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FCC TEST REPORT (15.247)

REPORT NO.: RF111219C11

MODEL NO.: EA2700

FCC ID: Q87-EA2700

RECEIVED: Dec. 19, 2011

TESTED: Dec. 20, 2011 ~ Jan. 17, 2012

ISSUED: Jan. 18, 2012

APPLICANT: Cisco Consumer Products LLC

ADDRESS: 121 Theory Drive Irvine California 92617 United States

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

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

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	N/A	Jan. 18, 2012



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1. CERTIFICATION

PRODUCT: Linksys EA2700 Dual-Band N600 Router with Gigabit

MODEL: EA2700

BRAND: CISCO

APPLICANT: Cisco Consumer Products LLC

TESTED: Dec. 20, 2011 ~ Jan. 17, 2012

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**

ANSI C63.4-2003

ANSI C63.10-2009

The above equipment (Model: EA2700) 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 : *Ivy Lin* , DATE: Jan. 18, 2012

Ivy Lin / Specialist

APPROVED BY : *Gary Chang* , DATE: Jan. 18, 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
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.82dB at 0.474MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 4824.00MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	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	Linksys EA2700 Dual-Band N600 Router with Gigabit
MODEL NO.	EA2700
FCC ID	Q87-EA2700
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 450.0Mbps
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	547.29mW for 2412 ~ 2462MHz 470.99mW for 5745 ~ 5825MHz
ANTENNA TYPE	Refer to Note for more details
ANTENNA CONNECTOR	Refer to Note for more details
DATA CABLE	NA
I/O PORTS	RJ45
ACCESSORY DEVICES	Adapter

NOTE:

1. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2412~2462	5180~5240	5745~5825
802.11b	√		
802.11g	√		
802.11a		√	√
802.11n (20MHz)	√	√	√
802.11n (40MHz)	√	√	√

2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11a	1TX
802.11n (20MHz)	1TX/ 2TX
802.11n (40MHz)	1TX/ 2TX

3. The EUT has main source and second source, the components list as below.

EUT	COMPONENT TYPE	P/N	VENDOR
Main source	DDR SDRAM (U1)	H5DU5162ETR-E3C	Hynix
	Flash (U3)	H27U518S2CTR-BC	Hynix
Second source	DDR SDRAM (U1)	EM6AB160TSD-5G	ETRON
	Flash (U3)	NAND512W3A2SN6F	Micron

4. The following antennas provided to EUT.

ANTENNA	ANTENNA TYPE	ANTENNA GAIN (dBi)		ANTENNA CONNECTOR
		2412~2462MHz	5745~5825MHz	
Right	Dipole	3.45	5.15	NA
Front	Dipole	2.46	3.60	NA

* For 802.11abg, the right antenna with highest gain was chosen for final test.

5. The EUT was powered by the following adapters:

ADAPTER 1	
BRAND:	SOLYTECH ENTERPRISE CORPORATION
MODEL:	CAD1212C
INPUT:	100-240Vac, 0.5A, 50-60Hz
OUTPUT:	12Vdc, 1.0A Max. 12W
POWER LINE:	1.5m non-shielded cable without core

ADAPTER 2	
BRAND:	LEADER ELECTRONICS INC.
MODEL:	MU12-G120100-A1
INPUT:	100-240Vac, 50/60Hz, 0.5A
OUTPUT:	12Vdc, 1.0A
POWER LINE:	1.5m non-shielded cable without core



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ADAPTER 3	
BRAND:	CWT
MODEL:	CAP012121 US
INPUT:	100-240Vac, 47-63Hz, 0.35A
OUTPUT:	12.0Vdc, 1.0A
POWER LINE:	1.5m non-shielded cable without core

*After pre-testing, adapter 1 is the worst case for final test.

6. 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
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

FOR 5.0GHz (5745 ~ 5825MHz):

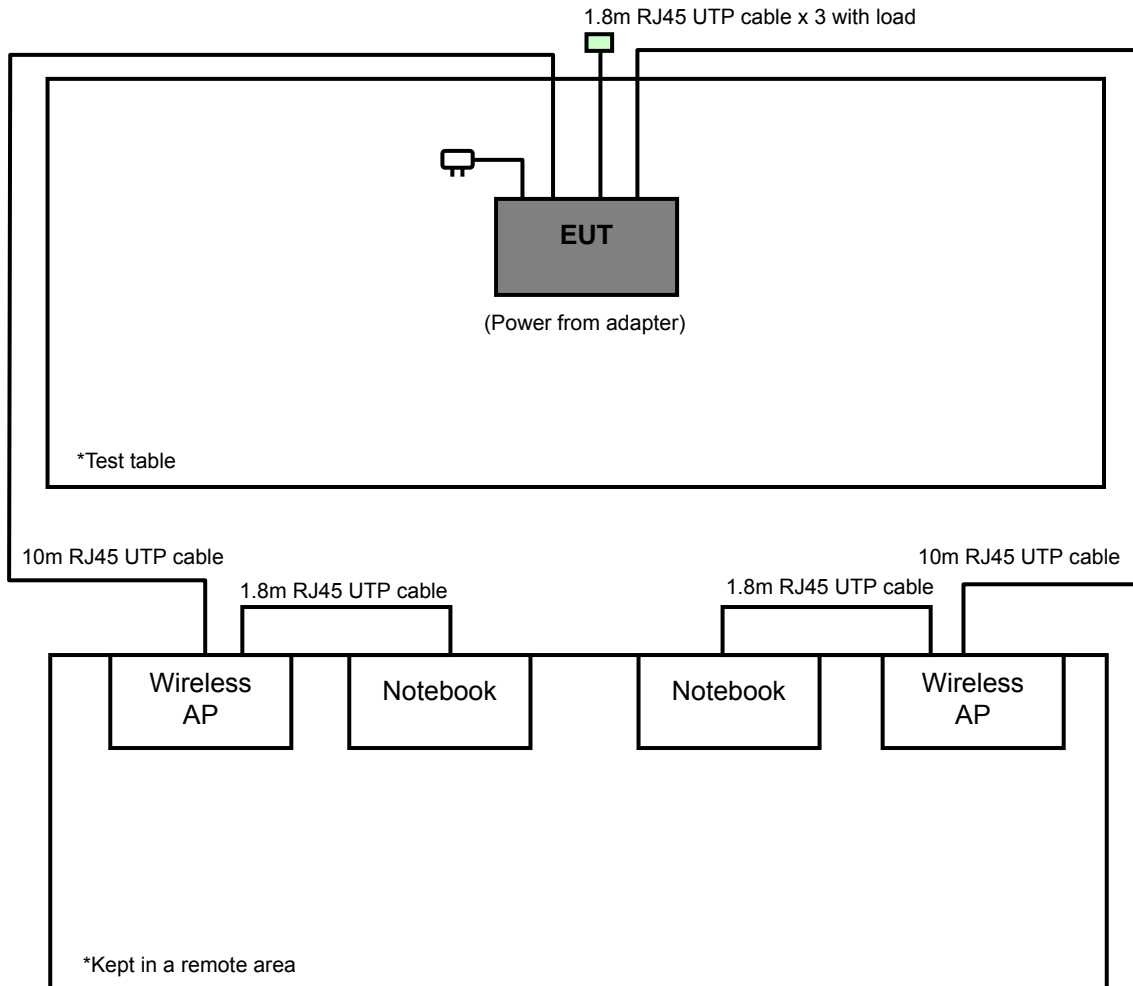
5 channels are provided for 802.11a, 802.11n (20MHz):

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 CONFIGURATION OF SYSTEM UNDER TEST





3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

FOR 2.4GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	EUT: Main source
B	-	√	√	-	EUT: Second source

Where **RE≥1G**: Radiated Emission above 1GHz **RE<1G**: Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM**: Antenna Port Conducted Measurement
NOTE: "-": Means no effect.

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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	1 to 7	1, 4, 7	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)
A, B	802.11g	1 to 7	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)
A, B	802.11g	1 to 7	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)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	1 to 7	1, 7	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)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2
A	802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	TEST MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	A	22deg. C, 65%RH	120Vac, 60Hz	Antony Lee, Haru Yang
RE<1G	A	21deg. C, 69%RH	120Vac, 60Hz	Antony Lee
	B	22deg. C, 65%RH	120Vac, 60Hz	Antony Lee
PLC	A	23deg. C, 64%RH	120Vac, 60Hz	Antony Lee
	B	23deg. C, 64%RH	120Vac, 60Hz	Antony Lee
APCM	A	22deg. C, 65%RH	120Vac, 60Hz	Antony Lee



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FOR 5.745 ~ 5.825GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE \geq 1G	RE<1G	PLC	APCM	
A	√	√	√	√	EUT: Main source
B	-	√	√	-	EUT: Second source

Where **PLC**: Power Line Conducted Emission **RE<1G**: Radiated Emission below 1GHz
RE \geq 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement
NOTE: "-": Means no effect.

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)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	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)
A, B	802.11a	149 to 165	157	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)
A, B	802.11a	149 to 165	157	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)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
A	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)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	TEST MODE	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE _≥ 1G	A	22deg. C, 65%RH	120Vac, 60Hz	Antony Lee, Haru Yang
RE _{<} 1G	A	21deg. C, 69%RH	120Vac, 60Hz	Antony Lee
	B	22deg. C, 65%RH	120Vac, 60Hz	Antony Lee
PLC	A	23deg. C, 64%RH	120Vac, 60Hz	Antony Lee
	B	23deg. C, 64%RH	120Vac, 60Hz	Antony Lee
APCM	A	22deg. C, 65%RH	120Vac, 60Hz	Antony Lee



3.3 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)

ANSI C63.4-2003

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.

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	D531	CN-0XM006-48643-8 1U-2973	QDS-BRCM1020
2	NOTEBOOK	DELL	D531	CN-0XM006-48643-8 1U-2610	QDS-BRCM1020
3	WIRELESS AP	CISCO	EA2700	NA	Q87-EA2700
4	WIRELESS AP	CISCO	EA2700	NA	Q87-EA2700

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8m RJ45 UTP cable
2	1.8m RJ45 UTP cable
3	10m RJ45 UTP cable
4	10m RJ45 UTP cable

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 ~ 4 as a communication partners to transfer data.
3. Item 3 ~ 4 are provided by the client.



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

4.1 RADIATED EMISSION AND BANDEGE MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION AND BANDEGE MEASUREMENT

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). 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. As shown in 15.35(b), 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	ESI7	838496/016	Jan. 03, 2012	Jan. 02, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 05, 2012	Jan. 04, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 20, 2011	Jul. 19, 2012
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
High Speed Peak Power Meter	ML2495A	0842014	Apr. 26, 2011	Apr. 25, 2012
Power Sensor	MA2411B	0738404	Apr. 26, 2011	Apr. 25, 2012

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 4.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The FCC Site Registration No. is 460141.
 5. The IC Site Registration No. is IC7450F-4.



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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.

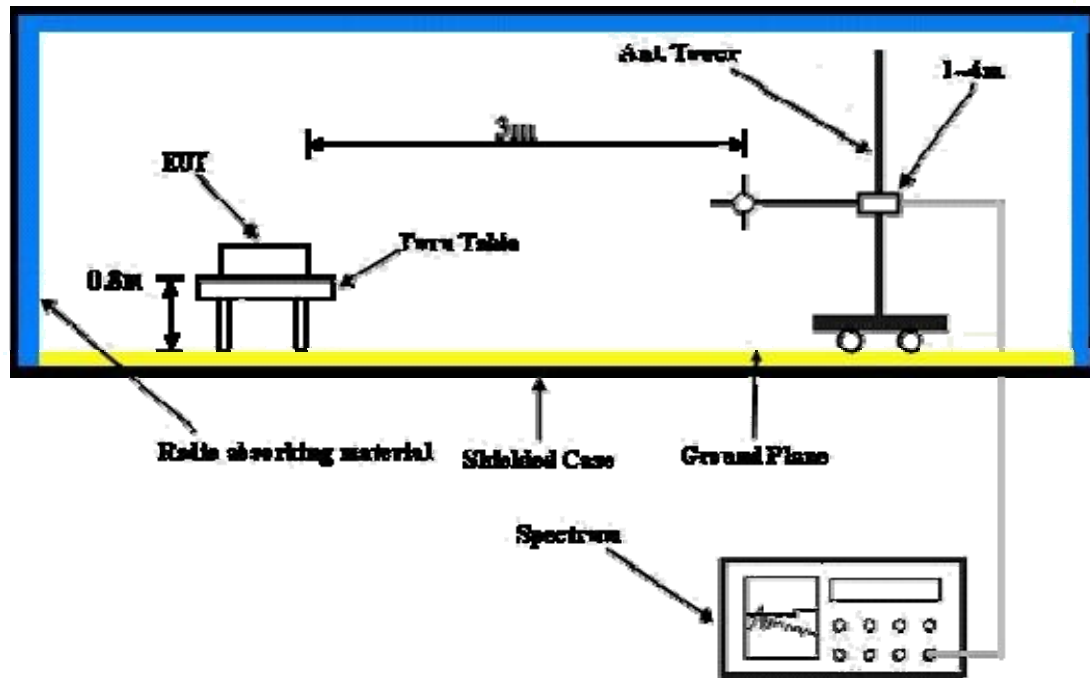
NOTE:

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

- a. Placed the EUT on the testing table.
- b. Prepared notebooks and wireless AP to act as communication partner and placed it outside of testing area.
- c. 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.
- d. The communication partner sent data to EUT by command "PING".



