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FCC TEST REPORT (15.247)

REPORT NO.: RF120816C23
MODEL NO.: TL-WDR3500
FCC ID: TE7WDR3500
IC: 8853A-WDR3500
RECEIVED: Aug. 16, 2012
TESTED: Aug. 24 ~ Sep. 04, 2012
ISSUED: Sep. 10, 2012

APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120816C23	Original release	Sep. 10, 2012



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1. CERTIFICATION

PRODUCT: N600 Wireless Dual Band Router
MODEL NO.: TL-WDR3500
BRAND: TP-LINK
APPLICANT: TP-LINK TECHNOLOGIES CO., LTD.
TESTED: Aug. 24 ~ Sep. 04, 2012
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
Canada RSS-210 Issue 8 (2010-12)
Canada RSS-Gen Issue 3 (2010-12)
ANSI C63.10-2009

The above equipment (model: TL-WDR3500) 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 :  , DATE : Sep. 10, 2012
Pettie Chen / Senior Specialist

APPROVED BY :  , DATE : Sep. 10, 2012
Gary Chang / Technical Manager



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)				
STANDARD SECTION		TEST TYPE	RESULT	REMARK
FCC Part 15	CANADA STANDARD			
15.207	RSS-Gen 7.2.4	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -17.07dB at 0.22422MHz.
-	RSS-Gen 4.6	Occupied Bandwidth Measurement	PASS	Meet the requirement of limit.
15.247(d) 15.209	RSS-210 A8.5	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.1dB at 2390.00, 2483.50MHz.
15.247(d)	RSS-210 A8.5	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	RSS-210 A8.2 (a)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	RSS-210 A8.4 (4)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	RSS-210 A8.2 (b)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	-	Antenna Requirement	PASS	Antenna connector is SMA Male Reverse not a 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	3.19 dB
	200MHz ~1000MHz	3.21 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	N600 Wireless Dual Band Router
MODEL NO.	TL-WDR3500
POWER SUPPLY	12Vdc (Adapter)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
OPERATING FREQUENCY	2.4GHz: 2412 ~ 2462MHz 5.0GHz: 5745 ~ 5825MHz
NUMBER OF CHANNEL	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) 5.0GHz: 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
OUTPUT POWER	831.28mW for 2412 ~ 2462MHz 476.16mW for 5745 ~ 5825MHz
ANTENNA TYPE	2.4GHz: Omni-Directional antenna with 2dBi gain 5.0GHz: Omni-Directional antenna with 3dBi gain
ANTENNA CONNECTOR	SMA Male Reverse
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 two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	2TX
802.11g	2TX
802.11a	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX



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2. The EUT consumes power from the following adapter.

BRAND:	LEADER ELECTRONICS INC.
MODEL:	MU12-S120100-A1
INPUT:	100-240Vac, 50/60Hz, 0.5A
OUTPUT:	12Vdc, 1.0A
POWER LINE:	1.50m non-shielded cable without core

3. 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 2.4GHz:

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

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

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

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

FOR 5.0GHz (5745 ~ 5825MHz):

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

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

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)
-	802.11g	1 to 11	6	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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0



BANDEDGE MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 9	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)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
-	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE \geq 1G	24deg. C, 67%RH	120Vac, 60Hz	Alan Wu
RE<1G	24deg. C, 67%RH	120Vac, 60Hz	Alan Wu
PLC	22deg. C, 55%RH	120Vac, 60Hz	Skys Huang
APCM	24deg. C, 62%RH	120Vac, 60Hz	Felix Soong



FOR 5.0GHz (5745 ~ 5825MHz):

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

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

NOTE:
The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **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	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

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 (20MHz)	149 to 165	165	OFDM	BPSK	7.2

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 (20MHz)	149 to 165	165	OFDM	BPSK	7.2



BANDEDGE MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	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	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	24deg. C, 67%RH	120Vac, 60Hz	Alan Wu
RE<1G	24deg. C, 67%RH	120Vac, 60Hz	Alan Wu
PLC	22deg. C, 55%RH	120Vac, 60Hz	Skys Huang
APCM	24deg. C, 62%RH	120Vac, 60Hz	Felix Soong



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3.3 DESCRIPTION OF SUPPORT UNITS

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

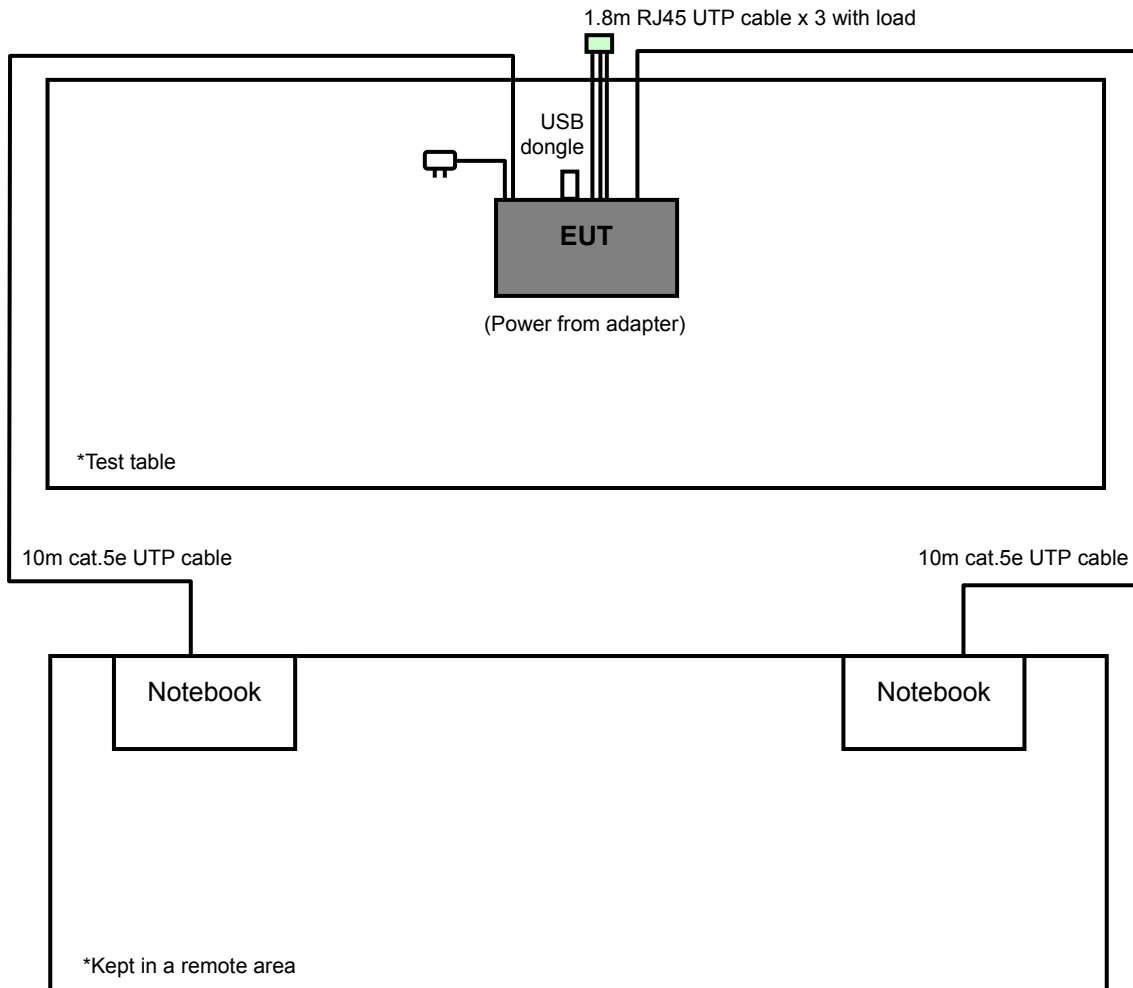
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	USB dongle	SanDisk	SDC26-8192RB	NA	NA
2	Notebook	DELL	E5420	BPQ8MQ1	FCC DoC Approved
3	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	10m cat.5e UTP cable without core.
3	10m cat.5e UTP cable without core.

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 2, 3 acted as communication partner to transfer data.

3.3.1 CONFIGURATION OF SYSTEM UNDER TEST





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3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C (15.247)

558074 D01 DTS Meas Guidance v01

Canada RSS-210 Issue 8 (2010-12)

Canada RSS-Gen Issue 3 (2010-12)

ANSI C63.10-2009

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

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



4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND)

4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

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

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

NOTE:

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



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4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ES17	838496/016	Jan. 03, 2012	Jan. 02, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP 40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 05, 2012	Jan. 04, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8447D	2944A10738	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Nov. 03, 2011	Nov. 02, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Nov. 03, 2011	Nov. 02, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Nov. 03, 2011	Nov. 02, 2012
Software ADT	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT	TT100.	TT93021704	NA	NA
Turn Table Controller ADT	SC100.	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 29, 2011	Oct. 28, 2012
High Speed Peak Power Meter	ML2495A	0842014	Apr. 28, 2012	Apr. 27, 2013
Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013

- 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 4.
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 460141.
6. The IC Site Registration No. is IC7450F-4.



4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

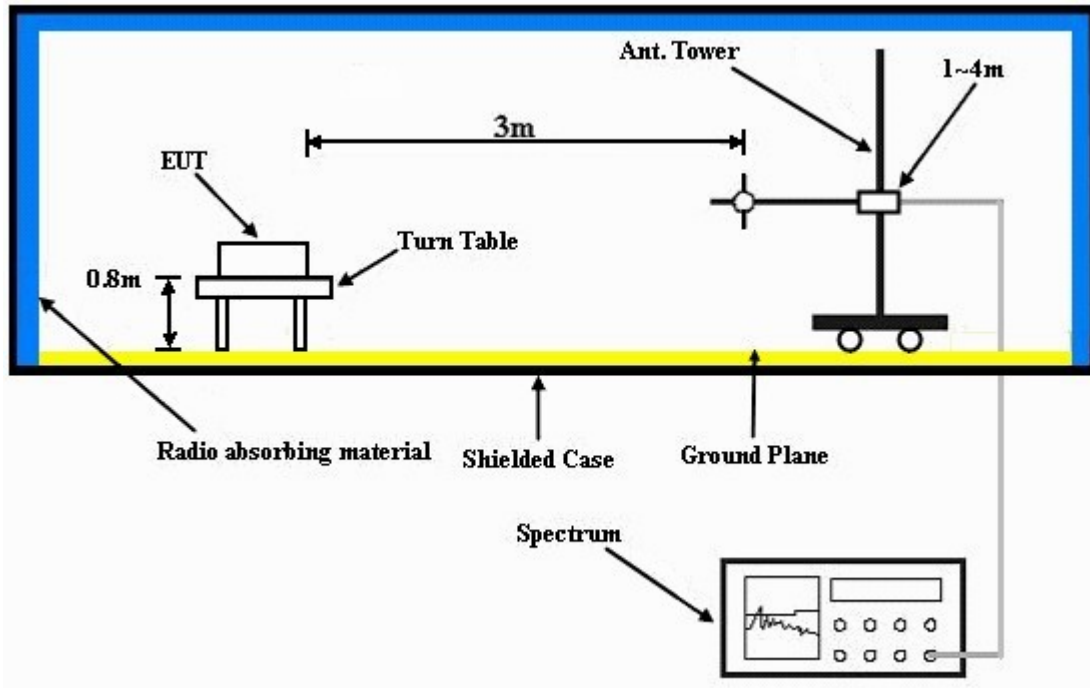
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



