHz & 5870MHz: Out of restricted band

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	Charles Hsiao

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
5712	57.45	48.3	68.2	-10.75	34.61	8.65	34.11	100	237	Peak
5720	57.62	48.46	78.2	-20.58	34.62	8.65	34.11	100	237	Peak
5825	100.42	91.13			34.73	8.69	34.13	100	237	Average
5825	108.19	98.9			34.73	8.69	34.13	100	237	Peak
5858	57.88	48.56	78.2	-20.32	34.76	8.7	34.14	100	237	Peak
5866	57.58	48.25	68.2	-10.62	34.76	8.71	34.14	100	237	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
5712	56.7	47.55	68.2	-11.5	34.61	8.65	34.11	100	67	Peak
5716	57.24	48.09	78.2	-20.96	34.61	8.65	34.11	100	67	Peak
5825	95.52	86.23			34.73	8.69	34.13	100	67	Average
5825	103.82	94.53			34.73	8.69	34.13	100	67	Peak
5858	57.62	48.3	78.2	-20.58	34.76	8.7	34.14	100	67	Peak
5864	58.23	48.9	68.2	-9.97	34.76	8.71	34.14	100	67	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5712MHz, 5716MHz, 5720MHz, 5758MHz, 5864MHz & 5866MHz: Out of restricted band

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	Hwa Chiang

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	47.54	39.29	54	-6.46	34.12	8.13	34	106	224	Average
5150	57.08	48.83	74	-16.92	34.12	8.13	34	106	224	Peak
5190	100.64	92.3			34.15	8.19	34	104	217	Average
5190	108.75	100.41			34.15	8.19	34	104	217	Peak
5416	44.09	35.36	54	-9.91	34.33	8.44	34.04	104	217	Average
5416	58.37	49.64	74	-15.63	34.33	8.44	34.04	104	217	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	44.77	36.52	54	-9.23	34.12	8.13	34	112	359	Average
5150	58.56	50.31	74	-15.44	34.12	8.13	34	112	359	Peak
5190	95.26	86.92			34.15	8.19	34	111	345	Average
5190	103.16	94.82			34.15	8.19	34	111	345	Peak
5434	43.89	35.1	54	-10.11	34.35	8.48	34.04	111	345	Average
5434	57.47	48.68	74	-16.53	34.35	8.48	34.04	111	345	Peak

REMARKS:

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

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	Hwa Chiang

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
5054	43.71	35.65	54	-10.29	34.04	8	33.98	102	218	Average
5054	57.46	49.4	74	-16.54	34.04	8	33.98	102	218	Peak
5230	99.96	91.56			34.19	8.22	34.01	102	218	Average
5230	108.14	99.74			34.19	8.22	34.01	102	218	Peak
5394	45.9	37.19	54	-8.1	34.31	8.44	34.04	102	218	Average
5394	57.33	48.62	74	-16.67	34.31	8.44	34.04	102	218	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
5060	43.56	35.46	54	-10.44	34.05	8.03	33.98	111	346	Average
5060	57.01	48.91	74	-16.99	34.05	8.03	33.98	111	346	Peak
5230	94.8	86.4			34.19	8.22	34.01	111	346	Average
5230	103.28	94.88			34.19	8.22	34.01	111	346	Peak
5440	45.75	36.96	54	-8.25	34.35	8.48	34.04	111	346	Average
5440	57.69	48.9	74	-16.31	34.35	8.48	34.04	111	346	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 151	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Charles Hsiao

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
5714	62.65	53.5	68.2	-5.55	34.61	8.65	34.11	101	237	Peak
5724	73.37	64.21	78.2	-4.83	34.62	8.65	34.11	100	238	Peak
5755	101.12	91.91			34.66	8.66	34.11	100	237	Average
5755	109.01	99.8			34.66	8.66	34.11	100	237	Peak
5852	56.57	47.27	78.2	-21.63	34.74	8.7	34.14	100	237	Peak
5864	57.21	47.88	68.2	-10.99	34.76	8.71	34.14	100	237	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
5714	62.13	52.98	68.2	-6.07	34.61	8.65	34.11	108	58	Peak
5724	71.8	62.64	78.2	-6.4	34.62	8.65	34.11	108	65	Peak
5755	95.52	86.31			34.66	8.66	34.11	114	65	Average
5755	103.55	94.34			34.66	8.66	34.11	114	65	Peak
5860	57.74	48.42	78.2	-20.46	34.76	8.7	34.14	114	65	Peak
5862	57.79	48.46	68.2	-10.41	34.76	8.71	34.14	114	65	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5755MHz: Fundamental frequency.
- 5714MHz, 5724MHz, 5852MHz, 5860MHz, 5862MHz & 5864MHz: Out of restricted band