4.1.7 TEST RESULTS

802.11b

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

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	55.7 PK	74.0	-18.3	1.08 H	1	23.30	32.40
2	2390.00	44.5 AV	54.0	-9.5	1.08 H	1	12.10	32.40
3	*2412.00	102.9 PK			1.08 H	2	70.50	32.40
4	*2412.00	98.4 AV			1.08 H	2	66.00	32.40
5	4824.00	52.1 PK	74.0	-21.9	1.39 H	264	13.40	38.70
6	4824.00	46.6 AV	54.0	-7.4	1.39 H	264	7.90	38.70
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	2390.00	55.2 PK	74.0	-18.8	1.00 V	115	22.80	32.40
2	2390.00	45.6 AV	54.0	-8.4	1.00 V	115	13.20	32.40
3	*2412.00	104.1 PK			1.00 V	114	71.70	32.40
4	*2412.00	100.7 AV			1.00 V	114	68.30	32.40
5	4824.00	57.9 PK	74.0	-16.1	1.00 V	265	19.20	38.70
6	4824.00	53.0 AV	54.0	-1.0	1.00 V	265	14.30	38.70

- 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.



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

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	102.8 PK			1.06 H	3	70.30	32.50
2	*2437.00	98.3 AV			1.06 H	3	65.80	32.50
3	#3249.00	47.3 PK	82.8	-35.5	1.00 H	258	12.50	34.80
4	#3249.00	42.3 AV	78.3	-36.0	1.00 H	258	7.50	34.80
5	4874.00	52.3 PK	74.0	-21.7	1.41 H	266	13.50	38.80
6	4874.00	46.9 AV	54.0	-7.1	1.41 H	266	8.10	38.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.1 PK			1.20 V	10	71.60	32.50
2	*2437.00	99.7 AV			1.20 V	10	67.20	32.50
3	#3249.00	47.4 PK	84.1	-36.7	1.02 V	276	12.60	34.80
4	#3249.00	42.0 AV	79.7	-37.7	1.02 V	276	7.20	34.80
5	4874.00	57.1 PK	74.0	-16.9	1.00 V	267	18.30	38.80
6	4874.00	52.9 AV	54.0	-1.1	1.00 V	267	14.10	38.80

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



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

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	102.8 PK			1.05 H	3	70.20	32.60
2	*2462.00	98.2 AV			1.05 H	3	65.60	32.60
3	2483.50	55.9 PK	74.0	-18.1	1.05 H	3	23.20	32.70
4	2483.50	45.2 AV	54.0	-8.8	1.05 H	3	12.50	32.70
5	4924.00	52.3 PK	74.0	-21.7	1.42 H	265	13.30	39.00
6	4924.00	46.8 AV	54.0	-7.2	1.42 H	265	7.80	39.00
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	104.2 PK			1.12 V	3	71.60	32.60
2	*2462.00	99.5 AV			1.12 V	3	66.90	32.60
3	2483.50	53.8 PK	74.0	-20.2	1.12 V	5	21.10	32.70
4	2483.50	45.2 AV	54.0	-8.8	1.12 V	5	12.50	32.70
5	4924.00	55.4 PK	74.0	-18.6	1.02 V	262	16.40	39.00
6	4924.00	52.7 AV	54.0	-1.3	1.02 V	262	13.70	39.00

- 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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802.11g

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

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	66.6 PK	74.0	-7.4	1.07 V	198	34.20	32.40
2	2390.00	48.7 AV	54.0	-5.3	1.07 V	198	16.30	32.40
3	*2412.00	102.2 PK			1.07 V	199	69.80	32.40
4	*2412.00	90.0 AV			1.07 V	199	57.60	32.40
5	4824.00	47.8 PK	74.0	-26.2	1.05 V	36	9.10	38.70
6	4824.00	36.2 AV	54.0	-17.8	1.05 V	36	-2.50	38.70
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	2390.00	67.8 PK	74.0	-6.2	1.12 H	194	35.40	32.40
2	2390.00	52.8 AV	54.0	-1.2	1.12 H	194	20.40	32.40
3	*2412.00	108.8 PK			1.00 H	197	76.40	32.40
4	*2412.00	93.2 AV			1.00 H	197	60.80	32.40
5	4824.00	46.8 PK	74.0	-27.2	1.00 H	66	8.10	38.70
6	4824.00	35.5 AV	54.0	-18.5	1.00 H	66	-3.20	38.70

- 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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Haru Yang

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	61.2 PK	74.0	-12.8	1.08 H	5	28.80	32.40
2	2390.00	47.6 AV	54.0	-6.4	1.08 H	5	15.20	32.40
3	*2437.00	112.1 PK			1.08 H	5	79.60	32.50
4	*2437.00	102.3 AV			1.08 H	5	69.80	32.50
5	4874.00	55.5 PK	74.0	-18.5	1.12 H	195	16.70	38.80
6	4874.00	40.4 AV	54.0	-13.6	1.12 H	195	1.60	38.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.5 PK	74.0	-12.5	1.02 V	129	29.10	32.40
2	2390.00	47.5 AV	54.0	-6.5	1.02 V	129	15.10	32.40
3	*2437.00	102.3 PK			1.05 V	198	69.80	32.50
4	*2437.00	90.2 AV			1.05 V	198	57.70	32.50
5	4874.00	48.2 PK	74.0	-25.8	1.02 V	39	9.40	38.80
6	4874.00	36.5 AV	54.0	-17.5	1.02 V	39	-2.30	38.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	108.1 PK			1.00 H	139	75.50	32.60
2	*2462.00	93.5 AV			1.00 H	139	60.90	32.60
3	2483.50	64.0 PK	74.0	-10.0	1.00 H	138	31.30	32.70
4	2483.50	52.5 AV	54.0	-1.5	1.00 H	138	19.80	32.70
5	4924.00	48.2 PK	74.0	-25.8	1.02 H	33	9.20	39.00
6	4924.00	36.5 AV	54.0	-17.5	1.02 H	33	-2.50	39.00
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	102.3 PK			1.05 V	189	69.70	32.60
2	*2462.00	90.5 AV			1.05 V	189	57.90	32.60
3	2483.50	66.3 PK	74.0	-7.7	1.05 V	189	33.60	32.70
4	2483.50	48.6 AV	54.0	-5.4	1.05 V	189	15.90	32.70
5	4924.00	48.2 PK	74.0	-25.8	1.02 V	38	9.20	39.00
6	4924.00	36.5 AV	54.0	-17.5	1.02 V	38	-2.50	39.00

- 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	72.0 PK	74.0	-2.0	1.12 H	199	39.60	32.40
2	2390.00	52.6 AV	54.0	-1.4	1.12 H	199	20.20	32.40
3	*2412.00	109.1 PK			1.12 H	201	76.70	32.40
4	*2412.00	90.5 AV			1.12 H	201	58.10	32.40
5	4824.00	47.3 PK	74.0	-26.7	1.00 H	36	8.60	38.70
6	4824.00	36.1 AV	54.0	-17.9	1.00 H	36	-2.60	38.70
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	2390.00	65.8 PK	74.0	-8.2	1.00 V	118	33.40	32.40
2	2390.00	48.5 AV	54.0	-5.5	1.00 V	118	16.10	32.40
3	*2412.00	104.1 PK			1.00 V	119	71.70	32.40
4	*2412.00	86.5 AV			1.00 V	119	54.10	32.40
5	4824.00	61.4 PK	74.0	-12.6	1.02 V	340	22.70	38.70
6	4824.00	42.4 AV	54.0	-11.6	1.02 V	340	3.70	38.70

- 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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Antony Lee

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	60.5 PK	74.0	-13.5	1.21 H	153	28.10	32.40
2	2390.00	46.5 AV	54.0	-7.5	1.21 H	153	14.10	32.40
3	*2437.00	109.1 PK			1.21 H	159	76.60	32.50
4	*2437.00	99.3 AV			1.21 H	159	66.80	32.50
5	4874.00	62.8 PK	74.0	-11.2	1.16 H	145	24.00	38.80
6	4874.00	46.8 AV	54.0	-7.2	1.16 H	145	8.00	38.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.2 PK	74.0	-13.8	1.00 V	121	27.80	32.40
2	2390.00	46.3 AV	54.0	-7.7	1.00 V	121	13.90	32.40
3	*2437.00	104.2 PK			1.00 V	120	71.70	32.50
4	*2437.00	84.3 AV			1.00 V	120	51.80	32.50
5	4874.00	61.6 PK	74.0	-12.4	1.01 V	342	22.80	38.80
6	4874.00	42.6 AV	54.0	-11.4	1.01 V	342	3.80	38.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	109.5 PK			1.51 H	51	76.90	32.60
2	*2462.00	90.7 AV			1.51 H	51	58.10	32.60
3	2483.50	70.9 PK	74.0	-3.1	1.02 H	72	38.20	32.70
4	2483.50	52.9 AV	54.0	-1.1	1.02 H	72	20.20	32.70
5	4924.00	48.1 PK	74.0	-25.9	1.00 H	33	9.10	39.00
6	4924.00	36.5 AV	54.0	-17.5	1.00 H	33	-2.50	39.00
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	104.2 PK			1.00 V	123	71.60	32.60
2	*2462.00	84.3 AV			1.00 V	123	51.70	32.60
3	2483.50	60.7 PK	74.0	-13.3	1.00 V	123	28.00	32.70
4	2483.50	46.2 AV	54.0	-7.8	1.00 V	123	13.50	32.70
5	4924.00	48.3 PK	74.0	-25.7	1.00 V	35	9.30	39.00
6	4924.00	36.7 AV	54.0	-17.3	1.00 V	35	-2.30	39.00

- 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 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	70.1 PK	74.0	-3.9	1.08 H	201	37.70	32.40
2	2390.00	52.6 AV	54.0	-1.4	1.08 H	201	20.20	32.40
3	*2422.00	105.1 PK			1.08 H	204	72.60	32.50
4	*2422.00	81.3 AV			1.08 H	204	48.80	32.50
5	4844.00	48.6 PK	74.0	-25.4	1.02 H	36	9.80	38.80
6	4844.00	35.5 AV	54.0	-18.5	1.02 H	36	-3.30	38.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.2 PK	74.0	-13.8	1.02 V	106	27.80	32.40
2	2390.00	48.7 AV	54.0	-5.3	1.02 V	106	16.30	32.40
3	*2422.00	97.5 PK			1.00 V	44	65.00	32.50
4	*2422.00	76.2 AV			1.00 V	44	43.70	32.50
5	4844.00	46.5 PK	74.0	-27.5	1.00 V	274	7.70	38.80
6	4844.00	33.6 AV	54.0	-20.4	1.00 V	274	-5.20	38.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 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 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Haru Yang

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	68.3 PK	74.0	-5.7	1.05 H	208	35.90	32.40
2	2390.00	50.2 AV	54.0	-3.8	1.05 H	208	17.80	32.40
3	*2437.00	108.2 PK			1.05 H	208	75.70	32.50
4	*2437.00	84.5 AV			1.05 H	208	52.00	32.50
5	4874.00	48.9 PK	74.0	-25.1	1.01 H	39	10.10	38.80
6	4874.00	35.7 AV	54.0	-18.3	1.01 H	39	-3.10	38.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.7 PK	74.0	-10.3	1.23 V	181	31.30	32.40
2	2390.00	48.5 AV	54.0	-5.5	1.23 V	181	16.10	32.40
3	*2437.00	101.7 PK			1.23 V	156	69.20	32.50
4	*2437.00	91.8 AV			1.23 V	156	59.30	32.50
5	4874.00	55.7 PK	74.0	-18.3	1.28 V	151	16.90	38.80
6	4874.00	41.7 AV	54.0	-12.3	1.28 V	151	2.90	38.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 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 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	106.1 PK			1.07 H	191	73.50	32.60
2	*2452.00	81.9 AV			1.07 H	191	49.30	32.60
3	2483.50	68.7 PK	74.0	-5.3	1.02 H	197	36.00	32.70
4	2483.50	52.5 AV	54.0	-1.5	1.02 H	197	19.80	32.70
5	4904.00	48.3 PK	74.0	-25.7	1.00 H	33	9.40	38.90
6	4904.00	35.2 AV	54.0	-18.8	1.00 H	33	-3.70	38.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	98.3 PK			1.00 V	58	65.70	32.60
2	*2452.00	77.4 AV			1.00 V	58	44.80	32.60
3	2483.50	60.3 PK	74.0	-13.7	1.02 V	107	27.60	32.70
4	2483.50	48.5 AV	54.0	-5.5	1.02 V	107	15.80	32.70
5	4904.00	46.6 PK	74.0	-27.4	1.00 V	281	7.70	38.90
6	4904.00	34.2 AV	54.0	-19.8	1.00 V	281	-4.70	38.90

