

FCC TEST REPORT (15.247)

REPORT NO.: RF111214E06

MODEL NO.: MC919ZWR

FCC ID: UZ7MC919ZWR

RECEIVED: Dec. 14, 2011

TESTED: Dec. 20, 2011 to Jan. 03, 2012

ISSUED: Jan. 11, 2012

APPLICANT: Motorola Solution Inc.

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11742-1300 USA

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

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF111214E06	Original release	Jan. 11, 2012

1. CERTIFICATION

PRODUCT: Hand Held RFID Reader
BRAND NAME: MOTOROLA
MODEL NO.: MC919ZWR
TEST SAMPLE: PROTOTYPE
APPLICANT: Motorola Solution Inc.
TESTED: Dec. 20, 2011 to Jan. 03, 2012
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (Model: MC919ZWR) 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 : Midoli Peng, **DATE:** Jan. 11, 2012
(Midoli Peng, Specialist)

APPROVED BY : May Chen, **DATE:** Jan. 11, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

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 -11.00dB at 0.212MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -5.7dB at 2483.5MHz.
15.247(d)	Conducted Out-Band Emission 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	Antenna connector is Hirose not a standard connector.

For 5GHz, 5725~5850MHz Band

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 -11.00dB at 0.212MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -6.4dB at 66.0MHz, 11570MHz & 11650MHz.
15.247(d)	Conducted Out-Band Emission 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	Antenna connector is Hirose not a standard connector.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz RF parameters was recorded in another test report.

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:

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.81 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Hand Held RFID Reader
MODEL NO.	MC919ZWR
FCC ID	UZ7MC919ZWR
POWER SUPPLY	DC 7.4V from battery, DC 12V from cradle or car charger
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps
OPERATING FREQUENCY	For 15.407 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.58GHz & 5.66~5.7GHz
	For 15.247 802.11b/g: 2.412 ~ 2.472GHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 : 16 for 802.11a
	For 15.247(2.4GHz) : 13 for 802.11b, 802.11g
	For 15.247(5GHz) : 5 for 802.11a
MAXIMUM OUTPUT POWER	For 15.407 802.11a: 32.4mW
	For 15.247(2.4GHz) 802.11b: 52.5mW 802.11g: 166.0mW For 15.247(5GHz) 802.11a: 109.6mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	Refer User's manual
ASSOCIATED DEVICES	Battery x 1 (Part No.: 21-65587-03)

NOTE:

1. There are Bluetooth, WLAN and RFID technology used for the EUT.

Remark	Report No.
15.247	RF111214E06
15.407	RF111214E06-1
DFS	RF111214E06-2
Bluetooth	RF111214E06-3
RFID	RF111214E06-4

2. Spurious Emission of the simultaneous operation (Bluetooth, WLAN and RFID) have been evaluated and no non-compliance found.

3. The EUT configuration list:

Keypad	53keys
Scan	SE1524
WLAN (a/b/g)	V
BT	V
RFID	V

4. The antennas provided to the EUT, please refer to the following table:

WLAN Antenna Spec.								
No.	Brand	Model No.	Antenna Type	Gain (dBi) < included cable loss>	Connector Type	Frequency range (MHz)	Cable Loss (dB)	Cable Length (mm)
1	Auden	750353-00 (Main, Tx & Rx)	Loop	4.5 (2.4G) 5.5 (5G)	Hirose	2400~2500 5150~5850	0.082 (2.4G) 0.138 (5G)	33
2	Auden	750330-00 (Aux ,Tx & Rx)	PIFA	4.5 (2.4G) 5.5 (5G)	Hirose	2400~2500 5150~5850	0.235 (2.4G) 0.394 (5G)	94
Bluetooth								
No.	Brand	Model	Antenna Type	Gain (dBi) < included cable loss>	Connector Type	Frequency range (MHz)		
1	TY	AH104F2650S1-T	Chip	-3.73	SMT	2400~2500		
RFID Antenna Spec.								
No.	Brand	Model No.	Antenna Type	Gain (dBi) < included cable loss>	Connector Type	Frequency range (MHz)	Cable Loss (dB)	Cable Length (mm)
1_USS	Auden	41-68888-05	YAGI	5	Hirose	902~928	0.304	185
2_USL	Auden	41-68888-07	YAGI	5	Hirose	902~928	0.304	185

5. The EUT could be supplied with a Cradle, Car Charger and battery as below table:

Cradle (not for sale together)	
Brand:	SYMBOL
Model No.:	CRD9000-1000
Part No.:	CRD9000-1001SR
Input power :	+12V ----- 9A
I/O Ports:	USB Port x 1 RS232 Port x 1
Associated Devices:	USB cable (unshielded, 1.8m with one core) USB cable (Part No.: 25-64396-01R) RJ-45 to RS232 cable (shielded, 1.85m with one core) RJ-45 to RS232 cable(Part No.: 25-63852-01R) Adapter (Part No.: 50-14000-148R)
Direct charging (Car Charger) (not for sale together)	
Brand:	SYMBOL
Part No.:	ADP9000-110R and ADP9000-100R
I/O Ports:	RS232 Port x 1
Associated Devices:	USB cable (shielded, 1.85m with one core) USB cable (Part No.: 25-62166-01R)
Adapter (for Cradle & Car Charger only, and not for sale together)	
Brand:	HIPRO
Model No.:	HP-O2040D43
Part No.:	50-14000-148R
Input power :	100-240V, 50-60Hz, 1.5A
Output power :	+12V ----- 3.33A DC output cable (unshielded, 1.8m with one core)
Battery	
Brand:	SYMBOL
Part No.:	21-65587-03
Rating:	7.4V, 2200mAh, 16.3Wh

6. For the Radiated Emissions: The EUT was pre-tested in chamber under following test modes :

Pre-test Mode	Description
Mode A	Direct charging(Part No.: ADP9000-110R) mode : EUT (X-Y plane)
Mode B	Direct charging(Part No.: ADP9000-100R) mode : EUT (X-Y plane)
Mode C	Direct charging(Part No.: ADP9000-100R) mode : EUT (X-Z plane)
Mode D	Direct charging(Part No.: ADP9000-100R) mode : EUT (Y-Z plane)
Mode E	Battery mode : EUT (X-Y plane)
Mode F	Cradle mode : EUT

For 2.4GHz (below 1GHz): The Main / Aux. antenna worse case was found in **Mode C**.

For 2.4GHz (above 1GHz): The Main / Aux. antenna worse case was found in **Mode D**.

For 5GHz (below 1GHz): The Main / Aux. antenna worse case was found in **Mode C**.

For 5GHz (above 1GHz): The Main antenna worse case was found in **Mode C** & the
Aux. antenna worse case was found in **Mode B**.

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

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

Thirteen channels are provided for 802.11b, 802.11g:

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	8	2447MHz
2	2417MHz	9	2452MHz
3	2422MHz	10	2457MHz
4	2427MHz	11	2462MHz
5	2432MHz	12	2467MHz
6	2437MHz	13	2472MHz
7	2442MHz		

Operated in 5725 ~ 5850MHz band:

Five channels are provided for 802.11a:

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

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	OB	
1	√	-	-	-	-	Cradle mode
2	√	√	√	√	√	Direct charging (Part No.: ADP9000-100R) mode

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

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 13	6	OFDM	BPSK	6
802.11a	149 to 165	149	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

- ☒ 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11g	1 to 13	6	OFDM	BPSK	6
802.11a	149 to 165	149	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHz):

- ☒ 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1
802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 13	1, 11, 12, 13	DSSS	DBPSK	1
802.11g	1 to 13	1, 11, 12, 13	OFDM	BPSK	6
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6

CONDUCTED OUT-BAND EMISSION 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 13	1, 11, 12, 13	DSSS	DBPSK	1
802.11g	1 to 13	1, 11, 12, 13	OFDM	BPSK	6
802.11a	149 to 165	149, 165	OFDM	BPSK	6



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER(system)	TESTED BY
PLC	25deg. C, 58%RH,	120Vac, 60Hz	Kyle Huang
RE<1G	26deg. C, 71%RH	120Vac, 60Hz	Nick Chang
RE ³ 1G	17deg. C, 62%RH	120Vac, 60Hz	Nick Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang

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.

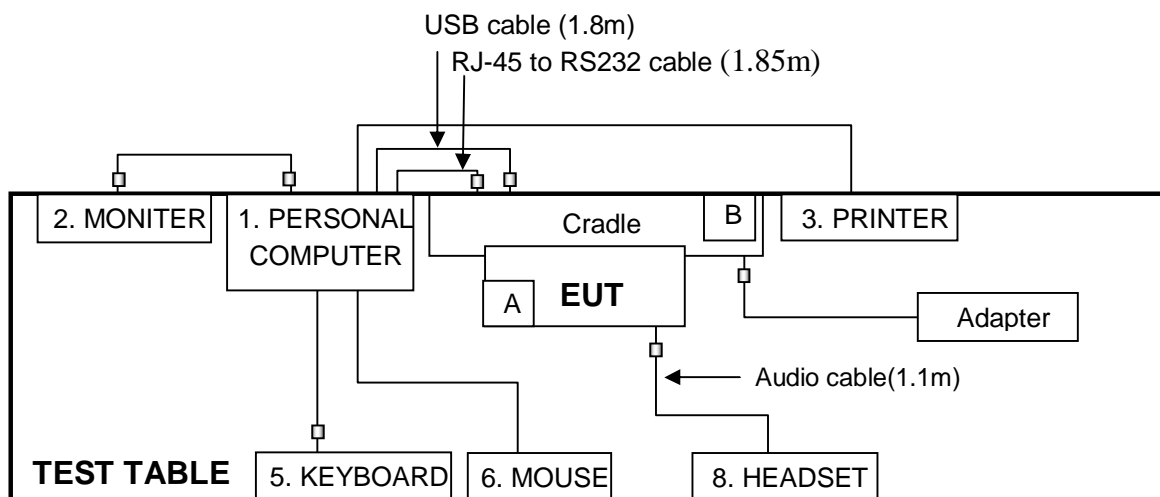
For conducted emission test					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	DELL	DCSCMF	9KKKB32S	FCC DoC
2	MONITOR	DELL	E2210Hc	CN-OG337R-6418 0-97S-OQMS	FCC DoC
3	PRINTER	EPSON	LQ-300+II	G88Y074085	FCC DoC
4	MODEM	ACEEX	1414	0206026778	IFAXDM1414
5	KEYBOARD	DELL	SK-8115	MY-0DJ325-71619- 99B-0475	FCC DoC
6	MOUSE	DELL	MOC5UO	I1401LVG	FCC DoC
7	HEADSET	VX1	NA	NA	NA
For other test items					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	iPod shuffle	Apple	MC749TA/A	CC4DMFJUDFDM	NA
3	HEADSET	VX1	NA	NA	NA

For conducted emission test	
No.	Signal cable description
1	RJ-45 to RS232 cable (shielded, 1.85m with one core) USB cable (shielded, 1.8m with one core) USB cable (shielded, 1.85m with one core)
2	VGA cable. (1.8m with two cores)
3	USB cable.(1m)
4	RS232 cable.(1m)
5	USB cable.(2m with one core)
6	USB cable.(2m)
7	Audio cable (shielded, 1.1m with one core)
For other test items	
No.	Signal cable description
1	USB cable (shielded, 1.85m with one core)
2	USB cable (shielded, 0.1m)
3	Audio cable (shielded, 1.1m with one core)

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

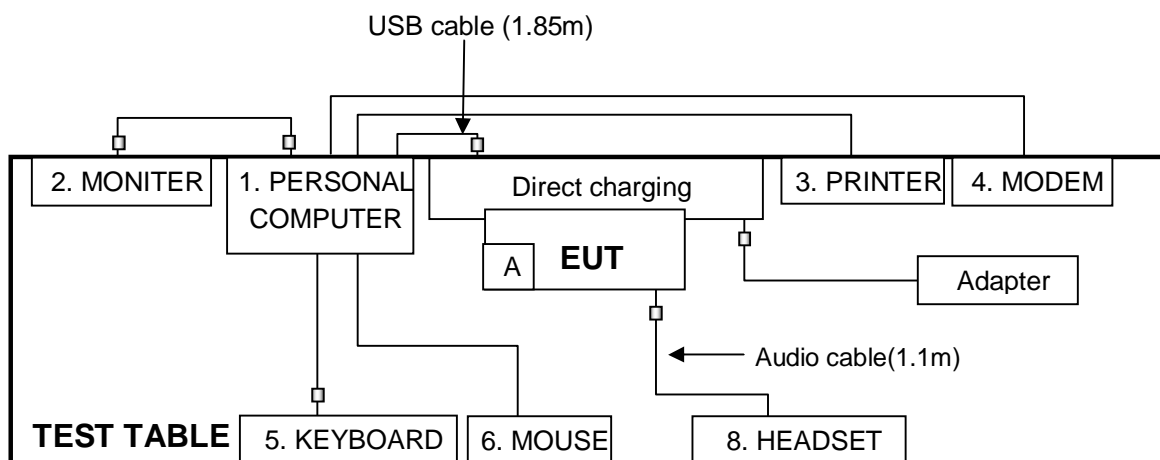
3.5 CONFIGURATION OF SYSTEM UNDER TEST

For conducted emission test mode 1:



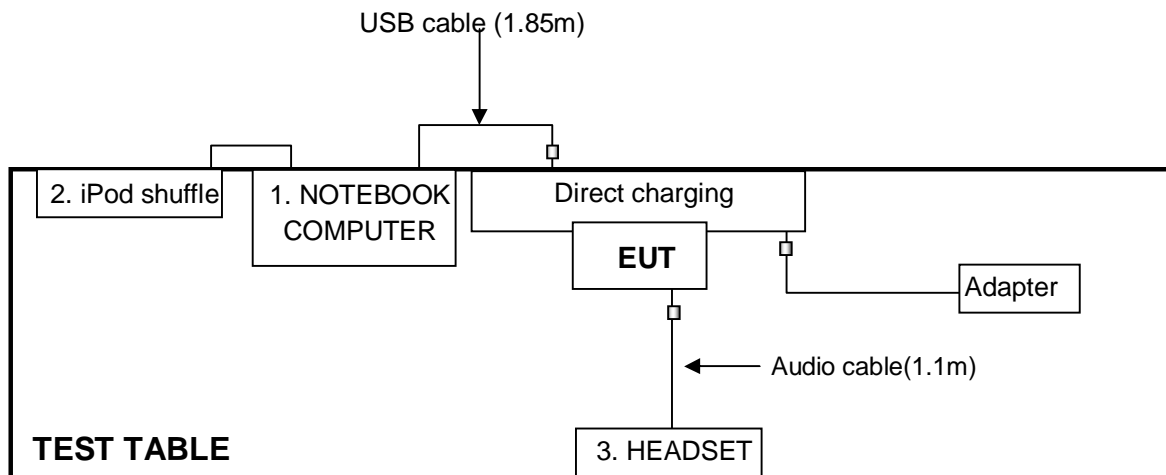
NOTE: 1. Item A is the SD Card.
2. Item B is the Battery.

For conducted emission test mode 2:



NOTE: 1. Item A is the SD Card.

For other test items



4. TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 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 0.50 MHz.

4.1.2 TEST INSTRUMENTS

Test date: Jan. 03, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 20, 2011	Sep. 19, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 05, 2011	Aug. 04, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
Software	BV 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 Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

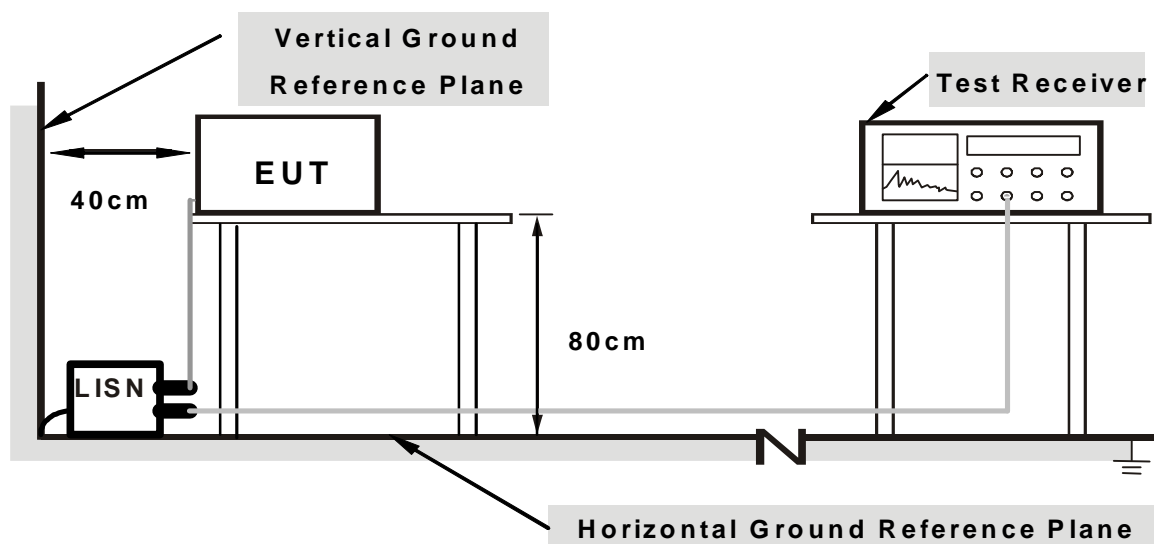
4.1.3 TEST PROCEDURES

- 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) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 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 related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

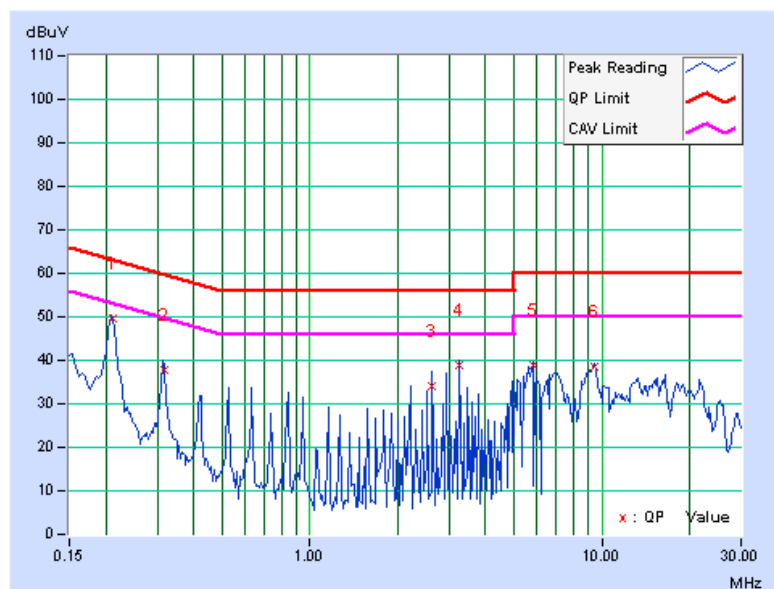
1. Connect the EUT with the support unit 1 (Personal Computer) which is placed on a testing table.
2. The communication partner run test program “CEcTxRx.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 TEST RESULTS(MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.212	0.06	49.46	42.07	49.52	42.13	63.13	53.13	-13.61	-11.00
2	0.317	0.07	37.65	29.18	37.72	29.25	59.77	49.77	-22.06	-20.53
3	2.632	0.19	33.73	25.83	33.92	26.02	56.00	46.00	-22.08	-19.98
4	3.262	0.21	38.79	30.25	39.00	30.46	56.00	46.00	-17.00	-15.54
5	5.789	0.28	38.46	36.52	38.74	36.80	60.00	50.00	-21.26	-13.20
6	9.473	0.38	38.11	35.65	38.49	36.03	60.00	50.00	-21.51	-13.97

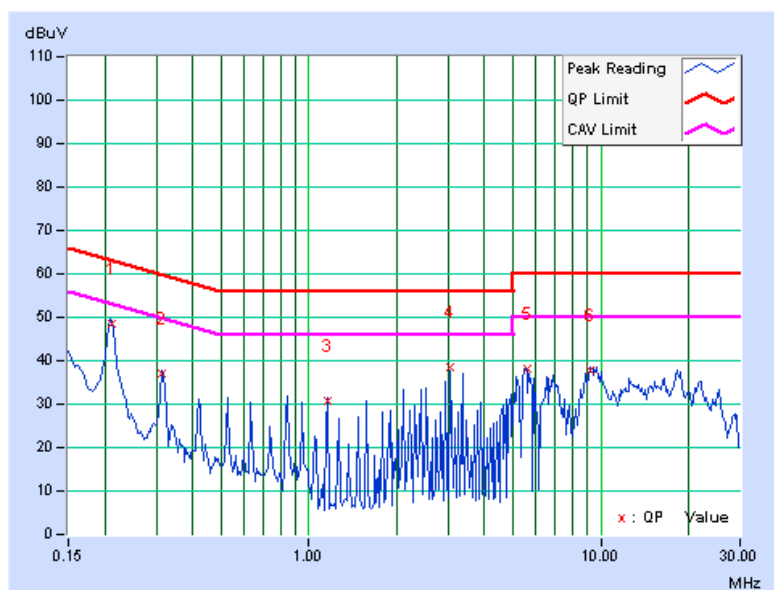
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.212	0.07	48.38	41.50	48.45	41.57	63.13	53.13	-14.68	-11.56
2	0.315	0.08	36.90	29.66	36.98	29.74	59.84	49.84	-22.86	-20.10
3	1.156	0.10	30.77	28.18	30.87	28.28	56.00	46.00	-25.13	-17.72
4	3.052	0.19	38.44	28.76	38.63	28.95	56.00	46.00	-17.37	-17.05
5	5.578	0.26	37.90	36.31	38.16	36.57	60.00	50.00	-21.84	-13.43
6	9.156	0.35	37.33	33.99	37.68	34.34	60.00	50.00	-22.32	-15.66

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

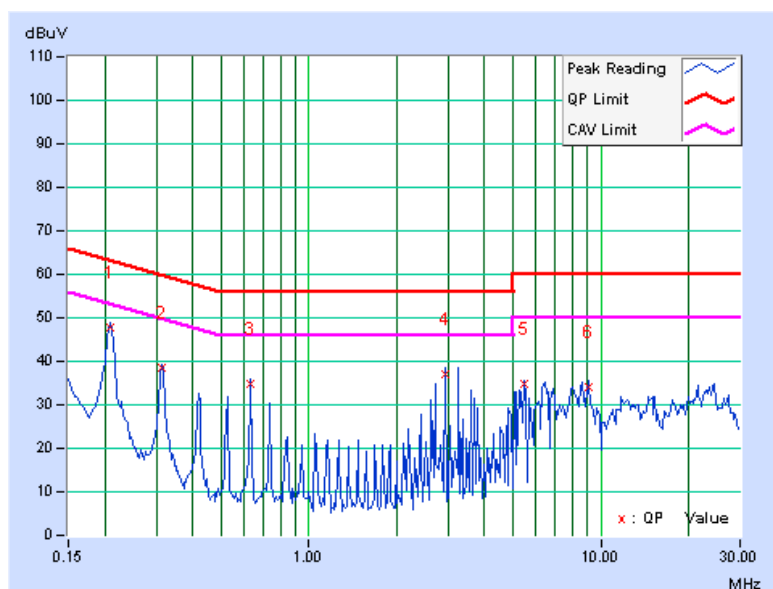


4.1.8 TEST RESULTS(MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	(dB)	(dB)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.06	47.58	39.05	47.64	39.11	63.26	53.26	-15.62	-14.15
2	0.314	0.07	38.39	33.38	38.46	33.45	59.86	49.86	-21.41	-16.42
3	0.630	0.08	34.84	33.77	34.92	33.85	56.00	46.00	-21.08	-12.15
4	2.941	0.20	36.97	26.93	37.17	27.13	56.00	46.00	-18.83	-18.87
5	5.464	0.28	34.71	33.38	34.99	33.66	60.00	50.00	-25.01	-16.34
6	9.037	0.37	33.87	30.96	34.24	31.33	60.00	50.00	-25.76	-18.67

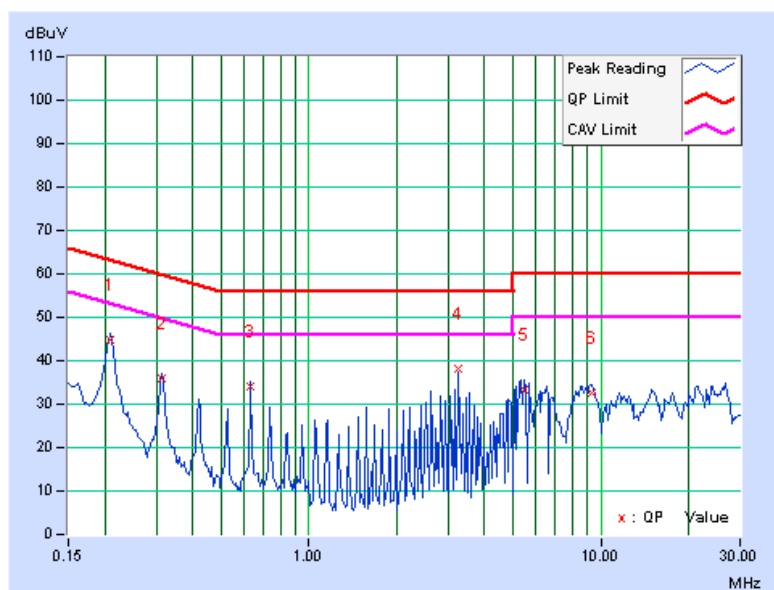
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor +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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.07	44.83	38.09	44.90	38.16	63.26	53.26	-18.36	-15.10
2	0.314	0.08	35.97	32.01	36.05	32.09	59.86	49.86	-23.82	-17.78
3	0.630	0.08	33.99	33.31	34.07	33.39	56.00	46.00	-21.93	-12.61
4	3.258	0.20	37.90	28.24	38.10	28.44	56.00	46.00	-17.90	-17.56
5	5.465	0.26	33.07	32.11	33.33	32.37	60.00	50.00	-26.67	-17.63
6	9.352	0.35	32.06	30.54	32.41	30.89	60.00	50.00	-27.59	-19.11

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



4.2 RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE 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.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.



