



FCC TEST REPORT (15.407)

REPORT NO.: RF130829C04-1

MODEL NO.: C7

FCC ID: TE7C7V2

RECEIVED: Aug. 27, 2013

TESTED: Dec. 06, 2013 ~ Mar. 05, 2014

ISSUED: Mar. 06, 2014

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130829C04-1	Original release	Mar. 06, 2014



1. CERTIFICATION

PRODUCT: AC1750 Wireless Dual Band Gigabit Router

MODEL: C7

BRAND: TP-LINK

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

TESTED: Dec. 06, 2013 ~ Mar. 05, 2014

TEST SAMPLE: PRODUCTION SAMPLE

STANDARDS: FCC Part 15, Subpart E (Section 15.407)

ANSI C63.10-2009

The above equipment (model: C7) 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 : Celine Chou , **DATE :** Mar. 06, 2014
Celine Chou / Specialist

APPROVED BY : Ken Liu , **DATE :** Mar. 06, 2014
Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART 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 -19.15dB at 0.15782MHz.
15.407(b)(1/2/3) (b)(6)	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5150.00MHz.
15.407(a)(1/2)	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)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector for PIFA antenna and RP-SMA-F antenna connector for Dipole antenna is not standard connector.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 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	AC1750 Wireless Dual Band Gigabit Router
MODEL NO.	C7
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	256QAM, 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 450.0Mbps 802.11ac: up to 1300.0Mbps
OPERATING FREQUENCY	5180 ~ 5240MHz
NUMBER OF CHANNEL	4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 1 for 802.11ac (80MHz)
OUTPUT POWER	46.873mW
ANTENNA TYPE	Refer to note
ANTENNA CONNECTOR	Refer to note
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter

NOTE:

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

MODULATION MODE	TX FUNCTION
802.11b	3TX
802.11g	3TX
802.11a	3TX
802.11n (20MHz)	3TX
802.11n (40MHz)	3TX
802.11ac (80MHz)	3TX

2. The EUT with follow antennas gain is listed as table below.

Frequency	Ant.	Type	Gain(dBi)	Connector
2.4GHz	1	PIFA	3.81	NA
	2	PIFA	2.44	NA
	3	PIFA	3.67	NA
5GHz	4 ~ 6	Dipole	4.1	RP-SMA-F

3. The EUT consumes power from the following adapter.

BRAND:	Ten Pao International Inc.
MODEL:	S040EU1200250
INPUT:	100-240Vac, 50/60Hz, 1.2A Max
OUTPUT:	12Vdc, 2500mA
POWER LINE:	1.5m cable without core attached on adapter

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

3.2 DESCRIPTION OF TEST MODES

FOR 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

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

CHANNEL	FREQUENCY
42	5210MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **RE \geq 1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (80MHz)	42	42	OFDM	BPSK	32.5

RADIATED EMISSION TEST (BELOW 1GHz):

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (40MHz)	38 to 46	46	OFDM	BPSK	15.0

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (40MHz)	38 to 46	46	OFDM	BPSK	15.0

ANTENNA PORT CONDUCTED MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (20MHz)	36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (40MHz)	38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (80MHz)	42	42	OFDM	BPSK	32.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
RE $<$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

3.3 DUTY CYCLE OF TEST SIGNAL

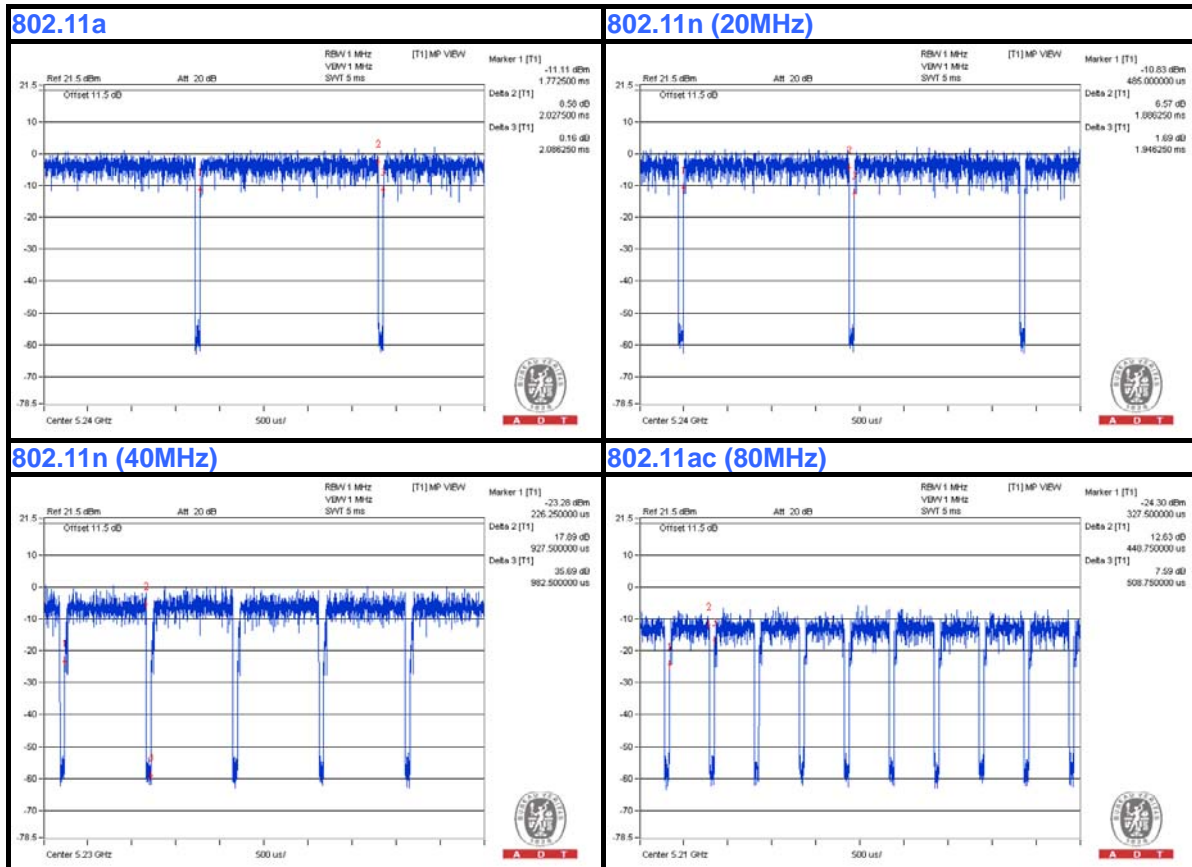
MODULATION TYPE: BPSK

802.11a: Duty cycle = $2.027/2.086 = 0.972$, Duty factor = $10 * \log(1/0.972) = 0.12$

802.11n (20MHz): Duty cycle = $1.886/1.946 = 0.969$, Duty factor = $10 * \log(1/0.969) = 0.14$

802.11n (40MHz): Duty cycle = $0.927/0.982 = 0.944$, Duty factor = $10 * \log(1/0.944) = 0.25$

802.11ac (80MHz): Duty cycle = $0.449/0.509 = 0.882$, Duty factor = $10 * \log(1/0.882) = 0.54$





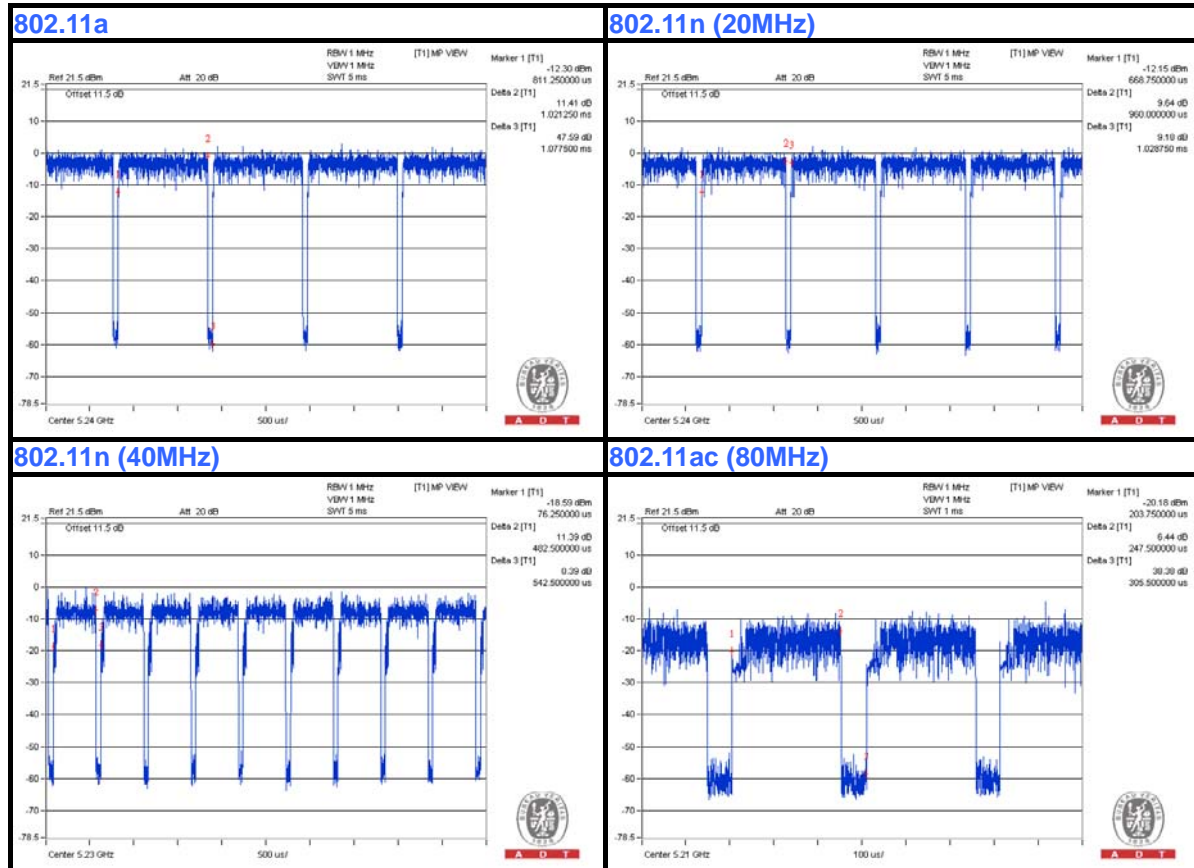
MODULATION TYPE: QPSK

802.11a: Duty cycle = $1.021/1.077 = 0.948$, Duty factor = $10 * \log(1/0.948) = 0.23$

802.11n (20MHz): Duty cycle = $0.960/1.029 = 0.933$, Duty factor = $10 * \log(1/0.933) = 0.30$

