FCC TEST REPORT (15.247)

REPORT NO.: RF951023L03

MODEL NO.: BW1180 (Refer to page 7 for more info)

RECEIVED: Oct. 02, 2006

TESTED: Oct. 02 ~ Nov. 09, 2006

ISSUED: Nov. 10, 2006

APPLICANT: Gemtek Technology Co., Ltd.

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ISSUED BY: Advance Data Technology Corporation

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0528

No.: 2177-01

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1. CERTIFICATION

PRODUCT: MOBILE MESH NETWORK SUBSCRIBER UNIT (MMSU)
(Refer to page 7 for more info)

MODEL: BW1180 (Refer to page 7 for more info)

BRAND: BROWAN (Refer to page 7 for more info)

APPLICANT: Gemtek Technology Co., Ltd.

TEST SAMPLE: ENGINEERING SAMPLE

TESTED: Oct. 02 ~ Nov. 09, 2006

STANDARDS: FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment 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 : Andrea Hsia , **DATE:** Nov. 10, 2006
Andrea Hsia

TECHNICAL ACCEPTANCE : Long Chen , **DATE:** Nov. 10, 2006
Responsible for RF
Long Chen

APPROVED BY : Gary Chang , **DATE:** Nov. 10, 2006
Gary Chang / Supervisor

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -12.49dB at 0.189MHz
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 –1.16dB at 900.95MHz
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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.62 dB
	200MHz ~1000MHz	3.64 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

PRODUCT	MOBILE MESH NETWORK SUBSCRIBER UNIT (MMSU)
MODEL	BW1180
FCC ID	MXF-A950927AG
POWER SUPPLY	5Vdc from host equipment or AC Adapter
MODULATION TYPE	BPSK,QBSK,16-QAM
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11g: 24/12/6Mbps 802.11a: 24/12/6Mbps
FREQUENCY RANGE	802.11g: 2.412 ~ 2.462GHz 802.11a: 5.150 ~ 5.250GHz , 5.745 ~ 5.805GHz
NUMBER OF CHANNEL	802.11g: 11 802.11a: 8
CHANNEL SPACING	802.11g: 5MHz 802.11a: 20MHz
OUTPUT POWER	56.754mW for 802.11g 40.458mW for 5.150 ~ 5.250GHz 36.058mW for 5.745 ~ 5.805GHz
ANTENNA TYPE	Integrated antenna with 1.8dBi gain
DATA CABLE	1.03m shielded USB cable without core 1.00m shielded USB cable with one core 1.8m RJ45 cable
I/O PORTS	USB, RJ45
ASSOCIATED DEVICES	NA

NOTE:

1. The structure of all the models are exactly same, the only difference are shown as below:

PRODUCT NAME	MODEL	BRAND
MOBILE MESH NETWORK SUBSCRIBER UNIT (MMSU)	BW1180	BROWAN
SONmetro A230 Pocket Modem	A230	Packet ONE
ODMA Subscriber Unit	PARROT 212B	IWICS

2. The EUT was powered by the following adapter:

Brand:	UNIFIVE
Model:	US300520
Input:	100 ~ 240Vdc, 50/60Hz, 0.3A
Output:	5Vdc, 2A
Power Line:	DC 1.8m non-shielded cable without core

3. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11g technology.
4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

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		

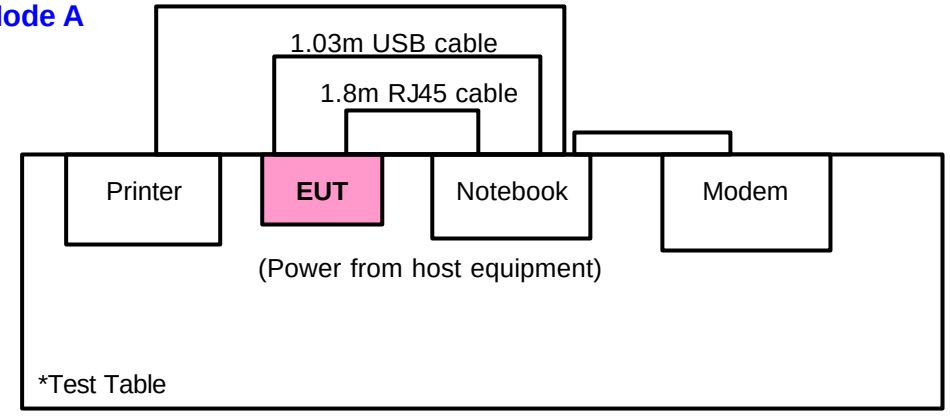
Operated in 5745 ~ 5805MHz band:

4 channels are provided to this EUT:

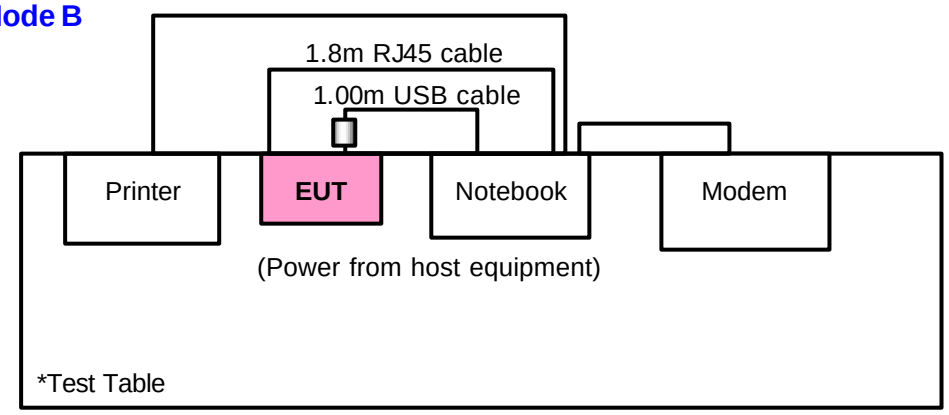
CHANNEL	FREQUENCY
1	5745 MHz
2	5765 MHz
3	5785 MHz
4	5805 MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

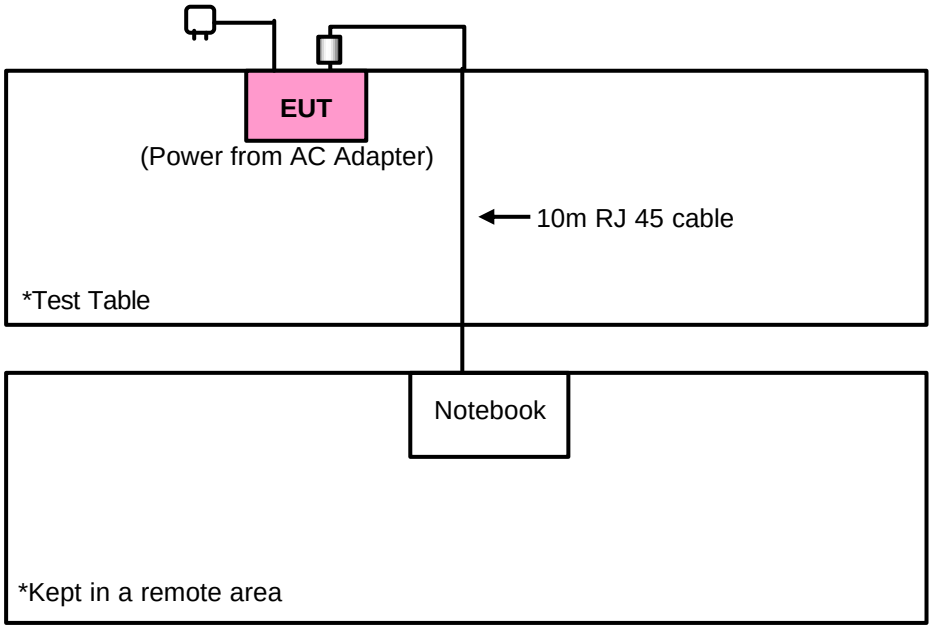
Test Mode A



Test Mode B



Test Mode C



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE<1G	RE³ 1G	APCM	
A	v	v	v	v	Powered by host via 1.03m USB cable without core
B	-	v	-	-	Powered by host via 1.00m USB cable with one core
C	v	v	-	-	Powered by AC Adapter

Where **PLC**: Power Line Conducted Emission **RE<1G**: Radiated Emission below 1GHz
RE³ 1G: Radiated Emission above 1GHz **APCM** : Antenna Port Conducted Measurement
NOTE: "-" means no effect.

Power Line Conducted Emission Test:

☒? Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
C	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
A	802.11a	1 to 4	4	OFDM	BPSK	6
C	802.11a	1 to 4	4	OFDM	BPSK	6

Radiated Emission Test (Below 1 GHz):

☒? Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	11	OFDM	BPSK	6
A	802.11a	1 to 4	4	OFDM	BPSK	6
B	802.11g	1 to 11	11	OFDM	BPSK	6
B	802.11a	1 to 4	4	OFDM	BPSK	6
C	802.11g	1 to 11	11	OFDM	BPSK	6
C	802.11a	1 to 4	4	OFDM	BPSK	6

Radiated Emission Test (Above 1 GHz):

☒? Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
A	802.11a	1 to 4	1, 3, 4	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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6
A	802.11a	1 to 4	1, 4	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	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
A	802.11a	1 to 4	1, 3, 4	OFDM	BPSK	6

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.

3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	20838027664	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054146	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008260	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m shielded without core
3	1.2m shielded without core

NOTE: 1. All power cords of the above support units are non shielded (1.8m).
2. For mode C Item 1act as a communication partner to transfer data.

4. TEST TYPES AND RESULTS (FOR 802.11g 2412~2462MHz BAND)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 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	100288	Nov. 02, 2006
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2007
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 09, 2007
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 22, 2007
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.

