



FCC TEST REPORT (FOR WIRELESS LAN)

REPORT NO.: RF960830L03-2

Model No.: CLIO200

RECEIVED: Aug. 30, 2007

TESTED: Sep. 03 ~ Sep. 20, 2007

ISSUED: Oct. 01, 2007

APPLICANT: High Tech Computer Corp.

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ISSUED BY: Advance Data Technology Corporation

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

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TABLE OF CONTENTS

1.	CERTIFICATION.....	4
2.	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY.....	5
3.	GENERAL INFORMATION.....	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	8
3.2.1	CONFIGURATION OF SYSTEM UNDER TEST	9
3.2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	10
3.3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	11
3.3.4	DESCRIPTION OF SUPPORT UNITS	12
4.	TEST TYPES AND RESULTS	13
4.1	CONDUCTED EMISSION MEASUREMENT	13
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	13
4.1.2	TEST INSTRUMENTS.....	13
4.1.3	TEST PROCEDURES	14
4.1.4	DEVIATION FROM TEST STANDARD.....	14
4.1.5	TEST SETUP.....	15
4.1.6	EUT OPERATING CONDITIONS	15
4.1.7	TEST RESULTS	16
4.2	RADIATED EMISSION MEASUREMENT	22
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	22
4.2.2	TEST INSTRUMENTS.....	23
4.2.3	TEST PROCEDURES	24
4.2.4	DEVIATION FROM TEST STANDARD.....	24
4.2.5	TEST SETUP.....	25
4.2.6	EUT OPERATING CONDITIONS	25
4.2.7	TEST RESULTS	26
4.3	6dB BANDWIDTH MEASUREMENT.....	34
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	34
4.3.2	TEST INSTRUMENTS.....	34
4.3.3	TEST PROCEDURE.....	34
4.3.4	DEVIATION FROM TEST STANDARD.....	34
4.3.5	TEST SETUP.....	35
4.3.6	EUT OPERATING CONDITIONS	35
4.3.7	TEST RESULTS	36
4.4	MAXIMUM PEAK OUTPUT POWER.....	40
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	40
4.4.2	TEST INSTRUMENTS.....	40
4.4.3	TEST PROCEDURES	41
4.4.4	DEVIATION FROM TEST STANDARD.....	41
4.4.5	TEST SETUP.....	41
4.4.6	EUT OPERATING CONDITIONS	41
4.4.7	TEST RESULTS	42
4.5	POWER SPECTRAL DENSITY MEASUREMENT	43
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	43
4.5.2	TEST INSTRUMENTS.....	43
4.5.3	TEST PROCEDURE.....	43
4.5.4	DEVIATION FROM TEST STANDARD.....	43



4.5.5	TEST SETUP	44
4.5.6	EUT OPERATING CONDITION.....	44
4.5.7	TEST RESULTS	45
4.6	BAND EDGES MEASUREMENT	49
4.6.1	LIMITS OF BAND EDGES MEASUREMENT	49
4.6.2	TEST INSTRUMENTS.....	49
4.6.3	TEST PROCEDURE.....	49
4.6.4	DEVIATION FROM TEST STANDARD.....	49
4.6.5	EUT OPERATING CONDITION.....	49
4.6.6	TEST RESULTS	50
4.7	ANTENNA REQUIREMENT	58
4.7.1	STANDARD APPLICABLE	58
4.7.2	ANTENNA CONNECTED CONSTRUCTION	58
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	59
6.	INFORMATION ON THE TESTING LABORATORIES	60
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	61



1. CERTIFICATION

PRODUCT: UMPC

MODEL: CLIO200

APPLICANT: High Tech Computer Corp.

TESTED: Sep. 03 ~ Sep. 20, 2007

TEST SAMPLE: ENGINEERING SAMPLE

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

ANSI C63.4-2003

The above equipment (model: CLIO200) has been tested by **Advance Data Technology Corporation**, 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 : Rennie Wang , **DATE:** Oct. 01, 2007
Rennie Wang / Senior Specialist

TECHNICAL ACCEPTANCE : Long Chen , **DATE:** Oct. 01, 2007
Responsible for RF Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE:** Oct. 01, 2007
Gary Chang / Assistant Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -15.35dB at 0.182MHz.
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 -1.28dB at 249.60MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	UMPC
MODEL NO.	CLIO200
FCC ID	NM8CLIO200
POWER SUPPLY	7.4Vdc from rechargeable lithium battery 12.0Vdc from power adapter
MODULATION TYPE	Wireless LAN: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK
MODULATION TECHNOLOGY	DSSS, OFDM, FHSS
TRANSFER RATE	Wireless LAN: 802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps Bluetooth: 1/2/3Mbps
FREQUENCY RANGE	2400 ~ 2483.5MHz
NUMBER OF CHANNEL	Wireless LAN: 11 Bluetooth: 79
CHANNEL SPACING	Wireless LAN: 5MHz Bluetooth: 1MHz
OUTPUT POWER	Wireless LAN: 63.973mW Bluetooth: 1.042mW
ANTENNA TYPE	Wireless LAN: PIFA antenna with -1dBi gain Bluetooth: PIFA antenna with -1dBi gain
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	Adapter, Battery, Pouch, Extension Kit, Headset

NOTE:

- The EUT is a UMPC which has CDMA2000 1xEVDO/ 1xRTT .0/A (850/1900) + EVDO + WLAN (b/g) + BT v2.0 w EDR functions. This report is only covered the functions of wireless LAN. The Bluetooth function is covered in another test report (Report no.: RF960830L03-3). For CDMA850 function is covered in another test report, which standard used is FCC Part 22. And the CDMA1900 mobile phone function is covered in another test report, which standard used is FCC Part 24.
- The EUT has following accessories.

ACCESSORY	BRAND	MODEL	REMARKS
Pouch	Xigma	HTC-021	
Extension Kit	Goodway	HE2130	
Headset (1.7m)	hTC	HS G511	2.5mm audio connector

3. The communicated functions of EUT listed as below:

		850MHz	1900MHz	With 802.11b/g WLAN + Bluetooth w EDR functions
3G	CDMA	V	V	
	EVDO	V	V	
**CDMA, WLAN and BT functions are for data transmission only.				

4. The EUT has lithium batteries listed as below:

BATTERY A:	
BRAND:	Dynapack
MODEL:	CLIO160
RATING:	7.4Vdc, 2700mAh

BATTERY B:	
BRAND:	Simplo
MODEL:	CLIO160
RATING:	7.4Vdc, 2700mAh

NOTE: After pre-tested both batteries, found battery B is worse, therefore all the test results came out from this.

5. The EUT was operated with following power adapter:

BRAND:	DELTA ELECTRONICS, INC.
MODEL:	ADP-36EH A
INPUT:	100-240Vac, 1.0A, 50-60Hz
OUTPUT:	12Vdc, 3A
POWER LINE:	AC 1.6m non-shielded cable without core DC 1.8m non-shielded cable with one core

6. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.

7. Bluetooth technology is used in this EUT.





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

3.2 DESCRIPTION OF TEST MODES

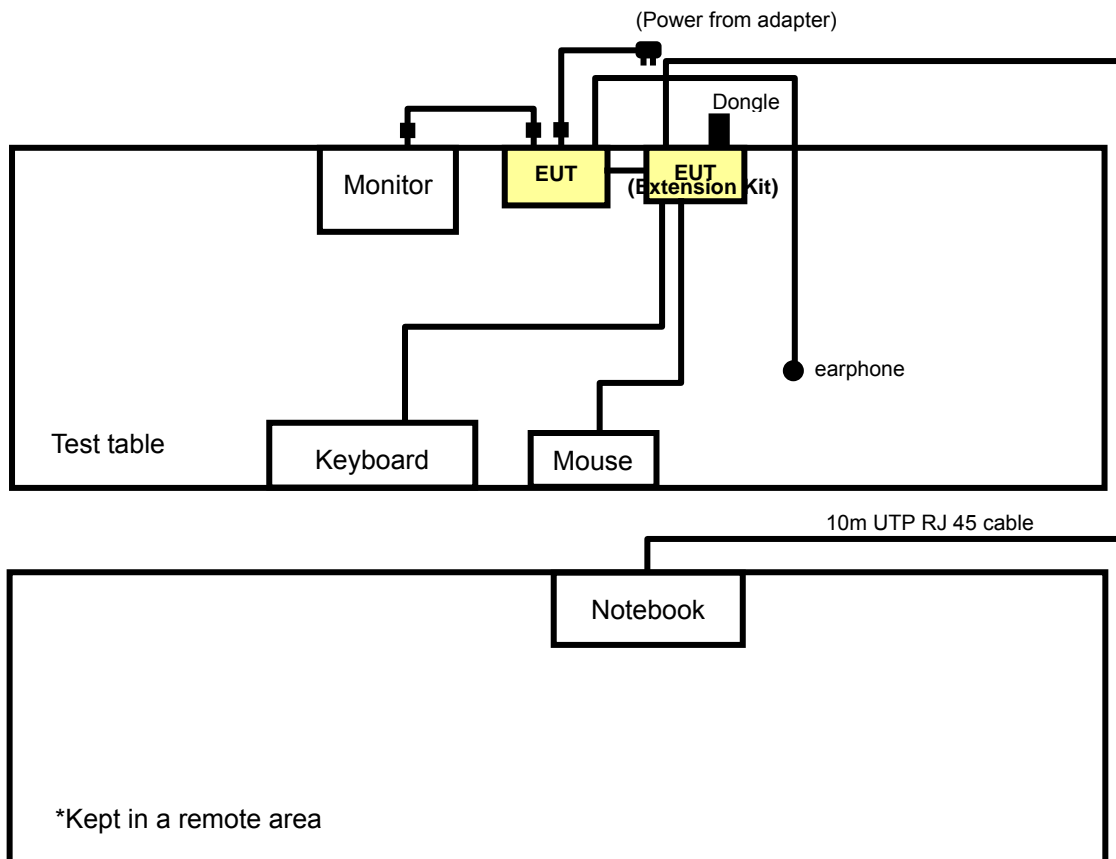
11 channels are provided to the EUT:

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

The EUT have been pre-tested under following situations, and found **mode A** is worse. Therefore the entire test came out with this one.