A D T

4.2.2 TEST INSTRUMENTS

Test date: Dec. 20 to 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 12, 2011	July 11, 2012
Agilent Pre-Selector	N9039A	MY46520311	July 12, 2011	July 11, 2012
Agilent Signal Generator	N5181A	MY49060517	July 12, 2011	July 11, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 14, 2011	Nov. 13, 2012
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	Oct. 07, 2011	Oct. 06, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.

4.2.3 TEST PROCEDURES

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

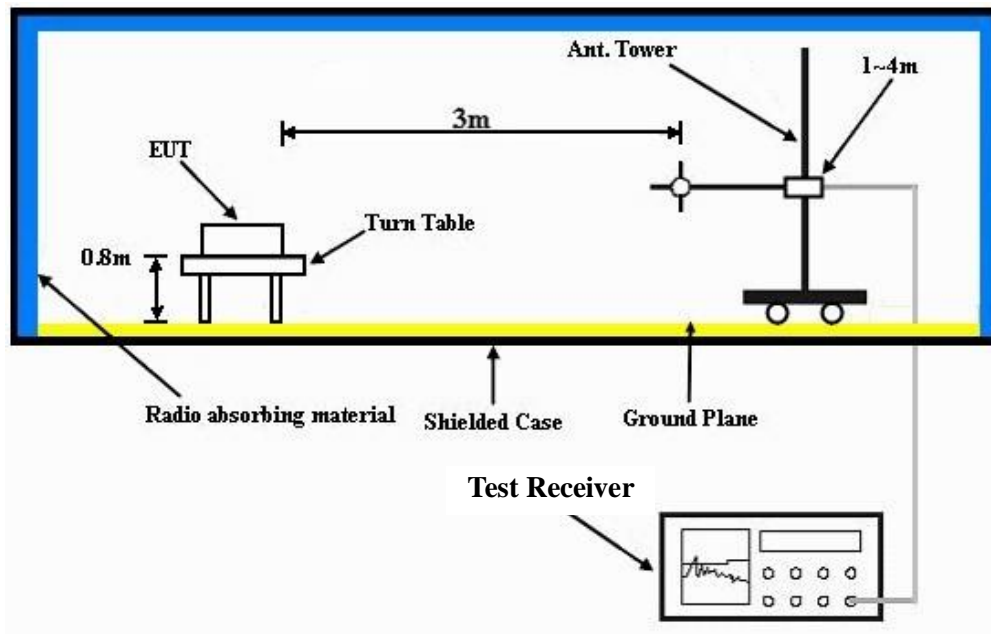
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. 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



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “CEcTxRx.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.2.7 TEST RESULTS (MAIN ANTENNA)

BELOW 1GHz WORST-CASE DATA : 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Nick Chang

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	65.65	24.5 QP	40.0	-15.6	1.00 H	360	11.42	13.03
2	158.84	32.0 QP	43.5	-11.5	1.50 H	141	17.37	14.64
3	301.31	33.6 QP	46.0	-12.4	1.00 H	360	18.26	15.35
4	599.49	33.0 QP	46.0	-13.0	1.00 H	77	10.44	22.57
5	745.75	29.5 QP	46.0	-16.5	1.00 H	114	5.22	24.30
6	844.98	29.9 QP	46.0	-16.1	1.50 H	51	3.36	26.57
7	950.03	31.8 QP	46.0	-14.2	1.00 H	340	4.06	27.77
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	34.14	30.0 QP	40.0	-10.0	1.00 V	57	16.73	13.27
2	303.44	32.1 QP	46.0	-13.9	1.50 V	62	16.68	15.41
3	520.03	30.6 QP	46.0	-15.5	1.00 V	89	9.77	20.78
4	598.78	30.3 QP	46.0	-15.7	1.00 V	63	7.78	22.55
5	747.17	28.8 QP	46.0	-17.2	1.50 V	133	4.46	24.34
6	944.10	33.3 QP	46.0	-12.7	1.00 V	63	5.61	27.72

- 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.

ABOVE 1GHz WORST-CASE DATA

802.11b DSSS MODULATION

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	2389.70	66.2 PK	74.0	-7.8	1.20 H	93	34.45	31.75
2	2389.70	46.0 AV	54.0	-8.0	1.20 H	93	14.25	31.75
3	*2412.00	106.2 PK			1.20 H	95	74.38	31.82
4	*2412.00	100.4 AV			1.20 H	95	68.58	31.82
5	4824.00	46.5 PK	74.0	-27.5	1.29 H	123	7.14	39.36
6	4824.00	35.3 AV	54.0	-18.7	1.29 H	123	-4.06	39.36
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	59.2 PK	74.0	-14.8	1.00 V	195	27.45	31.75
2	2390.00	43.4 AV	54.0	-10.6	1.00 V	195	11.65	31.75
3	*2412.00	97.1 PK			1.00 V	195	65.28	31.82
4	*2412.00	91.6 AV			1.00 V	195	59.78	31.82
5	4824.00	49.4 PK	74.0	-24.6	1.23 V	196	10.04	39.36
6	4824.00	36.8 AV	54.0	-17.2	1.23 V	196	-2.56	39.36

- 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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	105.5 PK			1.25 H	80	73.58	31.92
2	*2437.00	100.4 AV			1.25 H	80	68.48	31.92
3	4874.00	47.4 PK	74.0	-26.6	1.33 H	136	7.90	39.50
4	4874.00	36.1 AV	54.0	-17.9	1.33 H	136	-3.40	39.50
5	7311.00	53.8 PK	74.0	-20.2	1.67 H	53	6.92	46.88
6	7311.00	41.8 AV	54.0	-12.2	1.67 H	53	-5.08	46.88
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	97.8 PK			1.00 V	160	65.88	31.92
2	*2437.00	92.8 AV			1.00 V	160	60.88	31.92
3	4874.00	49.1 PK	74.0	-24.9	1.21 V	195	9.60	39.50
4	4874.00	36.8 AV	54.0	-17.2	1.21 V	195	-2.70	39.50
5	7311.00	54.2 PK	74.0	-19.8	1.24 V	322	7.32	46.88
6	7311.00	42.3 AV	54.0	-11.7	1.24 V	322	-4.58	46.88

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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	105.4 PK			1.21 H	108	73.39	32.01
2	*2462.00	99.7 AV			1.21 H	108	67.69	32.01
3	2483.50	66.9 PK	74.0	-7.1	1.21 H	108	34.81	32.09
4	2483.50	44.6 AV	54.0	-9.4	1.21 H	108	12.51	32.09
5	4924.00	47.6 PK	74.0	-26.4	1.30 H	149	7.93	39.67
6	4924.00	36.1 AV	54.0	-17.9	1.30 H	149	-3.57	39.67
7	7386.00	53.5 PK	74.0	-20.5	1.65 H	35	6.70	46.80
8	7386.00	41.6 AV	54.0	-12.4	1.65 H	35	-5.20	46.80
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	*2462.00	97.0 PK			1.00 V	170	64.99	32.01
2	*2462.00	91.4 AV			1.00 V	170	59.39	32.01
3	2483.50	59.6 PK	74.0	-14.4	1.00 V	169	27.51	32.09
4	2483.50	43.1 AV	54.0	-10.9	1.00 V	169	11.01	32.09
5	4924.00	49.0 PK	74.0	-25.0	1.14 V	197	9.33	39.67
6	4924.00	36.8 AV	54.0	-17.2	1.14 V	197	-2.87	39.67
7	7386.00	53.4 PK	74.0	-20.6	1.19 V	337	6.60	46.80
8	7386.00	41.9 AV	54.0	-12.1	1.19 V	337	-4.90	46.80

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 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2467.00	92.9 PK			1.23 H	93	60.87	32.03
2	*2467.00	87.4 AV			1.23 H	93	55.37	32.03
3	2483.50	62.3 PK	74.0	-11.7	1.24 H	95	30.21	32.09
4	2483.50	43.0 AV	54.0	-11.0	1.24 H	95	10.91	32.09
5	4934.00	46.3 PK	74.0	-27.7	1.23 H	142	6.59	39.71
6	4934.00	35.1 AV	54.0	-18.9	1.23 H	142	-4.61	39.71
7	7401.00	54.8 PK	74.0	-19.2	1.62 H	60	8.02	46.78
8	7401.00	42.2 AV	54.0	-11.8	1.62 H	60	-4.58	46.78
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	*2467.00	84.7 PK			1.00 V	190	52.67	32.03
2	*2467.00	79.5 AV			1.00 V	190	47.47	32.03
3	2483.50	56.5 PK	74.0	-17.5	1.00 V	195	24.41	32.09
4	2483.50	42.8 AV	54.0	-11.2	1.00 V	195	10.71	32.09
5	4934.00	47.1 PK	74.0	-26.9	1.21 V	229	7.39	39.71
6	4934.00	35.2 AV	54.0	-18.8	1.21 V	229	-4.51	39.71
7	7401.00	54.5 PK	74.0	-19.5	1.25 V	333	7.72	46.78
8	7401.00	42.1 AV	54.0	-11.9	1.25 V	333	-4.68	46.78

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 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2472.00	93.2 PK			1.21 H	91	61.15	32.05
2	*2472.00	87.5 AV			1.21 H	91	55.45	32.05
3	2483.50	66.3 PK	74.0	-7.7	1.21 H	91	34.21	32.09
4	2483.50	45.4 AV	54.0	-8.6	1.21 H	91	13.31	32.09
5	4944.00	45.7 PK	74.0	-28.3	1.21 H	146	5.95	39.75
6	4944.00	34.7 AV	54.0	-19.3	1.21 H	146	-5.05	39.75
7	7416.00	54.0 PK	74.0	-20.0	1.56 H	72	7.23	46.77
8	7416.00	41.1 AV	54.0	-12.9	1.56 H	72	-5.67	46.77
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	*2472.00	84.6 PK			1.00 V	193	52.55	32.05
2	*2472.00	79.3 AV			1.00 V	193	47.25	32.05
3	2483.50	58.6 PK	74.0	-15.4	1.00 V	193	26.51	32.09
4	2483.50	43.1 AV	54.0	-10.9	1.00 V	193	11.01	32.09
5	4944.00	46.4 PK	74.0	-27.6	1.24 V	220	6.65	39.75
6	4944.00	34.7 AV	54.0	-19.3	1.24 V	220	-5.05	39.75
7	7416.00	54.5 PK	74.0	-19.5	1.28 V	334	7.73	46.77
8	7416.00	42.3 AV	54.0	-11.7	1.28 V	334	-4.47	46.77