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

4.1.6 EUT OPERATING CONDITIONS

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



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4.1.7 TEST RESULTS

ABOVE 1GHz DATA: 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	2390.00	62.3 PK	74.0	-11.7	1.02 H	217	30.30	32.00
2	2390.00	45.0 AV	54.0	-9.0	1.02 H	217	13.00	32.00
3	*2412.00	102.5 PK			1.07 H	219	70.50	32.00
4	*2412.00	98.2 AV			1.07 H	219	66.20	32.00
5	4824.00	46.8 PK	74.0	-27.2	1.20 H	222	8.40	38.40
6	4824.00	42.1 AV	54.0	-11.9	1.20 H	222	3.70	38.40
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	2390.00	68.0 PK	74.0	-6.0	1.00 V	32	36.00	32.00
2	2390.00	47.5 AV	54.0	-6.5	1.00 V	32	15.50	32.00
3	*2412.00	110.4 PK			1.00 V	8	78.40	32.00
4	*2412.00	106.6 AV			1.00 V	8	74.60	32.00
5	4824.00	52.6 PK	74.0	-21.4	1.44 V	322	14.20	38.40
6	4824.00	48.3 AV	54.0	-5.7	1.44 V	322	9.90	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * ”: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	2356.00	61.0 PK	74.0	-13.0	1.00 H	2	29.20	31.80
2	2356.00	47.4 AV	54.0	-6.6	1.00 H	2	15.60	31.80
3	*2437.00	103.8 PK			1.04 H	186	71.70	32.10
4	*2437.00	99.9 AV			1.04 H	186	67.80	32.10
5	4874.00	51.2 PK	74.0	-22.8	1.02 H	52	12.80	38.40
6	4874.00	45.6 AV	54.0	-8.4	1.02 H	52	7.20	38.40
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	2356.00	62.0 PK	74.0	-12.0	1.00 V	26	30.20	31.80
2	2356.00	48.6 AV	54.0	-5.4	1.00 V	26	16.80	31.80
3	*2437.00	112.2 PK			1.21 V	21	80.10	32.10
4	*2437.00	108.2 AV			1.21 V	21	76.10	32.10
5	4874.00	55.1 PK	74.0	-18.9	1.17 V	325	16.70	38.40
6	4874.00	51.6 AV	54.0	-2.4	1.17 V	325	13.20	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2462.00	104.3 PK			1.35 H	112	72.10	32.20
2	*2462.00	99.9 AV			1.35 H	112	67.70	32.20
3	2483.50	66.1 PK	74.0	-7.9	1.32 H	110	33.80	32.30
4	2483.50	47.1 AV	54.0	-6.9	1.32 H	110	14.80	32.30
5	4924.00	49.6 PK	74.0	-24.4	1.15 H	272	11.20	38.40
6	4924.00	46.3 AV	54.0	-7.7	1.15 H	272	7.90	38.40
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	*2462.00	111.0 PK			1.35 V	146	78.80	32.20
2	*2462.00	106.8 AV			1.35 V	146	74.60	32.20
3	2483.50	70.2 PK	74.0	-3.8	1.10 V	143	37.90	32.30
4	2483.50	50.2 AV	54.0	-3.8	1.10 V	143	17.90	32.30
5	4924.00	55.1 PK	74.0	-18.9	1.30 V	327	16.70	38.40
6	4924.00	52.1 AV	54.0	-1.9	1.30 V	327	13.70	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	2390.00	61.3 PK	74.0	-12.7	1.04 H	217	29.30	32.00
2	2390.00	46.0 AV	54.0	-8.0	1.04 H	217	14.00	32.00
3	*2412.00	103.7 PK			1.08 H	219	71.70	32.00
4	*2412.00	94.1 AV			1.08 H	219	62.10	32.00
5	4824.00	49.9 PK	74.0	-24.1	1.00 H	201	11.50	38.40
6	4824.00	36.9 AV	54.0	-17.1	1.00 H	201	-1.50	38.40

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	2390.00	70.0 PK	74.0	-4.0	1.16 V	194	38.00	32.00
2	2390.00	52.4 AV	54.0	-1.6	1.16 V	194	20.40	32.00
3	*2412.00	110.4 PK			1.00 V	27	78.40	32.00
4	*2412.00	100.6 AV			1.00 V	27	68.60	32.00
5	4824.00	50.9 PK	74.0	-23.1	1.00 V	310	12.50	38.40
6	4824.00	37.2 AV	54.0	-16.8	1.00 V	310	-1.20	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2437.00	109.3 PK			1.06 H	212	77.20	32.10
2	*2437.00	99.6 AV			1.06 H	212	67.50	32.10
3	2483.50	63.1 PK	74.0	-10.9	1.03 H	211	30.80	32.30
4	2483.50	46.0 AV	54.0	-8.0	1.03 H	211	13.70	32.30
5	4874.00	51.8 PK	74.0	-22.2	1.00 H	271	13.40	38.40
6	4874.00	38.4 AV	54.0	-15.6	1.00 H	271	0.00	38.40
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	*2437.00	118.0 PK			1.22 V	21	85.90	32.10
2	*2437.00	107.7 AV			1.22 V	21	75.60	32.10
3	2483.50	64.7 PK	74.0	-9.3	1.26 V	28	32.40	32.30
4	2483.50	47.0 AV	54.0	-7.0	1.26 V	28	14.70	32.30
5	4874.00	52.6 PK	74.0	-21.4	1.00 V	317	14.20	38.40
6	4874.00	39.5 AV	54.0	-14.5	1.00 V	317	1.10	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2462.00	103.3 PK			1.06 H	215	71.10	32.20
2	*2462.00	93.4 AV			1.06 H	215	61.20	32.20
3	2483.50	60.9 PK	74.0	-13.1	1.03 H	219	28.60	32.30
4	2483.50	46.8 AV	54.0	-7.2	1.03 H	219	14.50	32.30
5	4924.00	50.9 PK	74.0	-23.1	1.00 H	200	12.50	38.40
6	4924.00	37.7 AV	54.0	-16.3	1.00 H	200	-0.70	38.40
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	*2462.00	111.0 PK			1.12 V	183	78.80	32.20
2	*2462.00	101.1 AV			1.12 V	183	68.90	32.20
3	2483.50	70.4 PK	74.0	-3.6	1.12 V	170	38.10	32.30
4	2483.50	52.9 AV	54.0	-1.1	1.12 V	170	20.60	32.30
5	4924.00	51.9 PK	74.0	-22.1	1.00 V	300	13.50	38.40
6	4924.00	38.9 AV	54.0	-15.1	1.00 V	300	0.50	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



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802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	2390.00	60.7 PK	74.0	-13.3	1.39 H	269	28.70	32.00
2	2390.00	47.2 AV	54.0	-6.8	1.39 H	269	15.20	32.00
3	*2412.00	101.8 PK			1.34 H	263	69.80	32.00
4	*2412.00	91.4 AV			1.34 H	263	59.40	32.00
5	4824.00	48.0 PK	74.0	-26.0	1.10 H	285	9.60	38.40
6	4824.00	33.6 AV	54.0	-20.4	1.10 H	285	-4.80	38.40
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	2390.00	70.6 PK	74.0	-3.4	1.24 V	5	38.60	32.00
2	2390.00	52.6 AV	54.0	-1.4	1.24 V	5	20.60	32.00
3	*2412.00	109.9 PK			1.00 V	20	77.90	32.00
4	*2412.00	100.3 AV			1.00 V	20	68.30	32.00
5	4824.00	49.1 PK	74.0	-24.9	1.28 V	358	10.70	38.40
6	4824.00	34.2 AV	54.0	-19.8	1.28 V	358	-4.20	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2437.00	107.1 PK			1.05 H	214	75.00	32.10
2	*2437.00	96.9 AV			1.05 H	214	64.80	32.10
3	2483.50	57.4 PK	74.0	-16.6	1.08 H	213	25.10	32.30
4	2483.50	45.1 AV	54.0	-8.9	1.08 H	213	12.80	32.30
5	4874.00	50.0 PK	74.0	-24.0	1.00 H	278	11.60	38.40
6	4874.00	35.2 AV	54.0	-18.8	1.00 H	278	-3.20	38.40
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	*2437.00	116.7 PK			1.22 V	347	84.60	32.10
2	*2437.00	106.9 AV			1.22 V	347	74.80	32.10
3	2483.50	66.3 PK	74.0	-7.7	1.28 V	342	34.00	32.30
4	2483.50	48.7 AV	54.0	-5.3	1.28 V	342	16.40	32.30
5	4874.00	51.0 PK	74.0	-23.0	1.00 V	312	12.60	38.40
6	4874.00	36.6 AV	54.0	-17.4	1.00 V	312	-1.80	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2462.00	100.8 PK			1.00 H	224	68.60	32.20
2	*2462.00	90.3 AV			1.00 H	224	58.10	32.20
3	2483.50	59.2 PK	74.0	-14.8	1.00 H	225	26.90	32.30
4	2483.50	46.3 AV	54.0	-7.7	1.00 H	225	14.00	32.30
5	4924.00	46.0 PK	74.0	-28.0	1.00 H	209	7.60	38.40
6	4924.00	31.1 AV	54.0	-22.9	1.00 H	209	-7.30	38.40
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	*2462.00	109.2 PK			1.20 V	348	77.00	32.20
2	*2462.00	99.3 AV			1.20 V	348	67.10	32.20
3	2483.50	69.6 PK	74.0	-4.4	1.13 V	247	37.30	32.30
4	2483.50	52.8 AV	54.0	-1.2	1.13 V	247	20.50	32.30
5	4924.00	47.0 PK	74.0	-27.0	1.00 V	302	8.60	38.40
6	4924.00	32.9 AV	54.0	-21.1	1.00 V	302	-5.50	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	2390.00	59.9 PK	74.0	-14.1	1.01 H	216	27.90	32.00
2	2390.00	45.7 AV	54.0	-8.3	1.01 H	216	13.70	32.00
3	*2422.00	97.5 PK			1.05 H	217	65.40	32.10
4	*2422.00	86.6 AV			1.05 H	217	54.50	32.10
5	4844.00	45.0 PK	74.0	-29.0	1.00 H	203	6.60	38.40
6	4844.00	32.0 AV	54.0	-22.0	1.00 H	203	-6.40	38.40
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	2390.00	67.0 PK	74.0	-7.0	1.00 V	350	35.00	32.00
2	2390.00	52.9 AV	54.0	-1.1	1.00 V	350	20.90	32.00
3	*2422.00	105.9 PK			1.22 V	18	73.80	32.10
4	*2422.00	96.4 AV			1.22 V	18	64.30	32.10
5	4844.00	46.4 PK	74.0	-27.6	1.63 V	330	8.00	38.40
6	4844.00	33.7 AV	54.0	-20.3	1.63 V	330	-4.70	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2437.00	101.2 PK			1.05 H	215	69.10	32.10
2	*2437.00	91.3 AV			1.05 H	215	59.20	32.10
3	2483.50	60.8 PK	74.0	-13.2	1.08 H	212	28.50	32.30
4	2483.50	46.6 AV	54.0	-7.4	1.08 H	212	14.30	32.30
5	4874.00	47.0 PK	74.0	-27.0	1.10 H	213	8.60	38.40
6	4874.00	34.0 AV	54.0	-20.0	1.10 H	213	-4.40	38.40
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	*2437.00	110.3 PK			1.21 V	20	78.20	32.10
2	*2437.00	100.8 AV			1.21 V	20	68.70	32.10
3	2483.50	71.8 PK	74.0	-2.2	1.28 V	21	39.50	32.30
4	2483.50	50.4 AV	54.0	-3.6	1.28 V	21	18.10	32.30
5	4874.00	48.0 PK	74.0	-26.0	1.30 V	331	9.60	38.40
6	4874.00	35.0 AV	54.0	-19.0	1.30 V	331	-3.40	38.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

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	*2452.00	96.2 PK			1.04 H	198	64.00	32.20
2	*2452.00	86.6 AV			1.04 H	198	54.40	32.20
3	2483.50	59.3 PK	74.0	-14.7	1.09 H	193	27.00	32.30
4	2483.50	46.8 AV	54.0	-7.2	1.09 H	193	14.50	32.30
5	4904.00	45.5 PK	74.0	-28.5	1.00 H	223	7.00	38.50
6	4904.00	32.2 AV	54.0	-21.8	1.00 H	223	-6.30	38.50
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	*2452.00	105.7 PK			1.21 V	18	73.50	32.20
2	*2452.00	95.7 AV			1.21 V	18	63.50	32.20
3	2483.50	69.0 PK	74.0	-5.0	1.12 V	221	36.70	32.30
4	2483.50	52.9 AV	54.0	-1.1	1.12 V	221	20.60	32.30
5	4904.00	46.9 PK	74.0	-27.1	1.00 V	332	8.40	38.50
6	4904.00	33.9 AV	54.0	-20.1	1.00 V	332	-4.60	38.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	206.48	37.8 QP	43.5	-5.7	1.24 H	97	26.70	11.10
2	375.29	34.4 QP	46.0	-11.6	1.00 H	248	17.80	16.60
3	625.60	35.9 QP	46.0	-10.1	1.49 H	235	14.20	21.70
4	676.05	34.4 QP	46.0	-11.6	1.24 H	166	12.40	22.00
5	751.73	33.3 QP	46.0	-12.7	1.00 H	216	9.90	23.40
6	875.91	38.5 QP	46.0	-7.5	1.49 H	227	13.00	25.50