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	Charles Hsiao

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
5706	56.41	47.26	68.2	-11.79	34.61	8.65	34.11	100	237	Peak
5718	57.12	47.96	78.2	-21.08	34.62	8.65	34.11	100	237	Peak
5795	100.17	90.93			34.69	8.68	34.13	100	237	Average
5795	108.43	99.19			34.69	8.68	34.13	100	237	Peak
5860	57.23	47.91	78.2	-20.97	34.76	8.7	34.14	100	237	Peak
5868	56.71	47.38	68.2	-11.49	34.76	8.71	34.14	100	237	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
5706	57.13	47.98	68.2	-11.07	34.61	8.65	34.11	100	63	Peak
5720	56.23	47.07	78.2	-21.97	34.62	8.65	34.11	100	63	Peak
5795	95.67	86.43			34.69	8.68	34.13	100	63	Average
5795	103.53	94.29			34.69	8.68	34.13	100	63	Peak
5858	56.81	47.49	78.2	-21.39	34.76	8.7	34.14	100	63	Peak
5866	57.12	47.79	68.2	-11.08	34.76	8.71	34.14	100	63	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5795MHz: Fundamental frequency.
- 5706MHz, 5718MHz, 5720MHz, 5758MHz, 5860MHz, 5866MHz & 5868MHz: Out of restricted band

BELOW 1GHz WORST-CASE DATA:

MODE A

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Charles Hsiao

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
98.85	25.61	44.39	43.5	-17.89	12.15	1.28	32.21	192	202	Peak
198.21	24.85	44.51	43.5	-18.65	11.02	1.61	32.29	159	69	Peak
297.03	37.67	54.77	46	-8.33	13	2.03	32.13	103	168	Peak
346.2	33.96	49.68	46	-12.04	14.16	2.19	32.07	158	131	Peak
395.9	33.69	48.65	46	-12.31	14.91	2.34	32.21	176	121	Peak
544.3	29.5	41.97	46	-16.5	16.96	2.76	32.19	143	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
32.16	35.9	55.76	40	-4.1	11.66	0.74	32.26	182	101	Peak
49.44	27.39	44.16	40	-12.61	14.55	0.9	32.22	134	161	Peak
98.85	22.68	41.46	43.5	-20.82	12.15	1.28	32.21	171	281	Peak
395.9	28.1	43.06	46	-17.9	14.91	2.34	32.21	103	350	Peak
544.3	29	41.47	46	-17	16.96	2.76	32.19	166	256	Peak
643	25.16	35.99	46	-20.84	18.34	2.99	32.16	125	214	Peak

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

Margin value = Emission level – Limit value

802.11n (20MHz)

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	Charles Hsiao

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
198.21	31.77	51.43	43.5	-11.73	11.02	1.61	32.29	186	266	Peak
247.62	32.04	50.05	46	-13.96	12.25	1.85	32.11	167	178	Peak
297.03	37.53	54.63	46	-8.47	13	2.03	32.13	166	231	Peak
395.9	34.2	49.16	46	-11.8	14.91	2.34	32.21	184	145	Peak
445.6	30.69	44.86	46	-15.31	15.49	2.49	32.15	102	321	Peak
544.3	29.96	42.43	46	-16.04	16.96	2.76	32.19	114	291	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
32.16	36.15	56.01	40	-3.85	11.66	0.74	32.26	162	182	Peak
49.44	27.72	44.49	40	-12.28	14.55	0.9	32.22	148	348	Peak
98.85	28.56	47.34	43.5	-14.94	12.15	1.28	32.21	162	172	Peak
395.9	27.75	42.71	46	-18.25	14.91	2.34	32.21	169	163	Peak
445.6	27.17	41.34	46	-18.83	15.49	2.49	32.15	108	27	Peak
544.3	28.16	40.63	46	-17.84	16.96	2.76	32.19	124	101	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	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 TEST PROCEDURES