802.11n (40MHz): Duty cycle = $0.482/0.542 = 0.889$, Duty factor = $10 * \log(1/0.889) = 0.51$

802.11ac (80MHz): Duty cycle = $0.247/0.305 = 0.810$, Duty factor = $10 * \log(1/0.810) = 0.92$





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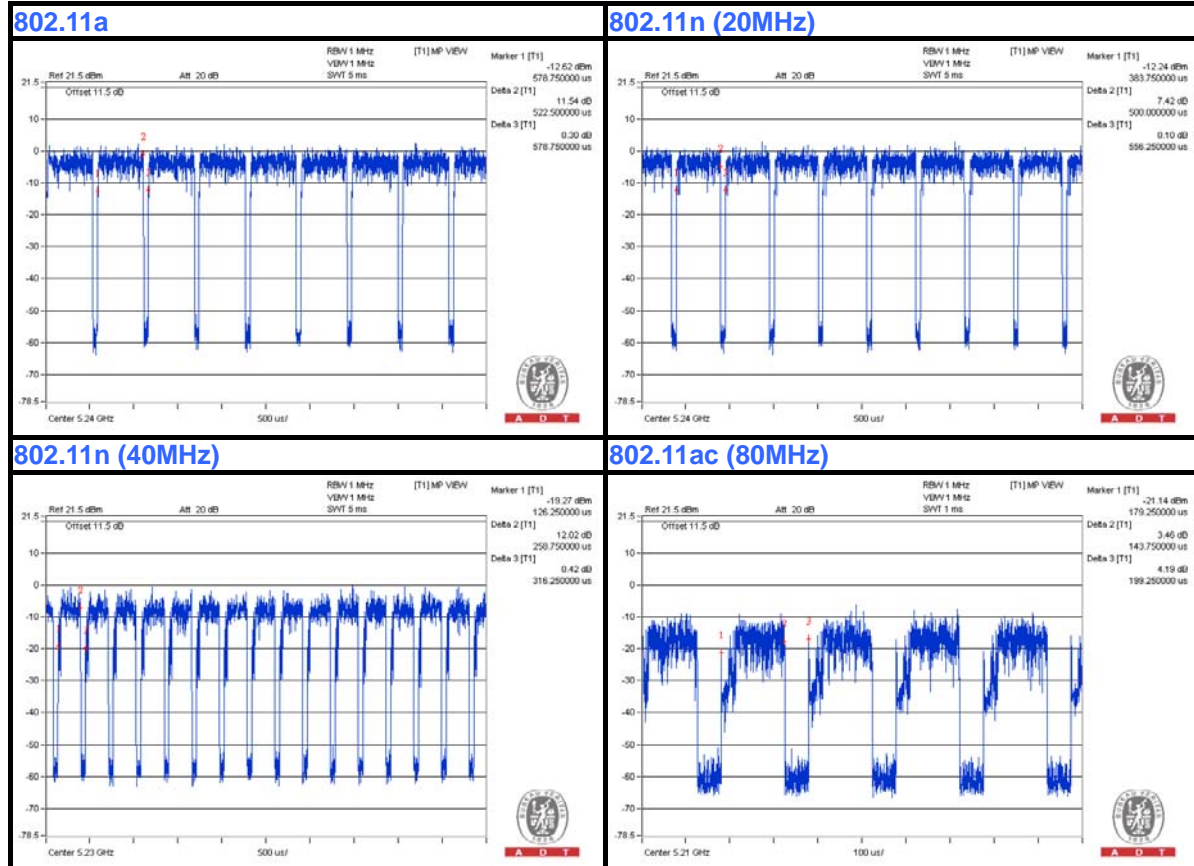
MODULATION TYPE: 16QAM

802.11a: Duty cycle = $0.522/0.579 = 0.902$, Duty factor = $10 * \log(1/0.902) = 0.45$

802.11n (20MHz): Duty cycle = $0.500/0.556 = 0.899$, Duty factor = $10 * \log(1/0.899) = 0.46$

802.11n (40MHz): Duty cycle = $0.259/0.316 = 0.820$, Duty factor = $10 * \log(1/0.820) = 0.86$

802.11ac (80MHz): Duty cycle = $0.144/0.199 = 0.724$, Duty factor = $10 * \log(1/0.724) = 1.40$



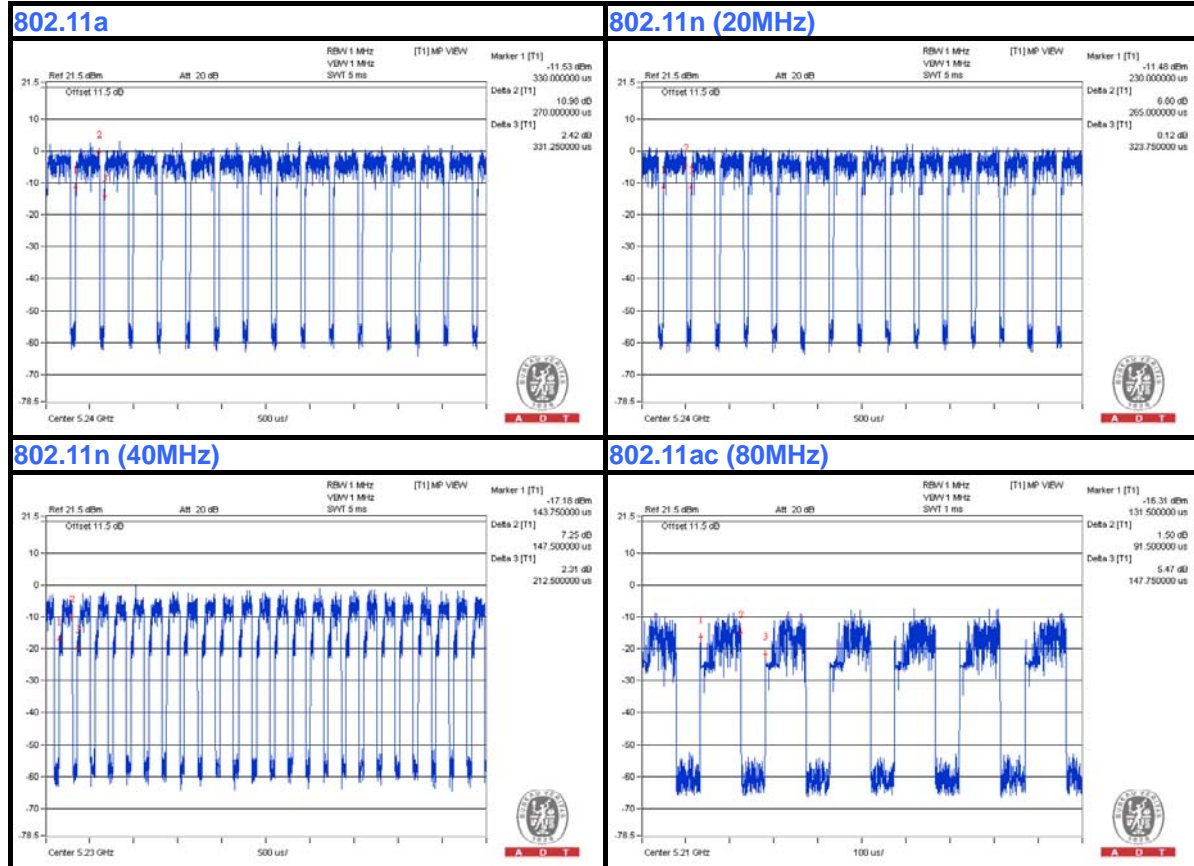
MODULATION TYPE: 64QAM

802.11a: Duty cycle = $0.270/0.331 = 0.816$, Duty factor = $10 * \log(1/0.816) = 0.88$

802.11n (20MHz): Duty cycle = $0.265/0.324 = 0.818$, Duty factor = $10 * \log(1/0.818) = 0.87$

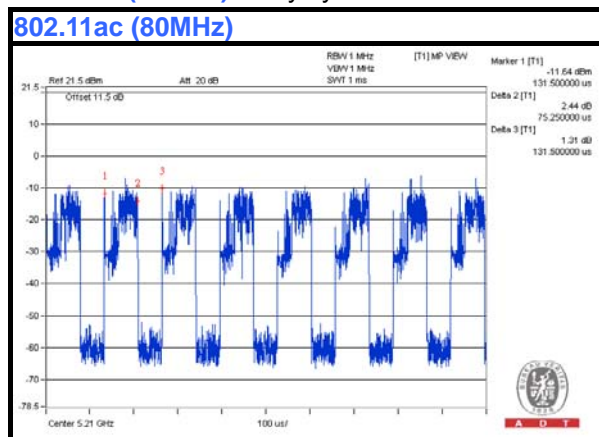
802.11n (40MHz): Duty cycle = $0.148/0.213 = 0.695$, Duty factor = $10 * \log(1/0.695) = 1.58$

802.11ac (80MHz): Duty cycle = $0.092/0.148 = 0.622$, Duty factor = $10 * \log(1/0.622) = 2.06$



MODULATION TYPE: 256QAM

802.11ac (80MHz): Duty cycle = $0.075/0.131 = 0.568$, Duty factor = $10 * \log(1/0.568) = 2.46$



