

FCC TEST REPORT (15.407)

REPORT NO.: RF150318C29-2
MODEL NO.: SHC-2000
FCC ID: ASU-SHC2000
RECEIVED: Mar. 18, 2015
TESTED: Apr. 03, 2015 ~ Apr. 07, 2015
ISSUED: Apr. 13, 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 Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 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	8
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	9
3.3 DESCRIPTION OF SUPPORT UNITS	12
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST	12
3.4 DUTY CYCLE TEST SIGNAL	13
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS	20
4. TEST TYPES AND RESULTS	21
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	21
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	21
4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	21
4.1.3 TEST INSTRUMENTS	22
4.1.4 TEST PROCEDURES	23
4.1.5 DEVIATION FROM TEST STANDARD	23
4.1.6 TEST SETUP	24
4.1.7 EUT OPERATING CONDITIONS	24
4.1.8 TEST RESULTS	25
4.2 CONDUCTED EMISSION MEASUREMENT	55
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	55
4.2.2 TEST INSTRUMENTS	55
4.2.3 TEST PROCEDURES	56
4.2.4 DEVIATION FROM TEST STANDARD	56
4.2.5 TEST SETUP	57
4.2.6 EUT OPERATING CONDITIONS	57
4.2.7 TEST RESULTS	58
4.3 TRANSMIT POWER MEASUREMENT	60
4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT	60
4.3.2 TEST SETUP	60
4.3.3 TEST INSTRUMENTS	60
4.3.4 TEST PROCEDURE	61
4.3.5 DEVIATION FROM TEST STANDARD	61
4.3.6 EUT OPERATING CONDITIONS	61
4.3.7 TEST RESULTS	62
4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT	64
4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	64
4.4.2 TEST SETUP	64
4.4.3 TEST INSTRUMENTS	64
4.4.4 TEST PROCEDURES	64
4.4.5 DEVIATION FROM TEST STANDARD	65
4.4.6 EUT OPERATING CONDITIONS	65
4.4.7 TEST RESULTS	66
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.....	82
6.	INFORMATION ON THE TESTING LABORATORIES	83
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	84



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF150318C29-2	Original release	Apr. 13, 2015

1. CERTIFICATION

PRODUCT: Smart Host Controller
MODEL NO.: SHC-2000
BRAND: Savant
APPLICANT: Savant Systems LLC
TESTED: Apr. 03, 2015 ~ Apr. 07, 2015
TEST SAMPLE: Production Unit
STANDARDS: **FCC Part 15, Subpart E (Section 15.407)**
ANSI C63.10-2013

The above equipment (model: SHC-2000) 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** : Apr. 13, 2015
Gina Liu / Specialist
APPROVED BY : Sam Chen , **DATE** : Apr. 13, 2015
Sam Chen / Senior Project Engineer

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -17.72dB at 0.29506MHz.
15.407(b/1/2/3)(b)(6)	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.06dB at 5150.00MHz.
15.407(a/1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	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	Smart Host Controller
MODEL NO.	SHC-2000
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	29.38mW for 5180 ~ 5240MHz 31.33mW for 5745 ~ 5825MHz
ANTENNA TYPE	PIFA antenna with 4.23dBi gain (5180 ~ 5240MHz) PIFA antenna with 3.44dBi 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:

- The EUT contains following accessory devices.

ITEM	BRAND	MODEL	SPECIFICATION
Adapter 1	ASIAN POWER DEVICES INC.	WA-15I05RUGKN-AAAA	I/P: 100-240Vac, 50/60Hz, 0.5A O/P: 5Vdc, 3A
Adapter 2	ASIAN POWER DEVICES INC.	WA-15I05RUGKN-HAAA	I/P: 100-240Vac, 50/60Hz, 0.5A O/P: 5Vdc, 3A
WLAN Chip	Qualcomm Atheros	QCA6234X	--

- 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

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

3.2 DESCRIPTION OF TEST MODES

WLAN 5180 ~ 5240MHz

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	√	√	√	√	Chain 0
B	√	-	-	-	Chain 1
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			
B				102			
A	802.11a	5745-5825	149 to 161	149, 157, 165	OFDM	BPSK	6.0
B				149			
A, C	802.11n (20MHz)		149 to 161	149, 157, 165	OFDM	BPSK	MCS0
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
	802.11a	5745-5825	149 to 161	149	OFDM	BPSK	6.0

POWER LINE CONDUCTED EMISSION TEST:

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

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

EUT CONFIGURE MODE	MODE	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

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 161	149, 157, 165	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		149 to 161	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 161	149, 157, 165	OFDM	BPSK	6.0
A, C	802.11n (20MHz)		149 to 161	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)		151 to 159	151, 159	OFDM	BPSK	MCS0



A D T

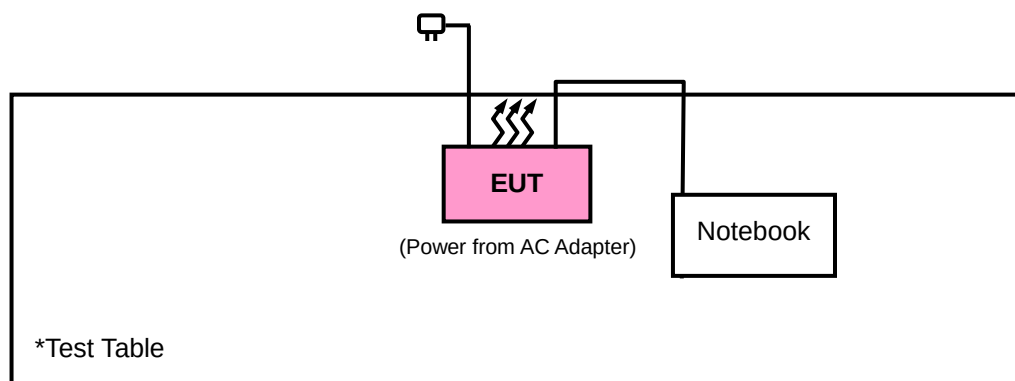
Test CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Karl Lee, 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	Taylor Liu

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

5180MHz ~ 5240MHz

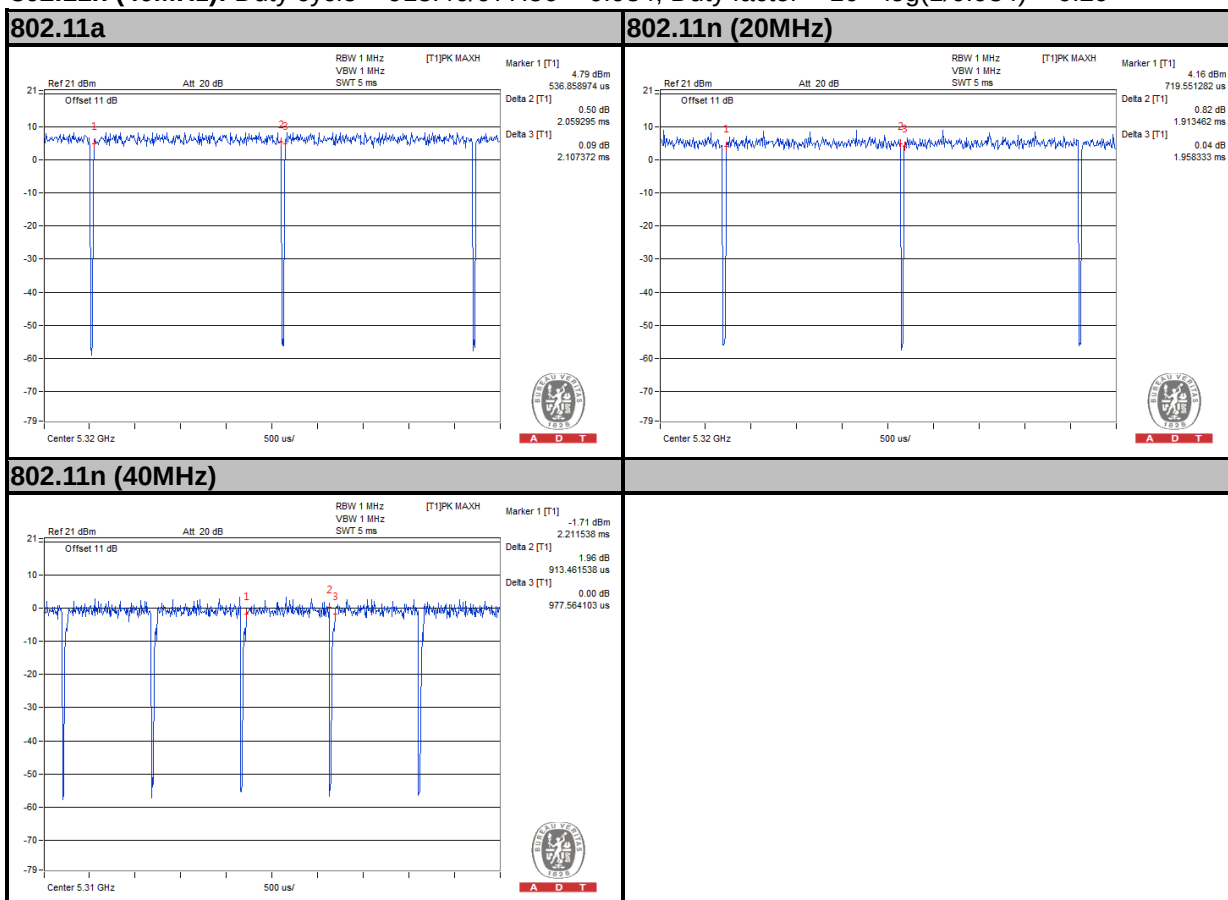
MODE A

MODULATION TYPE: BPSK

802.11a: Duty cycle = $2.059/2.107 = 0.977$, Duty factor = $10 * \log(1/0.977) = 0.10$

802.11n (20MHz): Duty cycle = $1.913/1.958 = 0.977$, Duty factor = $10 * \log(1/0.977) = 0.10$

802.11n (40MHz): Duty cycle = $913.46/977.56 = 0.934$, Duty factor = $10 * \log(1/0.934) = 0.29$



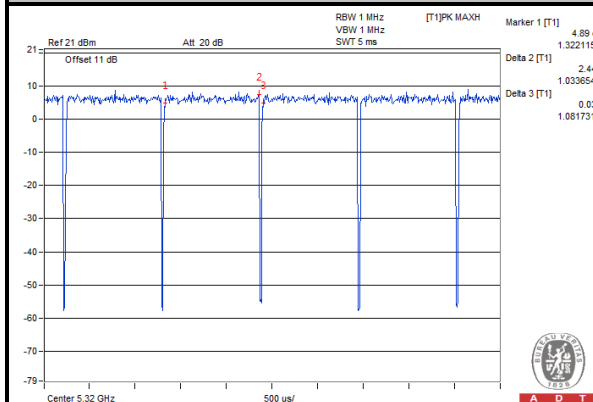
MODULATION TYPE: QPSK

802.11a: Duty cycle = $1.033/1.081 = 0.956$, Duty factor = $10 * \log(1/0.956) = 0.20$

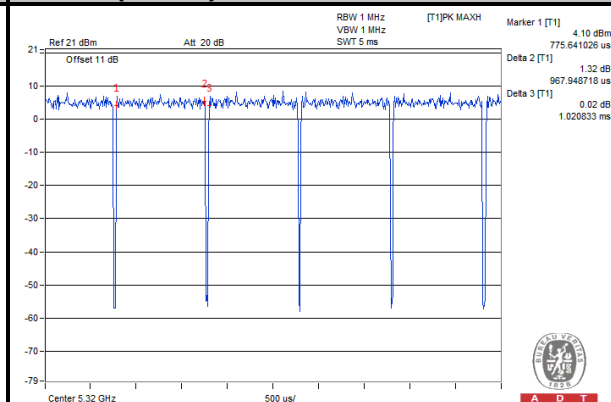
802.11n (20MHz): Duty cycle = $0.967/1.02 = 0.948$, Duty factor = $10 * \log(1/0.948) = 0.23$

802.11n (40MHz): Duty cycle = $463.14/533.65 = 0.868$, Duty factor = $10 * \log(1/0.868) = 0.62$

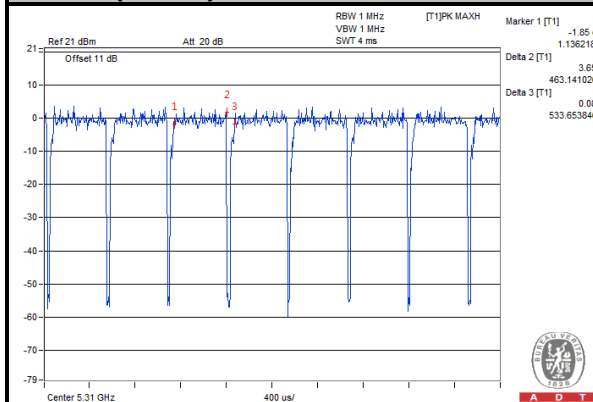
802.11a



802.11n (20MHz)