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

802.11g OFDM MODULATION

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	64.6 PK	74.0	-9.4	1.24 H	116	32.85	31.75
2	2390.00	46.6 AV	54.0	-7.4	1.24 H	116	14.85	31.75
3	*2412.00	103.9 PK			1.24 H	116	72.08	31.82
4	*2412.00	94.4 AV			1.24 H	116	62.58	31.82
5	4824.00	47.3 PK	74.0	-26.7	1.30 H	133	7.94	39.36
6	4824.00	34.4 AV	54.0	-19.6	1.30 H	133	-4.96	39.36
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	57.5 PK	74.0	-16.5	1.00 V	189	25.75	31.75
2	2390.00	43.8 AV	54.0	-10.2	1.00 V	189	12.05	31.75
3	*2412.00	95.8 PK			1.00 V	189	63.98	31.82
4	*2412.00	86.1 AV			1.00 V	189	54.28	31.82
5	4824.00	47.6 PK	74.0	-26.4	1.16 V	197	8.24	39.36
6	4824.00	34.5 AV	54.0	-19.5	1.16 V	197	-4.86	39.36

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	108.3 PK			1.22 H	110	76.38	31.92
2	*2437.00	98.5 AV			1.22 H	110	66.58	31.92
3	4874.00	47.8 PK	74.0	-26.2	1.26 H	148	8.30	39.50
4	4874.00	35.1 AV	54.0	-18.9	1.26 H	148	-4.40	39.50
5	7311.00	52.9 PK	74.0	-21.1	1.59 H	31	6.02	46.88
6	7311.00	41.1 AV	54.0	-12.9	1.59 H	31	-5.78	46.88
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	95.4 PK			1.00 V	185	63.48	31.92
2	*2437.00	85.9 AV			1.00 V	185	53.98	31.92
3	4874.00	48.2 PK	74.0	-25.8	1.20 V	190	8.70	39.50
4	4874.00	35.3 AV	54.0	-18.7	1.20 V	190	-4.20	39.50
5	7311.00	54.9 PK	74.0	-19.1	1.25 V	331	8.02	46.88
6	7311.00	42.5 AV	54.0	-11.5	1.25 V	331	-4.38	46.88

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 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.1 PK			1.24 H	84	71.09	32.01
2	*2462.00	93.3 AV			1.24 H	84	61.29	32.01
3	2483.50	64.6 PK	74.0	-9.4	1.24 H	85	32.51	32.09
4	2483.50	46.1 AV	54.0	-7.9	1.24 H	85	14.01	32.09
5	4924.00	47.3 PK	74.0	-26.7	1.25 H	151	7.63	39.67
6	4924.00	34.9 AV	54.0	-19.1	1.25 H	151	-4.77	39.67
7	7386.00	53.2 PK	74.0	-20.8	1.61 H	34	6.40	46.80
8	7386.00	41.6 AV	54.0	-12.4	1.61 H	34	-5.20	46.80
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	*2462.00	95.0 PK			1.00 V	182	62.99	32.01
2	*2462.00	85.3 AV			1.00 V	182	53.29	32.01
3	2483.50	58.1 PK	74.0	-15.9	1.00 V	182	26.01	32.09
4	2483.50	43.4 AV	54.0	-10.6	1.00 V	182	11.31	32.09
5	4924.00	47.5 PK	74.0	-26.5	1.11 V	176	7.83	39.67
6	4924.00	34.5 AV	54.0	-19.5	1.11 V	176	-5.17	39.67
7	7386.00	54.5 PK	74.0	-19.5	1.24 V	316	7.70	46.80
8	7386.00	42.5 AV	54.0	-11.5	1.24 V	316	-4.30	46.80

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2467.00	93.8 PK			1.24 H	95	61.77	32.03
2	*2467.00	83.7 AV			1.24 H	95	51.67	32.03
3	2483.50	62.8 PK	74.0	-11.2	1.24 H	95	30.71	32.09
4	2483.50	44.0 AV	54.0	-10.0	1.24 H	95	11.91	32.09
5	4934.00	46.4 PK	74.0	-27.6	1.25 H	142	6.69	39.71
6	4934.00	33.2 AV	54.0	-20.8	1.25 H	142	-6.51	39.71
7	7401.00	52.9 PK	74.0	-21.1	1.55 H	9	6.12	46.78
8	7401.00	41.1 AV	54.0	-12.9	1.55 H	9	-5.68	46.78
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	*2467.00	84.2 PK			1.00 V	188	52.17	32.03
2	*2467.00	74.9 AV			1.00 V	188	42.87	32.03
3	2483.50	55.2 PK	74.0	-18.8	1.00 V	188	23.11	32.09
4	2483.50	42.8 AV	54.0	-11.2	1.00 V	188	10.71	32.09
5	4934.00	47.0 PK	74.0	-27.0	1.10 V	156	7.29	39.71
6	4934.00	34.6 AV	54.0	-19.4	1.10 V	156	-5.11	39.71
7	7401.00	53.4 PK	74.0	-20.6	1.24 V	326	6.62	46.78
8	7401.00	41.6 AV	54.0	-12.4	1.24 V	326	-5.18	46.78

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2472.00	93.3 PK			1.20 H	101	61.25	32.05
2	*2472.00	83.4 AV			1.20 H	101	51.35	32.05
3	2483.80	65.1 PK	74.0	-8.9	1.20 H	101	33.01	32.09
4	2483.80	47.1 AV	54.0	-6.9	1.20 H	101	15.01	32.09
5	4944.00	47.0 PK	74.0	-27.0	1.22 H	145	7.25	39.75
6	4944.00	34.0 AV	54.0	-20.0	1.22 H	145	-5.75	39.75
7	7416.00	53.9 PK	74.0	-20.1	1.50 H	11	7.13	46.77
8	7416.00	41.6 AV	54.0	-12.4	1.50 H	11	-5.17	46.77
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	*2472.00	84.7 PK			1.00 V	178	52.65	32.05
2	*2472.00	75.4 AV			1.00 V	178	43.35	32.05
3	2483.70	59.2 PK	74.0	-14.8	1.00 V	178	27.11	32.09
4	2483.70	43.5 AV	54.0	-10.5	1.00 V	178	11.41	32.09
5	4944.00	47.3 PK	74.0	-26.7	1.21 V	199	7.55	39.75
6	4944.00	34.8 AV	54.0	-19.2	1.21 V	199	-4.95	39.75
7	7416.00	55.0 PK	74.0	-19.0	1.25 V	342	8.23	46.77
8	7416.00	42.8 AV	54.0	-11.2	1.25 V	342	-3.97	46.77

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.

4.2.8 TEST RESULTS (AUX ANTENNA)

BELOW 1GHz WORST-CASE DATA : 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Nick Chang

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	69.79	24.6 QP	40.0	-15.4	1.50 H	41	12.09	12.54
2	149.25	31.5 QP	43.5	-12.0	1.50 H	151	16.88	14.66
3	290.41	33.6 QP	46.0	-12.4	1.00 H	360	18.68	14.94
4	504.05	26.1 QP	46.0	-19.9	1.50 H	118	5.68	20.40
5	599.85	28.1 QP	46.0	-17.9	1.50 H	3	5.53	22.58
6	749.54	33.8 QP	46.0	-12.2	1.00 H	93	9.38	24.41
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	90.04	28.7 QP	43.5	-14.8	1.50 V	52	20.13	8.59
2	149.01	29.2 QP	43.5	-14.3	1.00 V	202	14.59	14.65
3	298.58	32.4 QP	46.0	-13.6	1.50 V	102	17.17	15.26
4	599.73	34.2 QP	46.0	-11.9	1.00 V	358	11.58	22.57
5	849.25	31.5 QP	46.0	-14.5	1.50 V	102	4.90	26.64
6	951.21	33.5 QP	46.0	-12.5	1.00 V	89	5.68	27.78

- 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.

ABOVE 1GHz WORST-CASE DATA

802.11b DSSS MODULATION

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	66.0 PK	74.0	-8.0	1.27 H	274	34.25	31.75
2	2390.00	45.7 AV	54.0	-8.3	1.27 H	274	13.95	31.75
3	*2412.00	107.0 PK			1.27 H	274	75.18	31.82
4	*2412.00	101.1 AV			1.27 H	274	69.28	31.82
5	4824.00	48.8 PK	74.0	-25.2	1.78 H	243	9.44	39.36
6	4824.00	40.1 AV	54.0	-13.9	1.78 H	243	0.74	39.36
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	61.7 PK	74.0	-12.3	1.12 V	230	29.95	31.75
2	2390.00	43.9 AV	54.0	-10.1	1.12 V	230	12.15	31.75
3	*2412.00	99.8 PK			1.12 V	230	67.98	31.82
4	*2412.00	94.1 AV			1.12 V	230	62.28	31.82
5	4824.00	48.4 PK	74.0	-25.6	1.00 V	221	9.04	39.36
6	4824.00	38.3 AV	54.0	-15.7	1.00 V	221	-1.06	39.36

- 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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.2 PK			1.22 H	270	75.28	31.92
2	*2437.00	101.6 AV			1.22 H	270	69.68	31.92
3	4874.00	48.5 PK	74.0	-25.5	1.77 H	235	9.00	39.50
4	4874.00	39.9 AV	54.0	-14.1	1.77 H	235	0.40	39.50
5	7311.00	53.2 PK	74.0	-20.8	1.43 H	56	6.32	46.88
6	7311.00	42.7 AV	54.0	-11.3	1.43 H	56	-4.18	46.88
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	100.0 PK			1.14 V	220	68.08	31.92
2	*2437.00	94.1 AV			1.14 V	220	62.18	31.92
3	4874.00	48.2 PK	74.0	-25.8	1.00 V	218	8.70	39.50
4	4874.00	38.1 AV	54.0	-15.9	1.00 V	218	-1.40	39.50
5	7311.00	53.4 PK	74.0	-20.6	1.18 V	263	6.52	46.88
6	7311.00	41.6 AV	54.0	-12.4	1.18 V	263	-5.28	46.88

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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	107.4 PK			1.24 H	272	75.39	32.01
2	*2462.00	101.5 AV			1.24 H	272	69.49	32.01
3	2483.50	68.3 PK	74.0	-5.7	1.24 H	272	36.21	32.09
4	2483.50	45.7 AV	54.0	-8.3	1.24 H	272	13.61	32.09
5	4924.00	49.2 PK	74.0	-24.8	1.75 H	242	9.53	39.67
6	4924.00	40.3 AV	54.0	-13.7	1.75 H	242	0.63	39.67
7	7386.00	53.4 PK	74.0	-20.6	1.43 H	44	6.60	46.80
8	7386.00	43.0 AV	54.0	-11.0	1.43 H	44	-3.80	46.80
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	*2462.00	98.7 PK			1.09 V	235	66.69	32.01
2	*2462.00	93.6 AV			1.09 V	235	61.59	32.01
3	2483.50	62.0 PK	74.0	-12.0	1.09 V	235	29.91	32.09
4	2483.50	43.4 AV	54.0	-10.6	1.09 V	235	11.31	32.09
5	4924.00	48.4 PK	74.0	-25.6	1.02 V	234	8.73	39.67
6	4924.00	38.4 AV	54.0	-15.6	1.02 V	234	-1.27	39.67
7	7386.00	54.0 PK	74.0	-20.0	1.17 V	268	7.20	46.80
8	7386.00	41.9 AV	54.0	-12.1	1.17 V	268	-4.90	46.80

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2467.00	95.2 PK			1.24 H	262	63.17	32.03
2	*2467.00	89.3 AV			1.24 H	262	57.27	32.03
3	2486.33	64.2 PK	74.0	-9.8	1.24 H	262	32.10	32.10
4	2486.33	43.4 AV	54.0	-10.6	1.24 H	262	11.30	32.10
5	4934.00	47.0 PK	74.0	-27.0	1.82 H	230	7.29	39.71
6	4934.00	36.2 AV	54.0	-17.8	1.82 H	230	-3.51	39.71
7	7401.00	54.4 PK	74.0	-19.6	1.45 H	55	7.62	46.78
8	7401.00	42.3 AV	54.0	-11.7	1.45 H	55	-4.48	46.78
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	*2467.00	86.4 PK			1.11 V	232	54.37	32.03
2	*2467.00	81.3 AV			1.11 V	232	49.27	32.03
3	2483.50	58.2 PK	74.0	-15.8	1.11 V	232	26.11	32.09
4	2483.50	42.9 AV	54.0	-11.1	1.11 V	232	10.81	32.09
5	4934.00	45.5 PK	74.0	-28.5	1.02 V	244	5.79	39.71
6	4934.00	35.0 AV	54.0	-19.0	1.02 V	244	-4.71	39.71
7	7401.00	53.9 PK	74.0	-20.1	1.16 V	258	7.12	46.78
8	7401.00	42.8 AV	54.0	-11.2	1.16 V	258	-3.98	46.78

