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FCC TEST REPORT (WLAN - 15.247)

REPORT NO.: RF991201E03-1 R1

MODEL NO.: MC319ZUS

FCC ID: UZ7MC319ZUS

RECEIVED: Dec. 01, 2010

TESTED: Dec. 07 to 14, 2010 and Feb. 10 to 11, 2011

ISSUED: Mar. 15, 2011

APPLICANT: Motorola Solutions Inc.

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USA

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
Original release	NA	Mar. 09, 2011
RF991201E03-1 R1	Modify section 3.1 maximum output power for typing error.	Mar. 15, 2011



1. CERTIFICATION

PRODUCT: Mobile Computing Terminal
BRAND: MOTOROLA
MODEL NO.: MC319ZUS
TEST SAMPLE: ENGINEERING SAMPLE
TESTED: Dec. 07 to 14, 2010 and Feb. 10 to 11, 2011
APPLICANT: Motorola Solutions Inc.
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (Model: MC319ZUS) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , **DATE:** Mar. 15, 2011
(Claire Kuan, Specialist)

APPROVED BY :  , **DATE:** Mar. 15, 2011
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 802.11b & g, 2412~2472MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.07dB at 0.150MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -5.9dB at 2483.50MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is Hirose connector.



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For 802.11a, 5725~5850MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.07dB at 0.150MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -7.2dB at 11490.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is Hirose connector.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.725GHz 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 and 5.47~5.725GHz RF parameters was recorded in another test report.



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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)-Chamber G	3.30 dB
Radiated emissions (1GHz -18GHz)-Chamber G	2.19 dB
Radiated emissions (18GHz -40GHz)-Chamber G	2.55 dB
Radiated emissions (1GHz -18GHz)-Open site C	2.49 dB
Radiated emissions (18GHz -40GHz)-Open site C	2.70 dB



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Mobile Computing Terminal
MODEL NO.	MC319ZUS
FCC ID	UZ7MC319ZUS
POWER SUPPLY	DC 3.7V from battery, DC 12V to cradle or DC 5.4V to cable adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11a/g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps
FREQUENCY RANGE	15.247: 802.11b & 802.11g: 2.412 ~ 2.472GHz 802.11a: 5.745 ~ 5.825GHz
	15.407: 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.50 ~ 5.7GHz
NUMBER OF CHANNEL	15.247(2.4GHz) 13 for 802.11b, 802.11g, 15.247(5GHz) 5 for 802.11a
	15.407: 19 for 802.11a,
CHANNEL SPACING	802.11b/g: 5MHz 802.11a: 20MHz
MAXIMUM OUTPUT POWER	15.247(2.4GHz) 802.11b: 47.9mW 802.11g: 151.4mW 15.247(5GHz) 802.11a: 134.9mW
	15.407 802.11a: 33.1mW
ANTENNA TYPE	Please see note 2
ANTENNA CONNECTOR	Please see note 2



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DATA CABLE	Charger cable(Unshielded, 1.8m with one core) x 1 RS232 cable(Unshielded, 1.8m)x 1 USB cable(Shielded, 1.55m) x 1
I/O PORTS	micro SD port x 1
ASSOCIATED DEVICES	Battery x 1 (Part No.: 82-127909-02 Rev B)

NOTE:

1. There are Bluetooth technology (BT2.1+EDR), WLAN and RFID technology used for the EUT:

Technology	Report No.
DFS	RF991201E03
15.247	RF991201E03-1
15.407	RF991201E03-2
Bluetooth	RF991201E03-3
RFID	RF991201E03-4



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2. There are antennas provided to this EUT, please refer to the following table:

WLAN Antenna Spec.								
NO.	Brand	Antenna Type	Peak Gain(dBi) with cable loss	Connector Type	Frequency range (MHz)	Cable Loss (dB)	Cable Length	
1	Auden	Monopole + coupling	3.4 dBi (2.4GHz) 4.5 dBi (5GHz)	hirose	2.4 ~ 2.5 GHz 4.92 ~ 5.85 GHz	-0.2640 dB -0.6168 dB	52 mm	
2	Auden	PIFA	1.3 dBi (2.4GHz) 3.6 dBi (5GHz)	hirose	2.4 ~ 2.5 GHz 4.92 ~ 5.85 GHz	-0.6409 dB -1.0418 dB	68 mm	
RFID Antenna Spec.								
NO.	Brand	Antenna Type	Peak Gain(dBi) with cable loss	Connector Type	Frequency range (MHz)	Cable Loss (dB)	Cable Length	
1	Auden	Dipole	3.66	hirose	902 ~ 928 MHz	-0.43 dB	85 mm	
2	Auden	Slot Dipole	1.95	hirose	902 ~ 928 MHz	-0.43 dB	85 mm	
Bluetooth Antenna Spec.								
NO.	Brand	Model No.	Antenna Type	Peak Gain(dBi)	Connector Type	Frequency range (MHz)	Cable Loss (dB)	Cable Length
1	Antenova	(Mica 2.4GHz) 303DA5654-01	Chip Antenna	-1.34	U.FL	2400-2500	0.185	74 mm



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3. The EUT could be supplied with a Cradle, power adapter and battery as below table:

Battery	
Brand:	MOTOROLA
Part No.:	82-127909-02 Rev B
Rating:	3.7V, 4800mAh/17.8Wh
Cable adapter (not for sale together)	
Brand:	MOTOROLA
Model No.:	EADP-16BB A
Part No.:	PWRS-14000-249R
Input power :	100-240V, 50-60Hz, 0.4A AC input cable (unshielded, 1.85m)
Output power :	5.4V ----- 3A
Cradle (not for sale together)	
Brand:	SYMBOL TECHNOLOGIES INC.
Model No.:	CRD3000-1000R
Part No.:	CRD3000-1001RR
Rating:	12V, 3.33A
Adapter for Cradle (not for sale together)	
Brand:	HIPRO
Model No.:	HP-O204D43
Part No.:	50-14000-148R
Input power :	100-240V, 50-60Hz, 1.5A AC input cable (unshielded, 1.8m)
Output power :	+12V ----- 3.33A DC output cable (unshielded, 1.8m with one core)



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4. The EUT was pre-tested in chamber under following test modes :

Pre-test Mode	Description
Mode A	X-Y plane: EUT + Battery
Mode B	X-Z plane: EUT + Battery
Mode C	Y-Z plane: EUT + Battery
Mode D	X-Y plane: EUT + Cable adapter
Mode E	X-Z plane: EUT + Cable adapter
Mode F	Y-Z plane: EUT + Cable adapter
Mode G	Y-Z plane: EUT + Cradle + adapter

The worse spurious emission (Below 1GHz) was found in **Mode G**. And the spurious emission (Above 1GHz) was found in **Mode F**. Therefore only the test data of the modes were recorded in this report.

5. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a, 802.11b, 802.11g, Bluetooth technology and RFID in the 900MHz Band.
6. The above EUT information was declared by the manufacturer and for more detailed feature descriptions, please refer to the manufacturer's specifications or User's Manual.



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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		



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3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	
A	√	-	-	-	X-Y plane: EUT + Cable adapter
B	√	√	-	-	Y-Z plane: EUT + Cradle + adapter
C	-	-	√	√	Y-Z plane: EUT + Cable adapter

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz
RE ≥ 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted 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)	CONFIGURE MODE
WORSE CHANNEL	-	-	-	-	-	A ~ B

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)	CONFIGURE MODE
802.11g	1 to 13	6	OFDM	BPSK	6	B
802.11a	149 to 165	149	OFDM	BPSK	6	B



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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)	CONFIGURE MODE
802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1	C
802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6	C
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	C

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)	CONFIGURE MODE
802.11b	1 to 13	1, 11, 12, 13	DSSS	DBPSK	1	C
802.11g	1 to 13	1, 11, 12, 13	OFDM	BPSK	6	C
802.11a	149 to 165	149, 165	OFDM	BPSK	6	C

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)	CONFIGURE MODE
802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1	C
802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6	C
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	C



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE ³ 1G	23deg. C, 69%RH, 1023 hPa	120Vac, 60Hz	Eric Lee
	17deg. C, 64%RH, 1024 hPa	120Vac, 60Hz	Frank Liu
RE<1G	23deg. C, 71%RH, 1023 hPa	120Vac, 60Hz	Kent Liu
PLC	25deg. C, 60%RH, 1023 hPa	120Vac, 60Hz	Max Tseng
APCM	25deg. C, 60%RH, 1023 hPa	120Vac, 60Hz	Rex Huang
	25deg. C, 60%RH, 1024 hPa	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 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.

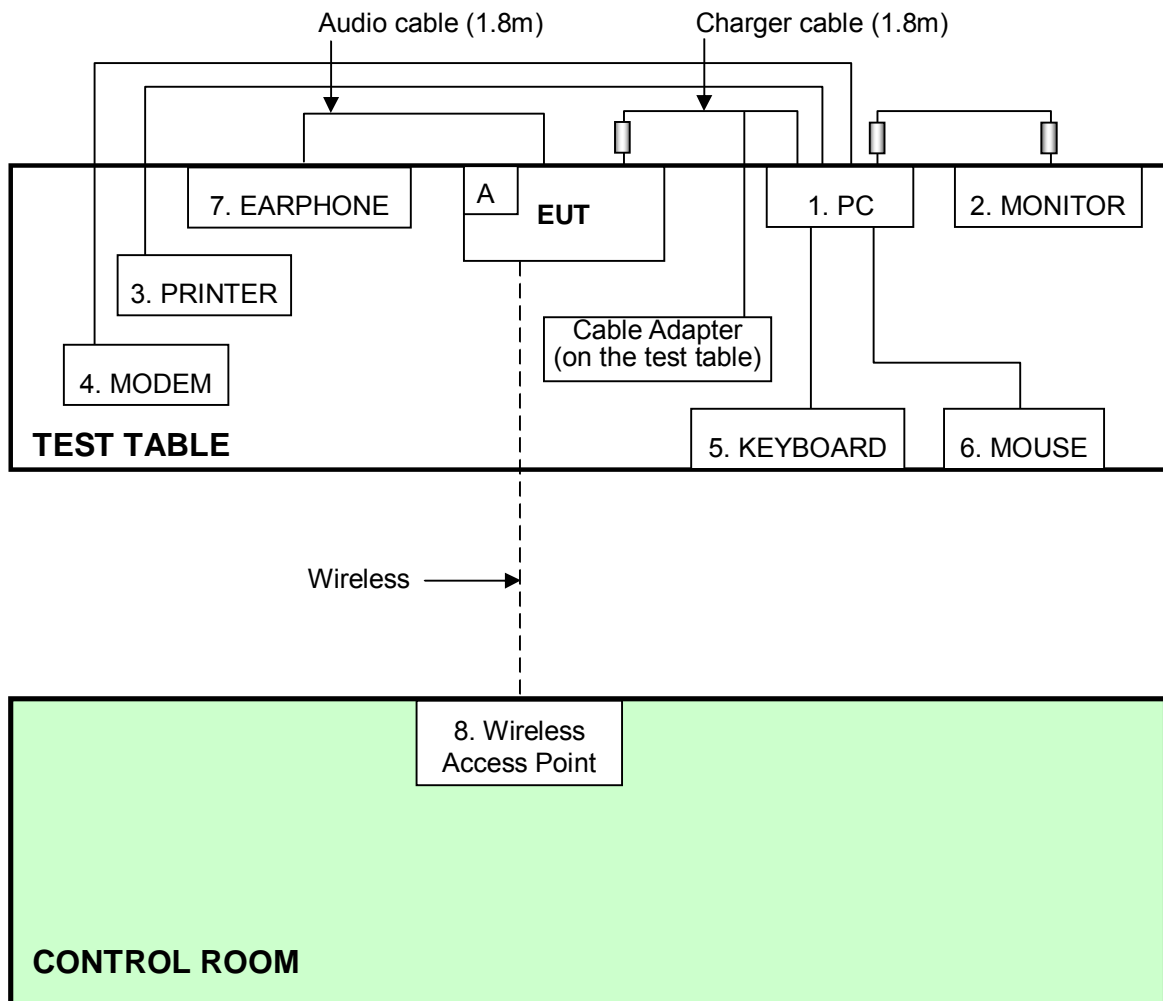
For conducted test					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	DELL	DCSCMF	9KKB32S	FCC DoC
2	MONITOR	DELL	E2210Hc	CN-OG337R-6418 0-97S-OQDS	FCC DoC
3	PRINTER	EPSON	LQ-300+II	G88Y074083	FCC DoC
4	MODEM	ACEEX	1414	0206026778	IFAXDM1414
5	KEYBOARD	DELL	SK-8115	MY-0DJ325-71619- 99B-0476	FCC DoC
6	MOUSE	DELL	MOC5UO	I1401LVG	FCC DoC
7	EARPHONE	Hawk	HKC920	H001	FCC DoC
8	Wireless Access Point	Air Station	WLA-G54	NA	FCC DoC
For radiated test					
No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	DSL32S	FCC DoC
2	EARPHONE	MOTOROLA	NA	NA	NA

For conducted test	
No.	Signal cable description
1	NA
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, with two cores
3	1.8m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.9 m foil shielded wire, USB connector, w/o core.
6	1.8 m foil shielded wire, USB connector, w/o core.
7	1.8 m Audio cable
8	NA
For radiated test	
No.	Signal cable description
1	NA
2	0.9 m Audio cable

Note: 1. All power cords of the above support units are unshielded (1.8m).

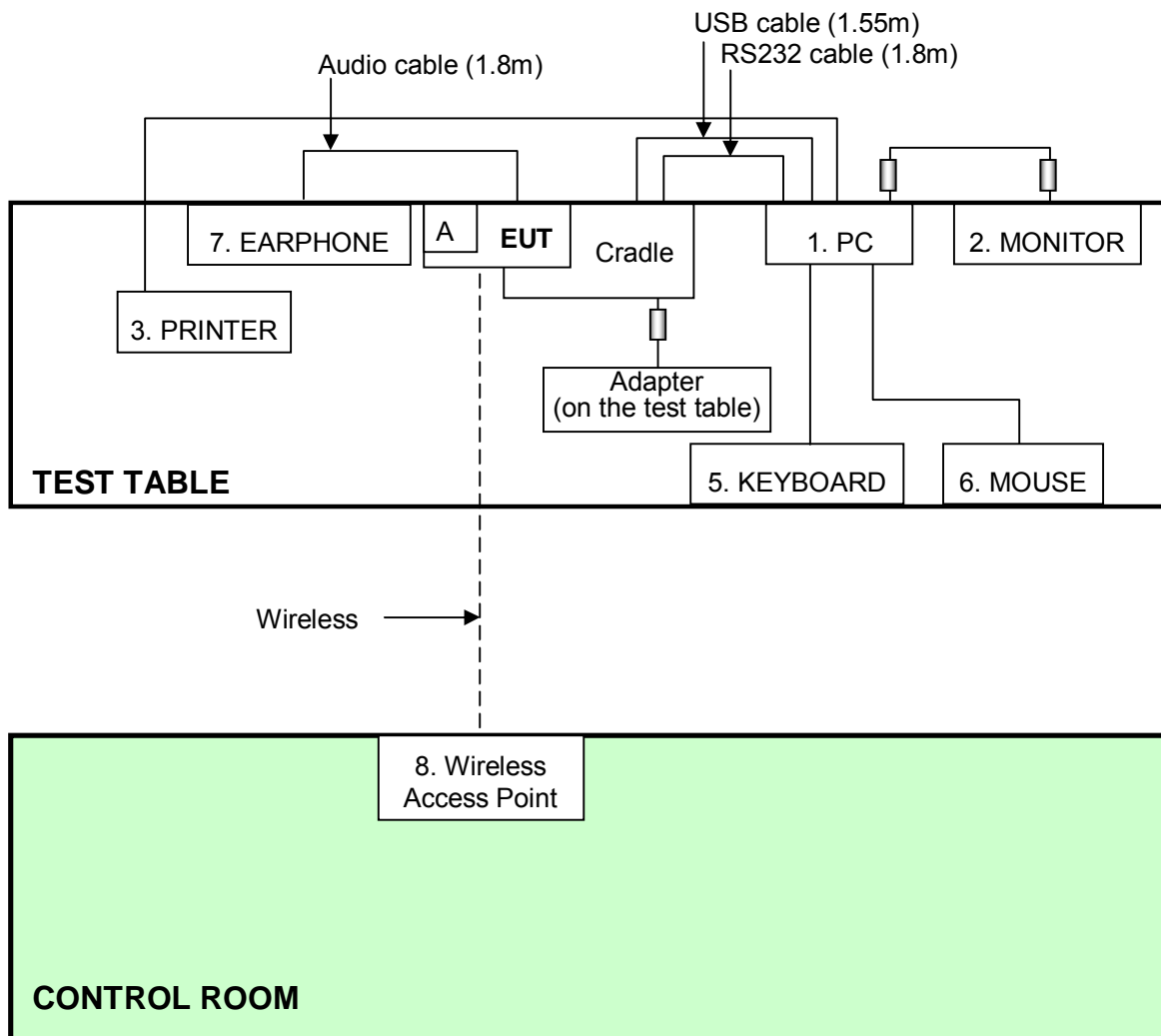
3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted test mode 1:



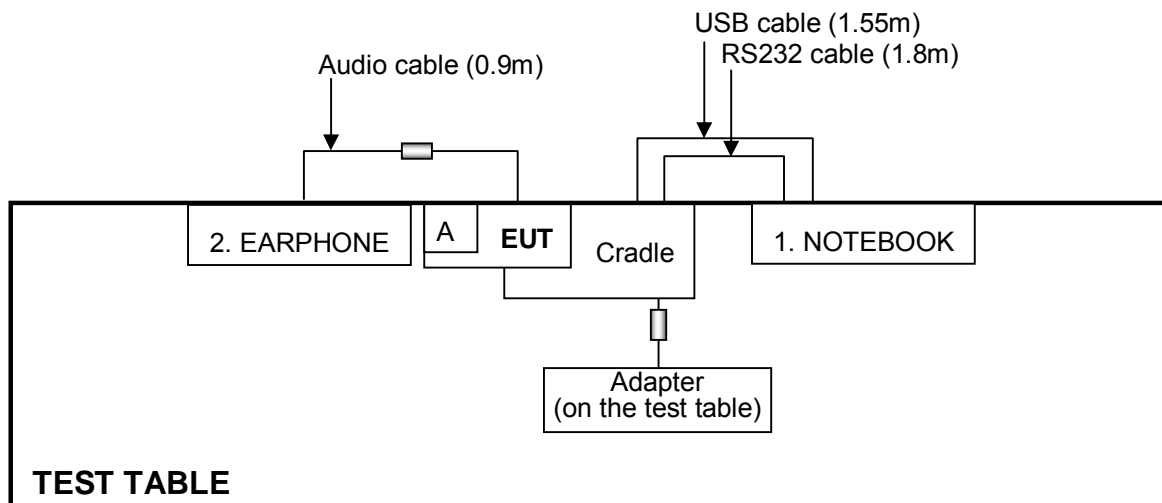
NOTE: 1. Item A is the micro SD card.

For Conducted test mode 2:



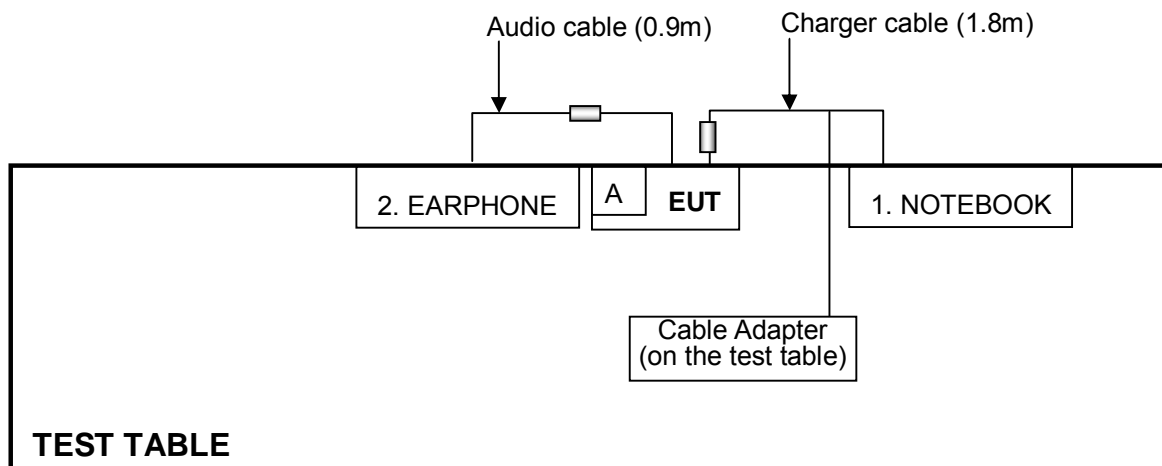
NOTE: 1. Item A is the micro SD Card.

For Radiated below 1GHz test:



NOTE: 1. Item A is the micro SD Card.

For Radiated above 1GHz test:



NOTE: 1. Item A is the micro SD Card.



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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 (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.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2010	Mar. 08, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 08, 2010	Sep. 07, 2011
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 30, 2010	Aug. 29, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
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. C.
3. The VCCI Con C Registration No. is C-3611.

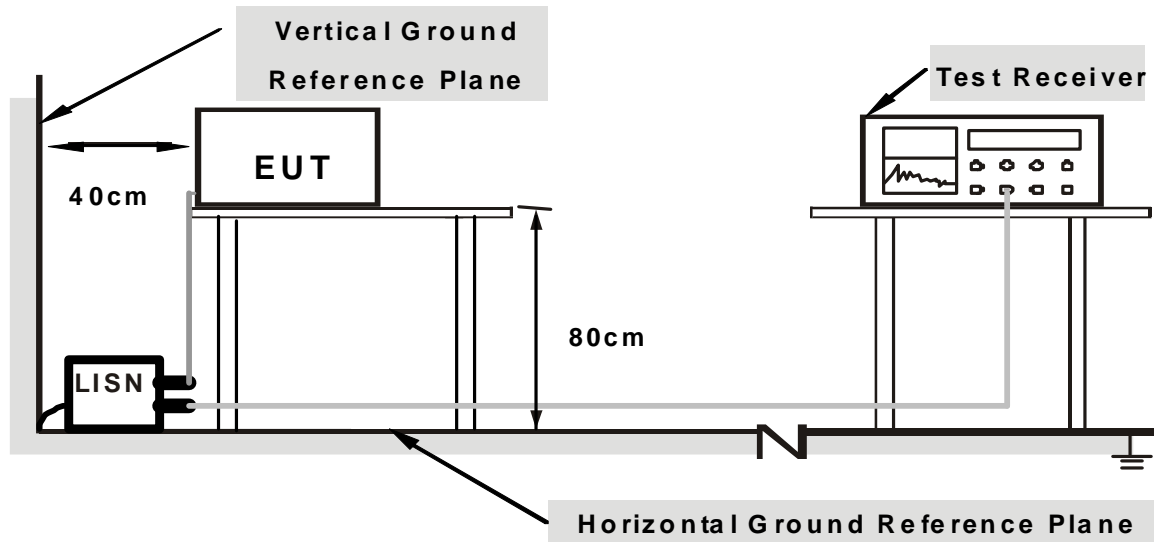
4.1.3 TEST PROCEDURES

- 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 cm 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

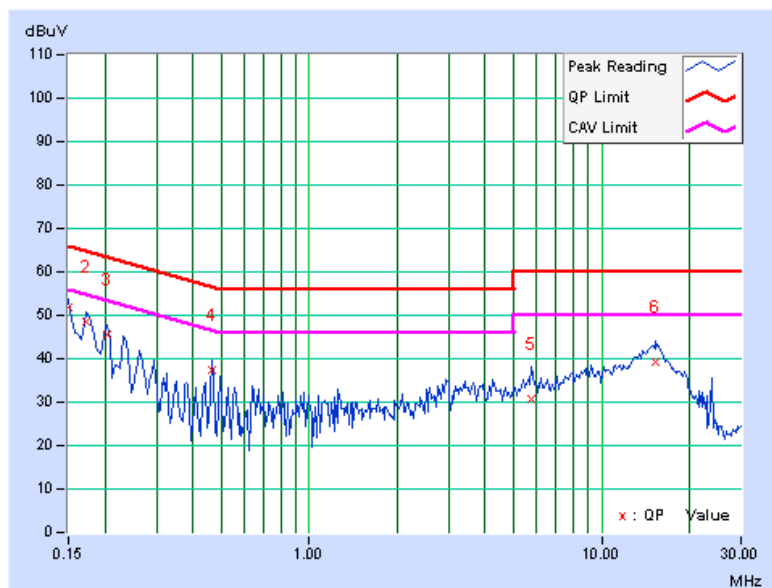
1. Turn on the power of EUT.
2. The EUT run test program “BTRegTest_ver3.5” to enable EUT under transmission / receiver condition continuously at specific channel frequency.