MODE	SITUATION	DESCRIPTION	CONFIGURATION
A	-	Open panel	
B	X-Axis	Close panel	
C	Y-Axis	Close panel	
D	Z-Axis	Close panel	

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

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.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	1 to 11	1, 6, 11	OFDM	BPSK	6

RADIATED EMISSION TEST (BELOW 1 GHz):

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	1 to 11	11	OFDM	BPSK	6

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	1 to 11	1, 6, 11	DSSS	DBPSK	1
-	1 to 11	1, 6, 11	OFDM	BPSK	6

BANDEDGE MEASUREMENT:

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	1 to 11	1, 11	DSSS	DBPSK	1
A	1 to 11	1, 11	OFDM	BPSK	6

ANTENNA PORT CONDUCTED MEASUREMENT:

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

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	1 to 11	1, 6, 11	DSSS	DBPSK	1
A	1 to 11	1, 6, 11	OFDM	BPSK	6

3.3.3 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

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

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



3.3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	LCD MONITOR	ACER	AL1511 bm	ET.L1408.04334 80013APK01	FCC DoC Approved
2	KEYBOARD	DELL	RT7D50	CN-0J4624-371 72-44T-000M	FCC DoC Approved
3	MOUSE	DELL	MO56UO	513021808	FCC DoC Approved
4	DONGLE	Transcend	Jetflash 512M	NA	NA
5	NOTEBOOK COMPUTER	DELL	PP05L	18661245328	E2K24CLNS

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.5m shielded cable
2	2m foil shielded wire, USB Connector, w/o core.
3	1.8m foil shielded wire, USB Connector, w/o core.
4	NA
5	10m UTP RJ45 cable

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 5 acted as communication partner to transfer data.

4. TEST TYPES AND RESULTS

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 UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 08, 2007
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2008
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 08, 2008
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 16, 2008
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.



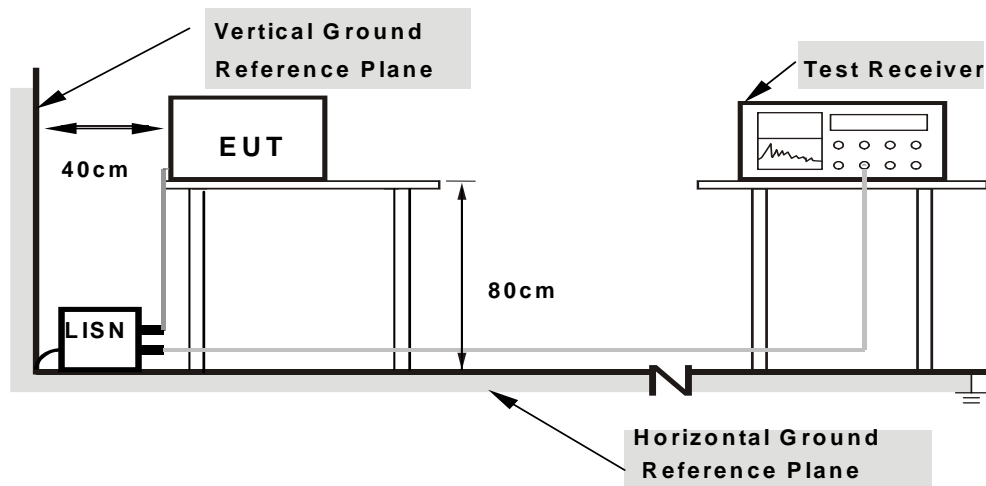
4.1.3 TEST PROCEDURES

- 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) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Prepared notebook system outside of testing area to act as a communication partner.
- c. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- d. The necessary accessories enable the system in full functions.

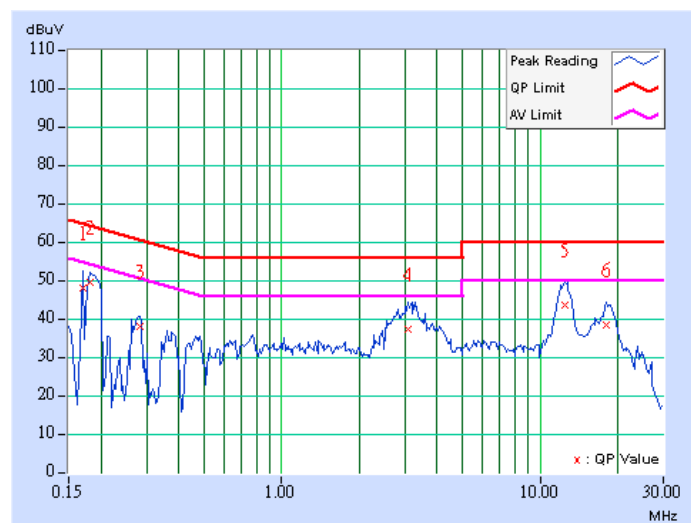
4.1.7 TEST RESULTS

CONDUCTED WORST CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 992hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	TESTED BY	Dean Wang

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.10	47.74	-	47.84	-	64.98	54.98	-17.14	-
2	0.182	0.10	48.93	-	49.03	-	64.38	54.38	-15.35	-
3	0.283	0.10	37.71	-	37.81	-	60.73	50.73	-22.92	-
4	3.074	0.25	36.92	-	37.17	-	56.00	46.00	-18.83	-
5	12.430	0.40	43.31	-	43.71	-	60.00	50.00	-16.29	-
6	17.984	0.53	38.13	-	38.66	-	60.00	50.00	-21.34	-

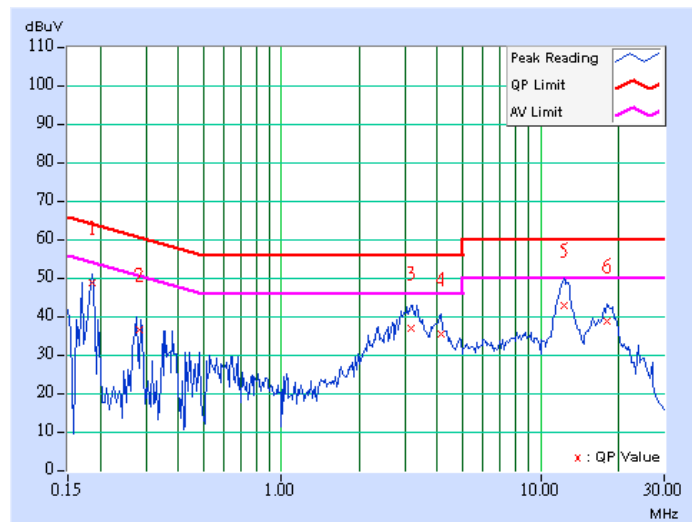
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 992hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	TESTED BY	Dean Wang

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.186	0.10	48.24	-	48.34	-	64.19	54.19	-15.85	-
2	0.281	0.10	36.17	-	36.27	-	60.78	50.78	-24.51	-
3	3.168	0.26	36.41	-	36.67	-	56.00	46.00	-19.33	-
4	4.141	0.28	35.16	-	35.44	-	56.00	46.00	-20.56	-
5	12.258	0.45	42.27	-	42.72	-	60.00	50.00	-17.28	-
6	18.105	0.54	38.34	-	38.88	-	60.00	50.00	-21.12	-

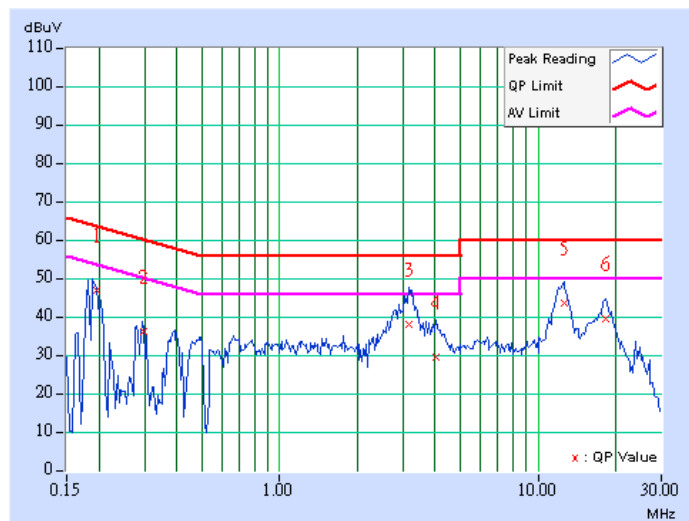
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 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 992hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	TESTED BY	Dean Wang

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.10	46.65	-	46.75	-	63.75	53.75	-17.00	-
2	0.297	0.10	35.77	-	35.87	-	60.32	50.32	-24.45	-
3	3.176	0.26	37.55	-	37.81	-	56.00	46.00	-18.19	-
4	4.051	0.28	28.95	-	29.23	-	56.00	46.00	-26.77	-
5	12.605	0.41	43.23	-	43.64	-	60.00	50.00	-16.36	-
6	18.352	0.54	38.99	-	39.53	-	60.00	50.00	-20.47	-

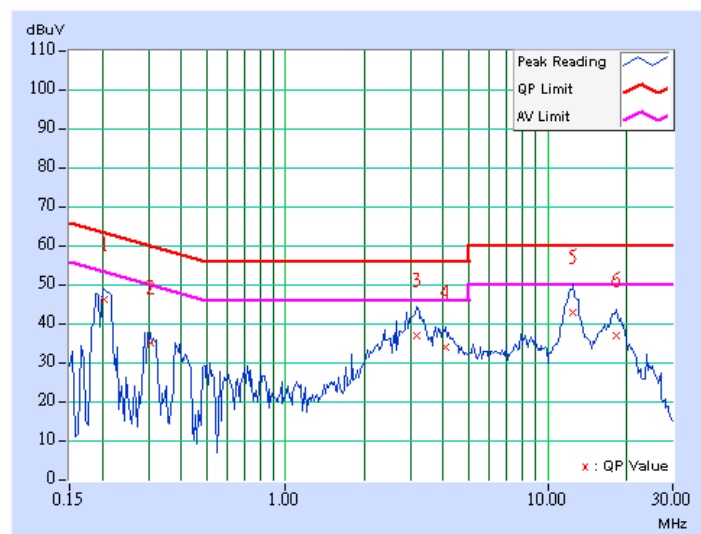
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 992hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	TESTED BY	Dean Wang

No	Freq. [MHz]	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor (dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	0.10	45.79	-	45.89	-	63.42	53.42	-17.53	-
2	0.306	0.10	34.71	-	34.81	-	60.07	50.07	-25.26	-
3	3.171	0.26	36.47	-	36.73	-	56.00	46.00	-19.27	-
4	4.082	0.28	33.65	-	33.93	-	56.00	46.00	-22.07	-
5	12.484	0.45	42.58	-	43.03	-	60.00	50.00	-16.97	-
6	18.355	0.54	36.45	-	36.99	-	60.00	50.00	-23.01	-