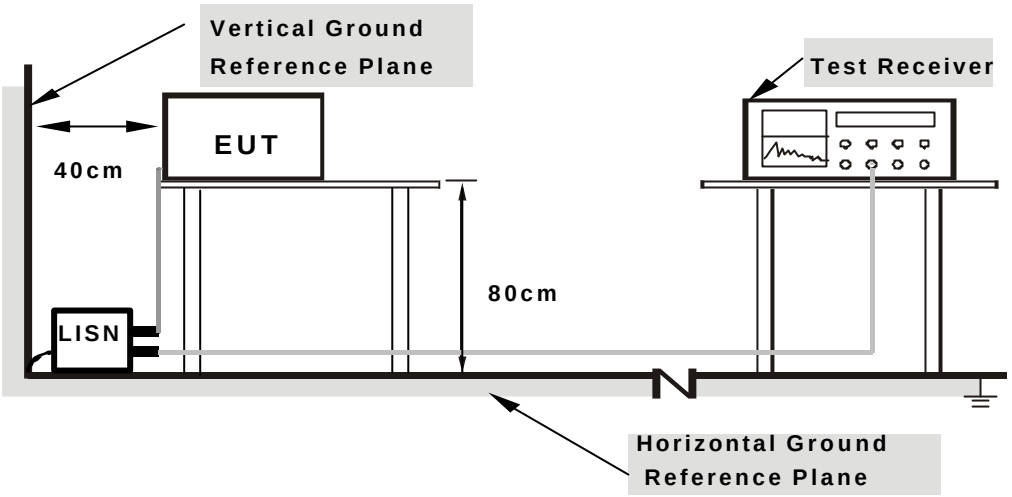
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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 related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

Test Mode A:

a. Connected the EUT to Notebook with USB cable and placed on a testing table.
b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The notebook system sent "H" messages to its screen.
d. The notebook system sent “H” messages to modem.
e. The notebook system sent "H" messages to printer, and the printer printed them on paper.
f. Steps c ~ e were repeated.

Test Mode C:

a. Connected the EUT to Notebook with RJ 45 cable and placed on a testing table.
b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
c. The notebook system sent "H" messages to its screen.

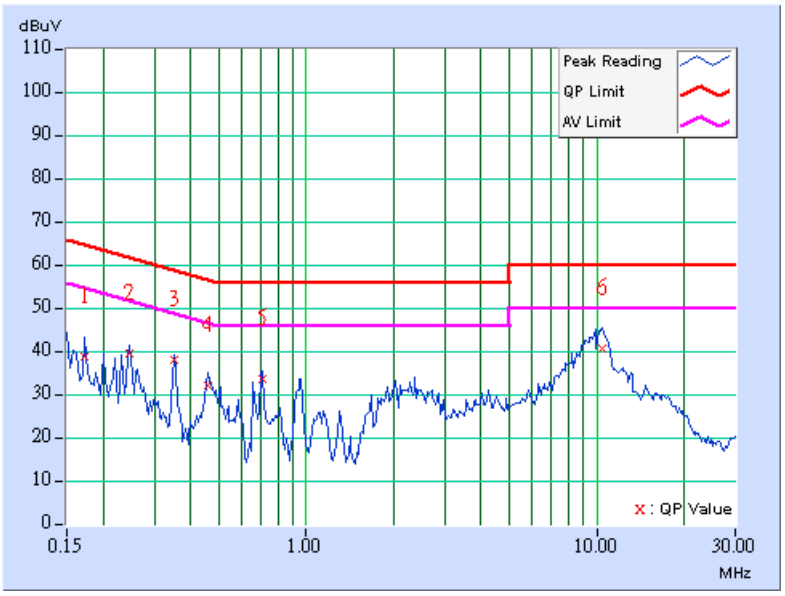
4.1.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	**PHASE**	Line 1
MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TRANSFER RATE	6Mbps	**ENVIRONMENTAL CONDITIONS**	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TEST MODE**	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.10	38.54	-	38.64	-	64.79	54.79	-26.15	-
2	0.248	0.10	39.32	-	39.42	-	61.84	51.84	-22.42	-
3	0.353	0.10	37.59	-	37.69	-	58.89	48.89	-21.20	-
4	0.459	0.10	31.73	-	31.83	-	56.72	46.72	-24.89	-
5	0.705	0.10	33.48	-	33.58	-	56.00	46.00	-22.42	-
6	10.453	0.38	40.20	-	40.58	-	60.00	50.00	-19.42	-

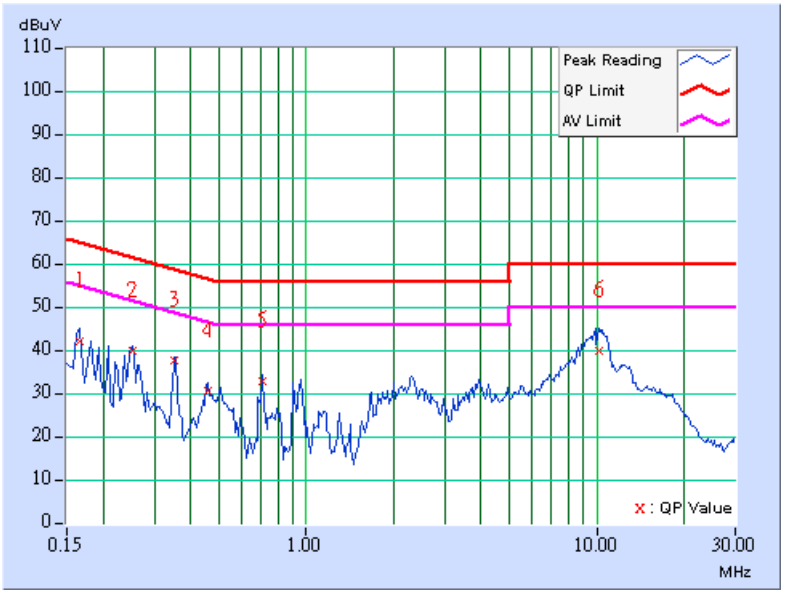
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.10	41.74	-	41.84	-	65.18	55.18	-23.34	-
2	0.252	0.10	39.58	-	39.68	-	61.71	51.71	-22.03	-
3	0.353	0.10	37.22	-	37.32	-	58.89	48.89	-21.57	-
4	0.459	0.11	30.23	-	30.34	-	56.72	46.72	-26.38	-
5	0.709	0.15	32.67	-	32.82	-	56.00	46.00	-23.18	-
6	10.211	0.47	39.66	-	40.13	-	60.00	50.00	-19.87	-

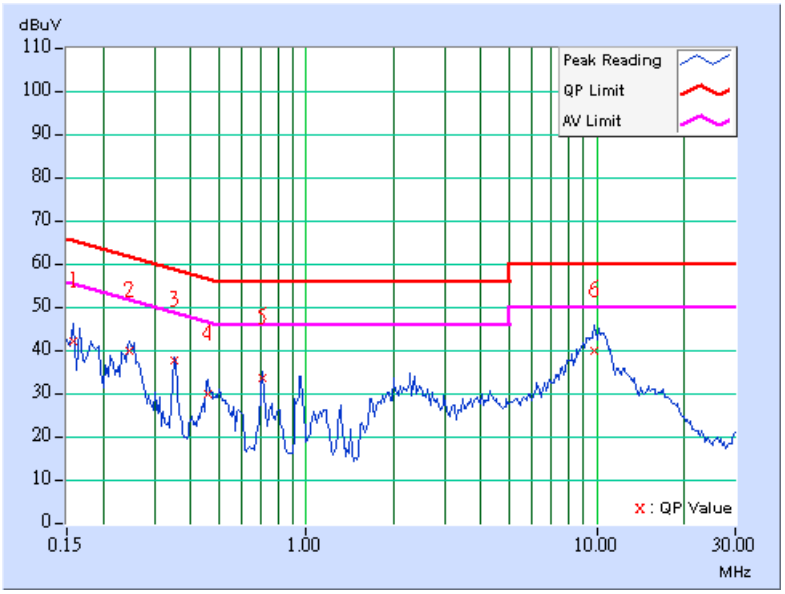
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	41.90	-	42.00	-	65.58	55.58	-23.58	-
2	0.248	0.10	39.72	-	39.82	-	61.84	51.84	-22.02	-
3	0.352	0.10	37.45	-	37.55	-	58.92	48.92	-21.37	-
4	0.459	0.10	29.78	-	29.88	-	56.72	46.72	-26.84	-
5	0.709	0.10	33.44	-	33.54	-	56.00	46.00	-22.46	-
6	9.832	0.36	39.48	-	39.84	-	60.00	50.00	-20.16	-

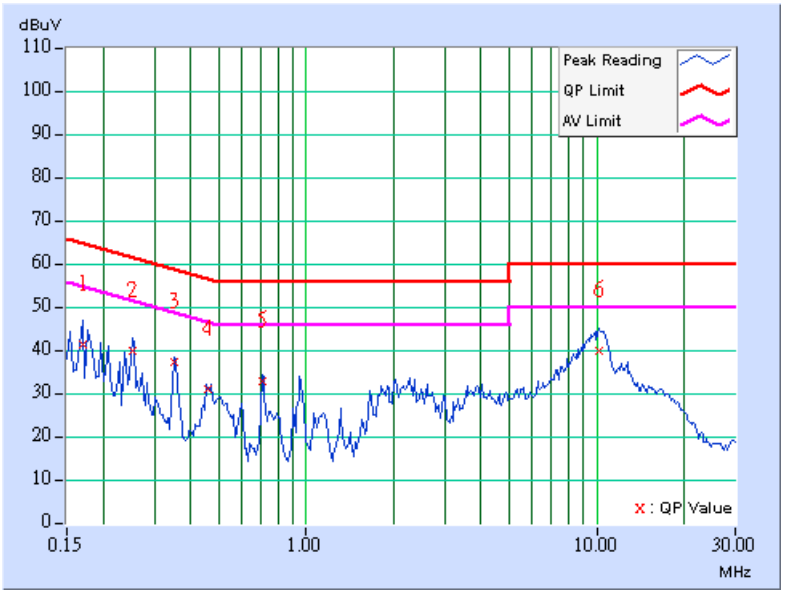
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.170	0.10	40.93	-	41.03	-	64.98	54.98	-23.95	-
2	0.252	0.10	39.70	-	39.80	-	61.71	51.71	-21.91	-
3	0.353	0.10	37.12	-	37.22	-	58.89	48.89	-21.67	-
4	0.456	0.11	30.60	-	30.71	-	56.76	46.76	-26.05	-
5	0.705	0.15	32.40	-	32.55	-	56.00	46.00	-23.45	-
6	10.199	0.47	39.54	-	40.01	-	60.00	50.00	-19.99	-