4.1.7 TEST RESULTS (MODE A)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	51.83	-	51.93	-	66.00	56.00	-14.07	-
2	0.173	0.12	48.23	-	48.35	-	64.79	54.79	-16.45	-
3	0.205	0.13	45.42	-	45.55	-	63.42	53.42	-17.87	-
4	0.466	0.13	37.44	-	37.57	-	56.58	46.58	-19.01	-
5	5.762	0.28	30.41	-	30.69	-	60.00	50.00	-29.31	-
6	15.277	0.57	38.82	-	39.39	-	60.00	50.00	-20.61	-

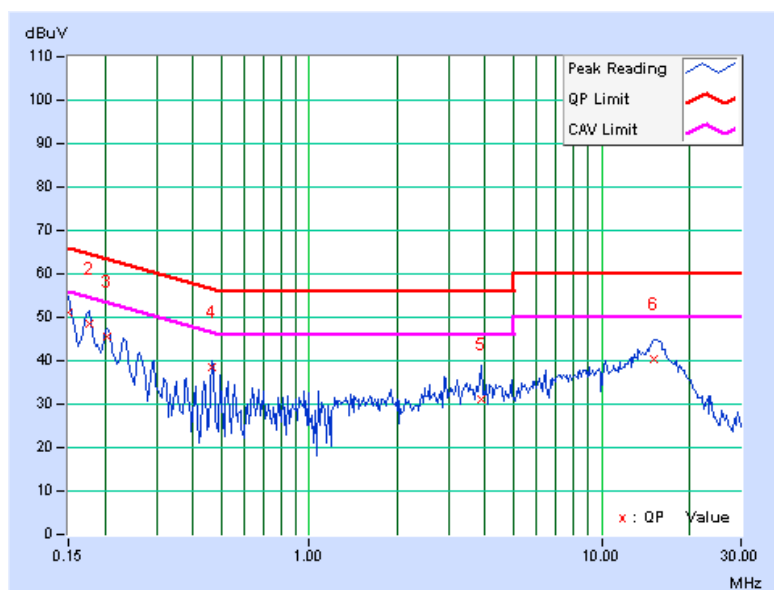
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.12	51.16	-	51.28	-	66.00	56.00	-14.72	-
2	0.177	0.13	48.29	-	48.42	-	64.61	54.61	-16.19	-
3	0.205	0.14	45.40	-	45.54	-	63.42	53.42	-17.88	-
4	0.466	0.15	38.24	-	38.39	-	56.58	46.58	-18.19	-
5	3.855	0.27	30.74	-	31.01	-	56.00	46.00	-24.99	-
6	15.090	1.13	39.18	-	40.31	-	60.00	50.00	-19.69	-

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

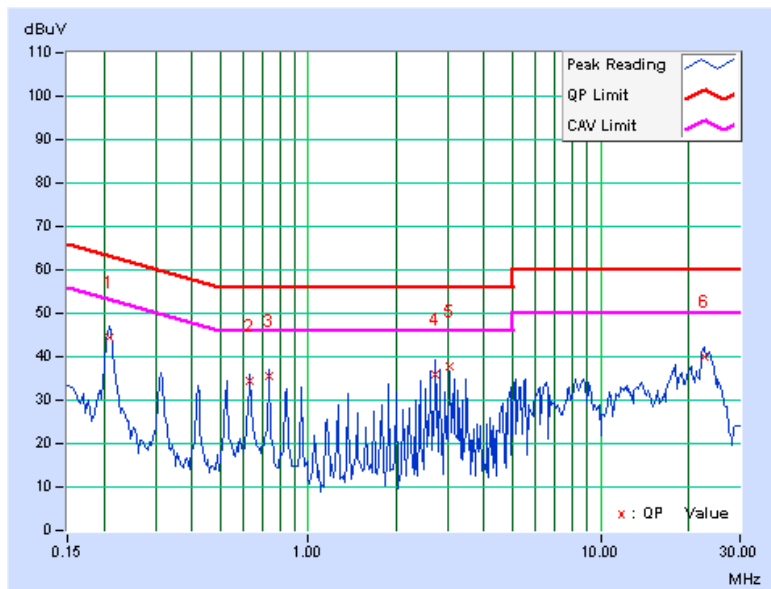


4.1.8 TEST RESULTS (MODE B)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.13	44.47	-	44.60	-	63.26	53.26	-18.66	-
2	0.630	0.13	34.13	-	34.26	-	56.00	46.00	-21.74	-
3	0.736	0.14	35.41	-	35.55	-	56.00	46.00	-20.45	-
4	2.734	0.17	35.74	-	35.91	-	56.00	46.00	-20.09	-
5	3.047	0.18	37.45	-	37.63	-	56.00	46.00	-18.37	-
6	22.797	0.75	39.12	-	39.87	-	60.00	50.00	-20.13	-

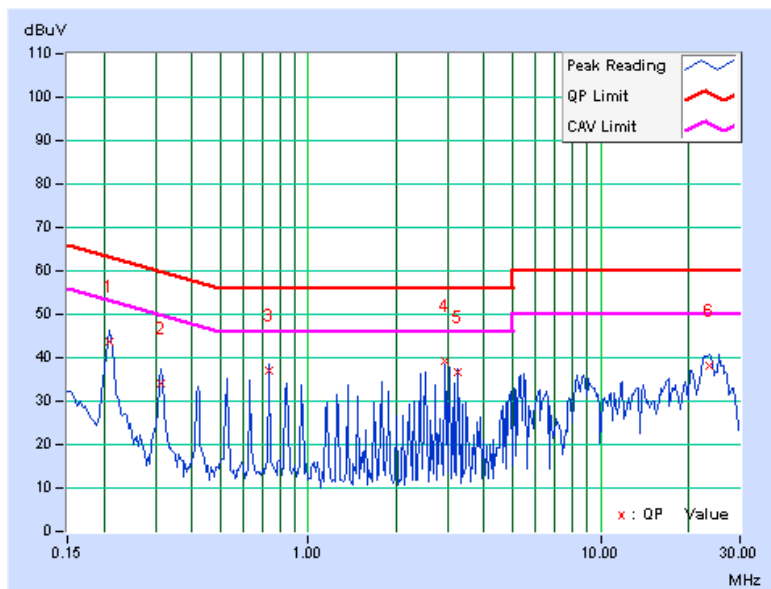
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.14	43.47	-	43.61	-	63.26	53.26	-19.65	-
2	0.314	0.15	34.07	-	34.22	-	59.86	49.86	-25.65	-
3	0.736	0.16	36.88	-	37.04	-	56.00	46.00	-18.96	-
4	2.941	0.23	39.05	-	39.28	-	56.00	46.00	-16.72	-
5	3.258	0.25	36.38	-	36.63	-	56.00	46.00	-19.37	-
6	23.531	1.69	36.61	-	38.30	-	60.00	50.00	-21.70	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED 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.



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4.2.2 TEST INSTRUMENTS

Test date: Dec. 07 to 14, 2010

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 29, 2010	Apr. 28, 2011
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 24, 2009	Dec. 23, 2010
RF Cable	NA	CHGCAB_001	NA	NA
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.



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DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 23, 2010	Aug. 22, 2011
Agilent Pre-Selector	N9039A	MY46520310	Aug. 23, 2010	Aug. 22, 2011
Agilent Signal Generator	N5181A	MY49060347	July 30, 2010	July 29, 2011
LIG NEX1 Test Receiver	ER-265	L09068005	Oct. 25, 2010	Oct. 24, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Mar. 01, 2010	Feb. 28, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 28, 2010	Apr. 27, 2011
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	NA	NA
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. H.
 4. The FCC Site Registration No. is 797305.
 5. The CANADA Site Registration No. is IC 7450H-3.

4.2.3 TEST PROCEDURES

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

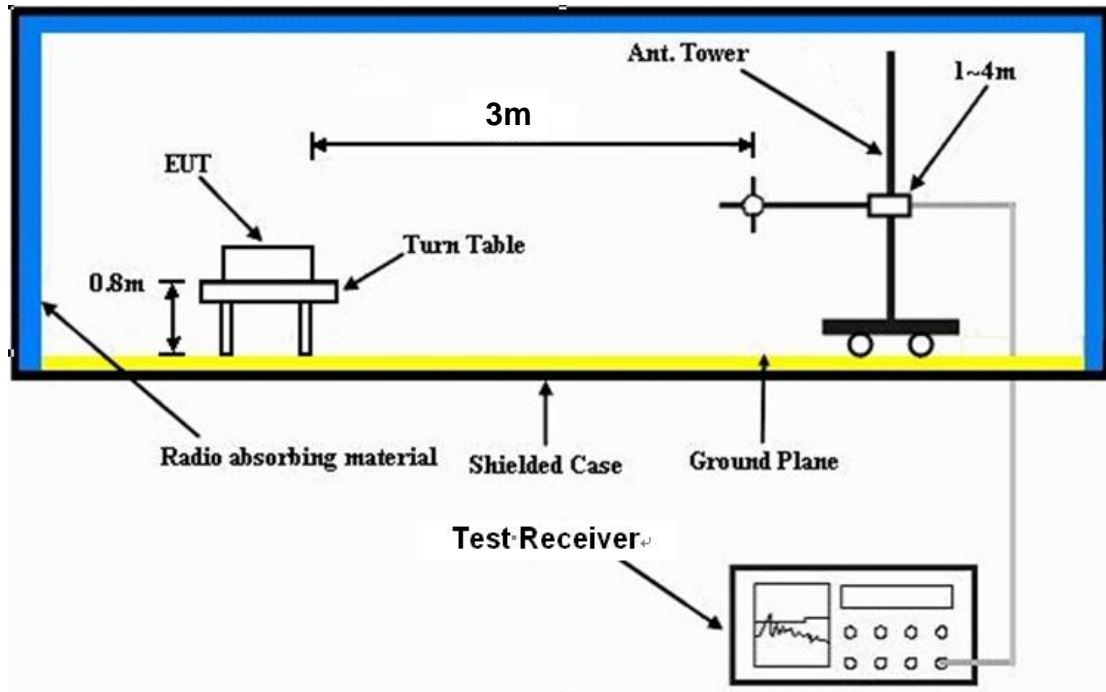
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and 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.

4.2.4 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

Same as the 4.1.6



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4.2.7 TEST RESULTS

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, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 71%RH 1012 hPa	TESTED BY	Kent Liu

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	96.08	30.8 QP	43.50	-12.7	2.00 H	69	21.66	9.16
2	147.12	34.0 QP	43.50	-9.5	2.00 H	304	20.03	14.00
3	180.04	30.7 QP	43.50	-12.8	1.50 H	0	18.76	11.95
4	219.24	31.6 QP	46.00	-14.4	1.50 H	289	19.78	11.82
5	263.41	32.5 QP	46.00	-13.5	1.25 H	37	18.51	13.98
6	385.74	25.5 QP	46.00	-20.5	1.00 H	341	8.09	17.37
7	700.04	32.0 QP	46.00	-14.0	1.50 H	0	8.32	23.67
8	750.01	28.2 QP	46.00	-17.8	1.00 H	352	3.91	24.33
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	108.04	31.0 QP	43.50	-12.5	1.75 V	355	20.27	10.74
2	146.76	34.7 QP	43.50	-8.8	1.00 V	360	20.67	14.00
3	221.84	31.2 QP	46.00	-14.9	1.00 V	30	19.19	11.96
4	385.74	27.4 QP	46.00	-18.6	1.75 V	0	9.99	17.37
5	434.89	27.6 QP	46.00	-18.4	1.25 V	168	9.10	18.52
6	693.05	28.3 QP	46.00	-17.7	1.50 V	343	4.73	23.58

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



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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, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	2389.20	63.0 PK	74.00	-11.0	1.31 H	61	31.35	31.65
2	2389.20	44.1 AV	54.00	-9.9	1.31 H	61	12.45	31.65
3	*2412.00	102.7 PK			1.31 H	61	70.97	31.73
4	*2412.00	96.6 AV			1.31 H	61	64.87	31.73
5	4824.00	52.6 PK	74.00	-21.4	1.49 H	265	13.63	38.97
6	4824.00	40.5 AV	54.00	-13.5	1.49 H	265	1.53	38.97
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	2389.50	58.8 PK	74.00	-15.2	1.19 V	12	27.14	31.66
2	2389.50	43.3 AV	54.00	-10.7	1.19 V	12	11.64	31.66
3	*2412.00	97.8 PK			1.19 V	12	66.07	31.73
4	*2412.00	91.6 AV			1.19 V	12	59.87	31.73
5	4824.00	46.1 PK	74.00	-27.9	1.00 V	323	7.13	38.97
6	4824.00	35.1 AV	54.00	-18.9	1.00 V	323	-3.87	38.97

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	104.9 PK			1.29 H	60	73.09	31.81
2	*2437.00	98.9 AV			1.29 H	60	67.09	31.81
3	4874.00	55.1 PK	74.00	-18.9	1.47 H	267	15.96	39.14
4	4874.00	44.9 AV	54.00	-9.1	1.47 H	267	5.76	39.14
5	7311.00	54.5 PK	74.00	-19.5	1.04 H	216	7.87	46.63
6	7311.00	41.8 AV	54.00	-12.2	1.04 H	216	-4.83	46.63
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	100.1 PK			1.17 V	11	68.29	31.81
2	*2437.00	93.7 AV			1.17 V	11	61.89	31.81
3	4874.00	48.4 PK	74.00	-25.6	1.00 V	241	9.26	39.14
4	4874.00	37.2 AV	54.00	-16.8	1.00 V	241	-1.94	39.14
5	7311.00	54.2 PK	74.00	-19.8	1.00 V	266	7.57	46.63
6	7311.00	41.4 AV	54.00	-12.6	1.00 V	266	-5.23	46.63

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	107.3 PK			1.27 H	62	75.41	31.89
2	*2462.00	101.1 AV			1.27 H	62	69.21	31.89
3	2483.50	67.1 PK	74.00	-6.9	1.27 H	62	35.13	31.97
4	2483.50	45.4 AV	54.00	-8.6	1.27 H	62	13.43	31.97
5	4924.00	56.6 PK	74.00	-17.4	1.47 H	257	17.29	39.31
6	4924.00	47.0 AV	54.00	-7.0	1.47 H	257	7.69	39.31
7	7386.00	54.9 PK	74.00	-19.1	1.06 H	192	8.30	46.60
8	7386.00	41.8 AV	54.00	-12.2	1.06 H	192	-4.80	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.9 PK			1.16 V	11	70.01	31.89
2	*2462.00	95.8 AV			1.16 V	11	63.91	31.89
3	2483.50	63.5 PK	74.00	-10.5	1.16 V	11	31.53	31.97
4	2483.50	43.6 AV	54.00	-10.4	1.16 V	11	11.63	31.97
5	4924.00	49.8 PK	74.00	-24.2	1.00 V	235	10.49	39.31
6	4924.00	39.7 AV	54.00	-14.3	1.00 V	235	0.39	39.31
7	7386.00	55.0 PK	74.00	-19.0	1.00 V	243	8.40	46.60
8	7386.00	41.6 AV	54.00	-12.4	1.00 V	243	-5.00	46.60

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	89.10 PK			1.03 H	136	56.96	32.14
2	*2467.00	86.40 AV			1.03 H	136	54.26	32.14
3	2483.50	60.80 PK	74.00	-13.2	1.00 H	137	28.61	32.19
4	2483.50	43.20 AV	54.00	-10.8	1.00 H	137	11.01	32.19
5	4934.00	48.50 PK	74.00	-25.5	1.09 H	150	7.00	41.50
6	4934.00	37.10 AV	54.00	-16.9	1.09 H	150	-4.40	41.50
7	7401.00	51.80 PK	74.00	-22.2	1.05 H	130	5.85	45.95
8	7401.00	40.80 AV	54.00	-13.2	1.05 H	130	-5.15	45.95
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	85.80 PK			1.13 V	352	53.66	32.14
2	*2467.00	83.20 AV			1.13 V	352	51.06	32.14
3	2483.50	57.10 PK	74.00	-16.9	1.13 V	352	24.91	32.19
4	2483.50	43.10 AV	54.00	-10.9	1.13 V	352	10.91	32.19
5	4934.00	48.20 PK	74.00	-25.8	1.24 V	114	6.70	41.50
6	4934.00	36.10 AV	54.00	-17.9	1.24 V	114	-5.40	41.50
7	7401.00	52.10 PK	74.00	-21.9	1.30 V	209	6.15	45.95
8	7401.00	40.20 AV	54.00	-13.8	1.30 V	209	-5.75	45.95

- 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 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	89.40 PK			1.04 H	137	57.25	32.15
2	*2472.00	86.70 AV			1.04 H	137	54.55	32.15
3	2483.50	64.40 PK	74.00	-9.6	1.00 H	136	32.21	32.19
4	2483.50	45.00 AV	54.00	-9.0	1.00 H	136	12.81	32.19
5	4944.00	48.30 PK	74.00	-25.7	1.00 H	133	6.78	41.52
6	4944.00	37.20 AV	54.00	-16.8	1.00 H	133	-4.32	41.52
7	7416.00	51.60 PK	74.00	-22.4	1.04 H	121	5.60	46.00
8	7416.00	40.80 AV	54.00	-13.2	1.04 H	121	-5.20	46.00

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

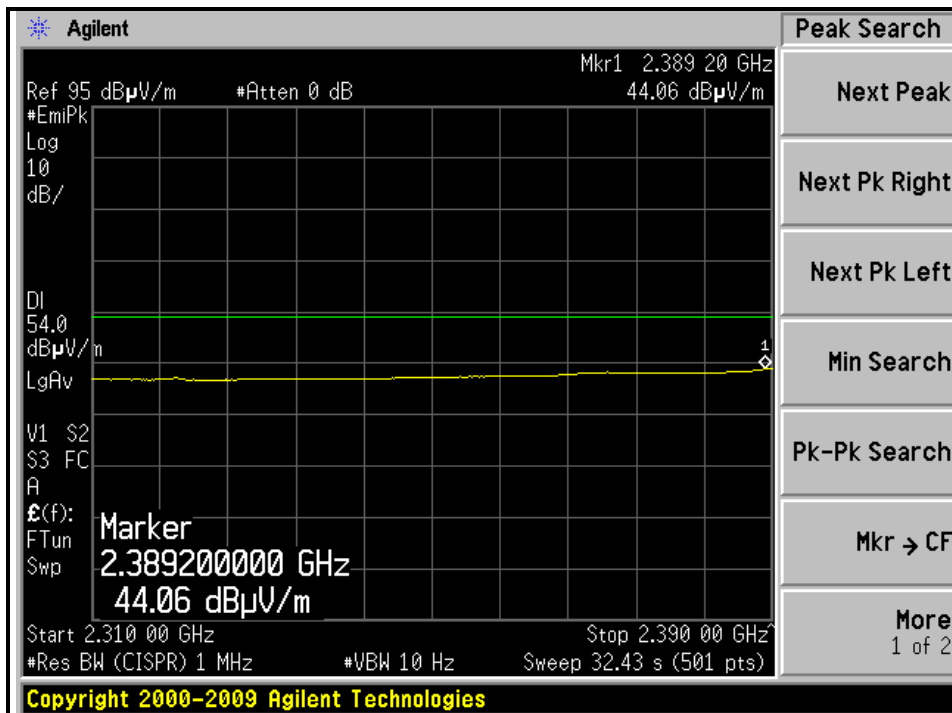
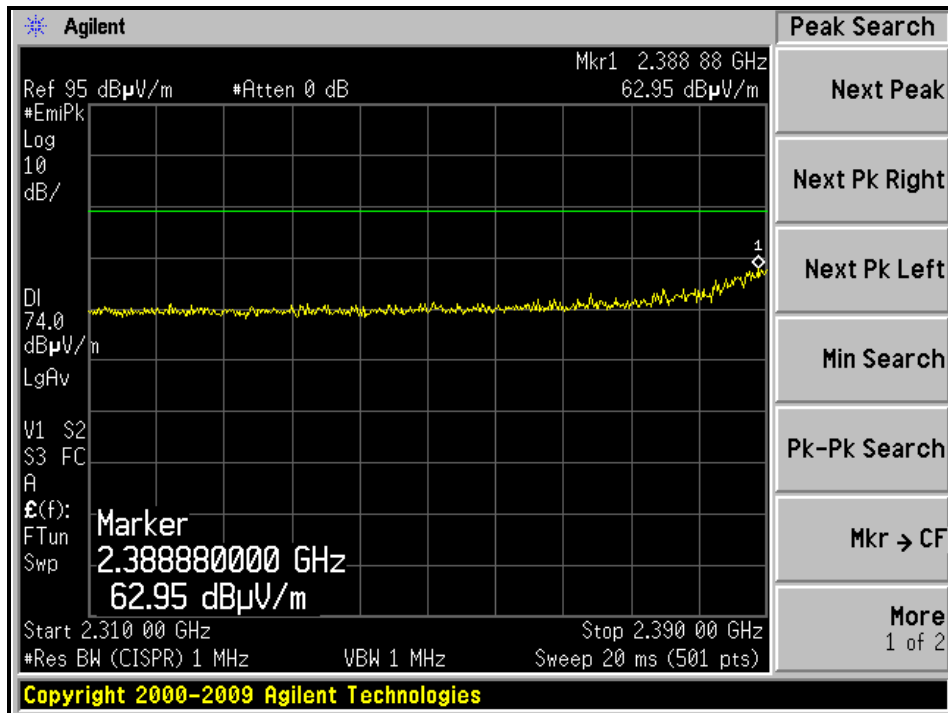
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	85.90 PK			1.17 V	352	53.75	32.15
2	*2472.00	83.40 AV			1.17 V	352	51.25	32.15
3	2483.50	60.60 PK	74.00	-13.4	1.17 V	345	28.41	32.19
4	2483.50	43.60 AV	54.00	-10.4	1.17 V	345	11.41	32.19
5	4944.00	48.00 PK	74.00	-26.0	1.23 V	144	6.48	41.52
6	4944.00	36.00 AV	54.00	-18.0	1.23 V	144	-5.52	41.52
7	7416.00	52.20 PK	74.00	-21.8	1.03 V	124	6.20	46.00
8	7416.00	40.10 AV	54.00	-13.9	1.03 V	124	-5.90	46.00