802.11n (40MHz)



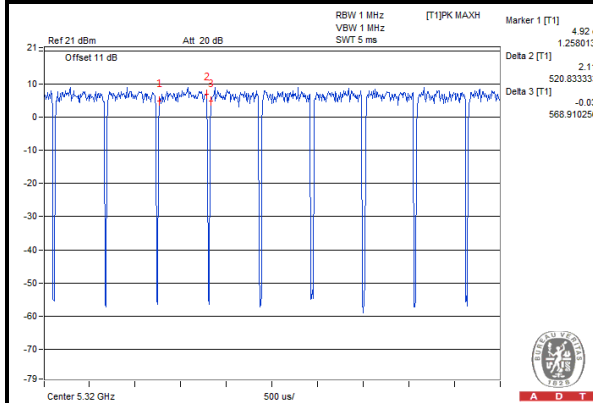
MODULATION TYPE: 16QAM

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

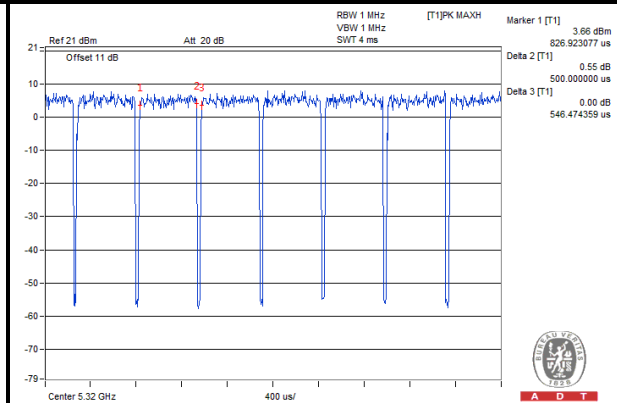
802.11n (20MHz): Duty cycle = $500/546.47 = 0.915$, Duty factor = $10 * \log(1/0.915) = 0.39$

802.11n (40MHz): Duty cycle = $229.16/299.67 = 0.765$, Duty factor = $10 * \log(1/0.765) = 1.17$

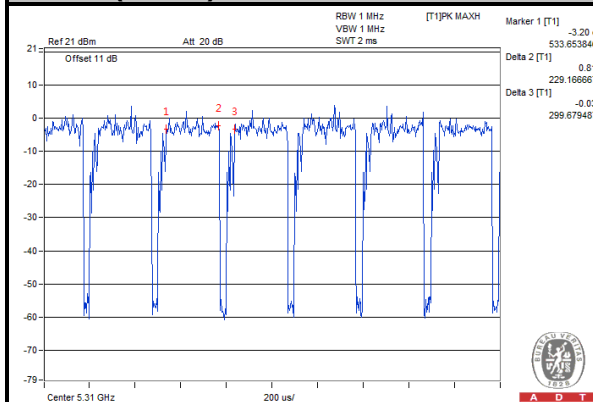
802.11a



802.11n (20MHz)



802.11n (40MHz)



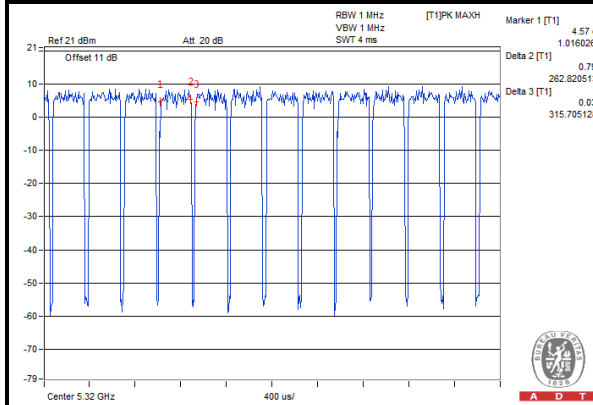
MODULATION TYPE: 64QAM

802.11a: Duty cycle = $262.82/315.7 = 0.832$, Duty factor = $10 * \log(1/0.832) = 0.80$

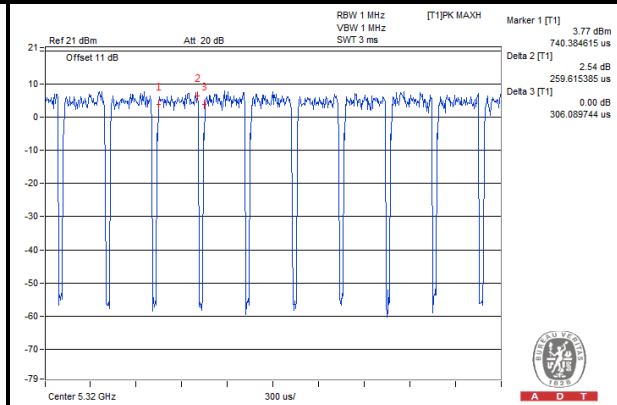
802.11n (20MHz): Duty cycle = $259.62/306.08 = 0.848$, Duty factor = $10 * \log(1/0.848) = 0.71$

802.11n (40MHz): Duty cycle = $121.79/187.5 = 0.650$, Duty factor = $10 * \log(1/0.650) = 1.87$

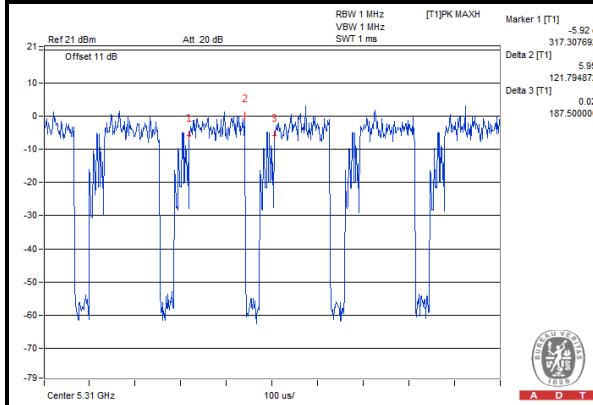
802.11a



802.11n (20MHz)



802.11n (40MHz)



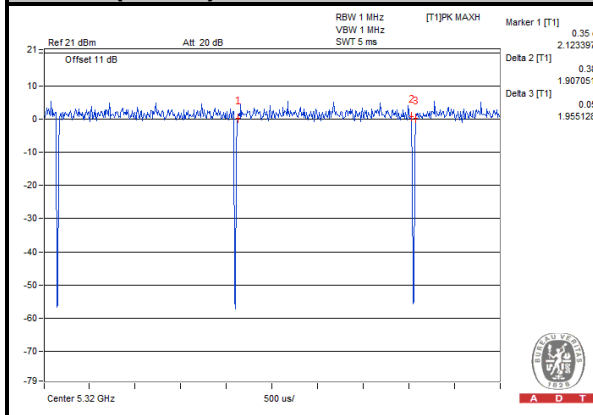
MODE C

MODULATION TYPE: BPSK

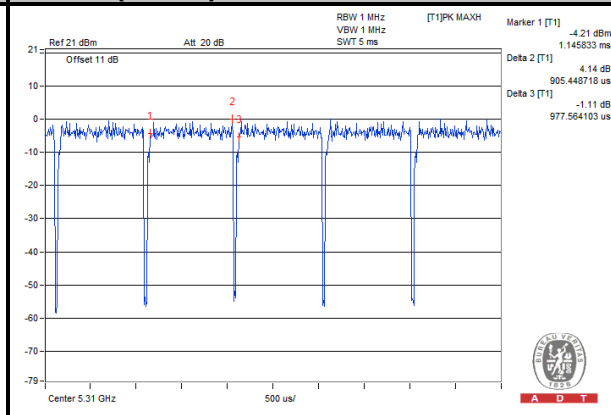
802.11n (20MHz): Duty cycle = $1.907/1.955 = 0.975$, Duty factor = $10 * \log(1/0.975) = 0.11$

802.11n (40MHz): Duty cycle = $905.44/977.56 = 0.926$, Duty factor = $10 * \log(1/0.926) = 0.33$

802.11n (20MHz)



802.11n (40MHz)

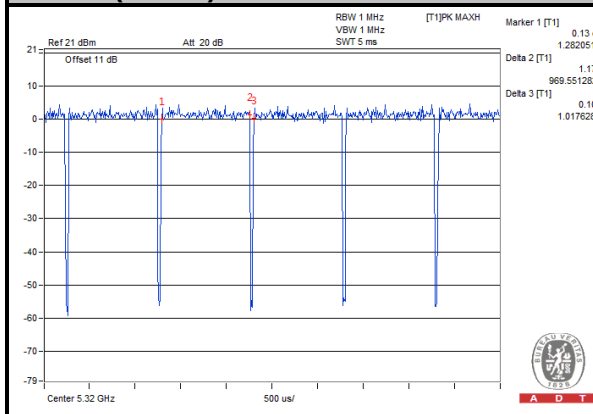


MODULATION TYPE: QPSK

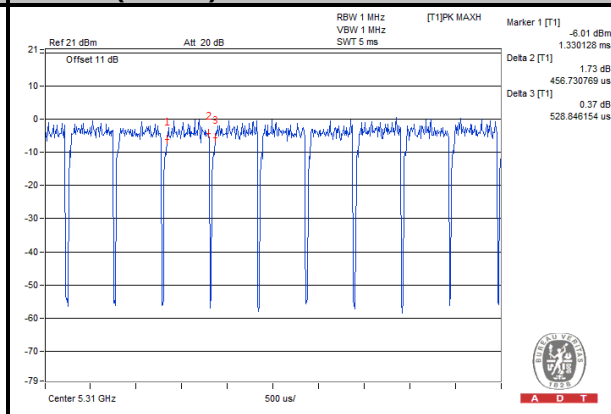
802.11n (20MHz): Duty cycle = $0.969/1.017 = 0.953$, Duty factor = $10 * \log(1/0.953) = 0.21$

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

802.11n (20MHz)



802.11n (40MHz)





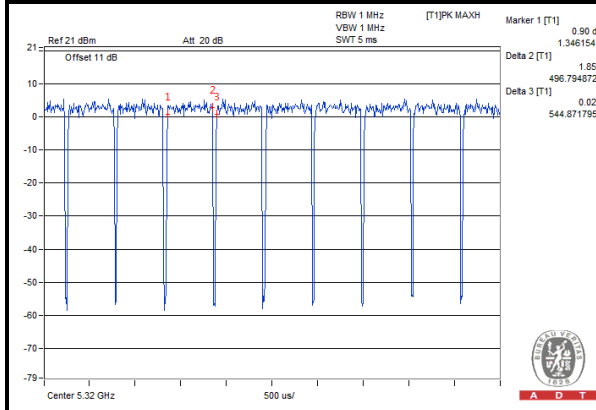
A D T

MODULATION TYPE: 16QAM

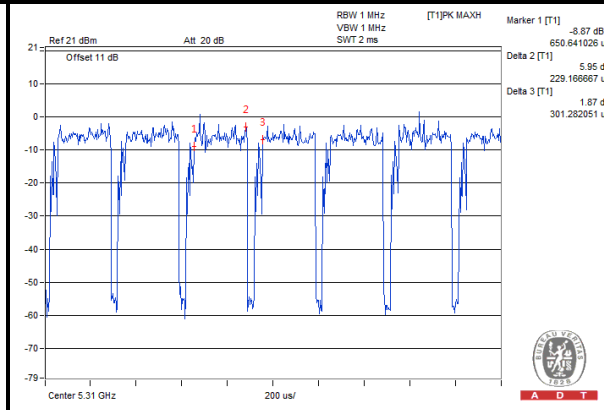
802.11n (20MHz): Duty cycle = $496.79/544.87 = 0.912$, Duty factor = $10 * \log(1/0.912) = 0.40$

802.11n (40MHz): Duty cycle = $229.16/301.28 = 0.761$, Duty factor = $10 * \log(1/0.761) = 1.19$

802.11n (20MHz)



802.11n (40MHz)