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	64.83	38.2 QP	40.0	-1.8	1.24 V	14	25.30	12.90
2	80.35	36.7 QP	40.0	-3.3	1.00 V	218	26.80	9.90
3	105.58	37.2 QP	43.5	-6.3	1.00 V	80	27.20	10.00
4	375.29	34.3 QP	46.0	-11.7	1.24 V	239	17.70	16.60
5	676.05	35.4 QP	46.0	-10.6	1.49 V	203	13.40	22.00
6	875.91	34.7 QP	46.0	-11.3	1.24 V	56	9.20	25.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



A D T

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. 19, 2011	Nov. 18, 2012
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 29, 2011	Dec. 28, 2012
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2011	Dec. 29, 2012
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 06, 2012	Jul. 05, 2013
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

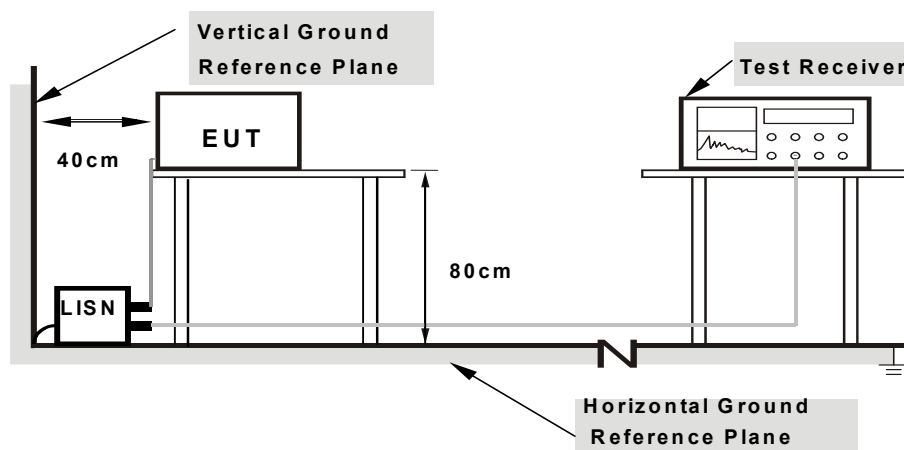
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

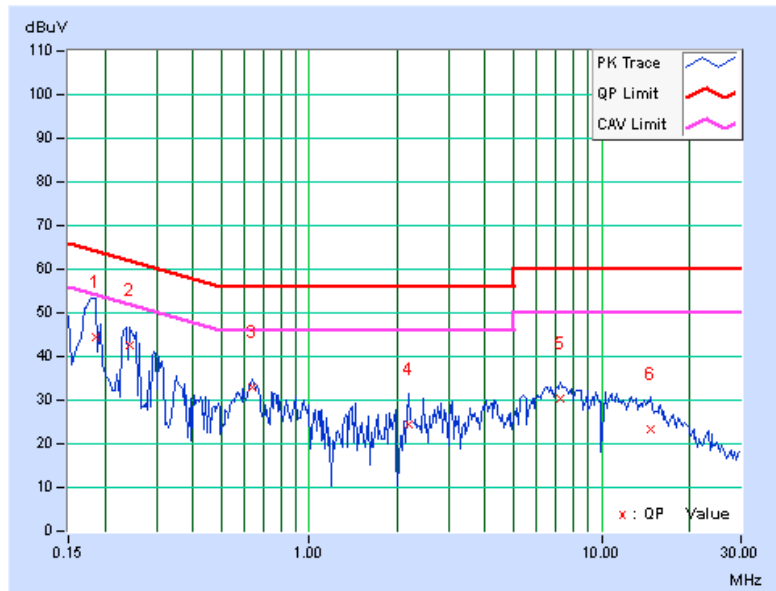
CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
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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	0.18516	0.17	44.40	15.89	44.57	16.06	64.25	54.25	-19.68	-38.19
2	0.24375	0.18	42.34	25.77	42.52	25.95	61.97	51.97	-19.45	-26.02
3	0.63828	0.19	32.72	24.96	32.91	25.15	56.00	46.00	-23.09	-20.85
4	2.20313	0.31	24.13	11.33	24.44	11.64	56.00	46.00	-31.56	-34.36
5	7.20313	0.43	29.78	18.98	30.21	19.41	60.00	50.00	-29.79	-30.59
6	14.74609	0.60	22.75	17.19	23.35	17.79	60.00	50.00	-36.65	-32.21

REMARKS:

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

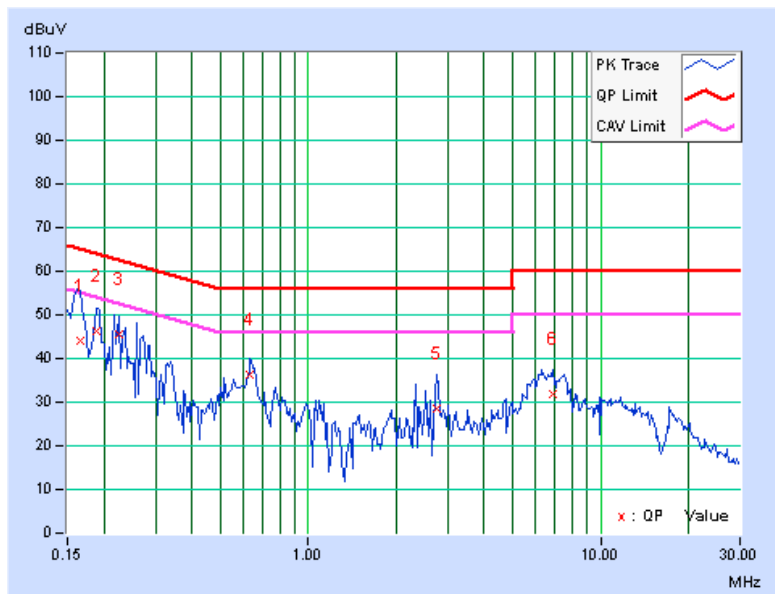


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16553	0.14	44.11	18.33	44.25	18.47	65.18	55.18	-20.93	-36.71
2	0.18906	0.15	46.03	38.08	46.18	38.23	64.08	54.08	-17.90	-15.85
3	0.22422	0.15	45.44	30.64	45.59	30.79	62.66	52.66	-17.07	-21.87
4	0.63047	0.20	36.21	26.28	36.41	26.48	56.00	46.00	-19.59	-19.52
5	2.75781	0.34	28.02	12.46	28.36	12.80	56.00	46.00	-27.64	-33.20
6	6.83203	0.49	31.44	22.40	31.93	22.89	60.00	50.00	-28.07	-27.11

REMARKS:

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

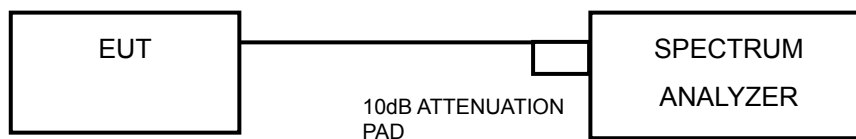


4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST SETUP



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.3.4 TEST PROCEDURE

- a. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
- b. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

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



4.3.7 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	10.28	10.27	0.5	PASS
6	2437	10.30	10.28	0.5	PASS
11	2462	10.30	10.27	0.5	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	16.55	16.48	0.5	PASS
6	2437	16.55	16.46	0.5	PASS
11	2462	16.58	16.52	0.5	PASS

802.11n (20MHz)

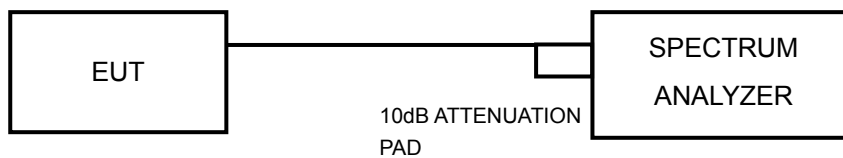
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.78	17.66	0.5	PASS
6	2437	17.81	17.78	0.5	PASS
11	2462	17.78	17.81	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
3	2422	36.82	37.01	0.5	PASS
6	2437	36.47	36.84	0.5	PASS
9	2452	36.93	37.10	0.5	PASS

4.4 OCCUPIED BANDWIDTH MEASUREMENT

4.4.1 TEST SETUP



4.4.2 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 300 kHz VBW. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 EUT OPERATING CONDITIONS

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



4.4.6 TEST RESULTS

802.11b

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	2412	13.92	13.80	PASS
6	2437	13.98	13.86	PASS
11	2462	13.98	13.86	PASS

802.11g

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	2412	16.92	17.16	PASS
6	2437	16.98	17.22	PASS
11	2462	16.92	17.22	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
1	2412	18.18	18.18	PASS
6	2437	18.06	18.30	PASS
11	2462	18.24	18.24	PASS

802.11n (40MHz)

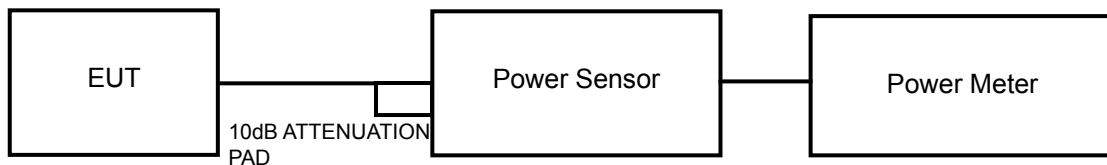
CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
3	2422	37.60	38.08	PASS
6	2437	37.60	38.40	PASS
9	2452	37.60	38.24	PASS

4.5 CONDUCTED OUTPUT POWER

4.5.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.5.4 TEST PROCEDURES

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

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



4.5.7 TEST RESULTS

802.11b

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	18.47	18.26	137.30	21.38	30	PASS
6	2437	18.53	18.76	146.45	21.66	30	PASS
11	2462	18.72	19.02	154.27	21.88	30	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the conducted power limit is not reduced.

802.11g

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	23.12	23.17	412.61	26.16	30	PASS
6	2437	25.93	26.43	831.28	29.20	30	PASS
11	2462	22.86	23.48	416.04	26.19	30	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the conducted power limit is not reduced.

802.11n (20MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	23.07	23.26	414.60	26.18	30	PASS
6	2437	25.76	26.44	817.26	29.12	30	PASS
11	2462	21.39	21.44	277.04	24.43	30	PASS

NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the conducted power limit is not reduced.



802.11n (40MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
3	2422	20.94	20.96	248.90	23.96	30	PASS
6	2437	23.52	24.64	515.98	27.13	30	PASS
9	2452	18.58	19.16	154.52	21.89	30	PASS

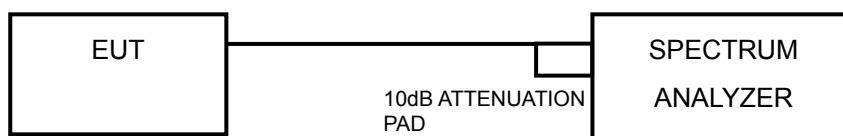
NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the conducted power limit is not reduced.

4.6 POWER SPECTRAL DENSITY MEASUREMENT

4.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.6.4 TEST PROCEDURE

- a. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
- b. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- c. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
- d. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6



4.6.7 TEST RESULTS

802.11b

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	6.96	-8.27	3.01	-5.26	8	PASS
	6	2437	6.79	-8.44	3.01	-5.43	8	PASS
	11	2462	7.09	-8.14	3.01	-5.13	8	PASS
1	1	2412	6.60	-8.63	3.01	-5.62	8	PASS
	6	2437	7.21	-8.02	3.01	-5.01	8	PASS
	11	2462	7.59	-7.64	3.01	-4.63	8	PASS

NOTE: Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi , so the power density limit is not reduced.

802.11g

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	3.35	-11.88	3.01	-8.87	8	PASS
	6	2437	7.70	-7.53	3.01	-4.52	8	PASS
	11	2462	3.11	-12.12	3.01	-9.11	8	PASS
1	1	2412	3.53	-11.70	3.01	-8.69	8	PASS
	6	2437	8.33	-6.90	3.01	-3.89	8	PASS
	11	2462	3.75	-11.48	3.01	-8.47	8	PASS

NOTE: Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi , so the power density limit is not reduced.