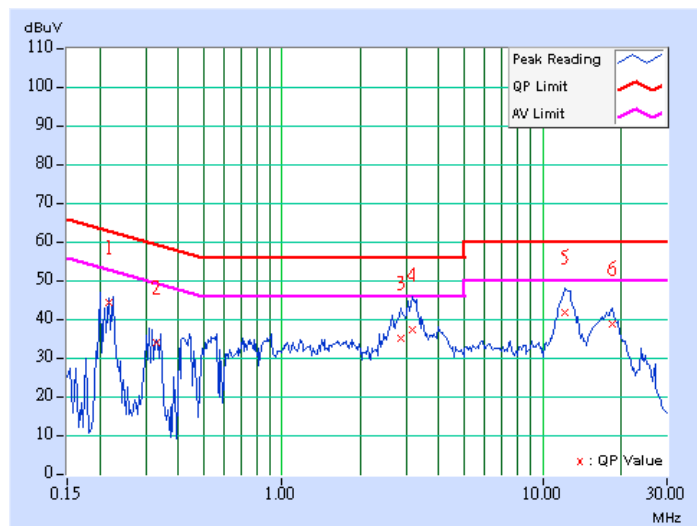
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 992hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	TESTED BY	Dean Wang

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	0.217	0.10	44.05	-	44.15	-	62.94	52.94	-18.79	-
2	0.328	0.10	33.56	-	33.66	-	59.50	49.50	-25.84	-
3	2.859	0.25	34.67	-	34.92	-	56.00	46.00	-21.08	-
4	3.172	0.26	36.83	-	37.09	-	56.00	46.00	-18.91	-
5	12.203	0.40	41.15	-	41.55	-	60.00	50.00	-18.45	-
6	18.414	0.54	38.26	-	38.80	-	60.00	50.00	-21.20	-

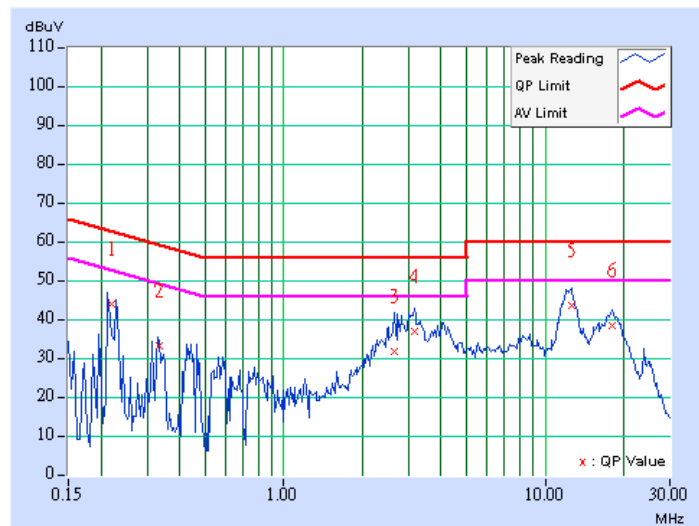
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	26deg. C, 68%RH, 992hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TRANSFER RATE	6Mbps	TESTED BY	Dean Wang

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.220	0.10	43.67	-	43.77	-	62.81	52.81	-19.04	-
2	0.332	0.10	32.79	-	32.89	-	59.40	49.40	-26.51	-
3	2.645	0.24	31.40	-	31.64	-	56.00	46.00	-24.36	-
4	3.152	0.25	36.35	-	36.60	-	56.00	46.00	-19.40	-
5	12.605	0.46	43.01	-	43.47	-	60.00	50.00	-16.53	-
6	18.043	0.53	38.07	-	38.60	-	60.00	50.00	-21.40	-

- 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.



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 29, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 01, 2007
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 04, 2008
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-405	Dec. 18, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 16, 2008
Preamplifier Agilent	8449B	3008A1960	Oct. 30, 2007
Preamplifier Agilent	8447D	2944A10631	Oct. 30, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	230128/4	Nov. 14, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	233233/4	Nov. 14, 2007
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Chamber 4.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC3789B-4.

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 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using the peak, quasi-peak or average method as specified and then reported in a data sheet.

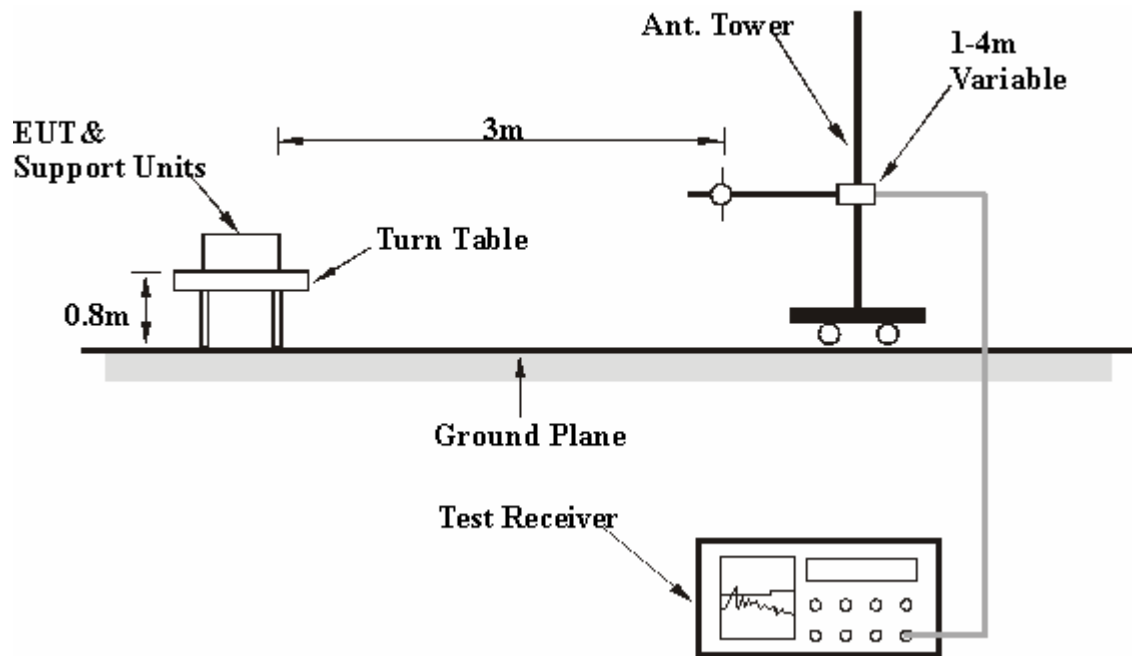
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz 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 attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

RADIATED BELOW 1GHz TEST DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH, 998hPa	TESTED BY	Morgan Chen

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	39.62	33.58 QP	40.00	-6.42	1.50 H	148	18.95	14.63
2	72.67	38.25 QP	40.00	-1.75	1.50 H	160	26.13	12.13
3	123.23	40.55 QP	43.50	-2.95	1.50 H	343	27.73	12.82
4	167.94	32.56 QP	43.50	-10.94	1.50 H	25	18.65	13.91
5	249.60	44.72 QP	46.00	-1.28	1.00 H	175	31.25	13.47
6	329.32	35.28 QP	46.00	-10.72	1.00 H	172	19.36	15.92
7	434.31	37.41 QP	46.00	-8.59	2.00 H	4	18.56	18.85
8	500.42	35.13 QP	46.00	-10.87	1.50 H	127	14.84	20.29
9	624.85	40.58 QP	46.00	-5.42	1.00 H	112	17.56	23.02
10	714.29	35.05 QP	46.00	-10.95	2.00 H	310	10.44	24.61
11	751.23	43.06 QP	46.00	-2.94	1.00 H	109	17.40	25.65
12	875.67	38.57 QP	46.00	-7.43	1.50 H	130	11.28	27.29

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH, 998hPa	TESTED BY	Morgan Chen

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	39.62	36.45 QP	40.00	-3.55	1.00 V	301	21.82	14.63
2	64.90	36.37 QP	40.00	-3.63	1.50 V	280	23.02	13.35
3	125.17	40.14 QP	43.50	-3.36	1.00 V	166	27.21	12.93
4	249.60	38.96 QP	46.00	-7.04	1.00 V	193	25.49	13.47
5	519.86	38.47 QP	46.00	-7.53	1.00 V	4	17.80	20.67
6	624.85	39.36 QP	46.00	-6.64	1.00 V	67	16.34	23.02
7	665.68	35.72 QP	46.00	-10.28	2.00 V	190	11.94	23.78
8	716.23	37.81 QP	46.00	-8.19	1.00 V	355	13.15	24.67
9	751.23	39.47 QP	46.00	-6.53	1.50 V	133	13.82	25.65
10	875.67	37.28 QP	46.00	-8.72	1.00 V	142	9.99	27.29
11	914.55	38.35 QP	46.00	-7.65	1.50 V	181	10.54	27.81

- 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.