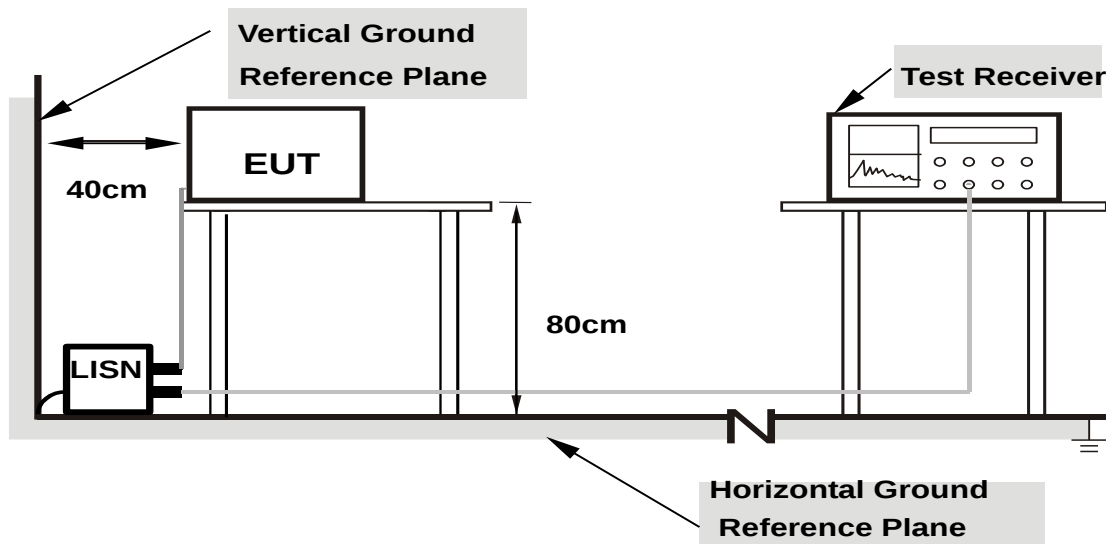
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

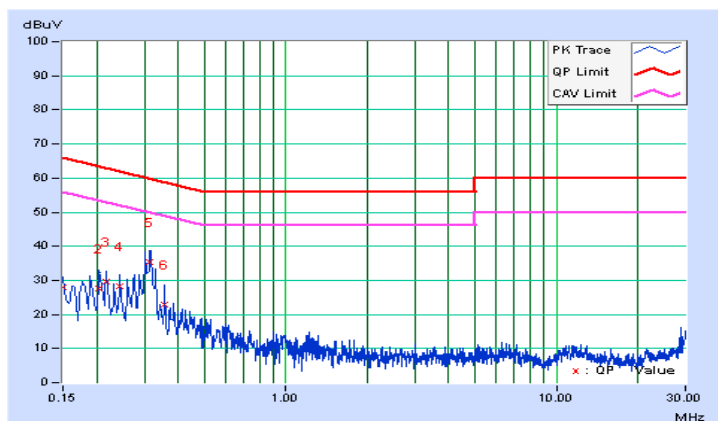
CONDUCTED WORST-CASE DATA :

PHASE	Line 1	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

Phase Of Power : Line (L)										
No	Frequency	Correction Factor	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
	(MHz)	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	27.99	21.71	28.04	21.76	66.00	56.00	-37.96	-34.24
2	0.20474	0.06	27.56	13.70	27.62	13.76	63.42	53.42	-35.80	-39.66
3	0.21679	0.06	29.47	16.59	29.53	16.65	62.94	52.94	-33.41	-36.29
4	0.24407	0.06	28.15	15.43	28.21	15.49	61.96	51.96	-33.75	-36.47
5	0.31432	0.06	35.44	23.96	35.50	24.02	59.86	49.86	-24.36	-25.84
6	0.35723	0.06	22.71	10.65	22.77	10.71	58.79	48.79	-36.02	-38.08