3.4 DESCRIPTION OF SUPPORT UNITS

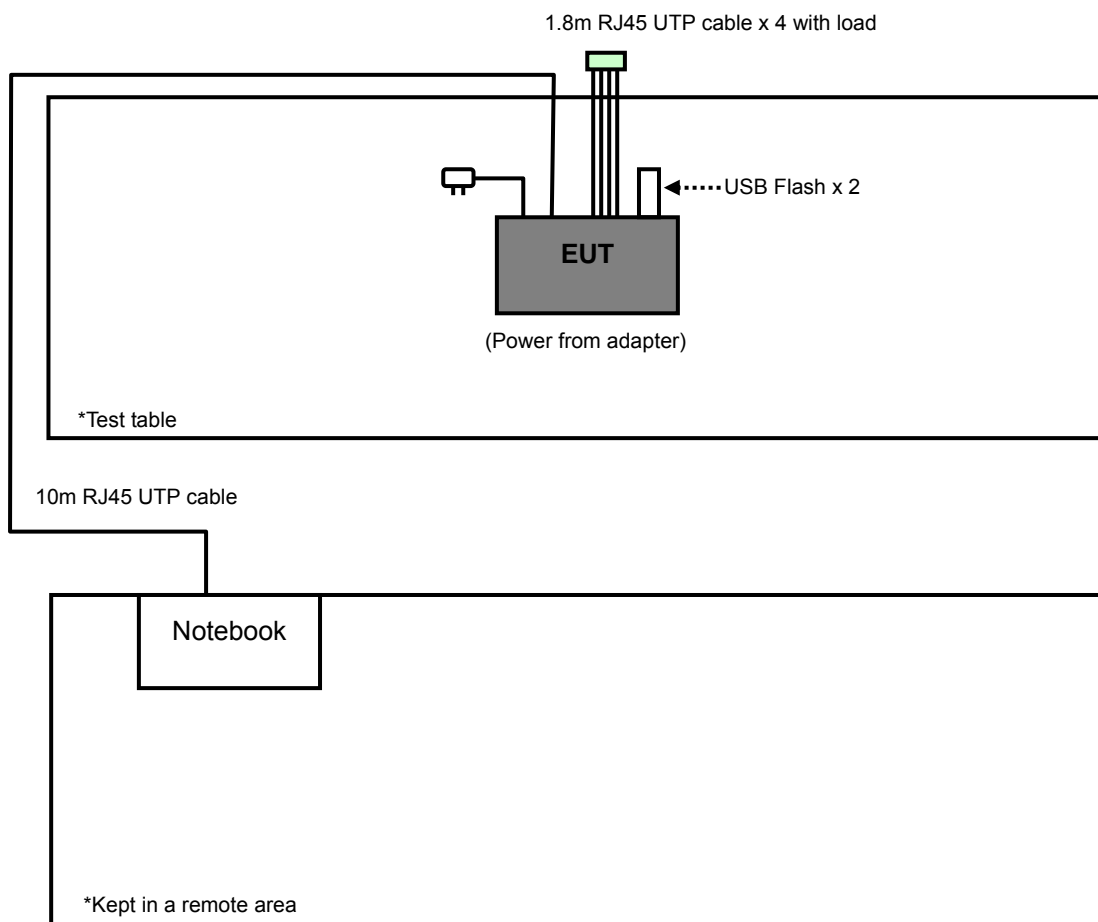
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	USB Flash Drive	Transcend	V85	538455 4490	FCC DoC Approved
2	USB Flash Drive	Lenovo	F310	OA0427594500756	FCC DoC Approved
3	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	3m LAN cable

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

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



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 D01 General UNII Test Procedures v01 r03

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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

4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

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

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

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

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2013	Jan. 01, 2014
			Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jan. 31, 2013	Jan. 30, 2014
			Jan. 31, 2014	Jan. 30, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Mar. 20, 2013	Mar. 19, 2014
HORN Antenna SCHWARZBECK	9120D	209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2013	Oct. 06, 2014
Preamplifier Agilent	8449B	3008A01964	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/ 4	Aug. 26, 2013	Aug. 25, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2013	Oct. 17, 2014
High Speed Peak Power Meter	ML2495A	0824012	Aug. 22, 2013	Aug. 21, 2014
Power Sensor	MA2411B	0738171	Jul. 30, 2013	Jul. 29, 2014
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 13, 2013	Jun. 12, 2014

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 3.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 988962.
 5. The IC Site Registration No. is IC 7450F-3.

4.1.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

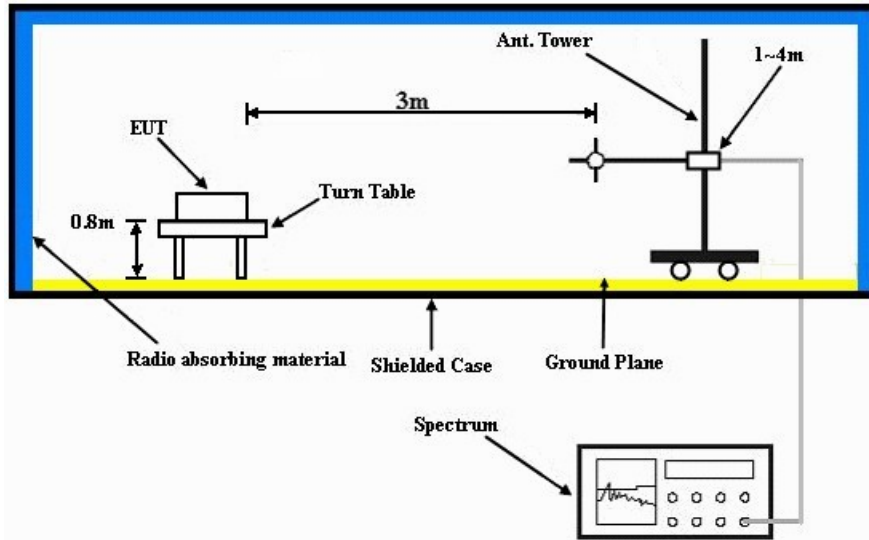
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

4.1.5 DEVIATION FROM TEST STANDARD

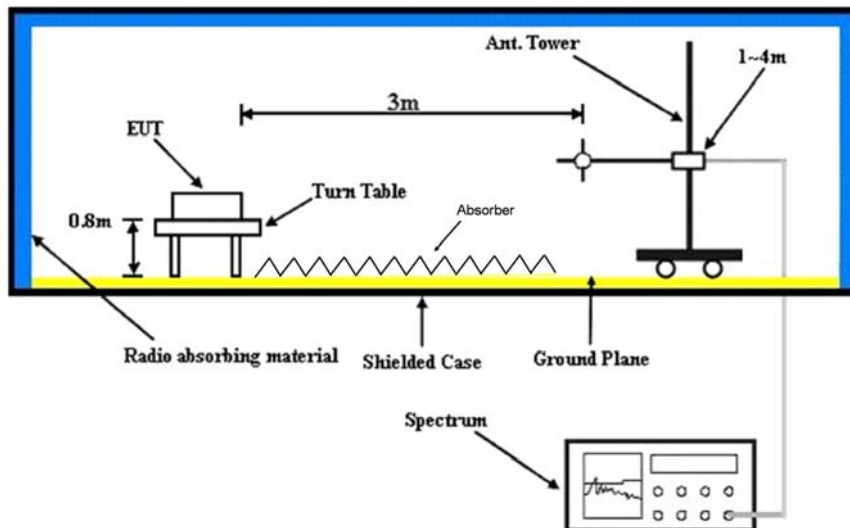
No deviation.

4.1.6 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



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

4.1.7 EUT OPERATING CONDITION

- a. Placed the EUT on the testing table.
- b. Prepared notebook to act as a communication partner and placed it outside of testing area.
- c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- d. The communication partner sent data to EUT by command "PING".

4.1.8 TEST RESULTS

ABOVE 1GHz DATA :

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.3 PK	74.0	-17.7	1.20 H	156	51.20	5.10
2	5150.00	43.8 AV	54.0	-10.2	1.20 H	156	38.70	5.10
3	*5180.00	98.6 PK			1.00 H	135	60.90	37.70
4	*5180.00	88.4 AV			1.00 H	135	50.70	37.70
5	#10360.00	58.1 PK	74.0	-15.9	1.36 H	54	40.60	17.50
6	#10360.00	47.2 AV	54.0	-6.8	1.36 H	54	29.70	17.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.5 PK	74.0	-17.5	1.17 V	150	51.40	5.10
2	5150.00	45.7 AV	54.0	-8.3	1.17 V	150	40.60	5.10
3	*5180.00	112.9 PK			1.00 V	356	75.20	37.70
4	*5180.00	103.2 AV			1.00 V	356	65.50	37.70
5	#10360.00	60.5 PK	74.0	-13.5	1.08 V	64	43.00	17.50
6	#10360.00	49.1 AV	54.0	-4.9	1.08 V	64	31.60	17.50

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	100.2 PK			1.00 H	136	62.40	37.80
2	*5200.00	89.2 AV			1.00 H	136	51.40	37.80
3	#10400.00	57.8 PK	74.0	-16.2	1.23 H	228	40.00	17.80
4	#10400.00	46.8 AV	54.0	-7.2	1.23 H	228	29.00	17.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	111.5 PK			1.10 V	357	73.70	37.80
2	*5200.00	101.6 AV			1.10 V	357	63.80	37.80
3	#10400.00	59.9 PK	74.0	-14.1	1.06 V	87	42.10	17.80
4	#10400.00	48.8 AV	54.0	-5.2	1.06 V	87	31.00	17.80

REMARKS:

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	98.3 PK			1.00 H	18	60.40	37.90
2	*5240.00	88.2 AV			1.00 H	18	50.30	37.90
3	5350.00	56.0 PK	74.0	-18.0	1.10 H	30	50.60	5.40
4	5350.00	44.1 AV	54.0	-9.9	1.10 H	30	38.70	5.40
5	#10480.00	59.3 PK	74.0	-14.7	1.33 H	147	41.00	18.30
6	#10480.00	48.0 AV	54.0	-6.0	1.33 H	147	29.70	18.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.7 PK			1.00 V	355	75.80	37.90
2	*5240.00	103.5 AV			1.00 V	355	65.60	37.90
3	5350.00	56.9 PK	74.0	-17.1	1.34 V	5	51.50	5.40
4	5350.00	46.0 AV	54.0	-8.0	1.34 V	5	40.60	5.40
5	#10480.00	60.9 PK	74.0	-13.1	1.15 V	207	42.60	18.30
6	#10480.00	49.5 AV	54.0	-4.5	1.15 V	207	31.20	18.30

REMARKS:

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

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.7 PK	74.0	-18.3	1.10 H	215	50.60	5.10
2	5150.00	43.7 AV	54.0	-10.3	1.10 H	215	38.60	5.10
3	*5180.00	99.6 PK			1.00 H	207	61.90	37.70
4	*5180.00	89.8 AV			1.00 H	207	52.10	37.70
5	#10360.00	57.8 PK	74.0	-16.2	1.52 H	236	40.30	17.50
6	#10360.00	47.7 AV	54.0	-6.3	1.52 H	236	30.20	17.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.3 PK	74.0	-7.7	1.10 V	340	61.20	5.10
2	5150.00	45.8 AV	54.0	-8.2	1.10 V	340	40.70	5.10
3	*5180.00	113.2 PK			1.00 V	358	75.50	37.70
4	*5180.00	102.8 AV			1.00 V	358	65.10	37.70
5	#10360.00	60.2 PK	74.0	-13.8	1.15 V	87	42.70	17.50
6	#10360.00	48.7 AV	54.0	-5.3	1.15 V	87	31.20	17.50

REMARKS:

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



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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	100.2 PK			1.00 H	127	62.40	37.80
2	*5200.00	89.9 AV			1.00 H	127	52.10	37.80
3	#10400.00	58.1 PK	74.0	-15.9	1.32 H	45	40.30	17.80
4	#10400.00	47.7 AV	54.0	-6.3	1.32 H	45	29.90	17.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	113.2 PK			1.00 V	358	75.40	37.80
2	*5200.00	103.2 AV			1.00 V	358	65.40	37.80
3	#10400.00	60.4 PK	74.0	-13.6	1.17 V	146	42.60	17.80
4	#10400.00	49.8 AV	54.0	-4.2	1.17 V	146	32.00	17.80