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	3.46	-11.77	3.01	-8.76	8	PASS
	6	2437	7.16	-8.07	3.01	-5.06	8	PASS
	11	2462	1.40	-13.83	3.01	-10.82	8	PASS
1	1	2412	3.39	-11.84	3.01	-8.83	8	PASS
	6	2437	8.21	-7.02	3.01	-4.01	8	PASS
	11	2462	1.45	-13.78	3.01	-10.77	8	PASS

NOTE: Directional gain = 2dBi + 10log(2) = 5.01dBi < 6dBi , so the power density limit is not reduced.



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802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-1.91	-17.14	3.01	-14.13	8	PASS
	6	2437	0.91	-14.32	3.01	-11.31	8	PASS
	9	2452	-4.51	-19.74	3.01	-16.73	8	PASS
1	3	2422	-1.75	-16.98	3.01	-13.97	8	PASS
	6	2437	2.15	-13.08	3.01	-10.07	8	PASS
	9	2452	-3.71	-18.94	3.01	-15.93	8	PASS

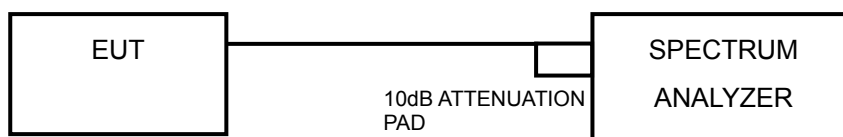
NOTE: Directional gain = $2\text{dBi} + 10\log(2) = 5.01\text{dBi} < 6\text{dBi}$, so the power density limit is not reduced.

4.7 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.7.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

4.7.2 TEST SETUP



4.7.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.7.4 TEST PROCEDURE

MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW \geq 300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.



MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW \geq 300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

4.7.5 DEVIATION FROM TEST STANDARD

No deviation.

4.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.7.7 TEST RESULTS

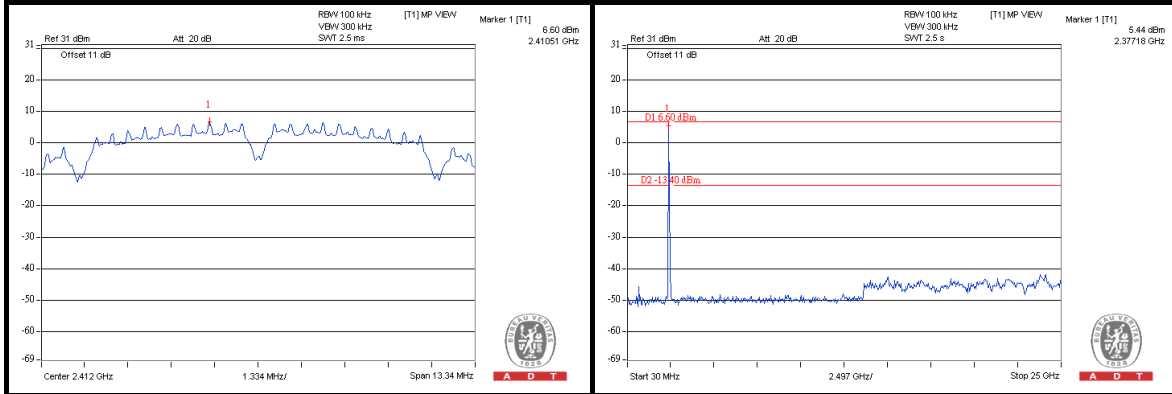
The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

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

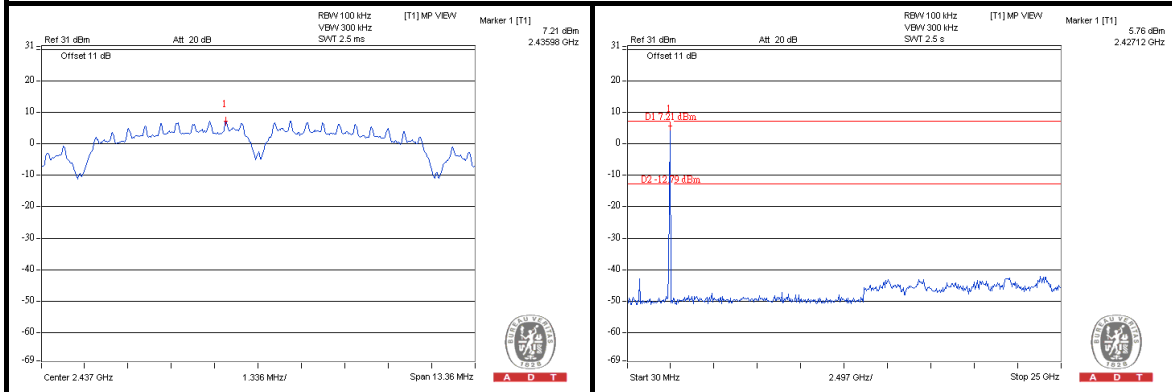
4.7.8 TEST RESULTS

802.11b

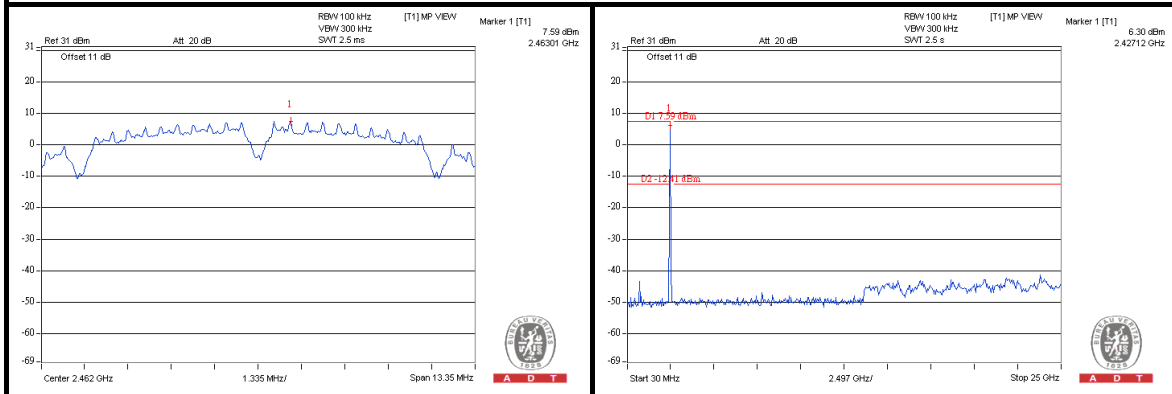
CH 1



CH 6



CH 11

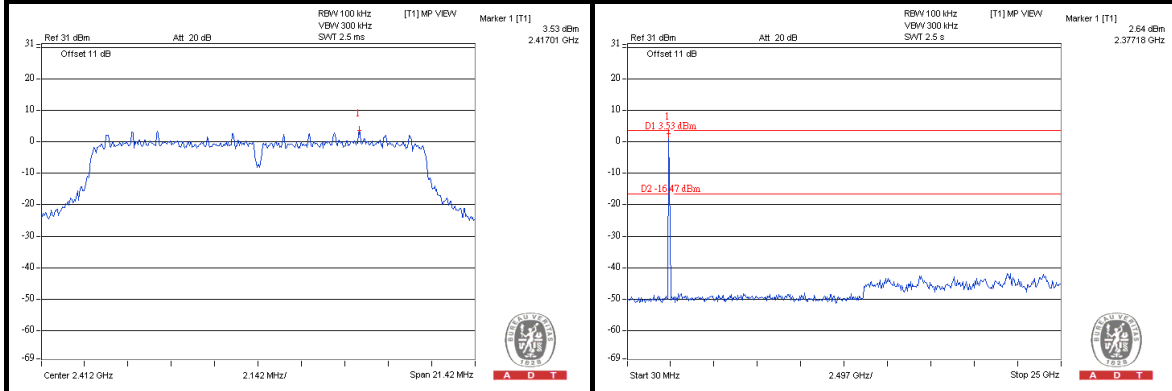




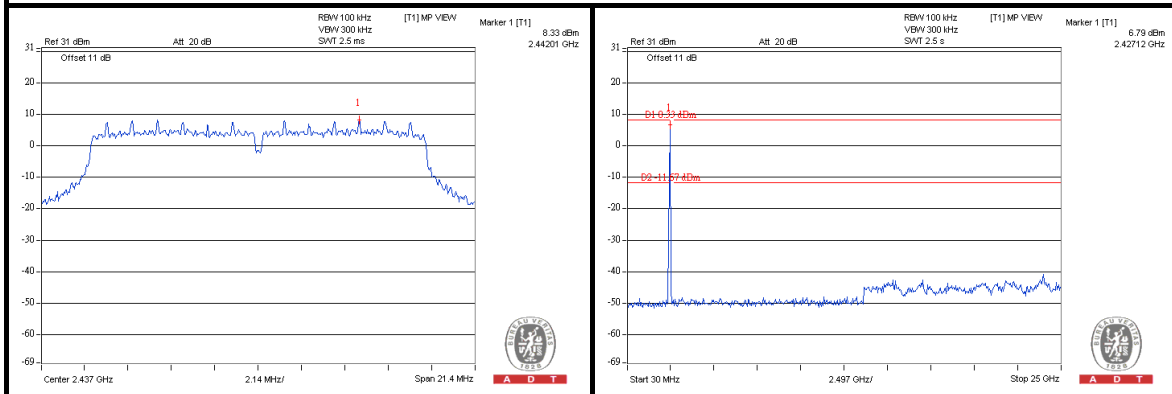
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802.11g

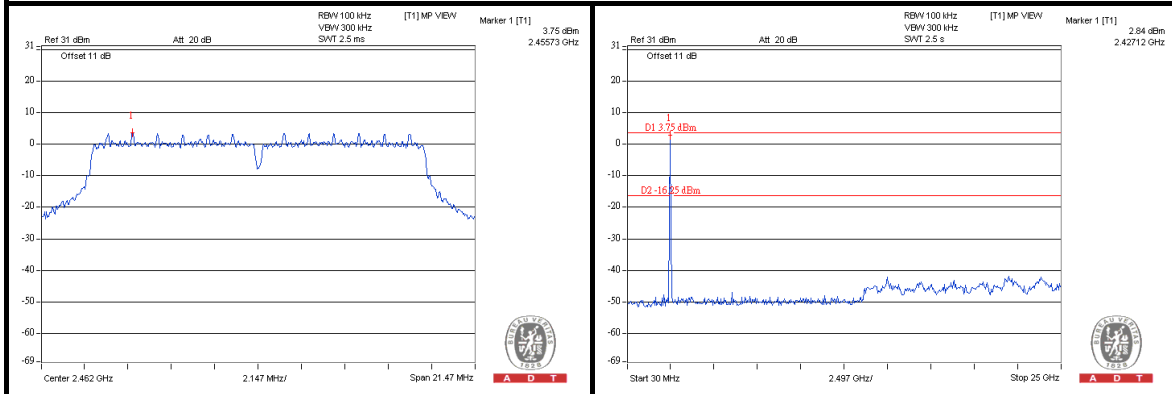
CH 1



CH 6



CH 11

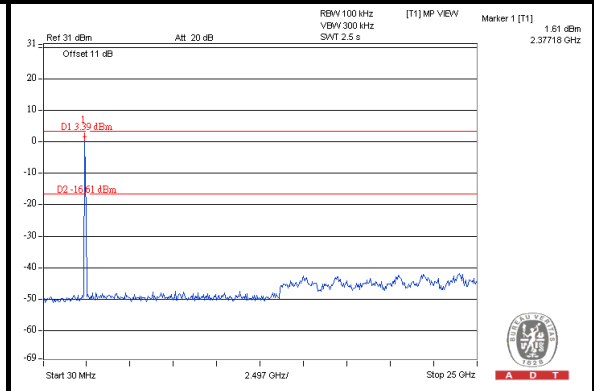
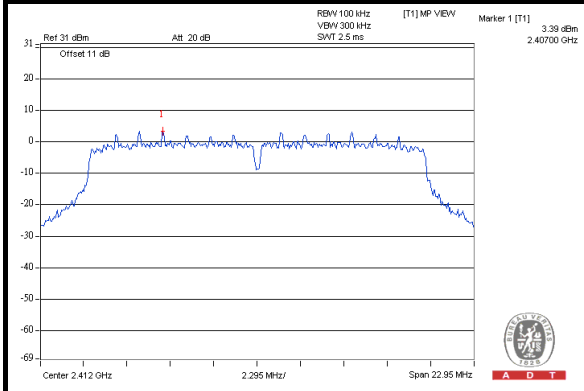