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

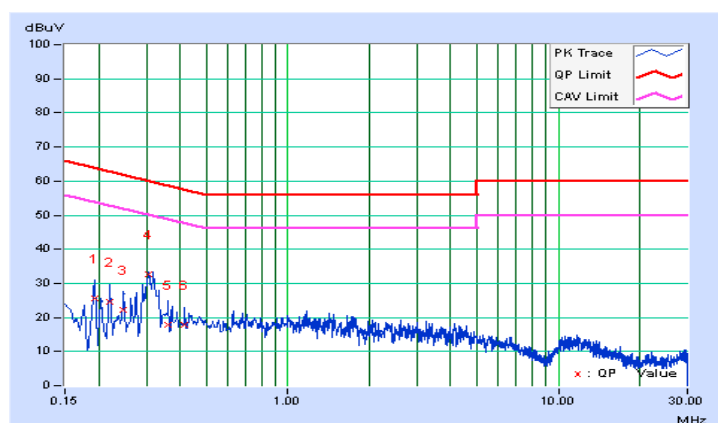


PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19301	0.05	25.64	10.04	25.69	10.09	63.91	53.91	-38.22	-43.82
2	0.22024	0.05	24.52	9.94	24.57	9.99	62.81	52.81	-38.24	-42.82
3	0.24775	0.05	22.19	8.17	22.24	8.22	61.83	51.83	-39.59	-43.61
4	0.30615	0.06	32.69	21.86	32.75	21.92	60.07	50.07	-27.33	-28.16
5	0.36114	0.06	17.78	8.23	17.84	8.29	58.70	48.70	-40.86	-40.41
6	0.41588	0.06	17.73	8.96	17.79	9.02	57.53	47.53	-39.74	-38.51

Remarks:

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



4.3 TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

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

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

Per KDB 662911 D01 Multiple Transmitter Output v02r01 Method of conducted output power measurement on IEEE 802.11 devices,

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

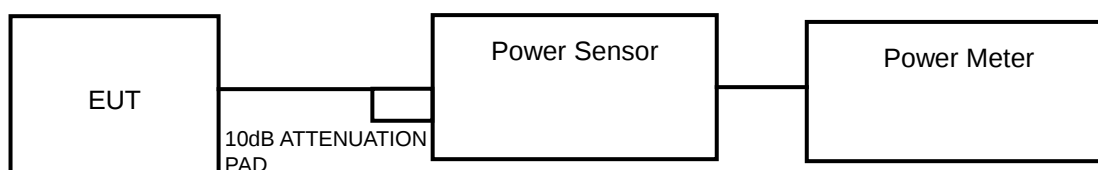
Array Gain = 0 dB (i.e., no array gain) for channel widths $\geq$ 40 MHz for any NANT;

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

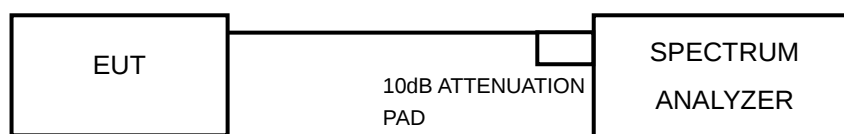
For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.3.2 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

<802.11a, 802.11n (20MHz), 802.11n (40MHz)>

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

FOR 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.

4.3.7 TEST RESULTS

POWER OUTPUT

MODE A

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	MAX. CONDUCTED POWER (mW)	MAX. CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	30.34	14.82	24	PASS
44	5220	30.20	14.80	24	PASS
48	5240	29.99	14.77	24	PASS
149	5745	21.63	13.35	30	PASS
157	5785	30.20	14.80	30	PASS
165	5825	28.44	14.54	30	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAX. CONDUCTED POWER (mW)	MAX. CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	25.82	14.12	24	PASS
44	5220	25.94	14.14	24	PASS
48	5240	26.00	14.15	24	PASS
149	5745	19.86	12.98	30	PASS
157	5785	24.43	13.88	30	PASS
165	5825	22.39	13.50	30	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAX. CONDUCTED POWER (mW)	MAX. CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	13.21	11.21	24	PASS
46	5230	25.18	14.01	24	PASS
151	5755	20.23	13.06	30	PASS
159	5795	22.65	13.55	30	PASS

MODE C

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	MAX. CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
36	5180	10.72	10.86	23.99	13.80	24	PASS
40	5200	10.18	11.52	24.61	13.91	24	PASS
48	5240	10.30	11.90	26.20	14.18	24	PASS
149	5745	9.92	12.15	26.223	14.19	30	PASS
157	5785	9.70	11.20	22.515	13.52	30	PASS
165	5825	10.22	11.82	25.725	14.10	30	PASS

802.11n (40MHz)

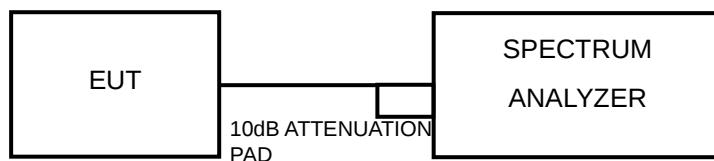
CHAN.	CHAN. FREQ. (MHz)	MAX. CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	9.84	11.41	23.47	13.71	24	PASS
46	5230	9.30	11.86	23.86	13.78	24	PASS
151	5755	11.90	10.22	26.008	14.15	30	PASS
159	5795	11.72	9.92	24.677	13.92	30	PASS