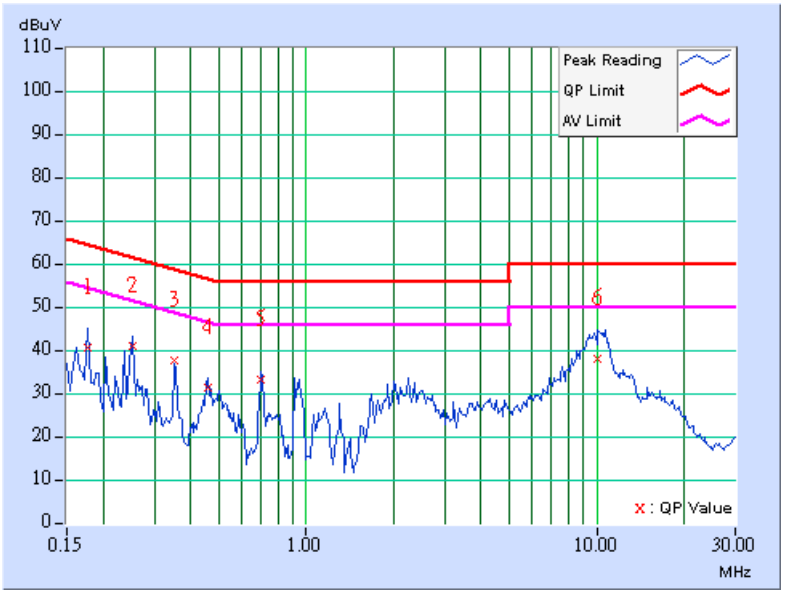
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	40.51	-	40.61	-	64.61	54.61	-24.00	-
2	0.252	0.10	40.83	-	40.93	-	61.71	51.71	-20.78	-
3	0.353	0.10	37.47	-	37.57	-	58.89	48.89	-21.32	-
4	0.459	0.10	30.94	-	31.04	-	56.72	46.72	-25.68	-
5	0.701	0.10	32.83	-	32.93	-	56.00	46.00	-23.07	-
6	10.035	0.36	37.94	-	38.30	-	60.00	50.00	-21.70	-

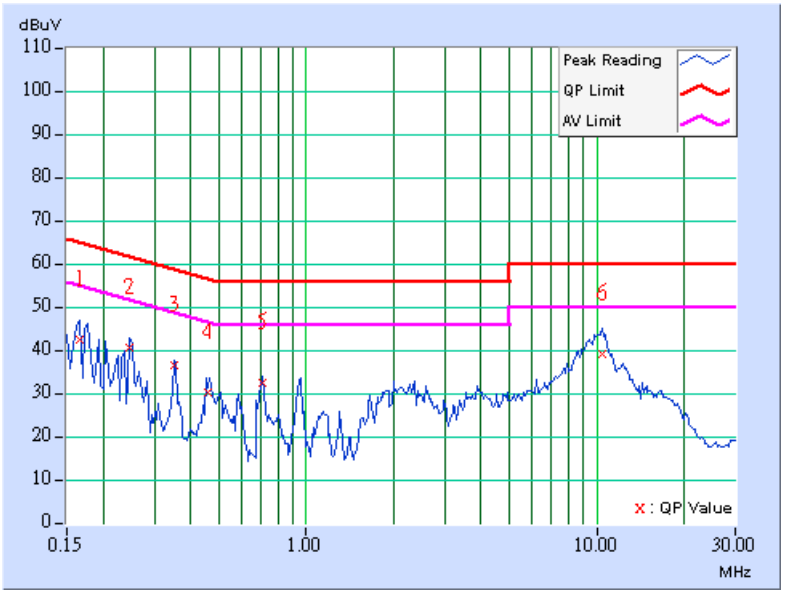
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.10	42.27	-	42.37	-	65.18	55.18	-22.81	-
2	0.248	0.10	40.37	-	40.47	-	61.84	51.84	-21.37	-
3	0.349	0.10	36.35	-	36.45	-	58.98	48.98	-22.53	-
4	0.456	0.11	29.95	-	30.06	-	56.76	46.76	-26.70	-
5	0.709	0.15	32.06	-	32.21	-	56.00	46.00	-23.79	-
6	10.461	0.48	38.77	-	39.25	-	60.00	50.00	-20.75	-

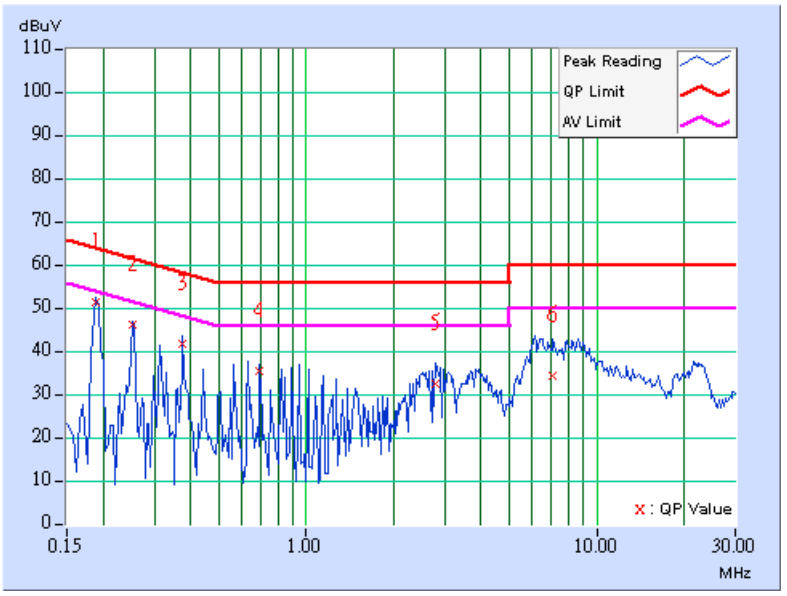
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.189	0.10	51.12	-	51.22	-	64.08	54.08	-12.86	-
2	0.252	0.10	45.92	-	46.02	-	61.71	51.71	-15.69	-
3	0.377	0.10	41.44	-	41.54	-	58.35	48.35	-16.81	-
4	0.693	0.10	35.37	-	35.47	-	56.00	46.00	-20.53	-
5	2.785	0.27	32.28	-	32.55	-	56.00	46.00	-23.45	-
6	7.090	0.36	34.08	-	34.44	-	60.00	50.00	-25.56	-

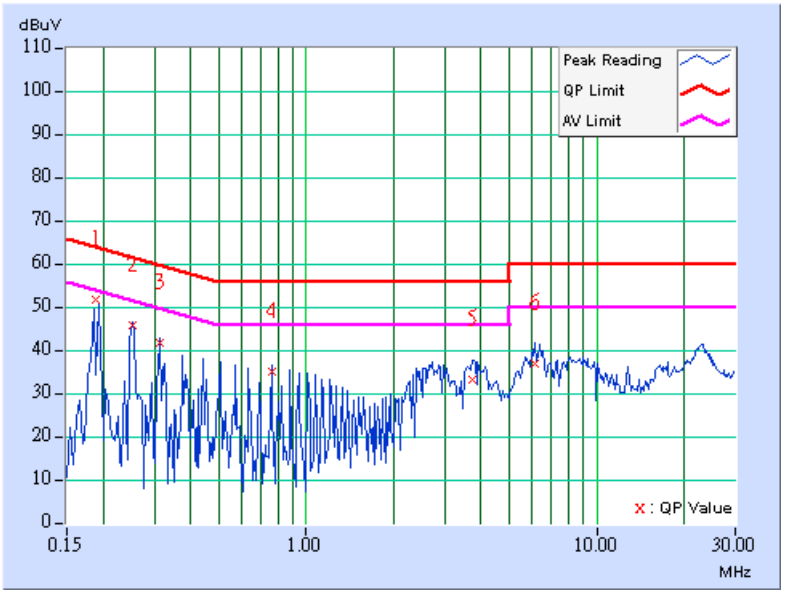
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.189**	**0.10**	**51.48**	**-**	**51.58**	**-**	**64.07**	**54.07**	**-12.49**	**-**
2	0.252	0.10	45.43	-	45.53	-	61.71	51.71	-16.18	-
3	0.314	0.10	41.52	-	41.62	-	59.86	49.86	-18.24	-
4	0.759	0.16	34.73	-	34.89	-	56.00	46.00	-21.11	-
5	3.738	0.35	33.01	-	33.36	-	56.00	46.00	-22.64	-
6	6.113	0.40	36.47	-	36.87	-	60.00	50.00	-23.13	-

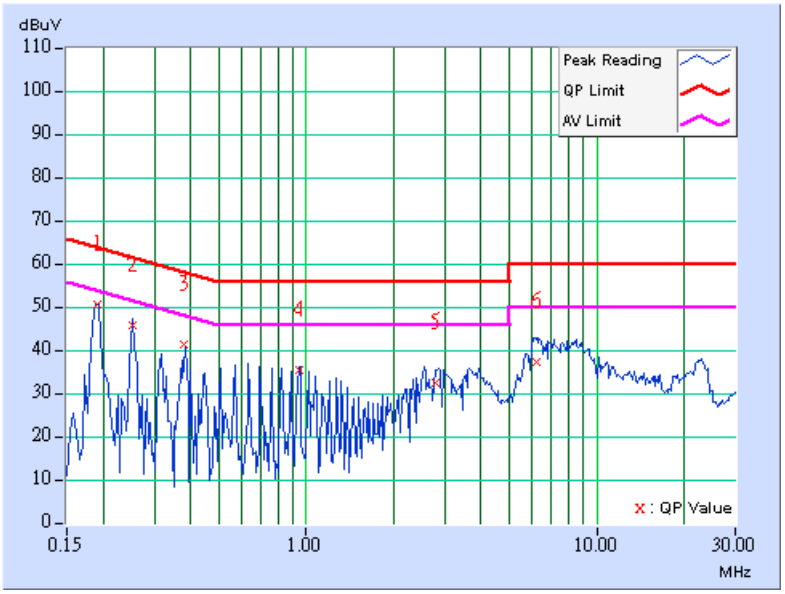
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.190	0.10	50.45	-	50.55	-	64.02	54.02	-13.47	-
2	0.252	0.10	45.73	-	45.83	-	61.71	51.71	-15.88	-
3	0.381	0.10	41.05	-	41.15	-	58.27	48.27	-17.12	-
4	0.946	0.10	35.28	-	35.38	-	56.00	46.00	-20.62	-
5	2.785	0.27	32.26	-	32.53	-	56.00	46.00	-23.47	-
6	6.172	0.37	37.02	-	37.39	-	60.00	50.00	-22.61	-