- 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, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Antony Lee
TEST MODE	A		

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	160.17	40.4 QP	43.5	-3.1	1.75 H	127	25.50	14.90
2	212.66	38.3 QP	43.5	-5.2	1.00 H	280	25.80	12.50
3	375.98	40.9 QP	46.0	-5.1	1.00 H	253	23.10	17.80
4	500.42	41.3 QP	46.0	-4.7	1.75 H	79	19.90	21.40
5	626.80	42.1 QP	46.0	-3.9	1.25 H	217	18.00	24.10
6	877.61	40.5 QP	46.0	-5.5	1.00 H	226	12.10	28.40
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	46.34	36.6 QP	40.0	-3.4	1.25 V	9	21.80	14.80
2	249.60	33.2 QP	46.0	-12.8	1.00 V	217	19.70	13.50
3	375.98	38.9 QP	46.0	-7.1	1.50 V	331	21.10	17.80
4	500.42	35.8 QP	46.0	-10.2	1.00 V	325	14.40	21.40
5	625.00	43.0 QP	46.0	-3.0	1.00 V	150	19.00	24.00
6	877.61	40.9 QP	46.0	-5.1	1.25 V	331	12.50	28.40

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Antony Lee
TEST MODE	B		

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	125.17	35.4 QP	43.5	-8.1	2.00 H	88	22.80	12.60
2	249.60	35.9 QP	46.0	-10.1	1.75 H	112	22.20	13.70
3	374.04	40.8 QP	46.0	-5.2	2.00 H	151	23.00	17.80
4	500.42	41.8 QP	46.0	-4.2	1.75 H	211	20.60	21.20
5	624.85	37.9 QP	46.0	-8.1	1.75 H	325	14.10	23.80
6	875.67	36.3 QP	46.0	-9.7	1.75 H	100	8.10	28.20
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	53.40	36.5 QP	40.0	-3.5	1.74 V	197	22.50	14.00
2	76.12	36.8 QP	40.0	-3.2	1.24 V	145	25.70	11.10
3	107.67	39.0 QP	43.5	-4.5	1.00 V	184	28.30	10.70
4	374.04	39.9 QP	46.0	-6.1	1.25 V	100	22.10	17.80
5	499.98	43.0 QP	46.0	-3.0	1.24 V	98	21.90	21.10
6	624.85	40.5 QP	46.0	-5.5	1.00 V	31	16.70	23.80

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



4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 19, 2011	Nov. 18, 2012
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 22, 2011	Dec. 21, 2012
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Dec. 30, 2011	Dec. 29, 2012
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jul. 07, 2011	Jul. 06, 2012
Software ADT	ADT_Cond_ V7.3.7	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.



A D T

4.2.3 TEST PROCEDURES

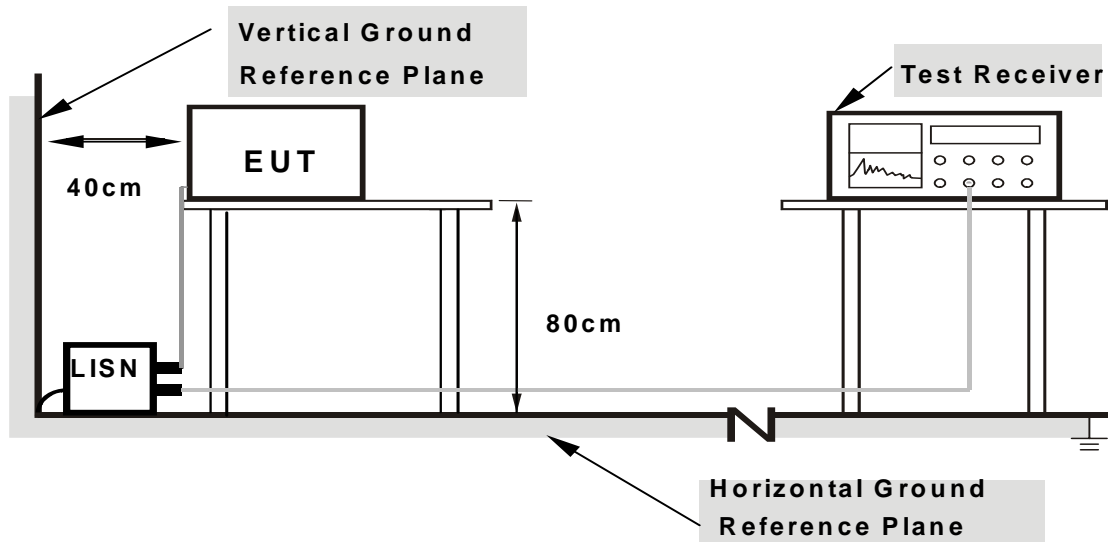
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

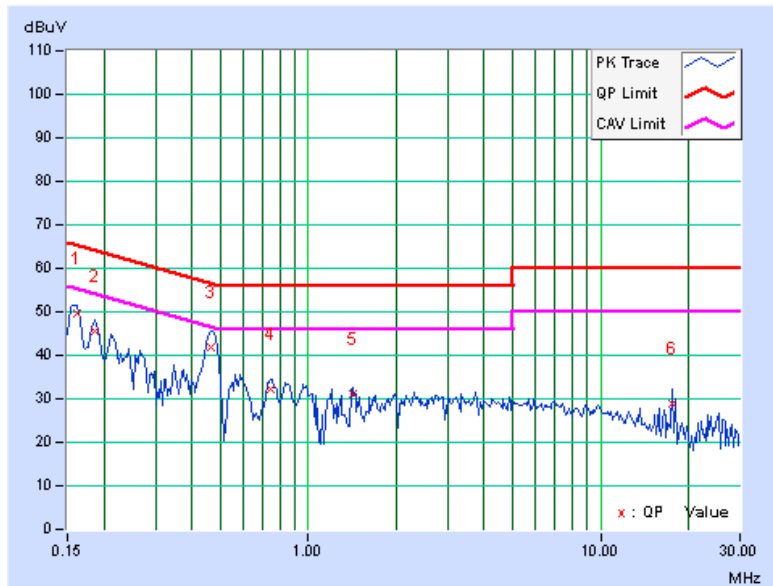
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11g

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor (dB)	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. [dB (uV)]	AV. [dB (uV)]	Q.P. (dB)	AV. (dB)
1	0.162	0.15	49.36	37.97	49.51	38.12	65.38	55.38	-15.87	-17.26
2	0.185	0.15	45.50	34.73	45.65	34.88	64.25	54.25	-18.60	-19.37
3	0.466	0.17	41.78	29.90	41.95	30.07	56.58	46.58	-14.63	-16.51
4	0.744	0.18	32.10	27.77	32.28	27.95	56.00	46.00	-23.72	-18.05
5	1.418	0.22	30.73	25.02	30.95	25.24	56.00	46.00	-25.05	-20.76
6	17.559	0.58	28.43	24.62	29.01	25.20	60.00	50.00	-30.99	-24.80

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



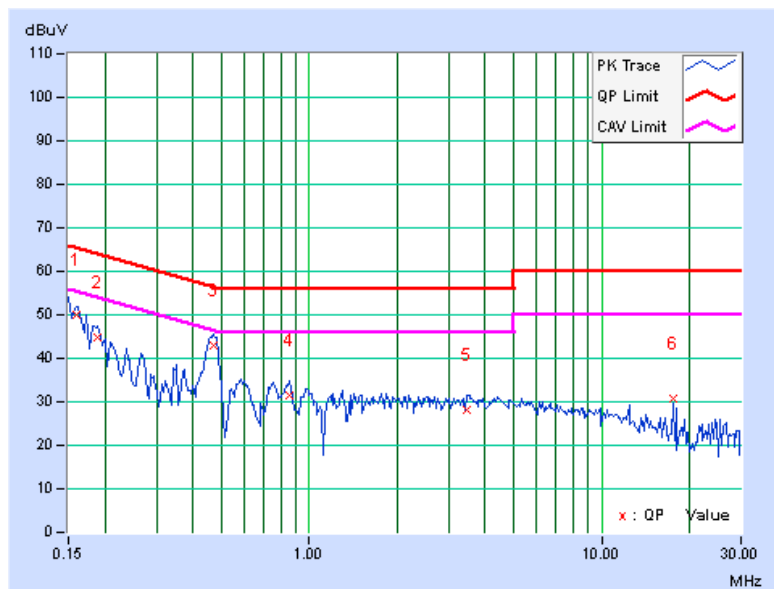


A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.160	0.13	49.82	38.16	49.95	38.29	65.44	55.44	-15.49	-17.15
2	0.189	0.14	44.51	33.54	44.65	33.68	64.08	54.08	-19.43	-20.40
3	0.470	0.16	42.71	34.53	42.87	34.69	56.51	46.51	-13.63	-11.81
4	0.853	0.18	31.42	25.85	31.60	26.03	56.00	46.00	-24.40	-19.97
5	3.461	0.33	27.79	22.16	28.12	22.49	56.00	46.00	-27.88	-23.51
6	17.559	0.66	30.14	27.33	30.80	27.99	60.00	50.00	-29.20	-22.01

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



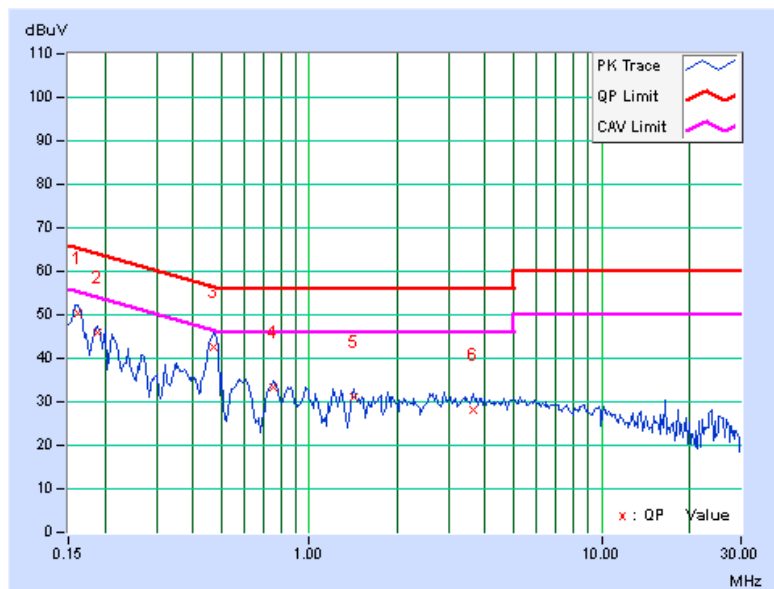


A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.15	50.15	38.86	50.30	39.01	65.38	55.38	-15.08	-16.37
2	0.189	0.15	45.64	35.25	45.79	35.40	64.08	54.08	-18.29	-18.68
3	0.470	0.17	42.29	31.13	42.46	31.30	56.51	46.51	-14.05	-15.21
4	0.752	0.18	33.17	29.30	33.35	29.48	56.00	46.00	-22.65	-16.52
5	1.414	0.22	30.87	24.81	31.09	25.03	56.00	46.00	-24.91	-20.97
6	3.633	0.33	27.98	22.38	28.31	22.71	56.00	46.00	-27.69	-23.29

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



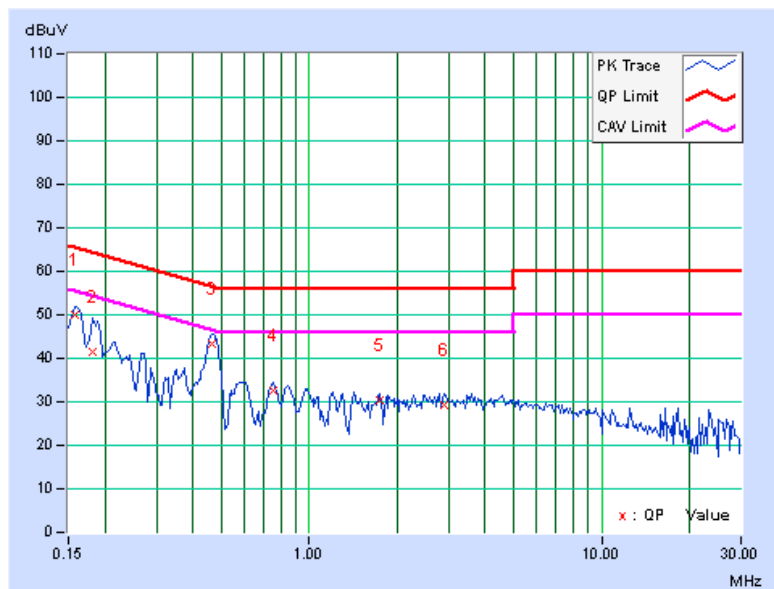


A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.13	49.81	37.55	49.94	37.68	65.58	55.58	-15.64	-17.90
2	0.181	0.14	41.27	27.38	41.41	27.52	64.43	54.43	-23.02	-26.91
3	0.463	0.16	43.31	37.28	43.47	37.44	56.65	46.65	-13.17	-9.20
4	0.752	0.18	32.57	28.67	32.75	28.85	56.00	46.00	-23.25	-17.15
5	1.750	0.24	30.22	23.93	30.46	24.17	56.00	46.00	-25.54	-21.83
6	2.902	0.30	28.87	23.68	29.17	23.98	56.00	46.00	-26.83	-22.02