4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.4.4 TEST PROCEDURES

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-1 alternative

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 30 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = 4 second.
- 5) Perform a single sweep.
- 6) Record the max value

Using method SA-2 alternative

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

For U-NII-3 band:

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 500 kHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- 3) Sweep time = auto, trigger set to "free run".
- 4) Trace average at least 100 traces in power averaging mode.
- 5) Record the max value 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

MODE A

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	2.18	0.12	2.30	11	PASS
44	5220	2.77	0.12	2.89	11	PASS
48	5240	2.76	0.12	2.88	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	1.56	0.13	1.69	11	PASS
44	5220	1.42	0.13	1.55	11	PASS
48	5240	1.74	0.13	1.87	11	PASS

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

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	-2.46	0.33	-2.13	11	PASS
46	5230	-0.71	0.33	-0.38	11	PASS

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

MODE C

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)		TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1					
36	5180	-2.98	-1.28	0.96	0.11	1.07	11	PASS
40	5200	-0.83	-1.90	1.68	0.11	1.79	11	PASS
48	5240	-0.15	-1.61	2.19	0.11	2.30	11	PASS

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For 5180~5240MHz:**
Directional gain = $2.48\text{dBi} + 10\log(2) = 5.49\text{dBi} < 6\text{dBi}$, so the limit no need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)		TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1					
38	5190	-2.22	-2.44	0.68	0.33	1.01	11	PASS
46	5230	-1.81	-3.01	0.64	0.33	0.97	11	PASS

NOTE:

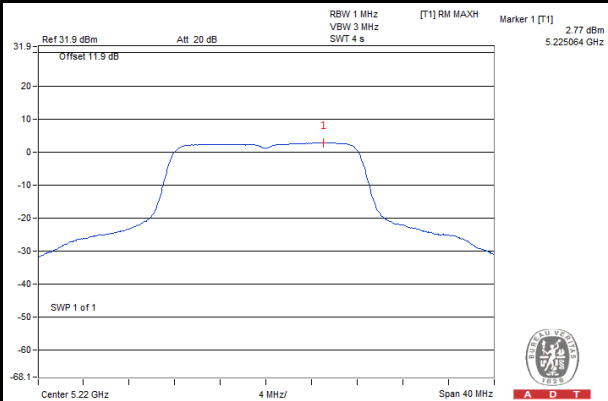
- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For 5180~5240MHz:**
Directional gain = $2.48\text{dBi} + 10\log(2) = 5.49\text{dBi} < 6\text{dBi}$, so the limit no need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.



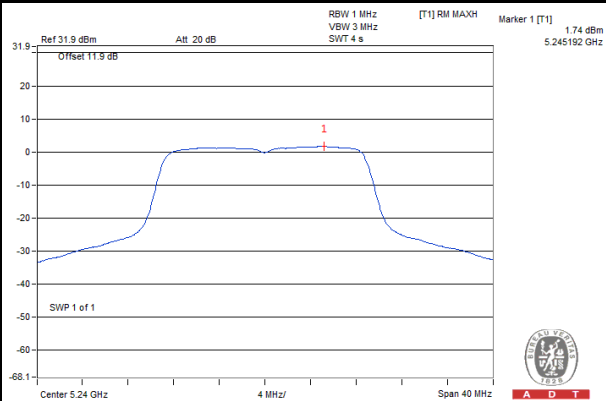
A D T

SPECTRUM PLOT OF WORST VALUE

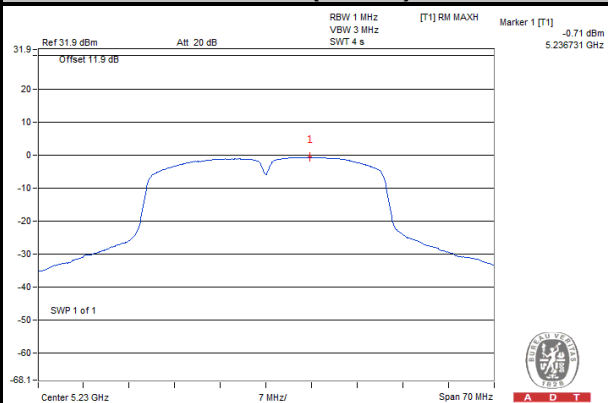
802.11a



802.11n (20MHz)