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



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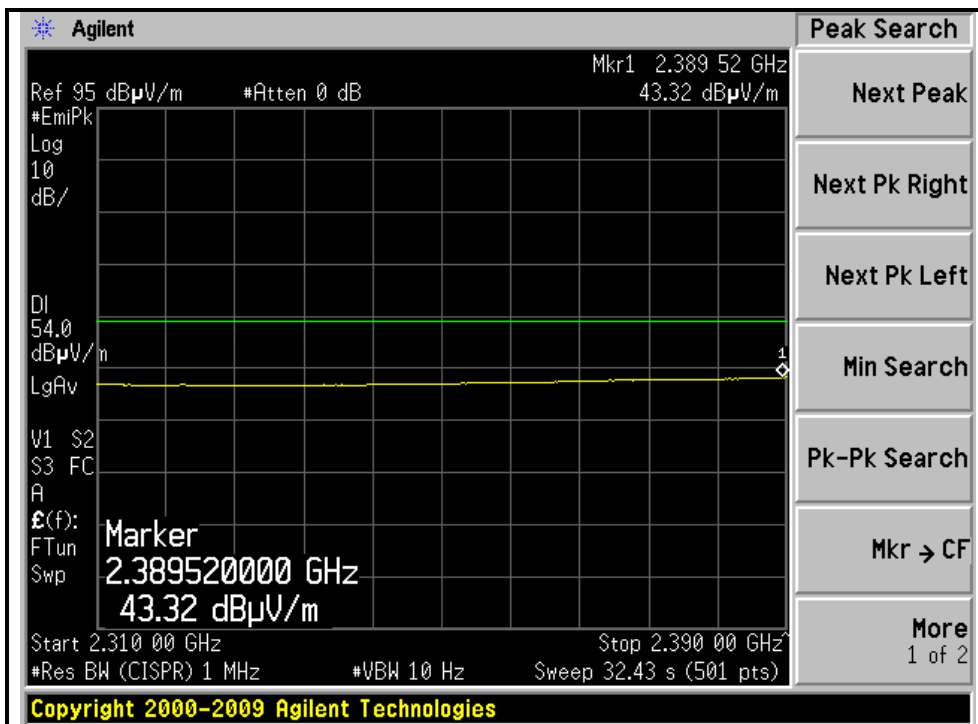
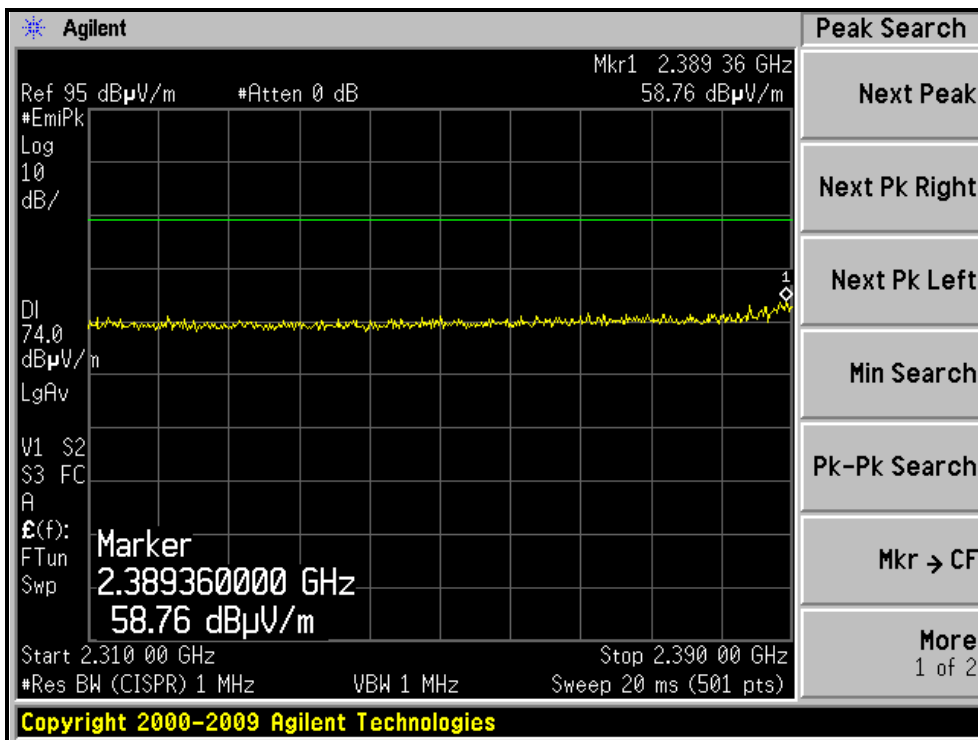
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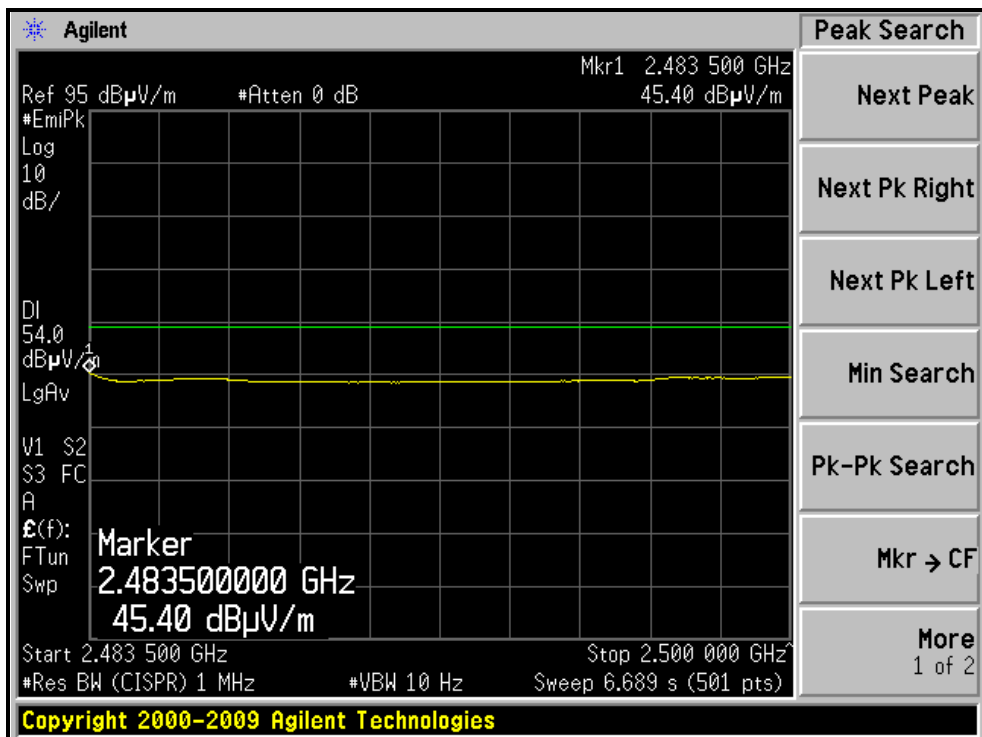
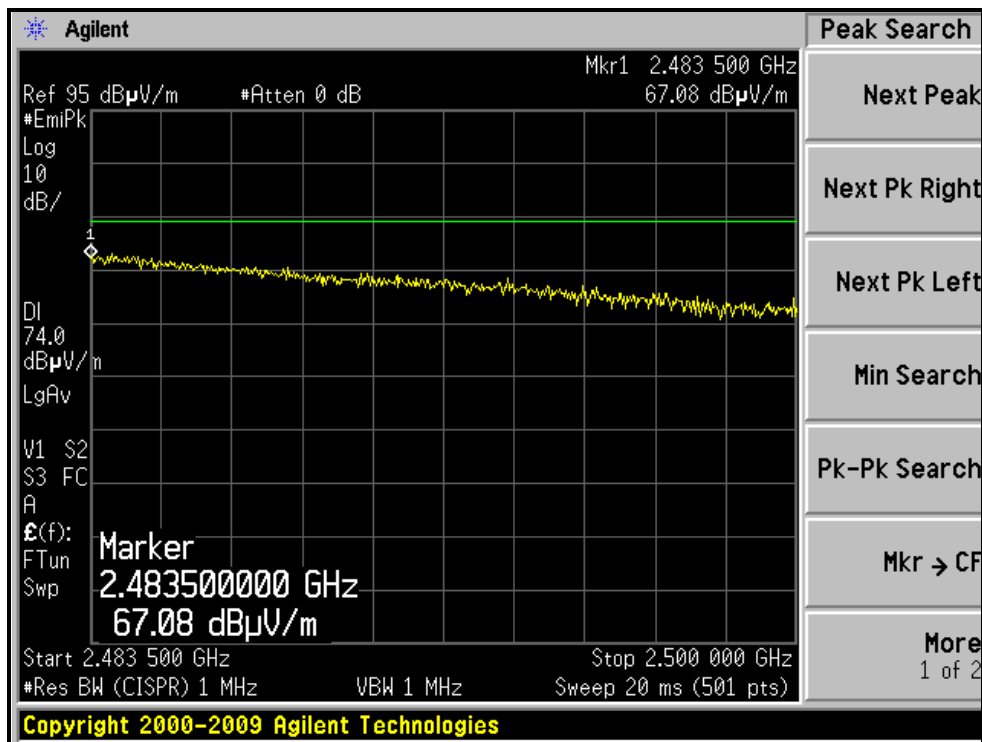
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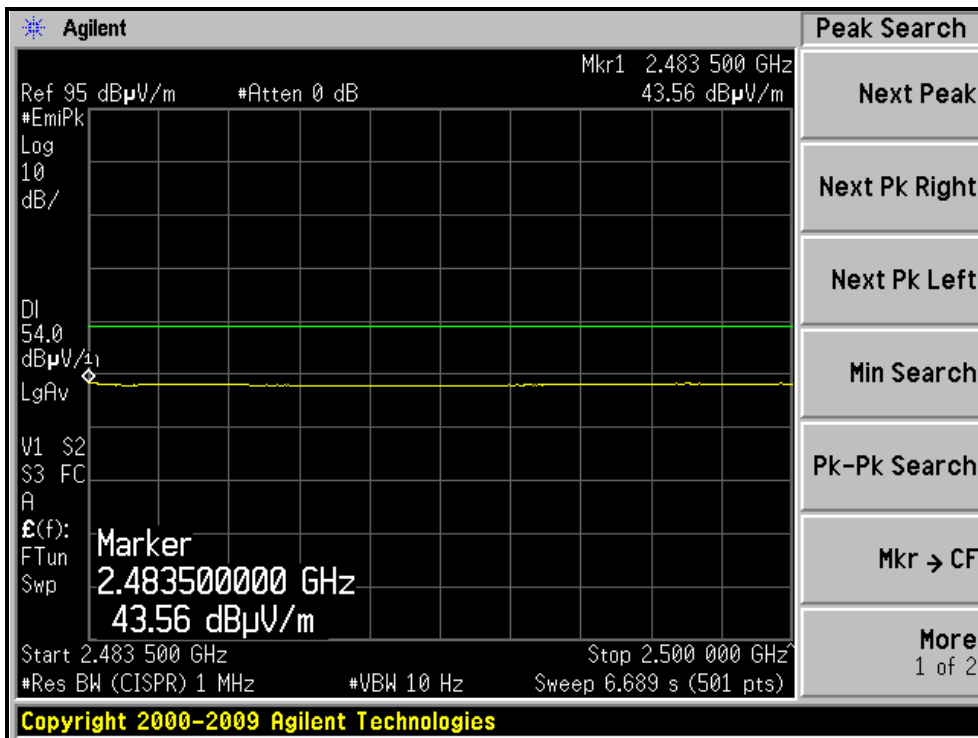
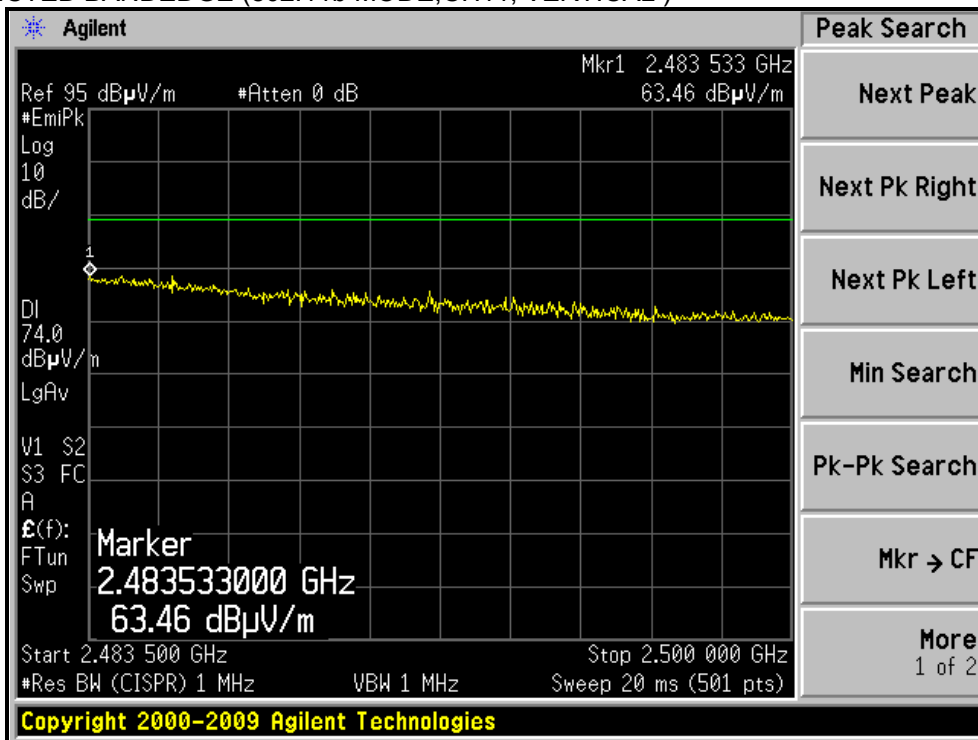
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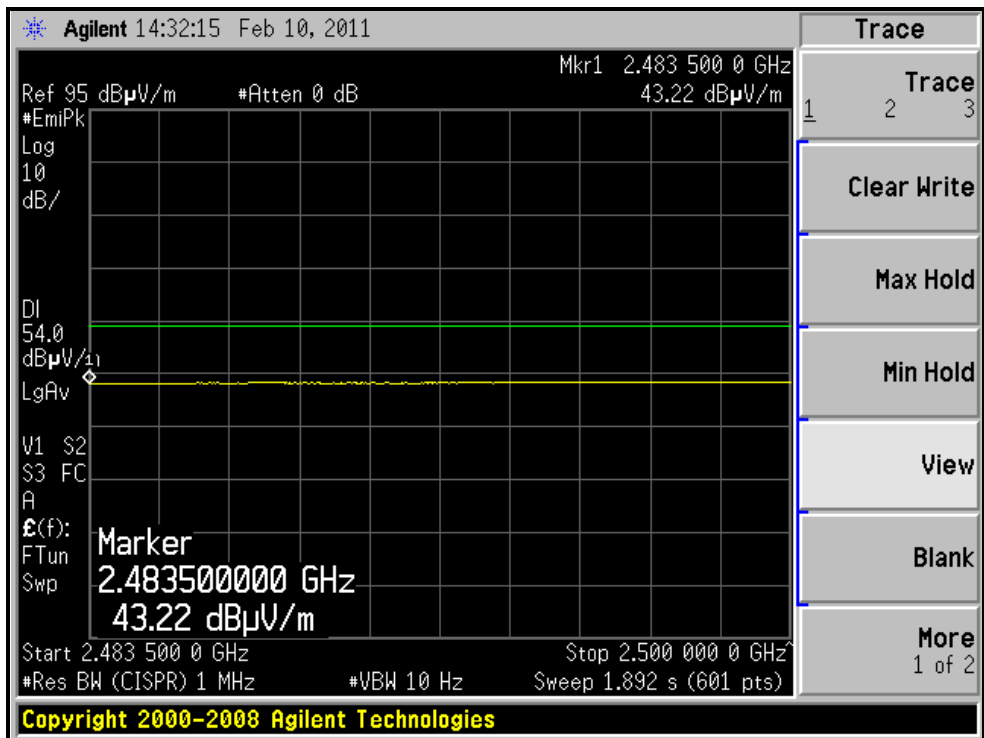
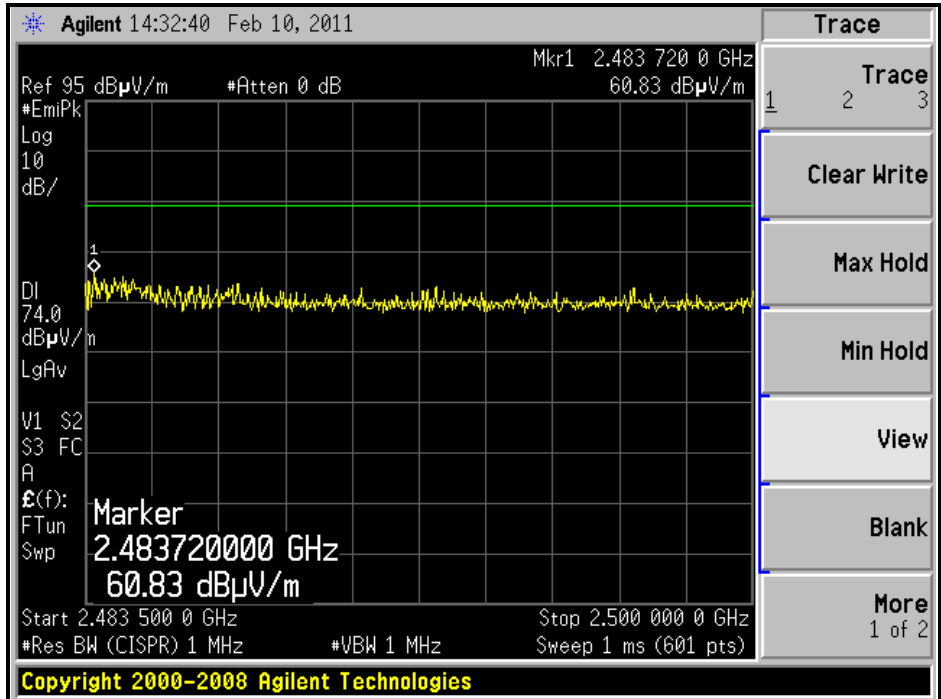
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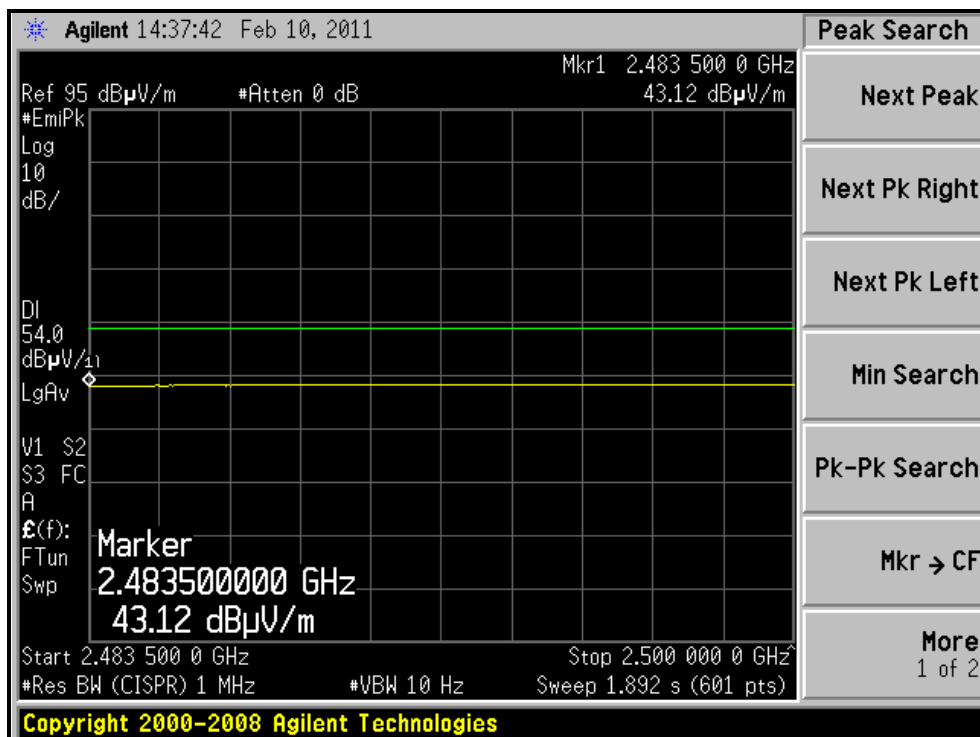
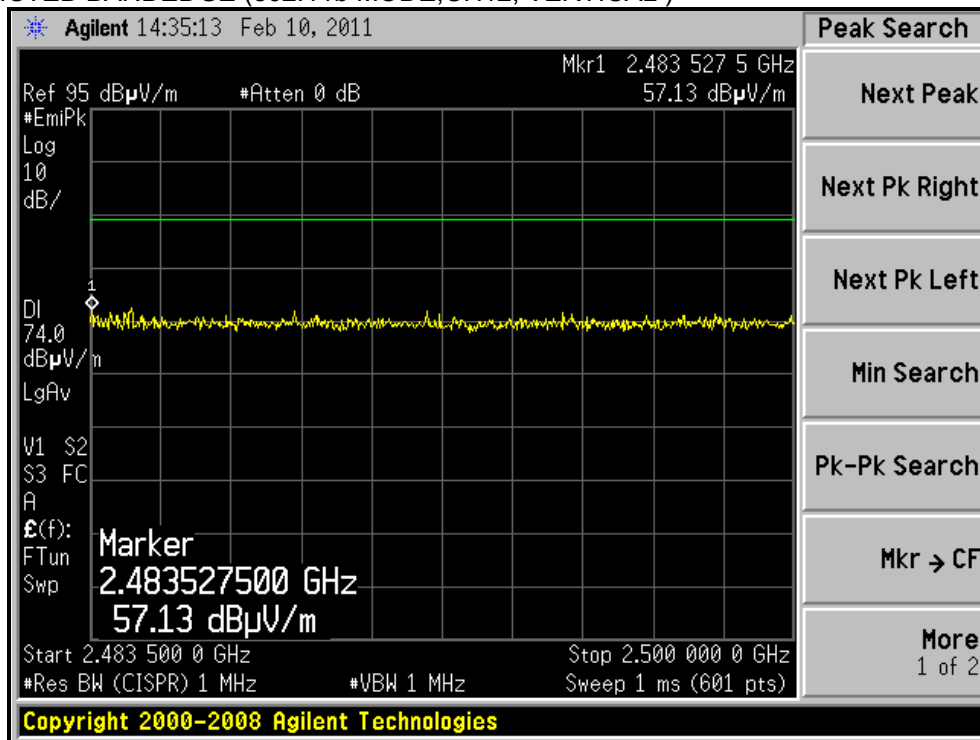
RESTRICTED BANDEDGE (802.11b MODE, CH12, HORIZONTAL)





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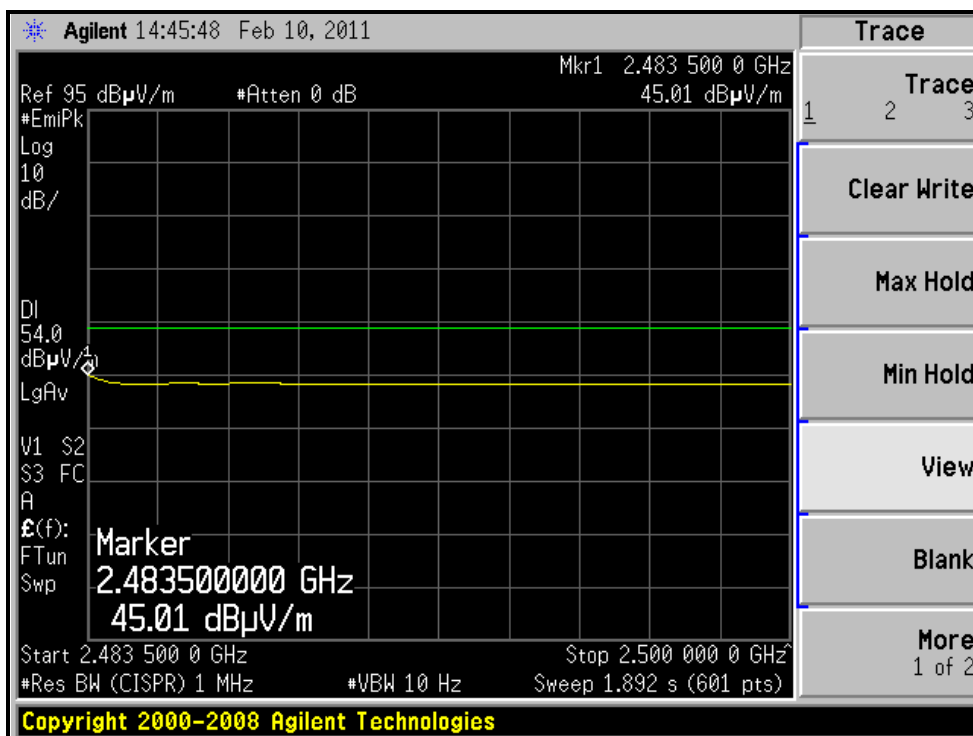
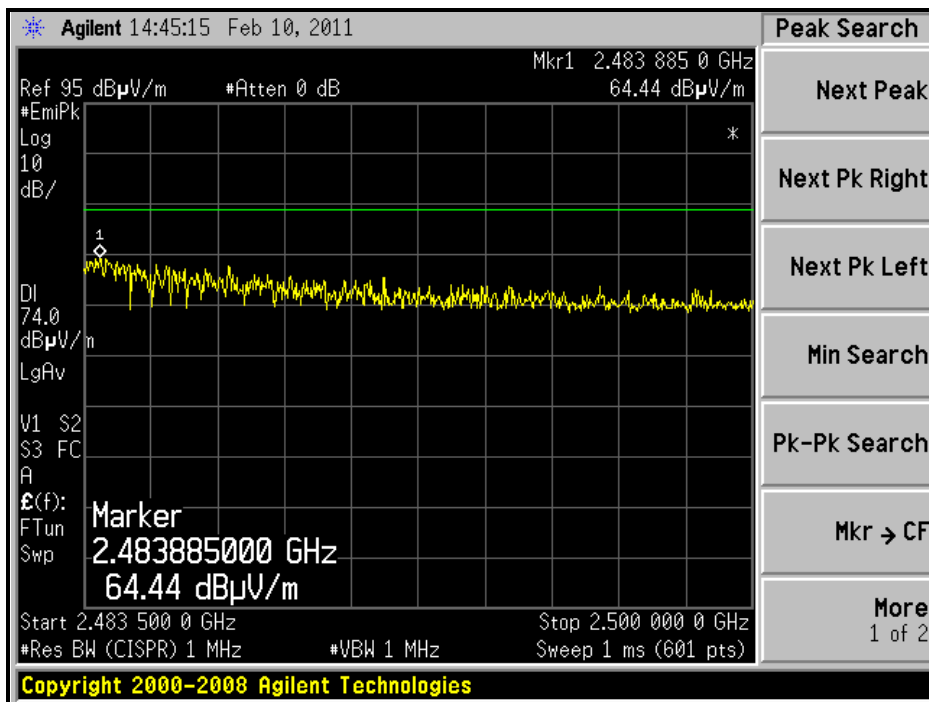
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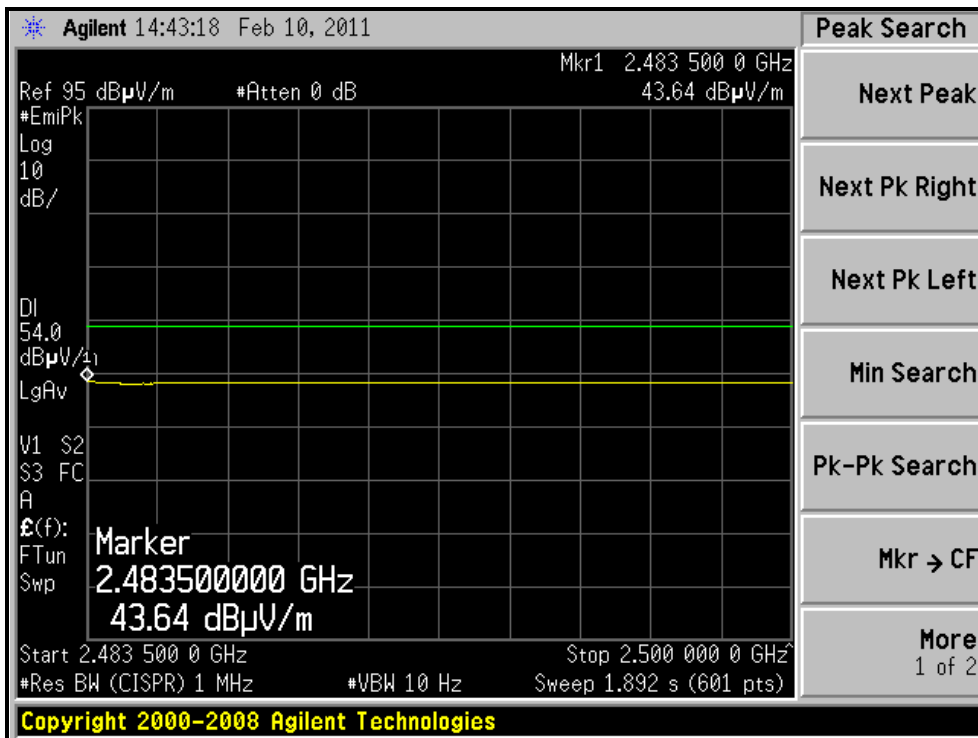
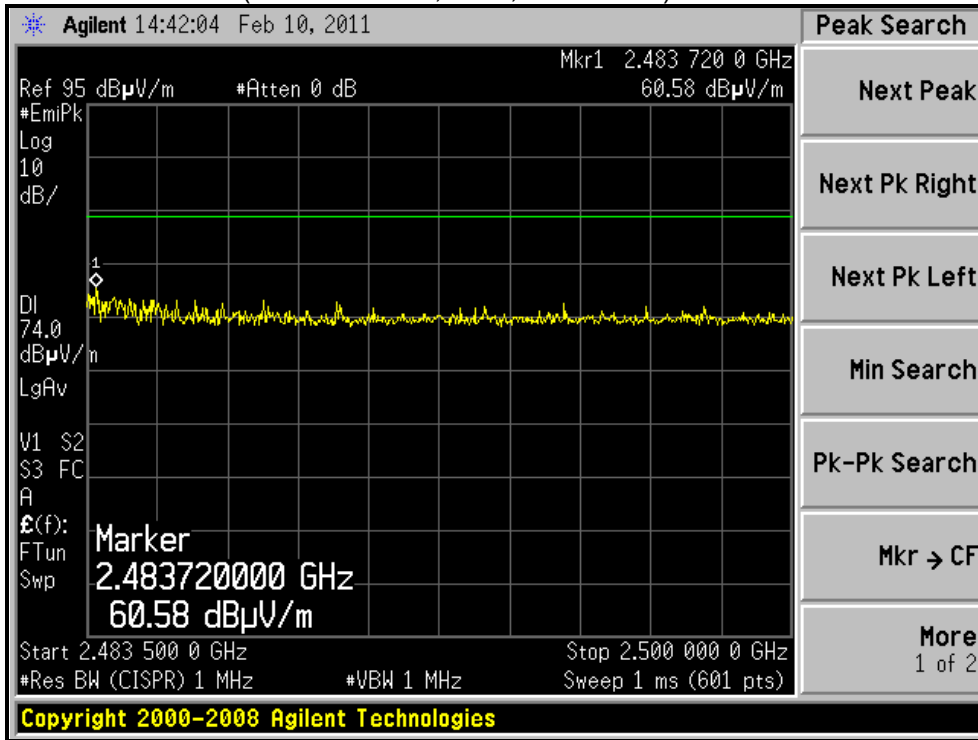
RESTRICTED BANDEDGE (802.11b MODE, CH13, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11b MODE, CH13, VERTICAL)





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802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	63.5 PK	74.00	-10.5	1.30 H	62	31.84	31.66
2	2390.00	44.6 AV	54.00	-9.4	1.30 H	62	12.94	31.66
3	*2412.00	101.1 PK			1.30 H	62	69.37	31.73
4	*2412.00	90.6 AV			1.30 H	62	58.87	31.73
5	4824.00	47.8 PK	74.00	-26.2	1.48 H	264	8.83	38.97
6	4824.00	34.2 AV	54.00	-19.8	1.48 H	264	-4.77	38.97
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	74.00	-16.5	1.19 V	11	25.84	31.66
2	2390.00	43.5 AV	54.00	-10.5	1.19 V	11	11.84	31.66
3	*2412.00	96.1 PK			1.19 V	11	64.37	31.73
4	*2412.00	85.6 AV			1.19 V	11	53.87	31.73
5	4824.00	46.2 PK	74.00	-27.8	1.00 V	226	7.23	38.97
6	4824.00	33.5 AV	54.00	-20.5	1.00 V	226	-5.47	38.97

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	106.8 PK			1.29 H	60	74.99	31.81
2	*2437.00	96.6 AV			1.29 H	60	64.79	31.81
3	4874.00	54.2 PK	74.00	-19.8	1.47 H	267	15.06	39.14
4	4874.00	36.9 AV	54.00	-17.1	1.47 H	267	-2.24	39.14
5	7311.00	54.8 PK	74.00	-19.2	1.02 H	194	8.17	46.63
6	7311.00	41.9 AV	54.00	-12.1	1.02 H	194	-4.73	46.63
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	101.2 PK			1.18 V	10	69.39	31.81
2	*2437.00	90.8 AV			1.18 V	10	58.99	31.81
3	4874.00	49.1 PK	74.00	-24.9	1.00 V	238	9.96	39.14
4	4874.00	33.9 AV	54.00	-20.1	1.00 V	238	-5.24	39.14
5	7311.00	54.6 PK	74.00	-19.4	1.00 V	287	7.97	46.63
6	7311.00	41.6 AV	54.00	-12.4	1.00 V	287	-5.03	46.63

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	105.3 PK			1.26 H	64	73.41	31.89
2	*2462.00	95.5 AV			1.26 H	64	63.61	31.89
3	2483.50	67.0 PK	74.00	-7.0	1.26 H	64	35.03	31.97
4	2483.50	48.1 AV	54.00	-5.9	1.26 H	64	16.13	31.97
5	4924.00	54.3 PK	74.00	-19.7	1.44 H	259	14.99	39.31
6	4924.00	36.7 AV	54.00	-17.3	1.44 H	259	-2.61	39.31
7	7386.00	55.4 PK	74.00	-18.6	1.05 H	195	8.80	46.60
8	7386.00	41.8 AV	54.00	-12.2	1.05 H	195	-4.80	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	99.9 PK			1.17 V	12	68.01	31.89
2	*2462.00	89.6 AV			1.17 V	12	57.71	31.89
3	2483.50	61.5 PK	74.00	-12.5	1.17 V	12	29.53	31.97
4	2483.50	45.2 AV	54.00	-8.8	1.17 V	12	13.23	31.97
5	4924.00	49.9 PK	74.00	-24.1	1.00 V	234	10.59	39.31
6	4924.00	34.3 AV	54.00	-19.7	1.00 V	234	-5.01	39.31
7	7386.00	55.1 PK	74.00	-18.9	1.00 V	252	8.50	46.60
8	7386.00	41.5 AV	54.00	-12.5	1.00 V	252	-5.10	46.60

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

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	92.70 PK			1.00 H	136	60.56	32.14
2	*2467.00	83.30 AV			1.00 H	136	51.16	32.14
3	2483.50	58.80 PK	74.00	-15.2	1.00 H	136	26.61	32.19
4	2483.50	43.50 AV	54.00	-10.5	1.00 H	136	11.31	32.19
5	4934.00	48.80 PK	74.00	-25.2	1.19 H	267	7.30	41.50
6	4934.00	37.20 AV	54.00	-16.8	1.19 H	267	-4.30	41.50
7	7401.00	51.70 PK	74.00	-22.3	1.22 H	41	5.75	45.95
8	7401.00	40.60 AV	54.00	-13.4	1.22 H	41	-5.35	45.95
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	88.10 PK			1.14 V	357	55.96	32.14
2	*2467.00	79.20 AV			1.14 V	357	47.06	32.14
3	2483.50	55.50 PK	74.00	-18.5	1.16 V	354	23.31	32.19
4	2483.50	43.30 AV	54.00	-10.7	1.16 V	354	11.11	32.19
5	4934.00	48.90 PK	74.00	-25.1	1.14 V	76	7.40	41.50
6	4934.00	36.20 AV	54.00	-17.8	1.14 V	76	-5.30	41.50
7	7401.00	52.30 PK	74.00	-21.7	1.27 V	298	6.35	45.95
8	7401.00	40.10 AV	54.00	-13.9	1.27 V	298	-5.85	45.95

- 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 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 69%RH 1012 hPa	TESTED BY	Rex Huang