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

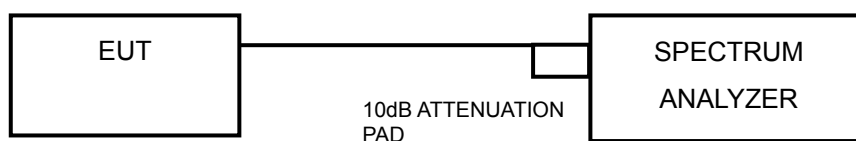


4.3 6dB BANDWIDTH MEASUREMENT

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

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. 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	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.14	0.5	PASS
6	2437	8.15	0.5	PASS
11	2462	8.14	0.5	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.68	0.5	PASS
6	2437	15.22	0.5	PASS
11	2462	16.92	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2412	17.13	16.89	0.5	PASS
6	2437	17.13	16.93	0.5	PASS
11	2462	17.12	17.44	0.5	PASS

802.11n (40MHz)

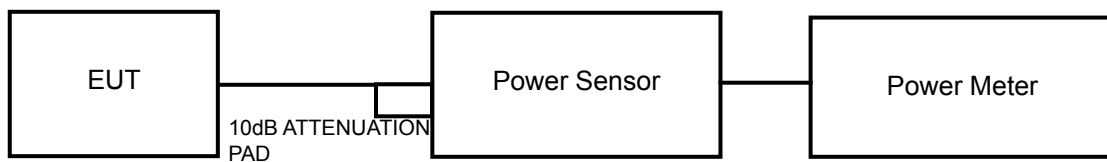
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
1	2422	35.91	35.83	0.5	PASS
4	2437	35.26	36.44	0.5	PASS
7	2452	35.71	35.76	0.5	PASS

4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

4.4.4 TEST PROCEDURES

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

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



4.4.7 TEST RESULTS

802.11b

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
1	2412	117.49	20.70	30	PASS
6	2437	139.00	21.43	30	PASS
11	2462	115.35	20.62	30	PASS

802.11g

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
1	2412	263.63	24.21	30	PASS
6	2437	284.45	24.54	30	PASS
11	2462	215.28	23.33	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2412	24.42	23.71	511.66	27.09	30	PASS
6	2437	24.61	24.12	547.29	27.38	30	PASS
11	2462	23.4	22.71	405.41	26.08	30	PASS

802.11n (40MHz)

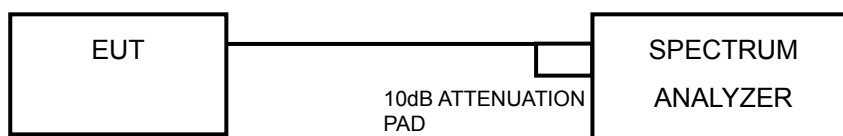
CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
1	2422	20.92	21.31	258.80	24.13	30	PASS
4	2437	23.44	23.43	441.09	26.45	30	PASS
7	2452	20.71	20.42	227.91	23.58	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

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 PROCEDURE

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
4. 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 $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



4.5.7 TEST RESULTS

802.11b

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	7.91	-7.32	8	PASS
6	2437	8.66	-6.57	8	PASS
11	2462	7.94	-7.29	8	PASS

802.11g

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	4.61	-10.62	8	PASS
6	2437	4.78	-10.45	8	PASS
11	2462	3.68	-11.55	8	PASS

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	5.53	-9.7	3.01	-6.69	8	PASS
	6	2437	5.67	-9.56	3.01	-6.55	8	PASS
	11	2462	4.70	-10.53	3.01	-7.52	8	PASS
1	1	2412	4.90	-10.33	3.01	-7.32	8	PASS
	6	2437	5.23	-10.00	3.01	-6.99	8	PASS
	11	2462	4.02	-11.21	3.01	-8.20	8	PASS

802.11n (40MHz)

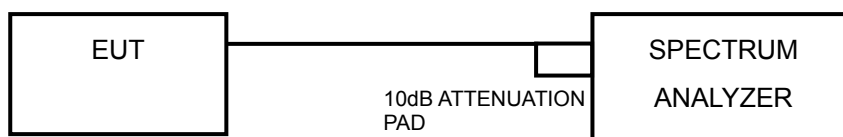
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2422	-1.50	-16.73	3.01	-13.72	8	PASS
	4	2437	0.78	-14.45	3.01	-11.44	8	PASS
	7	2452	-1.73	-16.96	3.01	-13.95	8	PASS
1	1	2422	-1.40	-16.63	3.01	-13.62	8	PASS
	4	2437	0.75	-14.48	3.01	-11.47	8	PASS
	7	2452	-2.34	-17.57	3.01	-14.56	8	PASS

4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

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

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.



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MEASUREMENT PROCEDURE OOBE

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.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

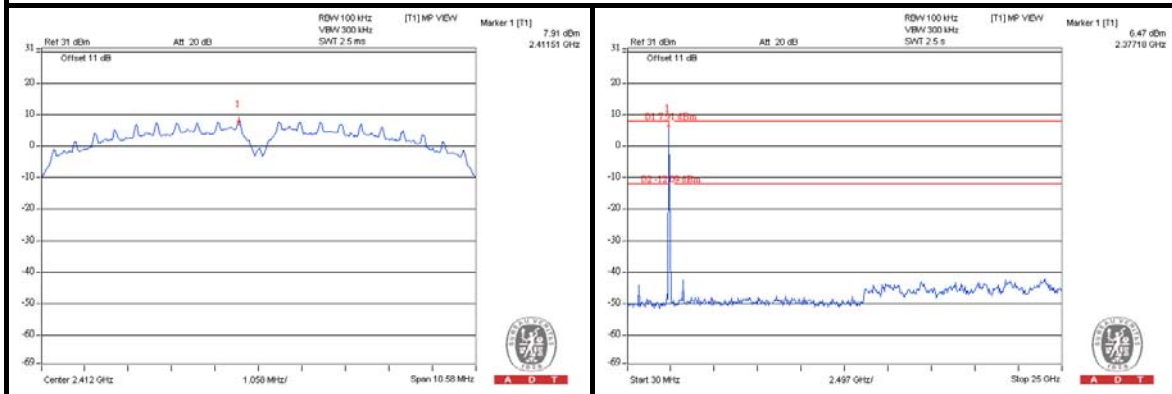
The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit. Only worst data of each operating mode is presented.

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 in part 15.247(d).

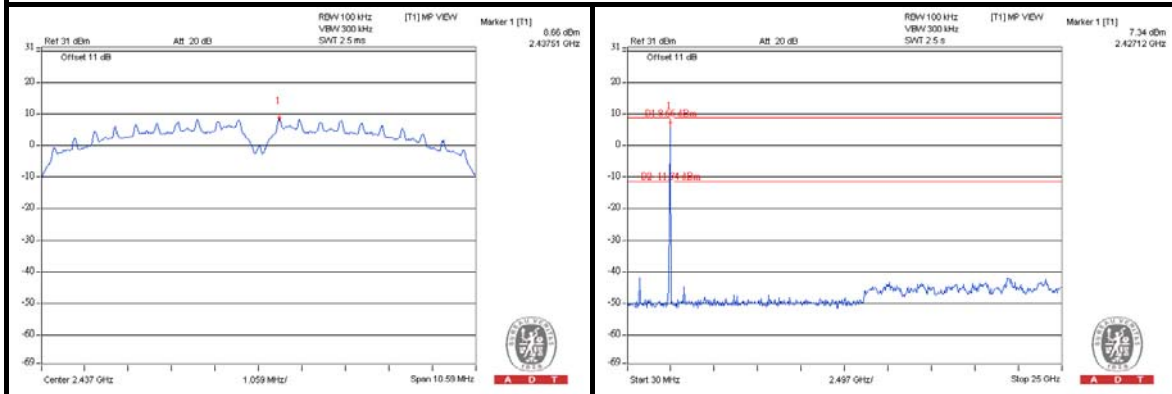
4.6.8 TEST RESULTS

802.11b

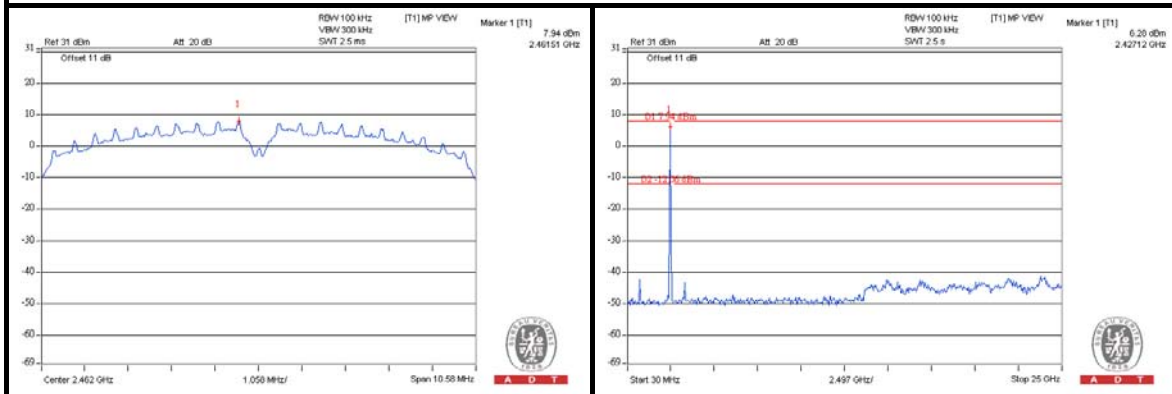
CH 1

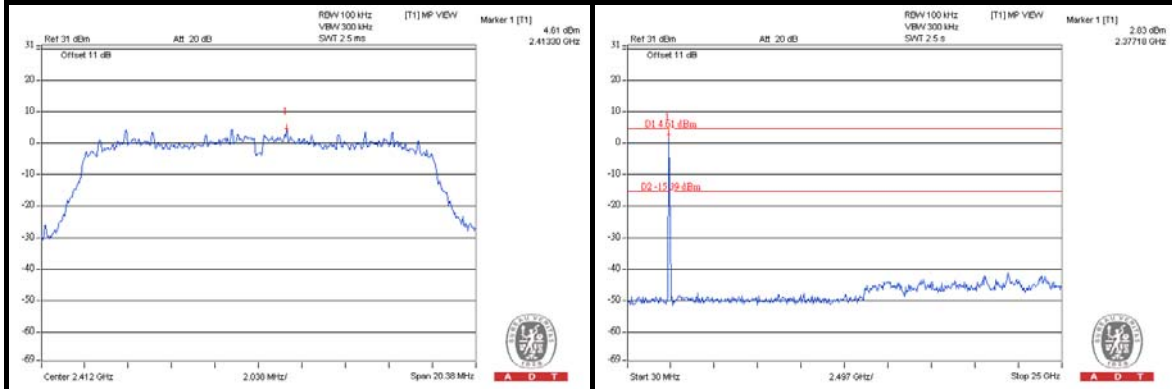
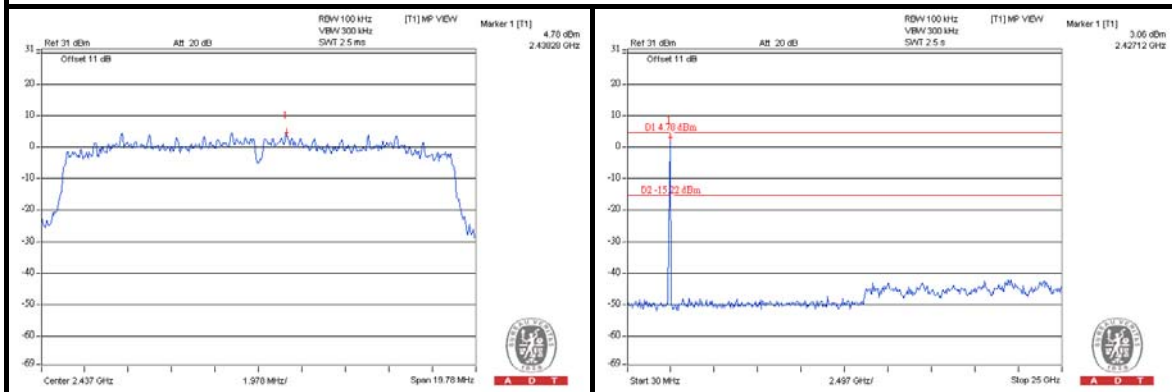
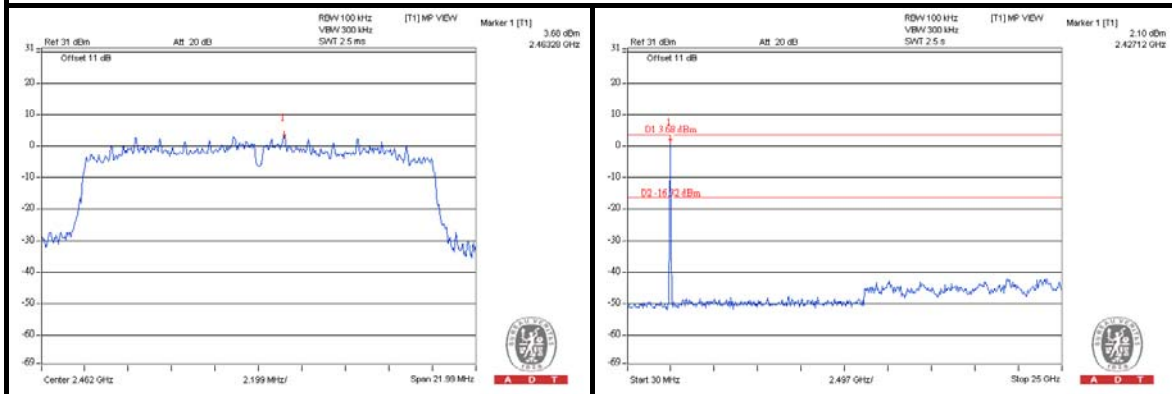