802.11n (40MHz)



MODE A

802.11a

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm/500kHz)	PASS/FAIL
149	5745	-0.76	0.12	-0.64	30	PASS
157	5785	-0.86	0.12	-0.74	30	PASS
165	5825	-0.39	0.12	-0.27	30	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm/500kHz)	PASS/FAIL
149	5745	-1.81	0.13	-1.68	30	PASS
157	5785	-1.61	0.13	-1.48	30	PASS
165	5825	-1.33	0.13	-1.20	30	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	LIMIT (dBm/500kHz)	PASS/FAIL
151	5755	-4.08	0.33	-3.75	30	PASS
159	5795	-4.04	0.33	-3.71	30	PASS

MODE C

802.11n (20MHz)

TX chain	Chan	Freq. (MHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD without Duty Factor (dBm/500kHz)	Duty Factor	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
0	149	5745	-3.80	3.01	-0.79	0.13	-0.68	30	PASS
	157	5785	-4.49	3.01	-1.48	0.13	-1.37	30	PASS
	165	5825	-3.97	3.01	-0.96	0.13	-0.85	30	PASS
1	149	5745	-4.45	3.01	-1.44	0.13	-1.33	30	PASS
	157	5785	-5.95	3.01	-2.94	0.13	-2.83	30	PASS
	165	5825	-5.44	3.01	-2.43	0.13	-2.32	30	PASS

NOTE:

- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 2.51dBi + 10log(2) = 5.52dBi < 6dBi, so the limit no need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

TX chain	Chan	Freq. (MHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD without Duty Factor (dBm/500kHz)	Duty Factor	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	PASS /FAIL
0	151	5755	-6.52	3.01	-3.51	0.33	-3.18	30	PASS
	159	5795	-6.32	3.01	-3.31	0.33	-2.98	30	PASS
1	151	5755	-7.72	3.01	-4.71	0.33	-4.38	30	PASS
	159	5795	-8.13	3.01	-5.12	0.33	-4.79	30	PASS

NOTE:

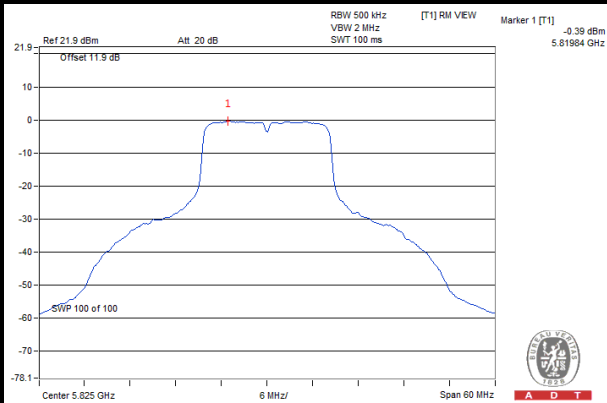
- Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 2.51dBi + 10log(2) = 5.52dBi < 6dBi, so the limit no need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.



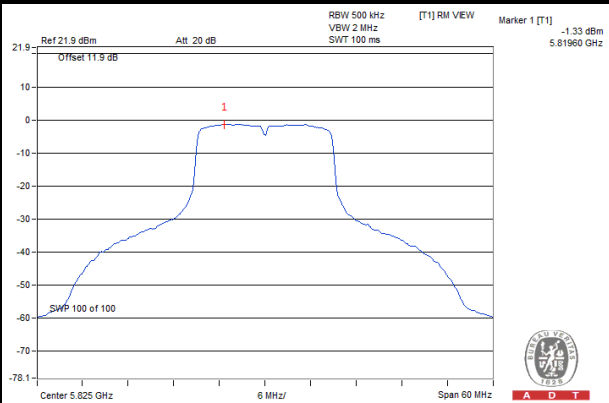
A D T

SPECTRUM PLOT OF WORST VALUE

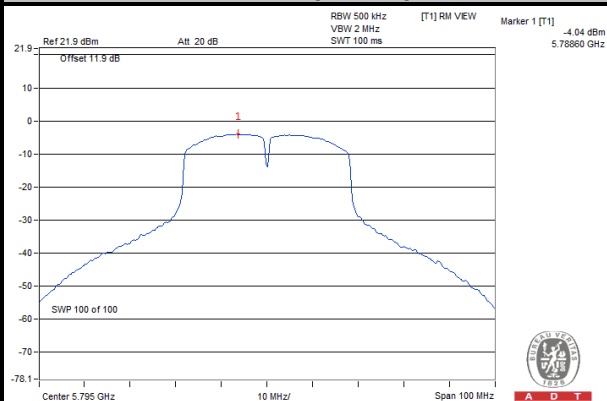
802.11a



802.11n (20MHz)