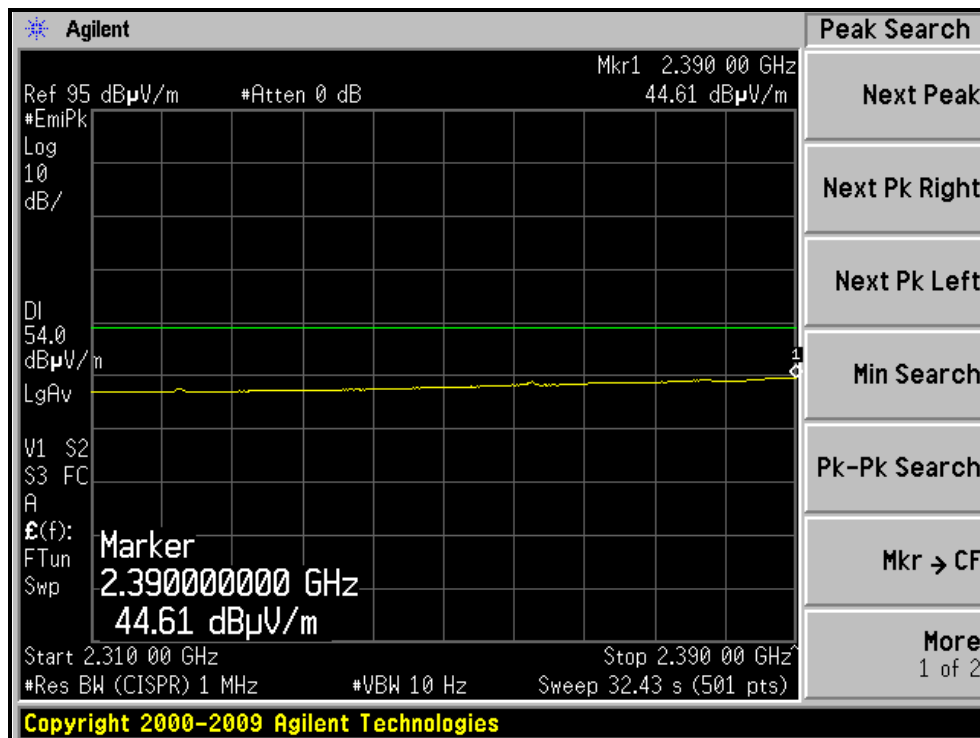
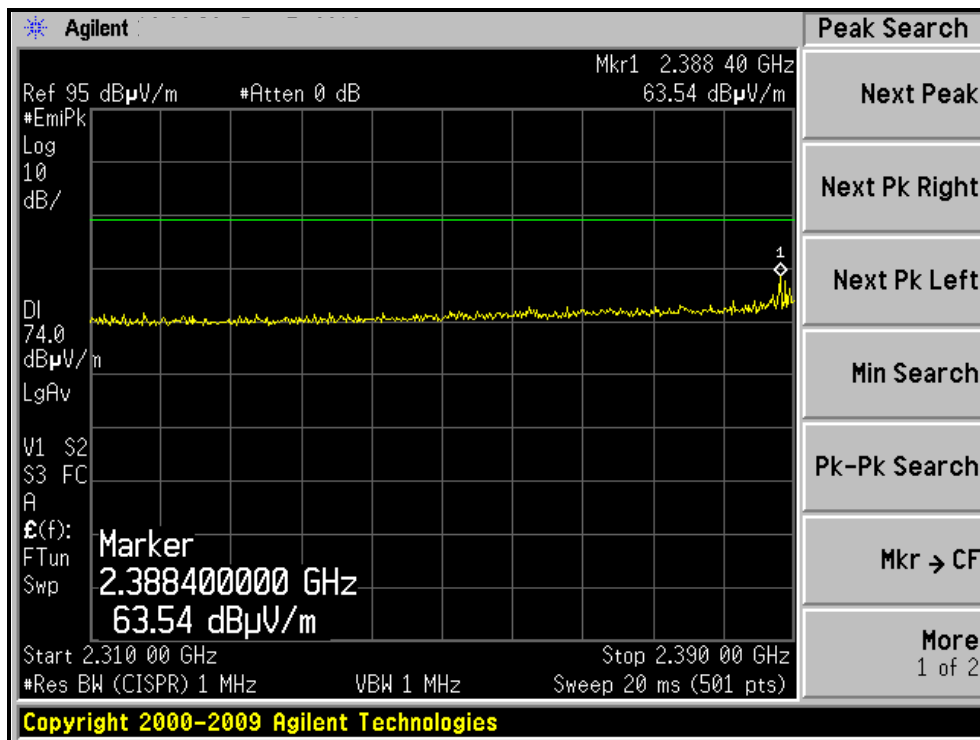
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	92.30 PK			1.02 H	136	60.15	32.15
2	*2472.00	83.10 AV			1.02 H	136	50.95	32.15
3	2483.50	64.50 PK	74.00	-9.5	1.01 H	137	32.31	32.19
4	2483.50	46.10 AV	54.00	-7.9	1.01 H	137	13.91	32.19
5	4944.00	48.60 PK	74.00	-25.4	1.20 H	69	7.08	41.52
6	4944.00	37.10 AV	54.00	-16.9	1.20 H	69	-4.42	41.52
7	7416.00	51.80 PK	74.00	-22.2	1.11 H	346	5.80	46.00
8	7416.00	40.70 AV	54.00	-13.3	1.11 H	346	-5.30	46.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	88.30 PK			1.16 V	352	56.15	32.15
2	*2472.00	79.10 AV			1.16 V	352	46.95	32.15
3	2483.50	60.50 PK	74.00	-13.5	1.12 V	349	28.31	32.19
4	2483.50	44.40 AV	54.00	-9.6	1.12 V	349	12.21	32.19
5	4944.00	48.80 PK	74.00	-25.2	1.12 V	69	7.28	41.52
6	4944.00	36.30 AV	54.00	-17.7	1.12 V	69	-5.22	41.52
7	7416.00	52.10 PK	74.00	-21.9	1.30 V	300	6.10	46.00
8	7416.00	40.20 AV	54.00	-13.8	1.30 V	300	-5.80	46.00

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



A D T

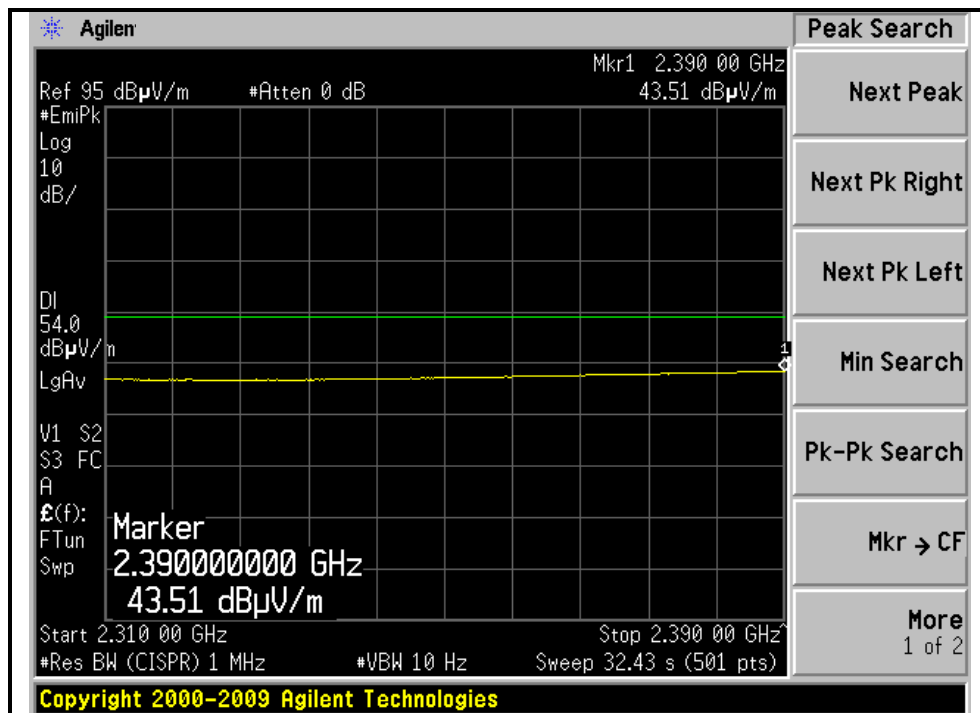
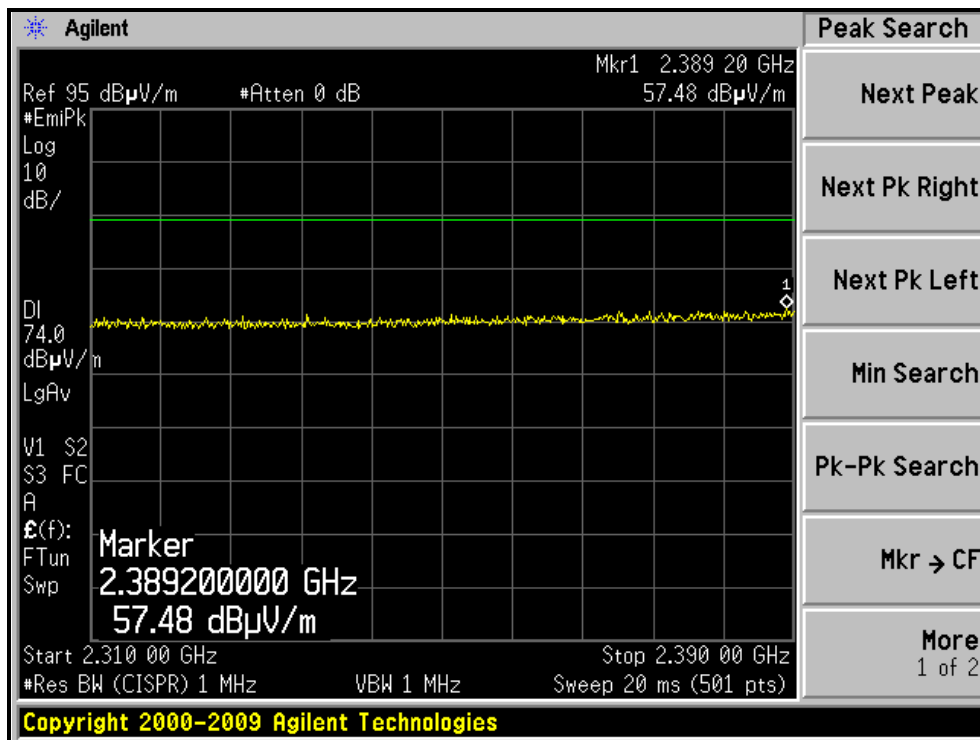
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)





A D T

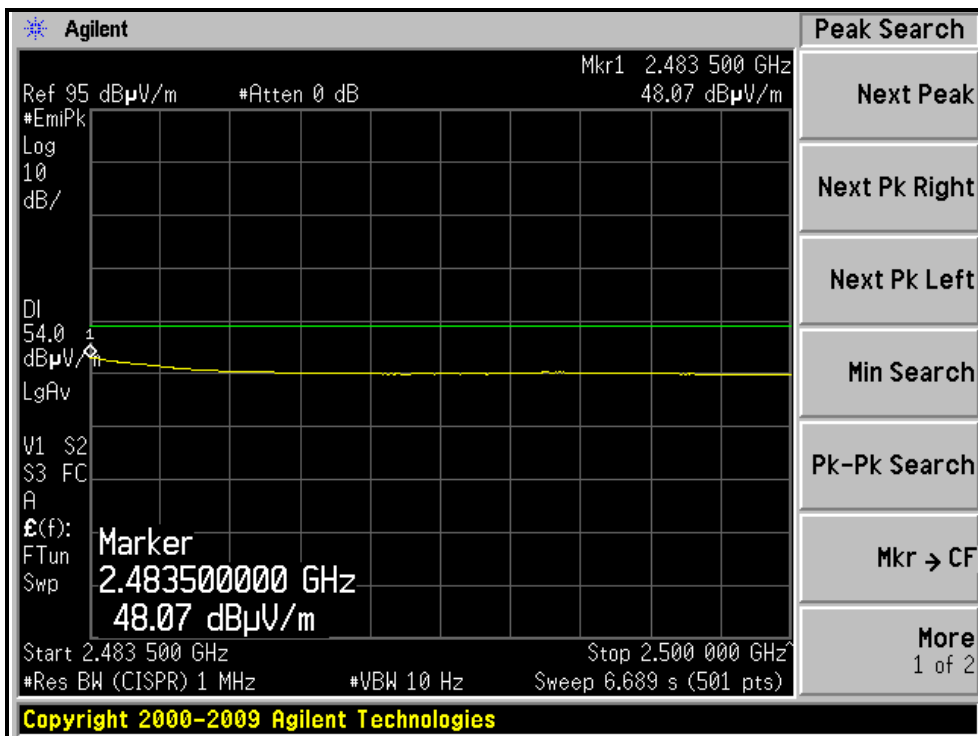
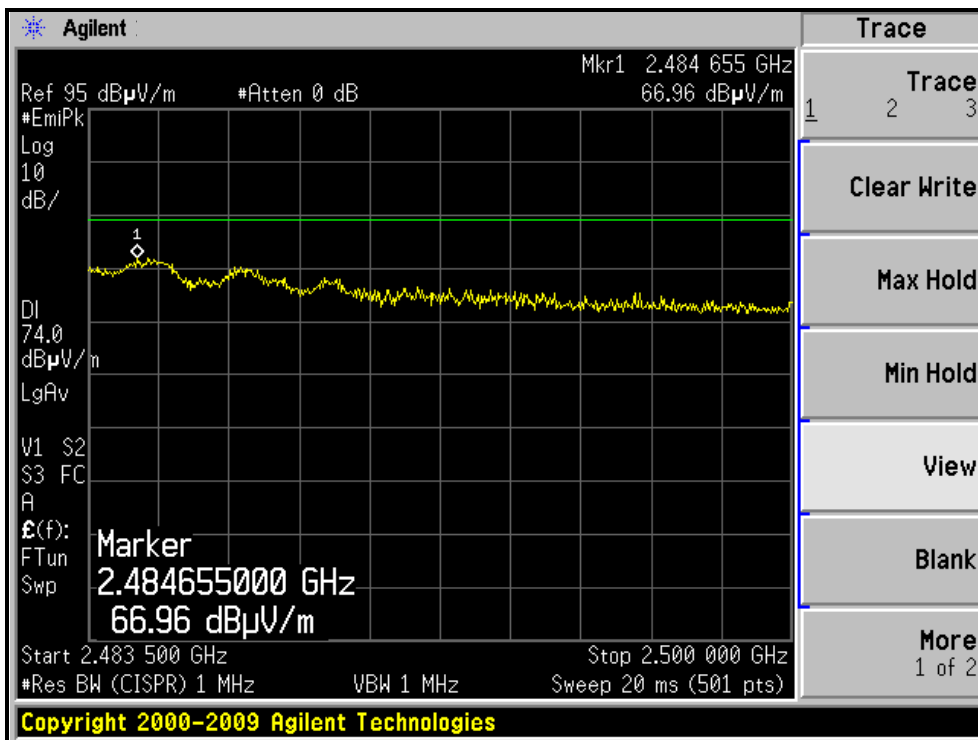
RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL)





A D T

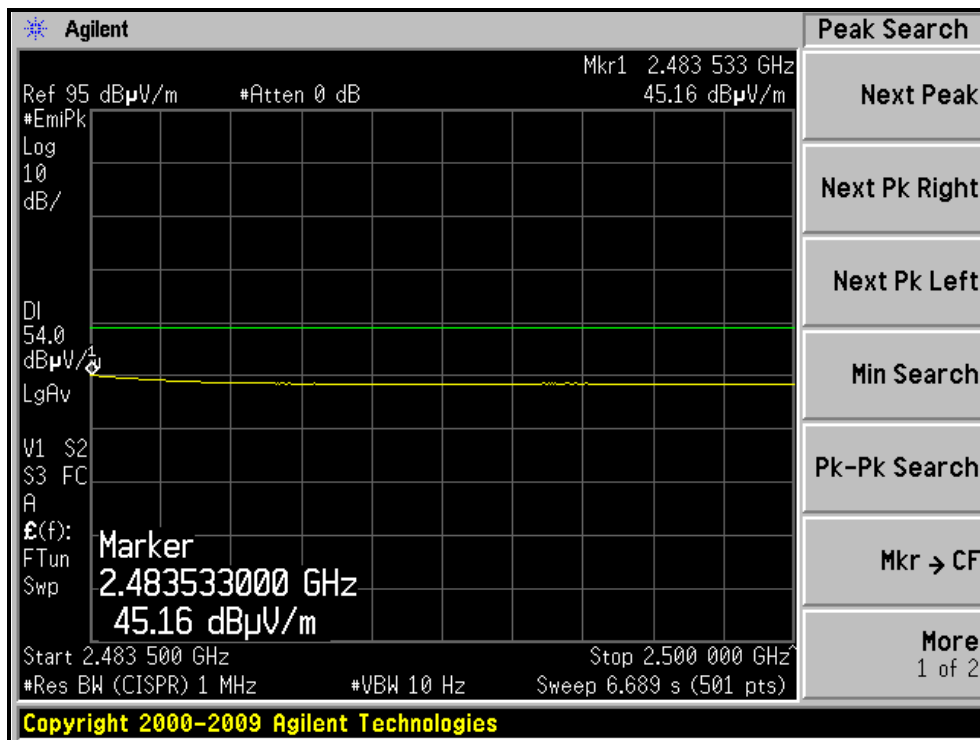
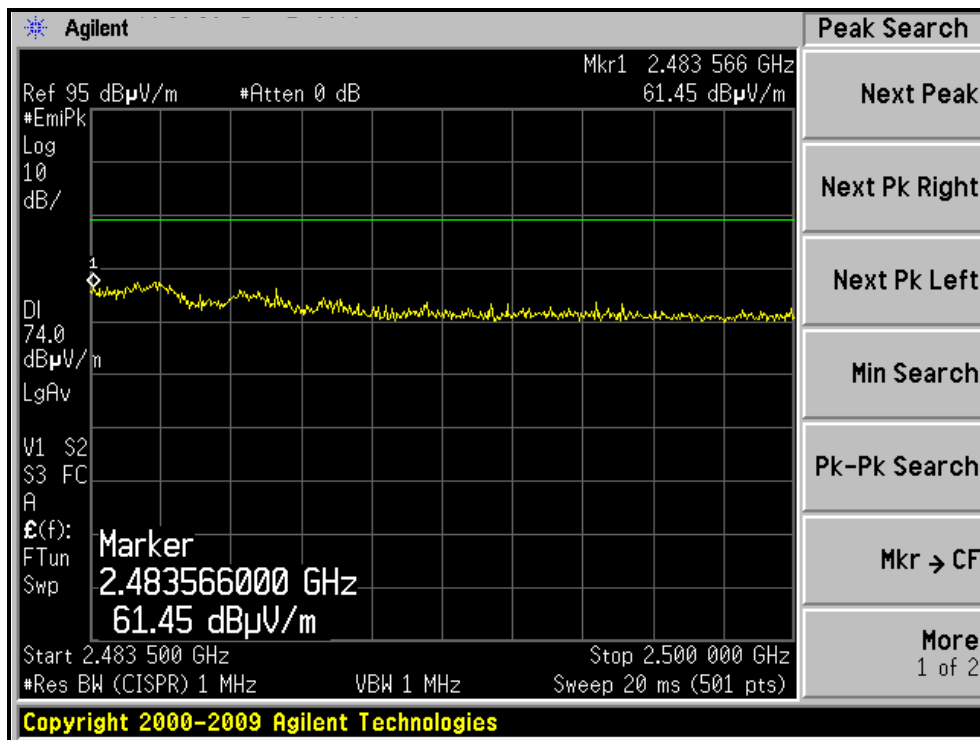
RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL)





A D T

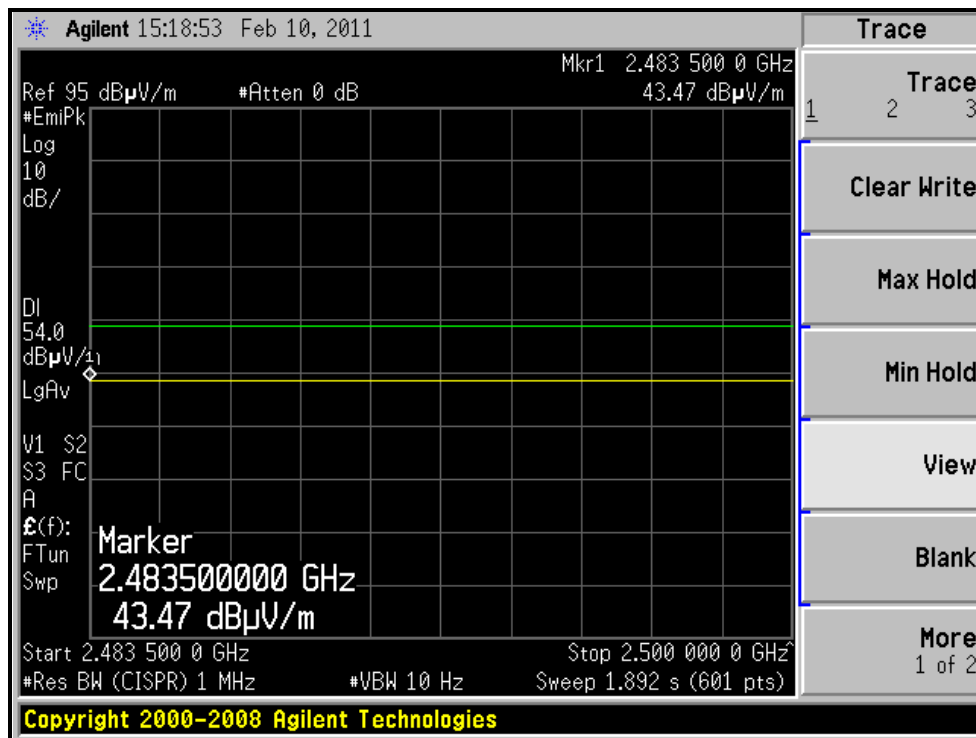
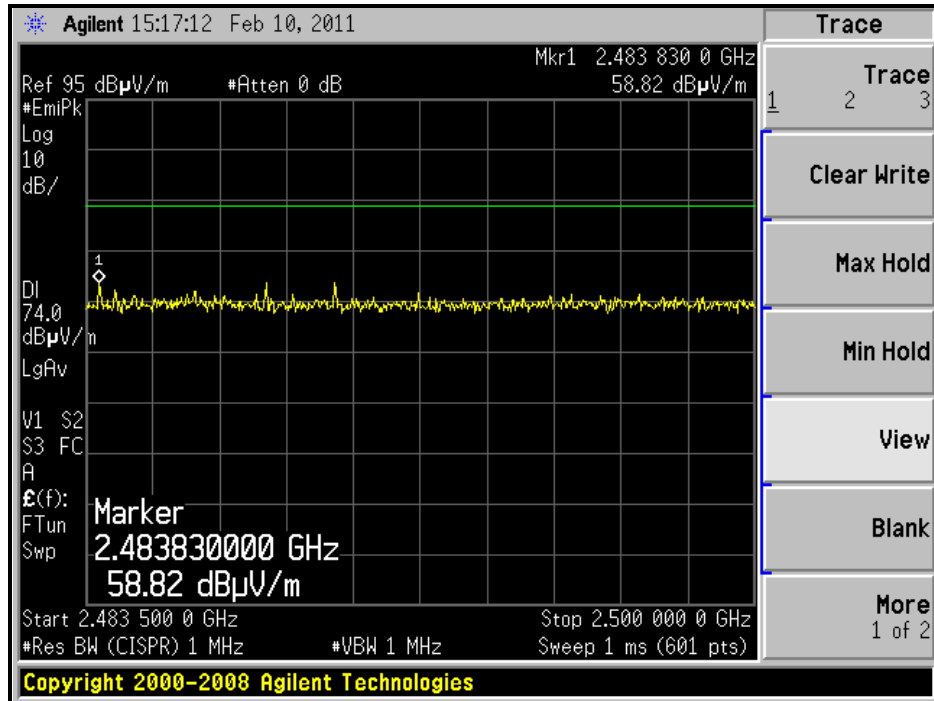
RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL)





A D T

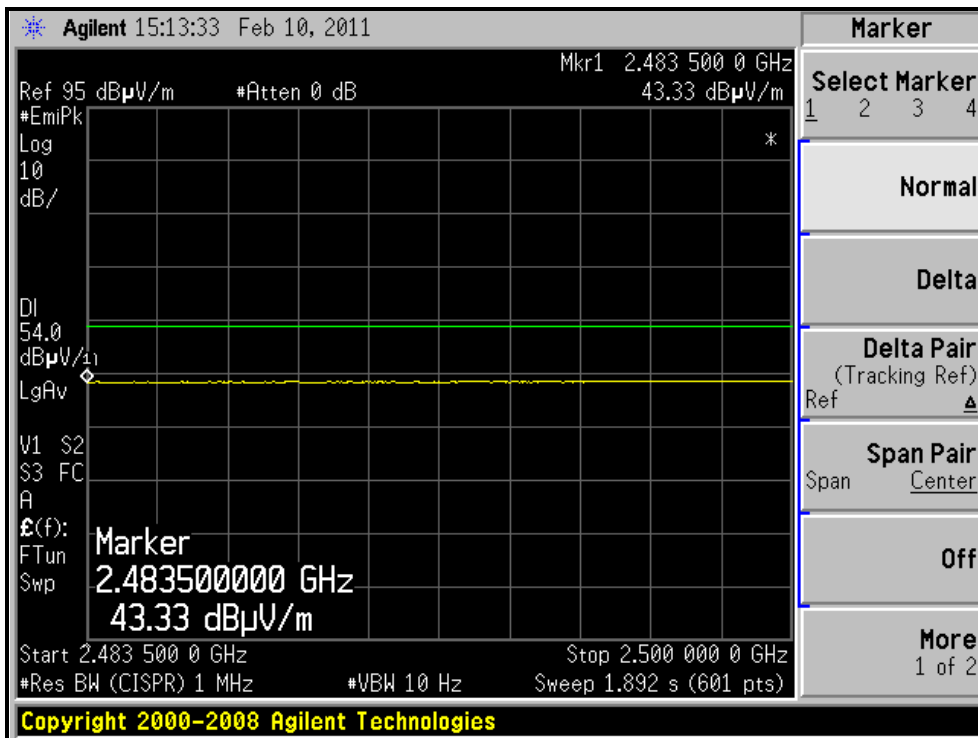
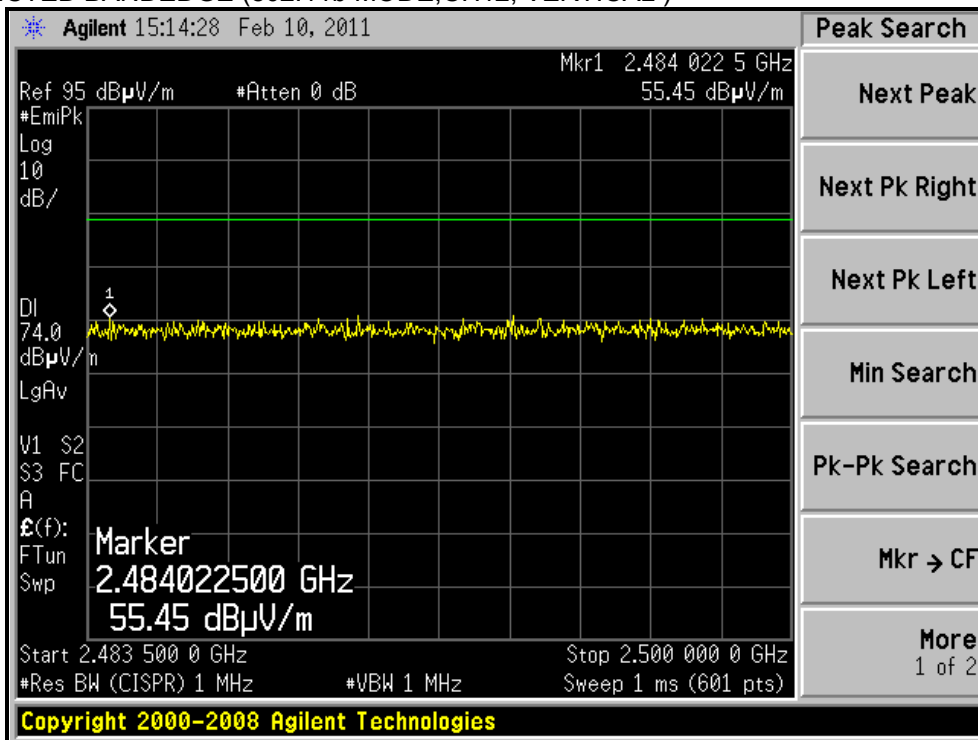
RESTRICTED BANDEDGE (802.11b MODE, CH12, HORIZONTAL)