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2472.00	93.4 PK			1.20 H	261	61.35	32.05
2	*2472.00	87.5 AV			1.20 H	261	55.45	32.05
3	2483.50	66.9 PK	74.0	-7.1	1.20 H	261	34.81	32.09
4	2483.50	45.6 AV	54.0	-8.4	1.20 H	261	13.51	32.09
5	4944.00	46.7 PK	74.0	-27.3	1.84 H	220	6.95	39.75
6	4944.00	36.1 AV	54.0	-17.9	1.84 H	220	-3.65	39.75
7	7416.00	54.4 PK	74.0	-19.6	1.47 H	67	7.63	46.77
8	7416.00	42.5 AV	54.0	-11.5	1.47 H	67	-4.27	46.77
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	*2472.00	86.5 PK			1.12 V	241	54.45	32.05
2	*2472.00	81.1 AV			1.12 V	241	49.05	32.05
3	2483.50	61.3 PK	74.0	-12.7	1.12 V	241	29.21	32.09
4	2483.50	43.4 AV	54.0	-10.6	1.12 V	241	11.31	32.09
5	4944.00	45.9 PK	74.0	-28.1	1.00 V	236	6.15	39.75
6	4944.00	35.4 AV	54.0	-18.6	1.00 V	236	-4.35	39.75
7	7416.00	53.9 PK	74.0	-20.1	1.15 V	266	7.13	46.77
8	7416.00	42.5 AV	54.0	-11.5	1.15 V	266	-4.27	46.77

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

802.11g OFDM MODULATION

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	66.7 PK	74.0	-7.3	1.03 H	270	34.95	31.75
2	2390.00	46.7 AV	54.0	-7.3	1.03 H	270	14.95	31.75
3	*2412.00	104.9 PK			1.21 H	270	73.08	31.82
4	*2412.00	95.4 AV			1.21 H	270	63.58	31.82
5	4824.00	46.5 PK	74.0	-27.5	1.80 H	210	7.14	39.36
6	4824.00	36.1 AV	54.0	-17.9	1.80 H	210	-3.26	39.36
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	61.2 PK	74.0	-12.8	1.09 V	234	29.45	31.75
2	2390.00	44.2 AV	54.0	-9.8	1.09 V	234	12.45	31.75
3	*2412.00	97.9 PK			1.09 V	234	66.08	31.82
4	*2412.00	88.1 AV			1.09 V	234	56.28	31.82
5	4824.00	45.9 PK	74.0	-28.1	1.00 V	213	6.54	39.36
6	4824.00	35.7 AV	54.0	-18.3	1.00 V	213	-3.66	39.36

- 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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.4 PK			1.25 H	277	77.48	31.92
2	*2437.00	99.6 AV			1.25 H	277	67.68	31.92
3	4874.00	47.4 PK	74.0	-26.6	1.83 H	226	7.90	39.50
4	4874.00	36.8 AV	54.0	-17.2	1.83 H	226	-2.70	39.50
5	7311.00	54.9 PK	74.0	-19.1	1.46 H	49	8.02	46.88
6	7311.00	43.0 AV	54.0	-11.0	1.46 H	49	-3.88	46.88
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	102.0 PK			1.13 V	236	70.08	31.92
2	*2437.00	92.3 AV			1.13 V	236	60.38	31.92
3	4874.00	47.0 PK	74.0	-27.0	1.00 V	218	7.50	39.50
4	4874.00	36.2 AV	54.0	-17.8	1.00 V	218	-3.30	39.50
5	7311.00	54.0 PK	74.0	-20.0	1.11 V	249	7.12	46.88
6	7311.00	42.8 AV	54.0	-11.2	1.11 V	249	-4.08	46.88

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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	105.5 PK			1.24 H	273	73.49	32.01
2	*2462.00	95.7 AV			1.24 H	273	63.69	32.01
3	2483.50	65.9 PK	74.0	-8.1	1.24 H	273	33.81	32.09
4	2483.50	47.6 AV	54.0	-6.4	1.24 H	273	15.51	32.09
5	4924.00	46.3 PK	74.0	-27.7	1.82 H	221	6.63	39.67
6	4924.00	35.7 AV	54.0	-18.3	1.82 H	221	-3.97	39.67
7	7386.00	54.2 PK	74.0	-19.8	1.45 H	51	7.40	46.80
8	7386.00	42.5 AV	54.0	-11.5	1.45 H	51	-4.30	46.80
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	*2462.00	97.3 PK			1.11 V	236	65.29	32.01
2	*2462.00	87.8 AV			1.11 V	236	55.79	32.01
3	2483.50	58.8 PK	74.0	-15.2	1.11 V	236	26.71	32.09
4	2483.50	44.0 AV	54.0	-10.0	1.11 V	236	11.91	32.09
5	4924.00	46.0 PK	74.0	-28.0	1.00 V	225	6.33	39.67
6	4924.00	35.6 AV	54.0	-18.4	1.00 V	225	-4.07	39.67
7	7386.00	53.7 PK	74.0	-20.3	1.14 V	264	6.90	46.80
8	7386.00	42.5 AV	54.0	-11.5	1.14 V	264	-4.30	46.80

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 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2467.00	94.9 PK			1.23 H	271	62.87	32.03
2	*2467.00	85.3 AV			1.23 H	271	53.27	32.03
3	2483.50	61.4 PK	74.0	-12.6	1.24 H	270	29.31	32.09
4	2483.50	43.7 AV	54.0	-10.3	1.24 H	270	11.61	32.09
5	4934.00	46.3 PK	74.0	-27.7	1.82 H	216	6.59	39.71
6	4934.00	35.5 AV	54.0	-18.5	1.82 H	216	-4.21	39.71
7	7401.00	54.5 PK	74.0	-19.5	1.40 H	64	7.72	46.78
8	7401.00	42.9 AV	54.0	-11.1	1.40 H	64	-3.88	46.78
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	*2467.00	85.4 PK			1.15 V	236	53.37	32.03
2	*2467.00	76.1 AV			1.15 V	236	44.07	32.03
3	2483.50	57.8 PK	74.0	-16.2	1.15 V	236	25.71	32.09
4	2483.50	43.0 AV	54.0	-11.0	1.15 V	236	10.91	32.09
5	4934.00	45.8 PK	74.0	-28.2	1.03 V	222	6.09	39.71
6	4934.00	35.5 AV	54.0	-18.5	1.03 V	222	-4.21	39.71
7	7401.00	54.2 PK	74.0	-19.8	1.12 V	273	7.42	46.78
8	7401.00	42.7 AV	54.0	-11.3	1.12 V	273	-4.08	46.78

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*2472.00	94.7 PK			1.20 H	266	62.65	32.05
2	*2472.00	85.2 AV			1.20 H	266	53.15	32.05
3	2483.80	63.6 PK	74.0	-10.4	1.20 H	265	31.51	32.09
4	2483.80	46.4 AV	54.0	-7.6	1.20 H	265	14.31	32.09
5	4944.00	46.0 PK	74.0	-28.0	1.86 H	213	6.25	39.75
6	4944.00	35.0 AV	54.0	-19.0	1.86 H	213	-4.75	39.75
7	7416.00	54.7 PK	74.0	-19.3	1.35 H	58	7.93	46.77
8	7416.00	43.2 AV	54.0	-10.8	1.35 H	58	-3.57	46.77
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	*2472.00	86.5 PK			1.13 V	201	54.45	32.05
2	*2472.00	76.9 AV			1.13 V	201	44.85	32.05
3	2483.70	60.6 PK	74.0	-13.4	1.13 V	201	28.51	32.09
4	2483.70	44.0 AV	54.0	-10.0	1.13 V	201	11.91	32.09
5	4944.00	45.7 PK	74.0	-28.3	1.01 V	208	5.95	39.75
6	4944.00	35.7 AV	54.0	-18.3	1.01 V	208	-4.05	39.75
7	7416.00	54.2 PK	74.0	-19.8	1.15 V	268	7.43	46.77
8	7416.00	42.6 AV	54.0	-11.4	1.15 V	268	-4.17	46.77

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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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 INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

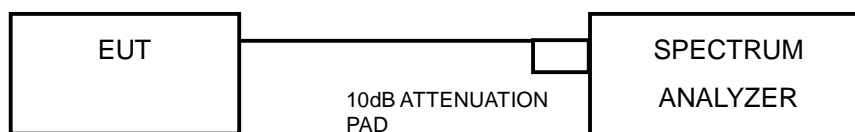
4.3.3 TEST PROCEDURE

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

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP





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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 DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	11.63	0.5	PASS
6	2437	11.60	0.5	PASS
11	2462	11.54	0.5	PASS
12	2467	11.56	0.5	PASS
13	2472	11.21	0.5	PASS

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.39	0.5	PASS
6	2437	16.42	0.5	PASS
11	2462	16.42	0.5	PASS
12	2467	16.41	0.5	PASS
13	2472	16.42	0.5	PASS



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4.4 CONDUCTED OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 902 –928 MHz, 2400–2483.5 MHz, and 5725 –5850 MHz bands: 1 Watt (30dBm)

4.4.2 INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Peak Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

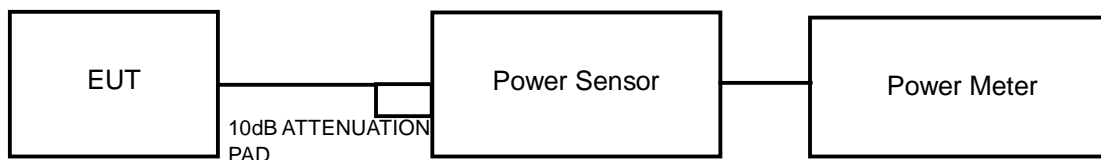
4.4.3 TEST PROCEDURES

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.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	47.9	16.8	30	PASS
6	2437	50.1	17.0	30	PASS
11	2462	52.5	17.2	30	PASS
12	2467	2.1	3.2	30	PASS
13	2472	2.1	3.2	30	PASS

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	125.9	21.0	30	PASS
6	2437	166.0	22.2	30	PASS
11	2462	128.8	21.1	30	PASS
12	2467	13.5	11.3	30	PASS
13	2472	13.2	11.2	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 INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

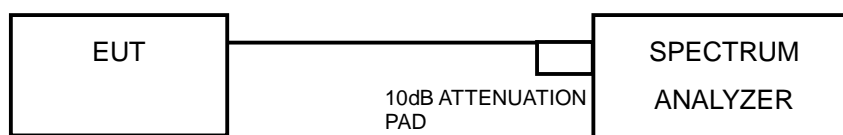
4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-10.3	8	PASS
6	2437	-10.3	8	PASS
11	2462	-10.0	8	PASS
12	2467	-23.0	8	PASS
13	2472	-23.0	8	PASS

802.11g OFDM MODULATION:

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-15.9	8	PASS
6	2437	-12.2	8	PASS
11	2462	-16.3	8	PASS
12	2467	-26.4	8	PASS
13	2472	-27.6	8	PASS

4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.6.3 TEST PROCEDURE

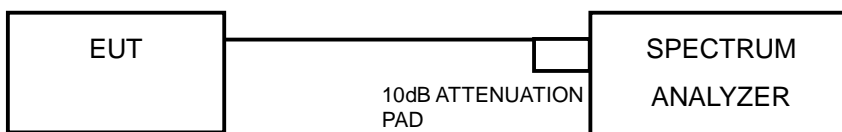
The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100MHz or 200MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



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.