CH 6



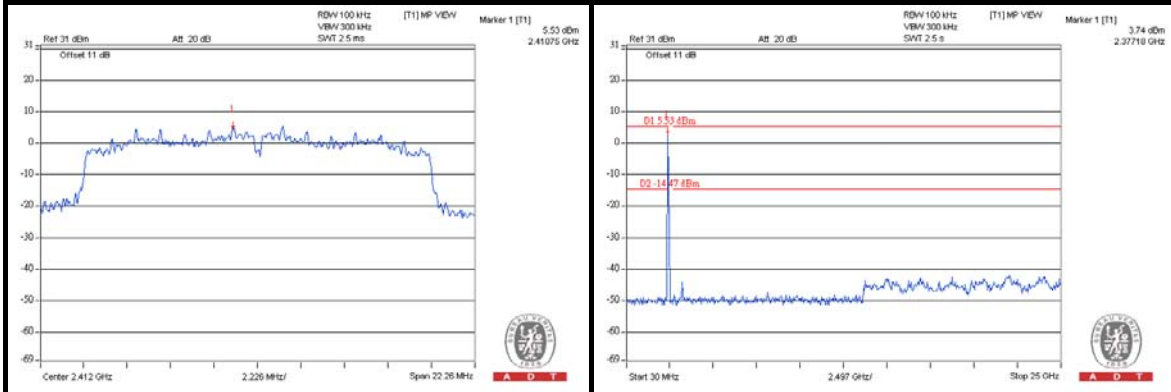
CH 11



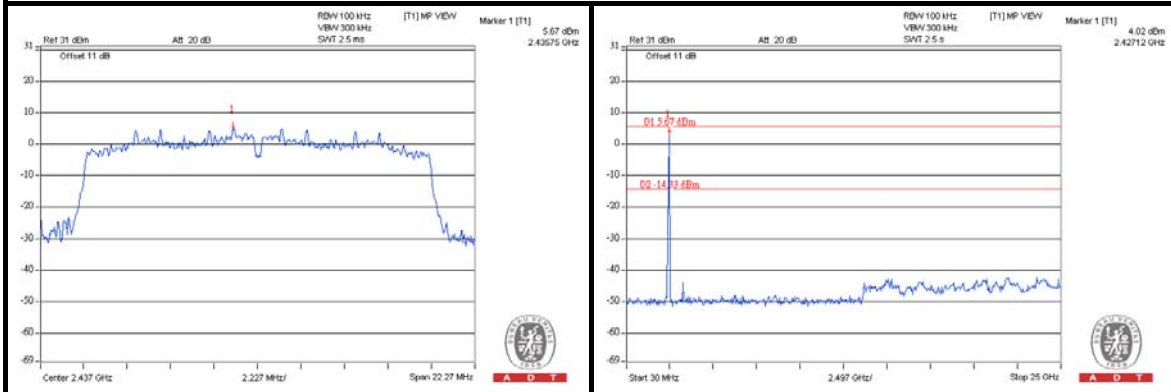
802.11g**CH 1****CH 6****CH 11**

802.11n (20MHz)

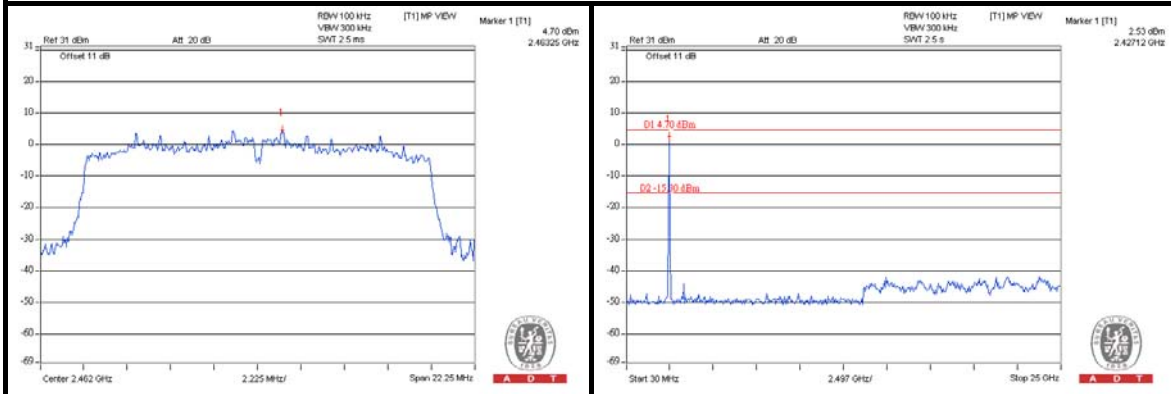
CH 1



CH 6

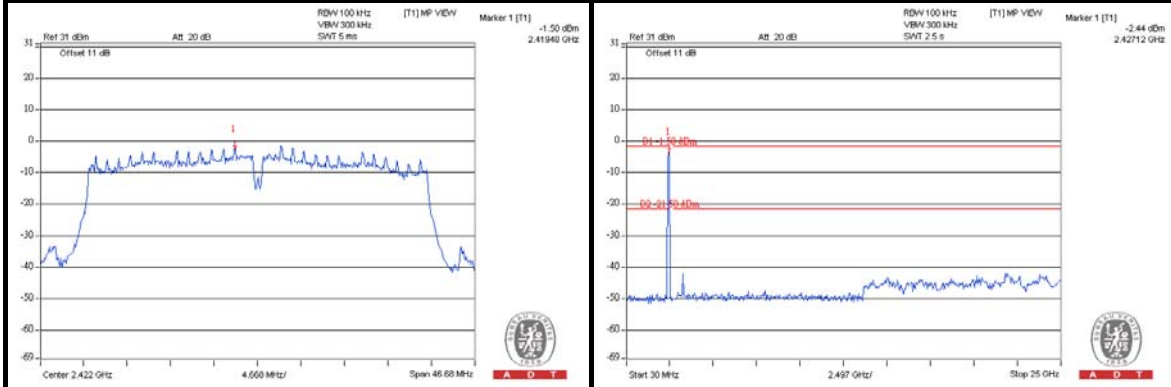


CH 11

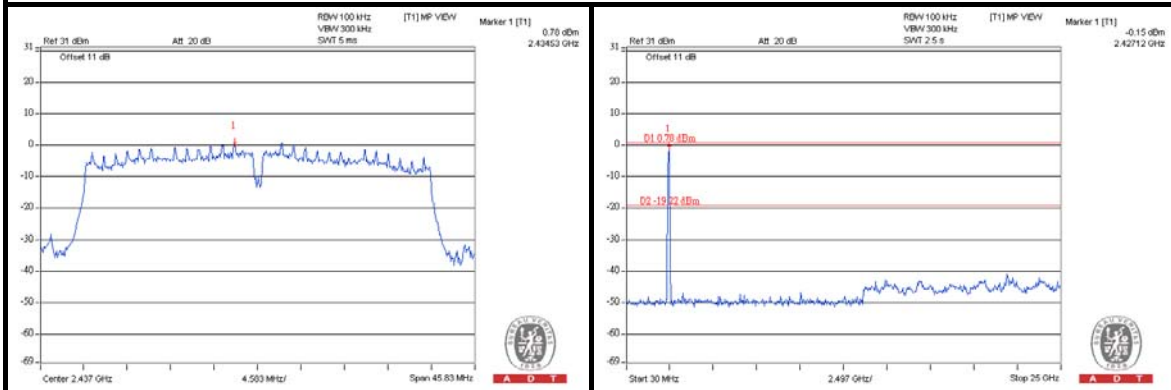


802.11n (40MHz)

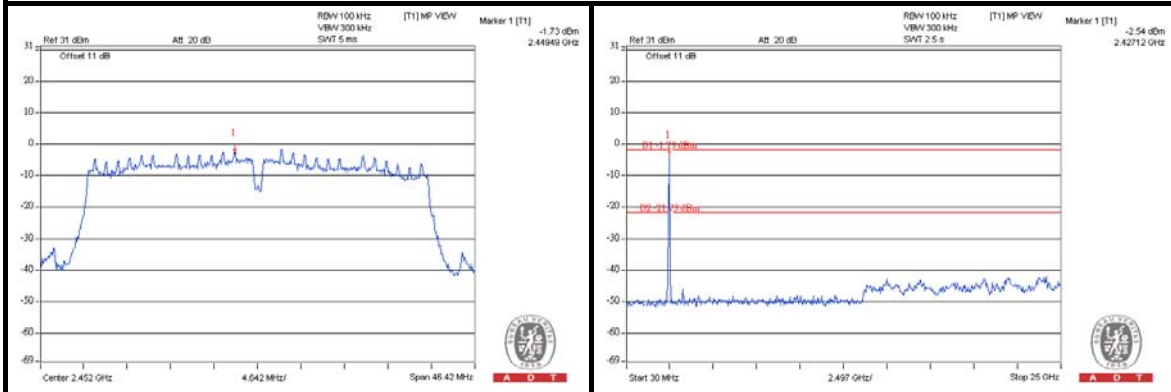
CH 1



CH 4



CH 7





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, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). 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. As shown in 15.35(b), 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 03, 2012	Jan. 02, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 23, 2011	Feb. 22, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 12, 2011	Apr. 11, 2012
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 05, 2012	Jan. 04, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 20, 2011	Jul. 19, 2012
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. 26, 2011	Apr. 25, 2012
Power Sensor	MA2411B	0738404	Apr. 26, 2011	Apr. 25, 2012

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.



5.1.3 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.

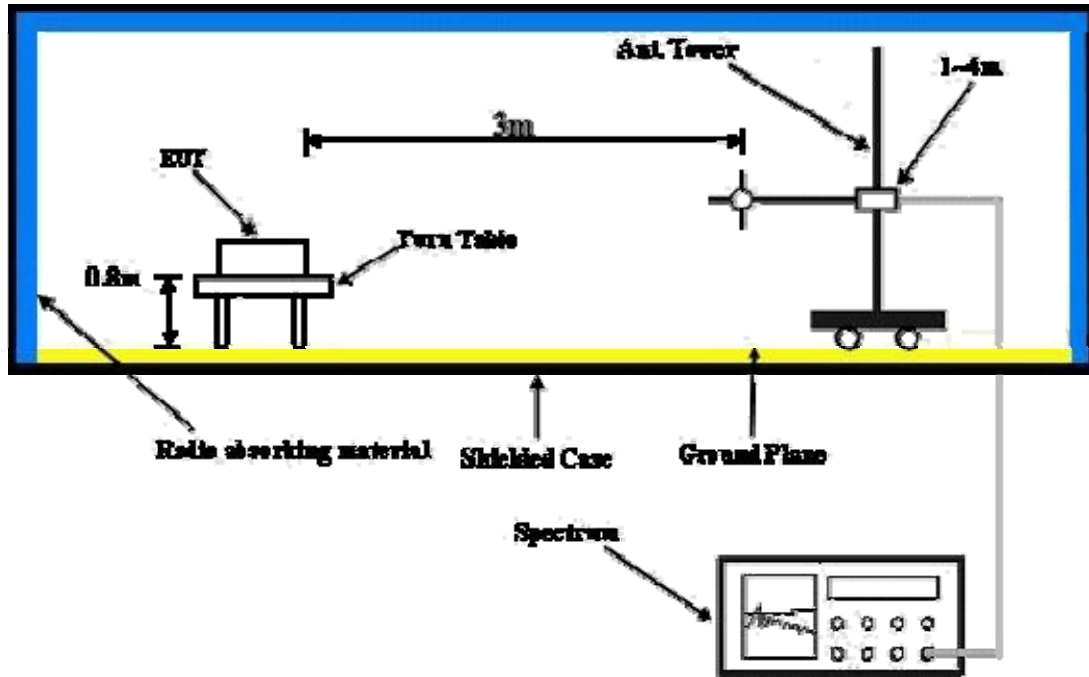
NOTE:

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.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

5.1.5 TEST SETUP



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

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6.