A D T

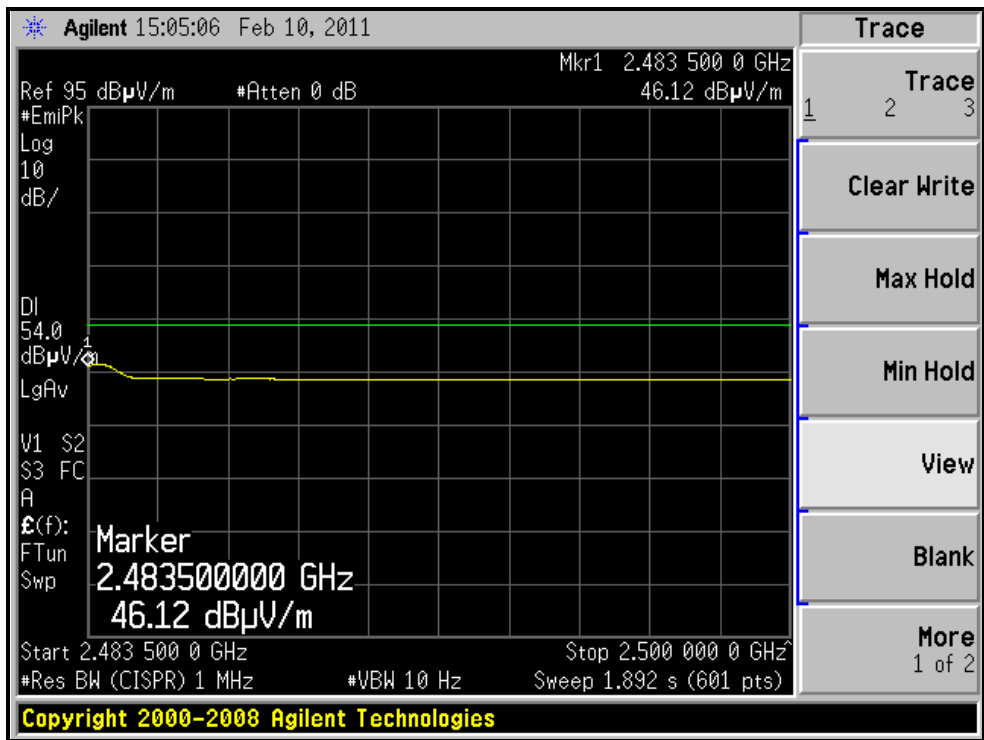
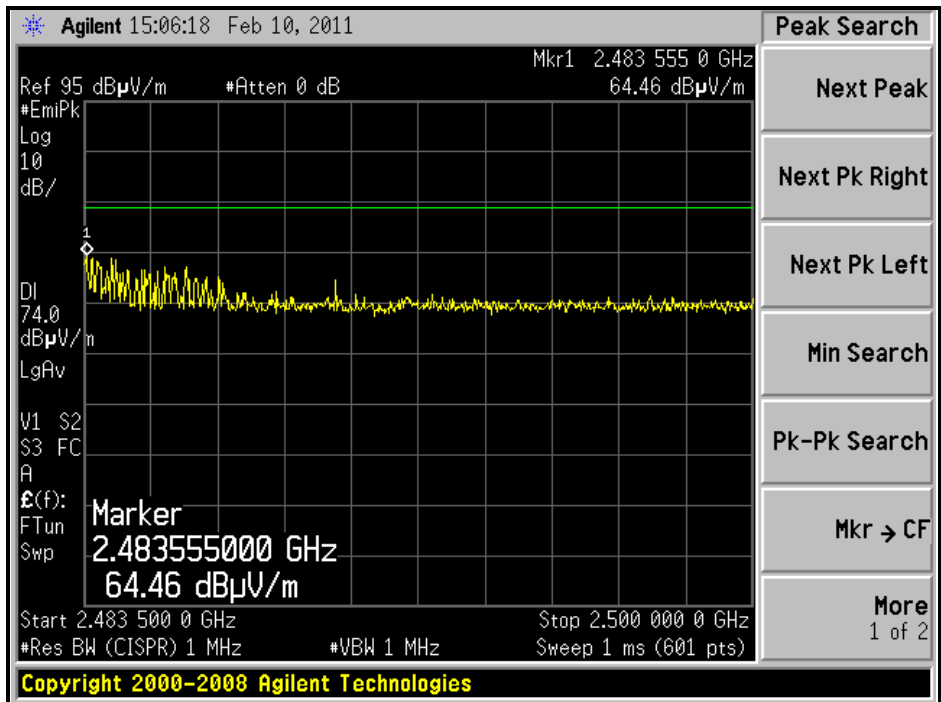
RESTRICTED BANDEDGE (802.11b MODE, CH12, VERTICAL)





A D T

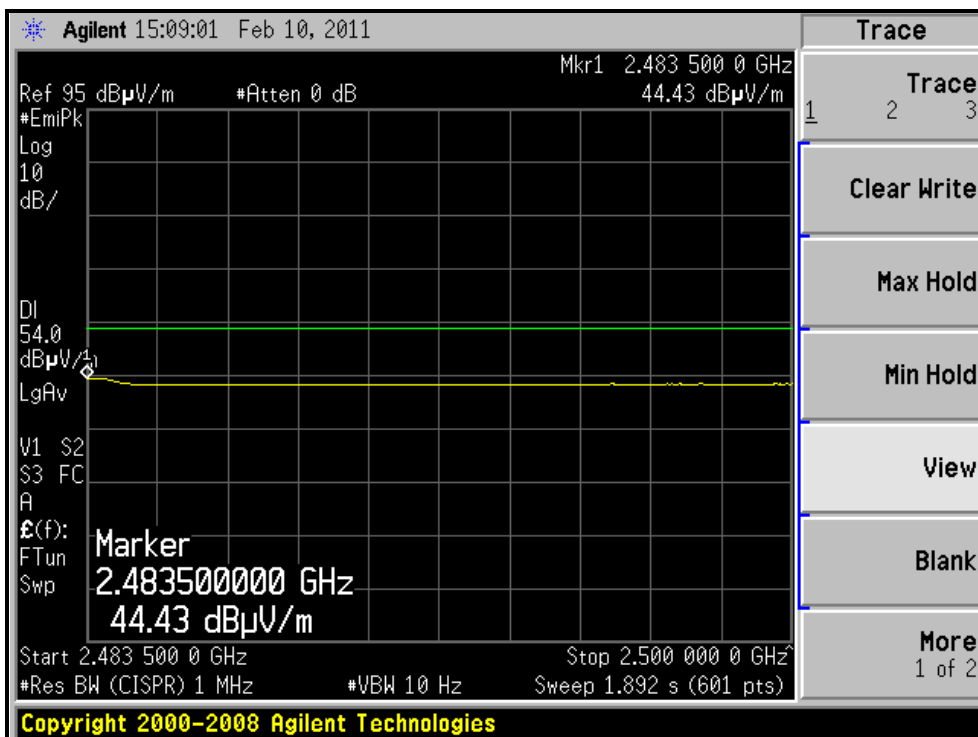
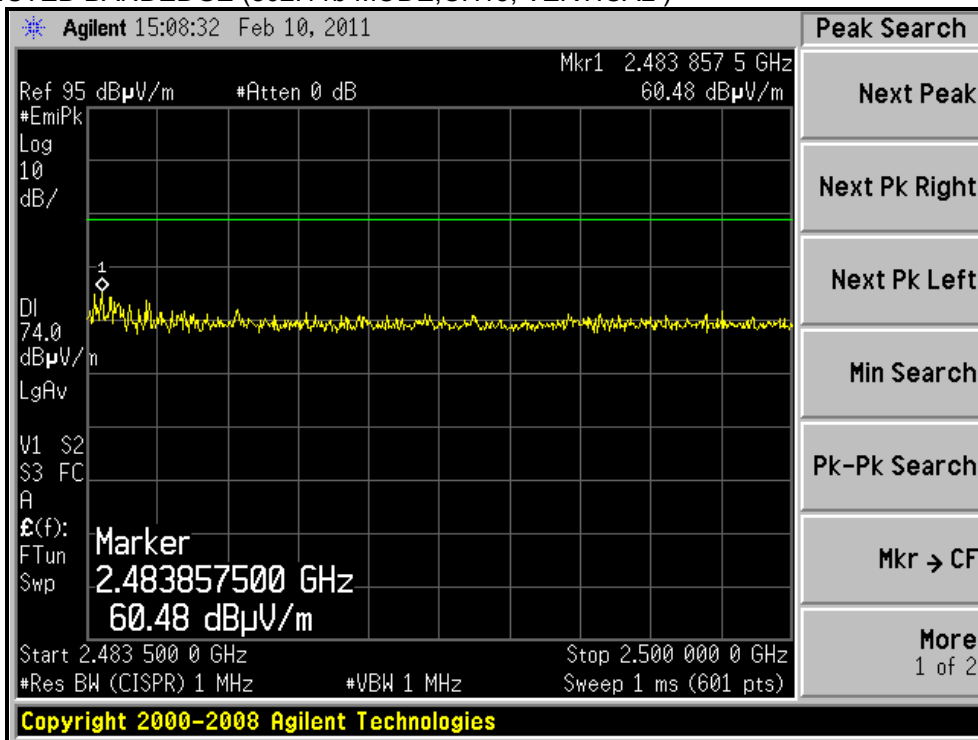
RESTRICTED BANDEDGE (802.11b MODE, CH13, HORIZONTAL)





A D T

RESTRICTED BANDEDGE (802.11b MODE, CH13, VERTICAL)



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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 17, 2010	May 16, 2011

NOTE:

1. 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

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

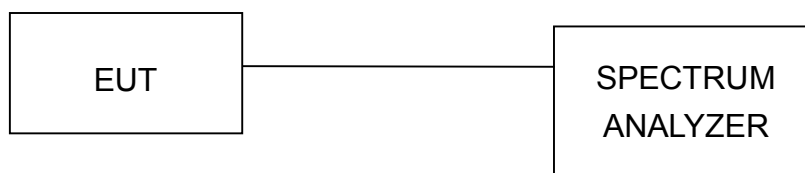
NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



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.



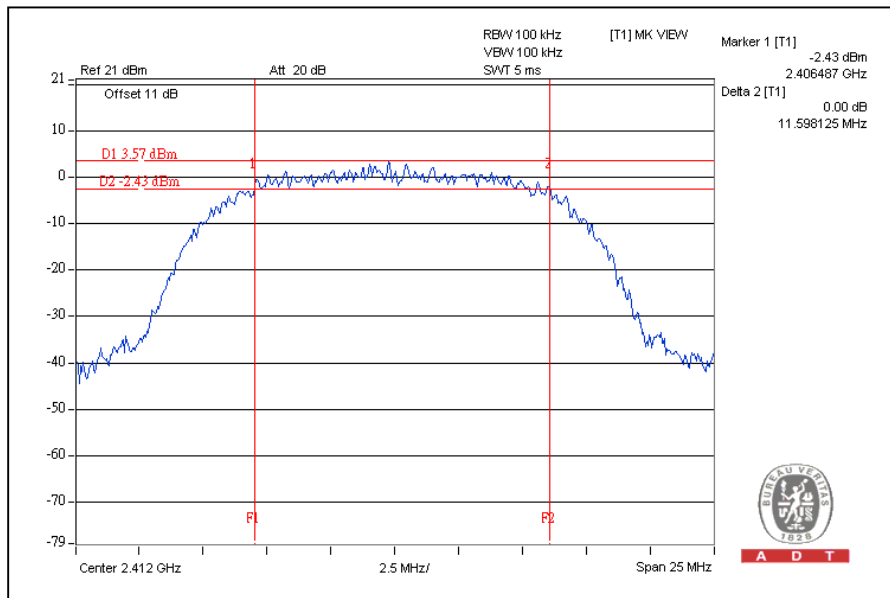
A D T

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	11.59	0.5	PASS
6	2437	11.58	0.5	PASS
11	2462	11.58	0.5	PASS
12	2467	11.20	0.5	PASS
13	2472	11.56	0.5	PASS

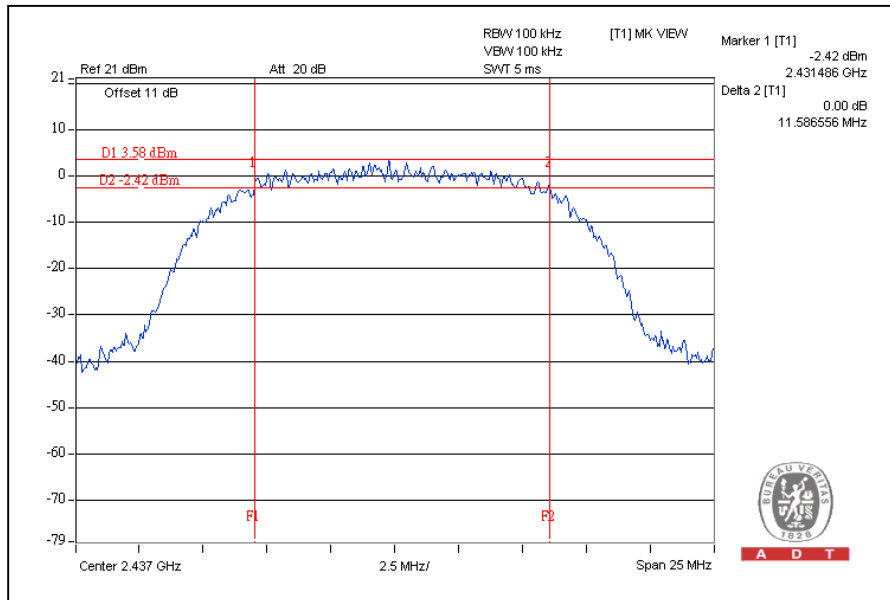
CH1



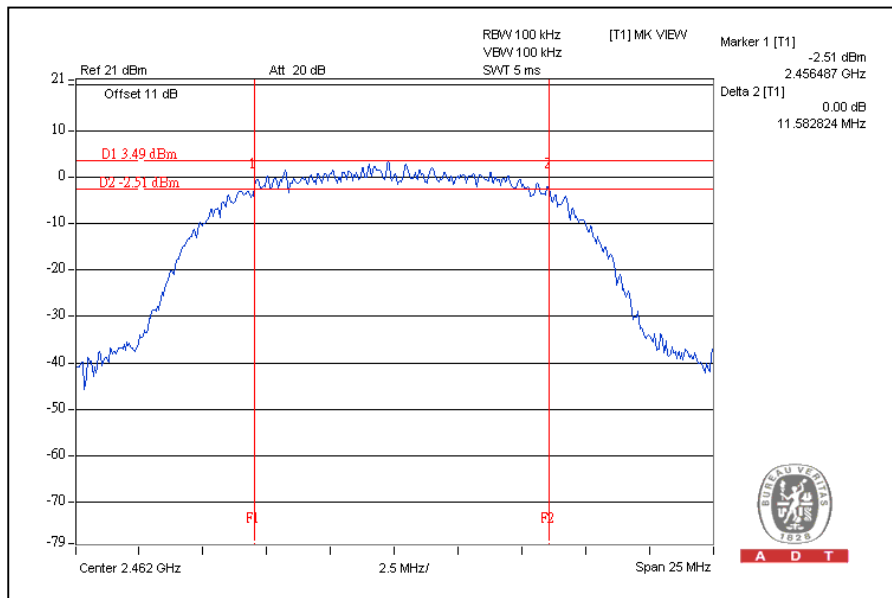


A D T

CH6



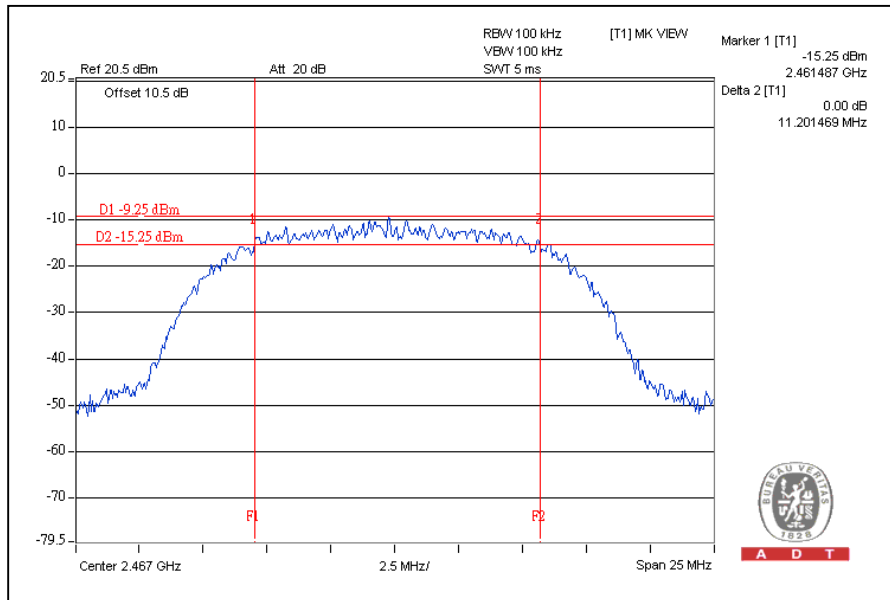
CH11



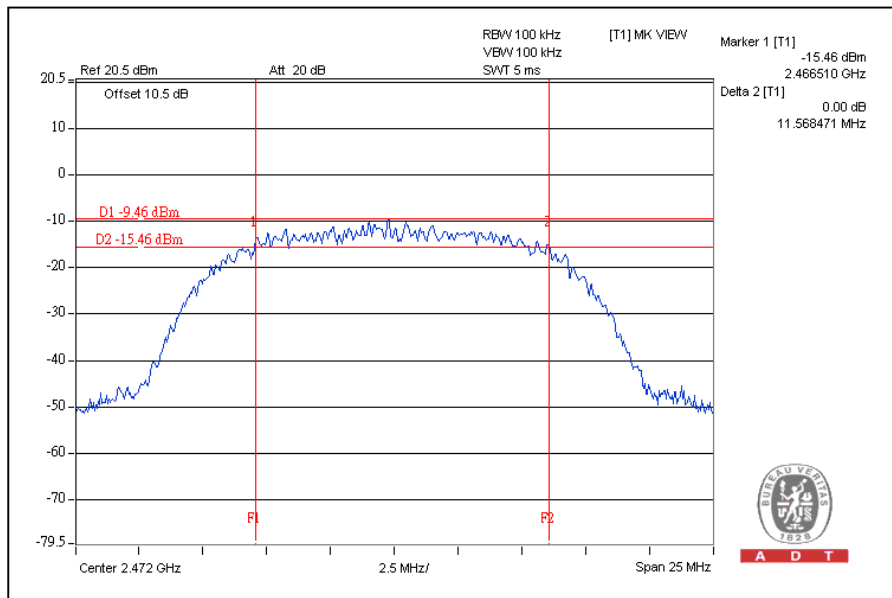


A D T

CH12



CH13



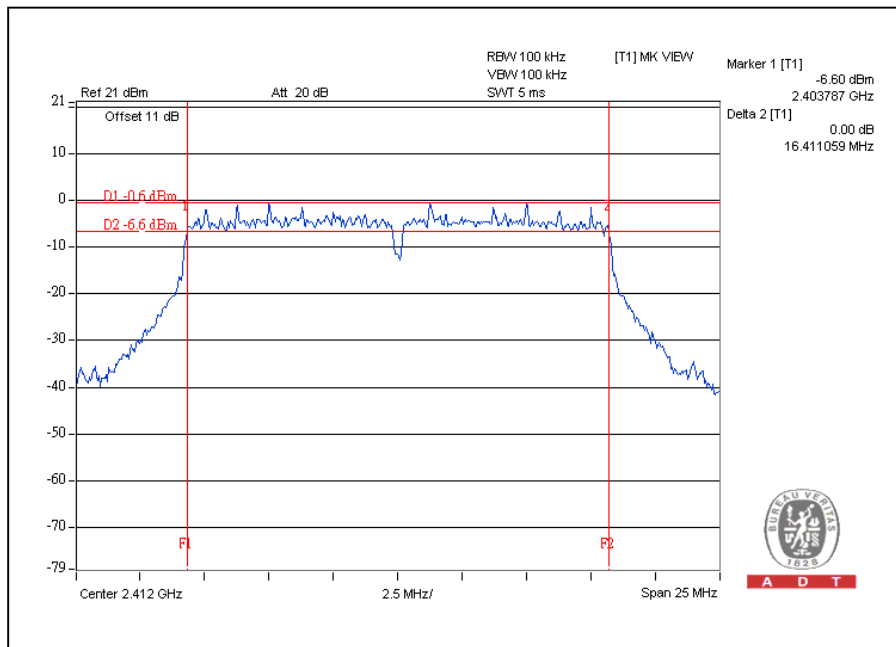


A D T

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.41	0.5	PASS
6	2437	16.36	0.5	PASS
11	2462	16.39	0.5	PASS
12	2467	16.39	0.5	PASS
13	2472	16.40	0.5	PASS

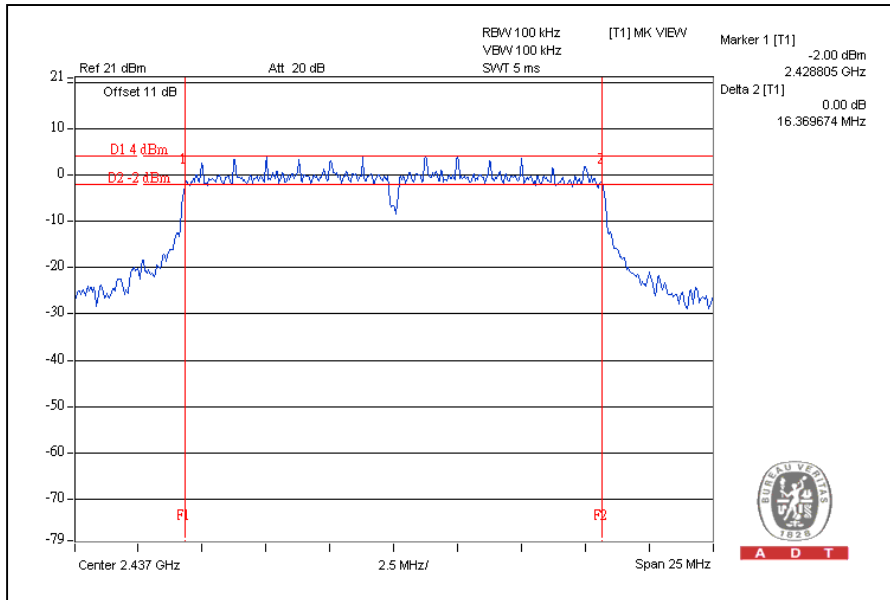
CH1



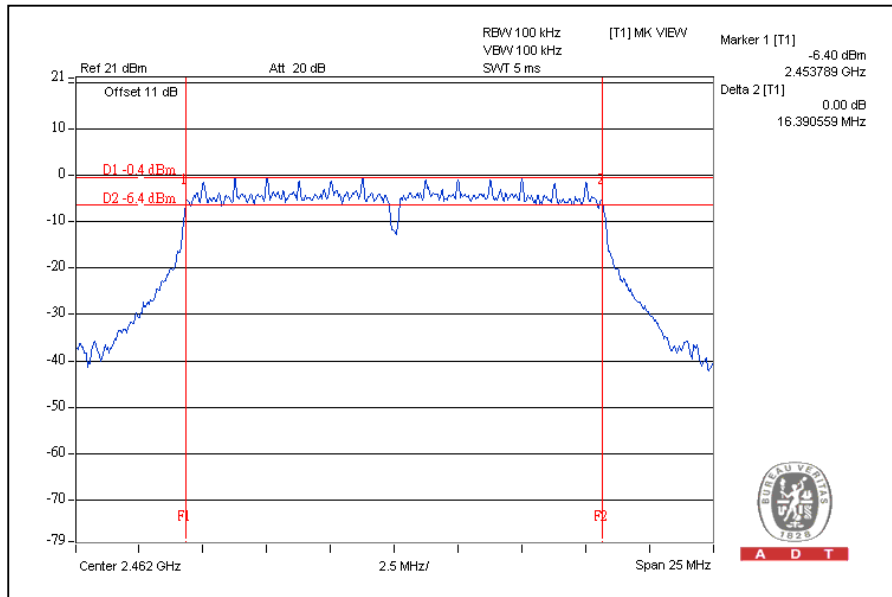


A D T

CH6



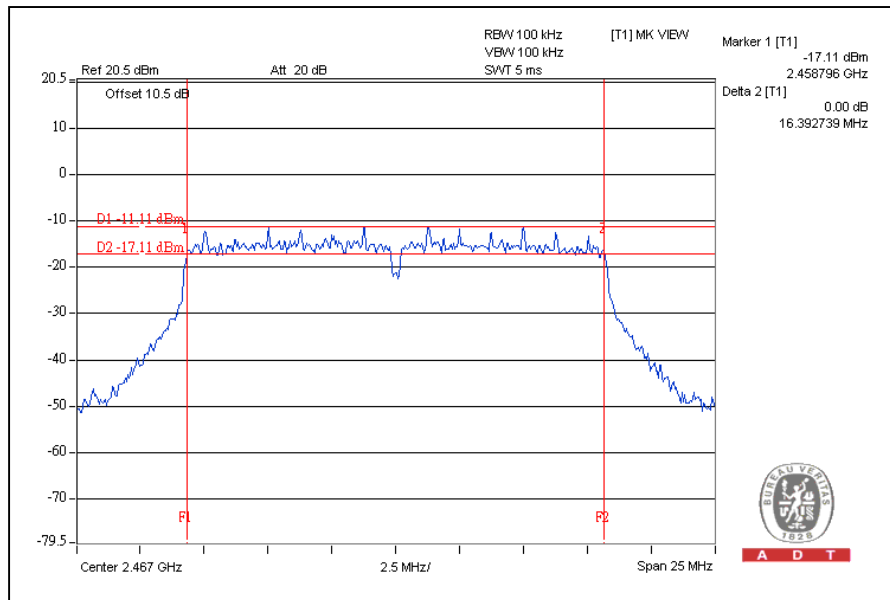
CH11



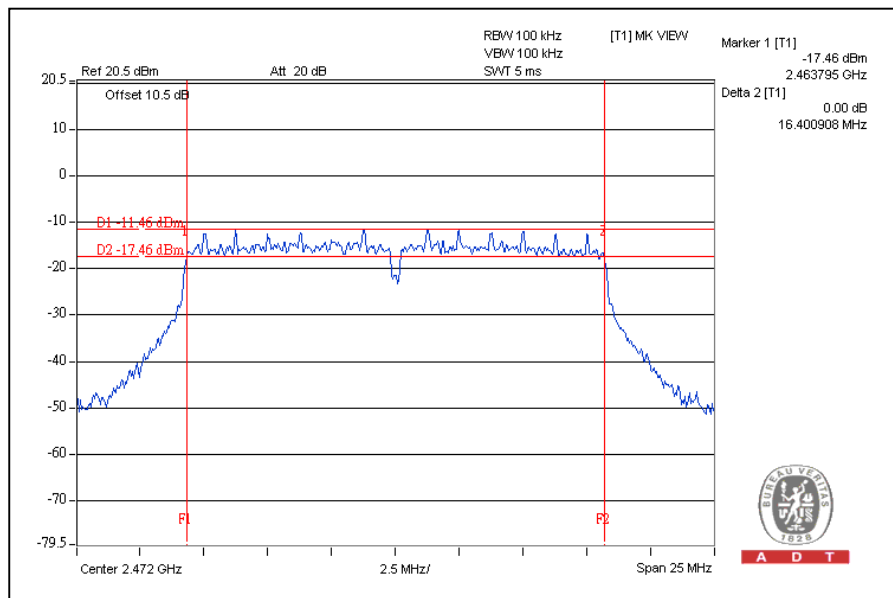


A D T

CH12



CH13



4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	May 04, 2010	May 03, 2011
Pulse Power Sensor	MA2411B	0738172	May 04, 2010	May 03, 2011

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

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

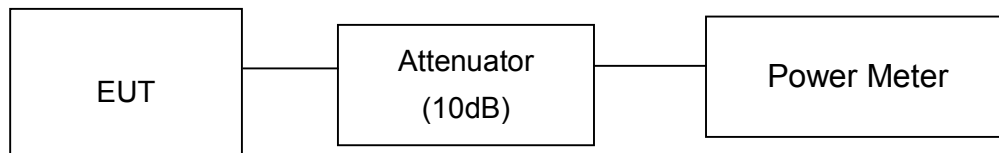
NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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



A D T

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	46.8	16.7	30	PASS
11	2462	45.7	16.6	30	PASS
12	2467	1.9	2.8	30	PASS
13	2472	1.9	2.7	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	151.4	21.8	30	PASS
11	2462	125.9	21.0	30	PASS
12	2467	11.2	10.5	30	PASS
13	2472	11.0	10.4	30	PASS

Note:

1. The channels 12 and 13 have been reduced power to meet band-edge and other requirement.
2. The power was fixed by firmware and end user cannot change or increase these power level thus possibly causing EMC failures.