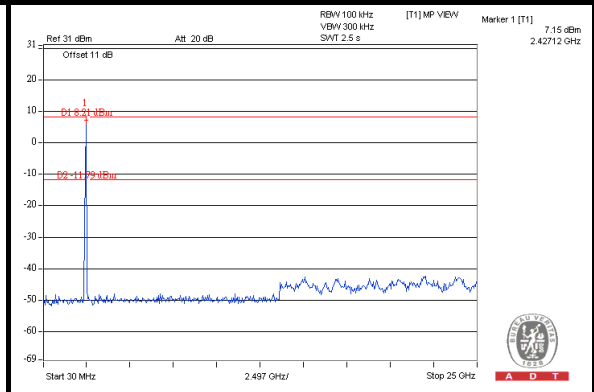
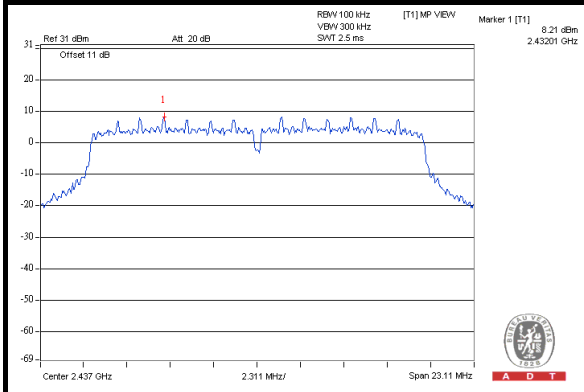
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802.11n (20MHz)

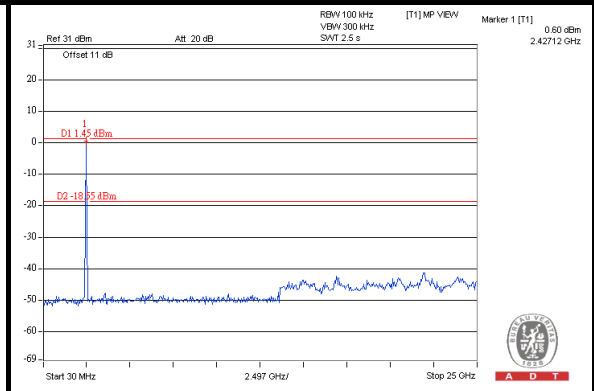
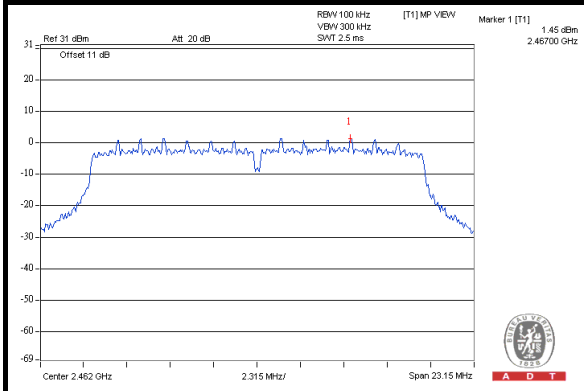
CH 1

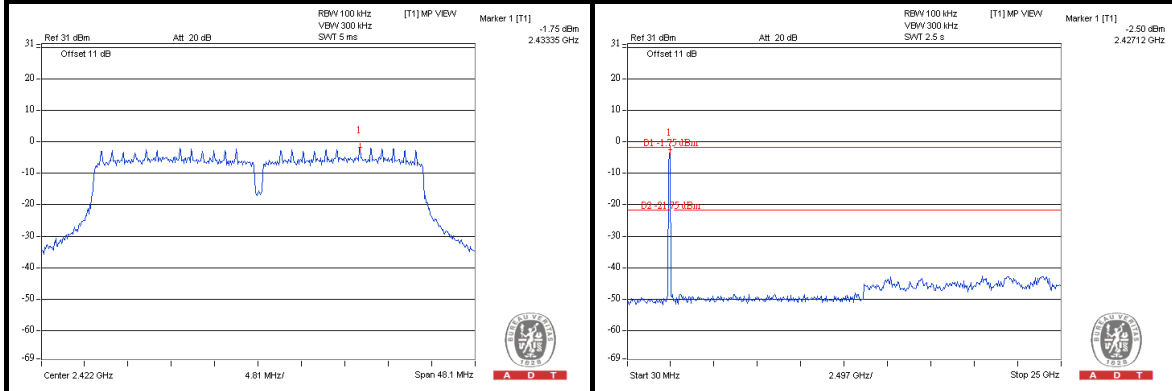
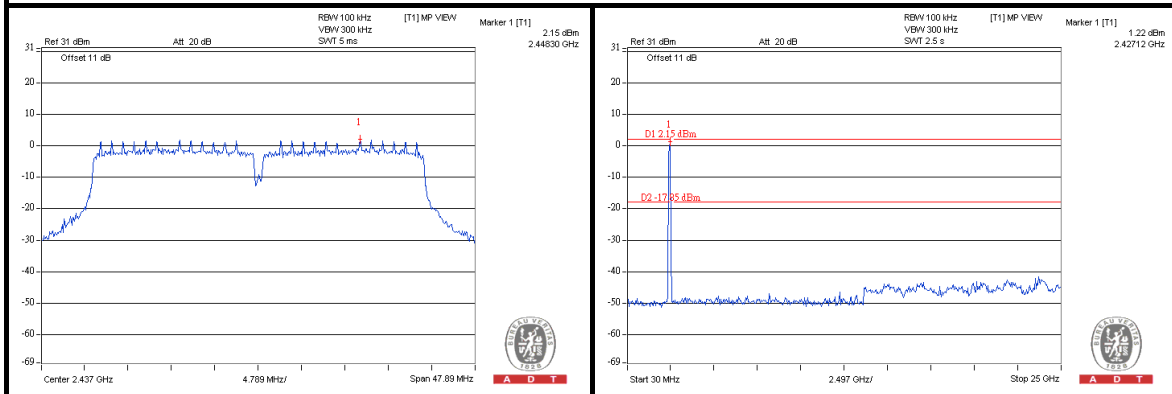
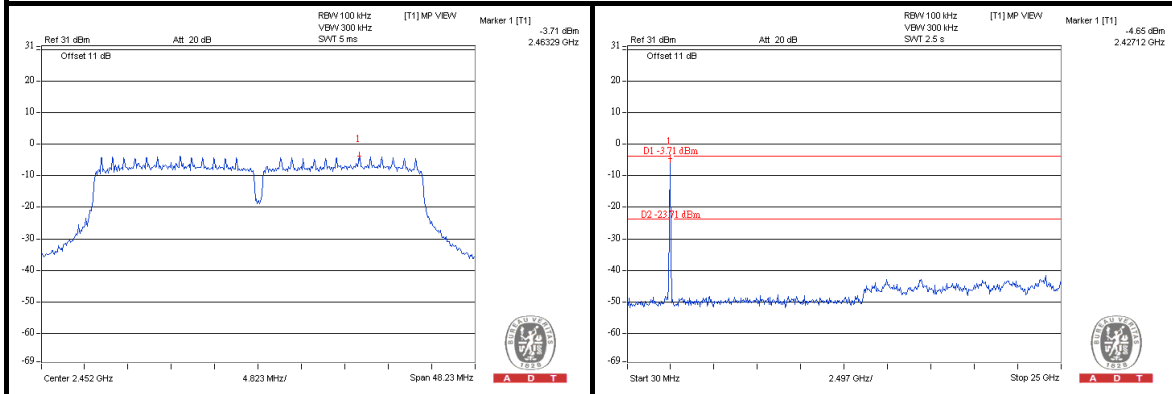


CH 6



CH 11



802.11n (40MHz)**CH 3****CH 6****CH 9**

4.8 RECEIVER RADIATED EMISSION MEASUREMENT

4.8.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in RSS-Gen table 2 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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. As shown in RSS-Gen 7.2.3, 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.

4.8.2 TEST INSTRUMENTS

Same as 4.1.2

4.8.3 TEST PROCEDURES

Same as 4.1.3

4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

4.8.5 TEST SETUP

Same as 4.1.5

4.8.6 EUT OPERATING CONDITIONS

Same as 4.1.6



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4.8.7 TEST RESULTS

ABOVE 1GHz DATA: 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 12.5GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	1350.00	40.6 PK	74.0	-33.4	1.20 H	156	12.10	28.50
2	1350.00	34.8 AV	54.0	-19.2	1.20 H	156	6.30	28.50
3	1608.00	37.5 PK	74.0	-36.5	1.00 H	134	8.30	29.20
4	1608.00	27.0 AV	54.0	-27.0	1.00 H	134	-2.20	29.20
5	3216.00	41.9 PK	74.0	-32.1	1.45 H	39	7.80	34.10
6	3216.00	28.7 AV	54.0	-25.3	1.45 H	39	-5.40	34.10
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	1350.00	41.5 PK	74.0	-32.5	1.50 V	265	13.00	28.50
2	1350.00	35.3 AV	54.0	-18.7	1.50 V	265	6.80	28.50
3	1608.00	38.7 PK	74.0	-35.3	1.00 V	243	9.50	29.20
4	1608.00	28.0 AV	54.0	-26.0	1.00 V	243	-1.20	29.20
5	3216.00	42.7 PK	74.0	-31.3	1.92 V	99	8.60	34.10
6	3216.00	29.8 AV	54.0	-24.2	1.92 V	99	-4.30	34.10

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 12.5GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	1350.00	39.9 PK	74.0	-34.1	1.27 H	106	11.40	28.50
2	1350.00	34.6 AV	54.0	-19.4	1.27 H	106	6.10	28.50
3	1624.00	43.0 PK	74.0	-31.0	1.00 H	147	13.70	29.30
4	1624.00	26.3 AV	54.0	-27.7	1.00 H	147	-3.00	29.30
5	3249.00	41.8 PK	74.0	-32.2	1.00 H	302	7.70	34.10
6	3249.00	28.8 AV	54.0	-25.2	1.00 H	302	-5.30	34.10
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	1350.00	40.9 PK	74.0	-33.1	1.55 V	260	12.40	28.50
2	1350.00	35.1 AV	54.0	-18.9	1.55 V	260	6.60	28.50
3	1624.00	44.6 PK	74.0	-29.4	1.00 V	274	15.30	29.30
4	1624.00	27.6 AV	54.0	-26.4	1.00 V	274	-1.70	29.30
5	3249.00	42.6 PK	74.0	-31.4	1.00 V	20	8.50	34.10
6	3249.00	29.9 AV	54.0	-24.1	1.00 V	20	-4.20	34.10

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 12.5GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	1350.00	40.8 PK	74.0	-33.2	1.22 H	126	12.30	28.50
2	1350.00	34.2 AV	54.0	-19.8	1.22 H	126	5.70	28.50
3	1641.00	44.7 PK	74.0	-29.3	1.00 H	182	15.40	29.30
4	1641.00	25.1 AV	54.0	-28.9	1.00 H	182	-4.20	29.30
5	3282.00	42.6 PK	74.0	-31.4	1.00 H	124	8.40	34.20
6	3282.00	28.8 AV	54.0	-25.2	1.00 H	124	-5.40	34.20
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	1350.00	41.7 PK	74.0	-32.3	1.53 V	262	13.20	28.50
2	1350.00	35.7 AV	54.0	-18.3	1.53 V	262	7.20	28.50
3	1641.00	45.2 PK	74.0	-28.8	1.08 V	328	15.90	29.30
4	1641.00	26.5 AV	54.0	-27.5	1.08 V	328	-2.80	29.30
5	3282.00	43.3 PK	74.0	-30.7	1.74 V	242	9.10	34.20
6	3282.00	29.9 AV	54.0	-24.1	1.74 V	242	-4.30	34.20

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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BELOW 1GHz WORST-CASE DATA : 802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	210.36	37.5 QP	43.5	-6.0	1.50 H	119	26.20	11.30
2	375.29	34.6 QP	46.0	-11.4	1.00 H	273	18.00	16.60
3	625.60	35.5 QP	46.0	-10.5	1.50 H	226	13.80	21.70
4	676.05	33.0 QP	46.0	-13.0	3.00 H	13	11.00	22.00
5	749.79	33.1 QP	46.0	-12.9	1.00 H	217	9.70	23.40
6	875.91	38.5 QP	46.0	-7.5	1.50 H	214	13.00	25.50
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	64.83	37.7 QP	40.0	-2.3	1.00 V	322	24.80	12.90
2	80.35	36.8 QP	40.0	-3.2	1.00 V	259	26.90	9.90
3	105.58	37.1 QP	43.5	-6.4	1.75 V	58	27.10	10.00
4	223.94	32.5 QP	46.0	-13.5	2.00 V	298	20.70	11.80
5	375.29	32.8 QP	46.0	-13.2	1.24 V	221	16.20	16.60
6	875.91	35.7 QP	46.0	-10.3	1.24 V	50	10.20	25.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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

5.1 RADIATED EMISSION MEASUREMENT

5.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



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5.1.2 TEST INSTRUMENTS

Same as item 4.1.2.