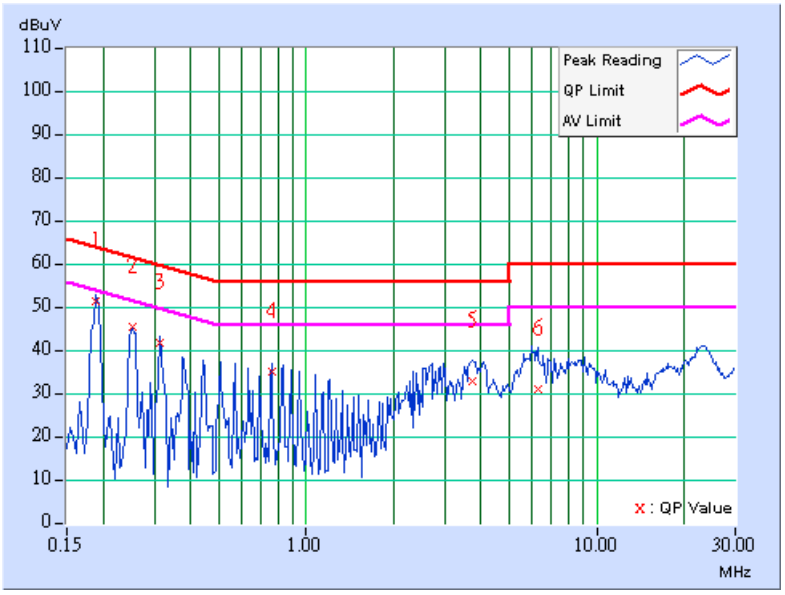
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.189	0.10	51.10	-	51.20	-	64.08	54.08	-12.88	-
2	0.252	0.10	45.15	-	45.25	-	61.71	51.71	-16.46	-
3	0.314	0.10	41.40	-	41.50	-	59.86	49.86	-18.36	-
4	0.759	0.16	34.61	-	34.77	-	56.00	46.00	-21.23	-
5	3.738	0.35	32.45	-	32.80	-	56.00	46.00	-23.20	-
6	6.277	0.40	30.69	-	31.09	-	60.00	50.00	-28.91	-

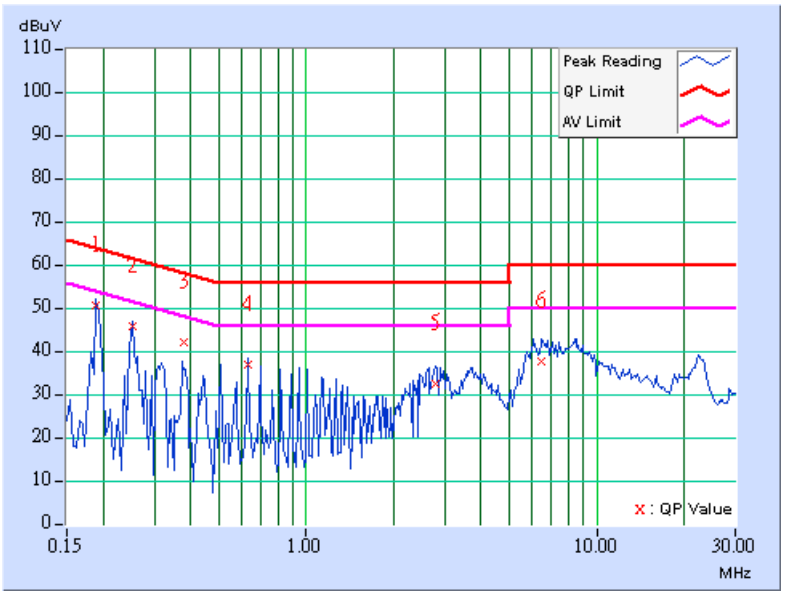
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.189	0.10	50.43	-	50.53	-	64.08	54.08	-13.55	-
2	0.252	0.10	45.57	-	45.67	-	61.71	51.71	-16.04	-
3	0.379	0.10	41.73	-	41.83	-	58.30	48.30	-16.47	-
4	0.630	0.10	36.59	-	36.69	-	56.00	46.00	-19.31	-
5	2.785	0.27	32.10	-	32.37	-	56.00	46.00	-23.63	-
6	6.488	0.37	37.32	-	37.69	-	60.00	50.00	-22.31	-

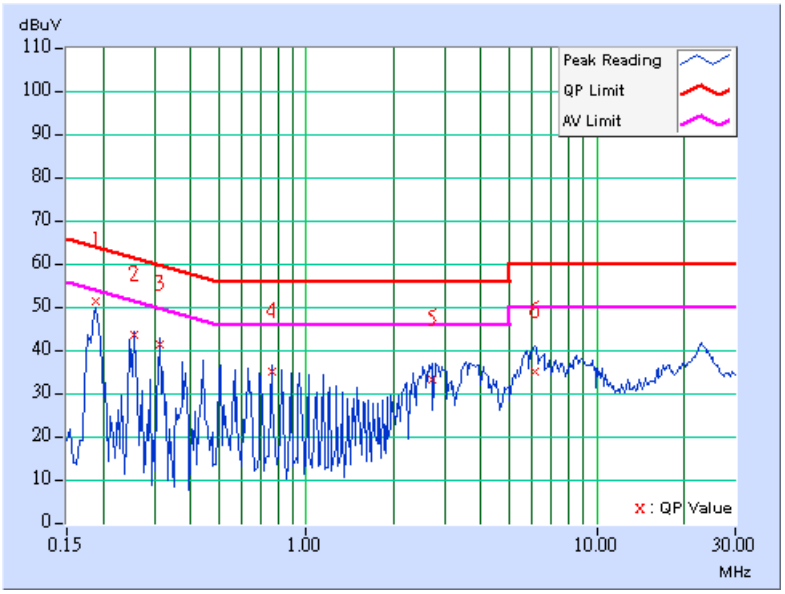
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.189	0.10	50.93	-	51.03	-	64.08	54.08	-13.05	-
2	0.255	0.10	43.18	-	43.28	-	61.58	51.58	-18.30	-
3	0.314	0.10	41.18	-	41.28	-	59.86	49.86	-18.58	-
4	0.759	0.16	34.67	-	34.83	-	56.00	46.00	-21.17	-
5	2.719	0.26	32.75	-	33.01	-	56.00	46.00	-22.99	-
6	6.108	0.40	34.96	-	35.36	-	60.00	50.00	-24.64	-

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	Jan. 01, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 04, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 15, 2007
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 01, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A01960	Nov. 09, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219268/4	Dec. 20, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	230129/4	Dec. 20, 2006
Software ADT.	ADT_Radiated_V5.14	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 IC4924-4.

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 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

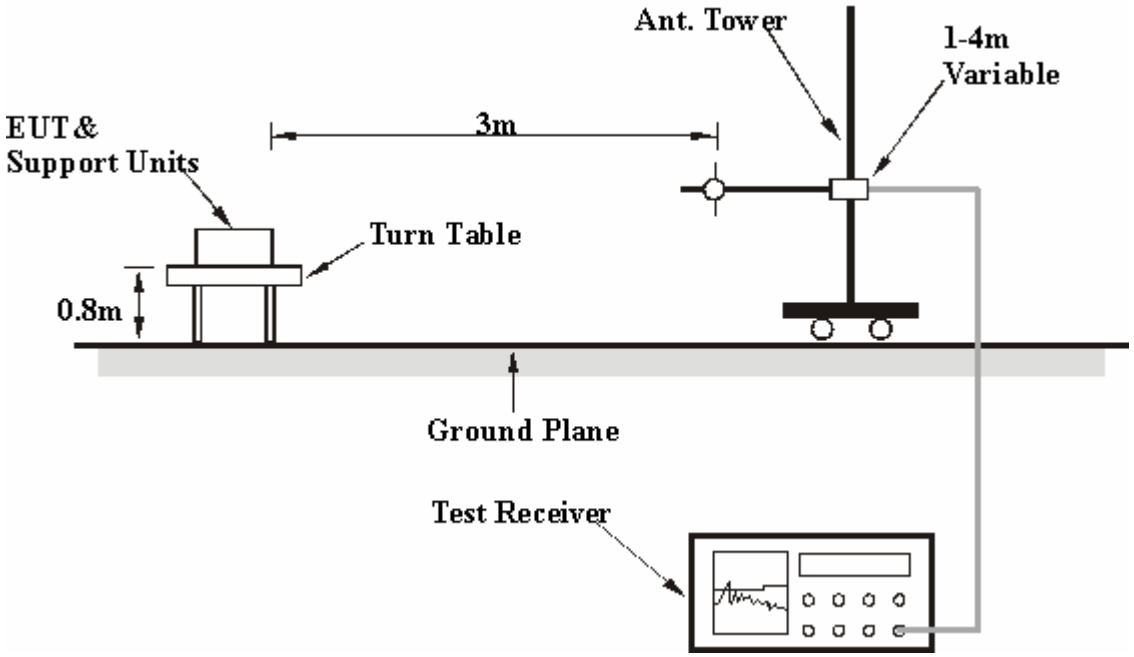
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 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 are 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 related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**DETECTOR FUNCTION**	Quasi-Peak
TRANSFER RATE	6Mbps	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TEST MODE**	A
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	267.15	40.55 QP	46.00	-5.45	1.25 H	178	26.91	13.63
2	712.30	42.65 QP	46.00	-3.35	1.00 H	121	18.11	24.54
3	799.78	39.75 QP	46.00	-6.25	1.00 H	163	13.64	26.11
4	900.86	44.73 QP	46.00	-1.27	1.50 H	181	17.24	27.49
5	933.91	42.95 QP	46.00	-3.05	1.25 H	130	13.91	29.04
6	939.74	41.56 QP	46.00	-4.44	1.50 H	163	12.25	29.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	37.78	36.84 QP	40.00	-3.16	1.00 V	79	22.99	13.85
2	249.66	36.82 QP	46.00	-9.18	1.50 V	154	24.39	12.43
3	500.42	35.88 QP	46.00	-10.12	1.00 V	202	15.93	19.95
4	799.78	37.67 QP	46.00	-8.33	1.25 V	307	11.56	26.11
5	900.86	44.57 QP	46.00	-1.43	1.00 V	127	17.08	27.49
6	933.91	43.11 QP	46.00	-2.89	1.00 V	310	14.08	29.04

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	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65% RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TEST MODE**	B
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	267.15	36.10 QP	46.00	-9.90	1.00 H	277	22.47	13.63
2	688.98	44.66 QP	46.00	-1.34	1.25 H	358	20.75	23.91
3	799.78	38.61 QP	46.00	-7.39	1.00 H	166	12.50	26.11
4	867.82	40.89 QP	46.00	-5.11	1.25 H	133	13.90	26.99
5	900.86	44.32 QP	46.00	-1.68	1.25 H	181	16.83	27.49
6	933.91	42.19 QP	46.00	-3.81	1.25 H	94	13.15	29.04