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 995hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Kevin Liang

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	2390.000	55.40 PK	74.00	-18.60	1.41 H	260	23.17	32.23
2	2390.000	44.34 AV	54.00	-9.66	1.41 H	260	12.11	32.23
3	*2412.000	103.56 PK			1.34 H	254	71.24	32.32
4	*2412.000	98.69 AV			1.34 H	254	66.37	32.32
5	4824.000	46.20 PK	74.00	-27.80	1.32 H	340	7.71	38.49
6	4824.000	34.47 AV	54.00	-19.53	1.32 H	340	-4.02	38.49

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	2390.000	56.93 PK	74.00	-17.07	1.22 V	165	24.70	32.23
2	2390.000	44.75 AV	54.00	-9.25	1.22 V	165	12.52	32.23
3	*2412.000	104.91 PK			1.21 V	173	72.59	32.32
4	*2412.000	100.13 AV			1.21 V	173	67.81	32.32
5	4824.000	48.67 PK	74.00	-25.33	1.68 V	171	10.18	38.49
6	4824.000	34.98 AV	54.00	-19.02	1.68 V	171	-3.51	38.49

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 995hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Kevin Liang

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	*2437.000	104.58 PK			1.32 H	126	72.17	32.41
2	*2437.000	100.85 AV			1.32 H	256	68.44	32.41
3	4874.000	47.35 PK	74.00	-26.65	1.28 H	241	8.66	38.69
4	4874.000	35.51 AV	54.00	-18.49	1.28 H	241	-3.18	38.69

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	*2437.000	105.24 PK			1.30 V	37	72.83	32.41
2	*2437.000	100.33 AV			1.30 V	37	67.92	32.41
3	4874.000	48.23 PK	74.00	-25.77	1.05 V	211	9.54	38.69
4	4874.000	37.02 AV	54.00	-16.98	1.05 V	211	-1.67	38.69

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	DBPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
TRANSFER RATE	1Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 995hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Kevin Liang

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	*2462.000	104.67 PK			1.33 H	130	72.16	32.51
2	*2462.000	100.27 AV			1.33 H	319	67.76	32.51
3	2483.500	57.72 PK	74.00	-16.28	1.28 H	130	25.13	32.59
4	2483.500	45.21 AV	54.00	-8.79	1.28 H	130	12.62	32.59
5	4924.000	46.52 PK	74.00	-27.48	1.41 H	224	7.67	38.85
6	4924.000	34.39 AV	54.00	-19.61	1.41 H	224	-4.46	38.85

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	*2462.000	105.50 PK			1.13 V	170	72.99	32.51
2	*2462.000	100.61 AV			1.13 V	170	68.10	32.51
3	2483.500	57.47 PK	74.00	-16.53	1.16 V	183	24.88	32.59
4	2483.500	46.07 AV	54.00	-7.93	1.16 V	183	13.48	32.59
5	4924.000	48.11 PK	74.00	-25.89	1.06 V	280	9.26	38.85
6	4924.000	34.59 AV	54.00	-19.41	1.06 V	280	-4.26	38.85

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

802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 995hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Kevin Liang

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	2390.000	64.38 PK	74.00	-9.62	1.39 H	136	32.15	32.23
2	2390.000	46.85 AV	54.00	-7.15	1.39 H	136	14.62	32.23
3	*2412.000	105.06 PK			1.41 H	135	72.74	32.32
4	*2412.000	94.39 AV			1.41 H	135	62.07	32.32
5	4824.000	47.30 PK	74.00	-26.70	1.07 H	248	8.81	38.49
6	4824.000	34.55 AV	54.00	-19.45	1.07 H	248	-3.94	38.49

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	2390.000	59.46 PK	74.00	-14.54	1.65 V	32	27.23	32.23
2	2390.000	45.21 AV	54.00	-8.79	1.65 V	32	12.98	32.23
3	*2412.000	106.93 PK			1.15 V	173	74.61	32.32
4	*2412.000	96.29 AV			1.15 V	173	63.97	32.32
5	4824.000	47.89 PK	74.00	-26.11	1.16 V	19	9.40	38.49
6	4824.000	34.85 AV	54.00	-19.15	1.16 V	19	-3.64	38.49

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 995hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Kevin Liang

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	*2437.000	105.98 PK			1.32 H	126	73.57	32.41
2	*2437.000	95.34 AV			1.32 H	126	62.93	32.41
3	4874.000	47.34 PK	74.00	-26.66	1.02 H	288	8.65	38.69
4	4874.000	34.42 AV	54.00	-19.58	1.02 H	288	-4.27	38.69

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	*2437.000	107.08 PK			1.20 V	174	74.67	32.41
2	*2437.000	96.18 AV			1.20 V	174	63.77	32.41
3	4874.000	47.72 PK	74.00	-26.28	1.28 V	42	9.03	38.69
4	4874.000	34.43 AV	54.00	-19.57	1.28 V	42	-4.26	38.69

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak (PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 995hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Kevin Liang

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	*2462.000	105.62 PK			1.34 H	131	73.11	32.51
2	*2462.000	94.82 AV			1.34 H	131	62.31	32.51
3	2483.500	62.17 PK	74.00	-11.83	1.29 H	133	29.58	32.59
4	2483.500	46.64 AV	54.00	-7.36	1.29 H	133	14.05	32.59
5	4924.000	47.71 PK	74.00	-26.29	1.00 H	30	8.86	38.85
6	4924.000	34.75 AV	54.00	-19.25	1.00 H	30	-4.10	38.85

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	*2462.000	107.02 PK			1.18 V	175	74.51	32.51
2	*2462.000	96.25 AV			1.18 V	175	63.74	32.51
3	2483.500	65.04 PK	74.00	-8.96	1.17 V	179	32.45	32.59
4	2483.500	48.06 AV	54.00	-5.94	1.17 V	179	15.47	32.59
5	4924.000	47.97 PK	74.00	-26.03	1.05 V	129	9.12	38.85
6	4924.000	34.80 AV	54.00	-19.20	1.05 V	129	-4.05	38.85

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



4.3 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 UNTIL
SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

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

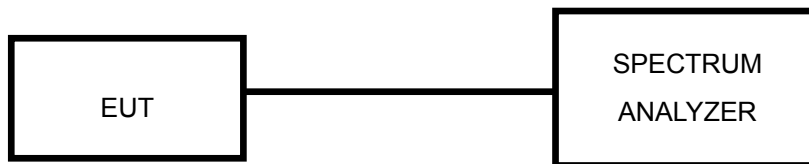
4.3.3 TEST PROCEDURE

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 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

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.



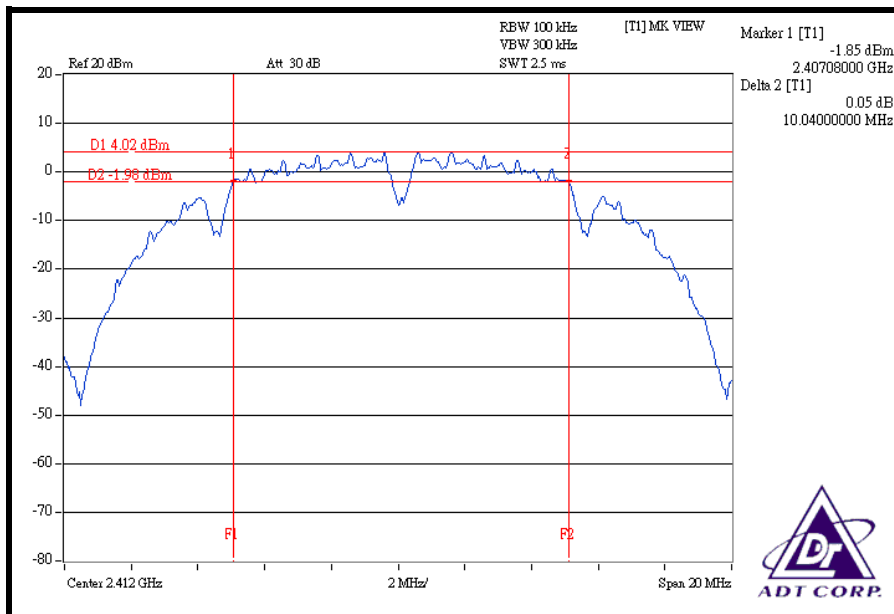
4.3.7 TEST RESULTS

802.11b DSSS MODULATION

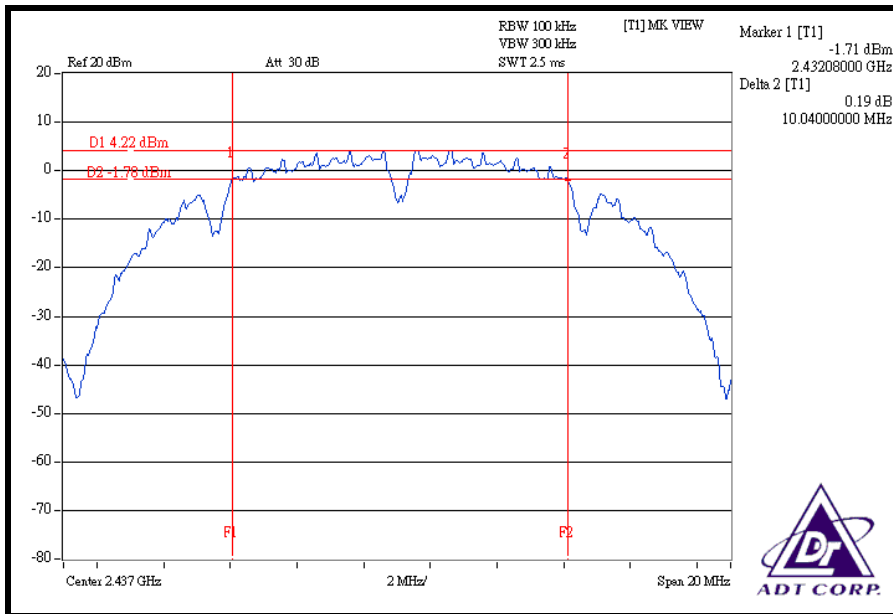
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 985hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.04	0.5	PASS
6	2437	10.04	0.5	PASS
11	2462	10.04	0.5	PASS