5.1.3 TEST PROCEDURES

Same as item 4.1.3.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP

Same as item 4.1.5.

5.1.6 EUT OPERATING CONDITIONS

Same as item 4.1.6.



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5.1.7 TEST RESULTS

ABOVE 1GHZ DATA: 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	#5725.00	63.8 PK	82.3	-18.5	1.59 H	357	24.30	39.50
2	#5725.00	54.1 AV	72.6	-18.5	1.59 H	357	14.60	39.50
3	*5745.00	102.3 PK			1.54 H	352	62.70	39.60
4	*5745.00	92.6 AV			1.54 H	352	53.00	39.60
5	11490.00	60.0 PK	74.0	-14.0	1.00 H	21	8.30	51.70
6	11490.00	48.0 AV	54.0	-6.0	1.00 H	21	-3.70	51.70
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	#5725.00	75.1 PK	92.9	-17.8	1.00 V	195	35.60	39.50
2	#5725.00	65.0 AV	82.8	-17.8	1.00 V	195	25.50	39.50
3	*5745.00	112.9 PK			1.00 V	181	73.30	39.60
4	*5745.00	102.8 AV			1.00 V	181	63.20	39.60
5	11490.00	62.0 PK	74.0	-12.0	1.90 V	119	10.30	51.70
6	11490.00	50.0 AV	54.0	-4.0	1.90 V	119	-1.70	51.70

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	*5785.00	102.5 PK			1.09 H	189	62.80	39.70
2	*5785.00	92.6 AV			1.09 H	189	52.90	39.70
3	7713.00	52.1 PK	74.0	-21.9	1.00 H	359	6.90	45.20
4	7713.00	38.1 AV	54.0	-15.9	1.00 H	359	-7.10	45.20
5	11570.00	59.2 PK	74.0	-14.8	1.00 H	11	7.60	51.60
6	11570.00	46.2 AV	54.0	-7.8	1.00 H	11	-5.40	51.60
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	*5785.00	112.7 PK			1.00 V	198	73.00	39.70
2	*5785.00	102.9 AV			1.00 V	198	63.20	39.70
3	7713.00	52.9 PK	74.0	-21.1	1.00 V	19	7.70	45.20
4	7713.00	39.2 AV	54.0	-14.8	1.00 V	19	-6.00	45.20
5	11570.00	61.9 PK	74.0	-12.1	1.90 V	117	10.30	51.60
6	11570.00	49.0 AV	54.0	-5.0	1.90 V	117	-2.60	51.60

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	*5825.00	101.2 PK			1.00 H	189	61.50	39.70
2	*5825.00	91.2 AV			1.00 H	189	51.50	39.70
3	#5850.00	52.7 PK	81.2	-28.5	1.00 H	181	12.90	39.80
4	#5850.00	42.7 AV	71.2	-28.5	1.00 H	181	2.90	39.80
5	11650.00	59.2 PK	74.0	-14.8	1.00 H	11	7.60	51.60
6	11650.00	46.6 AV	54.0	-7.4	1.00 H	11	-5.00	51.60
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	*5825.00	111.7 PK			1.07 V	194	72.00	39.70
2	*5825.00	102.1 AV			1.07 V	194	62.40	39.70
3	#5850.00	63.9 PK	91.7	-27.8	1.00 V	195	24.10	39.80
4	#5850.00	54.3 AV	82.1	-27.8	1.00 V	195	14.50	39.80
5	11650.00	61.1 PK	74.0	-12.9	1.90 V	115	9.50	51.60
6	11650.00	48.8 AV	54.0	-5.2	1.90 V	115	-2.80	51.60

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	#5725.00	66.7 PK	83.0	-16.3	1.56 H	359	27.20	39.50
2	#5725.00	55.9 AV	72.2	-16.3	1.56 H	359	16.40	39.50
3	*5745.00	103.0 PK			1.54 H	352	63.40	39.60
4	*5745.00	92.2 AV			1.54 H	352	52.60	39.60
5	11490.00	61.7 PK	74.0	-12.3	1.00 H	13	10.00	51.70
6	11490.00	47.0 AV	54.0	-7.0	1.00 H	13	-4.70	51.70
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	#5725.00	77.2 PK	93.0	-15.8	1.00 V	205	37.70	39.50
2	#5725.00	67.1 AV	82.9	-15.8	1.00 V	205	27.60	39.50
3	*5745.00	113.0 PK			1.00 V	209	73.40	39.60
4	*5745.00	102.9 AV			1.00 V	209	63.30	39.60
5	11490.00	63.4 PK	74.0	-10.6	1.30 V	61	11.70	51.70
6	11490.00	49.0 AV	54.0	-5.0	1.30 V	61	-2.70	51.70

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#“: The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	*5785.00	102.4 PK			1.00 H	350	62.70	39.70
2	*5785.00	91.8 AV			1.00 H	350	52.10	39.70
3	7713.00	51.9 PK	74.0	-22.1	1.00 H	350	6.70	45.20
4	7713.00	38.0 AV	54.0	-16.0	1.00 H	350	-7.20	45.20
5	11570.00	60.4 PK	74.0	-13.6	1.00 H	11	8.80	51.60
6	11570.00	46.0 AV	54.0	-8.0	1.00 H	11	-5.60	51.60
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	*5785.00	112.8 PK			1.00 V	206	73.10	39.70
2	*5785.00	102.3 AV			1.00 V	206	62.60	39.70
3	7713.00	52.7 PK	74.0	-21.3	1.00 V	21	7.50	45.20
4	7713.00	39.1 AV	54.0	-14.9	1.00 V	21	-6.10	45.20
5	11570.00	62.2 PK	74.0	-11.8	1.34 V	62	10.60	51.60
6	11570.00	48.2 AV	54.0	-5.8	1.34 V	62	-3.40	51.60

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * ”: Fundamental frequency.
6. The limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	*5825.00	101.5 PK			1.00 H	188	61.80	39.70
2	*5825.00	91.2 AV			1.00 H	188	51.50	39.70
3	#5850.00	50.1 PK	81.5	-31.4	1.00 H	181	10.30	39.80
4	#5850.00	39.8 AV	71.2	-31.4	1.00 H	181	0.00	39.80
5	11650.00	59.5 PK	74.0	-14.5	1.00 H	11	7.90	51.60
6	11650.00	46.0 AV	54.0	-8.0	1.00 H	11	-5.60	51.60
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	*5825.00	112.5 PK			1.06 V	207	72.80	39.70
2	*5825.00	102.2 AV			1.06 V	207	62.50	39.70
3	#5850.00	62.1 PK	92.5	-30.4	1.04 V	207	22.30	39.80
4	#5850.00	51.8 AV	82.2	-30.4	1.04 V	207	12.00	39.80
5	11650.00	61.4 PK	74.0	-12.6	1.34 V	67	9.80	51.60
6	11650.00	48.0 AV	54.0	-6.0	1.34 V	67	-3.60	51.60

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	#5725.00	67.2 PK	81.0	-13.8	1.52 H	352	27.70	39.50
2	#5725.00	56.6 AV	70.4	-13.8	1.52 H	352	17.10	39.50
3	*5755.00	101.0 PK			1.55 H	352	61.40	39.60
4	*5755.00	90.4 AV			1.55 H	352	50.80	39.60
5	11510.00	59.4 PK	74.0	-14.6	1.00 H	10	7.70	51.70
6	11510.00	46.6 AV	54.0	-7.4	1.00 H	10	-5.10	51.70

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	#5725.00	78.1 PK	90.7	-12.6	1.00 V	208	38.60	39.50
2	#5725.00	68.2 AV	80.8	-12.6	1.00 V	208	28.70	39.50
3	*5755.00	110.7 PK			1.00 V	208	71.10	39.60
4	*5755.00	100.8 AV			1.00 V	208	61.20	39.60
5	11510.00	61.3 PK	74.0	-12.7	1.35 V	77	9.60	51.70
6	11510.00	48.8 AV	54.0	-5.2	1.35 V	77	-2.90	51.70

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#“:The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	*5795.00	100.7 PK			1.00 H	352	61.00	39.70
2	*5795.00	89.9 AV			1.00 H	352	50.20	39.70
3	#5850.00	56.0 PK	80.7	-24.7	1.00 H	359	16.20	39.80
4	#5850.00	45.2 AV	69.9	-24.7	1.00 H	359	5.40	39.80
5	11590.00	58.4 PK	74.0	-15.6	1.00 H	31	6.90	51.50
6	11590.00	45.3 AV	54.0	-8.7	1.00 H	31	-6.20	51.50
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	*5795.00	109.6 PK			1.00 V	329	69.90	39.70
2	*5795.00	99.2 AV			1.00 V	329	59.50	39.70
3	#5850.00	66.2 PK	89.6	-23.4	1.00 V	245	26.40	39.80
4	#5850.00	55.8 AV	79.2	-23.4	1.00 V	245	16.00	39.80
5	11590.00	60.4 PK	74.0	-13.6	1.39 V	71	8.90	51.50
6	11590.00	47.6 AV	54.0	-6.4	1.39 V	71	-3.90	51.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “: Fundamental frequency.
6. The limit value is defined as per 15.247.
7. “#”:The radiated frequency is out the restricted band.



A D T

BELOW 1GHz WORST-CASE DATA : 802.11n(20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	212.30	37.6 QP	43.5	-5.9	1.49 H	103	26.30	11.30
2	375.29	35.8 QP	46.0	-10.2	1.00 H	261	19.20	16.60
3	625.60	34.5 QP	46.0	-11.5	1.24 H	234	12.80	21.70
4	676.05	34.4 QP	46.0	-11.6	2.00 H	314	12.40	22.00
5	751.73	32.8 QP	46.0	-13.2	3.00 H	232	9.40	23.40
6	875.91	39.3 QP	46.0	-6.7	1.49 H	225	13.80	25.50
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	64.83	38.6 QP	40.0	-1.4	1.24 V	11	25.70	12.90
2	105.58	37.6 QP	43.5	-5.9	1.24 V	253	27.60	10.00
3	210.36	31.9 QP	43.5	-11.6	1.00 V	88	20.60	11.30
4	375.29	35.1 QP	46.0	-10.9	1.00 V	228	18.50	16.60
5	676.05	31.6 QP	46.0	-14.4	3.00 V	80	9.60	22.00
6	875.91	35.8 QP	46.0	-10.2	1.75 V	34	10.30	25.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



5.2 CONDUCTED EMISSION MEASUREMENT

5.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB 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.

5.2.2 TEST INSTRUMENTS

Same as item 4.2.2.

5.2.3 TEST PROCEDURES

Same as item 4.2.3.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP

Same as item 4.2.5.