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	37.78	37.28 QP	40.00	-2.72	1.00 V	88	23.43	13.85
2	249.66	36.81 QP	46.00	-9.19	1.50 V	154	24.38	12.43
3	599.56	33.22 QP	46.00	-12.78	1.25 V	184	10.69	22.54
4	799.78	37.13 QP	46.00	-8.87	1.25 V	10	11.03	26.11
5	900.86	44.72 QP	46.00	-1.28	1.00 V	283	17.23	27.49
6	933.91	41.73 QP	46.00	-4.27	1.00 V	19	12.70	29.04

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	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TEST MODE**	C
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	249.66	37.33 QP	46.00	-8.67	1.25 H	118	24.91	12.43
2	399.34	32.53 QP	46.00	-13.47	1.00 H	271	14.76	17.78
3	751.18	43.01 QP	46.00	-2.99	1.25 H	67	17.22	25.79
4	867.82	41.30 QP	46.00	-4.70	1.25 H	61	14.31	26.99
5	933.91	44.61 QP	46.00	-1.39	1.50 H	100	15.57	29.04
6	949.46	40.06 QP	46.00	-5.94	1.00 H	40	10.30	29.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	55.27	38.73 QP	40.00	-1.27	1.00 V	58	24.81	13.91
2	249.66	34.33 QP	46.00	-11.67	1.50 V	55	21.90	12.43
3	799.78	38.87 QP	46.00	-7.13	1.50 V	79	12.77	26.11
4	867.82	40.05 QP	46.00	-5.95	1.00 V	31	13.06	26.99
5	900.86	44.70 QP	46.00	-1.30	1.25 V	28	17.21	27.49
6	933.91	44.81 QP	46.00	-1.19	1.00 V	58	15.77	29.04

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.

802.11g 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	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1200.00	51.57 PK	74.00	-22.43	1.22 H	145	23.16	28.41
1	1200.00	48.35 AV	54.00	-5.65	1.22 H	145	19.94	28.41
2	2390.00	60.35 PK	74.00	-13.65	1.38 H	96	28.25	32.10
2	2390.00	44.62 AV	54.00	-9.38	1.38 H	96	12.52	32.10
3	*2412.00	99.61 PK			1.38 H	96	67.43	32.18
3	*2412.00	89.60 AV			1.38 H	96	57.42	32.18
4	4824.00	48.55 PK	74.00	-25.45	1.00 H	21	9.92	38.63
4	4824.00	36.32 AV	54.00	-17.68	1.00 H	21	-2.31	38.63

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	1200.00	48.55 PK	74.00	-25.45	1.02 V	2	20.14	28.41
1	1200.00	43.14 AV	54.00	-10.86	1.02 V	2	14.73	28.41
2	2390.00	68.43 PK	74.00	-5.57	1.14 V	259	36.33	32.10
2	2390.00	52.76 AV	54.00	-1.24	1.14 V	259	20.66	32.10
3	*2412.00	107.59 PK			1.10 V	234	75.41	32.18
3	*2412.00	97.27 AV			1.10 V	234	65.09	32.18
4	4824.00	54.74 PK	74.00	-19.26	1.00 V	289	16.11	38.63
4	4824.00	41.38 AV	54.00	-12.62	1.00 V	289	2.75	38.63

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.

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**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1200.00	51.43 PK	74.00	-22.57	1.19 H	138	23.02	28.41
1	1200.00	48.21 AV	54.00	-5.79	1.19 H	138	19.80	28.41
2	*2437.00	99.16 PK			1.37 H	95	66.89	32.27
2	*2437.00	89.13 AV			1.37 H	95	56.86	32.27
3	4874.00	48.87 PK	74.00	-25.13	1.02 H	34	10.10	38.77
3	4874.00	36.65 AV	54.00	-17.35	1.02 H	34	-2.12	38.77

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	1200.00	48.41 PK	74.00	-25.59	1.04 V	18	20.00	28.41
1	1200.00	43.02 AV	54.00	-10.98	1.04 V	18	14.61	28.41
2	*2437.00	107.11 PK			1.11 V	230	74.84	32.27
2	*2437.00	97.41 AV			1.11 V	230	65.14	32.27
3	4874.00	54.86 PK	74.00	-19.14	1.04 V	213	16.09	38.77
3	4874.00	41.51 AV	54.00	-12.49	1.04 V	213	2.74	38.77

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.

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**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1200.00	51.68 PK	74.00	-22.32	1.20 H	139	23.27	28.41
1	1200.00	48.46 AV	54.00	-5.54	1.20 H	139	20.05	28.41
2	*2462.00	98.75 PK			1.36 H	100	66.39	32.36
2	*2462.00	88.72 AV			1.36 H	100	56.36	32.36
3	2483.50	59.22 PK	74.00	-14.78	1.36 H	100	26.78	32.44
3	2483.50	43.48 AV	54.00	-10.52	1.36 H	100	11.04	32.44
4	4924.00	48.69 PK	74.00	-25.31	1.09 H	265	9.79	38.90
4	4924.00	36.54 AV	54.00	-17.46	1.09 H	265	-2.36	38.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1200.00	48.68 PK	74.00	-25.32	1.05 V	19	20.27	28.41
1	1200.00	43.25 AV	54.00	-10.75	1.05 V	19	14.84	28.41
2	*2462.00	106.63 PK			1.09 V	233	74.27	32.36
2	*2462.00	96.79 AV			1.09 V	233	64.43	32.36
3	2483.50	62.58 PK	74.00	-11.42	1.09 V	233	30.14	32.44
3	2483.50	51.50 AV	54.00	-2.50	1.09 V	233	19.06	32.44
4	4924.00	54.86 PK	74.00	-19.14	1.05 V	301	15.96	38.90
4	4924.00	41.52 AV	54.00	-12.48	1.05 V	301	2.62	38.90

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

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	FSP 40	100040	Jun. 07, 2007

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

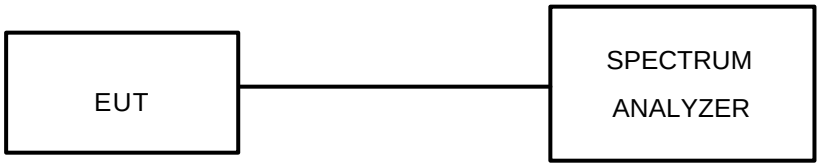
4.3.3 TEST PROCEDURE

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 100kHz 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.