802.11n (40MHz)

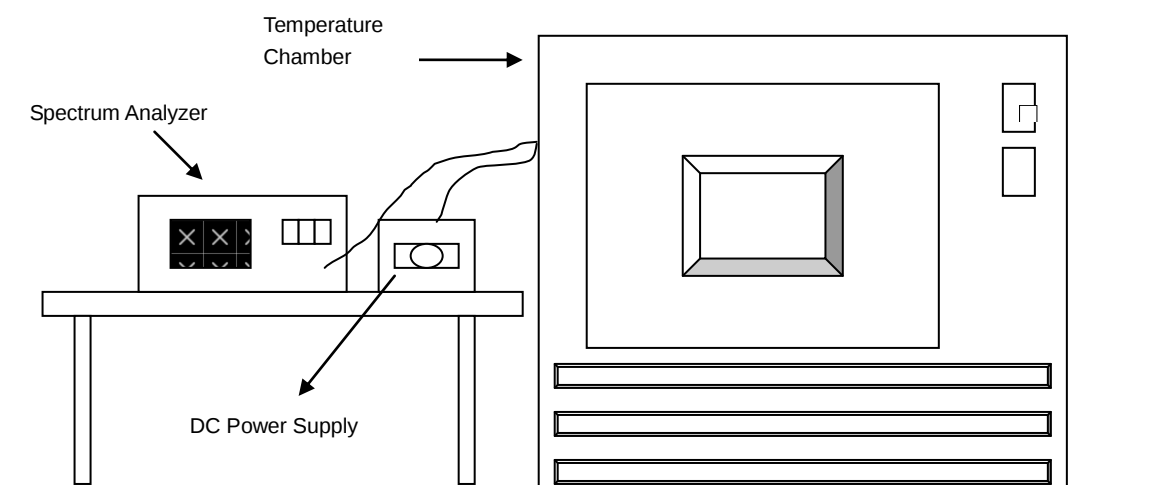


4.5 FREQUENCY STABILITY

4.5.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.5.4 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.

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

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

4.5.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5180MHz									
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	5.0	5180.065302	12.607	5180.065674	12.678	5180.066014	12.744	5180.065546	12.654
40	5.0	5180.066676	12.872	5180.066775	12.891	5180.066217	12.783	5180.066414	12.821
30	5.0	5180.067466	13.024	5180.067881	13.104	5180.067467	13.025	5180.067300	12.992
20	5.0	5180.068300	13.185	5180.068566	13.237	5180.068445	13.213	5180.068220	13.170
10	5.0	5180.069323	13.383	5180.069547	13.426	5180.069405	13.399	5180.069460	13.409
0	5.0	5180.068631	13.249	5180.068411	13.207	5180.068656	13.254	5180.068111	13.149
-10	5.0	5180.067046	12.943	5180.066910	12.917	5180.067405	13.013	5180.066653	12.867
-20	5.0	5180.066363	12.811	5180.066011	12.743	5180.066389	12.816	5180.066203	12.781
-30	5.0	5180.065201	12.587	5180.065076	12.563	5180.064877	12.525	5180.065016	12.551

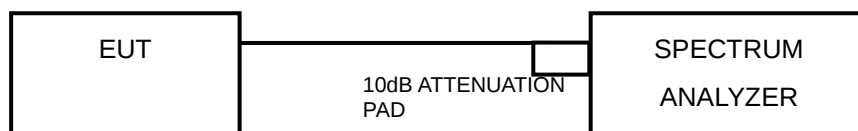
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	4.5	5180.067694	13.068	5180.067739	13.077	5180.068365	13.198	5180.068018	13.131
	5.0	5180.068300	13.185	5180.068566	13.237	5180.068445	13.213	5180.068220	13.170
	5.50	5180.069391	13.396	5180.069588	13.434	5180.069528	13.422	5180.069176	13.354

4.6 6dB BANDWIDTH MEASUREMENT

4.6.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.6.4 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.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITIONS

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

4.6.7 TEST RESULTS

MODE A

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.06	0.5	PASS
157	5785	16.08	0.5	PASS
165	5825	16.04	0.5	PASS