REMARKS:

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	99.0 PK			1.00 H	127	61.10	37.90
2	*5240.00	89.1 AV			1.00 H	127	51.20	37.90
3	5350.00	56.5 PK	74.0	-17.5	1.16 H	140	51.10	5.40
4	5350.00	44.1 AV	54.0	-9.9	1.16 H	140	38.70	5.40
5	#10480.00	58.6 PK	74.0	-15.4	1.16 H	208	40.30	18.30
6	#10480.00	46.9 AV	54.0	-7.1	1.16 H	208	28.60	18.30
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	113.6 PK			1.08 V	353	75.70	37.90
2	*5240.00	102.9 AV			1.08 V	353	65.00	37.90
3	5350.00	58.0 PK	74.0	-16.0	1.20 V	340	52.60	5.40
4	5350.00	46.7 AV	54.0	-7.3	1.20 V	340	41.30	5.40
5	#10480.00	60.9 PK	74.0	-13.1	1.18 V	54	42.60	18.30
6	#10480.00	49.8 AV	54.0	-4.2	1.18 V	54	31.50	18.30

REMARKS:

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



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.1 PK	74.0	-17.9	1.20 H	162	51.00	5.10
2	5150.00	43.3 AV	54.0	-10.7	1.20 H	162	38.20	5.10
3	*5190.00	97.4 PK			1.00 H	125	59.60	37.80
4	*5190.00	86.7 AV			1.00 H	125	48.90	37.80
5	#10380.00	58.0 PK	74.0	-16.0	1.32 H	148	40.40	17.60
6	#10380.00	47.1 AV	54.0	-6.9	1.32 H	148	29.50	17.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.9 PK	74.0	-11.1	1.00 V	3	57.80	5.10
2	5150.00	50.5 AV	54.0	-3.5	1.00 V	3	45.40	5.10
3	*5190.00	110.0 PK			1.00 V	359	72.20	37.80
4	*5190.00	99.9 AV			1.00 V	359	62.10	37.80
5	#10380.00	59.2 PK	74.0	-14.8	1.15 V	74	41.60	17.60
6	#10380.00	49.2 AV	54.0	-4.8	1.15 V	74	31.60	17.60

REMARKS:

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	97.3 PK			1.00 H	125	59.40	37.90
2	*5230.00	87.1 AV			1.00 H	125	49.20	37.90
3	5350.00	56.4 PK	74.0	-17.6	1.10 H	130	51.00	5.40
4	5350.00	44.4 AV	54.0	-9.6	1.10 H	130	39.00	5.40
5	#10460.00	58.8 PK	74.0	-15.2	1.45 H	221	40.70	18.10
6	#10460.00	47.8 AV	54.0	-6.2	1.45 H	221	29.70	18.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	110.2 PK			1.20 V	358	72.30	37.90
2	*5230.00	99.9 AV			1.20 V	358	62.00	37.90
3	5350.00	59.0 PK	74.0	-15.0	1.36 V	325	53.60	5.40
4	5350.00	45.7 AV	54.0	-8.3	1.36 V	325	40.30	5.40
5	#10460.00	60.7 PK	74.0	-13.3	1.36 V	58	42.60	18.10
6	#10460.00	49.4 AV	54.0	-4.6	1.36 V	58	31.30	18.10

REMARKS:

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

802.11ac (80MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 42	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.1 PK	74.0	-17.9	1.12 H	69	51.00	5.10
2	5150.00	44.1 AV	54.0	-9.9	1.12 H	69	39.00	5.10
3	*5210.00	89.5 PK			1.00 H	9	51.70	37.80
4	*5210.00	78.5 AV			1.00 H	9	40.70	37.80
5	5350.00	57.3 PK	74.0	-16.7	1.55 H	98	51.90	5.40
6	5350.00	44.3 AV	54.0	-9.7	1.55 H	98	38.90	5.40
7	#10420.00	58.9 PK	74.0	-15.1	1.32 H	95	41.00	17.90
8	#10420.00	47.6 AV	54.0	-6.4	1.32 H	95	29.70	17.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.9 PK	74.0	-7.1	1.00 V	13	61.80	5.10
2	5150.00	53.0 AV	54.0	-1.0	1.00 V	13	47.90	5.10
3	*5210.00	102.2 PK			1.00 V	351	64.40	37.80
4	*5210.00	91.7 AV			1.00 V	351	53.90	37.80
5	5350.00	56.3 PK	74.0	-17.7	1.33 V	205	50.90	5.40
6	5350.00	44.8 AV	54.0	-9.2	1.33 V	205	39.40	5.40
7	#10420.00	60.8 PK	74.0	-13.2	1.32 V	69	42.90	17.90
8	#10420.00	48.5 AV	54.0	-5.5	1.32 V	69	30.60	17.90

REMARKS:

- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
– Pre-Amplifier Factor(dB)
- The other emission levels were very low against the limit.
- Margin value = Emission Level – Limit value
- " * ": Fundamental frequency.
- "#":The radiated frequency is out the restricted band.

BELOW 1GHz WORST-CASE DATA : 802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Chris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	208.42	27.2 QP	43.5	-16.3	1.25 H	95	43.90	-16.70
2	375.29	39.1 QP	46.0	-6.9	1.00 H	213	50.00	-10.90
3	600.38	30.8 QP	46.0	-15.2	1.50 H	11	36.90	-6.10
4	749.79	30.4 QP	46.0	-15.6	1.00 H	144	33.60	-3.20
5	875.91	34.9 QP	46.0	-11.1	1.25 H	217	35.90	-1.00
6	961.29	50.2 QP	54.0	-3.8	1.50 H	12	49.50	0.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.07	30.5 QP	40.0	-9.5	1.25 V	344	45.40	-14.90
2	154.09	26.9 QP	43.5	-16.6	1.00 V	163	40.40	-13.50
3	375.29	38.7 QP	46.0	-7.3	1.50 V	190	49.60	-10.90
4	480.07	30.8 QP	46.0	-15.2	1.00 V	155	39.50	-8.70
5	625.60	35.2 QP	46.0	-10.8	1.25 V	270	40.70	-5.50
6	961.29	45.0 QP	54.0	-9.0	1.50 V	194	44.30	0.70

REMARKS:

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

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.2.2 TEST INSTRUMENTS

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

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

4.2.3 TEST PROCEDURES

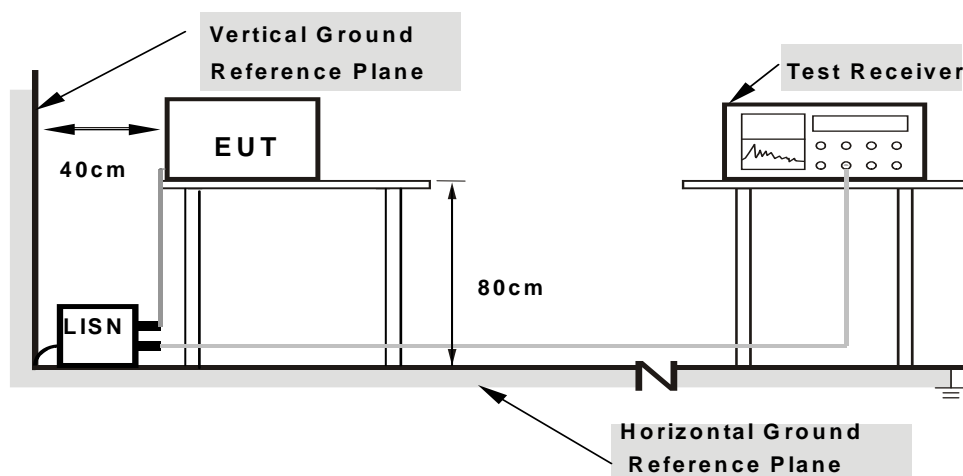
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



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

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

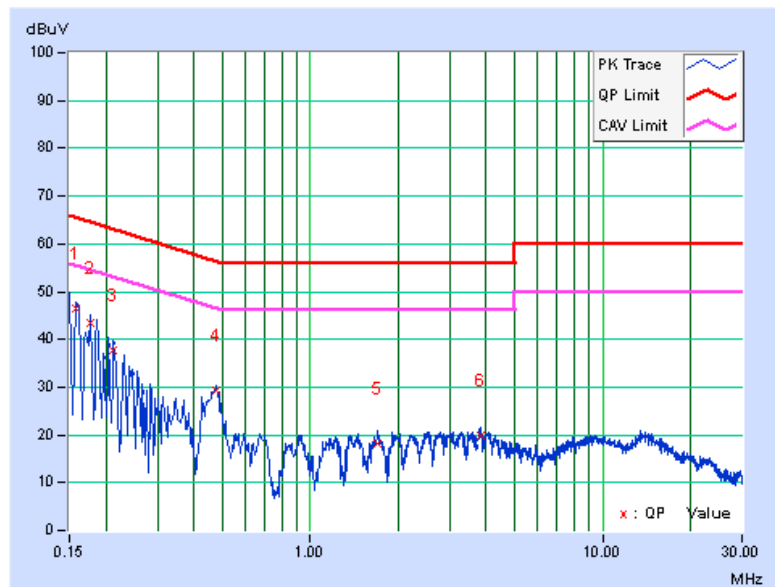
CONDUCTED WORST-CASE DATA : 802.11n (40MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
CHANNEL	Channel 46		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	0.11	46.32	30.27	46.43	30.38	65.58	55.58	-19.15	-25.20
2	0.17737	0.10	43.21	28.59	43.31	28.69	64.61	54.61	-21.30	-25.92
3	0.21256	0.09	37.66	22.77	37.75	22.86	63.10	53.10	-25.35	-30.24
4	0.47789	0.12	29.31	24.96	29.43	25.08	56.38	46.38	-26.94	-21.29
5	1.69836	0.24	17.79	13.97	18.03	14.21	56.00	46.00	-37.97	-31.79
6	3.80585	0.26	19.55	15.11	19.81	15.37	56.00	46.00	-36.19	-30.63