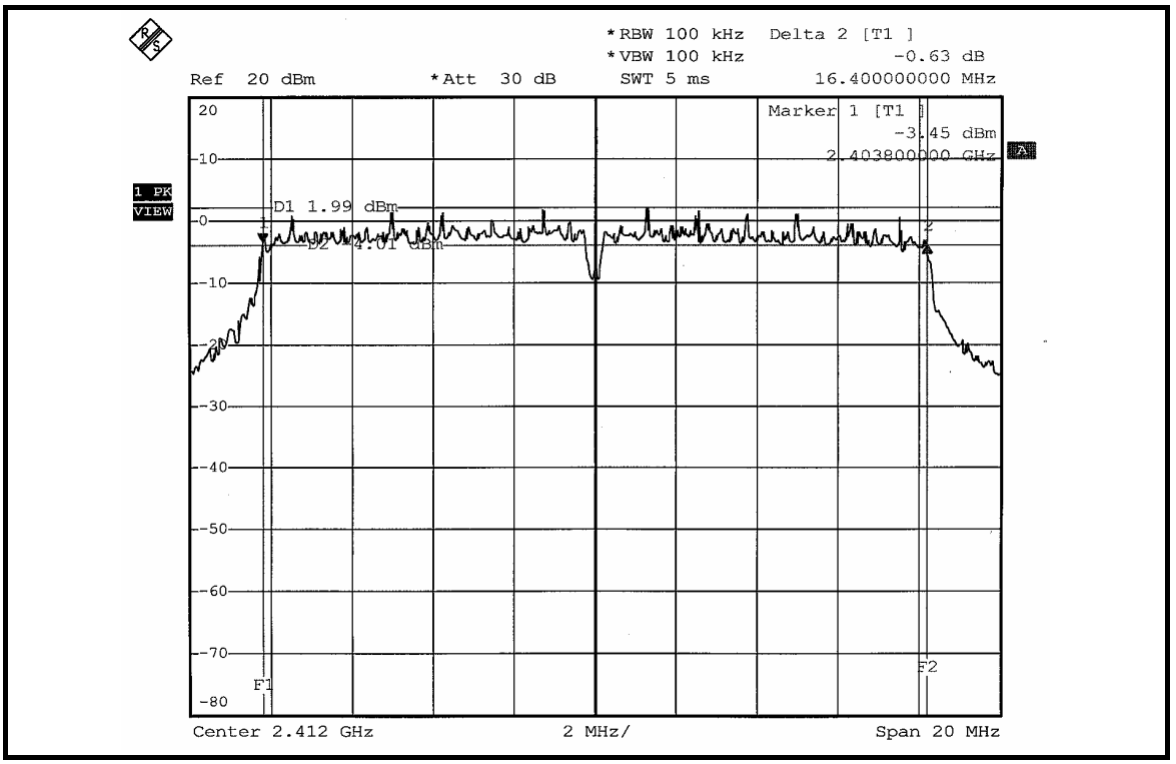
4.3.7 TEST RESULTS

802.11g OFDM MODULATION

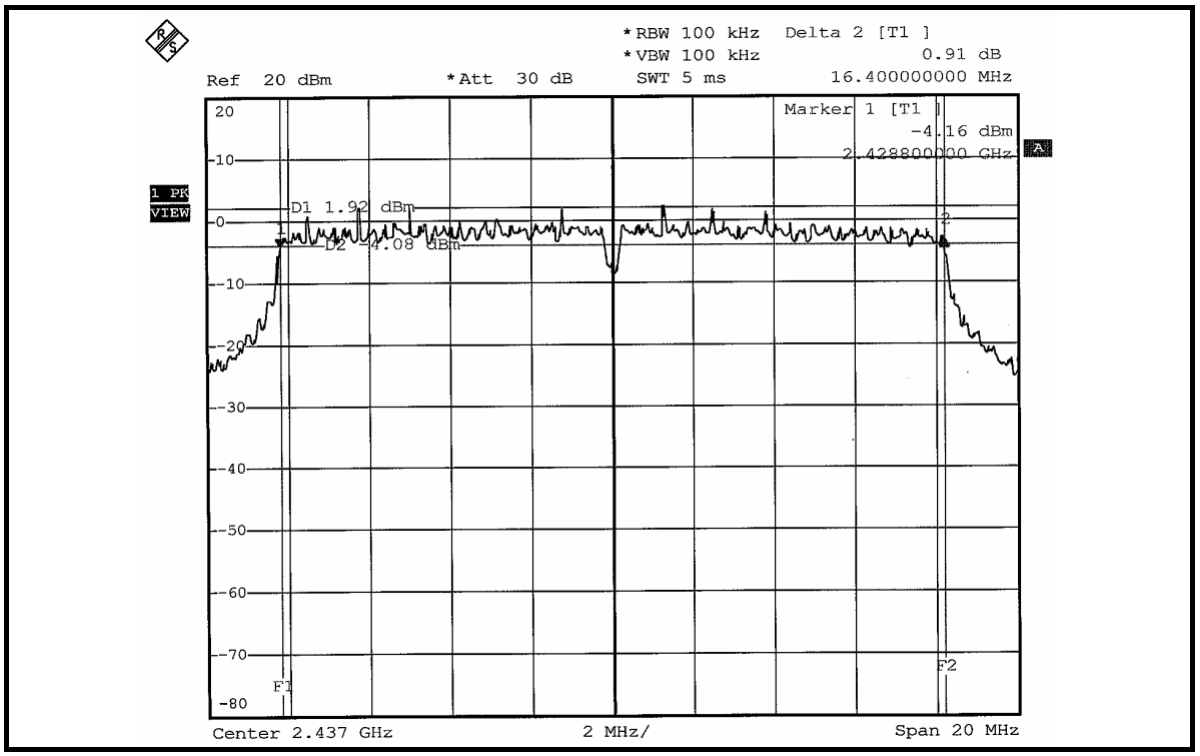
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.40	0.5	PASS
6	2437	16.40	0.5	PASS
11	2462	16.40	0.5	PASS

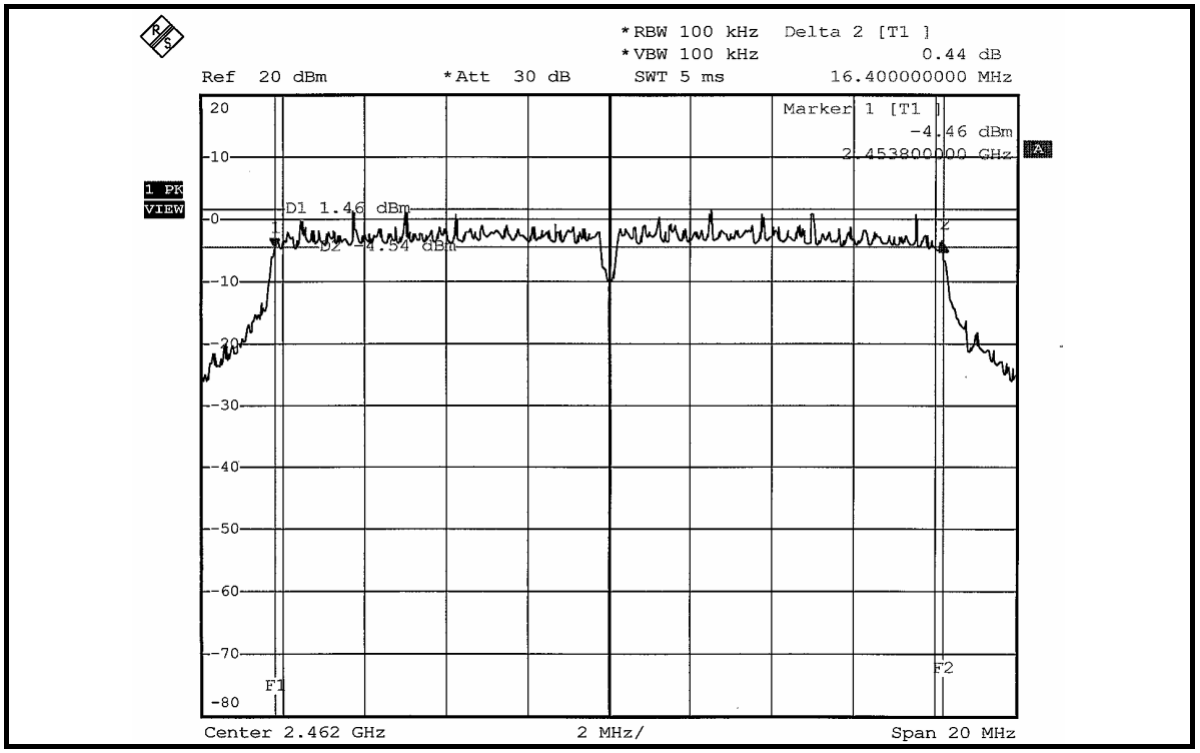
CH 1



CH 6


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1]
0.91 dB
16.400000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-4.16 dBm
2.428800000 GHz
1 PK
VIEW
D1 1.92 dBm
D2 -4.08 dBm
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH 11


*RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1]
0.44 dB
16.400000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-4.46 dBm
2.453800000 GHz
1 PK
VIEW
D1 1.46 dBm
D2 -4.54 dBm
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

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 Until
R&S SPECTRUM ANALYZER	FSP 40	100040	Jun. 07, 2007
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 30, 2006
TEKTRONIX OSCILLOSCOPE	TDS 1012	C019167	Jan. 16, 2007
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.

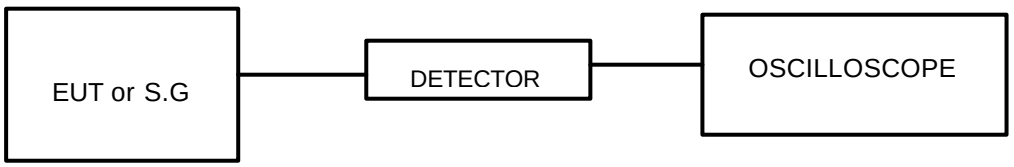
4.4.1 TEST PROCEDURES

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

4.4.2 DEVIATION FROM TEST STANDARD

No deviation

4.4.3 TEST SETUP



4.4.4 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.3 TEST RESULTS

802.11g OFDM MODULATION

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	56.754	17.54	30	PASS
6	2437	56.754	17.54	30	PASS
11	2462	51.050	17.08	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	FSP 40	100040	Jun. 07, 2007

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

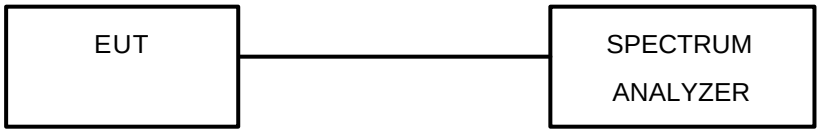
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