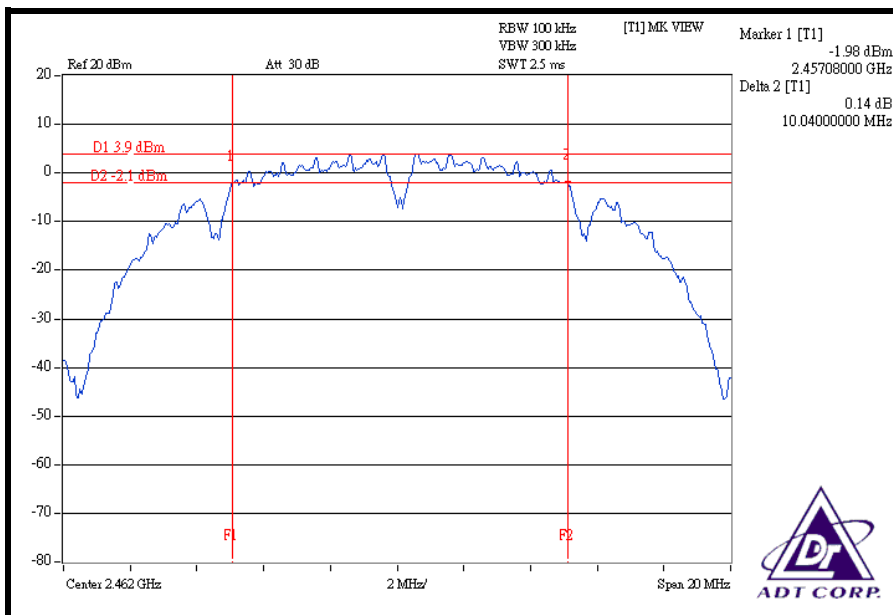
CH 1



CH 6



CH 11



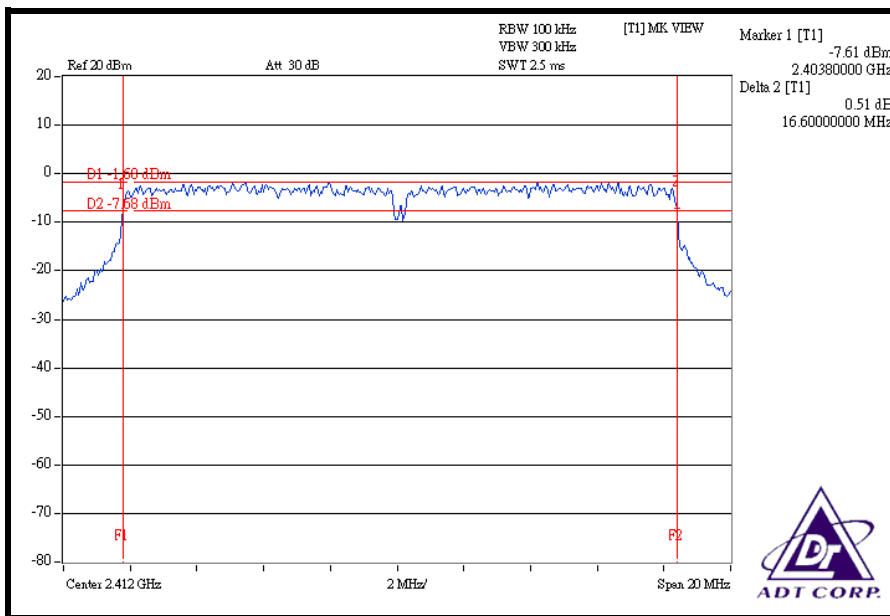


802.11g OFDM MODULATION

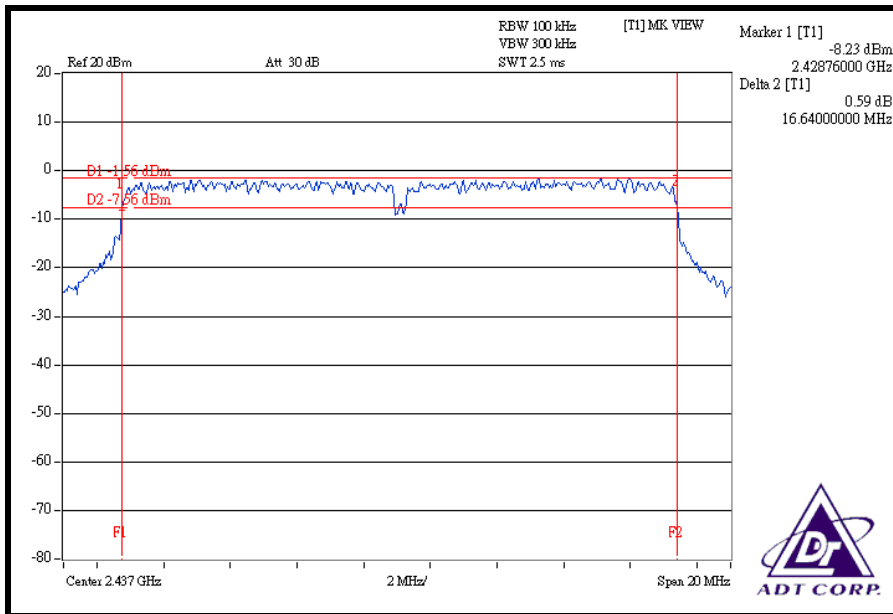
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 985hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.60	0.5	PASS
6	2437	16.64	0.5	PASS
11	2462	16.64	0.5	PASS

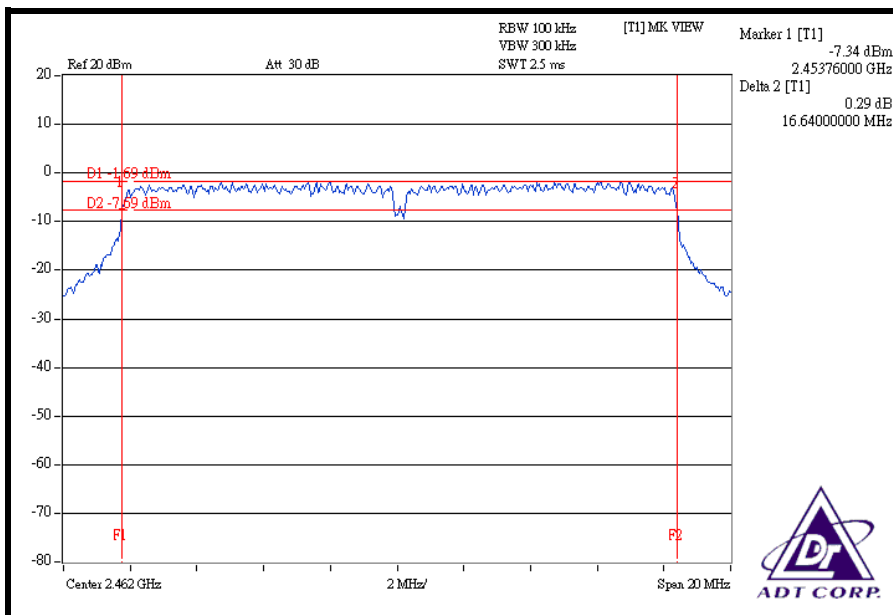
CH 1



CH 6



CH 11





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 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 28, 2007
DIGITAL RT OSCILLOSCOPE	TDS1012	C037299	Nov. 28, 2006
NARDA DETECTOR	4503A	FSCM99899	NA

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

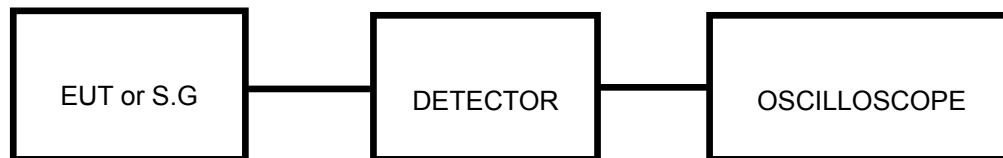
4.4.3 TEST PROCEDURES

- a. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
- b. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
- c. Adjusted the power to have the same reading on oscilloscope. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



4.4.7 TEST RESULTS

802.11b DSSS MODULATION

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 985hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	44.875	16.52	30	PASS
6	2437	45.082	16.54	30	PASS
11	2462	44.978	16.53	30	PASS

802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 985hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	63.826	18.05	30	PASS
6	2437	63.680	18.04	30	PASS
11	2462	63.973	18.06	30	PASS



4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

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

4.5.3 TEST PROCEDURE

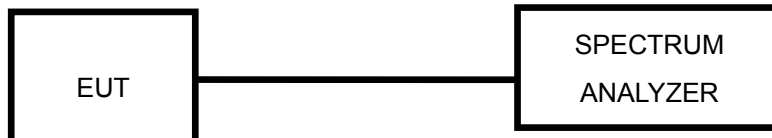
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/1.5MHz. The power spectral density was measured and recorded.

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

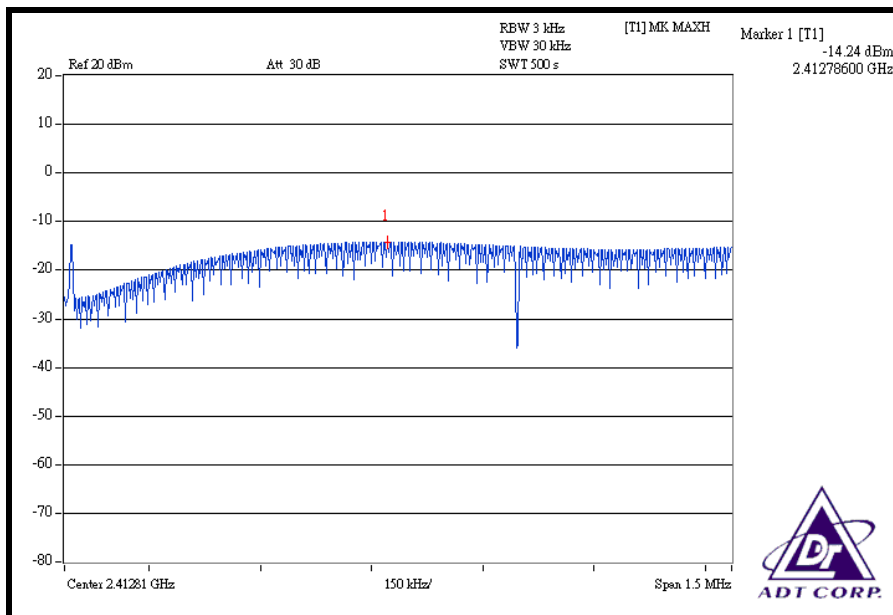
4.5.7 TEST RESULTS

802.11b DSSS MODULATION

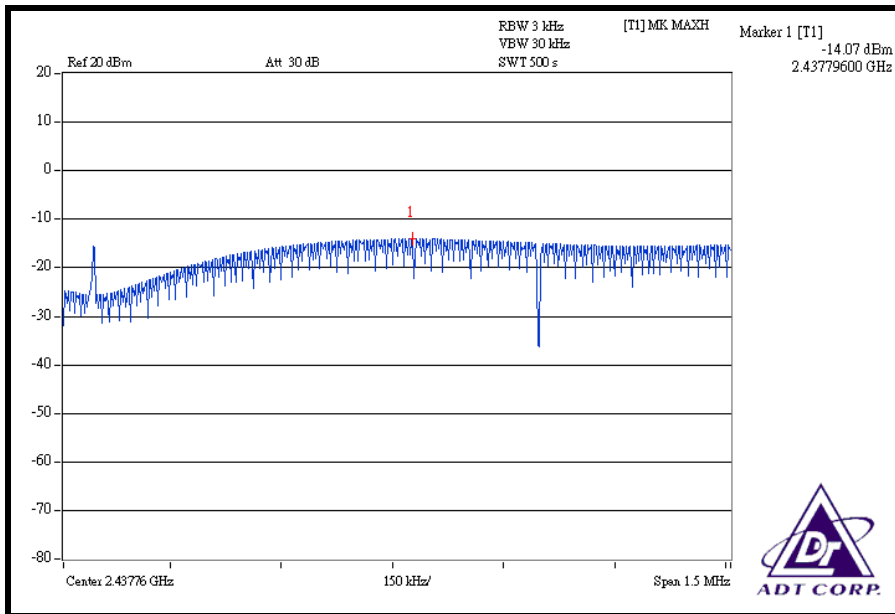
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 985hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-14.24	8	PASS
6	2437	-14.07	8	PASS
11	2462	-14.05	8	PASS