5.2.6 EUT OPERATING CONDITIONS

Same as item 4.1.6

5.2.7 TEST RESULTS

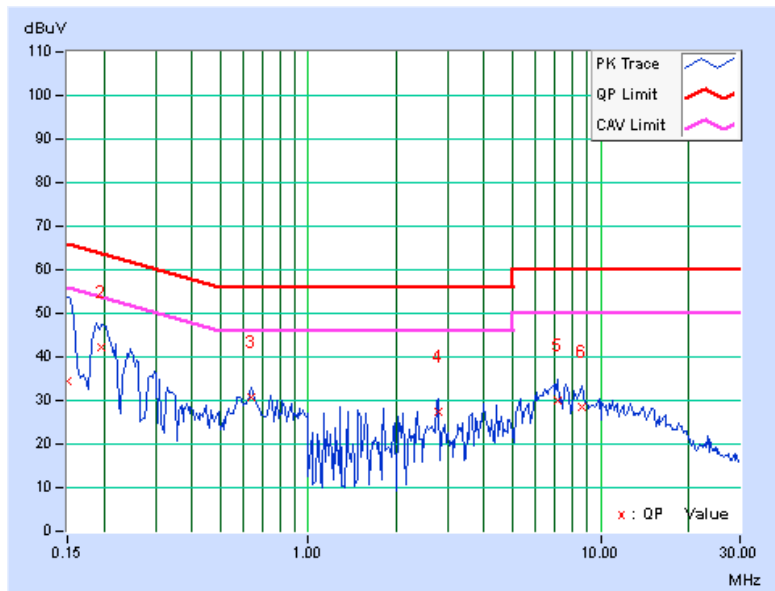
CONDUCTED WORST-CASE DATA : 802.11n(20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
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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	0.15000	0.16	34.17	9.57	34.33	9.73	66.00	56.00	-31.67	-46.27
2	0.19687	0.18	41.97	24.68	42.15	24.86	63.74	53.74	-21.59	-28.88
3	0.63828	0.19	30.44	21.46	30.63	21.65	56.00	46.00	-25.37	-24.35
4	2.80078	0.33	26.93	11.72	27.26	12.05	56.00	46.00	-28.74	-33.95
5	7.14844	0.43	29.67	18.81	30.10	19.24	60.00	50.00	-29.90	-30.76
6	8.60938	0.46	28.11	17.27	28.57	17.73	60.00	50.00	-31.43	-32.27

REMARKS:

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

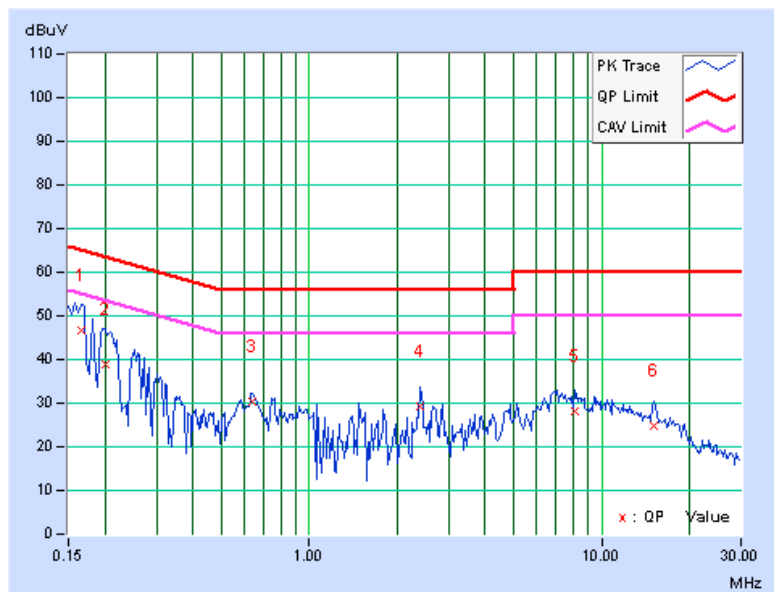


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	0.14	46.67	20.96	46.81	21.10	65.18	55.18	-18.36	-34.07
2	0.20078	0.15	38.91	32.16	39.06	32.31	63.58	53.58	-24.52	-21.27
3	0.64219	0.20	30.19	23.50	30.39	23.70	56.00	46.00	-25.61	-22.30
4	2.40625	0.32	28.80	14.54	29.12	14.86	56.00	46.00	-26.88	-31.14
5	8.14063	0.52	27.55	18.43	28.07	18.95	60.00	50.00	-31.93	-31.05
6	15.07422	0.69	24.08	16.12	24.77	16.81	60.00	50.00	-35.23	-33.19

REMARKS:

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





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5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP

Same as item 4.3.2.

5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

Same as item 4.3.4.

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

Same as item 4.3.6.



5.3.7 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	16.65	16.57	0.5	PASS
157	5785	16.64	16.64	0.5	PASS
165	5825	16.61	16.63	0.5	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.81	17.86	0.5	PASS
157	5785	17.83	17.89	0.5	PASS
165	5825	17.84	17.87	0.5	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	37.19	37.39	0.5	PASS
159	5795	37.09	37.08	0.5	PASS



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5.4 OCCUPIED BANDWIDTH MEASUREMENT

5.4.1 TEST SETUP

Same as item 4.4.1.

5.4.2 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.3 TEST PROCEDURE

Same as item 4.4.3.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation.

5.4.5 EUT OPERATING CONDITIONS

Same as item 4.4.5.



5.4.6 TEST RESULTS

802.11a

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
149	5745	17.58	17.16	PASS
157	5785	17.46	17.22	PASS
165	5825	17.46	17.22	PASS

802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
149	5745	18.54	18.42	PASS
157	5785	18.54	18.48	PASS
165	5825	18.54	18.72	PASS

802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	OCCUPIED BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
151	5755	39.36	39.84	PASS
159	5795	39.36	39.36	PASS



5.5 CONDUCTED OUTPUT POWER

5.5.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

5.5.2 TEST SETUP

Same as Item 4.4.2.

5.5.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURES

Same as Item 4.4.4.

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



5.5.7 TEST RESULTS

802.11a

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	23.27	23.89	457.23	26.60	30	PASS
157	5785	23.36	23.97	466.23	26.69	30	PASS
165	5825	23.11	23.76	442.33	26.46	30	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6\text{dBi} = 6\text{dBi}$, so the conducted power limit is not reduced.

802.11n (20MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	23.48	24.01	474.61	26.76	30	PASS
157	5785	23.28	24.09	469.26	26.71	30	PASS
165	5825	23.04	24.39	476.16	26.78	30	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6\text{dBi} = 6\text{dBi}$, so the conducted power limit is not reduced.

802.11n (40MHz)

CHAN.	FREQ. (MHz)	PEAK POWER (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	23.22	24.25	475.97	26.78	30	PASS
159	5795	23.18	23.36	424.74	26.28	30	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6\text{dBi} = 6\text{dBi}$, so the conducted power limit is not reduced.



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5.6 POWER SPECTRAL DENSITY MEASUREMENT

5.6.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.6.2 TEST SETUP

Same as item 4.5.2.

5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 TEST PROCEDURE.

Same as item 4.5.4.

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

Same as item 4.3.6.



5.6.7 TEST RESULTS

802.11a

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	4.52	-10.71	3.01	-7.70	8	PASS
	157	5785	4.78	-10.45	3.01	-7.44	8	PASS
	165	5825	4.25	-10.98	3.01	-7.97	8	PASS
1	149	5745	6.05	-9.18	3.01	-6.17	8	PASS
	157	5785	6.08	-9.15	3.01	-6.14	8	PASS
	165	5825	5.40	-9.83	3.01	-6.82	8	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6\text{dBi} = 6\text{dBi}$, so the power density limit is not reduced.

802.11n (20MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	149	5745	4.94	-10.29	3.01	-7.28	8	PASS
	157	5785	4.96	-10.27	3.01	-7.26	8	PASS
	165	5825	4.44	-10.79	3.01	-7.78	8	PASS
1	149	5745	6.50	-8.73	3.01	-5.72	8	PASS
	157	5785	6.46	-8.77	3.01	-5.76	8	PASS
	165	5825	-3.71	-18.94	3.01	-15.93	8	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6\text{dBi} = 6\text{dBi}$, so the power density limit is not reduced.

802.11n (40MHz)

TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	2.13	-13.10	3.01	-10.09	8	PASS
	159	5795	2.26	-12.97	3.01	-9.96	8	PASS
1	151	5755	3.91	-11.32	3.01	-8.31	8	PASS
	159	5795	3.16	-12.07	3.01	-9.06	8	PASS

NOTE: Directional gain = $3\text{dBi} + 10\log(2) = 6\text{dBi} = 6\text{dBi}$, so the power density limit is not reduced.



5.7 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.7.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.7.2 TEST SETUP

Same as Item 4.6.2

5.7.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.7.4 TEST PROCEDURE

Same as Item 4.6.4

5.7.5 DEVIATION FROM TEST STANDARD

No deviation.

5.7.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.7.7 TEST RESULTS

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

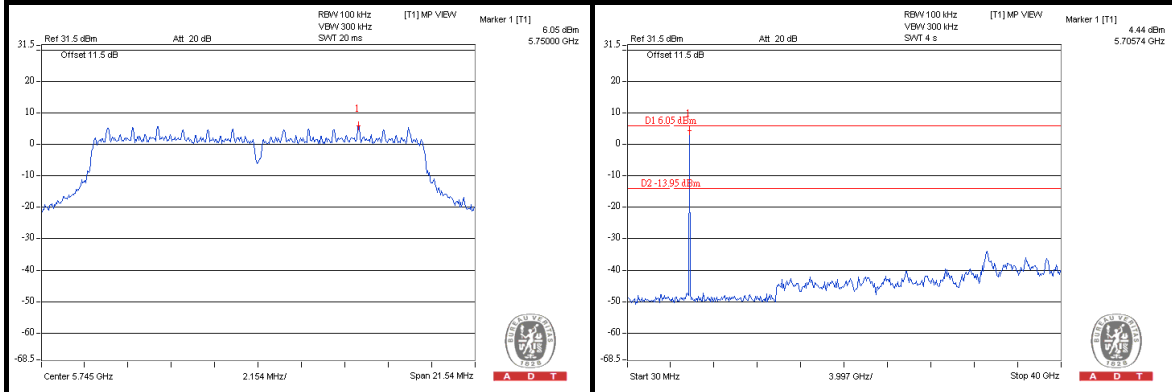
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



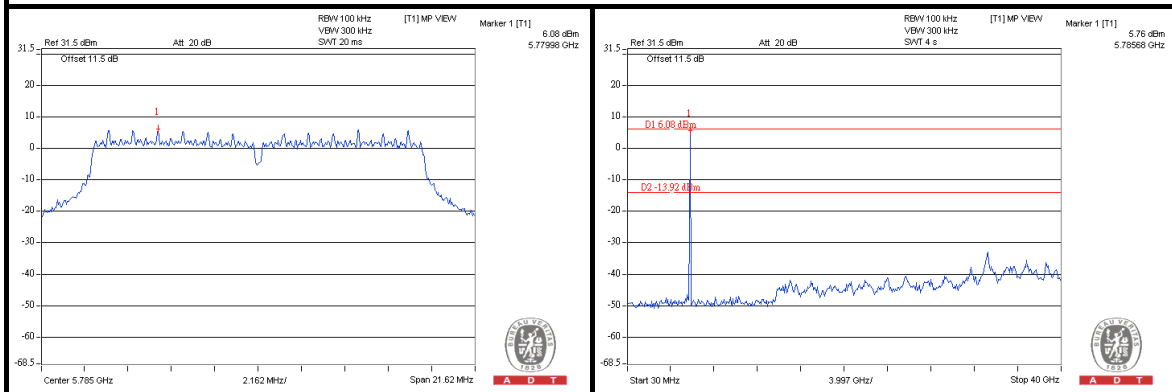
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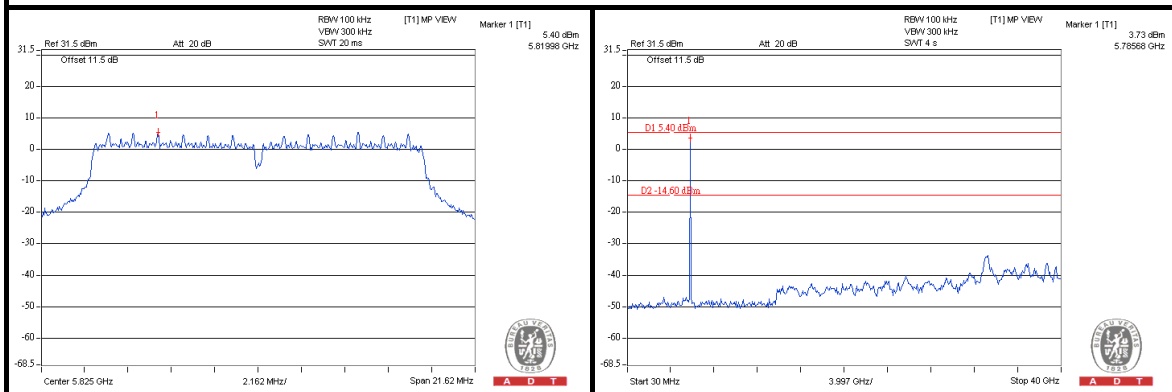
CH 149