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



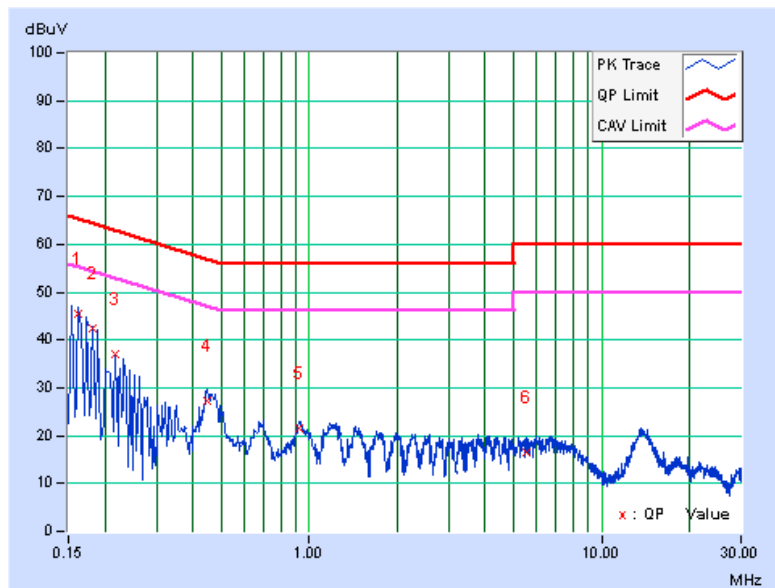


PHASE	Line 2	6dB BANDWIDTH	9kHz
CHANNEL	Channel 46		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16173	0.06	45.25	30.55	45.31	30.61	65.37	55.37	-20.07	-24.77
2	0.18128	0.08	42.47	26.94	42.55	27.02	64.43	54.43	-21.88	-27.41
3	0.21647	0.10	36.91	21.98	37.01	22.08	62.95	52.95	-25.95	-30.88
4	0.44624	0.17	27.08	22.72	27.25	22.89	56.94	46.94	-29.69	-24.05
5	0.92587	0.21	21.20	17.38	21.41	17.59	56.00	46.00	-34.59	-28.41
6	5.52625	0.33	16.08	10.49	16.41	10.82	60.00	50.00	-43.59	-39.18

REMARKS:

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



4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

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

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

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 ≤ 4;

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

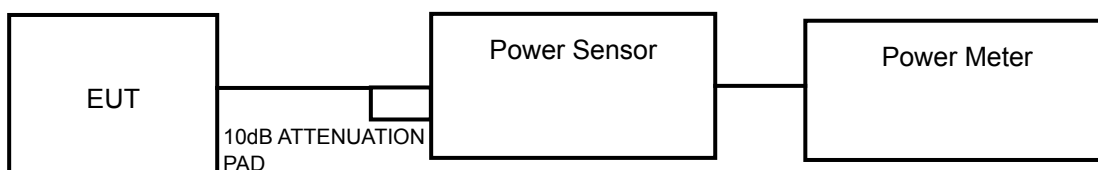
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

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

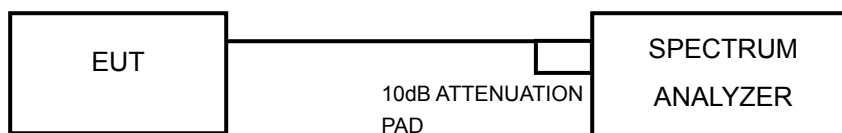
4.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT

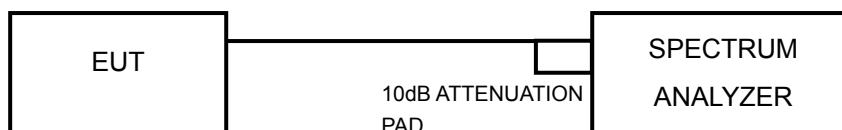
For 802.11a, 802.11n (20MHz), 802.11n (40MHz)



For 802.11ac (80MHz)



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

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

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

For 802.11ac (80MHz)

Method SA-1

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 1 MHz.
- 3) Set VBW \geq 3 MHz.
- 4) Number of points in sweep \geq 2 Span / RBW.
- 5) Sweep time = auto.
- 6) Set trigger to free run (duty cycle \geq 98 percent); Set video trigger (duty cycle $<$ 98 percent)
- 7) Detector = RMS.
- 8) Trace average at least 100 traces in power averaging mode
- 9) Compute power by integrating the spectrum across the 26 dB EBW of the signal.

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:

802.11a

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	9.24	9.69	9.35	26.316	14.20	17	PASS
40	5200	9.56	9.86	9.39	27.409	14.38	17	PASS
48	5240	9.27	8.24	9.24	23.516	13.71	17	PASS

NOTE:

CHAIN 0

1. $4\text{dBm} + 10\log (21.98) = 17.42 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (22.44) = 17.51 > 17\text{dBm}$
3. $4\text{dBm} + 10\log (22.68) = 17.56 > 17\text{dBm}$

CHAIN 1

1. $4\text{dBm} + 10\log (22.37) = 17.50 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (22.18) = 17.46 > 17\text{dBm}$
3. $4\text{dBm} + 10\log (22.29) = 17.48 > 17\text{dBm}$

CHAIN 2

1. $4\text{dBm} + 10\log (22.52) = 17.53 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (21.95) = 17.41 > 17\text{dBm}$
3. $4\text{dBm} + 10\log (23.30) = 17.67 > 17\text{dBm}$

**802.11n (20MHz)**

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
36	5180	9.59	9.95	9.51	27.918	14.46	17	PASS
40	5200	9.74	9.62	9.49	27.473	14.39	17	PASS
48	5240	9.71	9.71	9.68	27.998	14.47	17	PASS

NOTE:**CHAIN 0**

1. $4\text{dBm} + 10\log (23.26) = 17.67 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (23.03) = 17.62 > 17\text{dBm}$
3. $4\text{dBm} + 10\log (22.28) = 17.48 > 17\text{dBm}$

CHAIN 1

1. $4\text{dBm} + 10\log (22.64) = 17.55 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (22.84) = 17.59 > 17\text{dBm}$
3. $4\text{dBm} + 10\log (23.31) = 17.68 > 17\text{dBm}$

CHAIN 2

1. $4\text{dBm} + 10\log (22.55) = 17.53 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (23.34) = 17.68 > 17\text{dBm}$
3. $4\text{dBm} + 10\log (23.18) = 17.65 > 17\text{dBm}$

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
38	5190	12.12	12.19	11.45	46.815	16.70	17	PASS
46	5230	12.01	12.02	11.78	46.873	16.71	17	PASS

NOTE:**CHAIN 0**

1. $4\text{dBm} + 10\log (48.79) = 20.88 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (49.51) = 20.95 > 17\text{dBm}$

CHAIN 1

1. $4\text{dBm} + 10\log (47.37) = 20.76 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (48.58) = 20.86 > 17\text{dBm}$

CHAIN 2

1. $4\text{dBm} + 10\log (48.25) = 20.83 > 17\text{dBm}$
2. $4\text{dBm} + 10\log (49.08) = 20.91 > 17\text{dBm}$



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802.11ac (80MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
42	5210	7.58	7.23	7.03	16.059	12.06	17	PASS

NOTE:

CHAIN 0

$$1.4 \text{ dBm} + 10 \log (93.79) = 23.72 > 17 \text{ dBm}$$

CHAIN 1

$$1.4 \text{ dBm} + 10 \log (93.77) = 23.72 > 17 \text{ dBm}$$

CHAIN 2

$$1.4 \text{ dBm} + 10 \log (94.06) = 23.73 > 17 \text{ dBm}$$



26dB BANDWIDTH:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
36	5180	21.98	22.37	22.52	PASS
40	5200	22.44	22.18	21.95	PASS
48	5240	22.68	22.29	23.30	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
36	5180	23.26	22.64	22.55	PASS
40	5200	23.03	22.84	23.34	PASS
48	5240	22.28	23.31	23.18	PASS

802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
38	5190	48.79	47.37	48.25	PASS
46	5230	49.51	48.58	49.08	PASS

802.11ac (80MHz)

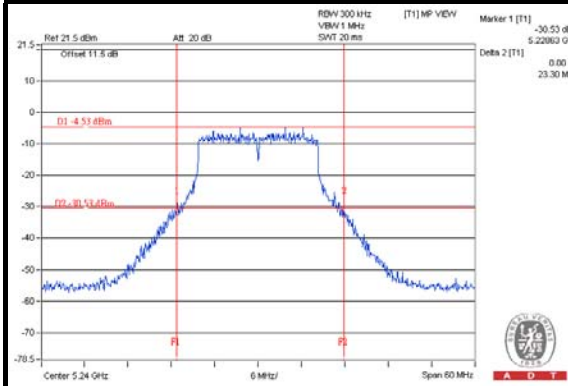
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
42	5210	93.79	93.77	94.06	PASS



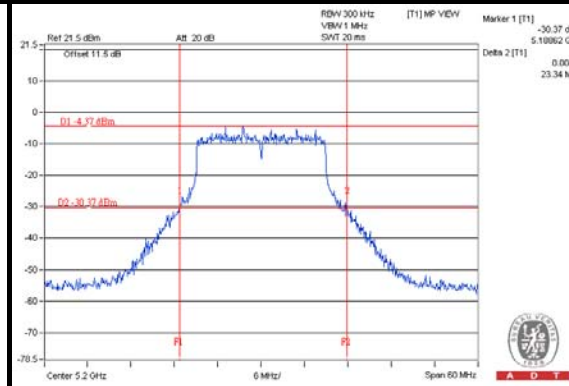
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SPECTRUM PLOT OF WORST VALUE

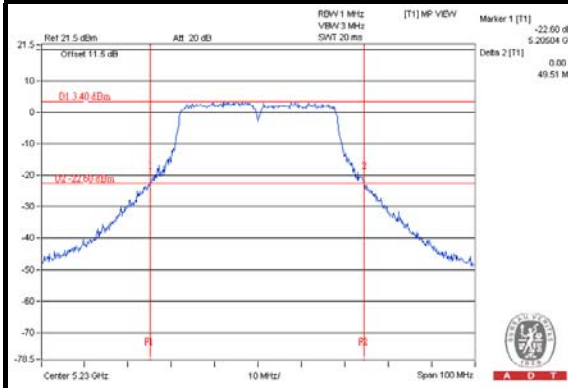
802.11a



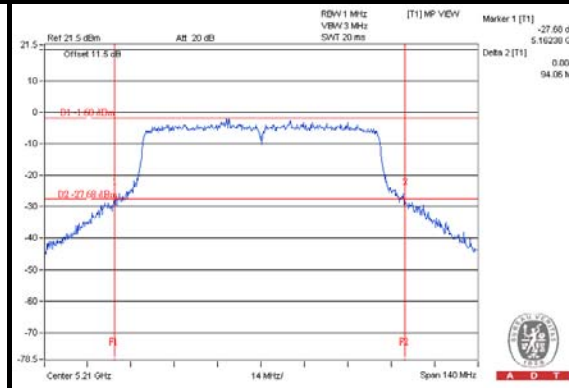
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)

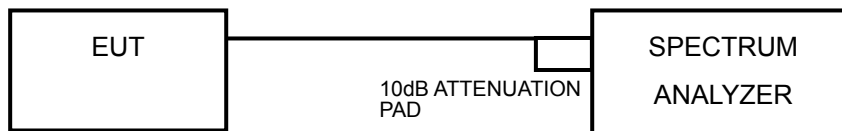


4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.4.4 TEST PROCEDURES

Using method SA-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 = 30ms.
- 5) Perform a single sweep.
- 6) Record the max value

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6.