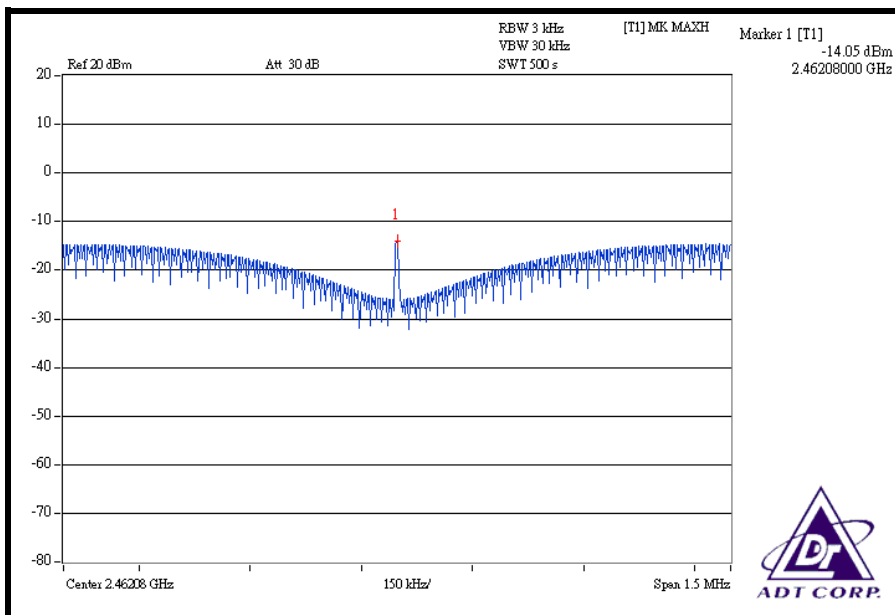
CH 1



CH 6



CH 11



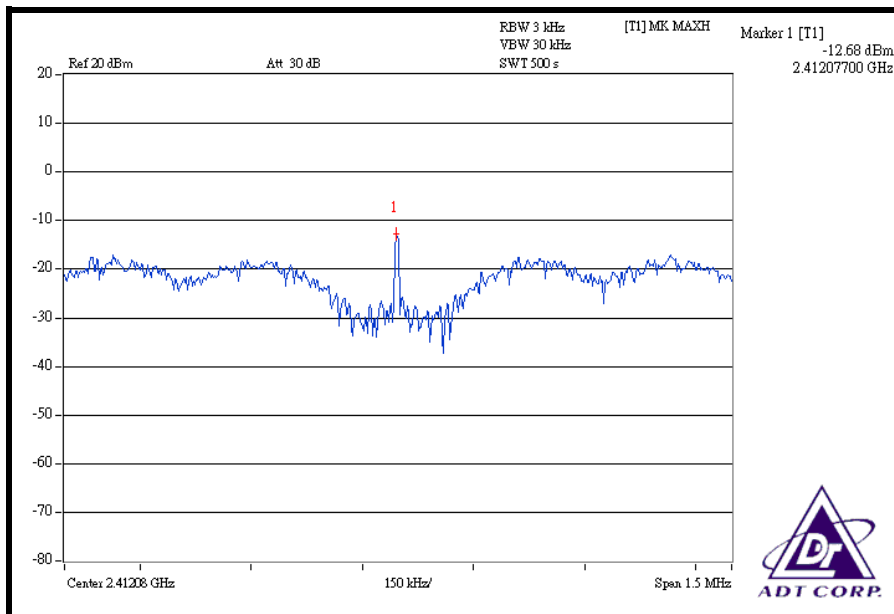


802.11g OFDM MODULATION

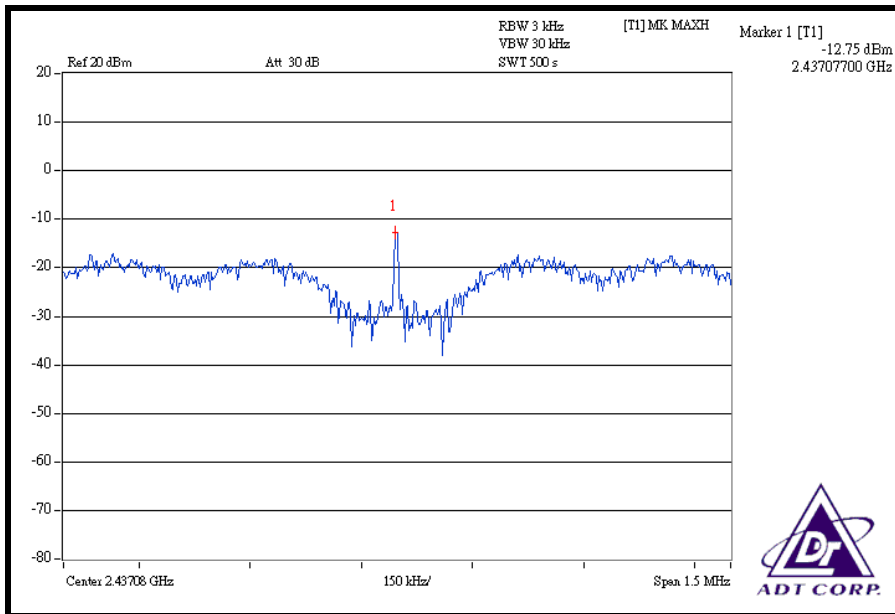
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	26deg. C, 67%RH, 985hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-12.68	8	PASS
6	2437	-12.75	8	PASS
11	2462	-12.91	8	PASS

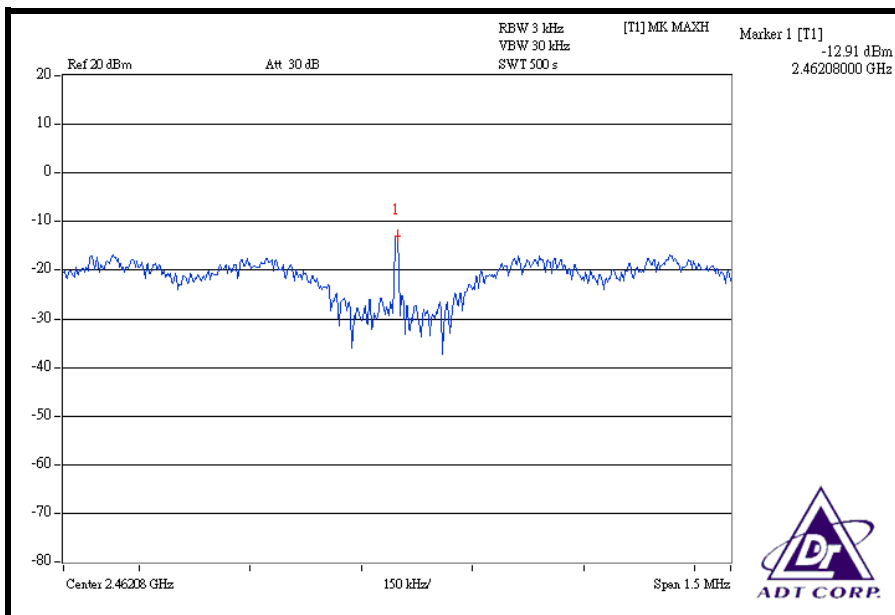
CH 1



CH 6



CH 11





4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

DESCRIPTION &	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

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

4.6.3 TEST PROCEDURE

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

The spectrum plots (Peak RBW=100kHz, VBW=300kHz; Average RBW=1MHz, VBW=10Hz) are attached on the following pages.

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 12 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).

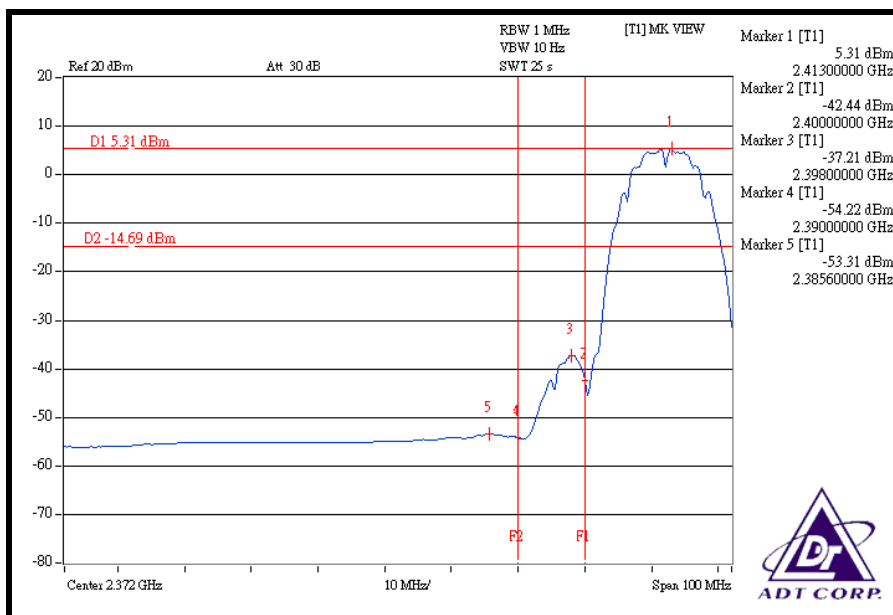
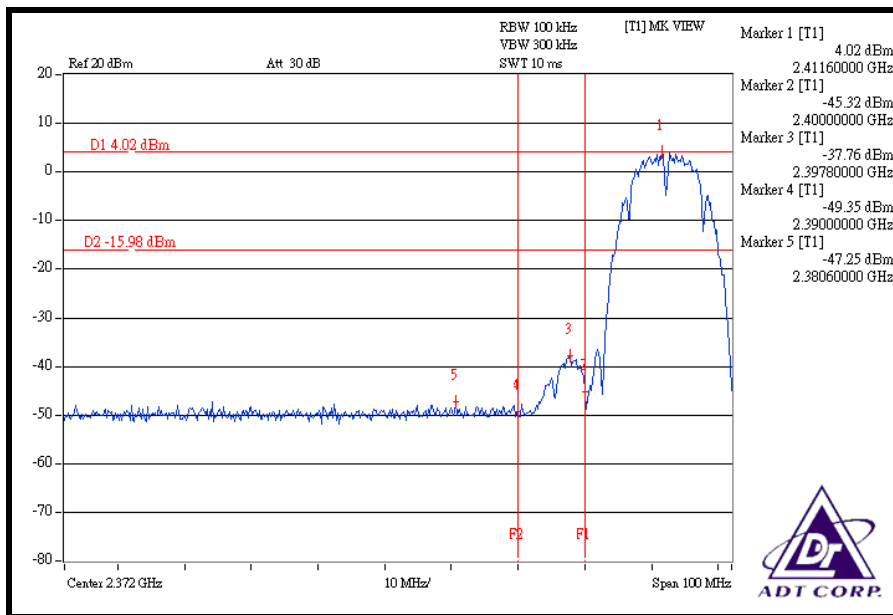
802.11b DSSS MODULATION