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5.1.7 TEST RESULTS

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Haru Yang

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	78.6 PK	85.1	-6.5	1.59 H	295	38.40	40.20
2	#5725.00	60.4 AV	74.2	-13.8	1.59 H	295	20.20	40.20
3	*5745.00	105.1 PK			1.30 H	310	64.90	40.20
4	*5745.00	94.2 AV			1.30 H	310	54.00	40.20
5	11490.00	58.4 PK	74.0	-15.6	1.28 H	240	7.20	51.20
6	11490.00	46.0 AV	54.0	-8.0	1.28 H	240	-5.20	51.20
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	#5725.00	85.6 PK	92.5	-6.9	1.02 V	359	45.40	40.20
2	#5725.00	66.9 AV	81.9	-15.0	1.02 V	359	26.70	40.20
3	*5745.00	112.5 PK			1.01 V	0	72.30	40.20
4	*5745.00	101.9 AV			1.01 V	0	61.70	40.20
5	11490.00	58.4 PK	74.0	-15.6	1.00 V	25	7.20	51.20
6	11490.00	46.5 AV	54.0	-7.5	1.00 V	25	-4.70	51.20

- 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.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.
 7. "#": The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Haru Yang

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	105.2 PK			1.25 H	308	64.90	40.30
2	*5785.00	94.3 AV			1.25 H	308	54.00	40.30
3	7713.00	54.6 PK	74.0	-19.4	1.15 H	215	9.00	45.60
4	7713.00	41.3 AV	54.0	-12.7	1.15 H	215	-4.30	45.60
5	11570.00	58.3 PK	74.0	-15.7	1.25 H	235	7.20	51.10
6	11570.00	46.2 AV	54.0	-7.8	1.25 H	235	-4.90	51.10
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	*5785.00	111.4 PK			1.13 V	343	71.10	40.30
2	*5785.00	100.5 AV			1.13 V	343	60.20	40.30
3	7713.00	54.4 PK	74.0	-19.6	1.14 V	208	8.80	45.60
4	7713.00	40.7 AV	54.0	-13.3	1.14 V	208	-4.90	45.60
5	11570.00	58.8 PK	74.0	-15.2	1.05 V	214	7.70	51.10
6	11570.00	46.3 AV	54.0	-7.7	1.05 V	214	-4.80	51.10

- 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.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Haru Yang

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	105.3 PK			1.35 H	311	64.90	40.40
2	*5825.00	95.1 AV			1.35 H	311	54.70	40.40
3	#5850.00	75.2 PK	85.3	-10.1	1.35 H	313	34.80	40.40
4	#5850.00	56.4 AV	75.1	-18.7	1.35 H	313	16.00	40.40
5	11650.00	59.5 PK	74.0	-14.5	1.59 H	163	8.50	51.00
6	11650.00	46.5 AV	54.0	-7.5	1.59 H	163	-4.50	51.00
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	113.8 PK			1.34 V	151	73.40	40.40
2	*5825.00	102.2 AV			1.34 V	151	61.80	40.40
3	#5850.00	77.2 PK	93.8	-16.6	1.59 V	118	36.80	40.40
4	#5850.00	59.5 AV	82.2	-22.7	1.59 V	118	19.10	40.40
5	11650.00	59.2 PK	74.0	-14.8	2.11 V	118	8.20	51.00
6	11650.00	46.7 AV	54.0	-7.3	2.11 V	118	-4.30	51.00

- 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	74.9 PK	89.8	-14.9	1.18 H	6	34.70	40.20
2	#5725.00	58.7 AV	78.4	-19.7	1.18 H	6	18.50	40.20
3	*5745.00	109.8 PK			1.18 H	5	69.60	40.20
4	*5745.00	98.4 AV			1.18 H	5	58.20	40.20
5	11490.00	57.9 PK	74.0	-16.1	1.13 H	39	6.70	51.20
6	11490.00	46.3 AV	54.0	-7.7	1.13 H	39	-4.90	51.20
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	#5725.00	77.2 PK	91.3	-14.1	1.00 V	328	37.00	40.20
2	#5725.00	58.9 AV	79.5	-20.6	1.00 V	328	18.70	40.20
3	*5745.00	111.3 PK			1.00 V	316	71.10	40.20
4	*5745.00	99.5 AV			1.00 V	316	59.30	40.20
5	11490.00	59.0 PK	74.0	-15.0	1.00 V	263	7.80	51.20
6	11490.00	45.8 AV	54.0	-8.2	1.00 V	263	-5.40	51.20

- 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.
 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	109.2 PK			1.21 H	7	68.90	40.30
2	*5785.00	98.4 AV			1.21 H	7	58.10	40.30
3	7713.00	51.6 PK	74.0	-22.4	1.00 H	121	6.00	45.60
4	7713.00	40.6 AV	54.0	-13.4	1.00 H	121	-5.00	45.60
5	11570.00	58.3 PK	74.0	-15.7	1.15 H	26	7.20	51.10
6	11570.00	46.5 AV	54.0	-7.5	1.15 H	26	-4.60	51.10
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	*5785.00	110.8 PK			1.00 V	353	70.50	40.30
2	*5785.00	99.4 AV			1.00 V	353	59.10	40.30
3	7713.00	52.7 PK	74.0	-21.3	1.00 V	113	7.10	45.60
4	7713.00	39.9 AV	54.0	-14.1	1.00 V	113	-5.70	45.60
5	11570.00	58.3 PK	74.0	-15.7	1.00 V	63	7.20	51.10
6	11570.00	45.8 AV	54.0	-8.2	1.00 V	63	-5.30	51.10

- 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.
 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	108.6 PK			1.16 H	7	68.20	40.40
2	*5825.00	98.2 AV			1.16 H	7	57.80	40.40
3	#5850.00	67.8 PK	88.6	-20.8	1.16 H	7	27.40	40.40
4	#5850.00	50.4 AV	78.2	-27.8	1.16 H	7	10.00	40.40
5	11650.00	59.5 PK	74.0	-14.5	1.00 H	261	8.50	51.00
6	11650.00	45.2 AV	54.0	-8.8	1.00 H	261	-5.80	51.00
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	110.9 PK			1.00 V	13	70.50	40.40
2	*5825.00	98.9 AV			1.00 V	13	58.50	40.40
3	#5850.00	70.9 PK	90.9	-20.0	1.01 V	8	30.50	40.40
4	#5850.00	53.3 AV	78.9	-25.6	1.01 V	8	12.90	40.40
5	11650.00	59.3 PK	74.0	-14.7	1.00 V	259	8.30	51.00
6	11650.00	45.6 AV	54.0	-8.4	1.00 V	259	-5.40	51.00

- 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	73.8 PK	84.9	-11.1	1.20 H	2	33.60	40.20
2	#5725.00	63.7 AV	75.4	-11.7	1.20 H	2	23.50	40.20
3	*5755.00	104.9 PK			1.18 H	2	64.70	40.20
4	*5755.00	95.4 AV			1.18 H	2	55.20	40.20
5	11510.00	57.9 PK	74.0	-16.1	1.25 H	15	6.70	51.20
6	11510.00	45.3 AV	54.0	-8.7	1.25 H	15	-5.90	51.20
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	#5725.00	76.1 PK	87.7	-11.6	1.02 V	5	35.90	40.20
2	#5725.00	65.6 AV	77.4	-11.8	1.02 V	5	25.40	40.20
3	*5755.00	107.7 PK			1.00 V	4	67.50	40.20
4	*5755.00	97.4 AV			1.00 V	4	57.20	40.20
5	11510.00	58.3 PK	74.0	-15.7	1.00 V	263	7.10	51.20
6	11510.00	46.0 AV	54.0	-8.0	1.00 V	263	-5.20	51.20

- 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.
 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, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Antony Lee

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	104.6 PK			1.16 H	8	64.30	40.30
2	*5795.00	95.2 AV			1.16 H	8	54.90	40.30
3	#5850.00	63.2 PK	84.6	-21.4	1.16 H	10	22.80	40.40
4	#5850.00	51.3 AV	75.2	-23.9	1.16 H	10	10.90	40.40
5	11590.00	57.5 PK	74.0	-16.5	1.20 H	17	6.40	51.10
6	11590.00	45.1 AV	54.0	-8.9	1.20 H	17	-6.00	51.10
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	*5795.00	108.6 PK			1.00 V	327	68.30	40.30
2	*5795.00	97.7 AV			1.00 V	327	57.40	40.30
3	#5850.00	65.9 PK	88.6	-22.7	1.00 V	326	25.50	40.40
4	#5850.00	53.0 AV	77.7	-24.7	1.00 V	326	12.60	40.40
5	11590.00	58.3 PK	74.0	-15.7	1.00 V	255	7.20	51.10
6	11590.00	45.5 AV	54.0	-8.5	1.00 V	255	-5.60	51.10

- 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.
 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 : 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 69%RH	TESTED BY	Antony Lee
TEST MODE	A		

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	160.17	39.8 QP	43.5	-3.7	1.75 H	145	24.90	14.90
2	249.60	42.1 QP	46.0	-3.9	1.25 H	283	28.60	13.50
3	375.98	40.5 QP	46.0	-5.5	1.00 H	229	22.70	17.80
4	500.42	41.1 QP	46.0	-4.9	1.75 H	91	19.70	21.40
5	626.80	42.8 QP	46.0	-3.2	1.25 H	229	18.70	24.10
6	877.61	40.3 QP	46.0	-5.7	1.75 H	217	11.90	28.40
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	45.45	36.6 QP	40.0	-3.4	1.00 V	61	21.60	15.00
2	249.60	37.0 QP	46.0	-9.0	1.00 V	10	23.50	13.50
3	375.98	37.2 QP	46.0	-8.8	1.75 V	349	19.40	17.80
4	500.42	36.3 QP	46.0	-9.7	1.00 V	103	14.90	21.40
5	626.80	42.8 QP	46.0	-3.2	1.00 V	1	18.70	24.10
6	877.61	39.9 QP	46.0	-6.1	1.25 V	151	11.50	28.40

- 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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Antony Lee
TEST MODE	B		

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	125.17	37.3 QP	43.5	-6.2	2.00 H	103	24.70	12.60
2	226.27	38.0 QP	46.0	-8.0	1.50 H	271	25.30	12.70
3	374.04	41.1 QP	46.0	-4.9	2.00 H	160	23.30	17.80
4	500.42	43.0 QP	46.0	-3.0	1.00 H	172	21.80	21.20
5	624.85	42.7 QP	46.0	-3.3	1.25 H	220	18.90	23.80
6	875.67	36.5 QP	46.0	-9.5	1.50 H	205	8.30	28.20
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	49.34	36.4 QP	40.0	-3.6	1.25 V	115	22.20	14.20
2	74.62	36.8 QP	40.0	-3.2	1.25 V	151	25.40	11.40
3	107.67	39.3 QP	43.5	-4.2	1.50 V	163	28.60	10.70
4	374.04	40.4 QP	46.0	-5.6	1.50 V	115	22.60	17.80
5	500.42	42.8 QP	46.0	-3.2	1.25 V	118	21.60	21.20
6	624.85	39.4 QP	46.0	-6.6	1.00 V	235	15.60	23.80

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 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 (dBµV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

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

5.2.2 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. 22, 2011	Dec. 21, 2012
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Dec. 30, 2011	Dec. 29, 2012
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jul. 07, 2011	Jul. 06, 2012
Software ADT	ADT_Cond_ V7.3.7	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.