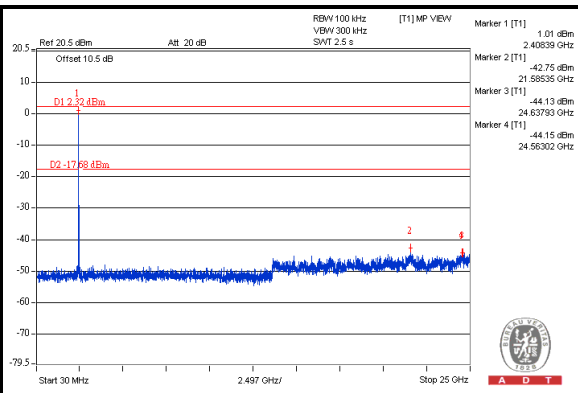
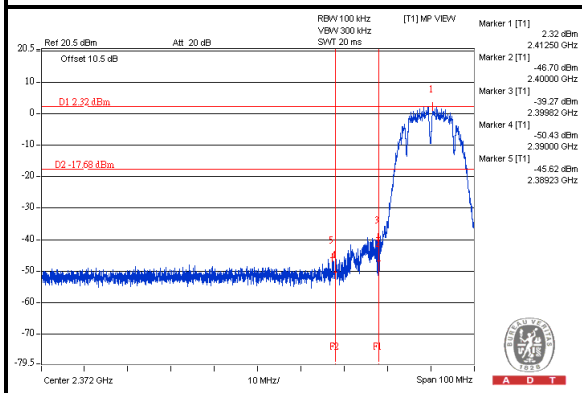
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



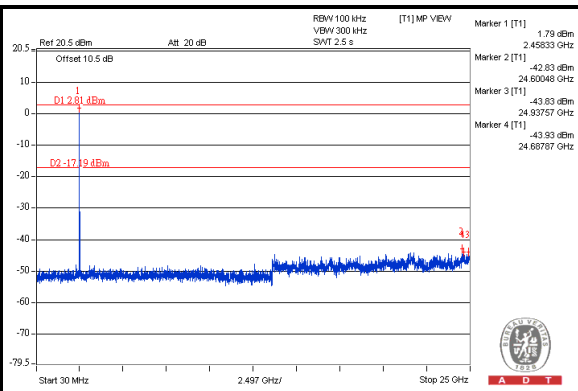
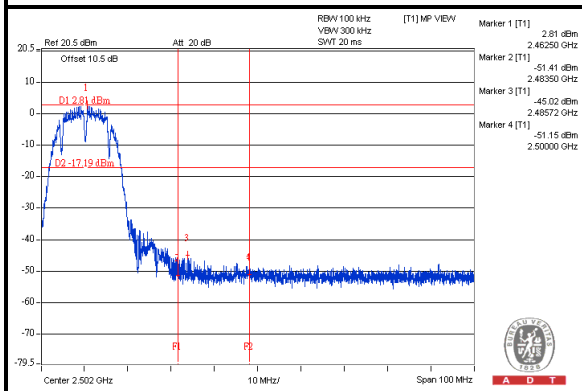
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802.11b DSSS MODULATION:

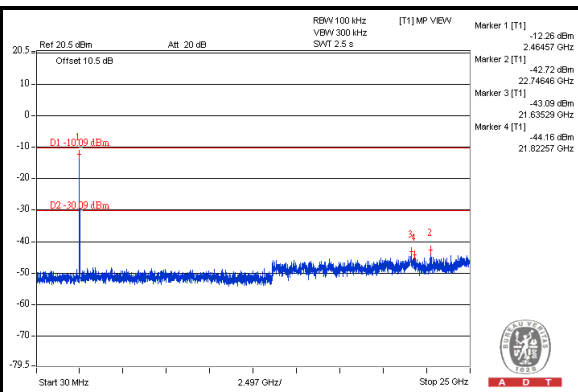
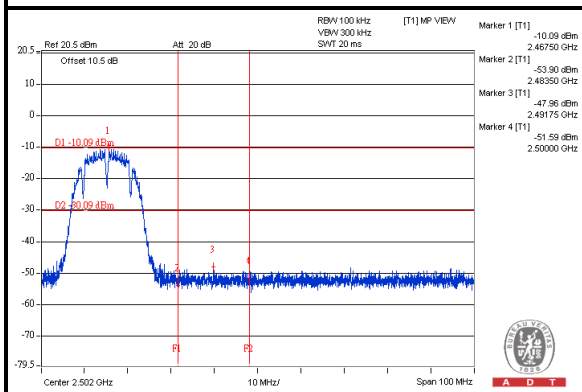
CH 1



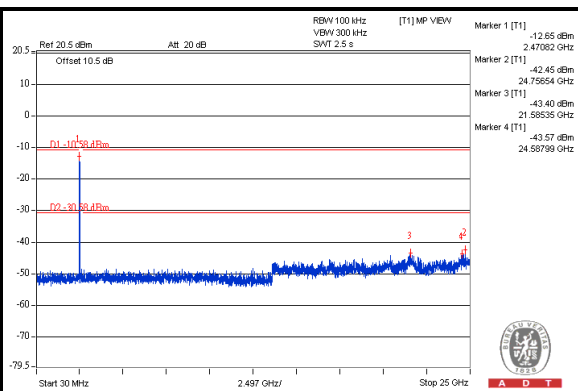
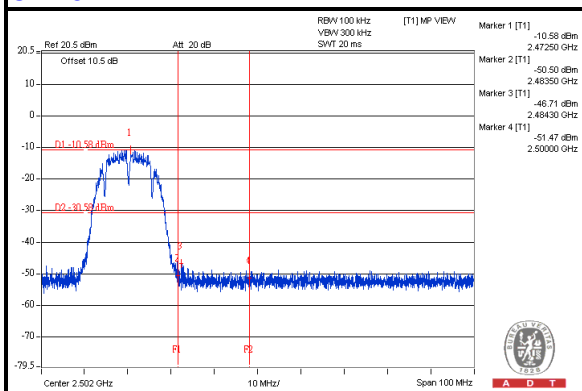
CH 11



CH 12



CH 13

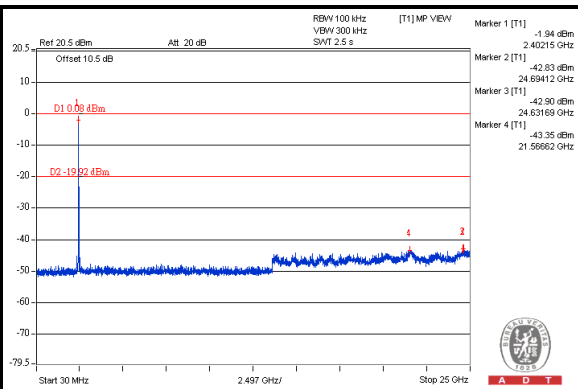
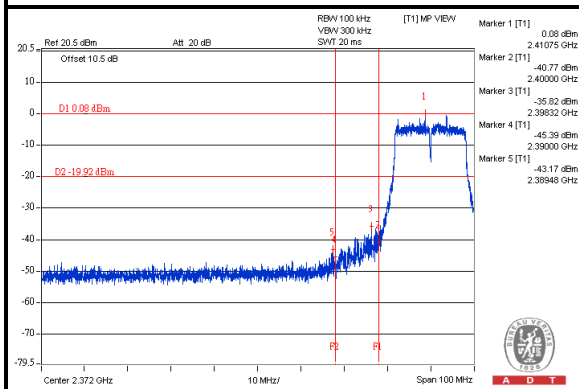




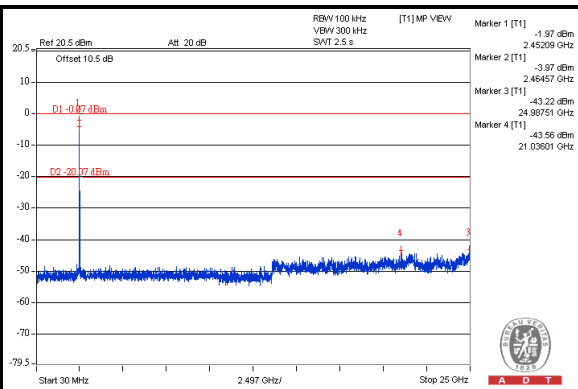
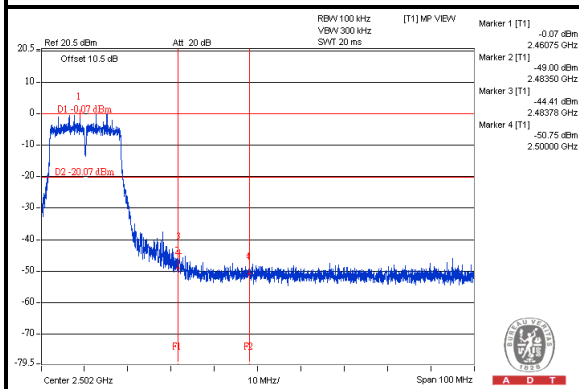
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802.11g OFDM MODULATION:

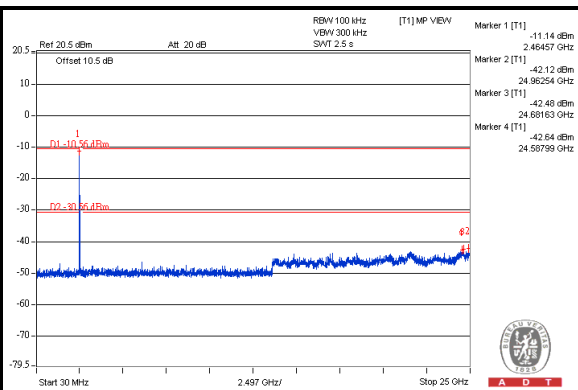
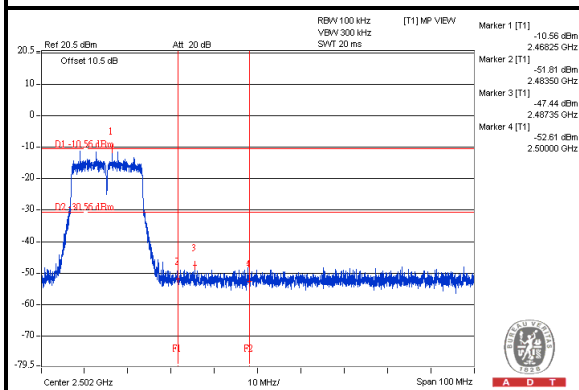
CH 1



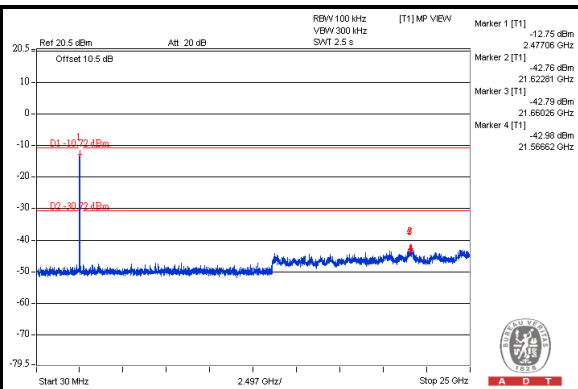
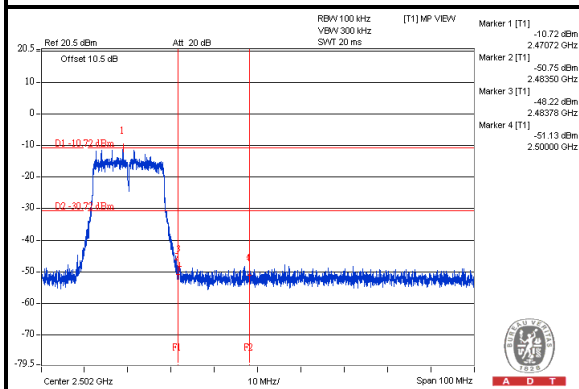
CH 11



CH 12



CH 13



5. TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE: 1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.1.2 TEST INSTRUMENTS

Test date: Jan. 03, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 20, 2011	Sep. 19, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 05, 2011	Aug. 04, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
Software	BV 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 Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

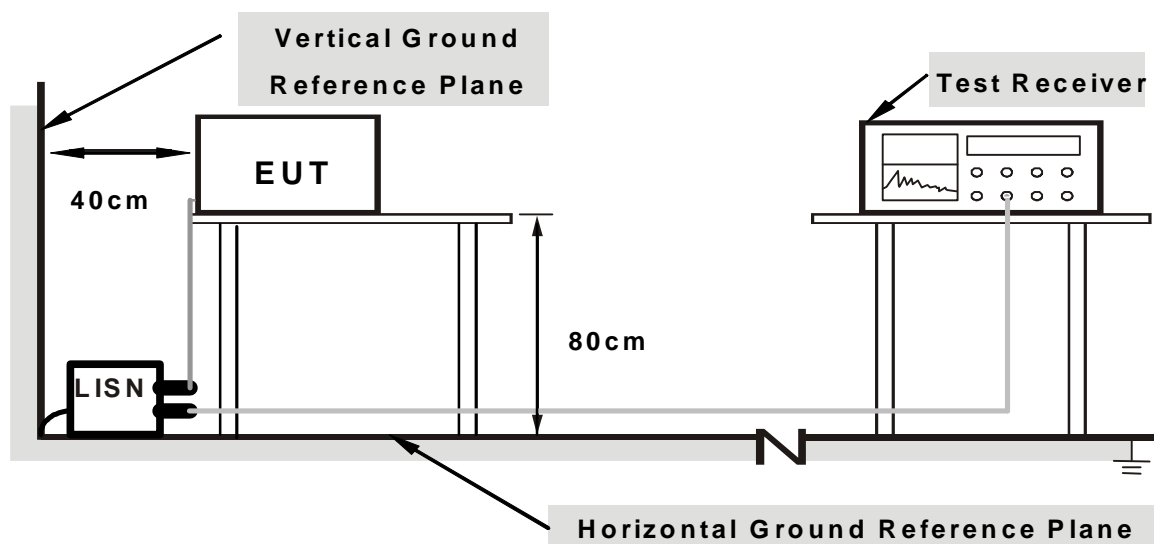
5.1.3 TEST PROCEDURES

- 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) were not recorded.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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 related item – Photographs of the Test Configuration.