CH 157



CH 165

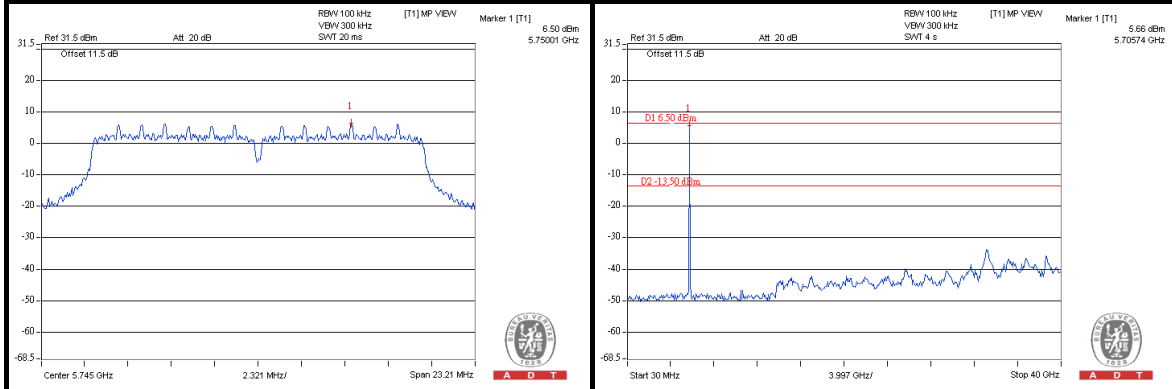




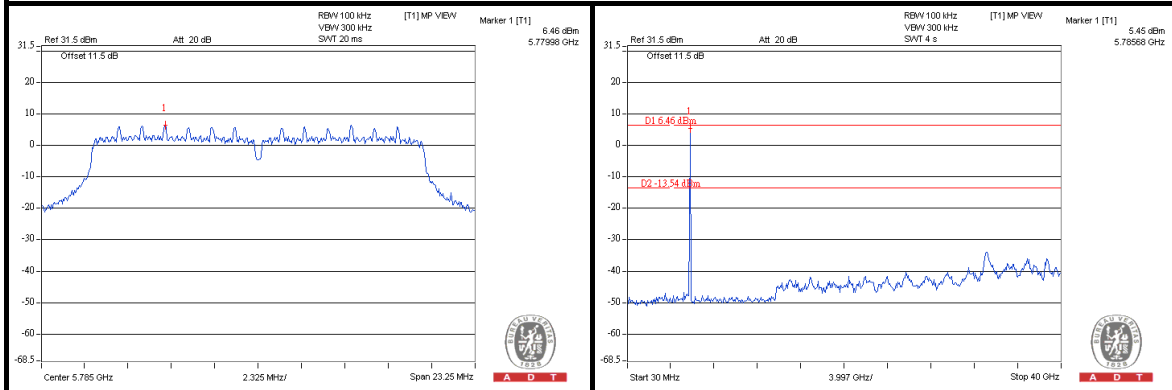
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802.11n (20MHz)

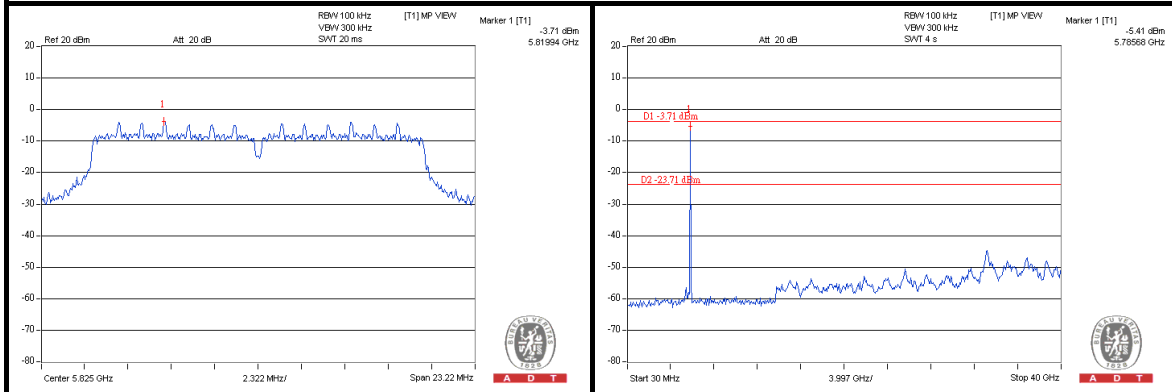
CH 149



CH 157



CH 165

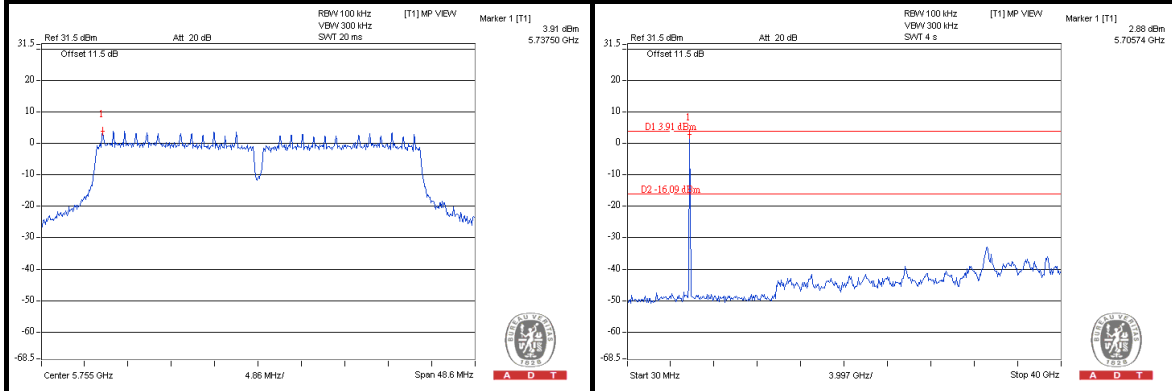




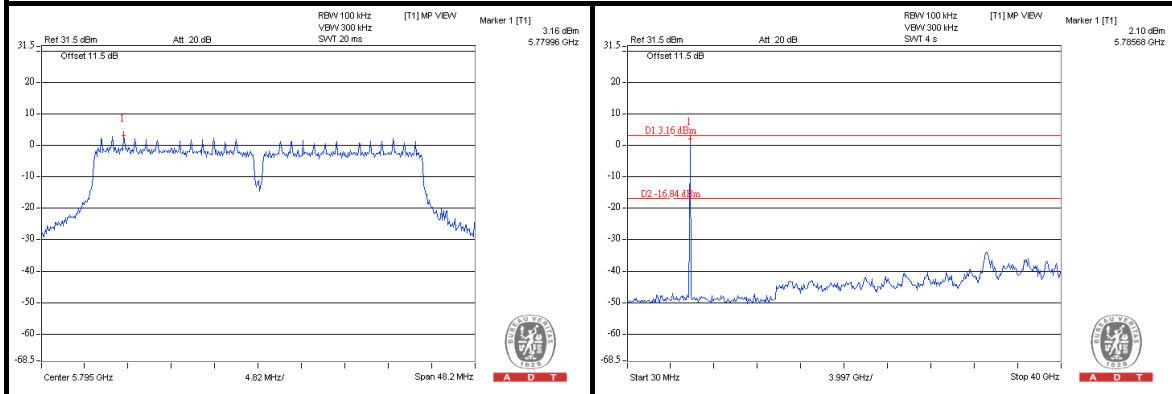
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802.11n (40MHz)

CH 151



CH 159



5.8 RECEIVER RADIATED EMISSION MEASUREMENT

5.8.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in RSS-Gen table 2 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
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. As shown in RSS-Gen 7.2.3, 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.

5.8.2 TEST INSTRUMENTS

Same as 4.1.2

5.8.3 TEST PROCEDURES

Same as 4.1.3

5.8.4 DEVIATION FROM TEST STANDARD

No deviation.

5.8.5 TEST SETUP

Same as 4.1.5

5.8.6 EUT OPERATING CONDITIONS

Same as 4.1.6



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5.8.7 TEST RESULTS

ABOVE 1GHz DATA: 802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 30GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	1350.00	41.0 PK	74.0	-33.0	1.00 H	126	12.50	28.50
2	1350.00	35.7 AV	54.0	-18.3	1.00 H	126	7.20	28.50
3	2250.00	40.3 PK	74.0	-33.7	1.00 H	107	8.90	31.40
4	2250.00	28.7 AV	54.0	-25.3	1.00 H	107	-2.70	31.40
5	7660.00	52.1 PK	74.0	-21.9	1.00 H	301	7.00	45.10
6	7660.00	38.0 AV	54.0	-16.0	1.00 H	301	-7.10	45.10
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	1350.00	41.9 PK	74.0	-32.1	1.57 V	262	13.40	28.50
2	1350.00	36.1 AV	54.0	-17.9	1.57 V	262	7.60	28.50
3	2250.00	41.2 PK	74.0	-32.8	1.00 V	270	9.80	31.40
4	2250.00	29.8 AV	54.0	-24.2	1.00 V	270	-1.60	31.40
5	7660.00	52.9 PK	74.0	-21.1	1.00 V	10	7.80	45.10
6	7660.00	39.1 AV	54.0	-14.9	1.00 V	10	-6.00	45.10

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 30GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	1350.00	40.5 PK	74.0	-33.5	1.25 H	156	12.00	28.50
2	1350.00	34.2 AV	54.0	-19.8	1.25 H	156	5.70	28.50
3	2250.00	40.5 PK	74.0	-33.5	1.00 H	157	9.10	31.40
4	2250.00	29.1 AV	54.0	-24.9	1.00 H	157	-2.30	31.40
5	7713.00	51.7 PK	74.0	-22.3	1.12 H	12	6.50	45.20
6	7713.00	38.7 AV	54.0	-15.3	1.12 H	12	-6.50	45.20
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	1350.00	41.4 PK	74.0	-32.6	1.50 V	265	12.90	28.50
2	1350.00	35.7 AV	54.0	-18.3	1.50 V	265	7.20	28.50
3	2250.00	41.4 PK	74.0	-32.6	1.00 V	275	10.00	31.40
4	2250.00	30.1 AV	54.0	-23.9	1.00 V	275	-1.30	31.40
5	7713.00	52.5 PK	74.0	-21.5	1.24 V	27	7.30	45.20
6	7713.00	39.7 AV	54.0	-14.3	1.24 V	27	-5.50	45.20

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 30GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	1350.00	41.6 PK	74.0	-32.4	1.25 H	146	13.10	28.50
2	1350.00	35.2 AV	54.0	-18.8	1.25 H	146	6.70	28.50
3	2250.00	40.4 PK	74.0	-33.6	1.00 H	147	9.00	31.40
4	2250.00	28.8 AV	54.0	-25.2	1.00 H	147	-2.60	31.40
5	7766.00	52.4 PK	74.0	-21.6	1.00 H	344	7.00	45.40
6	7766.00	38.5 AV	54.0	-15.5	1.00 H	344	-6.90	45.40
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	1350.00	42.4 PK	74.0	-31.6	1.50 V	264	13.90	28.50
2	1350.00	36.6 AV	54.0	-17.4	1.50 V	264	8.10	28.50
3	2250.00	41.3 PK	74.0	-32.7	1.00 V	274	9.90	31.40
4	2250.00	29.9 AV	54.0	-24.1	1.00 V	274	-1.50	31.40
5	7766.00	53.1 PK	74.0	-20.9	1.00 V	44	7.70	45.40
6	7766.00	39.6 AV	54.0	-14.4	1.00 V	44	-5.80	45.40

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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BELOW 1GHz WORST-CASE DATA : 802.11n(20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH	TESTED BY	Alan Wu

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	212.30	37.3 QP	43.5	-6.2	1.49 H	106	26.00	11.30
2	276.33	32.2 QP	46.0	-13.8	1.00 H	279	18.30	13.90
3	375.29	35.2 QP	46.0	-10.8	1.00 H	254	18.60	16.60
4	625.60	35.5 QP	46.0	-10.5	1.25 H	238	13.80	21.70
5	676.05	36.0 QP	46.0	-10.0	1.75 H	5	14.00	22.00
6	875.91	39.6 QP	46.0	-6.4	1.49 H	227	14.10	25.50

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	64.83	38.2 QP	40.0	-1.8	1.00 V	325	25.30	12.90
2	105.58	37.7 QP	43.5	-5.8	1.24 V	86	27.70	10.00
3	210.36	31.7 QP	43.5	-11.8	1.00 V	134	20.40	11.30
4	375.29	34.3 QP	46.0	-11.7	2.00 V	220	17.70	16.60
5	676.05	31.3 QP	46.0	-14.7	1.49 V	77	9.30	22.00
6	875.91	36.2 QP	46.0	-9.8	1.24 V	59	10.70	25.50

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).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.



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6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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7. INFORMATION ON THE TESTING LABORATORIES

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

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

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



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8. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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

---END---