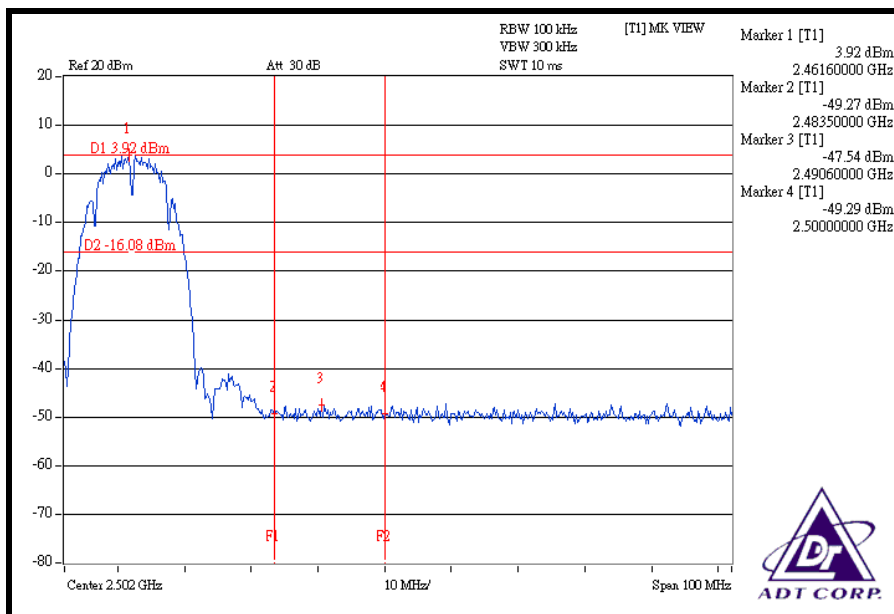
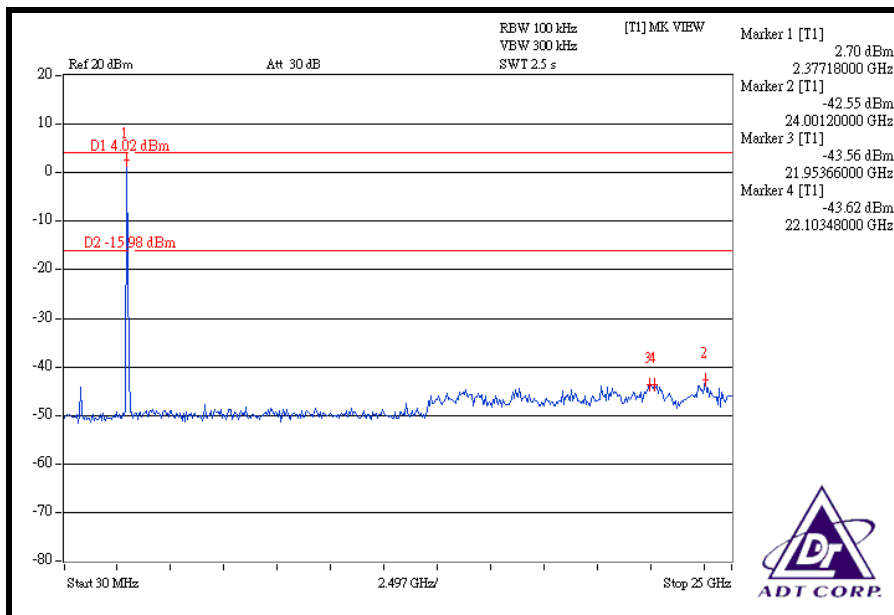
NOTE 1: The band edge emission plot on the next page shows 51.27dBc between carrier maximum power and local maximum emission in restrict band (2.38060GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 104.91dBuV/m (Peak), so the maximum field strength in restrict band is $104.91 - 51.27 = 53.64$ dBuV/m which is under 74dBuV/m limit.

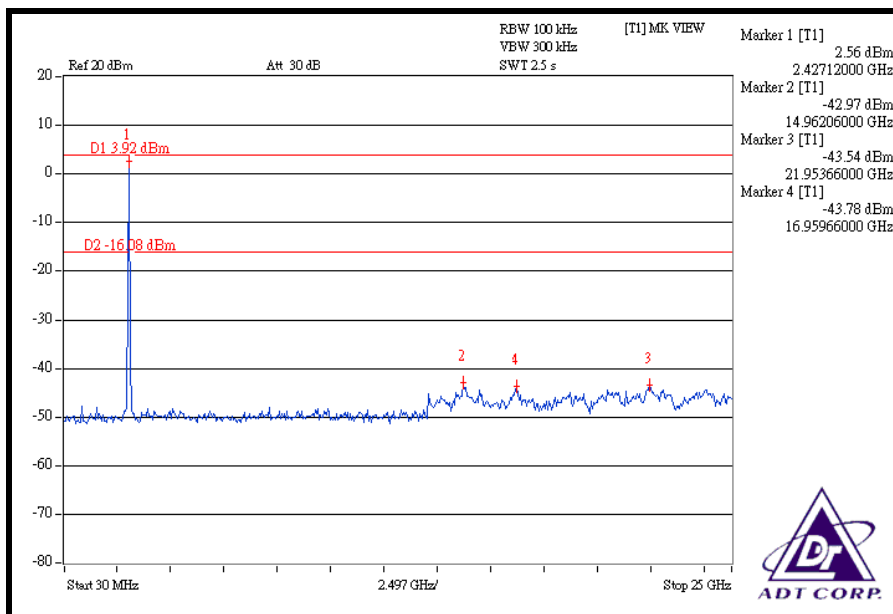
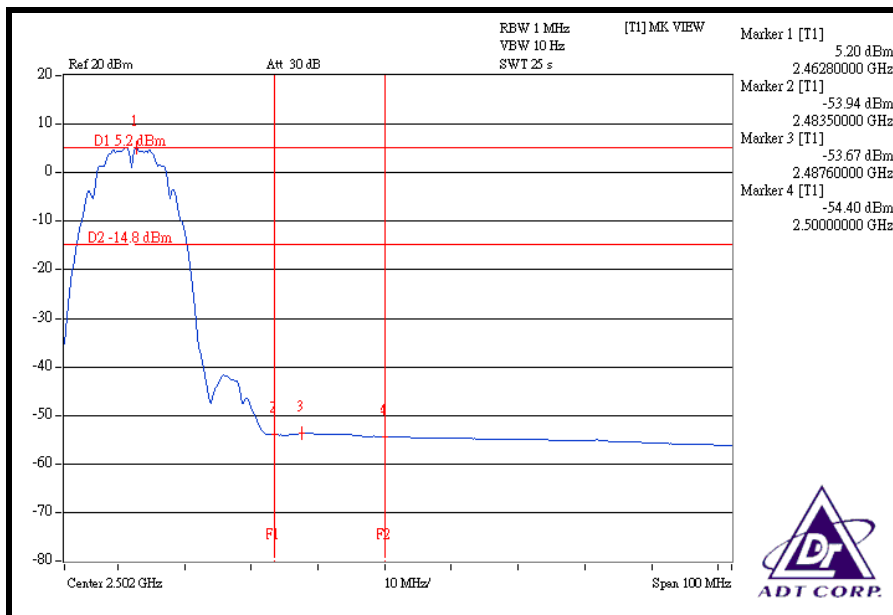
The band edge emission plot on the next page shows 58.62dBc between carrier maximum power and local maximum emission in restrict band (2.38560GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 100.13dBuV/m (Peak), so the maximum field strength in restrict band is $100.13 - 58.62 = 41.51$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on the next second page shows 51.46dBc between carrier maximum power and local maximum emission in restrict band (2.49060GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 105.50dBuV/m (Peak), so the maximum field strength in restrict band is $105.50 - 51.46 = 54.04$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 58.87dBc between carrier maximum power and local maximum emission in restrict band (2.48760GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 100.61dBuV/m (Peak), so the maximum field strength in restrict band is $100.61 - 58.87 = 41.74$ dBuV/m which is under 54dBuV/m limit.