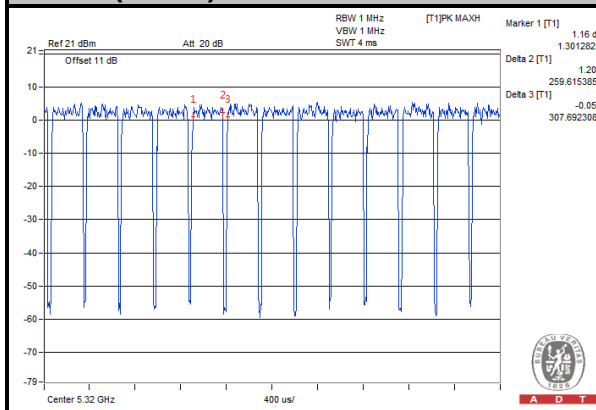


MODULATION TYPE: 64QAM

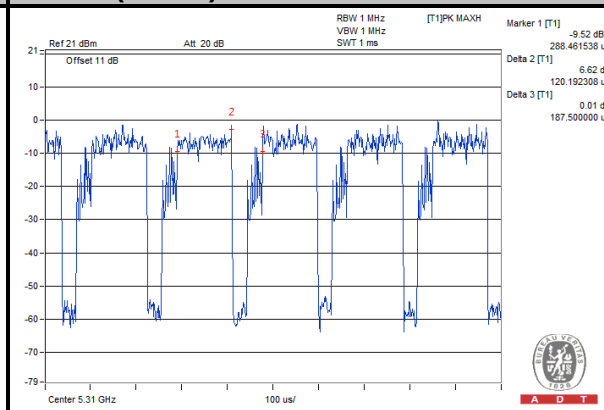
802.11n (20MHz): Duty cycle = $259.61/307.69 = 0.844$, Duty factor = $10 * \log(1/0.844) = 0.74$

802.11n (40MHz): Duty cycle = $120.19/187.5 = 0.641$, Duty factor = $10 * \log(1/0.641) = 1.93$

802.11n (20MHz)



802.11n (40MHz)



MODE A

5725MHz ~ 5825MHz

802.11a: Duty cycle = $2.059/2.107 = 0.952$, Duty factor = $10 * \log(1/0.977) = 0.10$

802.11n (20MHz): Duty cycle = $1.914/1.962 = 0.976$, Duty factor = $10 * \log(1/0.976) = 0.11$

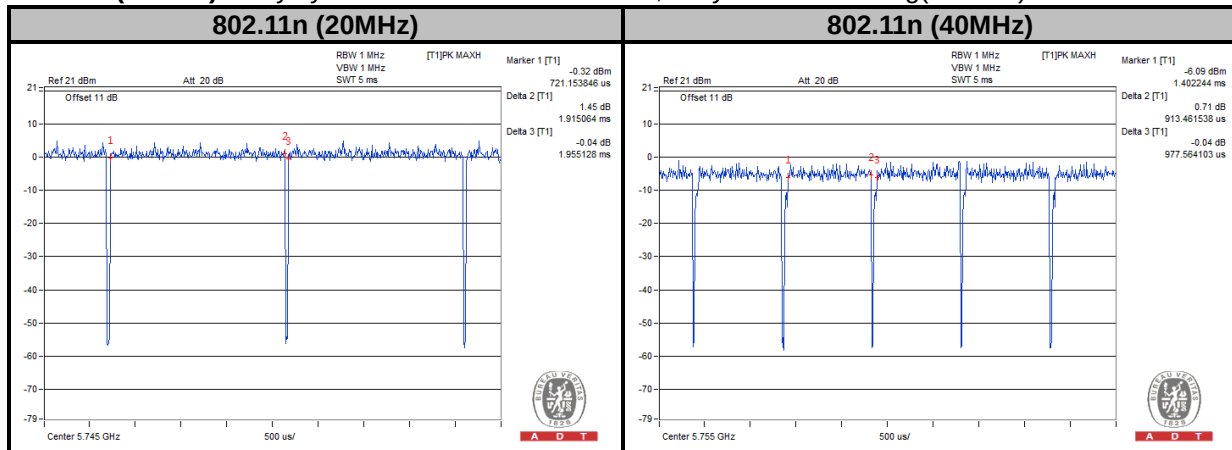
802.11n (40MHz): Duty cycle = $905.44/977.56 = 0.926$, Duty factor = $10 * \log(1/0.926) = 0.33$



MODE C

802.11n (20MHz): Duty cycle = $1.915/1.955 = 0.9795$, Duty factor = $10 * \log(1/0.9795) = 0.09$

802.11n (40MHz): Duty cycle = $913.46/977.56 = 0.934$, Duty factor = $10 * \log(1/0.934) = 0.29$





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
Power Meter Anritsu	ML2495A	1232002	Sep. 17, 2014	Sep. 16, 2015
Power Sensor Anritsu	MA2411B	1207325	Sep. 17, 2014	Sep. 16, 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 Coaxial Cable Worken	8D-FB	Cable-Ch10-01	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

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in HwaYa Chamber 10.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The FCC Site Registration No. is 690701.
6. The IC Site Registration No. is IC 7450F-10.

4.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

NOTE:

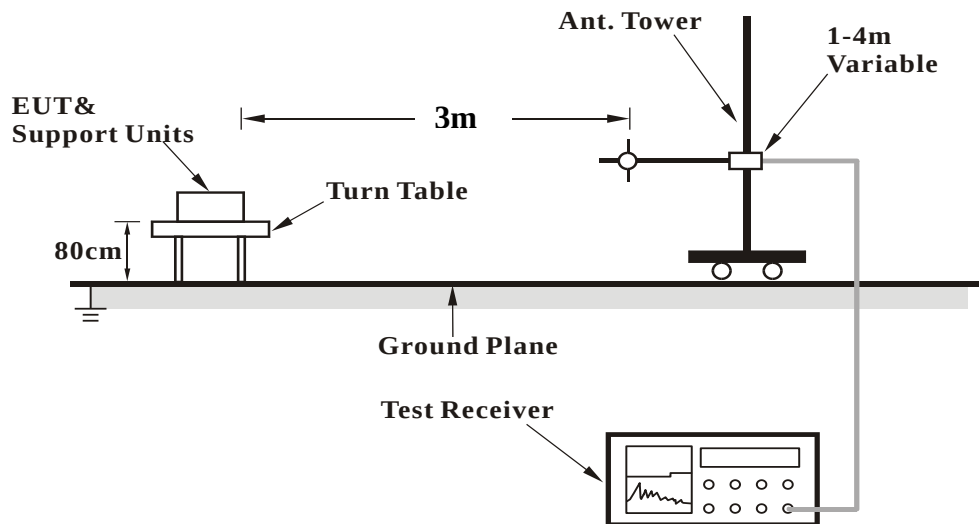
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor ($10 \log(1/\text{duty cycle})$).
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 DEVIATION FROM TEST STANDARD

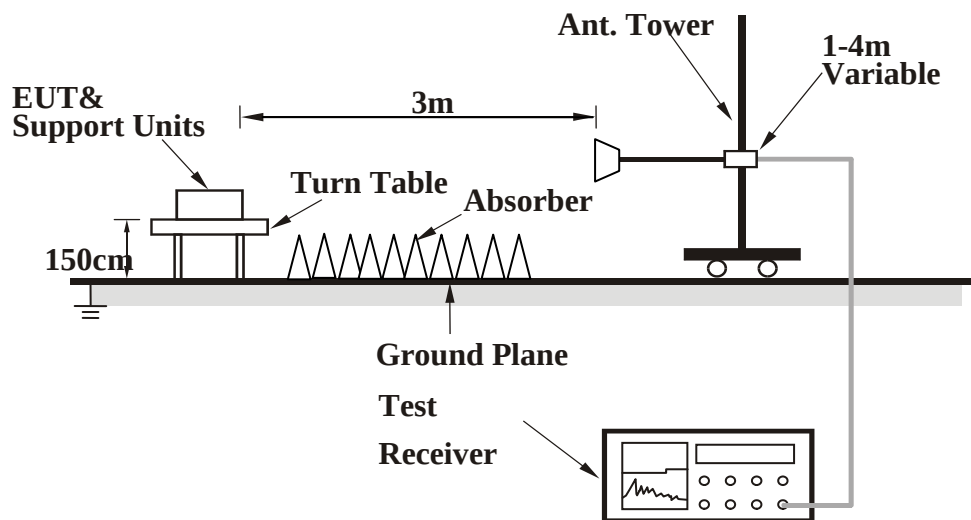
No deviation.

4.1.6 TEST SETUP

<Frequency Range below 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	Karl Lee

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
5042	43.62	35.56	54	-10.38	34.04	8	33.98	116	120	Average
5042	60.68	52.62	74	-13.32	34.04	8	33.98	116	120	Peak
5180	94.02	85.71			34.15	8.16	34	116	120	Average
5180	102.1	93.79			34.15	8.16	34	116	120	Peak
5426	43.67	34.9	54	-10.33	34.33	8.48	34.04	116	120	Average
5426	59.61	50.84	74	-14.39	34.33	8.48	34.04	116	120	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	46.11	37.86	54	-7.89	34.12	8.13	34	227	221	Average
5150	59.67	51.42	74	-14.33	34.12	8.13	34	227	221	Peak
5180	98.77	90.46			34.15	8.16	34	227	221	Average
5180	106.16	97.85			34.15	8.16	34	227	221	Peak
5442	43.39	34.6	54	-10.61	34.35	8.48	34.04	227	221	Average
5442	60.3	51.51	74	-13.7	34.35	8.48	34.04	227	221	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	Karl Lee

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
5130	43.22	35	54	-10.78	34.11	8.1	33.99	101	160	Average
5130	58.81	50.59	74	-15.19	34.11	8.1	33.99	101	160	Peak
5220	95.35	86.96			34.17	8.22	34	101	160	Average
5220	102.79	94.4			34.17	8.22	34	101	160	Peak
5436	43.81	35.02	54	-10.19	34.35	8.48	34.04	101	160	Average
5436	60.81	52.02	74	-13.19	34.35	8.48	34.04	101	160	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5074	42.96	34.84	54	-11.04	34.07	8.03	33.98	213	221	Average
5074	59.49	51.37	74	-14.51	34.07	8.03	33.98	213	221	Peak
5220	98.92	90.53			34.17	8.22	34	213	221	Average
5220	106.38	97.99			34.17	8.22	34	213	221	Peak
5360	43.55	34.92	54	-10.45	34.28	8.38	34.03	213	221	Average
5360	59.88	51.25	74	-14.12	34.28	8.38	34.03	213	221	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	Karl Lee