5.1.6 EUT OPERATING CONDITIONS

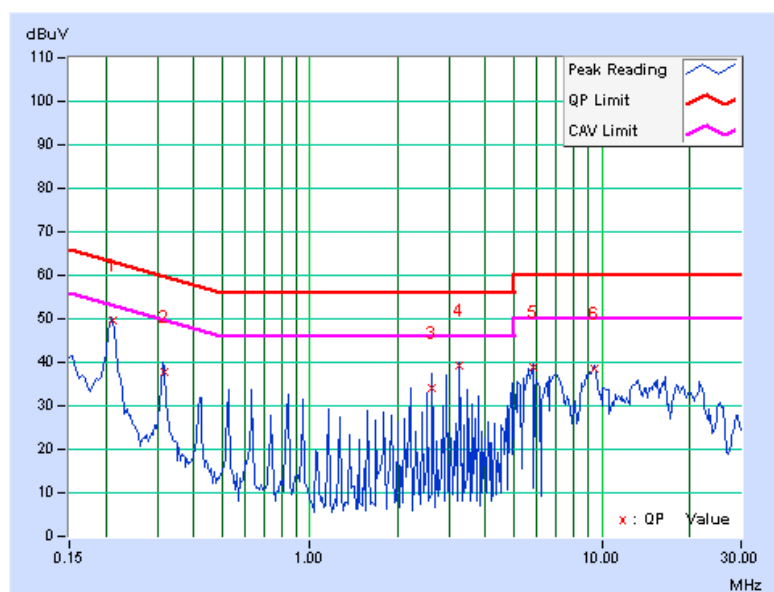
Same as the 4.1.6

5.1.7 TEST RESULTS(MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.212	0.06	49.50	42.07	49.56	42.13	63.13	53.13	-13.57	-11.00
2	0.317	0.07	37.68	29.26	37.75	29.33	59.77	49.77	-22.03	-20.45
3	2.632	0.19	33.91	25.90	34.10	26.09	56.00	46.00	-21.90	-19.91
4	3.262	0.21	39.00	30.35	39.21	30.56	56.00	46.00	-16.79	-15.44
5	5.789	0.28	38.58	36.69	38.86	36.97	60.00	50.00	-21.14	-13.03
6	9.473	0.38	38.11	35.69	38.49	36.07	60.00	50.00	-21.51	-13.93

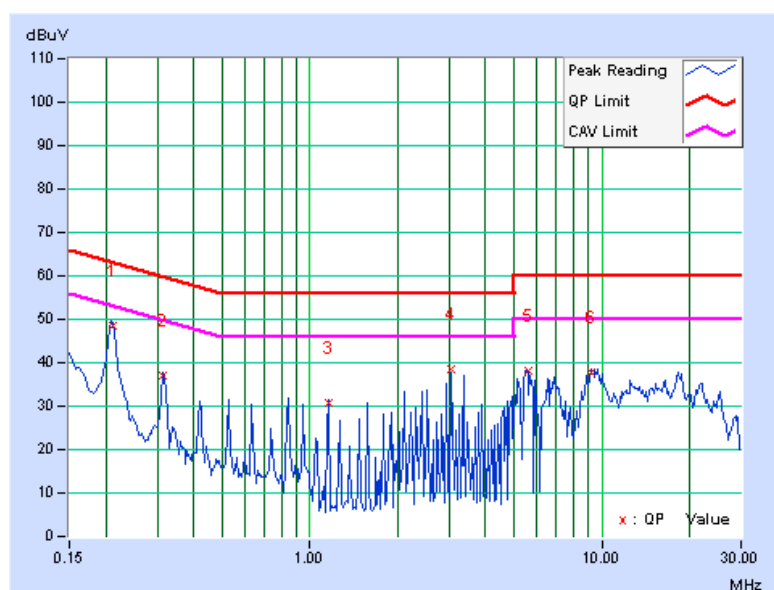
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.212	0.07	48.34	41.48	48.41	41.55	63.13	53.13	-14.72	-11.58
2	0.315	0.08	36.90	29.66	36.98	29.74	59.84	49.84	-22.86	-20.10
3	1.156	0.10	30.77	28.16	30.87	28.26	56.00	46.00	-25.13	-17.74
4	3.052	0.19	38.44	28.76	38.63	28.95	56.00	46.00	-17.37	-17.05
5	5.578	0.26	37.90	36.32	38.16	36.58	60.00	50.00	-21.84	-13.42
6	9.156	0.35	37.33	35.99	37.68	36.34	60.00	50.00	-22.32	-13.66

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

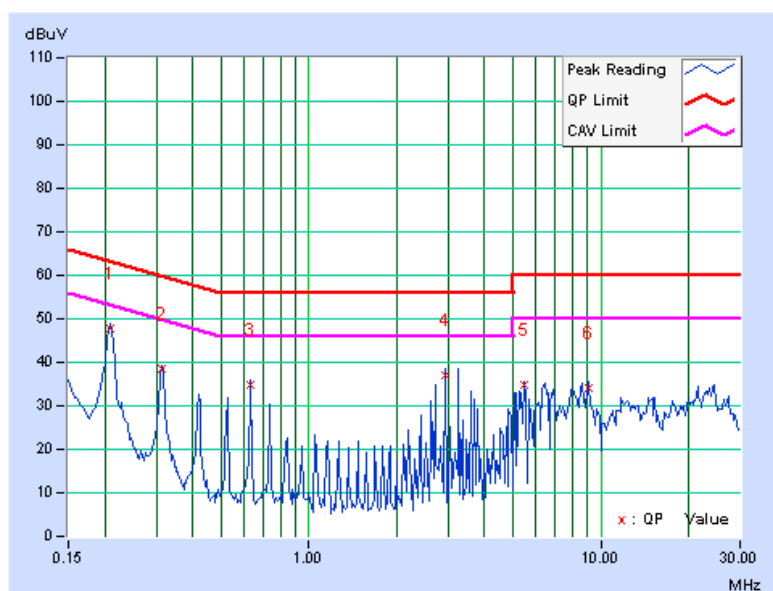


5.1.8 TEST RESULTS(MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	(dB)	(dB)
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.06	47.55	39.02	47.61	39.08	63.26	53.26	-15.65	-14.18
2	0.314	0.07	38.40	33.39	38.47	33.46	59.86	49.86	-21.40	-16.41
3	0.630	0.08	34.80	33.73	34.88	33.81	56.00	46.00	-21.12	-12.19
4	2.941	0.20	36.95	26.90	37.15	27.10	56.00	46.00	-18.85	-18.90
5	5.464	0.28	34.72	33.37	35.00	33.65	60.00	50.00	-25.00	-16.35
6	9.037	0.37	33.87	30.96	34.24	31.33	60.00	50.00	-25.76	-18.67

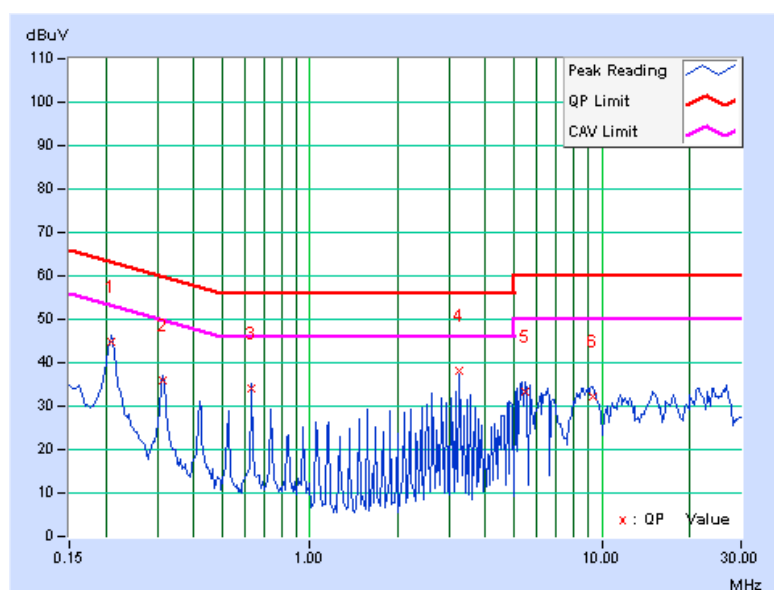
- REMARKS:** 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor +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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.07	44.82	38.08	44.89	38.15	63.26	53.26	-18.37	-15.11
2	0.314	0.08	35.96	32.04	36.04	32.12	59.86	49.86	-23.83	-17.75
3	0.630	0.08	34.01	33.31	34.09	33.39	56.00	46.00	-21.91	-12.61
4	3.258	0.20	37.90	28.24	38.10	28.44	56.00	46.00	-17.90	-17.56
5	5.465	0.26	33.07	32.08	33.33	32.34	60.00	50.00	-26.67	-17.66
6	9.352	0.35	32.01	30.56	32.36	30.91	60.00	50.00	-27.64	-19.09

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



5.2 RADIATED AND BANDEDGE EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED AND BANDEDGE EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.

5.2.2 TEST INSTRUMENTS

Test date: Dec. 20 to 24, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 12, 2011	July 11, 2012
Agilent Pre-Selector	N9039A	MY46520311	July 12, 2011	July 11, 2012
Agilent Signal Generator	N5181A	MY49060517	July 12, 2011	July 11, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 15, 2011	Nov. 14, 2012
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
SPACEK LABS	SLKKa-48-6	9K16	Nov. 15, 2011	Nov. 14, 2012
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 14, 2011	Nov. 13, 2012
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	Oct. 07, 2011	Oct. 06, 2012
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.

5.2.3 TEST PROCEDURES

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

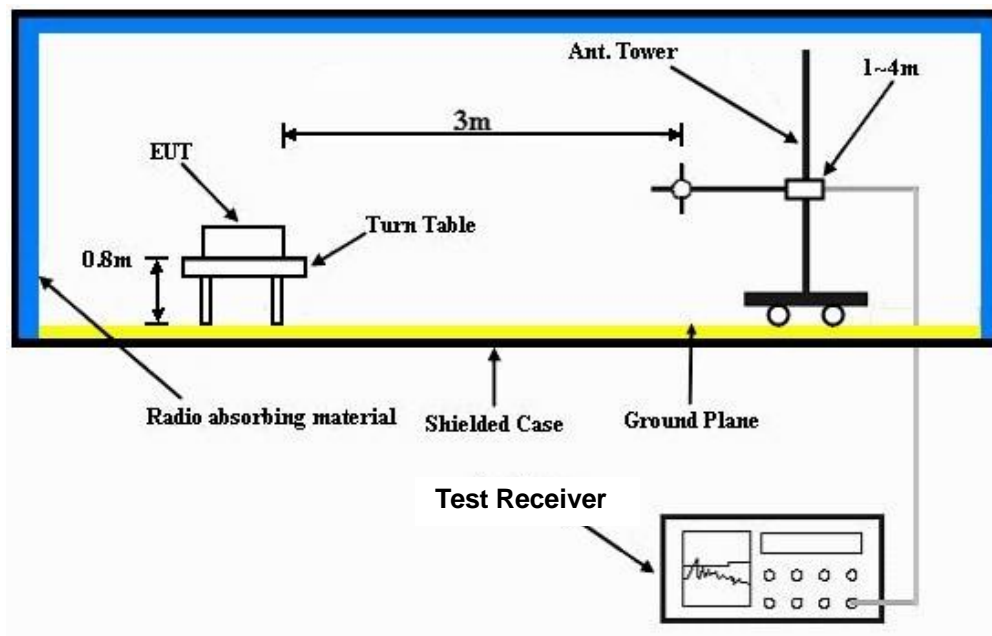
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.
4. 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



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

5.2.6 EUT OPERATING CONDITIONS

Same as the 4.2.6

5.2.7 TEST RESULTS (MAIN ANTENNA)

BELOW 1GHz WORST-CASE DATA : 802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Nick Chang

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	72.04	29.9 QP	40.0	-10.1	1.00 H	360	17.95	11.99
2	120.00	35.7 QP	43.5	-7.8	1.50 H	214	23.09	12.58
3	290.77	35.5 QP	46.0	-10.5	1.00 H	106	20.56	14.95
4	649.94	29.1 QP	46.0	-16.9	1.00 H	324	6.32	22.79
5	849.25	30.7 QP	46.0	-15.3	1.00 H	140	4.06	26.64
6	948.25	29.7 QP	46.0	-16.3	1.00 H	190	1.90	27.76
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	60.08	32.8 QP	40.0	-7.3	1.50 V	9	19.08	13.67
2	311.14	30.4 QP	46.0	-15.7	1.50 V	88	14.74	15.61
3	520.03	27.7 QP	46.0	-18.3	1.00 V	72	6.96	20.78
4	598.07	31.1 QP	46.0	-15.0	1.50 V	360	8.51	22.54
5	748.83	29.5 QP	46.0	-16.6	1.50 V	62	5.06	24.39
6	945.64	31.8 QP	46.0	-14.2	1.00 V	135	4.03	27.73

- 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.