A D T

5.2.3 TEST PROCEDURES

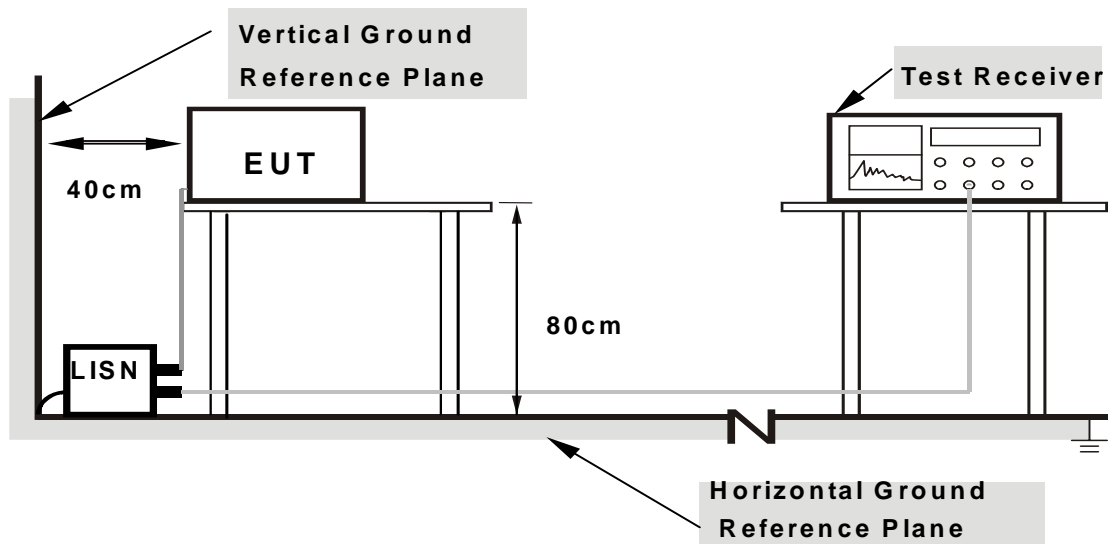
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

5.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

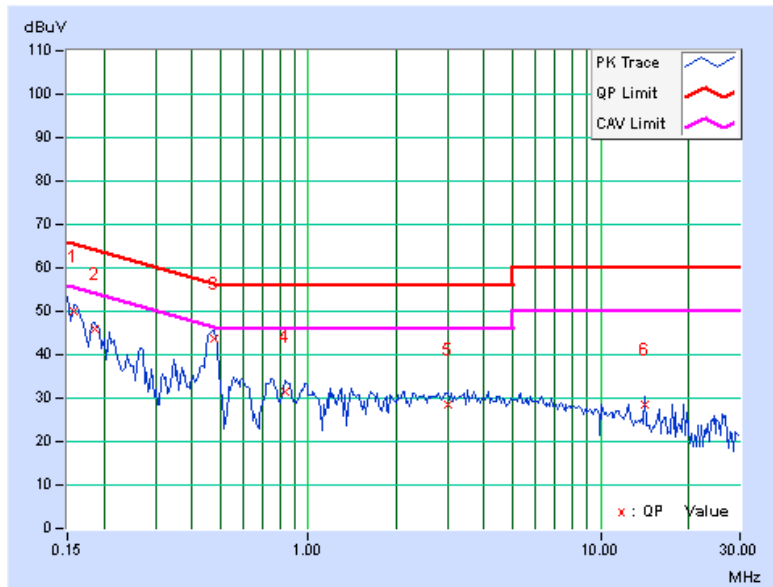
5.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA : 802.11a

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.15	49.98	38.12	50.13	38.27	65.58	55.58	-15.45	-17.31
2	0.185	0.15	45.66	34.89	45.81	35.04	64.25	54.25	-18.44	-19.21
3	0.474	0.17	43.66	38.45	43.83	38.62	56.44	46.44	-12.61	-7.82
4	0.838	0.18	31.46	23.95	31.64	24.13	56.00	46.00	-24.36	-21.87
5	3.008	0.30	28.39	22.47	28.69	22.77	56.00	46.00	-27.31	-23.23
6	14.164	0.51	28.04	24.41	28.55	24.92	60.00	50.00	-31.45	-25.08

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



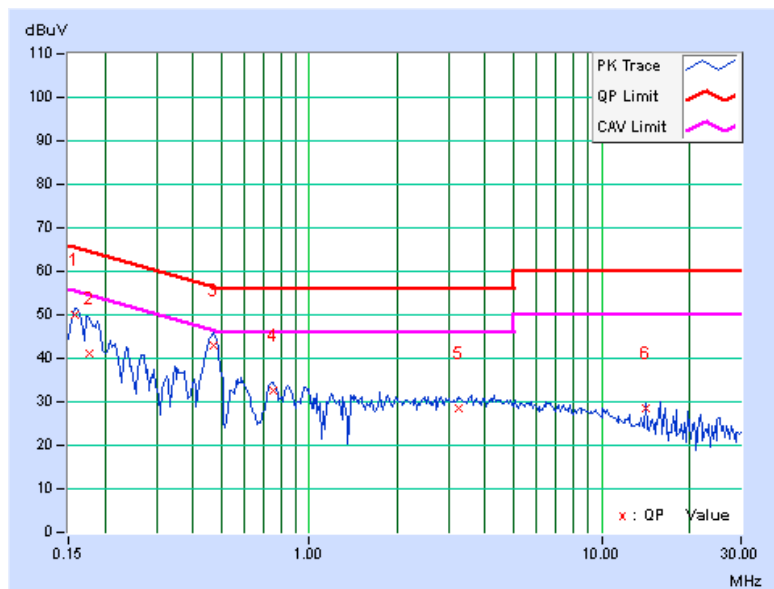


A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.13	49.86	38.03	49.99	38.16	65.58	55.58	-15.59	-17.42
2	0.177	0.14	41.04	21.50	41.18	21.64	64.61	54.61	-23.43	-32.97
3	0.470	0.16	42.91	33.24	43.07	33.40	56.51	46.51	-13.43	-13.10
4	0.752	0.18	32.49	26.50	32.67	26.68	56.00	46.00	-23.33	-19.32
5	3.234	0.32	28.07	21.96	28.39	22.28	56.00	46.00	-27.61	-23.72
6	14.164	0.58	28.06	24.51	28.64	25.09	60.00	50.00	-31.36	-24.91

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



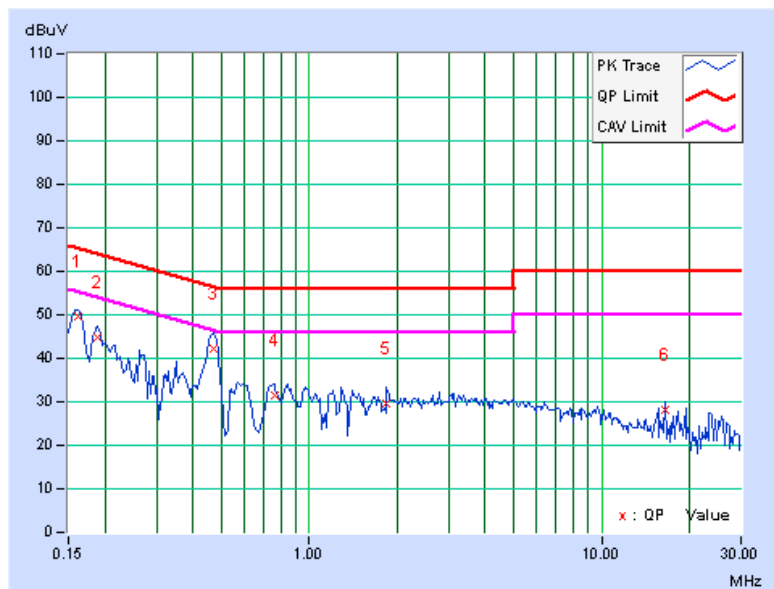


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PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.15	49.64	38.18	49.79	38.33	65.38	55.38	-15.59	-17.05
2	0.189	0.15	44.84	34.55	44.99	34.70	64.08	54.08	-19.09	-19.38
3	0.470	0.17	41.98	31.73	42.15	31.90	56.51	46.51	-14.36	-14.61
4	0.763	0.18	31.22	23.08	31.40	23.26	56.00	46.00	-24.60	-22.74
5	1.840	0.25	29.41	23.44	29.66	23.69	56.00	46.00	-26.34	-22.31
6	16.506	0.56	27.62	24.32	28.18	24.88	60.00	50.00	-31.82	-25.12

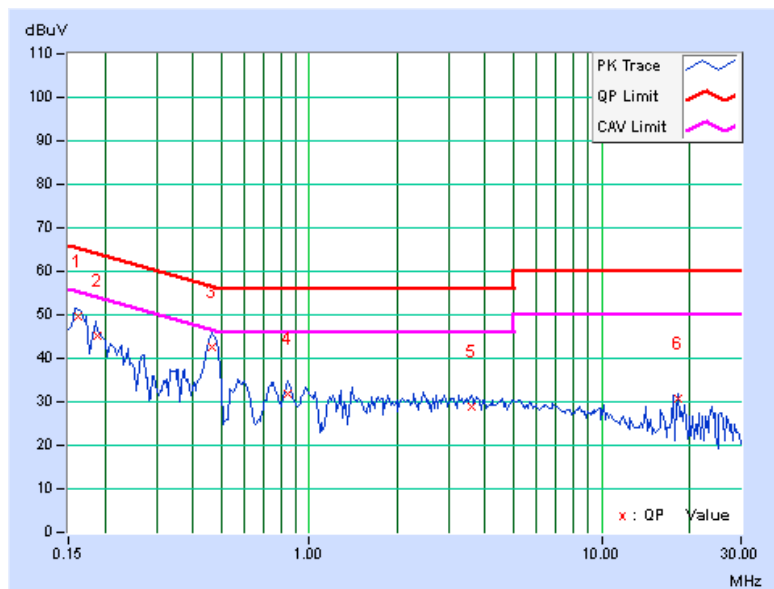
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.13	49.66	38.16	49.79	38.29	65.38	55.38	-15.58	-17.08
2	0.188	0.14	45.22	34.25	45.36	34.39	64.14	54.14	-18.78	-19.75
3	0.466	0.16	42.61	33.48	42.77	33.64	56.58	46.58	-13.80	-12.93
4	0.849	0.18	31.84	25.33	32.02	25.51	56.00	46.00	-23.98	-20.49
5	3.590	0.33	28.51	23.04	28.84	23.37	56.00	46.00	-27.16	-22.63
6	18.211	0.68	30.02	27.05	30.70	27.73	60.00	50.00	-29.30	-22.27

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

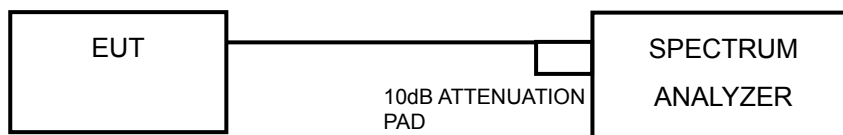


5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

5.3.2 TEST SETUP



5.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.3.4 TEST PROCEDURE

1. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
3. Trace mode = max hold.
4. Sweep = auto couple.
5. 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

5.3.5 DEVIATION FROM TEST STANDARD

No deviation.

5.3.6 EUT OPERATING CONDITIONS

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



5.3.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.01	0.5	PASS
157	5785	16.15	0.5	PASS
165	5825	15.96	0.5	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
149	5745	17.22	16.72	0.5	PASS
157	5785	17.36	16.51	0.5	PASS
165	5825	17.24	16.69	0.5	PASS

802.11n (40MHz)

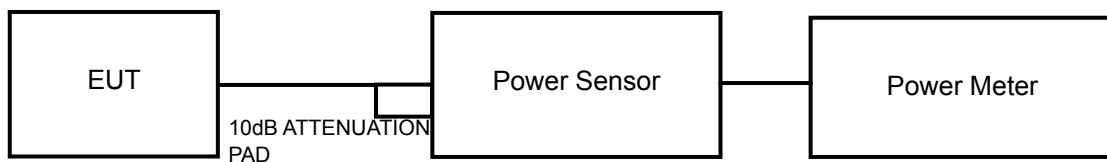
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN 0	CHAIN 1		
151	5755	36.58	36.27	0.5	PASS
159	5795	36.43	36.17	0.5	PASS

5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

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

5.4.2 TEST SETUP



5.4.3 INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.4.4 TEST PROCEDURES

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

5.4.5 DEVIATION FROM TEST STANDARD

No deviation.

5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6.



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5.4.7 TEST RESULTS

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
149	5745	246.60	23.92	30	PASS
157	5785	242.10	23.84	30	PASS
165	5825	241.55	23.83	30	PASS

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
149	5745	23.52	23.51	449.29	26.53	30	PASS
157	5785	23.71	23.52	459.87	26.63	30	PASS
165	5825	23.52	23.43	445.20	26.49	30	PASS

802.11n (40MHz)

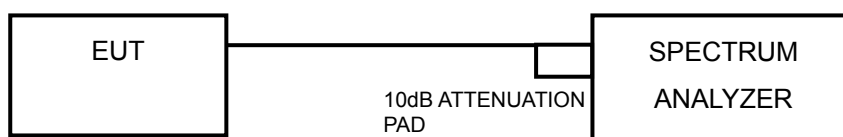
CHAN.	CHAN. FREQ. (MHz)	POWER OUTPUT (dBm)		TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1				
151	5755	23.92	23.51	470.99	26.73	30	PASS
159	5795	23.63	23.22	440.57	26.44	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST SETUP



5.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.5.4 TEST PROCEDURE.

1. Set the RBW = 100 kHz, VBW = 300 kHz, Detector = peak.
2. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
3. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
4. 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 $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

5.5.5 DEVIATION FROM TEST STANDARD

No deviation.

5.5.6 EUT OPERATING CONDITION

Same as Item 5.3.6.



5.5.7 TEST RESULTS

802.11a

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	6.46	-8.77	8	PASS
157	5785	6.29	-8.94	8	PASS
165	5825	6.16	-9.07	8	PASS

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	4.27	-10.96	3.01	-7.95	8	PASS
	157	5785	4.48	-10.75	3.01	-7.74	8	PASS
	165	5825	4.36	-10.87	3.01	-7.86	8	PASS
1	149	5745	3.95	-11.28	3.01	-8.27	8	PASS
	157	5785	4.05	-11.18	3.01	-8.17	8	PASS
	165	5825	4.00	-11.23	3.01	-8.22	8	PASS

802.11n (40MHz)

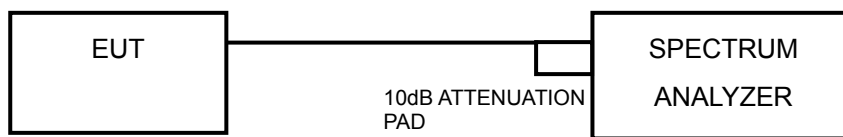
TX chain	Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	151	5755	1.37	-13.86	3.01	-10.85	8	PASS
	159	5795	0.94	-14.29	3.01	-11.28	8	PASS
1	151	5755	0.89	-14.34	3.01	-11.33	8	PASS
	159	5795	0.41	-14.82	3.01	-11.81	8	PASS

5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

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

5.6.2 TEST SETUP



5.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

5.6.4 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.