4.4.7 TEST RESULTS

802.11a

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	CHAIN 2					
36	5180	-5.19	-4.15	-4.28	0.26	0.12	0.38	1.13	PASS
40	5200	-4.22	-3.45	-4.22	0.82	0.12	0.94	1.13	PASS
48	5240	-4.14	-4.58	-4.52	0.36	0.12	0.48	1.13	PASS

NOTE:

1. 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.
2. Directional gain = $4.1\text{dBi} + 10\log(3) = 8.87\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $4-(8.87-6) = 1.13\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

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	CHAIN 2					
36	5180	-3.48	-3.47	-4.65	0.94	0.14	1.08	1.13	PASS
40	5200	-4.13	-4.37	-4.15	0.56	0.14	0.70	1.13	PASS
48	5240	-4.11	-4.41	-4.13	0.56	0.14	0.70	1.13	PASS

NOTE:

1. 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.
2. Directional gain = $4.1\text{dBi} + 10\log(3) = 8.87\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $4-(8.87-6) = 1.13\text{dBm}$.
3. 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	CHAIN 2					
38	5190	-3.14	-3.38	-5.57	0.87	0.25	1.12	1.13	PASS
46	5230	-3.41	-3.14	-5.87	0.79	0.25	1.04	1.13	PASS

NOTE:

1. 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.
2. Directional gain = $4.1\text{dBi} + 10\log(3) = 8.87\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $4-(8.87-6) = 1.13\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

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	CHAIN 2					
42	5210	-12.60	-12.62	-12.81	-7.90	0.54	-7.36	1.13	PASS

NOTE:

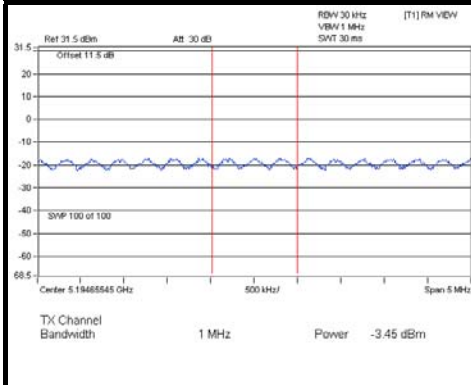
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = $4.1\text{dBi} + 10\log(3) = 8.87\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $4-(8.87-6) = 1.13\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.



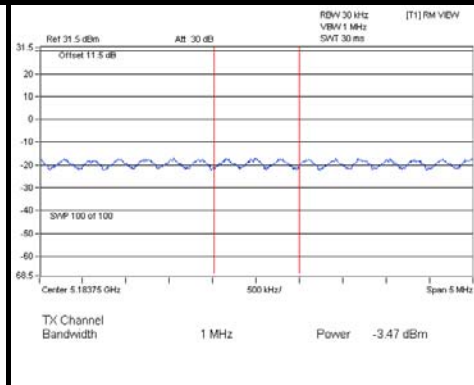
A D T

SPECTRUM PLOT OF WORST VALUE

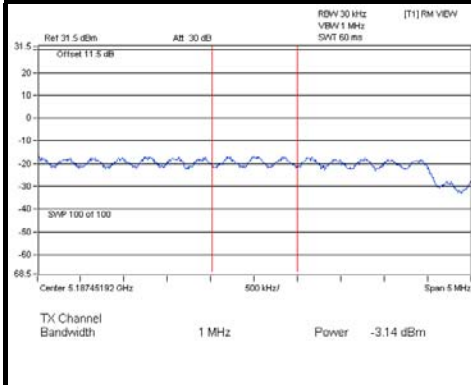
802.11a



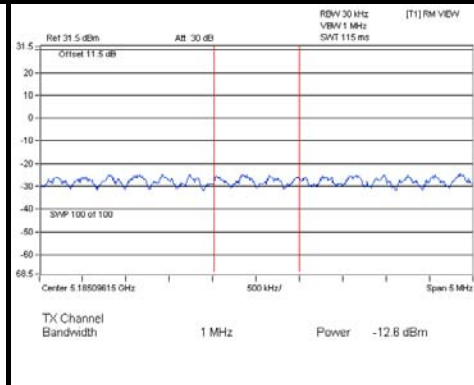
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)

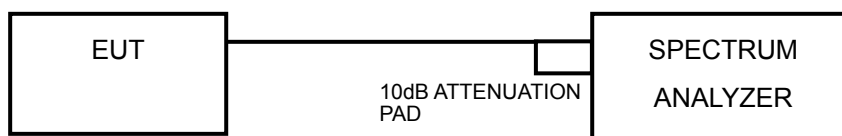


4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Shall not exceed 13 dB.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.5.4 TEST PROCEDURE

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

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

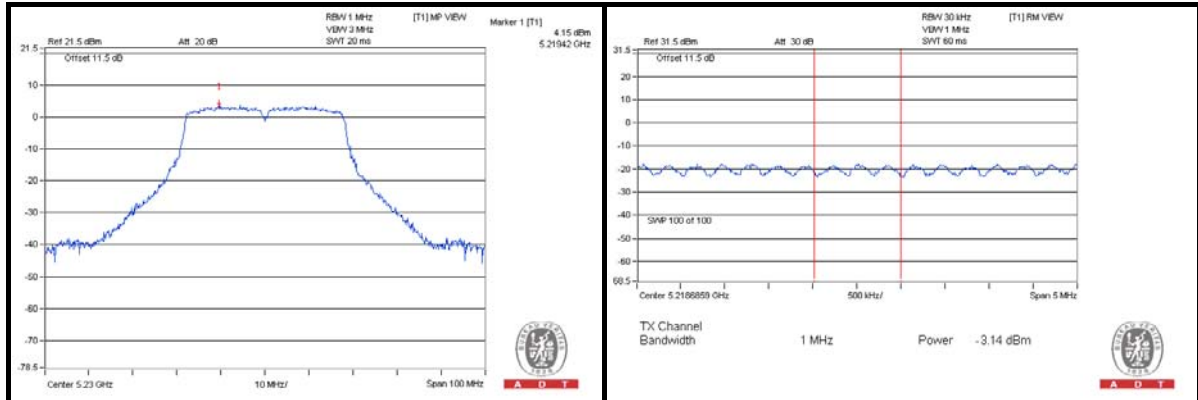
4.5.6 EUT OPERATING CONDITIONS

Same as 4.2.6



4.5.7 TEST RESULTS

MODULATION MODE	MODULATION TYPE	CHANNEL FREQUENCY (MHz)	PEAK VALUE (dBm)	PPSD (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS/ FAIL
802.11a	BPSK	5240	2.74	-4.14	-4.02	13	PASS
	QPSK		3.96	-5.75	-5.52	13	PASS
	16QAM		3.47	-5.71	-5.26	13	PASS
	64QAM		3.98	-6.74	-5.86	13	PASS
802.11n (20MHz)	BPSK	5240	2.37	-4.11	-3.97	13	PASS
	QPSK		3.37	-6.21	-5.91	13	PASS
	16QAM		4.94	-6.32	-5.86	13	PASS
	64QAM		3.92	-7.53	-6.66	13	PASS
802.11n (40MHz)	BPSK	5230	4.15	-3.14	-2.89	13	PASS
	QPSK		3.35	-7.12	-6.61	13	PASS
	16QAM		3.37	-8.00	-7.14	13	PASS
	64QAM		4.28	-8.79	-7.21	13	PASS
802.11ac (80MHz)	BPSK	5210	-2.12	-12.6	-12.06	13	PASS
	QPSK		-1.63	-13.02	-12.10	13	PASS
	16QAM		-1.96	-14.00	-12.60	13	PASS
	64QAM		-1.96	-14.82	-12.76	13	PASS
	256QAM		-2.21	-14.88	-12.42	13	PASS

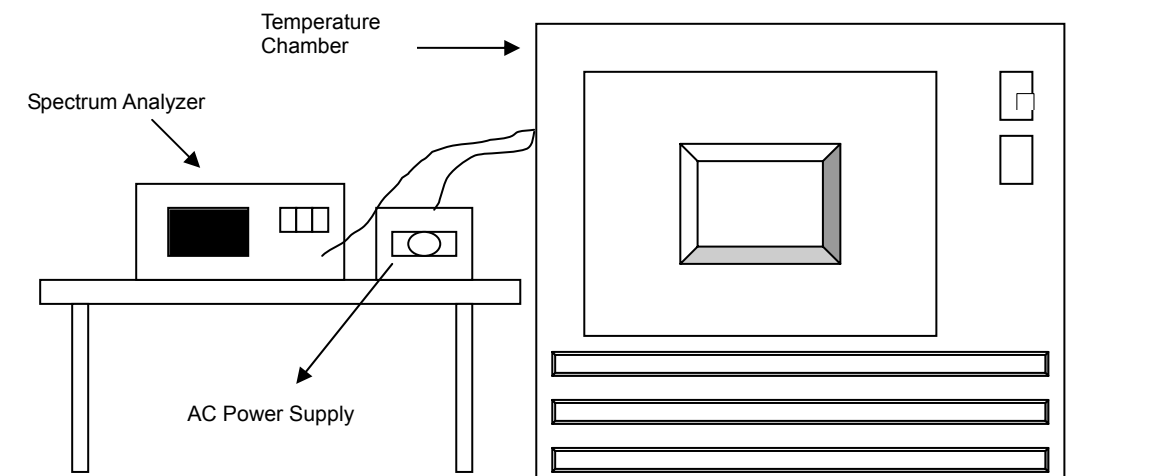


4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.6.4 TEST PROCEDURE

- a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

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

4.6.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5200MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5200.0014	0.00003	5199.9975	-0.00005	5199.9934	-0.00013	5199.9944	-0.00011
40	120	5200.0225	0.00043	5200.0173	0.00033	5200.0256	0.00049	5200.0171	0.00033
30	120	5200.0264	0.00051	5200.0243	0.00047	5200.0299	0.00058	5200.0236	0.00045
20	120	5199.9852	-0.00028	5199.9891	-0.00021	5199.9792	-0.00040	5199.9825	-0.00034
10	120	5200.0022	0.00004	5200.0004	0.00001	5200.003	0.00006	5200.002	0.00004
0	120	5199.9865	-0.00026	5199.9853	-0.00028	5199.9891	-0.00021	5199.986	-0.00027
-10	120	5200.0061	0.00012	5200.0127	0.00024	5200.0107	0.00021	5200.0093	0.00018
-20	120	5200.0208	0.00040	5200.0235	0.00045	5200.021	0.00040	5200.0183	0.00035
-30	120	5200.0048	0.00009	5200.0073	0.00014	5200.0056	0.00011	5200.0068	0.00013