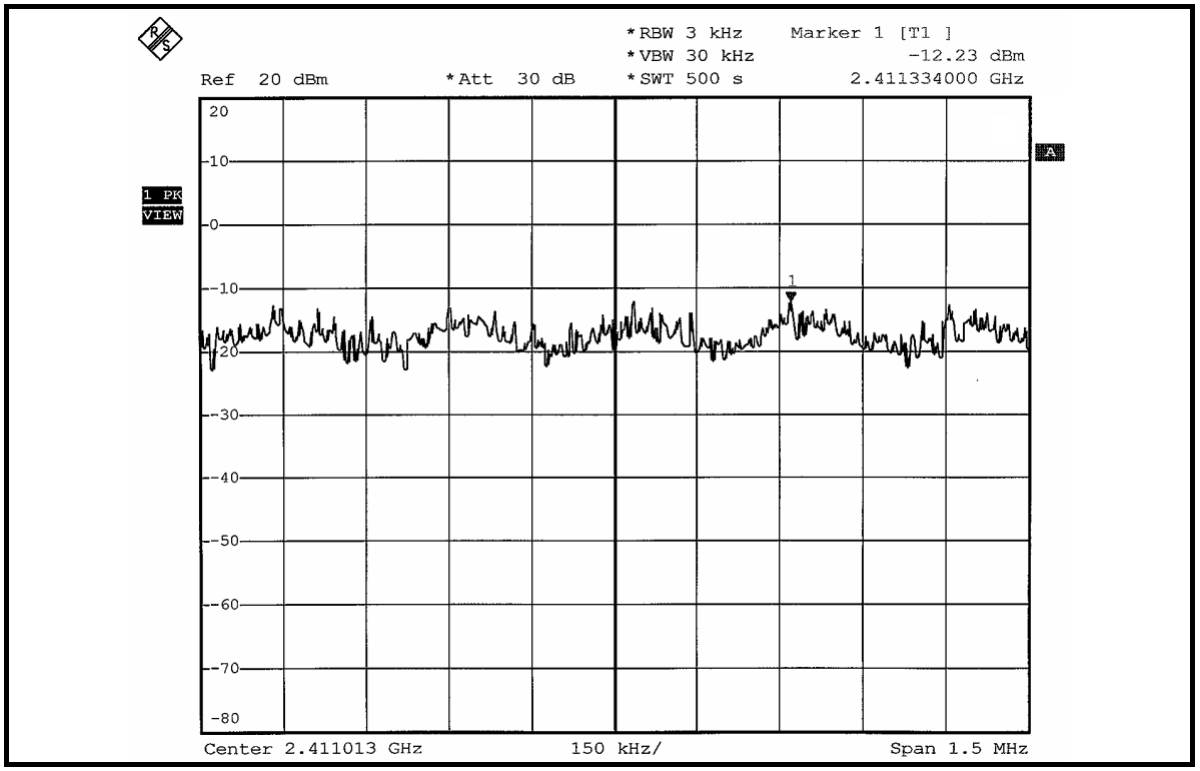
4.5.7 TEST RESULTS

802.11g OFDM MODULATION

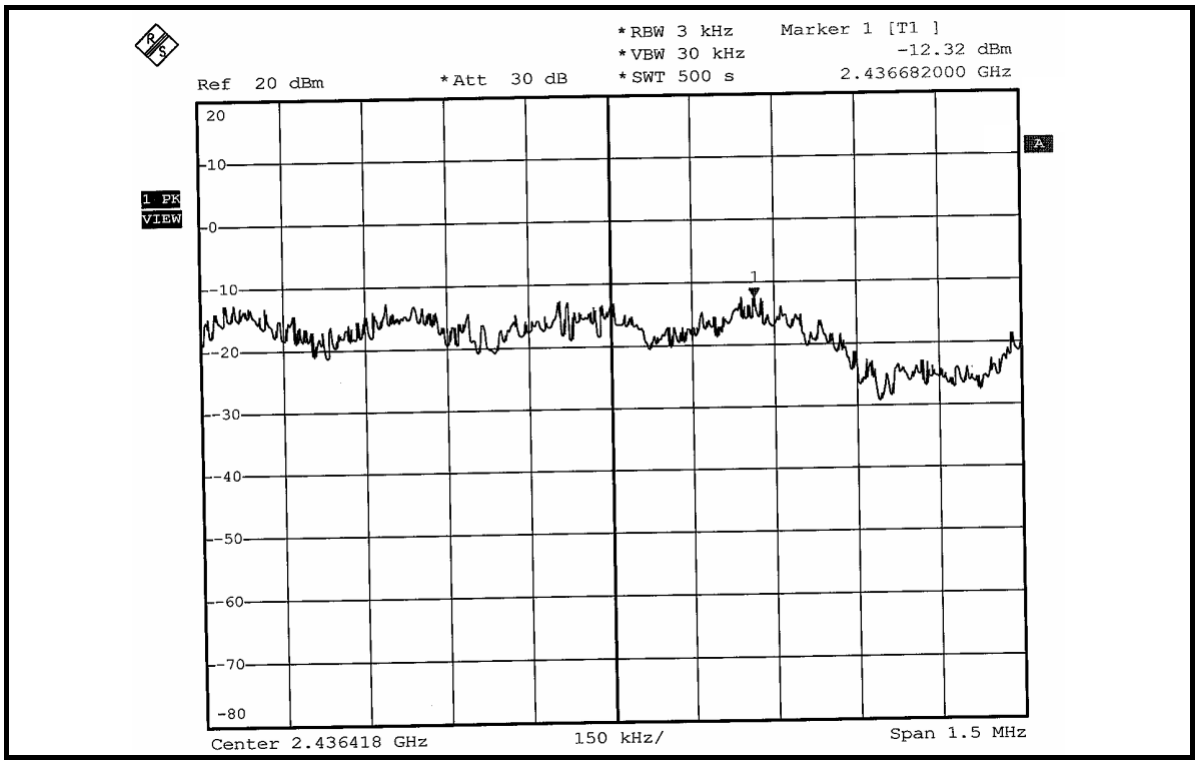
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-12.23	8	PASS
6	2437	-12.32	8	PASS
11	2462	-12.64	8	PASS

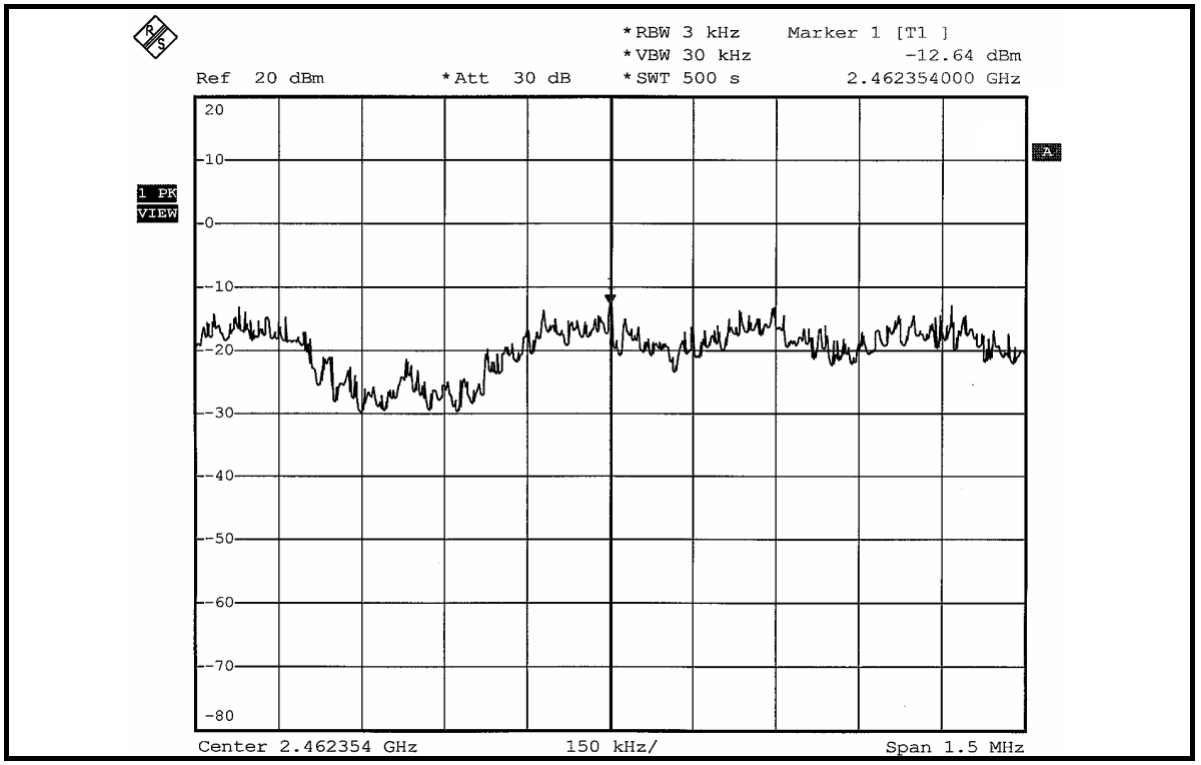
CH 1



CH 6


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-12.32 dBm
2.436682000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.436418 GHz
150 kHz/
Span 1.5 MHz

CH 11


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-12.64 dBm
2.462354000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.462354 GHz
150 kHz/
Span 1.5 MHz

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 & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP 40	100040	Jun. 07, 2007

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 100kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=VBW=100kHz; 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 6 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).

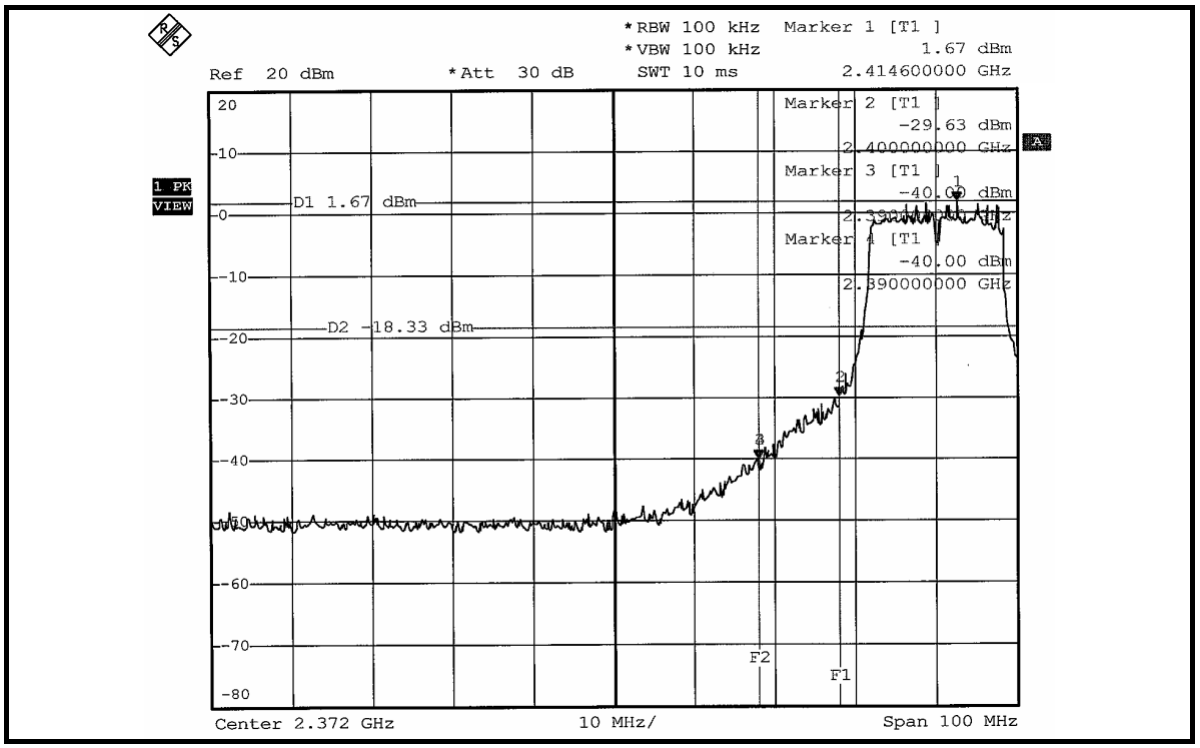
802.11g OFDM MODULATION

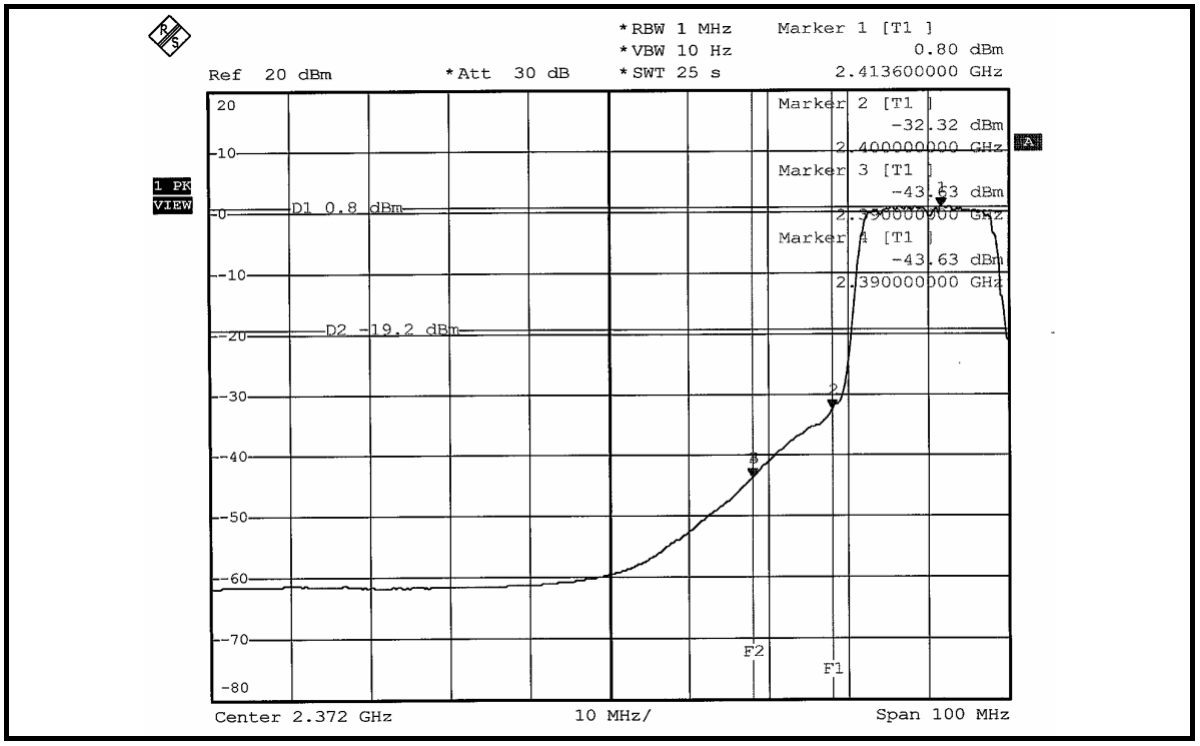
NOTE 1: The band edge emission plot on the next page shows 41.67dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 107.59dBuV/m (Peak), so the maximum field strength in restrict band is 107.59-41.67=65.92dBuV/m which is under 74dBuV/m limit.