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
5138	43.09	34.84	54	-10.91	34.11	8.13	33.99	101	160	Average
5138	58.76	50.51	74	-15.24	34.11	8.13	33.99	101	160	Peak
5240	93.97	85.53			34.19	8.26	34.01	101	160	Average
5240	102.18	93.74			34.19	8.26	34.01	101	160	Peak
5368	43.59	34.92	54	-10.41	34.29	8.41	34.03	101	160	Average
5368	59.38	50.71	74	-14.62	34.29	8.41	34.03	101	160	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5136	43.09	34.84	54	-10.91	34.11	8.13	33.99	256	225	Average
5136	59.49	51.24	74	-14.51	34.11	8.13	33.99	256	225	Peak
5240	98.01	89.57			34.19	8.26	34.01	256	225	Average
5240	106.2	97.76			34.19	8.26	34.01	256	225	Peak
5418	43.67	34.94	54	-10.33	34.33	8.44	34.04	256	225	Average
5418	60.01	51.28	74	-13.99	34.33	8.44	34.04	256	225	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	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
5714	59.61	50.46	68.2	-8.59	34.61	8.65	34.11	100	86	Peak
5724	74.77	65.61	78.2	-3.43	34.62	8.65	34.11	100	86	Peak
5745	95.95	86.76			34.64	8.66	34.11	100	86	Average
5745	103.91	94.72			34.64	8.66	34.11	100	86	Peak
5860	59.49	50.17	78.2	-18.71	34.76	8.7	34.14	100	86	Peak
5864	59	49.67	68.2	-9.2	34.76	8.71	34.14	100	86	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5706	59.52	50.37	68.2	-8.68	34.61	8.65	34.11	257	225	Peak
5724	76.87	67.71	78.2	-1.33	34.62	8.65	34.11	257	225	Peak
5745	99.03	89.84			34.64	8.66	34.11	257	225	Average
5745	106.9	97.71			34.64	8.66	34.11	257	225	Peak
5860	59.35	50.03	78.2	-18.85	34.76	8.7	34.14	257	225	Peak
5870	58.8	49.47	68.2	-9.4	34.76	8.71	34.14	257	225	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5706MHz, 5714MHz, 5724MHz, 5860MHz, 5864MHz & 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	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
5706	59.17	50.02	68.2	-9.03	34.61	8.65	34.11	136	91	Peak
5718	58.8	49.64	78.2	-19.4	34.62	8.65	34.11	136	91	Peak
5785	96.1	86.87			34.68	8.68	34.13	136	91	Average
5785	103.87	94.64			34.68	8.68	34.13	136	91	Peak
5854	59.5	50.18	78.2	-18.7	34.76	8.7	34.14	136	91	Peak
5864	59.05	49.72	68.2	-9.15	34.76	8.71	34.14	136	91	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	59.5	50.35	68.2	-8.7	34.61	8.65	34.11	224	224	Peak
5722	59.11	49.95	78.2	-19.09	34.62	8.65	34.11	224	224	Peak
5785	98.9	89.67			34.68	8.68	34.13	224	224	Average
5785	106.43	97.2			34.68	8.68	34.13	224	224	Peak
5858	59.12	49.8	78.2	-19.08	34.76	8.7	34.14	224	224	Peak
5864	59.25	49.92	68.2	-8.95	34.76	8.71	34.14	224	224	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5706MHz, 5708MHz, 5718MHz, 5722MHz, 5854MHz, 5858MHz & 5864MHz: 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	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
5712	59.27	50.12	68.2	-8.93	34.61	8.65	34.11	103	162	Peak
5716	59.5	50.35	78.2	-18.7	34.61	8.65	34.11	103	162	Peak
5825	95.69	86.4			34.73	8.69	34.13	103	162	Average
5825	103.25	93.96			34.73	8.69	34.13	103	162	Peak
5850	65.41	56.11	78.2	-12.79	34.74	8.7	34.14	103	162	Peak
5868	58.86	49.53	68.2	-9.34	34.76	8.71	34.14	103	162	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5710	59.85	50.7	68.2	-8.35	34.61	8.65	34.11	224	224	Peak
5724	59.58	50.42	78.2	-18.62	34.62	8.65	34.11	224	224	Peak
5825	99.28	89.99			34.73	8.69	34.13	224	224	Average
5825	106.93	97.64			34.73	8.69	34.13	224	224	Peak
5850	65.76	56.46	78.2	-12.44	34.74	8.7	34.14	224	224	Peak
5870	58.8	49.47	68.2	-9.4	34.76	8.71	34.14	224	224	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5712MHz, 5710MHz, 5716MHz, 5724MHz, 5750Hz, 5868MHz & 5870MHz: 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	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
5062	43.36	35.26	54	-10.64	34.05	8.03	33.98	116	121	Average
5062	59.62	51.52	74	-14.38	34.05	8.03	33.98	116	121	Peak
5180	93.31	85			34.15	8.16	34	116	121	Average
5180	101.11	92.8			34.15	8.16	34	116	121	Peak
5446	43.21	34.38	54	-10.79	34.36	8.51	34.04	116	121	Average
5446	59.86	51.03	74	-14.14	34.36	8.51	34.04	116	121	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
5146	45.16	36.91	54	-8.84	34.12	8.13	34	227	221	Average
5146	58.91	50.66	74	-15.09	34.12	8.13	34	227	221	Peak
5180	97.46	89.15			34.15	8.16	34	227	221	Average
5180	105.4	97.09			34.15	8.16	34	227	221	Peak
5362	43.62	34.98	54	-10.38	34.29	8.38	34.03	227	221	Average
5362	59.79	51.15	74	-14.21	34.29	8.38	34.03	227	221	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	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
5096	42.61	34.45	54	-11.39	34.08	8.07	33.99	102	160	Average
5096	59.4	51.24	74	-14.6	34.08	8.07	33.99	102	160	Peak
5220	93.64	85.25			34.17	8.22	34	102	160	Average
5220	101.38	92.99			34.17	8.22	34	102	160	Peak
5456	43.18	34.36	54	-10.82	34.36	8.51	34.05	102	160	Average
5456	59.31	50.49	74	-14.69	34.36	8.51	34.05	102	160	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5146	42.85	34.6	54	-11.15	34.12	8.13	34	248	219	Average
5146	59.94	51.69	74	-14.06	34.12	8.13	34	248	219	Peak
5220	97.22	88.83			34.17	8.22	34	248	219	Average
5220	105.44	97.05			34.17	8.22	34	248	219	Peak
5352	43.36	34.73	54	-10.64	34.28	8.38	34.03	248	219	Average
5352	59.49	50.86	74	-14.51	34.28	8.38	34.03	248	219	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	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
5052	42.54	34.48	54	-11.46	34.04	8	33.98	101	105	Average
5052	58.68	50.62	74	-15.32	34.04	8	33.98	101	105	Peak
5240	93.44	85			34.19	8.26	34.01	101	105	Average
5240	101.51	93.07			34.19	8.26	34.01	101	105	Peak
5460	42.92	34.1	54	-11.08	34.36	8.51	34.05	101	105	Average
5460	59.84	51.02	74	-14.16	34.36	8.51	34.05	101	105	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
5024	42.65	34.62	54	-11.35	34.03	7.97	33.97	243	226	Average
5024	58.44	50.41	74	-15.56	34.03	7.97	33.97	243	226	Peak
5240	97.14	88.7			34.19	8.26	34.01	243	226	Average
5240	105.59	97.15			34.19	8.26	34.01	243	226	Peak
5364	43.29	34.65	54	-10.71	34.29	8.38	34.03	243	226	Average
5364	60.13	51.49	74	-13.87	34.29	8.38	34.03	243	226	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	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
5706	59.06	49.91	68.2	-9.14	34.61	8.65	34.11	100	85	Peak
5724	73.43	64.27	78.2	-4.77	34.62	8.65	34.11	100	85	Peak
5745	94.74	85.55			34.64	8.66	34.11	100	85	Average
5745	102.82	93.63			34.64	8.66	34.11	100	85	Peak
5860	58.77	49.45	78.2	-19.43	34.76	8.7	34.14	100	85	Peak
5866	58.64	49.31	68.2	-9.56	34.76	8.71	34.14	100	85	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	59.08	49.93	68.2	-9.12	34.61	8.65	34.11	257	225	Peak
5724	76.23	67.07	78.2	-1.97	34.62	8.65	34.11	257	225	Peak
5745	97.98	88.79			34.64	8.66	34.11	257	225	Average
5745	105.92	96.73			34.64	8.66	34.11	257	225	Peak
5854	60.1	50.78	78.2	-18.1	34.76	8.7	34.14	257	225	Peak
5866	59.07	49.74	68.2	-9.13	34.76	8.71	34.14	257	225	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5706MHz, 5714MHz, 5724MHz, 5854MHz, 5860MHz & 5866MHz: 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	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
5706	58.72	49.57	68.2	-9.48	34.61	8.65	34.11	136	91	Peak
5722	59.59	50.43	78.2	-18.61	34.62	8.65	34.11	136	91	Peak
5785	94.08	84.85			34.68	8.68	34.13	136	91	Average
5785	102.25	93.02			34.68	8.68	34.13	136	91	Peak
5858	61.03	51.71	78.2	-17.17	34.76	8.7	34.14	136	91	Peak
5866	59.5	50.17	68.2	-8.7	34.76	8.71	34.14	136	91	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	59.59	50.44	68.2	-8.61	34.61	8.65	34.11	242	226	Peak
5720	58.49	49.33	78.2	-19.71	34.62	8.65	34.11	242	226	Peak
5785	97.2	87.97			34.68	8.68	34.13	242	226	Average
5785	105.32	96.09			34.68	8.68	34.13	242	226	Peak
5854	59.17	49.85	78.2	-19.03	34.76	8.7	34.14	242	226	Peak
5866	58.97	49.64	68.2	-9.23	34.76	8.71	34.14	242	226	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5706MHz, 5714MHz, 5720MHz, 5722MHz, 5854MHz, 5858MHz & 5866MHz: 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	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
5712	59.29	50.14	68.2	-8.91	34.61	8.65	34.11	103	158	Peak
5722	59.58	50.42	78.2	-18.62	34.62	8.65	34.11	103	158	Peak
5825	94.64	85.35			34.73	8.69	34.13	103	158	Average
5825	102.73	93.44			34.73	8.69	34.13	103	158	Peak
5850	66.76	57.46	78.2	-11.44	34.74	8.7	34.14	103	158	Peak
5868	59.22	49.89	68.2	-8.98	34.76	8.71	34.14	103	158	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	58.87	49.72	68.2	-9.33	34.61	8.65	34.11	224	226	Peak
5724	59.5	50.34	78.2	-18.7	34.62	8.65	34.11	224	226	Peak
5825	97.48	88.19			34.73	8.69	34.13	224	226	Average
5825	105.27	95.98			34.73	8.69	34.13	224	226	Peak
5850	67.29	57.99	78.2	-10.91	34.74	8.7	34.14	224	226	Peak
5870	60.32	50.99	68.2	-7.88	34.76	8.71	34.14	224	226	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5712MHz, 5714MHz, 5722Mhz, 5724MHz, 5850MHz, 5868MHz & 5870MHz: 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	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	51.65	43.4	54	-2.35	34.12	8.13	34	109	107	Average
5150	62.51	54.26	74	-11.49	34.12	8.13	34	109	107	Peak
5190	92.14	83.8			34.15	8.19	34	109	107	Average
5190	100.08	91.74			34.15	8.19	34	109	107	Peak
5350	43.26	34.63	54	-10.74	34.28	8.38	34.03	109	107	Average
5350	59.25	50.62	74	-14.75	34.28	8.38	34.03	109	107	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	52.94	44.69	54	-1.06	34.12	8.13	34	235	221	Average
5150	63.37	55.12	74	-10.63	34.12	8.13	34	235	221	Peak
5190	96.08	87.74			34.15	8.19	34	235	221	Average
5190	104.1	95.76			34.15	8.19	34	235	221	Peak
5442	43.94	35.15	54	-10.06	34.35	8.48	34.04	235	221	Average
5442	59.14	50.35	74	-14.86	34.35	8.48	34.04	235	221	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	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
5126	43.05	34.83	54	-10.95	34.11	8.1	33.99	101	105	Average
5126	59.06	50.84	74	-14.94	34.11	8.1	33.99	101	105	Peak
5230	92.81	84.41			34.19	8.22	34.01	101	105	Average
5230	100.42	92.02			34.19	8.22	34.01	101	105	Peak
5418	43.42	34.69	54	-10.58	34.33	8.44	34.04	101	105	Average
5418	59.53	50.8	74	-14.47	34.33	8.44	34.04	101	105	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5144	43.35	35.1	54	-10.65	34.12	8.13	34	243	226	Average
5144	58.65	50.4	74	-15.35	34.12	8.13	34	243	226	Peak
5230	96.81	88.41			34.19	8.22	34.01	243	226	Average
5230	104.81	96.41			34.19	8.22	34.01	243	226	Peak
5432	44.02	35.23	54	-9.98	34.35	8.48	34.04	243	226	Average
5432	59.68	50.89	74	-14.32	34.35	8.48	34.04	243	226	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	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	62	52.85	68.2	-6.2	34.61	8.65	34.11	100	84	Peak
5724	71.78	62.62	78.2	-6.42	34.62	8.65	34.11	100	84	Peak
5755	93.93	84.72			34.66	8.66	34.11	100	84	Average
5755	102.05	92.84			34.66	8.66	34.11	100	84	Peak
5860	59.37	50.05	78.2	-18.83	34.76	8.7	34.14	100	84	Peak
5868	59.46	50.13	68.2	-8.74	34.76	8.71	34.14	100	84	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	62.95	53.8	68.2	-5.25	34.61	8.65	34.11	256	225	Peak
5724	74.09	64.93	78.2	-4.11	34.62	8.65	34.11	256	225	Peak
5755	98.04	88.83			34.66	8.66	34.11	256	225	Average
5755	105.75	96.54			34.66	8.66	34.11	256	225	Peak
5856	59.77	50.45	78.2	-18.43	34.76	8.7	34.14	256	225	Peak
5862	59.24	49.91	68.2	-8.96	34.76	8.71	34.14	256	225	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5755MHz: Fundamental frequency.
- 5708MHz, 5714MHz, 5724MHz, 5856MHz, 5860MHz, 5862MHz & 5868MHz: 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	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
5710	60.69	51.54	68.2	-7.51	34.61	8.65	34.11	200	84	Peak
5716	59.04	49.89	78.2	-19.16	34.61	8.65	34.11	200	84	Peak
5795	94.21	84.97			34.69	8.68	34.13	200	84	Average
5795	102.59	93.35			34.69	8.68	34.13	200	84	Peak
5854	58.8	49.48	78.2	-19.4	34.76	8.7	34.14	200	84	Peak
5870	60.08	50.75	68.2	-8.12	34.76	8.71	34.14	200	84	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	60.19	51.04	68.2	-8.01	34.61	8.65	34.11	242	224	Peak
5724	58.99	49.83	78.2	-19.21	34.62	8.65	34.11	242	224	Peak
5795	98.19	88.95			34.69	8.68	34.13	242	224	Average
5795	105.72	96.48			34.69	8.68	34.13	242	224	Peak
5858	59.74	50.42	78.2	-18.46	34.76	8.7	34.14	242	224	Peak
5864	60.02	50.69	68.2	-8.18	34.76	8.71	34.14	242	224	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, 5754MHz, 5858MHz, 5864MHz & 5870MHz: Out of restricted band