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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.

5.6.5 DEVIATION FROM TEST STANDARD

No deviation.

5.6.6 EUT OPERATING CONDITION

Same as Item 5.3.6

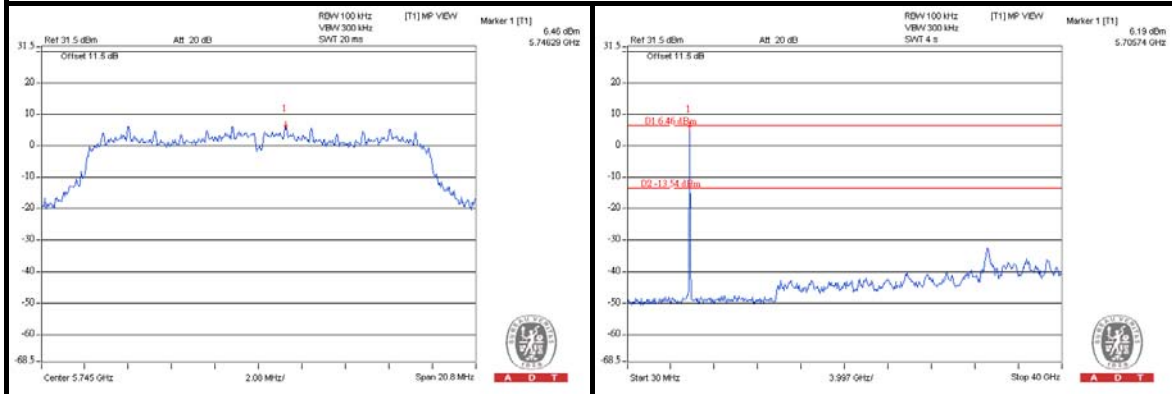
5.6.7 TEST RESULTS

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.

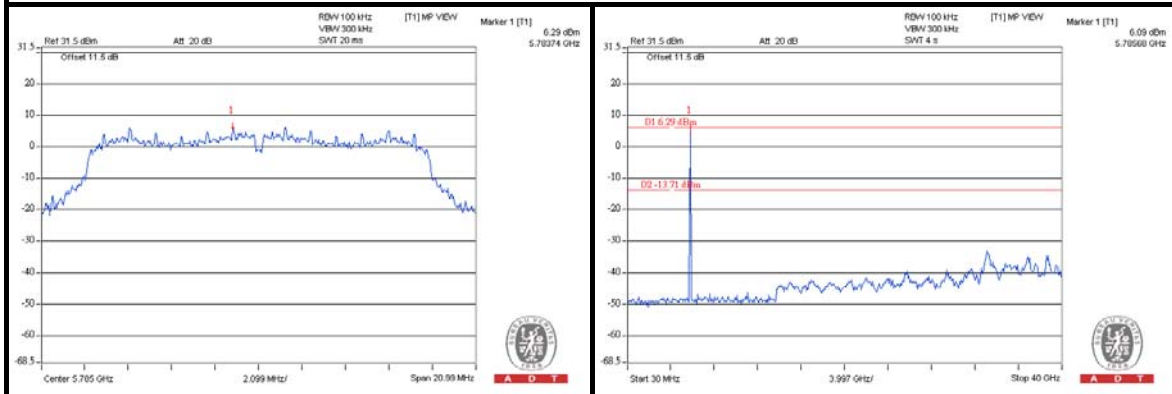
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11a

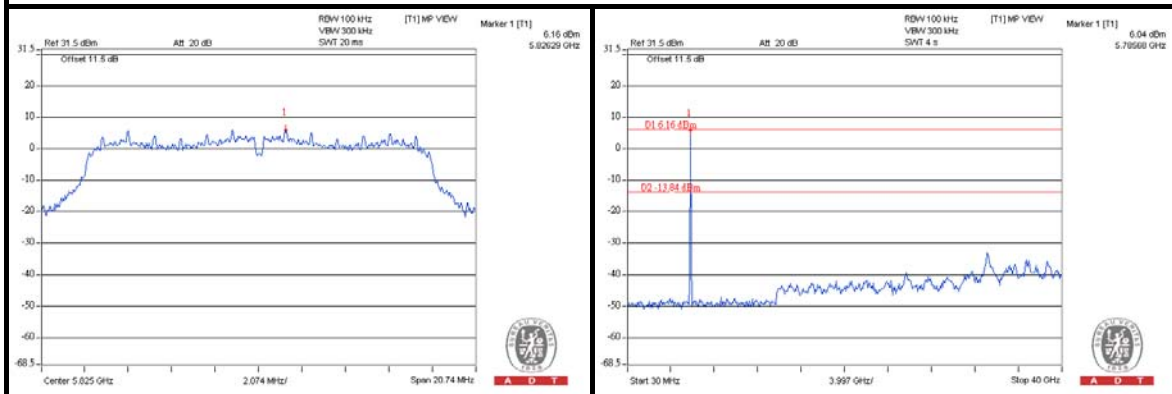
CH 149



CH 157

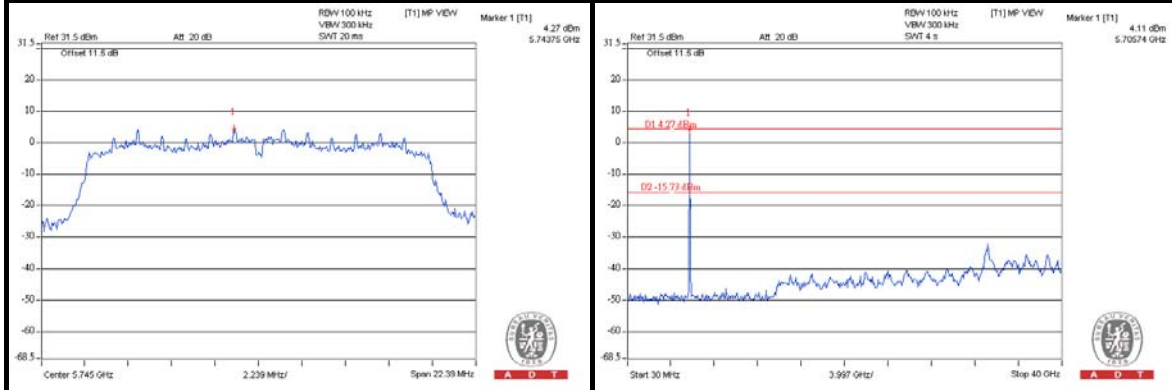


CH 165

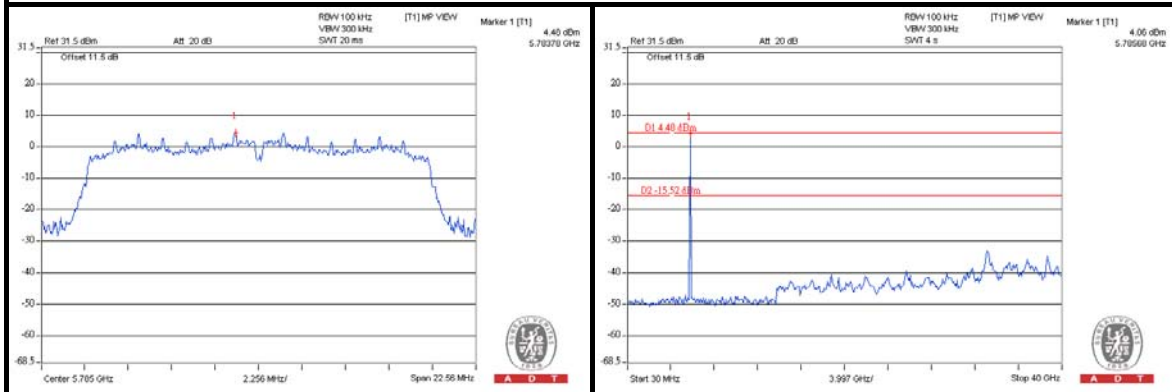


802.11n (20MHz)

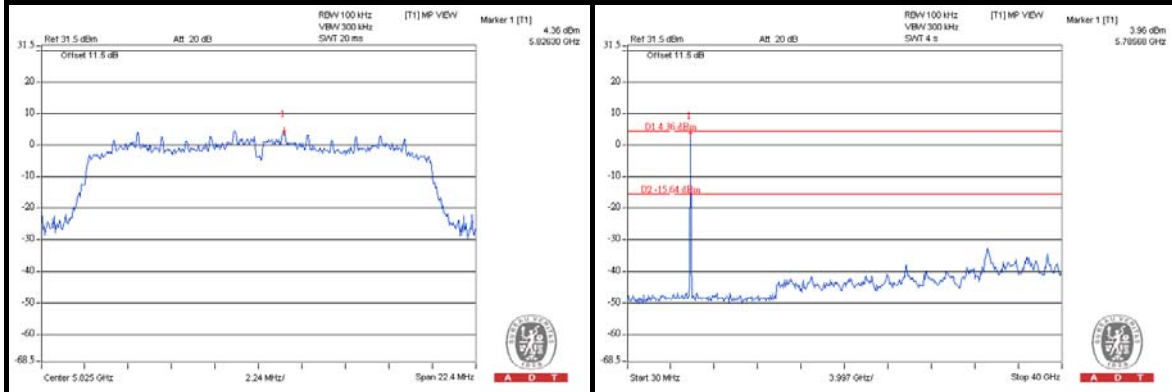
CH 149



CH 157

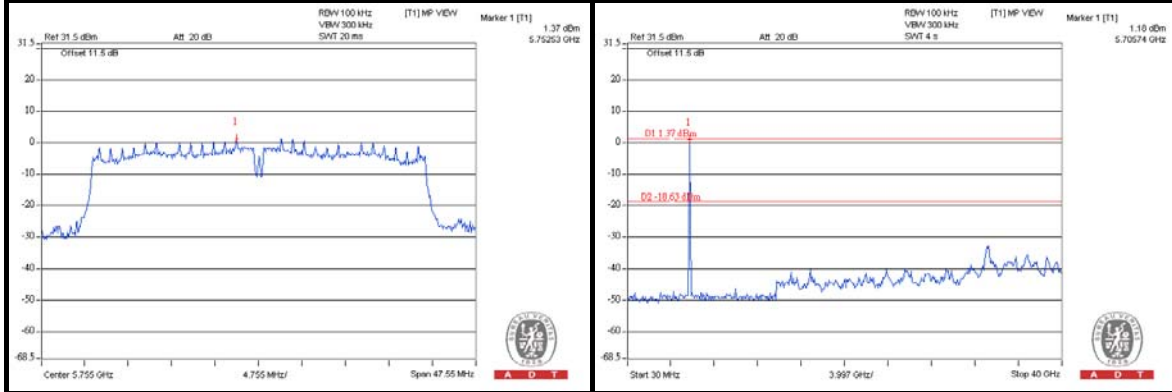


CH 165

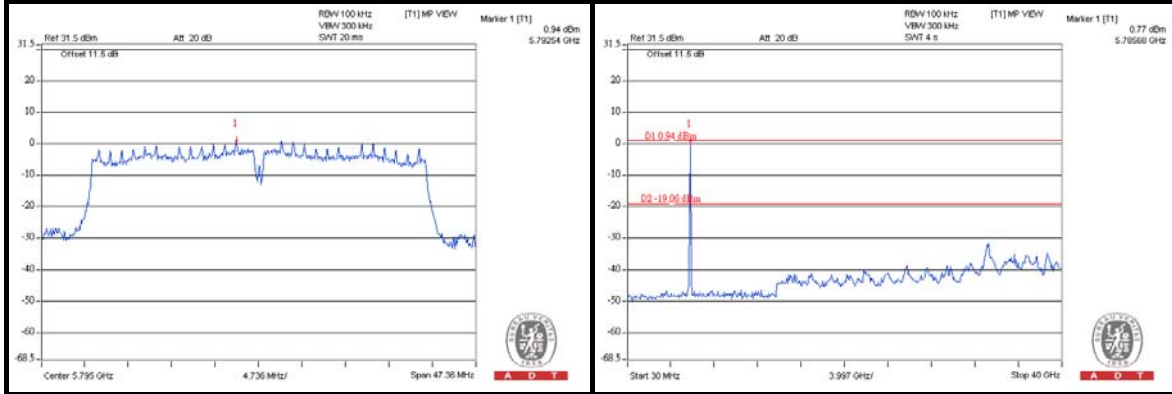


802.11n (40MHz)

CH 151



CH 159





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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.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml.

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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---