02.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.86	0.5	PASS
157	5785	16.85	0.5	PASS
165	5825	16.84	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	35.13	0.5	PASS
159	5795	33.89	0.5	PASS

MODE C

802.11n (20MHz)

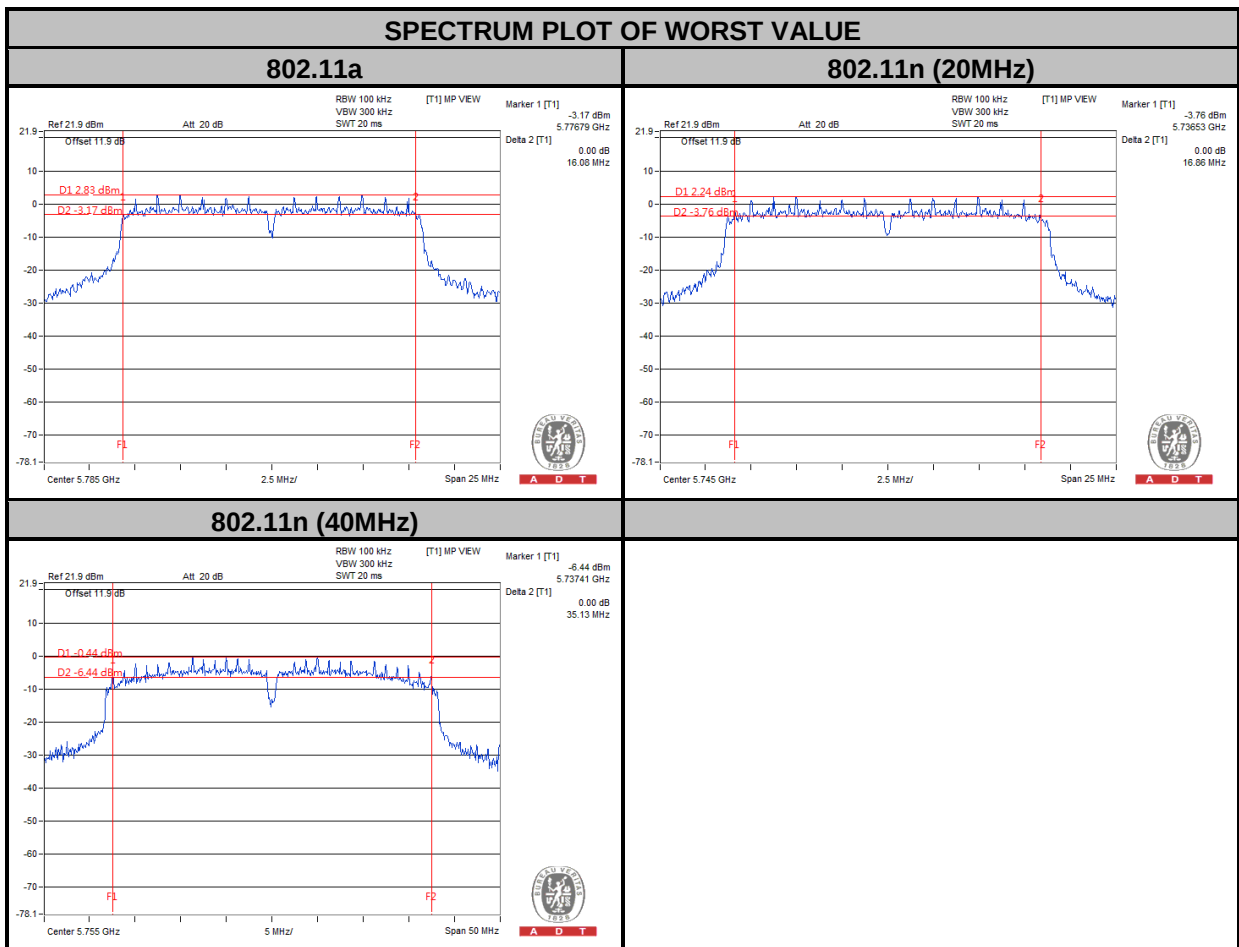
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.85	16.81	0.5	PASS
157	5785	16.86	16.57	0.5	PASS
165	5825	16.85	16.20	0.5	PASS



A D T

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	35.11	33.86	0.5	PASS
159	5795	32.70	33.87	0.5	PASS



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/Telecom Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Lab:

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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



A D T

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---