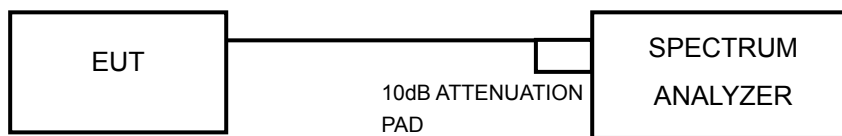
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5200MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5199.9858	-0.00027	5199.9891	-0.00021	5199.9797	-0.00039	5199.9815	-0.00036
	120	5199.9852	-0.00028	5199.9891	-0.00021	5199.9792	-0.00040	5199.9825	-0.00034
	102	5199.9858	-0.00027	5199.9901	-0.00019	5199.9802	-0.00038	5199.9822	-0.00034

4.7 20dBc BANDWIDTH MEASUREMENT

4.7.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

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

4.7.2 TEST SETUP



4.7.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.7.4 TEST PROCEDURE

789033 D01 General UNII Test Procedures v01r03

Emission bandwidth

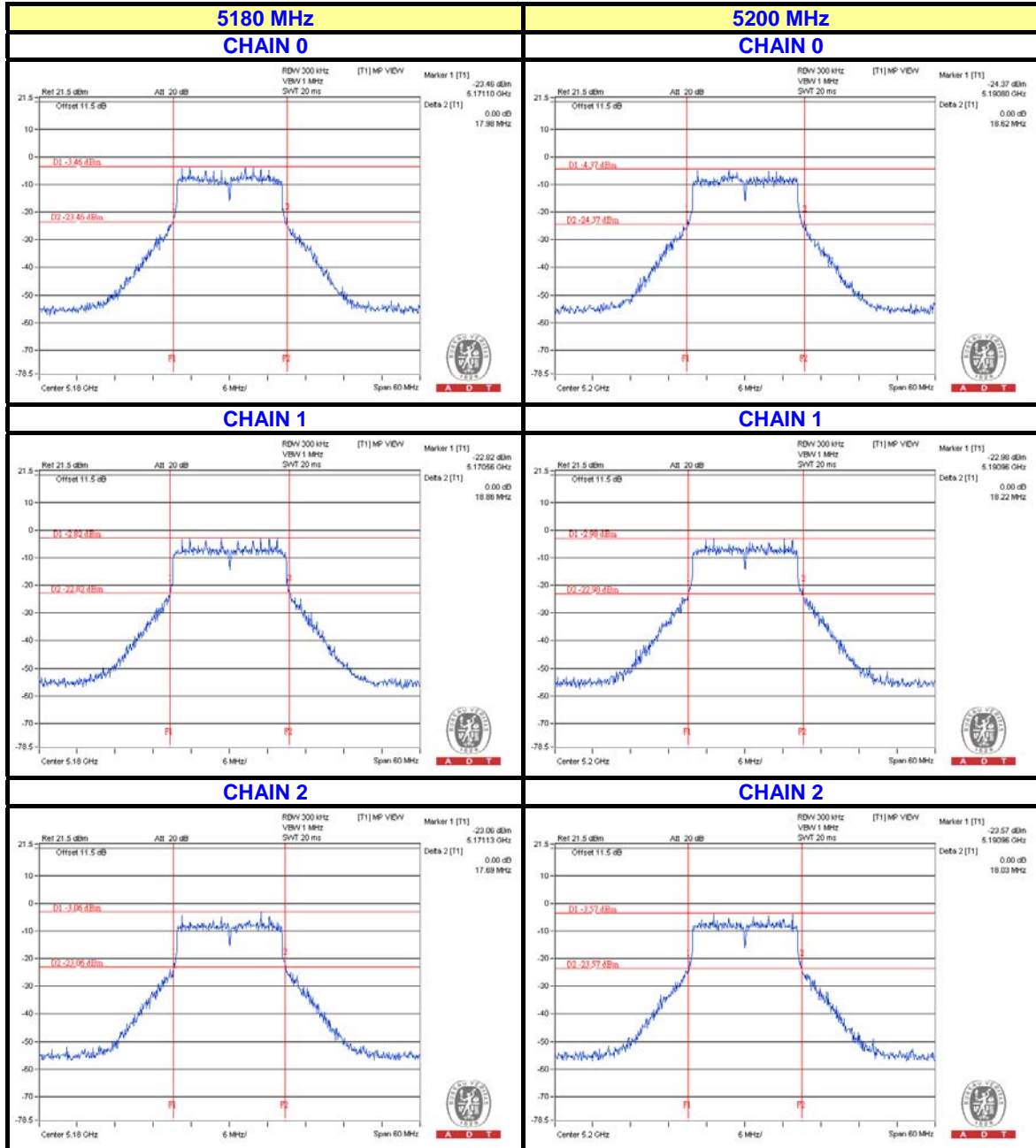
- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 20 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat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