A D T

MODE B

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	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
5714	59.82	50.67	68.2	-8.38	34.61	8.65	34.11	116	242	Peak
5724	76.58	67.42	78.2	-1.62	34.62	8.65	34.11	116	242	Peak
5745	97.81	88.62			34.64	8.66	34.11	116	242	Average
5745	105.61	96.42			34.64	8.66	34.11	116	242	Peak
5860	59.38	50.06	78.2	-18.82	34.76	8.7	34.14	116	242	Peak
5866	59.52	50.19	68.2	-8.68	34.76	8.71	34.14	116	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
5714	60	50.85	68.2	-8.2	34.61	8.65	34.11	226	140	Peak
5724	76.49	67.33	78.2	-1.71	34.62	8.65	34.11	226	140	Peak
5745	98.9	89.71			34.64	8.66	34.11	226	140	Average
5745	106.54	97.35			34.64	8.66	34.11	226	140	Peak
5860	59.71	50.39	78.2	-18.49	34.76	8.7	34.14	226	140	Peak
5866	58.86	49.53	68.2	-9.34	34.76	8.71	34.14	226	140	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5714MHz, 5724MHz, 5860MHz & 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	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
5150	53.87	45.62	54	-0.13	34.12	8.13	34	116	255	Average
5150	65.25	57	74	-8.75	34.12	8.13	34	116	255	Peak
5190	94.08	85.74			34.15	8.19	34	116	255	Average
5190	101.69	93.35			34.15	8.19	34	116	255	Peak
5456	46.52	37.7	54	-7.48	34.36	8.51	34.05	116	255	Average
5456	58.24	49.42	74	-15.76	34.36	8.51	34.05	116	255	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	53.38	45.13	54	-0.62	34.12	8.13	34	272	136	Average
5150	64.94	56.69	74	-9.06	34.12	8.13	34	272	136	Peak
5190	97.09	88.75			34.15	8.19	34	272	136	Average
5190	104.43	96.09			34.15	8.19	34	272	136	Peak
5434	48.82	40.03	54	-5.18	34.35	8.48	34.04	272	136	Average
5434	58.14	49.35	74	-15.86	34.35	8.48	34.04	272	136	Peak

REMARKS:

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

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	Karl Lee

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	44.3	36.24	54	-9.7	34.04	8	33.98	108	284	Average
5054	56.78	48.72	74	-17.22	34.04	8	33.98	108	284	Peak
5180	93.83	85.52			34.15	8.16	34	108	284	Average
5180	102.17	93.86			34.15	8.16	34	108	284	Peak
5382	45.21	36.53	54	-8.79	34.31	8.41	34.04	108	284	Average
5382	57.69	49.01	74	-16.31	34.31	8.41	34.04	108	284	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5062	44.46	36.36	54	-9.54	34.05	8.03	33.98	100	174	Average
5062	56.83	48.73	74	-17.17	34.05	8.03	33.98	100	174	Peak
5180	97.86	89.55			34.15	8.16	34	100	174	Average
5180	105.18	96.87			34.15	8.16	34	100	174	Peak
5410	43.91	35.19	54	-10.09	34.32	8.44	34.04	100	174	Average
5410	57.42	48.7	74	-16.58	34.32	8.44	34.04	100	174	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	Karl Lee

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
5138	42.83	34.58	54	-11.17	34.11	8.13	33.99	108	107	Average
5138	57.65	49.4	74	-16.35	34.11	8.13	33.99	108	107	Peak
5220	93.92	85.53			34.17	8.22	34	108	107	Average
5220	102.14	93.75			34.17	8.22	34	108	107	Peak
5414	43.46	34.73	54	-10.54	34.33	8.44	34.04	108	107	Average
5414	57.76	49.03	74	-16.24	34.33	8.44	34.04	108	107	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5064	43.28	35.18	54	-10.72	34.05	8.03	33.98	114	174	Average
5064	57.76	49.66	74	-16.24	34.05	8.03	33.98	114	174	Peak
5220	97.51	89.12			34.17	8.22	34	114	174	Average
5220	105.47	97.08			34.17	8.22	34	114	174	Peak
5452	44.06	35.24	54	-9.94	34.36	8.51	34.05	114	174	Average
5452	57.75	48.93	74	-16.25	34.36	8.51	34.05	114	174	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	Karl Lee

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	43.77	35.61	54	-10.23	34.08	8.07	33.99	102	160	Average
5096	57.27	49.11	74	-16.73	34.08	8.07	33.99	102	160	Peak
5240	94.65	86.21			34.19	8.26	34.01	102	160	Average
5240	102.68	94.24			34.19	8.26	34.01	102	160	Peak
5408	45.57	36.85	54	-8.43	34.32	8.44	34.04	102	160	Average
5408	57.39	48.67	74	-16.61	34.32	8.44	34.04	102	160	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5112	43.04	34.84	54	-10.96	34.09	8.1	33.99	105	185	Average
5112	57.6	49.4	74	-16.4	34.09	8.1	33.99	105	185	Peak
5240	97.28	88.84			34.19	8.26	34.01	105	185	Average
5240	105.13	96.69			34.19	8.26	34.01	105	185	Peak
5436	44.77	35.98	54	-9.23	34.35	8.48	34.04	105	185	Average
5436	58.1	49.31	74	-15.9	34.35	8.48	34.04	105	185	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	56.55	47.4	68.2	-11.65	34.61	8.65	34.11	100	177	Peak
5724	73.44	64.28	78.2	-4.76	34.62	8.65	34.11	100	216	Peak
5745	95.56	86.37			34.64	8.66	34.11	100	177	Average
5745	103.81	94.62			34.64	8.66	34.11	100	177	Peak
5854	55.75	46.43	78.2	-22.45	34.76	8.7	34.14	100	177	Peak
5868	56.37	47.04	68.2	-11.83	34.76	8.71	34.14	100	177	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	56.41	47.26	68.2	-11.79	34.61	8.65	34.11	122	177	Peak
5724	73.55	64.39	78.2	-4.65	34.62	8.65	34.11	122	176	Peak
5745	98.3	89.11			34.64	8.66	34.11	122	177	Average
5745	106.52	97.33			34.64	8.66	34.11	122	177	Peak
5860	56.62	47.3	78.2	-21.58	34.76	8.7	34.14	122	177	Peak
5868	55.75	46.42	68.2	-12.45	34.76	8.71	34.14	122	177	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: 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	56.86	47.71	68.2	-11.34	34.61	8.65	34.11	100	177	Peak
5716	57.68	48.53	78.2	-20.52	34.61	8.65	34.11	100	177	Peak
5785	95.73	86.5			34.68	8.68	34.13	100	177	Average
5785	103.38	94.15			34.68	8.68	34.13	100	177	Peak
5860	56.37	47.05	78.2	-21.83	34.76	8.7	34.14	100	177	Peak
5866	57.03	47.7	68.2	-11.17	34.76	8.71	34.14	100	177	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	56.4	47.25	68.2	-11.8	34.61	8.65	34.11	195	177	Peak
5716	56.52	47.37	78.2	-21.68	34.61	8.65	34.11	195	177	Peak
5785	98.76	89.53			34.68	8.68	34.13	195	177	Average
5785	106.35	97.12			34.68	8.68	34.13	195	177	Peak
5854	56.34	47.02	78.2	-21.86	34.76	8.7	34.14	195	177	Peak
5866	56.86	47.53	68.2	-11.34	34.76	8.71	34.14	195	177	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5710MHz, 5716MHz, 5754MHz, 5760MHz & 5866MHz: 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
5708	57.49	48.34	68.2	-10.71	34.61	8.65	34.11	104	153	Peak
5716	56.76	47.61	78.2	-21.44	34.61	8.65	34.11	104	153	Peak
5825	95.57	86.28			34.73	8.69	34.13	104	153	Average
5825	103.11	93.82			34.73	8.69	34.13	104	153	Peak
5850	58.45	49.15	78.2	-19.75	34.74	8.7	34.14	104	153	Peak
5866	57.69	48.36	68.2	-10.51	34.76	8.71	34.14	104	153	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	55.98	46.83	68.2	-12.22	34.61	8.65	34.11	193	178	Peak
5720	55.81	46.65	78.2	-22.39	34.62	8.65	34.11	193	178	Peak
5825	98.52	89.23			34.73	8.69	34.13	193	178	Average
5825	106.22	96.93			34.73	8.69	34.13	193	178	Peak
5854	56.47	47.15	78.2	-21.73	34.76	8.7	34.14	193	178	Peak
5866	56.04	46.71	68.2	-12.16	34.76	8.71	34.14	193	178	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5708MHz, 5716MHz, 5720Mhz, 5750MHz, 5854MHz & 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	Karl Lee

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	50.57	42.32	54	-3.43	34.12	8.13	34	108	284	Average
5150	62.76	54.51	74	-11.24	34.12	8.13	34	108	284	Peak
5190	94.88	86.54			34.15	8.19	34	108	284	Average
5190	102.48	94.14			34.15	8.19	34	108	284	Peak
5438	45.48	36.69	54	-8.52	34.35	8.48	34.04	108	284	Average
5438	58.08	49.29	74	-15.92	34.35	8.48	34.04	108	284	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
5148	52.91	44.66	54	-1.09	34.12	8.13	34	100	174	Average
5148	65.19	56.94	74	-8.81	34.12	8.13	34	100	174	Peak
5190	97.25	88.91			34.15	8.19	34	100	174	Average
5190	105.53	97.19			34.15	8.19	34	100	174	Peak
5438	44.41	35.62	54	-9.59	34.35	8.48	34.04	100	174	Average
5438	57.11	48.32	74	-16.89	34.35	8.48	34.04	100	174	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	Karl Lee

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	43.54	35.48	54	-10.46	34.04	8	33.98	102	160	Average
5054	56.39	48.33	74	-17.61	34.04	8	33.98	102	160	Peak
5230	94.94	86.54			34.19	8.22	34.01	102	160	Average
5230	102.87	94.47			34.19	8.22	34.01	102	160	Peak
5394	45.48	36.77	54	-8.52	34.31	8.44	34.04	102	160	Average
5394	56.89	48.18	74	-17.11	34.31	8.44	34.04	102	160	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5056	43.93	35.83	54	-10.07	34.05	8.03	33.98	120	182	Average
5056	56.87	48.77	74	-17.13	34.05	8.03	33.98	120	182	Peak
5230	97.6	89.2			34.19	8.22	34.01	120	182	Average
5230	105.22	96.82			34.19	8.22	34.01	120	182	Peak
5348	44.12	35.49	54	-9.88	34.28	8.38	34.03	120	182	Average
5348	57.83	49.2	74	-16.17	34.28	8.38	34.03	120	182	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	59.57	50.42	68.2	-8.63	34.61	8.65	34.11	100	177	Peak
5724	70.78	61.62	78.2	-7.42	34.62	8.65	34.11	100	177	Peak
5755	93.82	84.61			34.66	8.66	34.11	100	177	Average
5755	102.04	92.83			34.66	8.66	34.11	100	177	Peak
5860	56.36	47.04	78.2	-21.84	34.76	8.7	34.14	100	177	Peak
5870	56.04	46.71	68.2	-12.16	34.76	8.71	34.14	100	177	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	59.64	50.49	68.2	-8.56	34.61	8.65	34.11	116	177	Peak
5724	72.07	62.91	78.2	-6.13	34.62	8.65	34.11	116	177	Peak
5755	97.59	88.38			34.66	8.66	34.11	116	177	Average
5755	105.34	96.13			34.66	8.66	34.11	116	177	Peak
5852	58.24	48.94	78.2	-19.96	34.74	8.7	34.14	116	177	Peak
5868	57.95	48.62	68.2	-10.25	34.76	8.71	34.14	116	177	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5795MHz: Fundamental frequency.
- 5714MHz, 5724MHz, 5752MHz, 5860MHz, 5868MHz & 5870MHz: 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
5710	56.5	47.35	68.2	-11.7	34.61	8.65	34.11	104	154	Peak
5722	58.27	49.11	78.2	-19.93	34.62	8.65	34.11	104	154	Peak
5795	95.17	85.93			34.69	8.68	34.13	104	154	Average
5795	102.81	93.57			34.69	8.68	34.13	104	154	Peak
5858	57.62	48.3	78.2	-20.58	34.76	8.7	34.14	104	154	Peak
5866	57.09	47.76	68.2	-11.11	34.76	8.71	34.14	104	154	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	57.11	47.96	68.2	-11.09	34.61	8.65	34.11	186	177	Peak
5716	55.9	46.75	78.2	-22.3	34.61	8.65	34.11	186	177	Peak
5795	98.12	88.88			34.69	8.68	34.13	186	177	Average
5795	105.7	96.46			34.69	8.68	34.13	186	177	Peak
5860	57.1	47.78	78.2	-21.1	34.76	8.7	34.14	186	177	Peak
5868	56.46	47.13	68.2	-11.74	34.76	8.71	34.14	186	177	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5795MHz: Fundamental frequency.
- 5710MHz, 5716MHz, 5722MHz, 5858MHz, 5860MHz, 5866MHz & 5868MHz: Out of restricted band