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 17, 2010	May 16, 2011

NOTE:

1. 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.

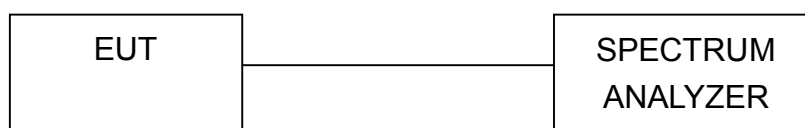
NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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



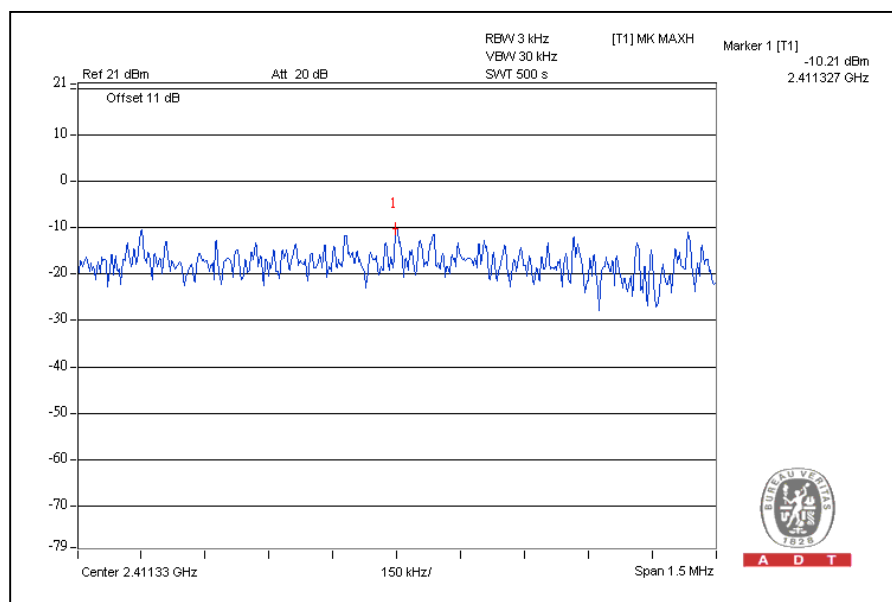
A D T

4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-10.2	8	PASS
6	2437	-10.3	8	PASS
11	2462	-10.3	8	PASS
12	2467	-23.1	8	PASS
13	2472	-23.3	8	PASS

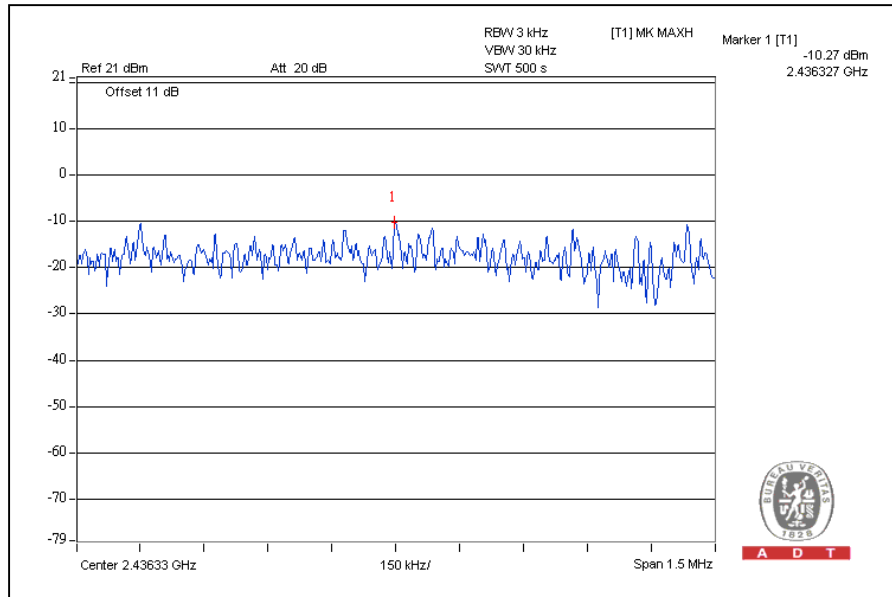
CH1



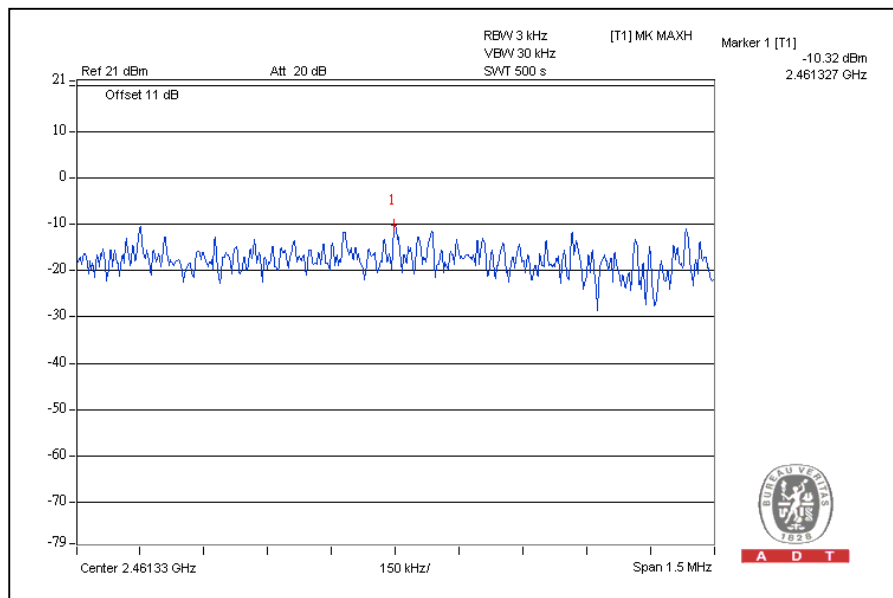


A D T

CH6



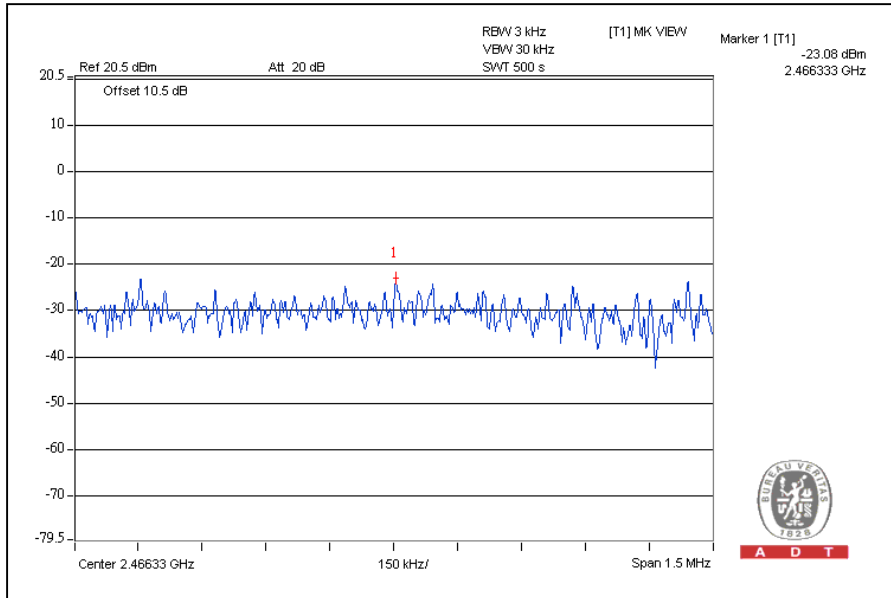
CH11



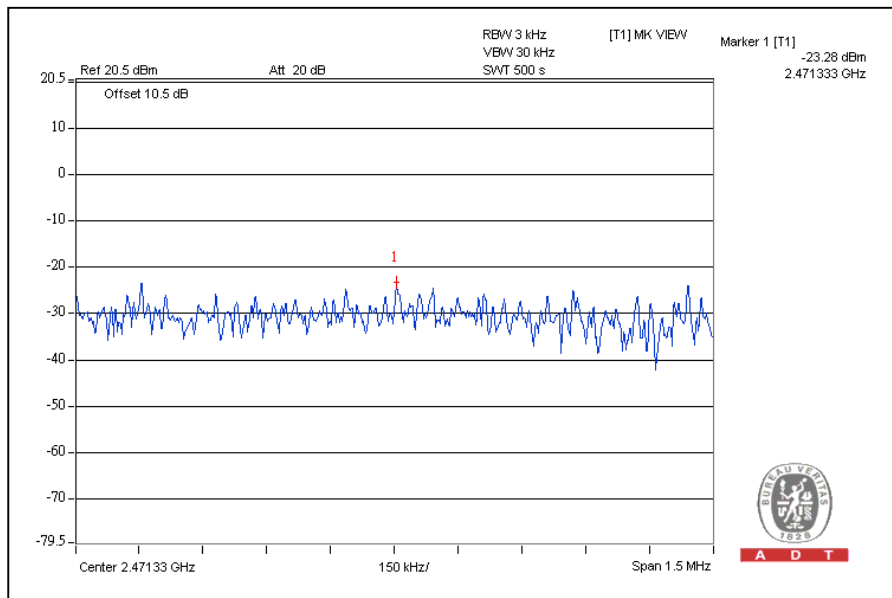


A D T

CH12



CH13



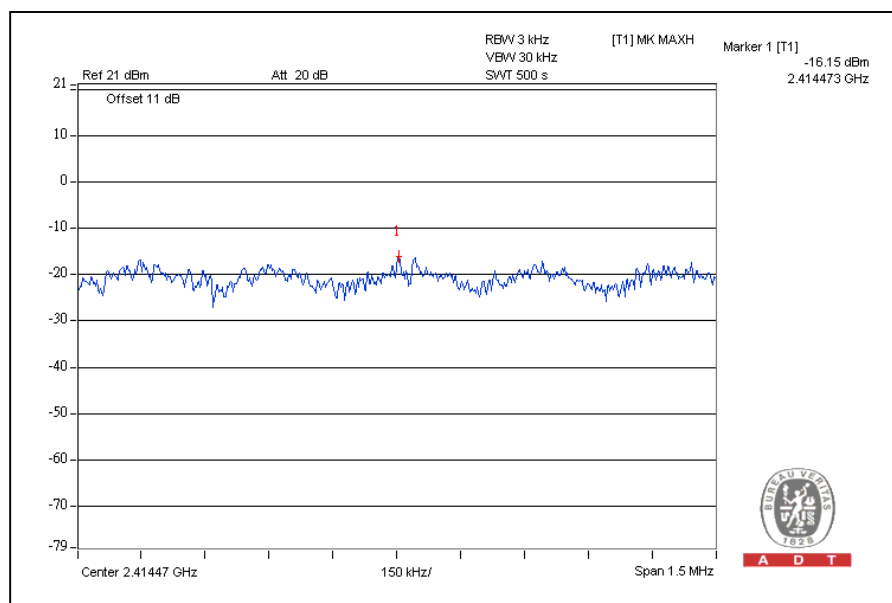


A D T

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-16.2	8	PASS
6	2437	-11.9	8	PASS
11	2462	-16.4	8	PASS
12	2467	-26.7	8	PASS
13	2472	-26.7	8	PASS

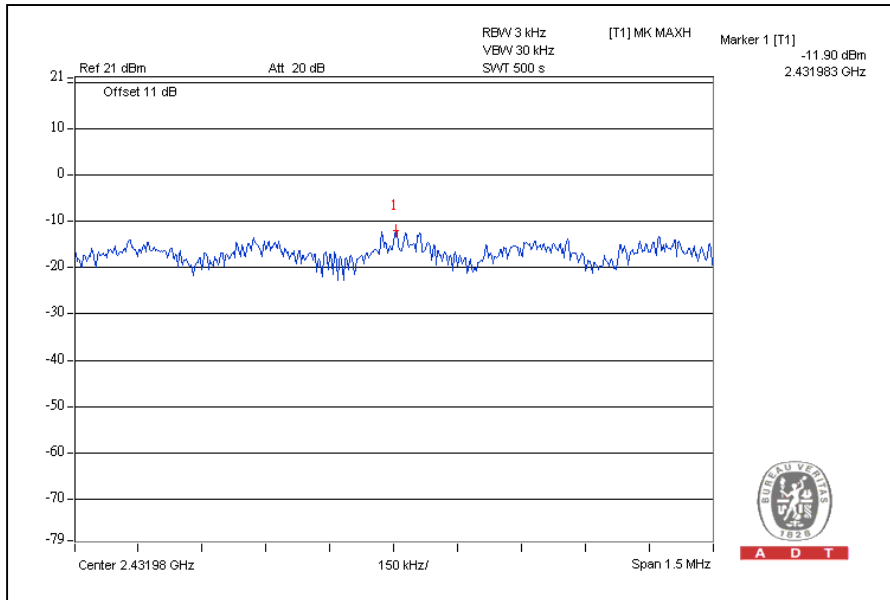
CH1



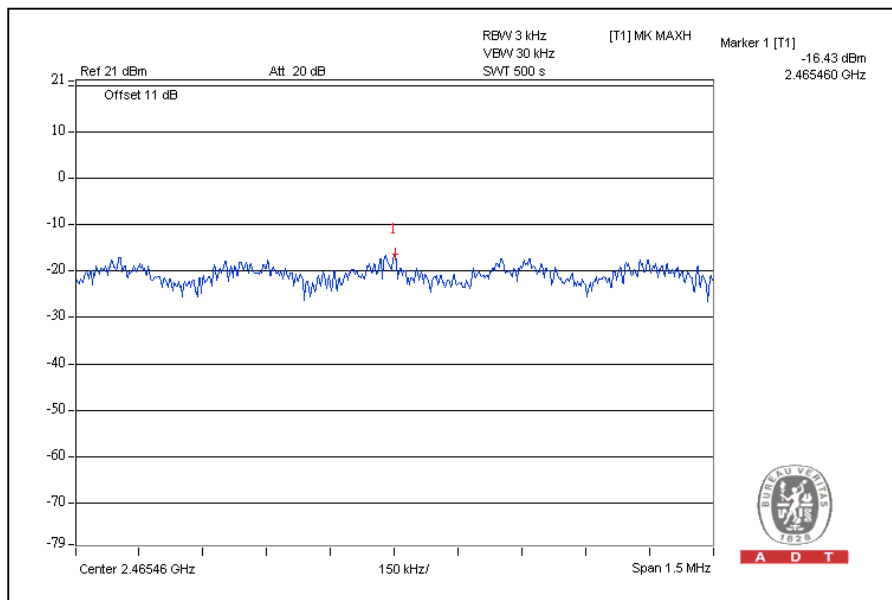


A D T

CH6



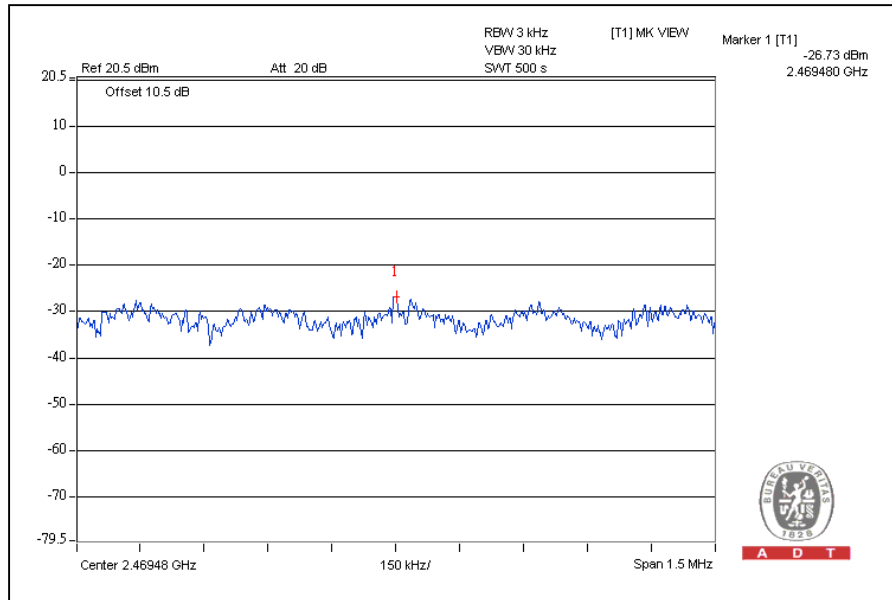
CH11



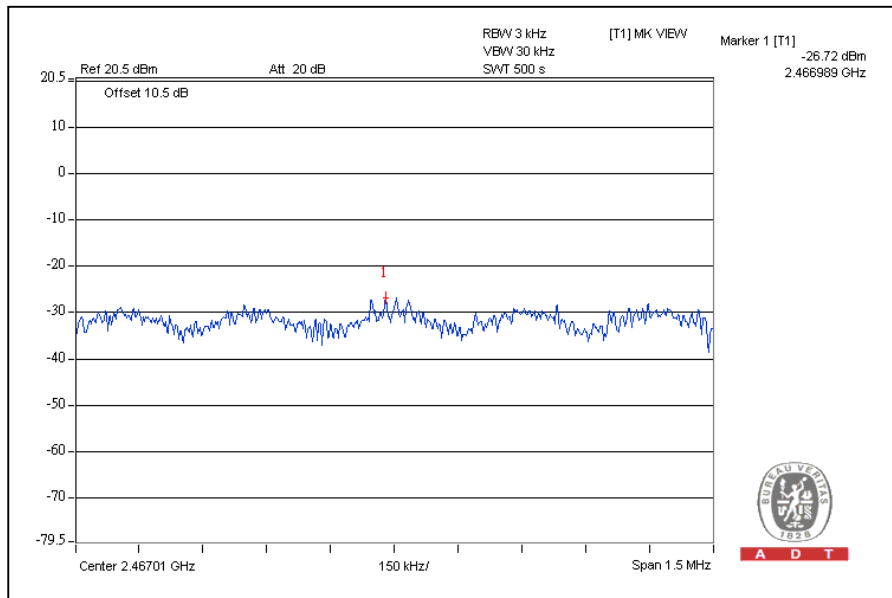


A D T

CH12



CH13





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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 17, 2010	May 16, 2011

NOTE:

1. 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 lose cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

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

NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.6 TEST RESULTS

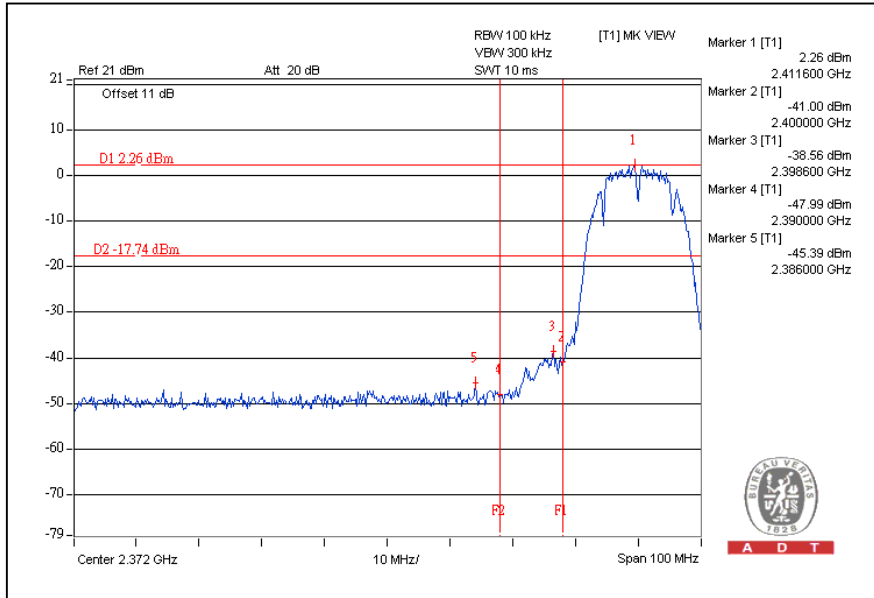
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



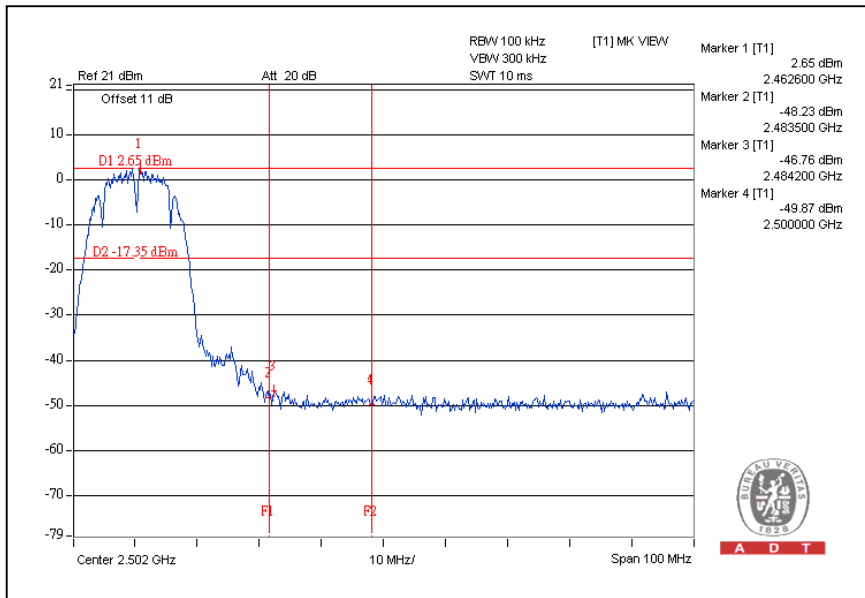
A D T

802.11b DSSS MODULATION:

CH1



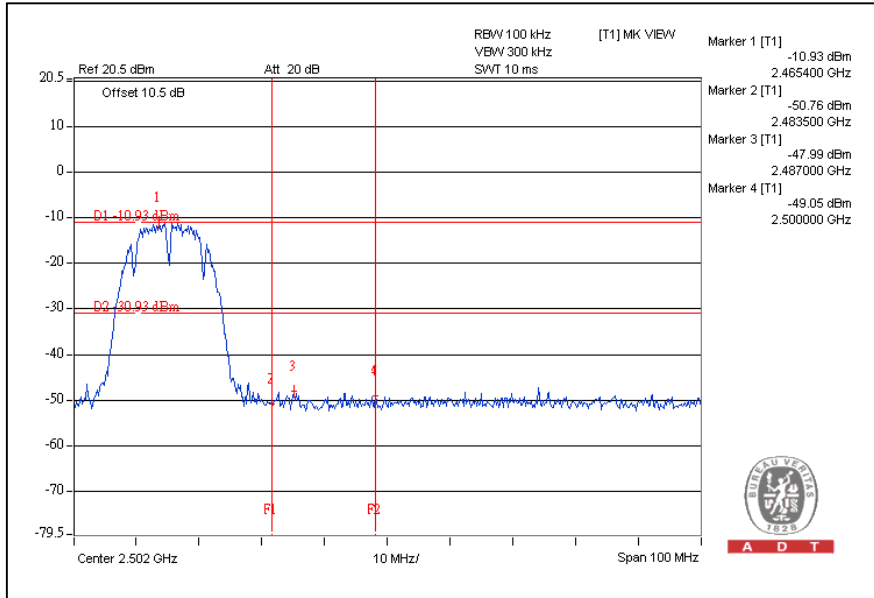
CH11



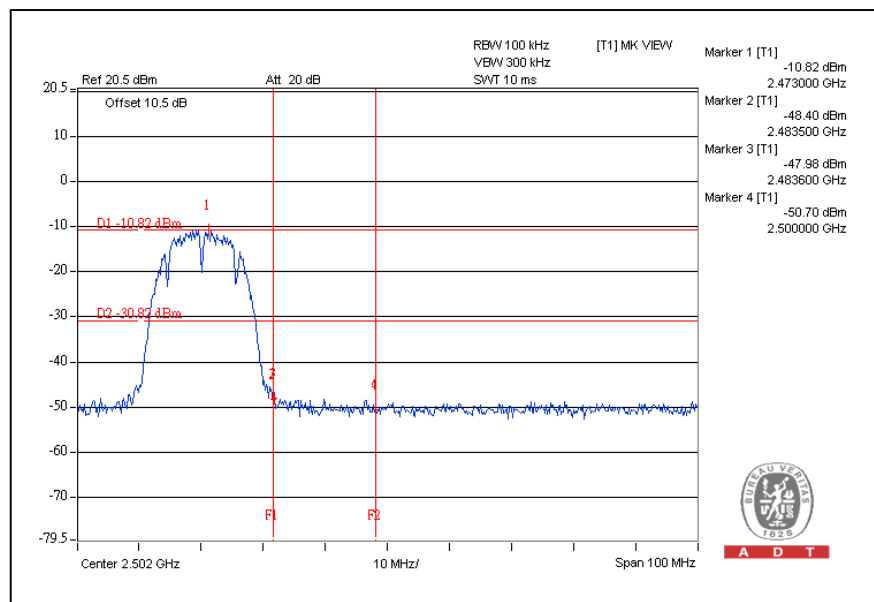


A D T

CH12



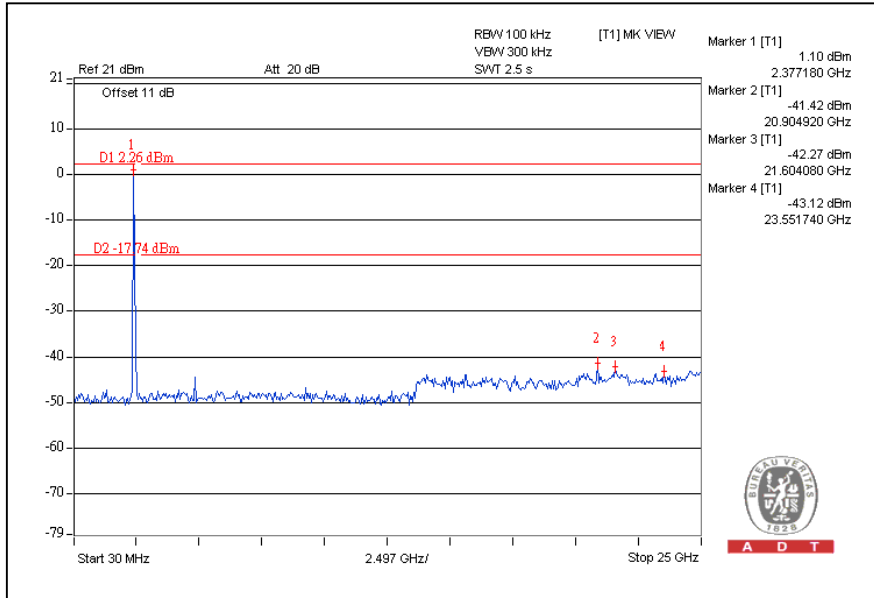
CH13



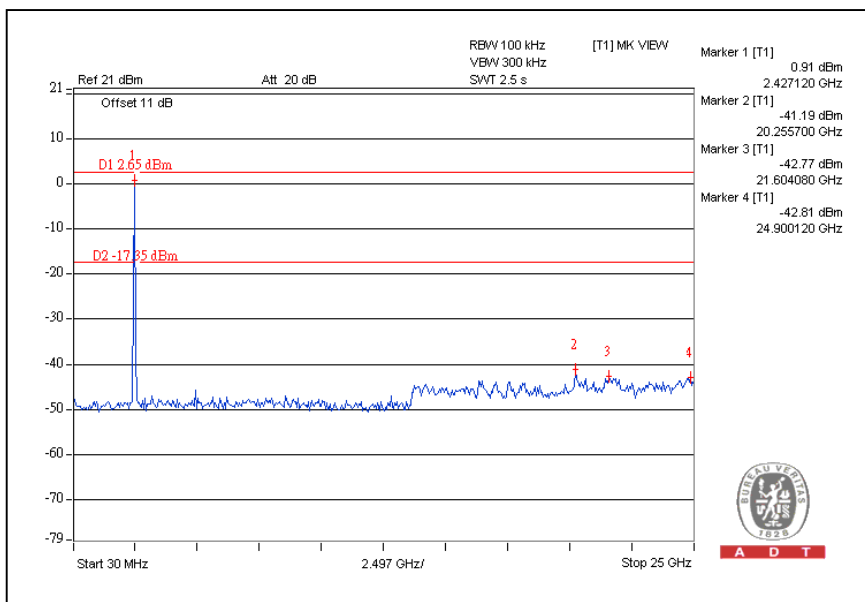


A D T

CH1



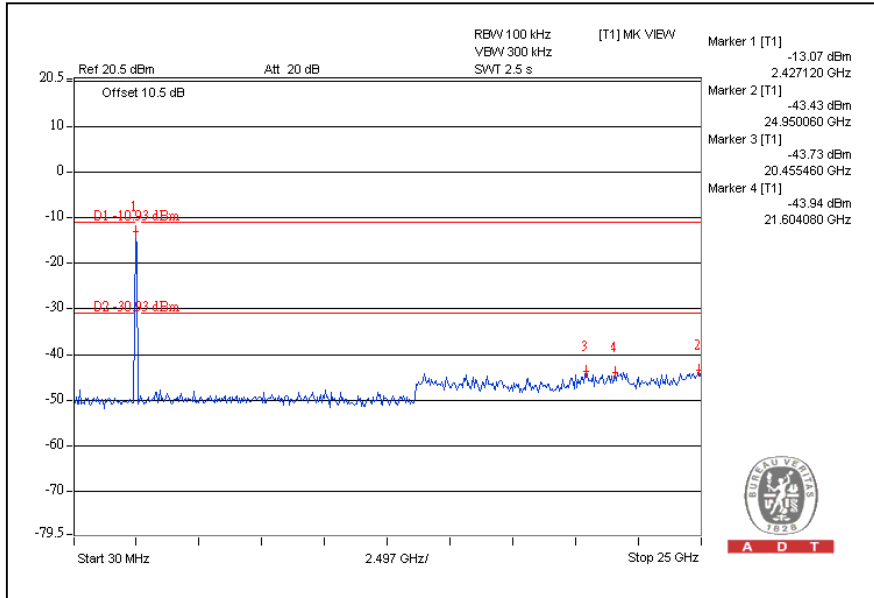
CH11



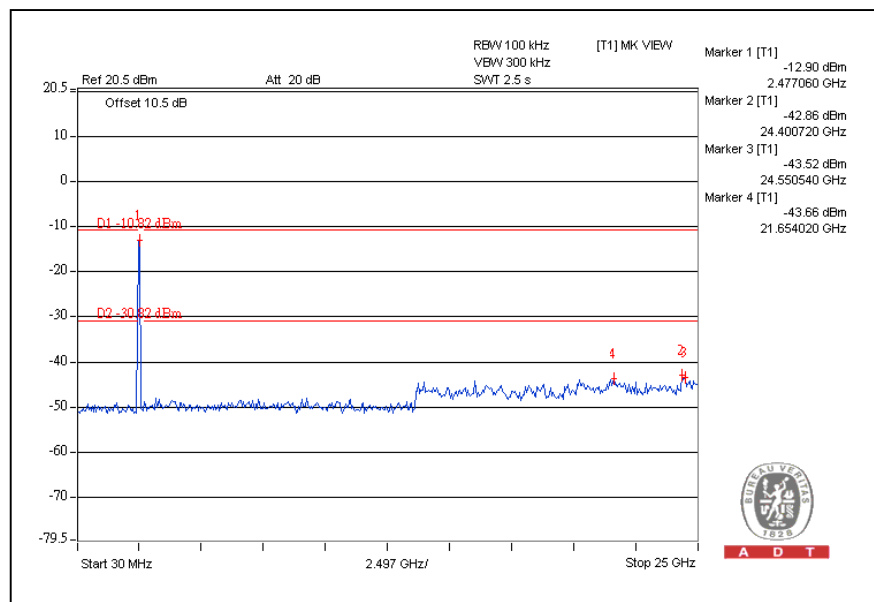


A D T

CH12



CH13

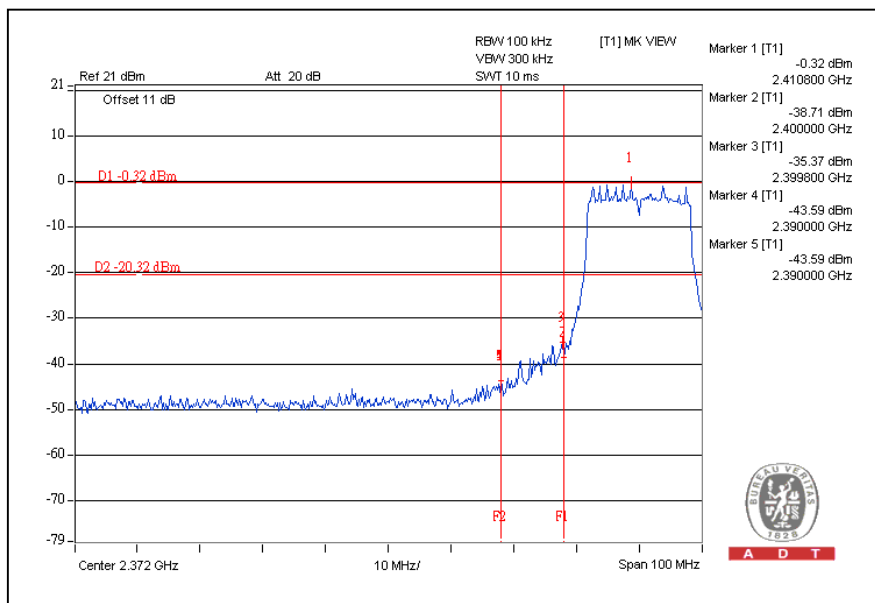




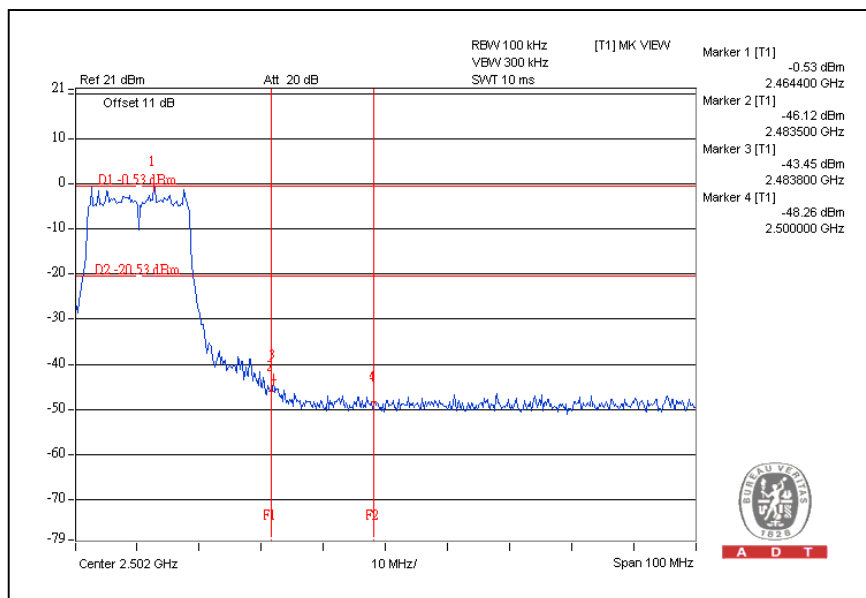
A D T

802.11g OFDM MODULATION:

CH1



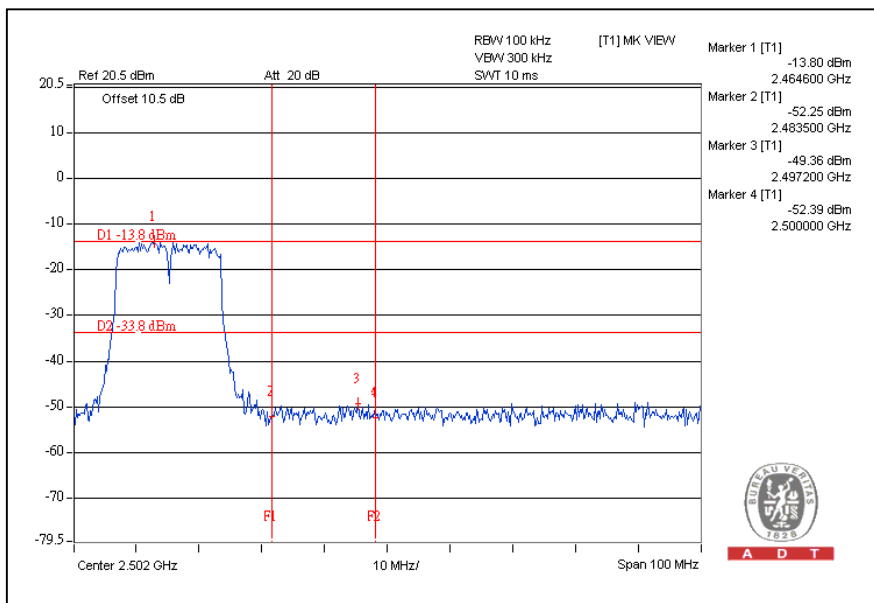
CH11



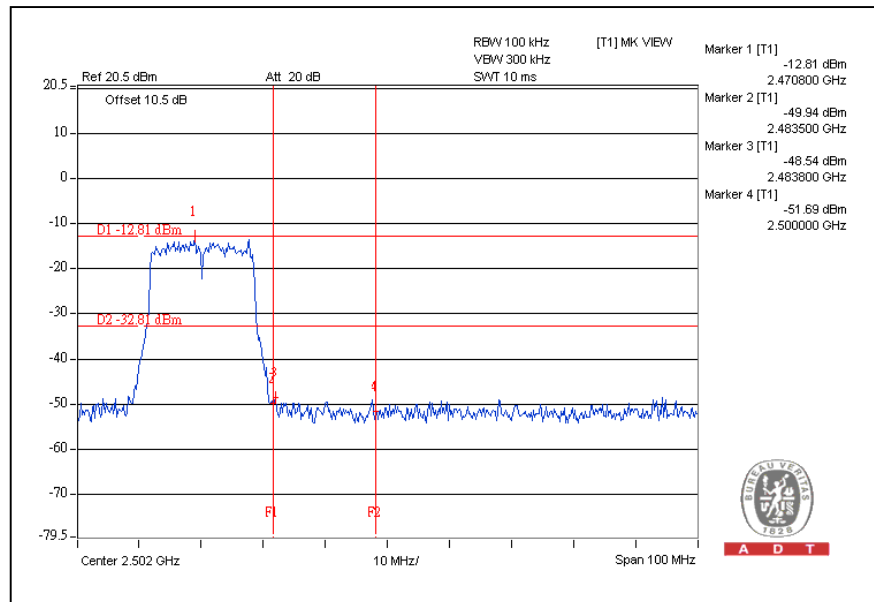


A D T

CH12



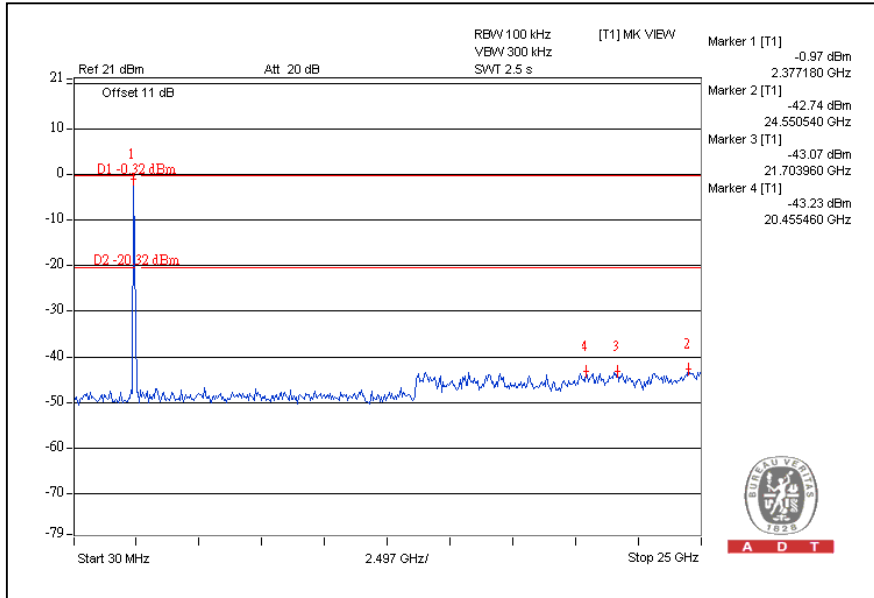
CH13



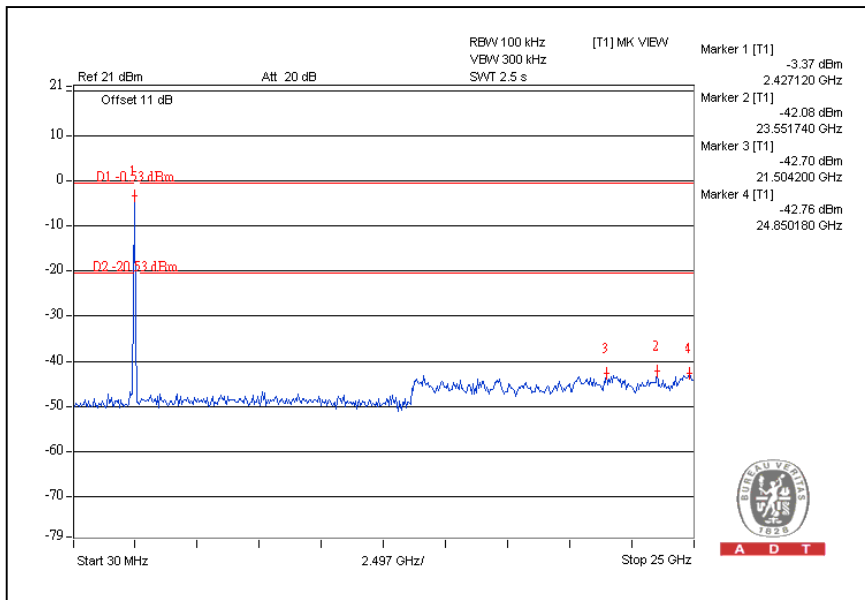


A D T

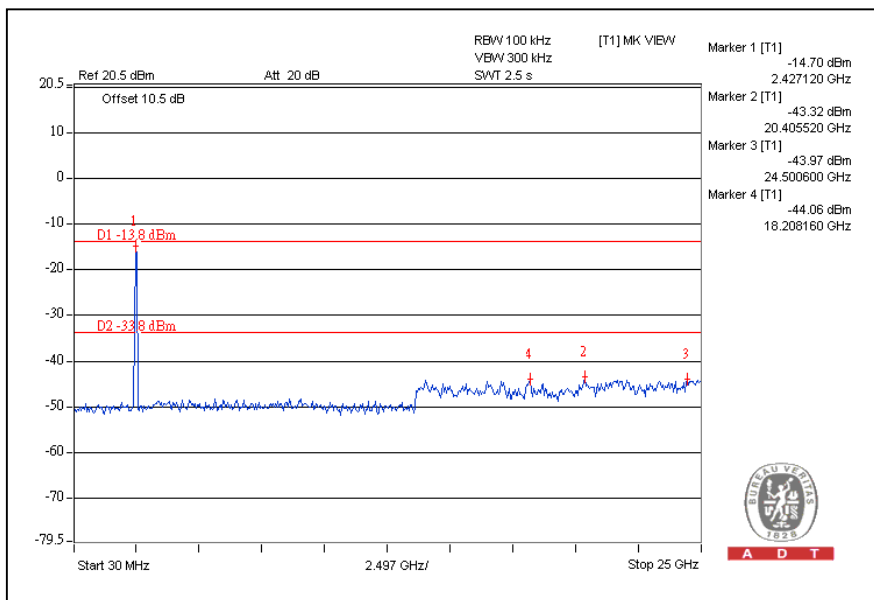
CH1



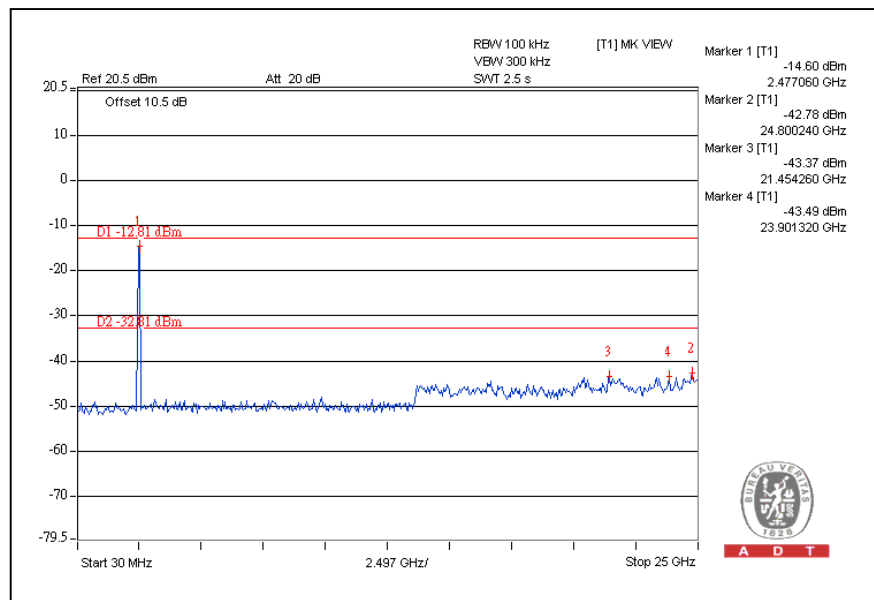
CH11



CH12



CH13





A D T

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.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2010	Mar. 08, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 08, 2010	Sep. 07, 2011
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 30, 2010	Aug. 29, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
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. C.
3. The VCCI Con C Registration No. is C-3611.

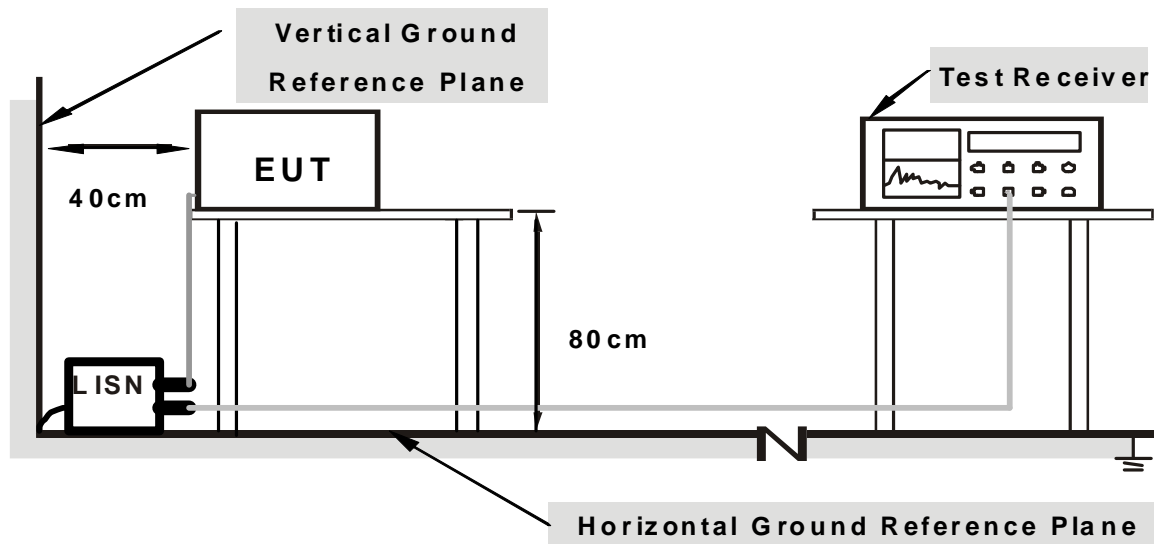
5.1.3 TEST PROCEDURES

- 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 cm 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

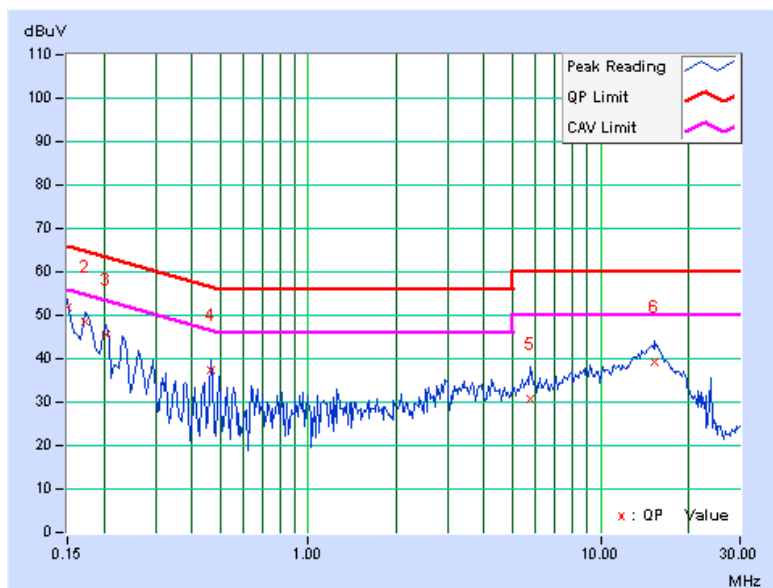
Same as the 4.1.6

5.1.7 TEST RESULTS (MODE A)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	51.83	-	51.93	-	66.00	56.00	-14.07	-
2	0.173	0.12	48.23	-	48.35	-	64.79	54.79	-16.45	-
3	0.205	0.13	45.42	-	45.55	-	63.42	53.42	-17.87	-
4	0.466	0.13	37.44	-	37.57	-	56.58	46.58	-19.01	-
5	5.762	0.28	30.41	-	30.69	-	60.00	50.00	-29.31	-
6	15.277	0.57	38.82	-	39.39	-	60.00	50.00	-20.61	-

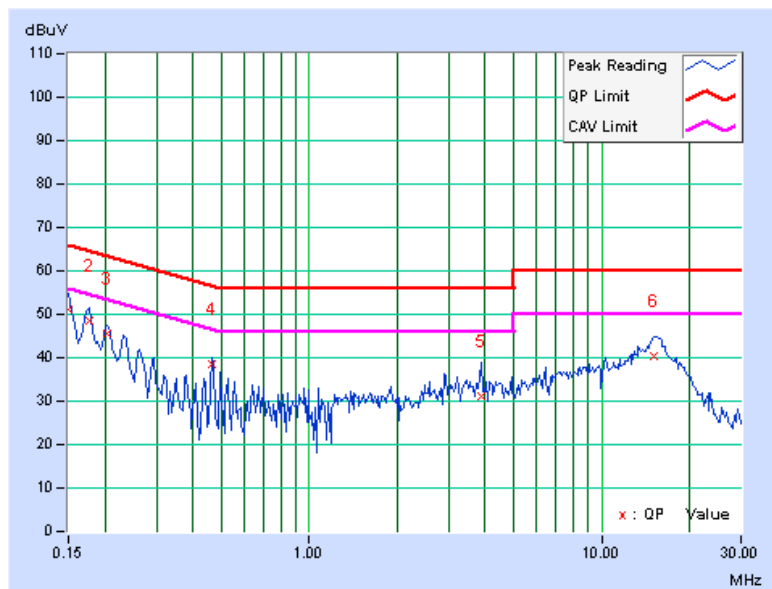
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.12	51.16	-	51.28	-	66.00	56.00	-14.72	-
2	0.177	0.13	48.29	-	48.42	-	64.61	54.61	-16.19	-
3	0.205	0.14	45.40	-	45.54	-	63.42	53.42	-17.88	-
4	0.466	0.15	38.24	-	38.39	-	56.58	46.58	-18.19	-
5	3.855	0.27	30.74	-	31.01	-	56.00	46.00	-24.99	-
6	15.090	1.13	39.18	-	40.31	-	60.00	50.00	-19.69	-

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

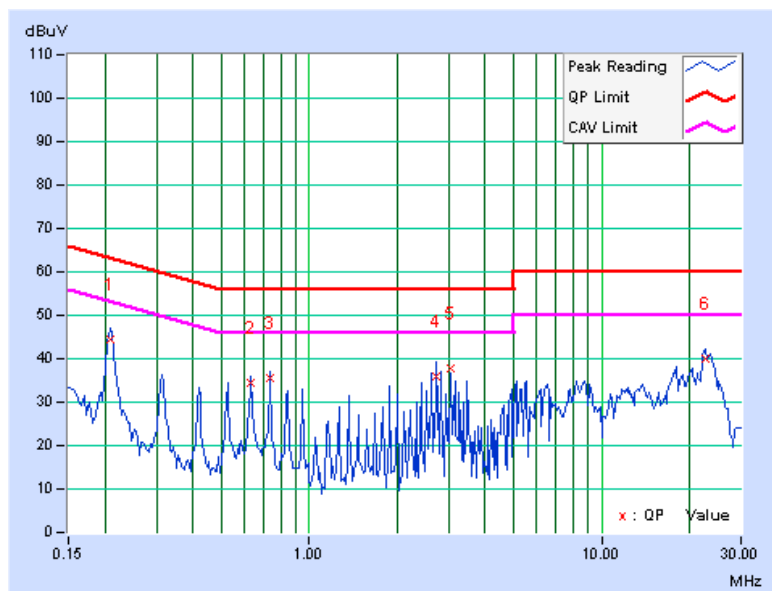


5.1.8 TEST RESULTS (MODE B)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.209	0.13	44.47	-	44.60	-	63.26
2	0.630	0.13	34.13	-	34.26	-	56.00	46.00	-21.74	-
3	0.736	0.14	35.41	-	35.55	-	56.00	46.00	-20.45	-
4	2.734	0.17	35.74	-	35.91	-	56.00	46.00	-20.09	-
5	3.047	0.18	37.45	-	37.63	-	56.00	46.00	-18.37	-
6	22.797	0.75	39.12	-	39.87	-	60.00	50.00	-20.13	-

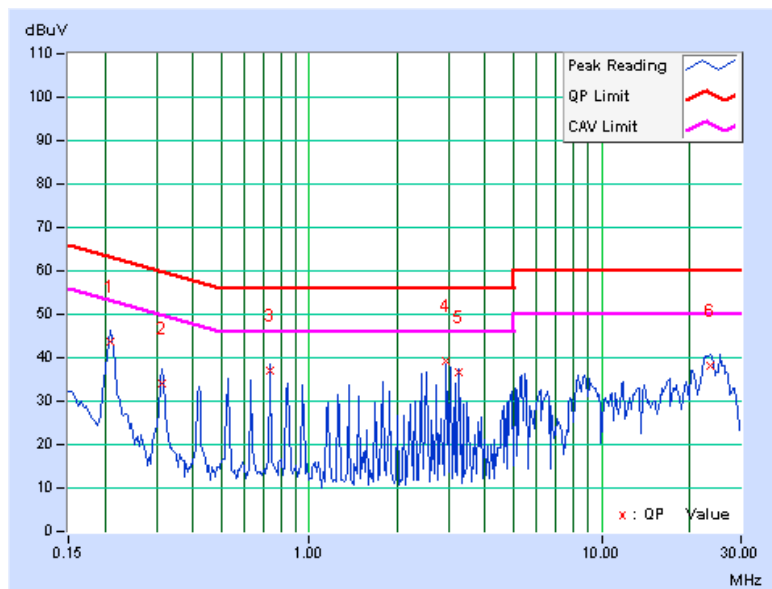
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.209	0.14	43.47	-	43.61	-	63.26	53.26	-19.65	-
2	0.314	0.15	34.07	-	34.22	-	59.86	49.86	-25.65	-
3	0.736	0.16	36.88	-	37.04	-	56.00	46.00	-18.96	-
4	2.941	0.23	39.05	-	39.28	-	56.00	46.00	-16.72	-
5	3.258	0.25	36.38	-	36.63	-	56.00	46.00	-19.37	-
6	23.531	1.69	36.61	-	38.30	-	60.00	50.00	-21.70	-

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



5.2 RADIATED EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED 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.