A D T

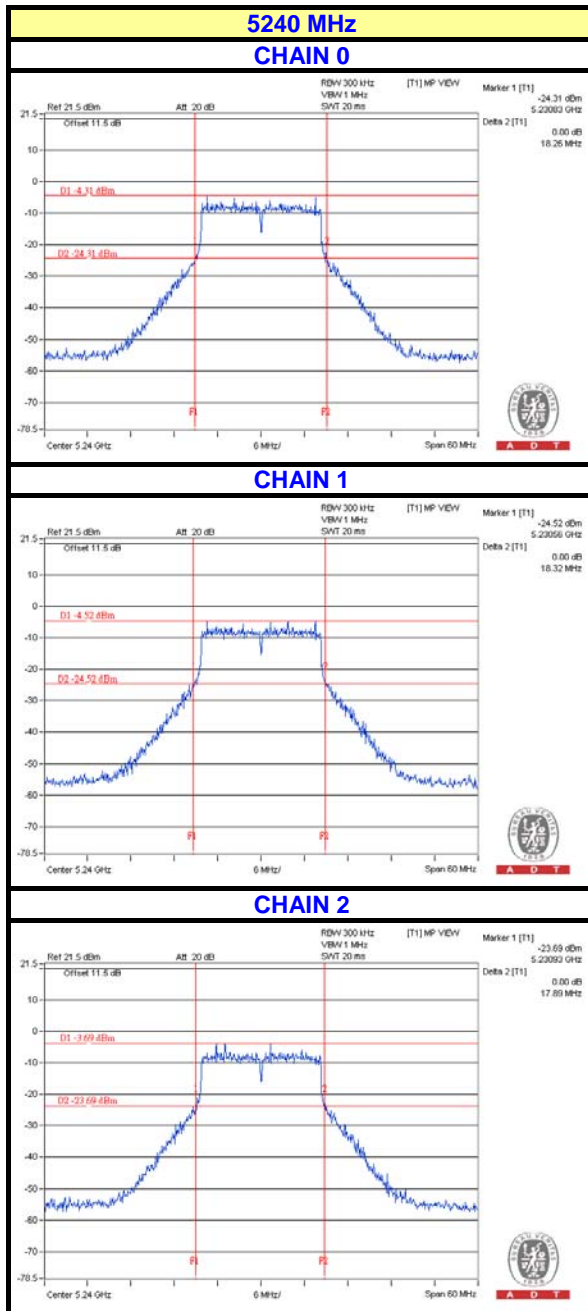
4.7.5 TEST RESULTS

802.11a





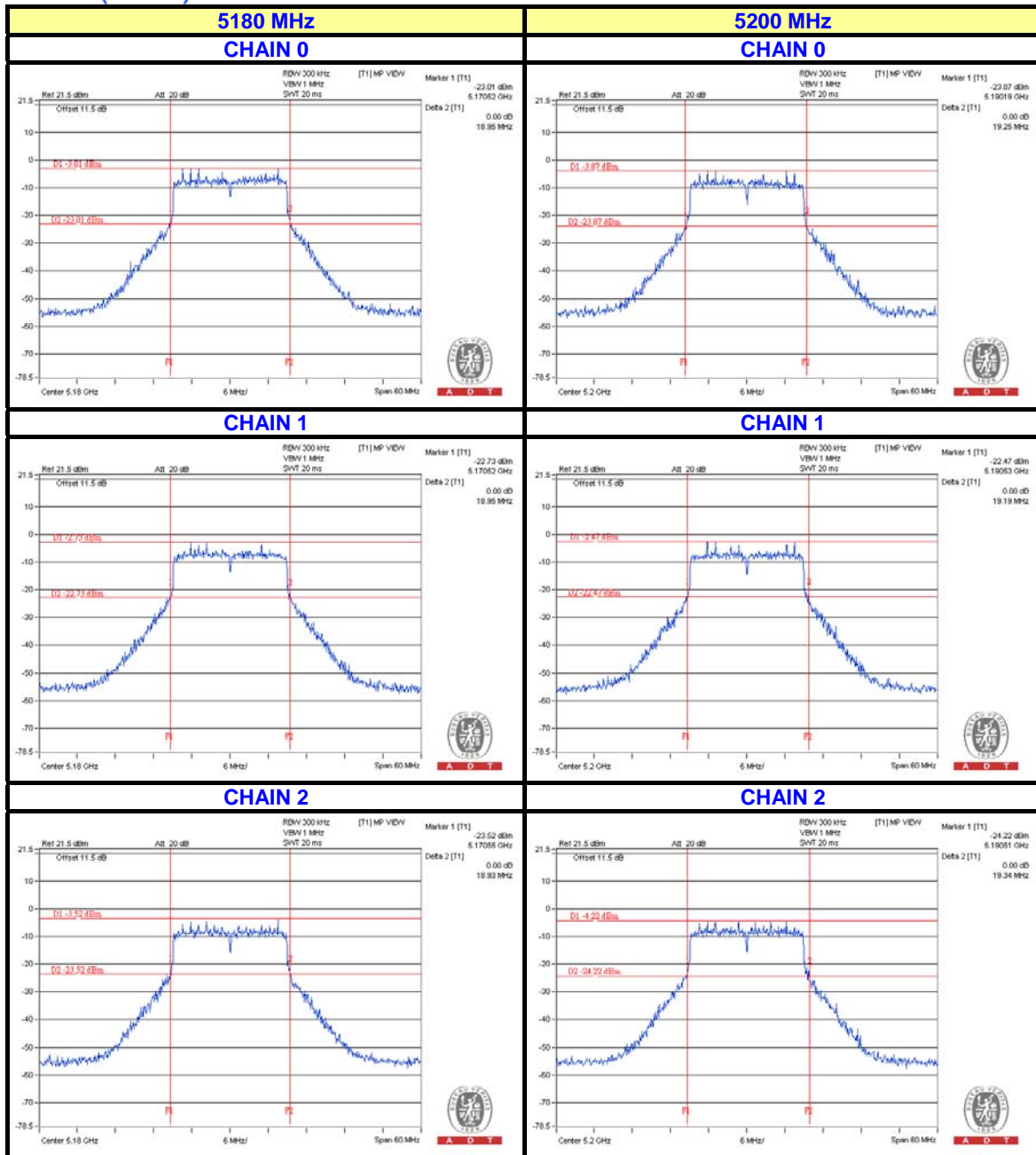
A D T





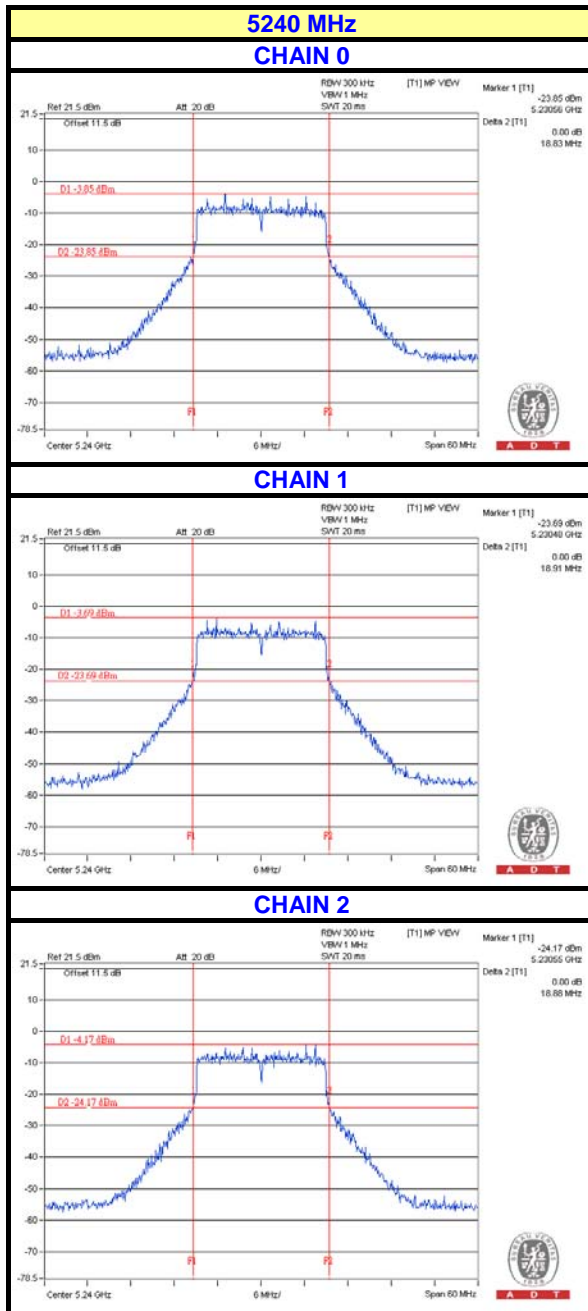
A D T

802.11n (20MHz)





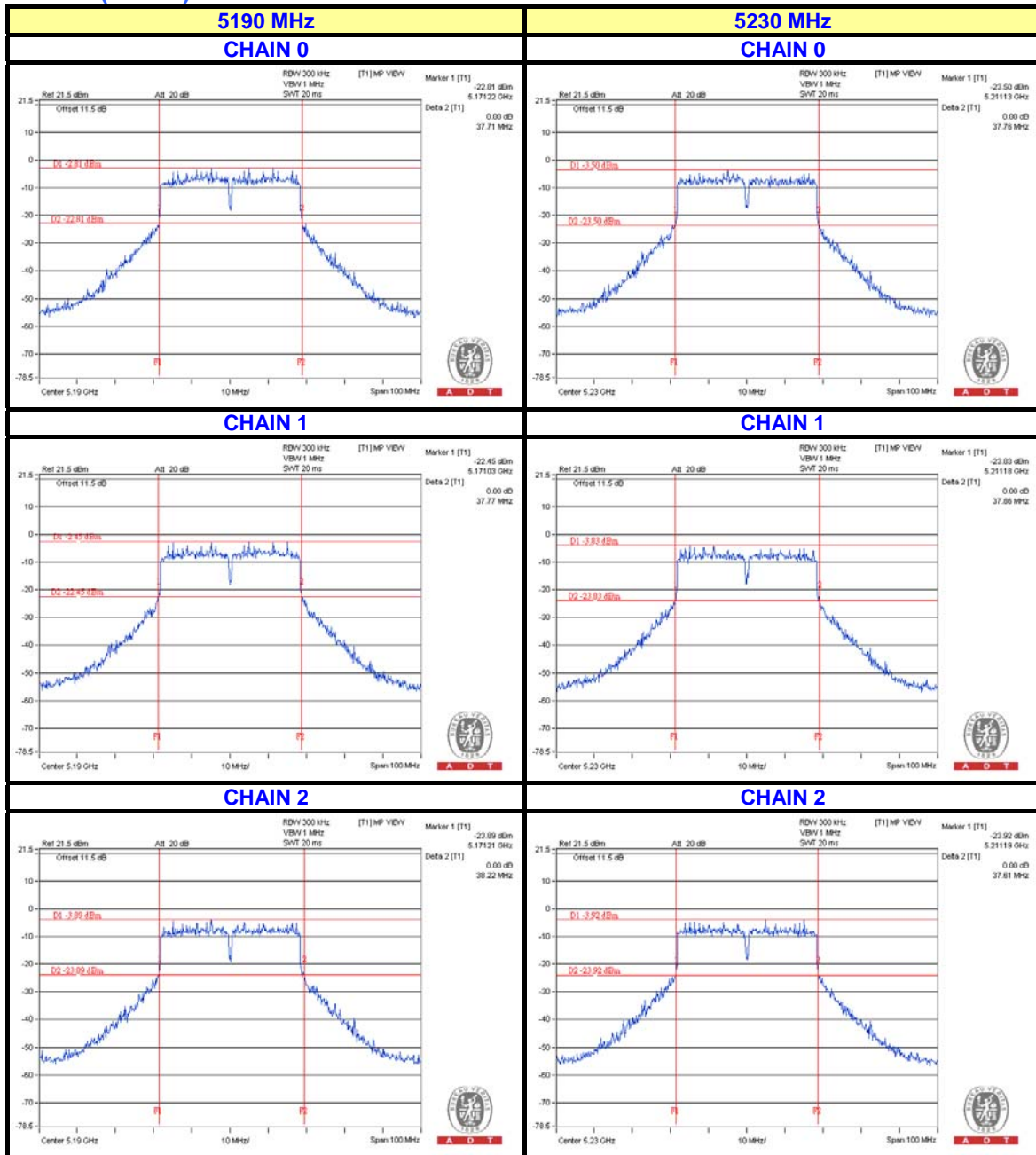
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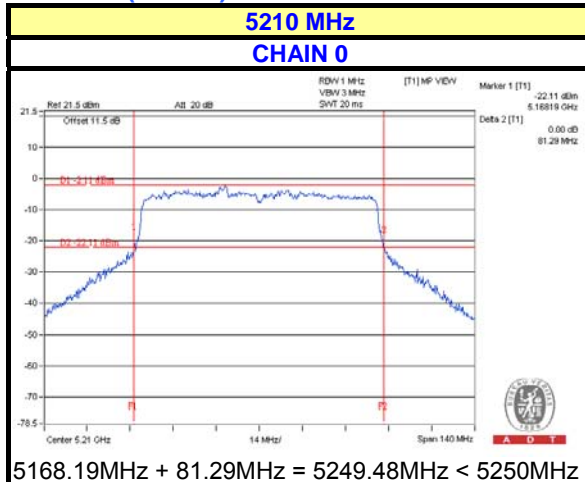
802.11n (40MHz)



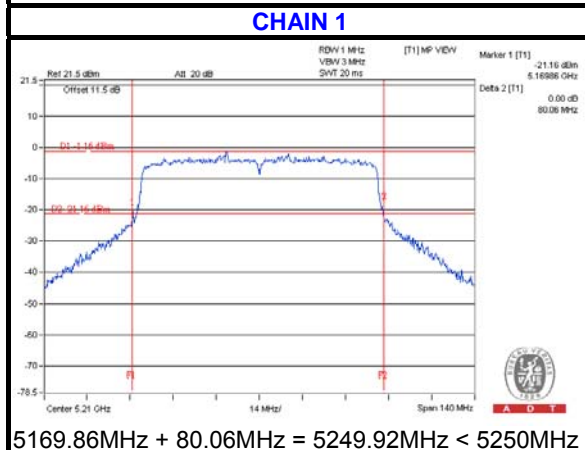


A D T

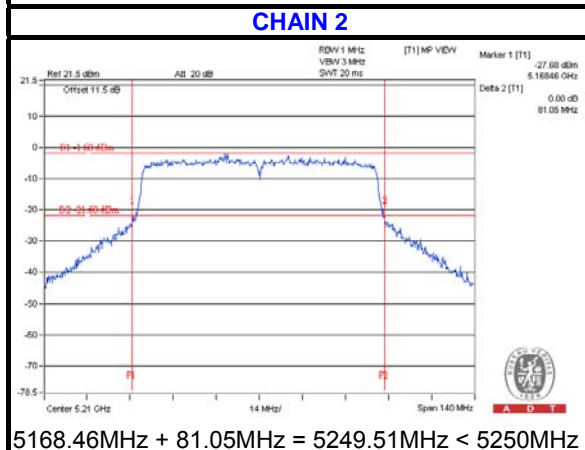
802.11ac (80MHz)



$$5168.19\text{MHz} + 81.29\text{MHz} = 5249.48\text{MHz} < 5250\text{MHz}$$



$$5169.86\text{MHz} + 80.06\text{MHz} = 5249.92\text{MHz} < 5250\text{MHz}$$



$$5168.46\text{MHz} + 81.05\text{MHz} = 5249.51\text{MHz} < 5250\text{MHz}$$

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



6. INFORMATION ON THE TESTING LABORATORIES

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

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Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

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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.

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

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

---END---