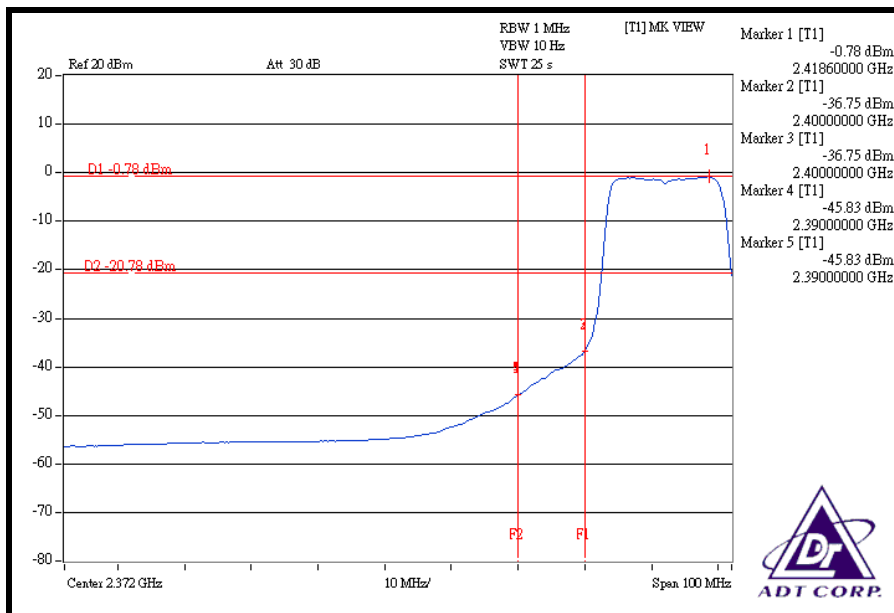
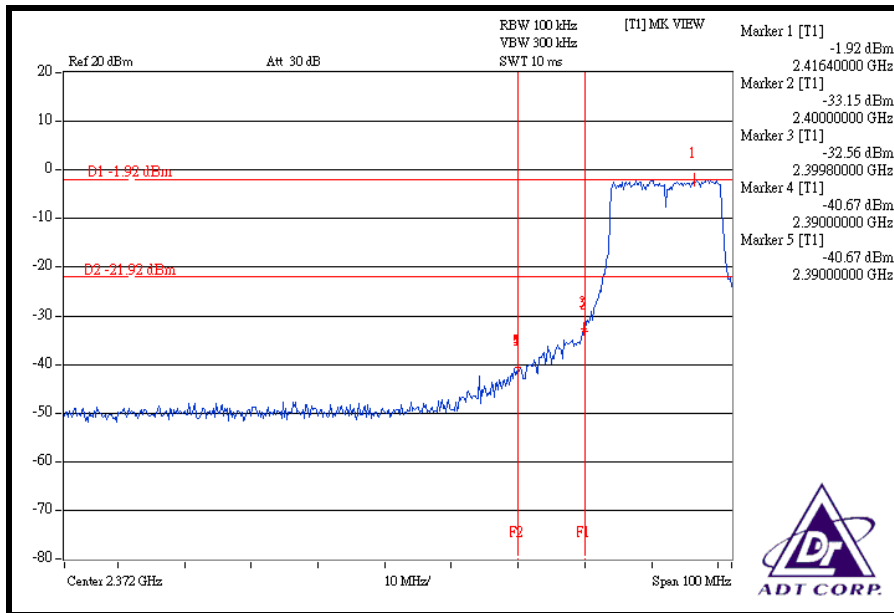
802.11g OFDM MODULATION

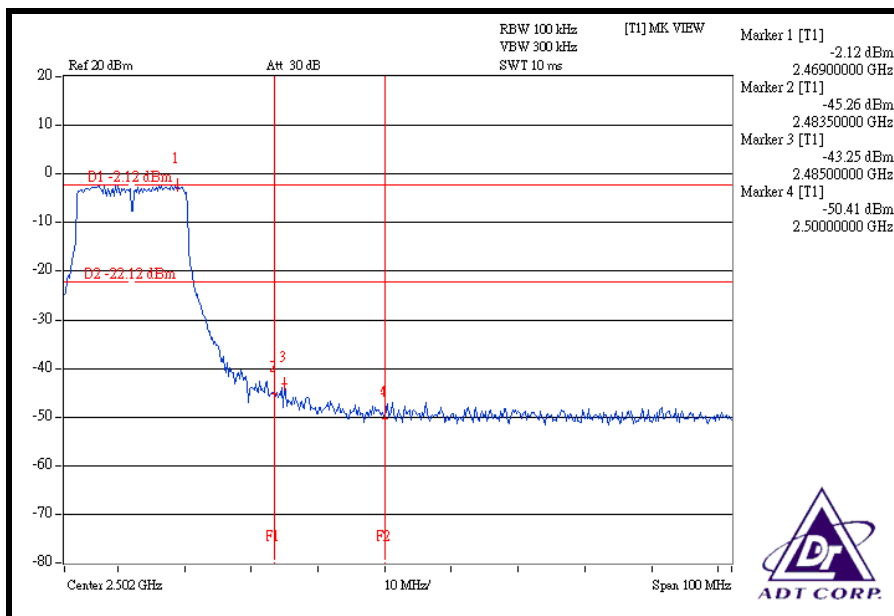
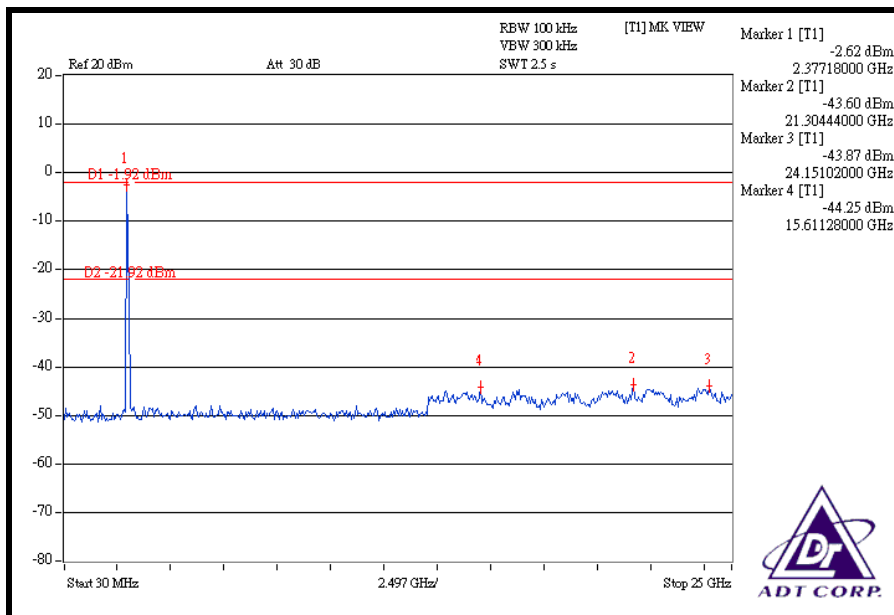
NOTE 1: The band edge emission plot on the next page shows 38.75dBc between carrier maximum power and local maximum emission in restrict band (2.39000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 106.93dBuV/m (Peak), so the maximum field strength in restrict band is $106.93 - 38.75 = 68.18$ dBuV/m which is under 74dBuV/m limit.

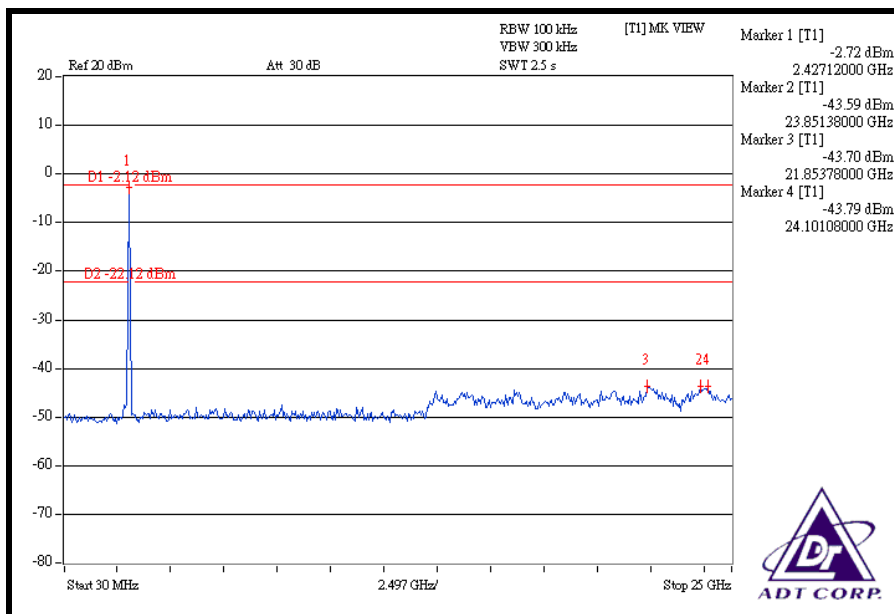
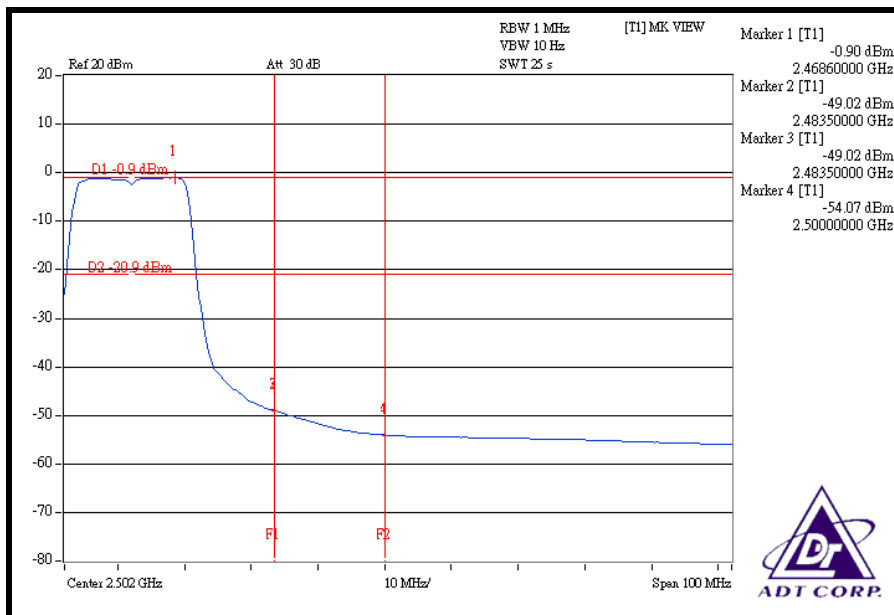
The band edge emission plot on the next page shows 45.05dBc between carrier maximum power and local maximum emission in restrict band (2.39000GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 96.29dBuV/m (Peak), so the maximum field strength in restrict band is $96.29 - 45.05 = 51.24$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot on the next second page shows 41.13dBc between carrier maximum power and local maximum emission in restrict band (2.48500GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 107.02dBuV/m (Peak), so the maximum field strength in restrict band is $107.02 - 41.13 = 65.89$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 48.12dBc between carrier maximum power and local maximum emission in restrict band (2.48350GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 96.25dBuV/m (Peak), so the maximum field strength in restrict band is $96.25 - 48.12 = 48.13$ dBuV/m which is under 54dBuV/m limit.









4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is PIFA antenna without connector. The maximum Gain of the antenna is -1dBi.



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



6. INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, UL, A2LA
GERMANY	TUV Rheinland
JAPAN	VCCI
NORWAY	NEMKO
CANADA	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
NETHERLANDS	Telefication
SINGAPORE	GOST-ASIA (MOU)
RUSSIA	CERTIS (MOU)

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: 886-2-26051924

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Web Site: www.adt.com.tw

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



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

No any modifications are made to the EUT by the lab during the test