ABOVE 1GHz WORST-CASE DATA

802.11a OFDM MODULATION

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*5745.00	105.0 PK			1.44 H	276	62.97	42.03
2	*5745.00	95.6 AV			1.44 H	276	53.57	42.03
3	11490.00	60.1 PK	74.0	-13.9	1.20 H	324	11.92	48.18
4	11490.00	46.6 AV	54.0	-7.4	1.20 H	324	-1.58	48.18
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	*5745.00	110.0 PK			1.10 V	287	67.97	42.03
2	*5745.00	99.8 AV			1.10 V	287	57.77	42.03
3	11490.00	61.0 PK	74.0	-13.0	1.02 V	228	12.82	48.18
4	11490.00	46.6 AV	54.0	-7.4	1.02 V	228	-1.58	48.18

- 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 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	104.1 PK			1.49 H	268	61.93	42.17
2	*5785.00	94.6 AV			1.49 H	268	52.43	42.17
3	11570.00	60.2 PK	74.0	-13.8	1.19 H	338	12.01	48.19
4	11570.00	46.4 AV	54.0	-7.6	1.19 H	338	-1.79	48.19
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	109.4 PK			1.12 V	293	67.23	42.17
2	*5785.00	99.3 AV			1.12 V	293	57.13	42.17
3	11570.00	61.5 PK	74.0	-12.5	1.04 V	239	13.31	48.19
4	11570.00	46.8 AV	54.0	-7.2	1.04 V	239	-1.39	48.19

- 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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	103.7 PK			1.44 H	253	61.45	42.25
2	*5825.00	94.4 AV			1.44 H	253	52.15	42.25
3	11650.00	59.6 PK	74.0	-14.4	1.24 H	348	11.29	48.31
4	11650.00	45.9 AV	54.0	-8.1	1.24 H	348	-2.41	48.31
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	109.2 PK			1.06 V	304	66.95	42.25
2	*5825.00	98.9 AV			1.06 V	304	56.65	42.25
3	11650.00	61.7 PK	74.0	-12.3	1.07 V	248	13.39	48.31
4	11650.00	46.8 AV	54.0	-7.2	1.07 V	248	-1.51	48.31

- 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.

5.2.8 TEST RESULTS (AUX. ANTENNA)

BELOW 1GHz WORST-CASE DATA : 802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Nick Chang

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	66.00	33.6 QP	40.0	-6.4	1.50 H	360	20.65	12.98
2	299.89	33.8 QP	46.0	-12.2	1.00 H	343	18.46	15.32
3	456.08	30.4 QP	46.0	-15.6	1.50 H	170	11.10	19.28
4	649.94	28.7 QP	46.0	-17.3	1.00 H	201	5.92	22.79
5	750.60	31.3 QP	46.0	-14.7	1.00 H	109	6.83	24.44
6	946.12	33.5 QP	46.0	-12.5	1.50 H	132	5.77	27.74
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	48.00	32.3 QP	40.0	-7.7	1.00 V	158	18.01	14.30
2	194.13	28.8 QP	43.5	-14.7	1.00 V	3	16.88	11.88
3	298.46	32.4 QP	46.0	-13.6	1.50 V	92	17.14	15.26
4	599.49	27.5 QP	46.0	-18.5	1.00 V	102	4.90	22.57
5	749.06	28.9 QP	46.0	-17.1	1.00 V	174	4.49	24.39
6	905.03	35.2 QP	46.0	-10.8	1.00 V	246	7.78	27.40

- 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.

ABOVE 1GHz WORST-CASE DATA

802.11a OFDM MODULATION

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	*5745.00	111.6 PK			1.58 H	265	69.57	42.03
2	*5745.00	101.7 AV			1.58 H	265	59.67	42.03
3	11490.00	60.5 PK	74.0	-13.5	1.08 H	177	12.32	48.18
4	11490.00	47.2 AV	54.0	-6.8	1.08 H	177	-0.98	48.18
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	*5745.00	104.9 PK			1.91 V	220	62.87	42.03
2	*5745.00	95.7 AV			1.91 V	220	53.67	42.03
3	11490.00	60.7 PK	74.0	-13.3	1.11 V	348	12.52	48.18
4	11490.00	47.0 AV	54.0	-7.0	1.11 V	348	-1.18	48.18

- 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 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 62%RH	TESTED BY	Nick Chang

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	112.2 PK			1.60 H	273	70.03	42.17
2	*5785.00	102.2 AV			1.60 H	273	60.03	42.17
3	11570.00	61.1 PK	74.0	-12.9	1.13 H	172	12.91	48.19
4	11570.00	47.6 AV	54.0	-6.4	1.13 H	172	-0.59	48.19
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	104.6 PK			1.88 V	220	62.43	42.17
2	*5785.00	95.6 AV			1.88 V	220	53.43	42.17
3	11570.00	60.6 PK	74.0	-13.4	1.14 V	357	12.41	48.19
4	11570.00	47.2 AV	54.0	-6.8	1.14 V	357	-0.99	48.19

- 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.

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	17deg. C, 62%RH	TESTED BY	Nick Chang

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	113.0 PK			1.61 H	277	70.75	42.25
2	*5825.00	102.7 AV			1.61 H	277	60.45	42.25
3	11650.00	61.3 PK	74.0	-12.7	1.09 H	180	12.99	48.31
4	11650.00	47.6 AV	54.0	-6.4	1.09 H	180	-0.71	48.31
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	104.7 PK			1.83 V	223	62.45	42.25
2	*5825.00	95.5 AV			1.83 V	223	53.25	42.25
3	11650.00	60.4 PK	74.0	-13.6	1.15 V	356	12.09	48.31
4	11650.00	47.0 AV	54.0	-7.0	1.15 V	356	-1.31	48.31

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.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

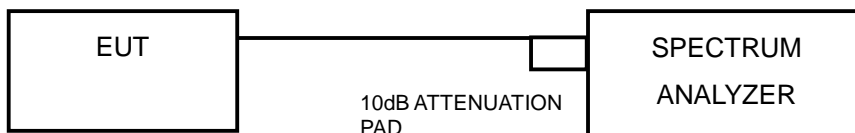
5.3.3 TEST PROCEDURE

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

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



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 OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.38	0.5	PASS
157	5785	16.14	0.5	PASS
165	5825	16.34	0.5	PASS



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5.4 CONDUCTED OUTPUT POWER

5.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 902 –928 MHz, 2400–2483.5 MHz, and 5725 –5850 MHz bands: 1 Watt (30dBm)

5.4.2 INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Peak Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

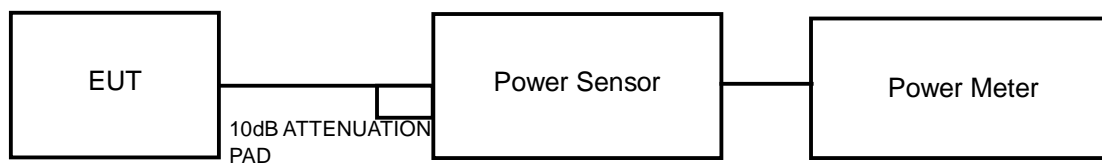
5.4.3 TEST PROCEDURES

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.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.4.7 TEST RESULTS

802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
149	5745	109.6	20.4	30	PASS
157	5785	107.2	20.3	30	PASS
165	5825	104.7	20.2	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 INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

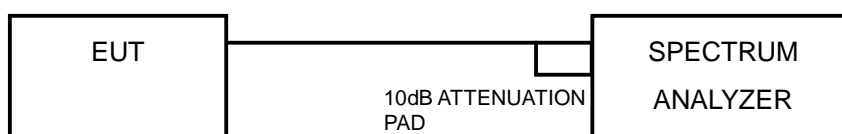
5.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a OFDM MODULATION:

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	-8.2	8	PASS
157	5785	-8.8	8	PASS
165	5825	-9.6	8	PASS



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5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

5.6.2 TEST INSTRUMENTS

Test date: Dec. 23, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

5.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100 kHz with suitable frequency span including 100MHz or 200MHz bandwidth from band edge. The band edges were measured and recorded.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.6 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.

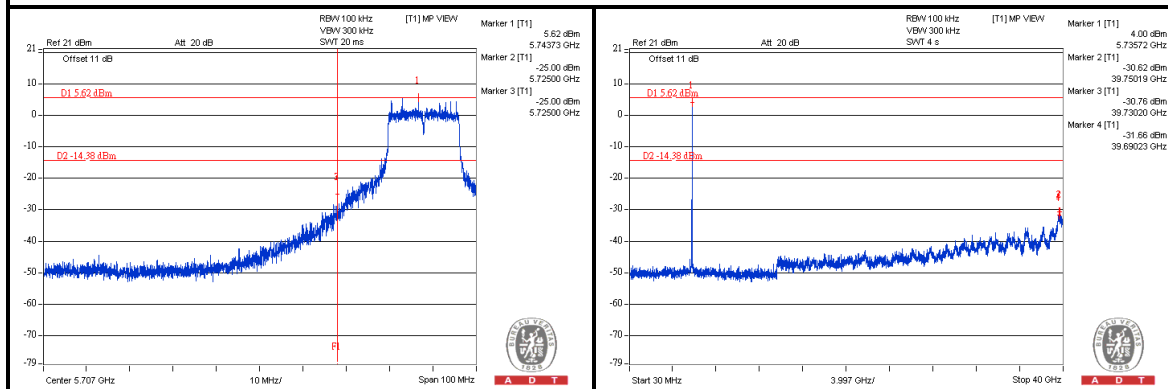
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



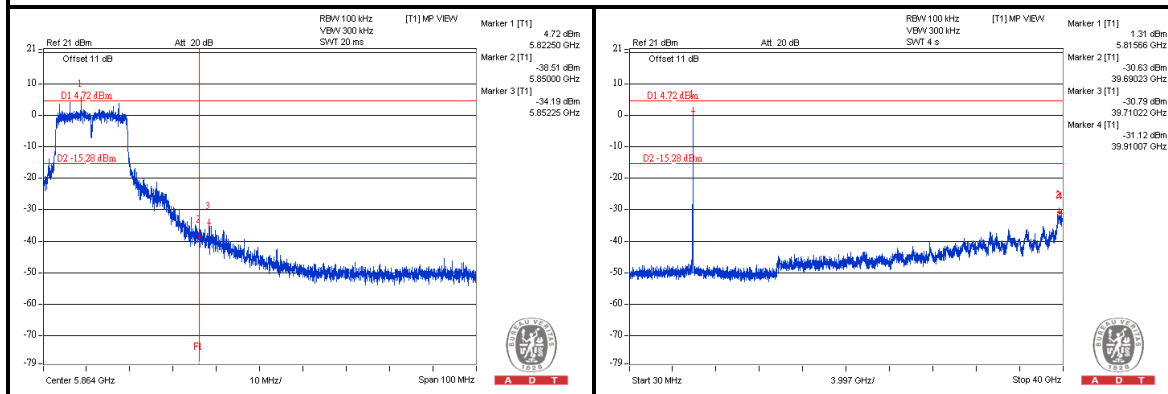
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802.11a OFDM MODULATION:

CH 149



CH 165



6. INFORMATION ON THE TESTING LABORATORIES

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

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:

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Fax: 886-2-26052943

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

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

--- END ---