BELOW 1GHz WORST-CASE DATA:

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi-peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	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
138.81	31.55	53.15	43.5	-11.95	9.29	1.38	32.27	129	230	Peak
160.41	31.32	51.27	43.5	-12.18	10.8	1.52	32.27	108	152	Peak
200.1	29.65	49.4	43.5	-13.85	10.9	1.65	32.3	129	200	Peak
400.1	39.76	51.54	46	-6.24	18.1	2.34	32.22	139	276	Peak
499.5	36.83	47.3	46	-9.17	19	2.63	32.1	149	295	Peak
700.4	39.15	45.03	46	-6.85	23.1	3.11	32.09	131	311	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30	26.19	39.92	40	-13.81	17.8	0.74	32.27	126	193	Peak
99.93	24.72	46.04	43.5	-18.78	9.66	1.28	32.26	199	284	Peak
160.41	25.77	45.72	43.5	-17.73	10.8	1.52	32.27	125	77	Peak
599.6	39.3	47.52	46	-6.7	21.1	2.87	32.19	129	299	Peak
700.4	38.32	44.2	46	-7.68	23.1	3.11	32.09	120	87	Peak
899.9	34.69	37.68	46	-11.31	25	3.49	31.48	162	315	Peak

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

Margin value = Emission level – Limit value

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
99.93	24.93	46.25	43.5	-18.57	9.66	1.28	32.26	126	128	Peak
160.41	31.98	51.93	43.5	-11.52	10.8	1.52	32.27	108	152	Peak
200.1	28.97	48.72	43.5	-14.53	10.9	1.65	32.3	135	271	Peak
400.1	39.86	51.64	46	-6.14	18.1	2.34	32.22	138	266	Peak
700.4	39.74	45.62	46	-6.26	23.1	3.11	32.09	170	231	Peak
899.9	37.77	40.76	46	-8.23	25	3.49	31.48	140	77	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
30	25.94	39.67	40	-14.06	17.8	0.74	32.27	196	336	Peak
99.93	24.74	46.06	43.5	-18.76	9.66	1.28	32.26	146	6	Peak
160.41	26.55	46.5	43.5	-16.95	10.8	1.52	32.27	101	152	Peak
599.6	39.2	47.42	46	-6.8	21.1	2.87	32.19	149	299	Peak
700.4	37.78	43.66	46	-8.22	23.1	3.11	32.09	120	187	Peak
896.4	39.71	42.73	46	-6.29	25	3.49	31.51	142	277	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 (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE:

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Apr. 24, 2014	Apr. 23, 2015
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 10, 2014	Jul. 09, 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 2.
 3. The VCCI Site Registration No. is C-2047.

4.2.3 TEST PROCEDURES

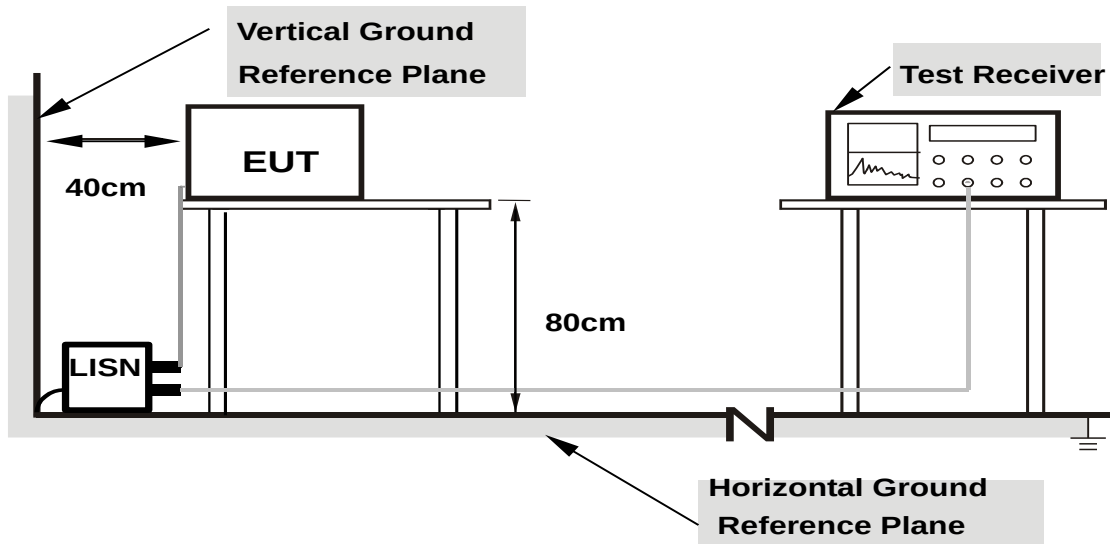
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as section 4.1.6.

4.2.7 TEST RESULTS

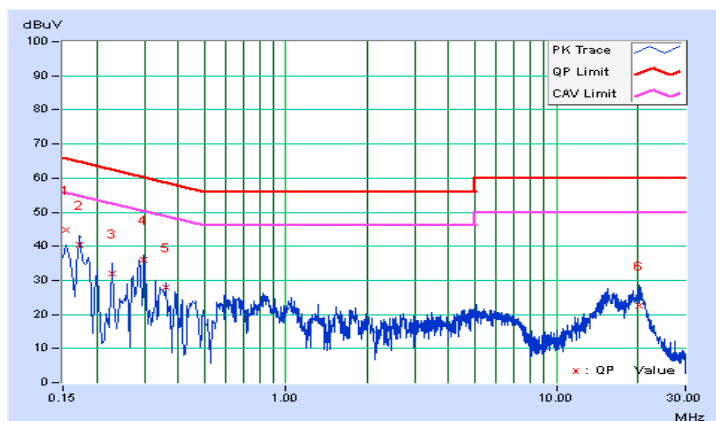
CONDUCTED WORST-CASE DATA :

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

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	0.15391	0.05	44.67	36.39	44.72	36.44	65.79	55.79	-21.07	-19.35
2	0.17283	0.05	40.35	32.19	40.40	32.24	64.82	54.82	-24.42	-22.58
3	0.22820	0.06	31.82	25.98	31.88	26.04	62.51	52.51	-30.63	-26.47
4	0.29897	0.06	35.94	28.60	36.00	28.66	60.27	50.27	-24.27	-21.61
5	0.36114	0.06	27.77	19.11	27.83	19.17	58.70	48.70	-30.87	-29.53
6	20.14574	0.90	21.70	13.98	22.60	14.88	60.00	50.00	-37.40	-35.12

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

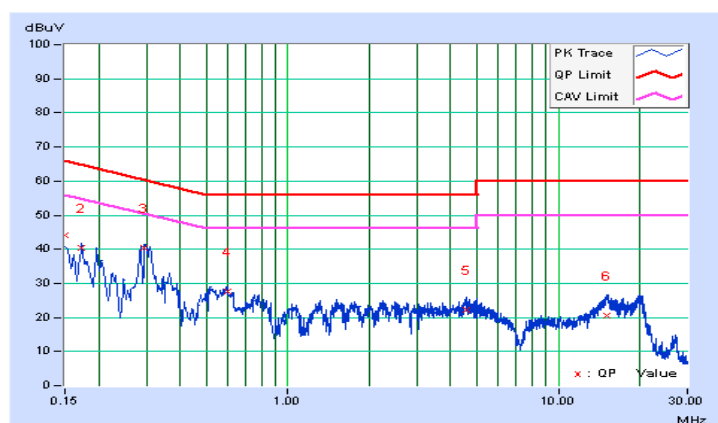


PHASE	Line 2	6dB BANDWIDTH	9kHz
-------	--------	---------------	------

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	0.15000	0.05	44.01	34.93	44.06	34.98	66.00	56.00	-21.94	-21.02
2	0.17237	0.05	40.26	31.05	40.31	31.10	64.85	54.85	-24.54	-23.75
3	0.29506	0.05	40.32	32.61	40.37	32.66	60.38	50.38	-20.01	-17.72
4	0.59574	0.07	27.41	19.84	27.48	19.91	56.00	46.00	-28.52	-26.09
5	4.59958	0.21	21.98	11.18	22.19	11.39	56.00	46.00	-33.81	-34.61
6	15.07056	0.58	19.92	11.33	20.50	11.91	60.00	50.00	-39.50	-38.09

Remarks:

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



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 $NANT \leq 4$;

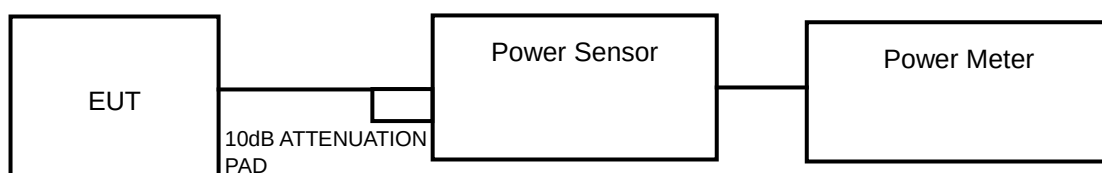
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

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

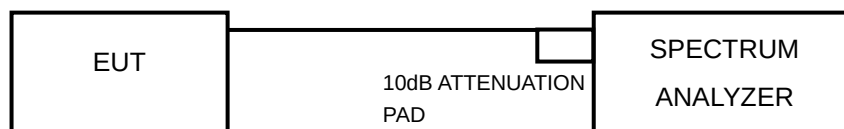
For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

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	28.71	14.58	24	PASS
44	5220	29.11	14.64	24	PASS
48	5240	29.38	14.68	24	PASS
149	5745	30.69	14.87	30	PASS
157	5785	31.33	14.96	30	PASS
165	5825	30.62	14.86	30	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAX. CONDUCTED POWER (mW)	MAX. CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	23.71	13.75	24	PASS
44	5220	24.21	13.84	24	PASS
48	5240	23.50	13.71	24	PASS
149	5745	24.43	13.88	30	PASS
157	5785	24.77	13.94	30	PASS
165	5825	23.77	13.76	30	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	MAX. CONDUCTED POWER (mW)	MAX. CONDUCTED POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
38	5190	16.37	12.14	24	PASS
46	5230	21.98	13.42	24	PASS
151	5755	23.66	13.74	30	PASS
159	5795	24.83	13.95	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	10.41	10.32	21.75	13.38	24	PASS
40	5200	10.56	10.14	21.70	13.37	24	PASS
48	5240	11.31	9.46	22.35	13.49	24	PASS
149	5745	11.28	10.35	24.267	13.85	30	PASS
157	5785	11.18	10.80	25.145	14.00	30	PASS
165	5825	10.73	9.98	21.784	13.38	30	PASS

802.11n (40MHz)

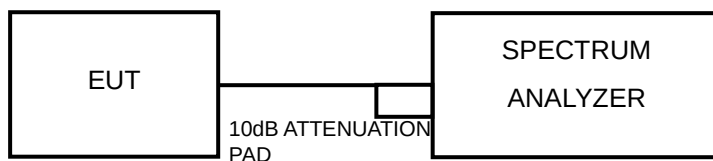
CHAN.	CHAN. FREQ. (MHz)	MAX. CONDUCTED POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
38	5190	10.35	10.30	21.55	13.34	24	PASS
46	5230	11.27	9.81	22.97	13.61	24	PASS
151	5755	10.58	10.32	22.193	13.46	30	PASS

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/ MHz

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 band:

Using method SA-1

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS
- 3) Set Channel power measure = 1MHz
- 4) Sweep time = auto, trigger set to “free run”.
- 5) Trace average at least 100 traces in power averaging mode.
- 6) Record the max value

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

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

For U-NII-1 Band

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	1.85	0.10	1.95	11	PASS
44	5220	2.32	0.10	2.42	11	PASS
48	5240	2.26	0.10	2.36	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	1.29	0.10	1.39	11	PASS
44	5220	1.54	0.10	1.64	11	PASS
48	5240	1.40	0.10	1.50	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	-2.68	0.29	-2.39	11	PASS
46	5230	-1.11	0.29	-0.82	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	-3.89	-1.65	0.38	0.11	0.49	9.76	PASS
40	5200	-1.52	-2.14	1.19	0.11	1.30	9.76	PASS
48	5240	-1.25	-2.12	1.35	0.11	1.46	9.76	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 = $4.23\text{dBi} + 10\log(2) = 7.24\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(7.24-6) = 9.76\text{dBm}$.
- 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	-4.04	-2.43	-0.15	0.33	0.18	9.76	PASS
46	5230	-2.10	-2.86	0.55	0.33	0.88	9.76	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 = $4.23\text{dBi} + 10\log(2) = 7.24\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(7.24-6) = 9.76\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

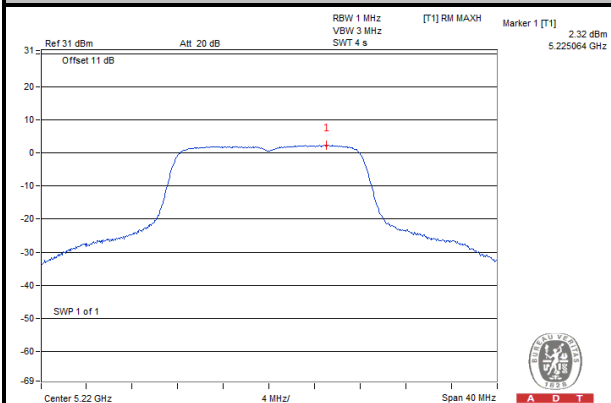


A D T

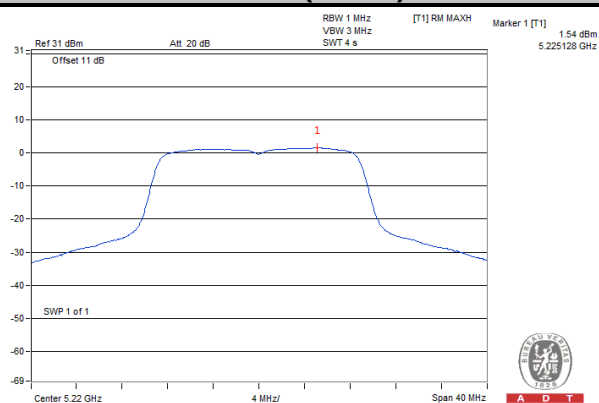
MODE A

SPECTRUM PLOT OF WORST VALUE

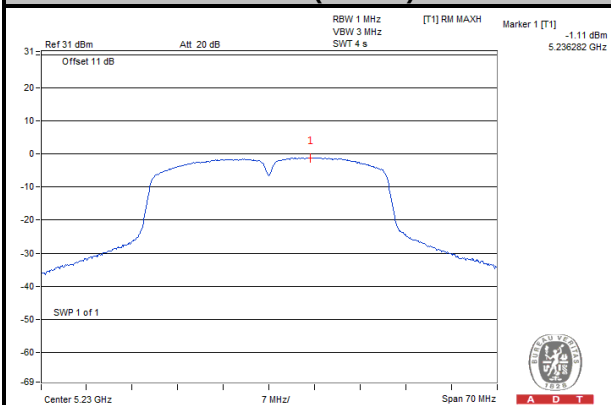
802.11a



802.11n (20MHz)



802.11n (40MHz)





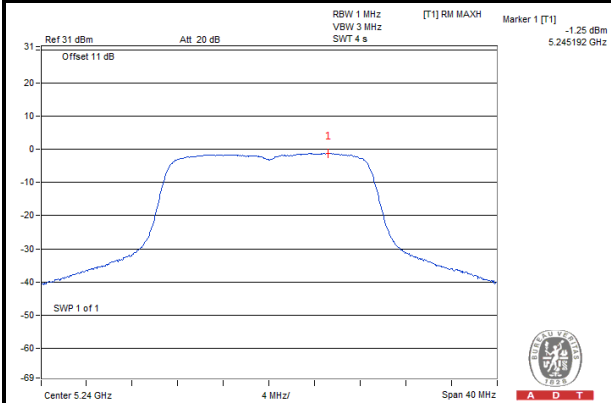
A D T

MODE C

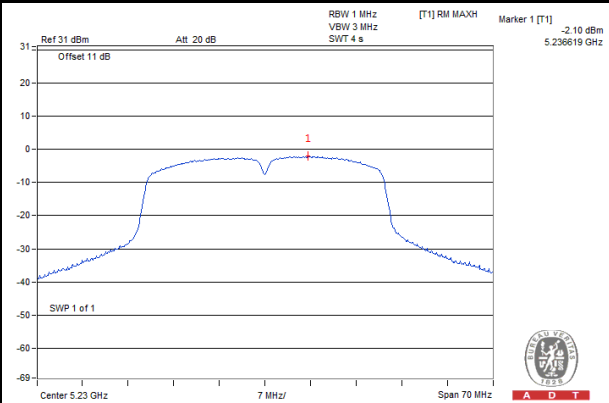
SPECTRUM PLOT OF WORST VALUE

Chain 0

802.11n (20MHz)

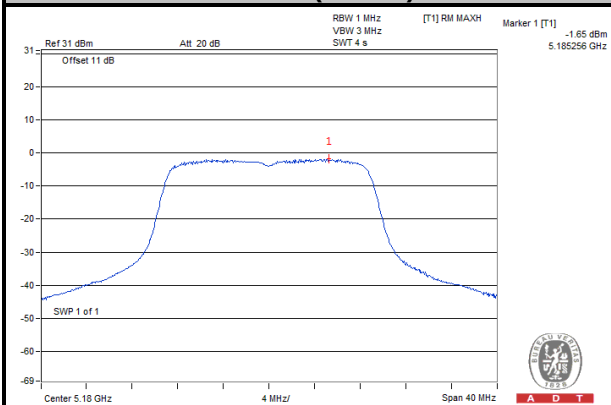


802.11n (40MHz)

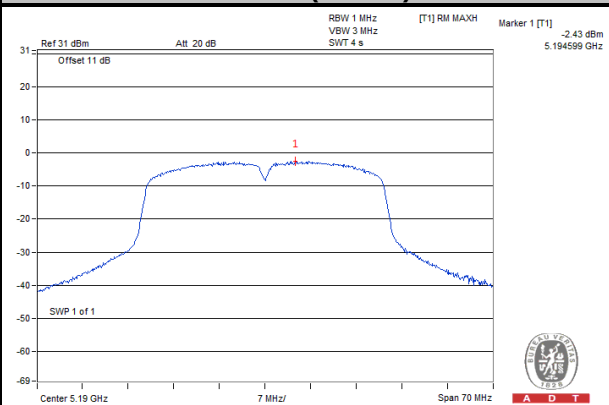


Chain 1

802.11n (20MHz)



802.11n (40MHz)



**A D T****For U-NII-3 Band****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	-0.62	0.10	-0.52	30	PASS
157	5785	-0.43	0.10	-0.33	30	PASS
165	5825	-0.03	0.10	0.07	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	-1.97	0.11	-1.86	30	PASS
157	5785	-1.58	0.11	-1.47	30	PASS
165	5825	-1.12	0.11	-1.01	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	-4.68	0.33	-4.35	30	PASS
159	5795	-4.01	0.33	-3.68	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	-4.95	3.01	-1.94	0.11	-1.85	29.55	PASS
	157	5785	-3.98	3.01	-0.97	0.11	-0.88	29.55	PASS
	165	5825	-4.47	3.01	-1.46	0.11	-1.37	29.55	PASS
1	149	5745	-5.15	3.01	-2.14	0.11	-2.05	29.55	PASS
	157	5785	-5.22	3.01	-2.21	0.11	-2.12	29.55	PASS
	165	5825	-6.00	3.01	-2.99	0.11	-2.90	29.55	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 = $3.44\text{dBi} + 10\log(2) = 6.45\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(6.45-6) = 29.55\text{dBm}$.
- 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	-7.42	3.01	-4.41	0.33	-4.12	29.55	PASS
	159	5795	-6.88	3.01	-3.87	0.33	-3.58	29.55	PASS
1	151	5755	-8.56	3.01	-5.55	0.33	-5.26	29.55	PASS
	159	5795	-7.55	3.01	-4.54	0.33	-4.25	29.55	PASS

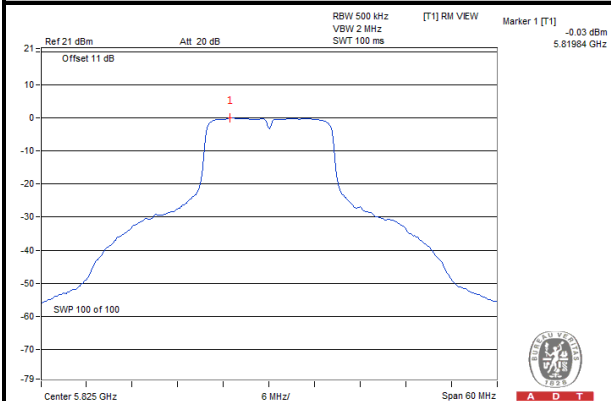
NOTE:

- 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 = $3.44\text{dBi} + 10\log(2) = 6.45\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(6.45-6) = 29.55\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

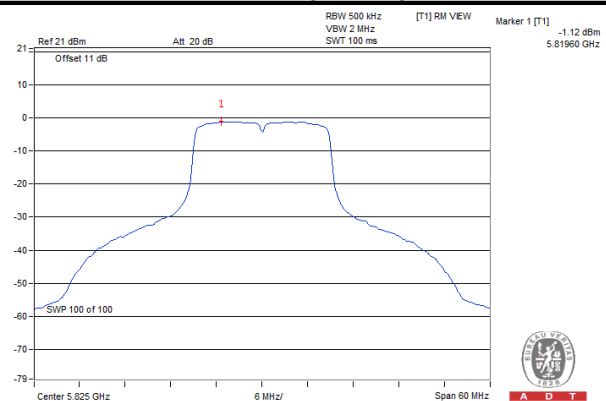
MODE A

SPECTRUM PLOT OF WORST VALUE

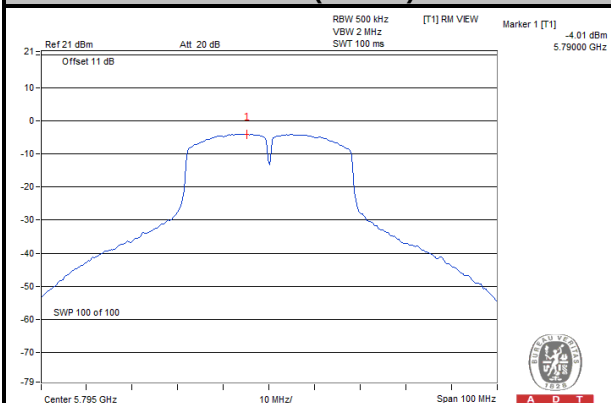
802.11a



802.11n (20MHz)



802.11n (40MHz)





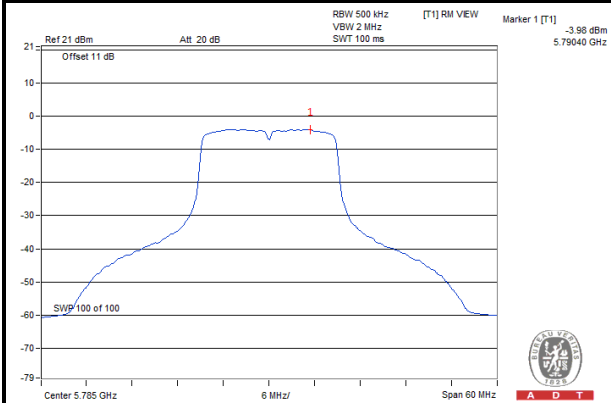
A D T

MODE C

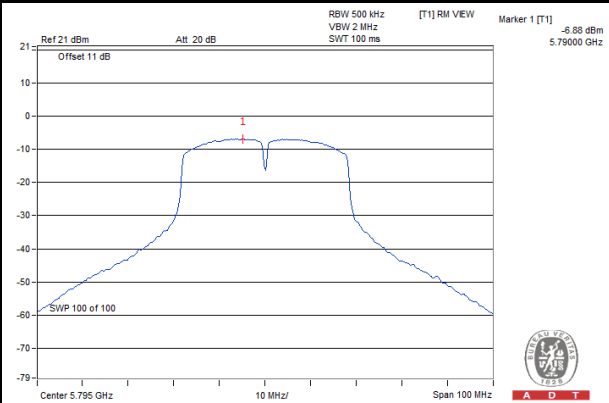
SPECTRUM PLOT OF WORST VALUE

Chain 0

802.11n (20MHz)