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5.2.2 TEST INSTRUMENTS

For below 1GHz test: (Test date: Dec. 07, 2010)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 29, 2010	Apr. 28, 2011
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 24, 2009	Dec. 23, 2010
RF Cable	NA	CHGCAB_001	NA	NA
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.



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For above 1GHz test: (Test date: Dec. 09, 2010)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	May 12 , 2010	May 11 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 01, 2010	Oct. 31, 2011
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 03, 2010	Sep. 02, 2011
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 28, 2010	Apr. 27, 2011
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 18, 2009	Dec. 17, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2010	Jan. 21, 2011
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 104+ Sucoflex 106	RF104-101+R F106-101	Aug. 24, 2010	Aug. 23, 2011
RF Cable	8DFB	STCCAB-30M- 1GHz	NA	NA
Software	ADT_Radiated_ V7.6.15.9.2	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) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

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

NOTE:

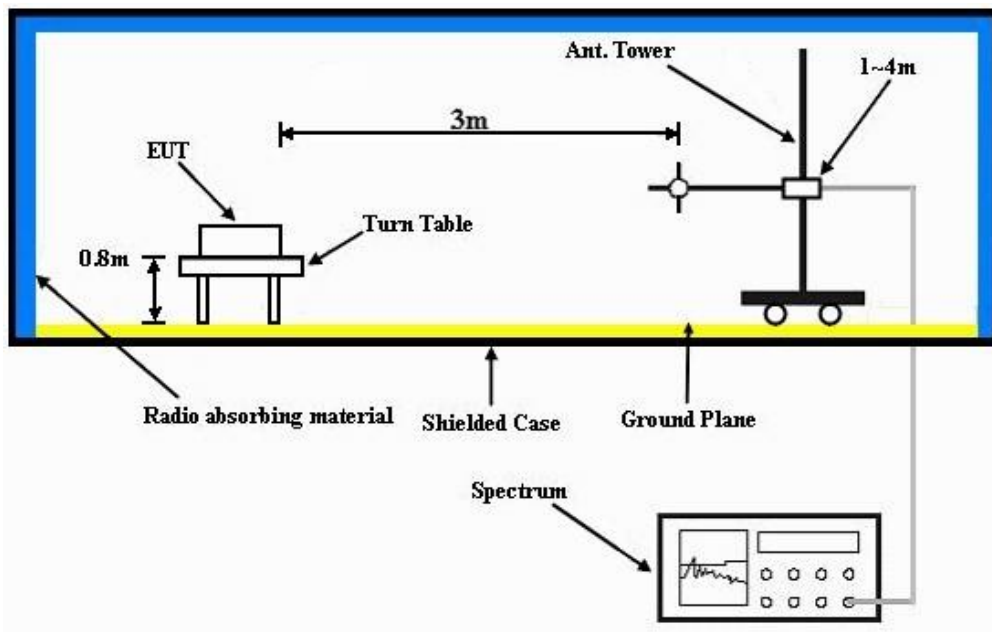
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK)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

5.2.4 DEVIATION FROM TEST STANDARD

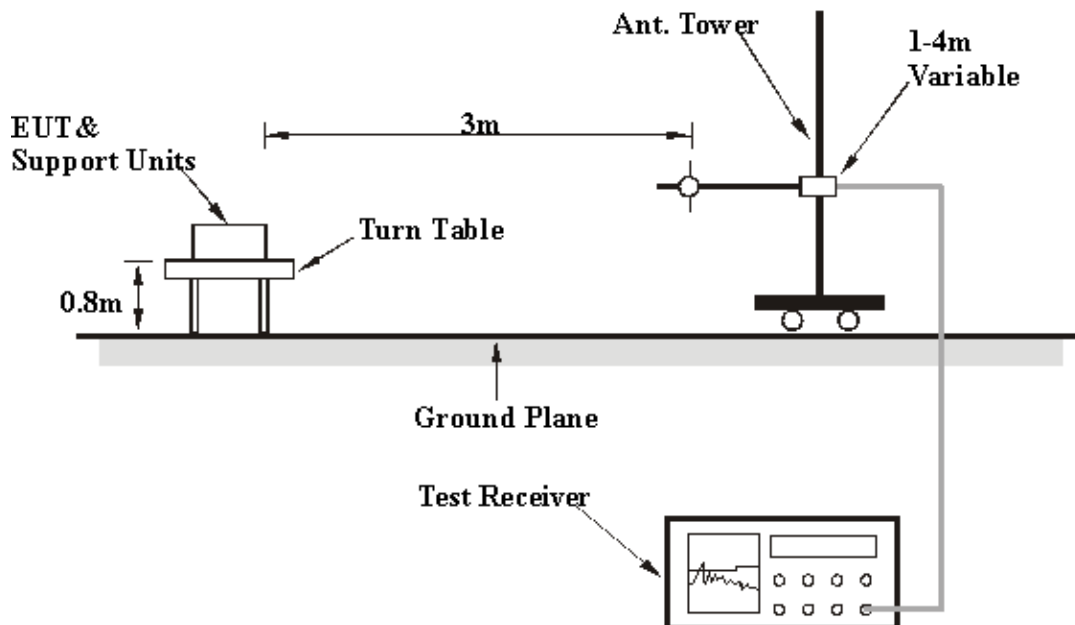
No deviation

5.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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 4.1.6



A D T

5.2.7 TEST RESULTS

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, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 71%RH 1024 hPa	TESTED BY	Kent Liu

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	96.08	31.2 QP	43.50	-12.3	2.00 H	24	22.06	9.16
2	147.12	33.2 QP	43.50	-10.3	2.00 H	314	19.24	14.00
3	180.00	32.2 QP	43.50	-11.3	1.50 H	24	20.21	11.95
4	219.30	30.7 QP	46.00	-15.3	1.55 H	285	18.86	11.82
5	263.41	32.5 QP	46.00	-13.5	1.25 H	64	18.49	13.98
6	385.77	30.3 QP	46.00	-15.7	1.00 H	349	12.96	17.37
7	700.04	31.6 QP	46.00	-14.4	1.50 H	24	7.90	23.67
8	750.01	29.2 QP	46.00	-16.8	1.00 H	342	4.89	24.33
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	96.20	30.3 QP	43.50	-13.2	1.00 V	360	21.10	9.17
2	133.15	32.7 QP	43.50	-10.8	1.00 V	360	19.14	13.55
3	228.83	31.3 QP	46.00	-14.8	1.00 V	360	18.93	12.32
4	385.74	28.6 QP	46.00	-17.4	1.75 V	22	11.27	17.37
5	434.89	28.4 QP	46.00	-17.6	1.25 V	155	9.87	18.52
6	700.04	27.5 QP	46.00	-18.5	1.00 V	70	3.87	23.67
7	799.98	28.7 QP	46.00	-17.3	1.00 V	272	3.67	25.00

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



A D T

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, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 70%RH 1024 hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	108.3 PK			1.24 H	208	66.14	42.16
2	*5745.00	99.2 AV			1.24 H	208	57.04	42.16
3	11490.00	57.4 PK	74.00	-16.6	1.02 H	326	8.78	48.62
4	11490.00	46.8 AV	54.00	-7.2	1.02 H	326	-1.82	48.62
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	107.9 PK			1.24 V	208	65.74	42.16
2	*5745.00	97.4 AV			1.24 V	208	55.24	42.16
3	11490.00	55.4 PK	74.00	-18.6	1.65 V	247	6.78	48.62
4	11490.00	45.2 AV	54.00	-8.8	1.65 V	247	-3.42	48.62

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 70%RH 1024 hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	109.0 PK			1.54 H	24	66.78	42.22
2	*5785.00	99.3 AV			1.54 H	24	57.08	42.22
3	11570.00	57.4 PK	74.00	-16.6	1.23 H	65	8.71	48.69
4	11570.00	46.1 AV	54.00	-7.9	1.23 H	65	-2.59	48.69
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	107.6 PK			1.25 V	222	65.38	42.22
2	*5785.00	97.6 AV			1.25 V	222	55.38	42.22
3	11570.00	54.4 PK	74.00	-19.6	1.25 V	246	5.71	48.69
4	11570.00	44.3 AV	54.00	-9.7	1.25 V	246	-4.39	48.69

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 70%RH 1024 hPa	TESTED BY	Eric Lee

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	108.6 PK			1.23 H	207	66.33	42.27
2	*5825.00	99.0 AV			1.23 H	207	56.73	42.27
3	11650.00	57.8 PK	74.00	-16.2	1.02 H	236	9.03	48.77
4	11650.00	46.3 AV	54.00	-7.7	1.02 H	236	-2.47	48.77
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	*5825.00	107.8 PK			1.24 V	216	65.53	42.27
2	*5825.00	97.8 AV			1.24 V	216	55.53	42.27
3	11650.00	54.2 PK	74.00	-19.8	1.20 V	236	5.43	48.77
4	11650.00	44.2 AV	54.00	-9.8	1.20 V	236	-4.57	48.77

- 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.
 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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 17, 2010	May 16, 2011

NOTE: 1. 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

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

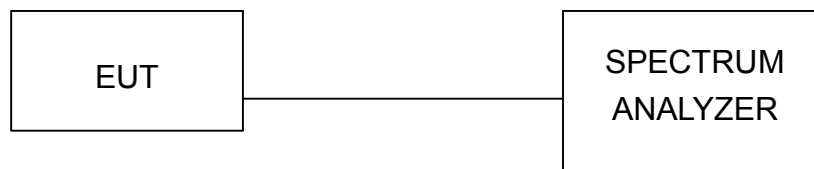
NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



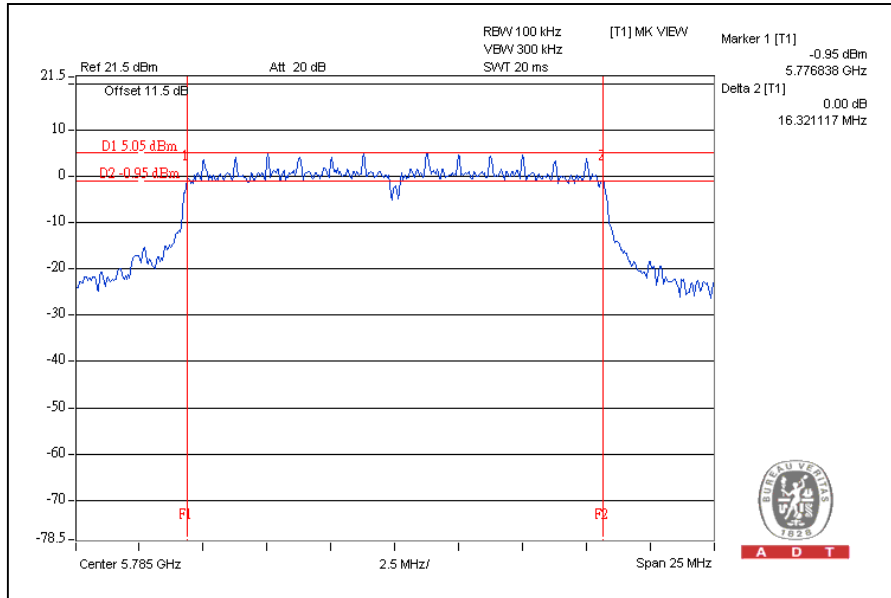
5.3.6 EUT OPERATING CONDITIONS

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



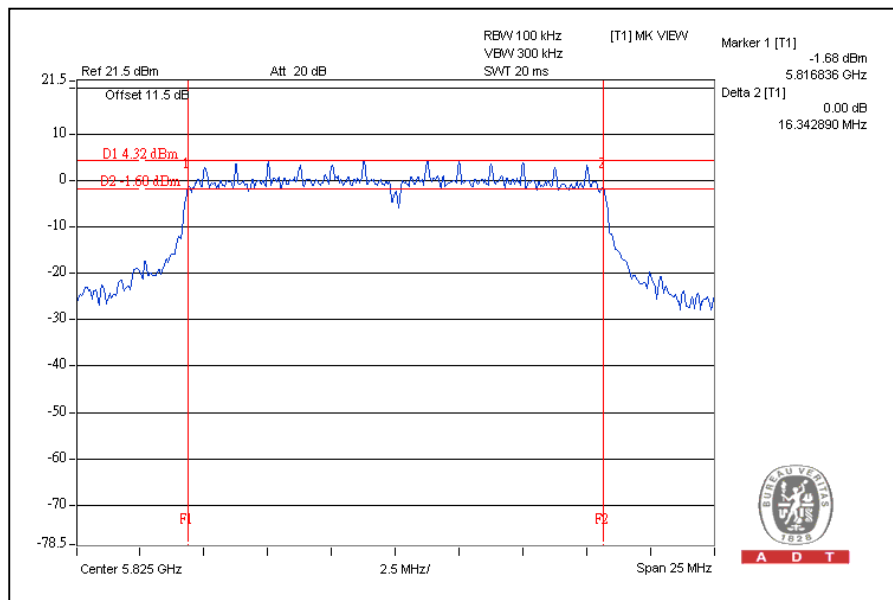
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5.4 MAXIMUM PEAK OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	May 04, 2010	May 03, 2011
Pulse Power Sensor	MA2411B	0738172	May 04, 2010	May 03, 2011

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

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

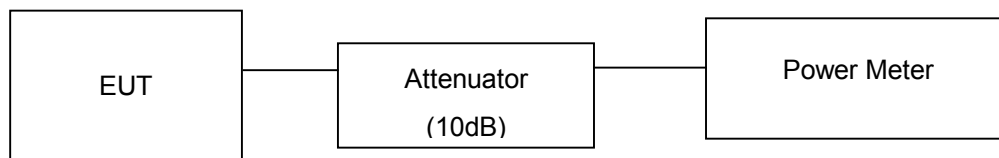
NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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



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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	134.9	21.3	30	PASS
157	5785	128.8	21.1	30	PASS
165	5825	123.0	20.9	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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 17, 2010	May 16, 2011

NOTE: 1. 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 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

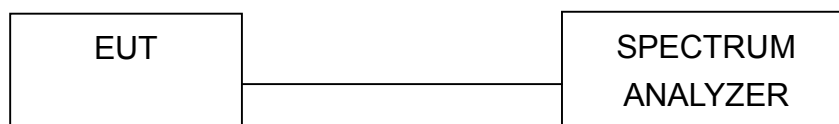
NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

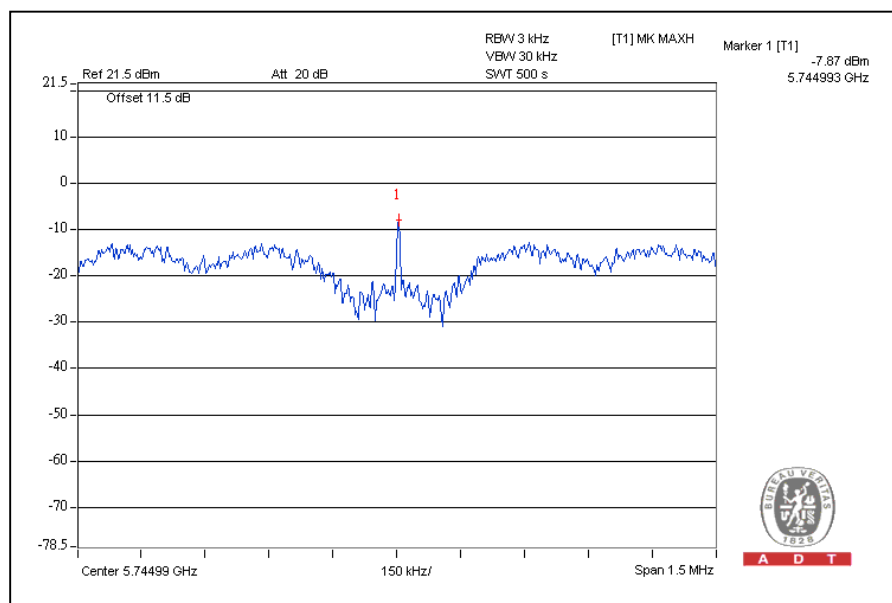
Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a OFDM modulation

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
149	5745	-7.9	8	PASS
157	5785	-8.1	8	PASS
165	5825	-8.1	8	PASS

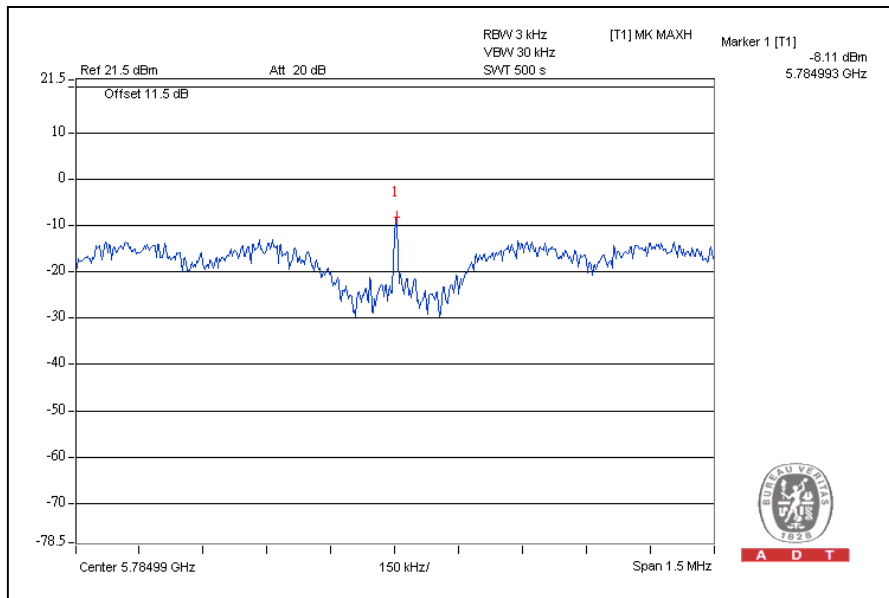
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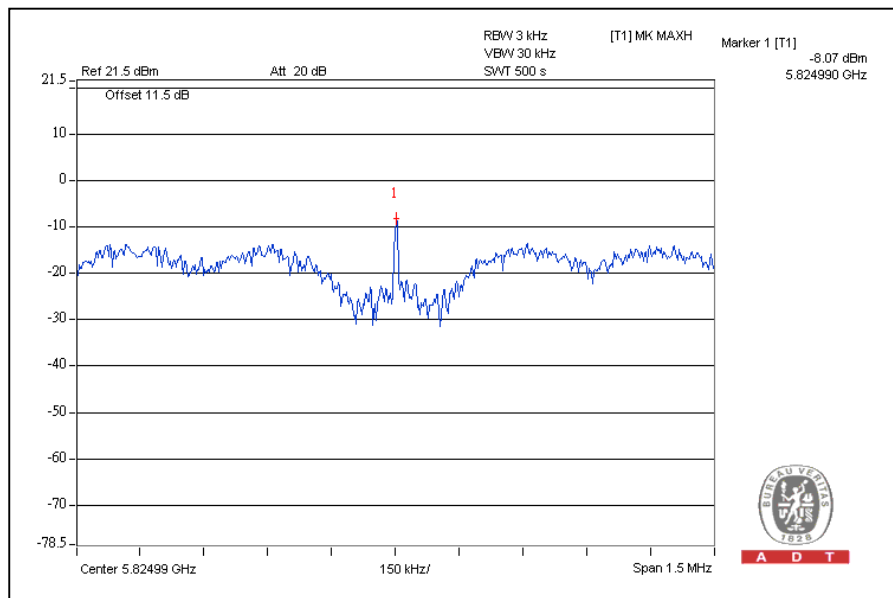
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5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
SPECTRUM ANALYZER R&S	FSP 40	100060	May 17, 2010	May 16, 2011

NOTE:

1. 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 lose cable. Set RBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

NOTE:

The EUT was setup to ANSI C63.4, tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

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

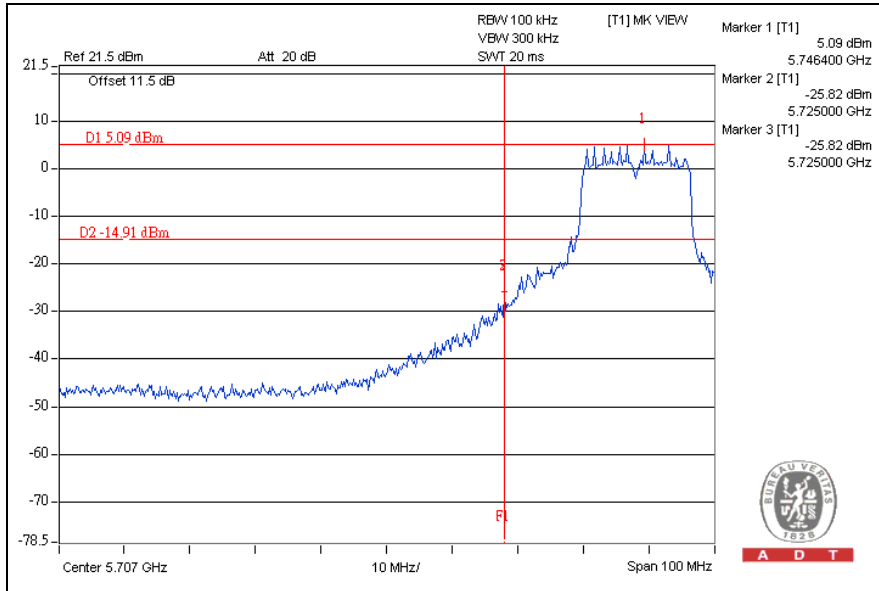
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).



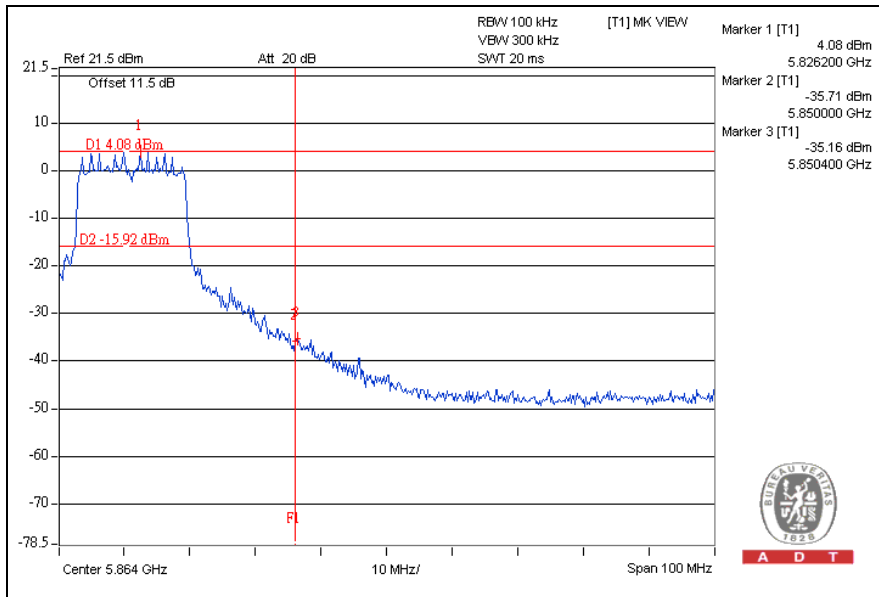
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802.11a OFDM modulation

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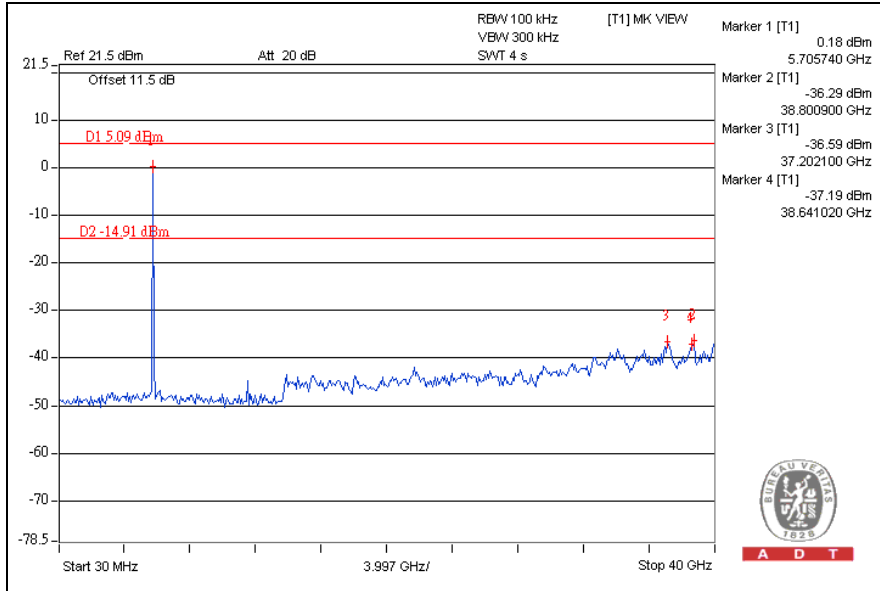
CH165



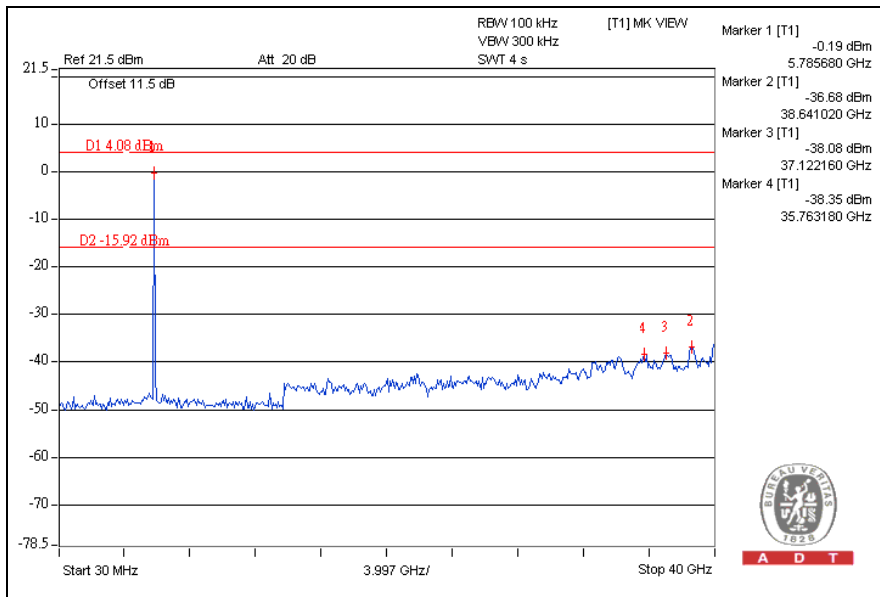


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6. INFORMATION ON THE TESTING LABORATORIES

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 certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml.
If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service@adt.com.tw

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 any modifications are made to the EUT by the lab during the test.

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