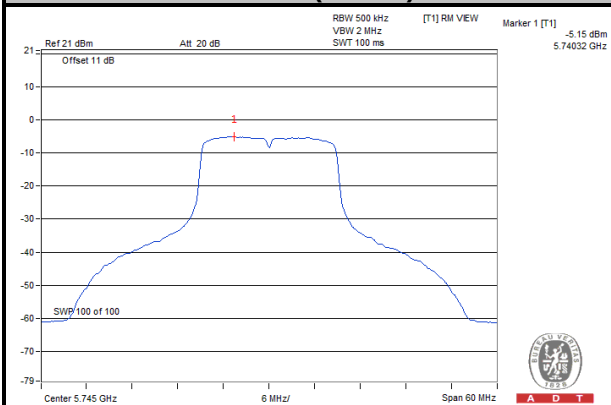


802.11n (40MHz)

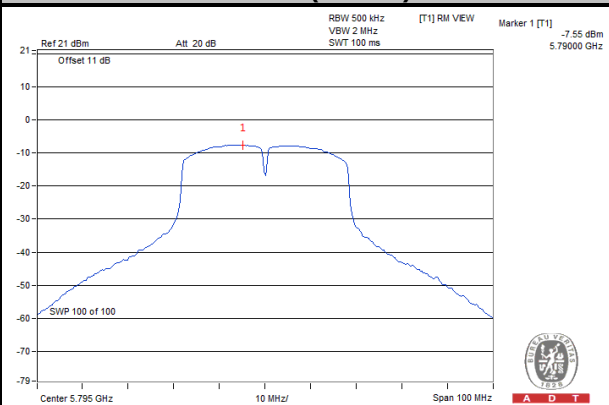


Chain 1

802.11n (20MHz)



802.11n (40MHz)

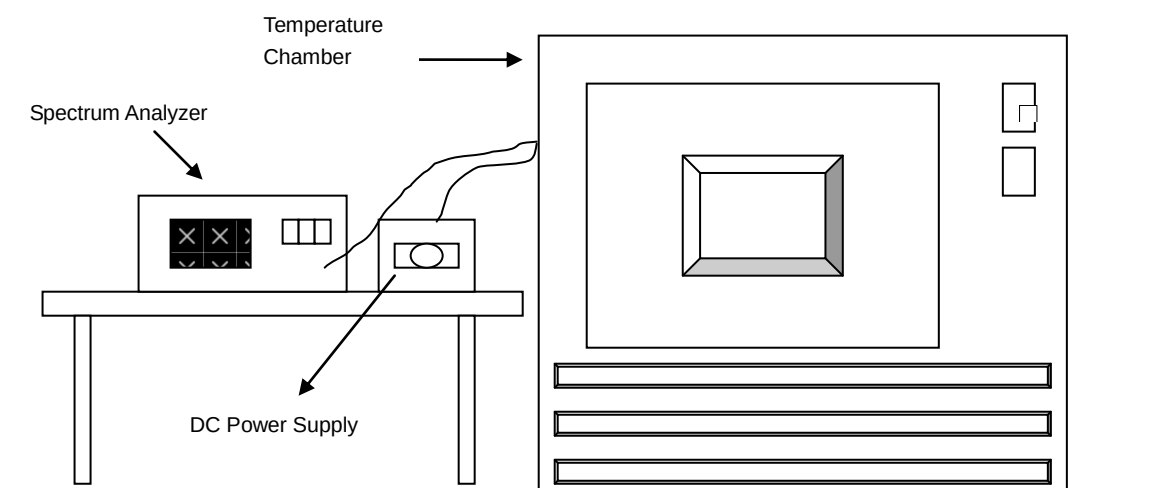


4.5 FREQUENCY STABILITY

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	5180.036851	7.114	5180.036948	7.133	5180.037195	7.181	5180.037123	7.167
40	5.0	5180.036740	7.093	5180.036696	7.084	5180.036905	7.125	5180.036596	7.065
30	5.0	5180.038503	7.433	5180.039070	7.542	5180.038580	7.448	5180.038304	7.395
20	5.0	5180.038908	7.511	5180.039494	7.624	5180.039294	7.586	5180.038885	7.507
10	5.0	5180.040533	7.825	5180.040459	7.811	5180.040243	7.769	5180.040633	7.844
0	5.0	5180.039851	7.693	5180.039423	7.611	5180.039967	7.716	5180.039862	7.695
-10	5.0	5180.037747	7.287	5180.037658	7.270	5180.038068	7.349	5180.037953	7.327
-20	5.0	5180.037511	7.242	5180.037570	7.253	5180.037423	7.225	5180.037485	7.236
-30	5.0	5180.036469	7.040	5180.036360	7.019	5180.036597	7.065	5180.036144	6.978

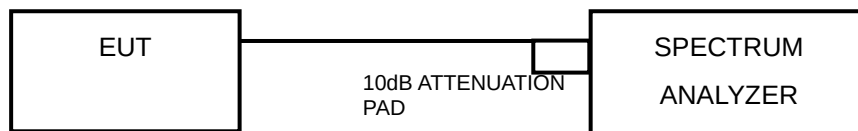
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5180MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	4.5	5320.038515	7.240	5320.038902	7.312	5320.038982	7.327	5320.038788	7.291
	5.0	5320.038969	7.325	5320.038916	7.315	5320.039256	7.379	5320.038704	7.275
	5.50	5320.040474	7.608	5320.040694	7.649	5320.040070	7.532	5320.040212	7.559

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	15.83	0.5	PASS
157	5785	15.98	0.5	PASS
165	5825	15.59	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.83	0.5	PASS
157	5785	16.81	0.5	PASS
165	5825	16.80	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	33.87	0.5	PASS
159	5795	35.12	0.5	PASS



A D T

MODE C

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.86	16.18	0.5	PASS
157	5785	16.85	16.81	0.5	PASS
165	5825	16.83	15.74	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	35.14	35.04	0.5	PASS
159	5795	35.15	33.85	0.5	PASS

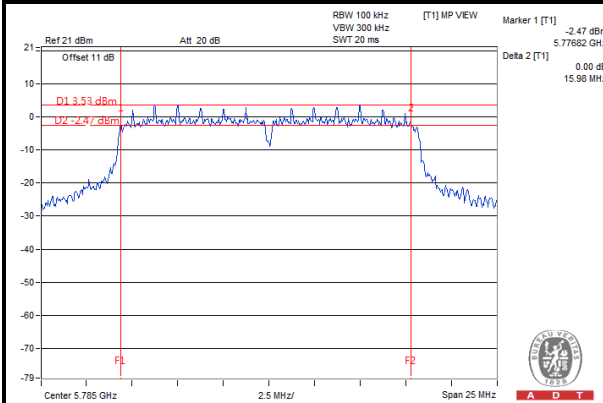


A D T

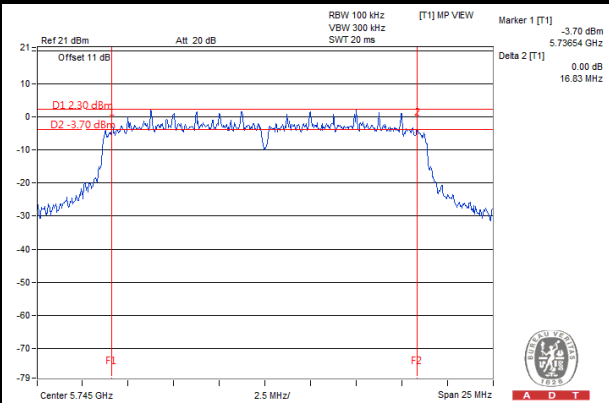
MODE A

SPECTRUM PLOT OF WORST VALUE

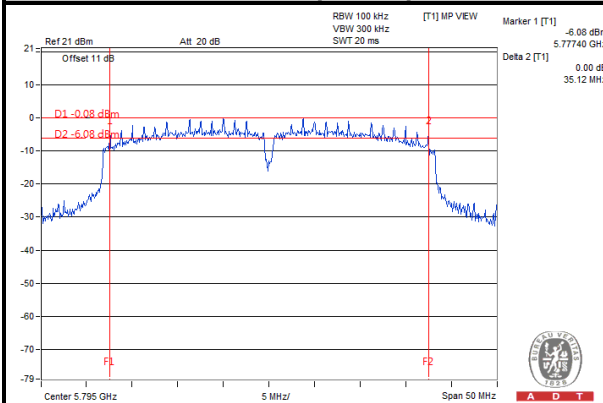
802.11a



802.11n (20MHz)



802.11n (40MHz)





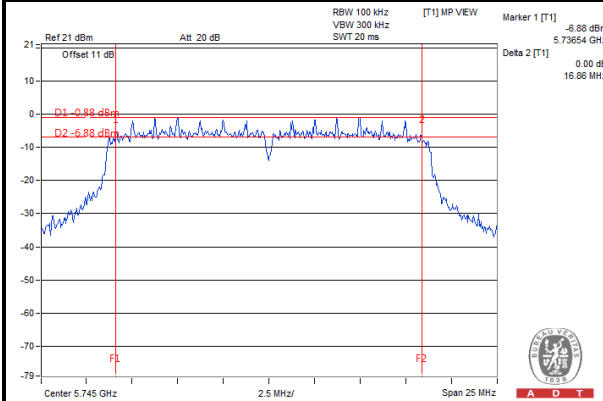
A D T

MODE C

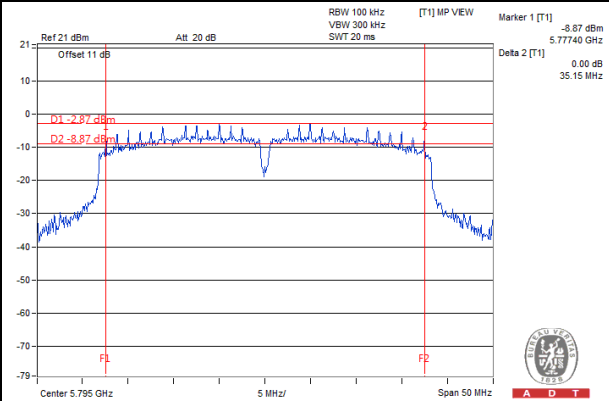
SPECTRUM PLOT OF WORST VALUE

Chain 0

802.11n (20MHz)

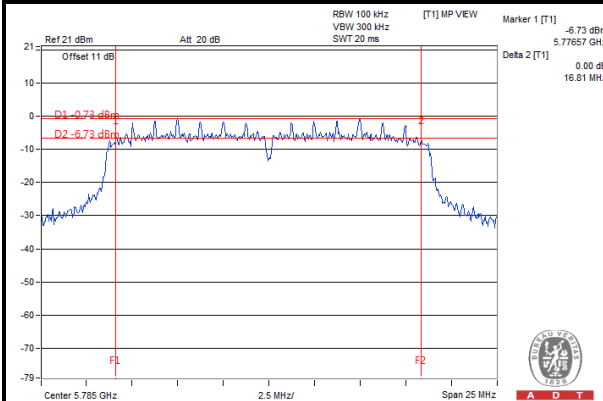


802.11n (40MHz)

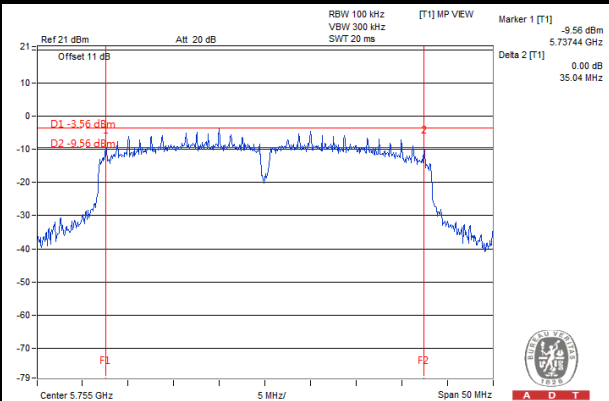


Chain 1

802.11n (20MHz)



802.11n (40MHz)



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---