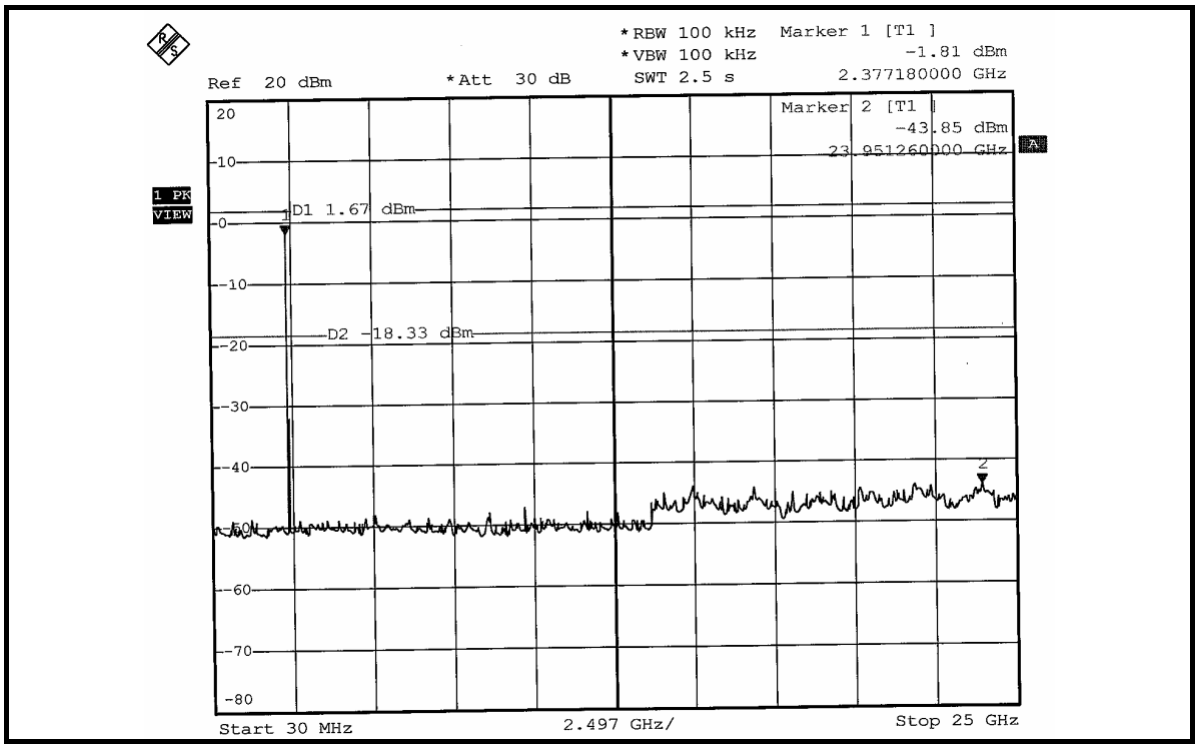
The band edge emission plot of on the next page shows 44.43dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 97.27dBuV/m (Average), so the maximum field strength in restrict band is 97.27-44.43=52.84dBuV/m which is under 54dBuV/m limit.

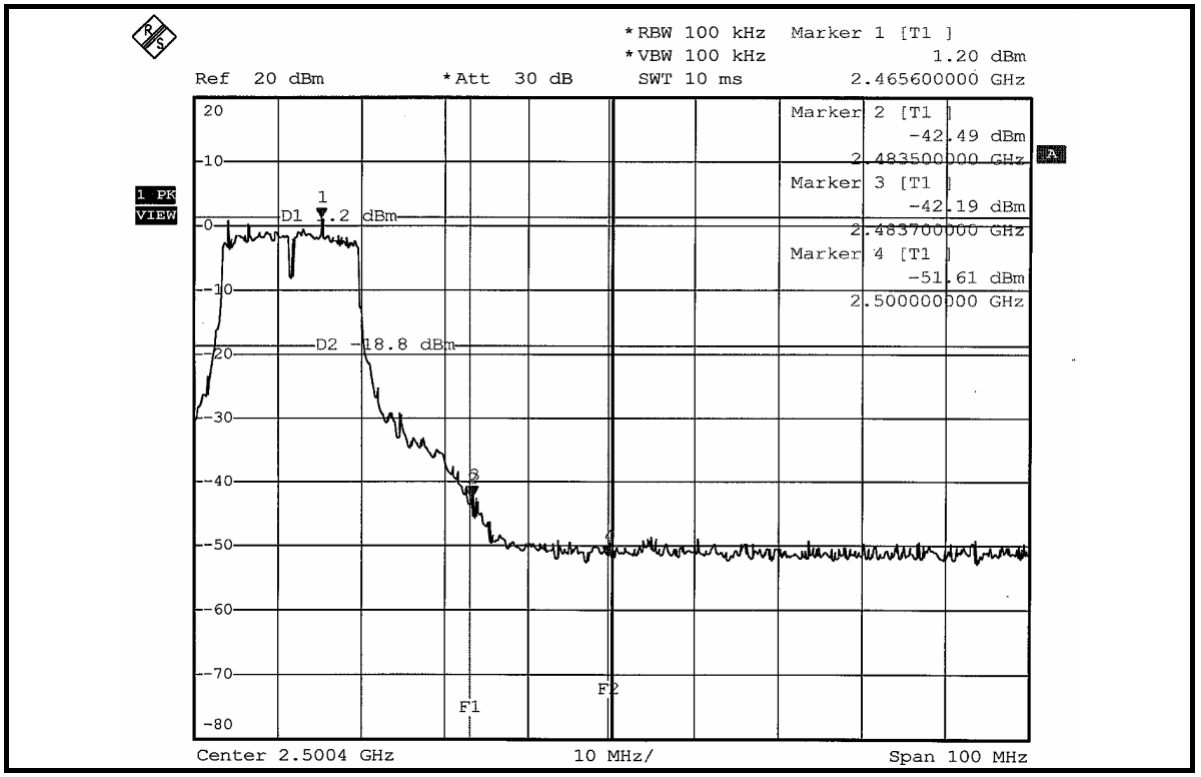
NOTE 2: The band edge emission plot on the next second page shows 43.39dBc between carrier maximum power and local maximum emission in restrict band (2.4837GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 106.63dBuV/m (Peak), so the maximum field strength in restrict band is 106.63-43.39=63.24dBuV/m which is under 74dBuV/m limit.

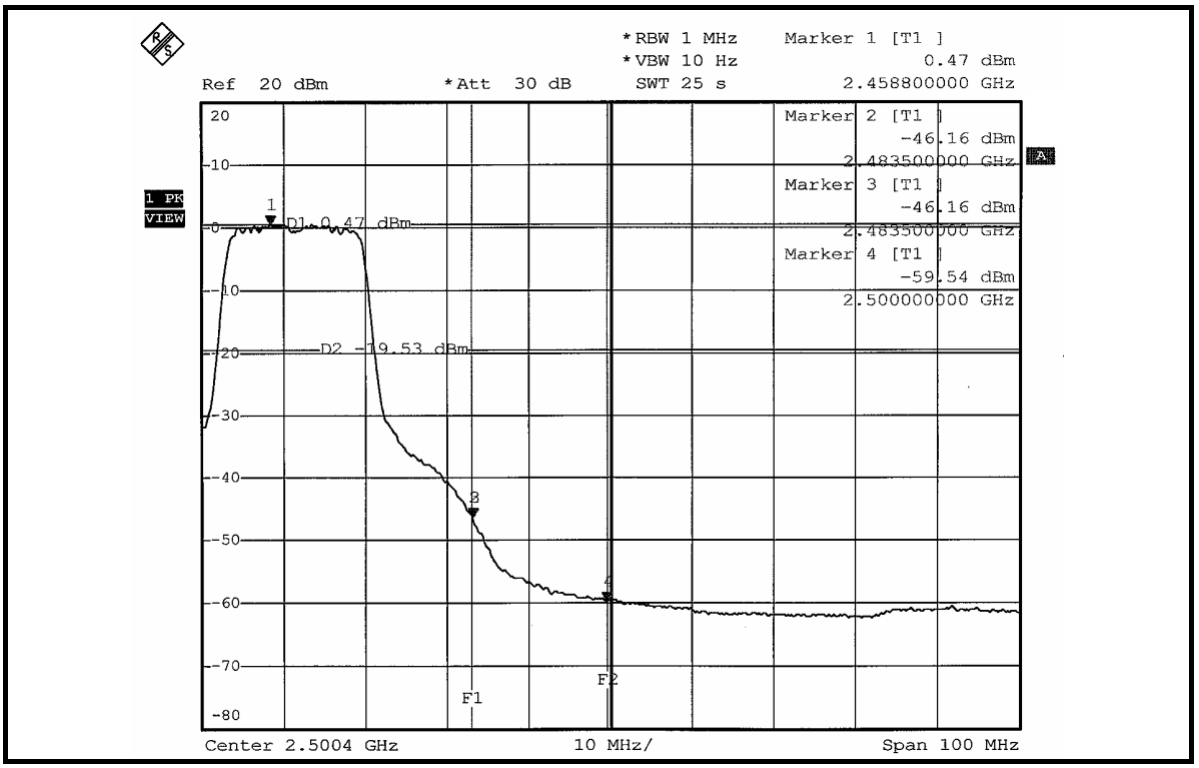
The band edge emission plot on the next third page shows 46.63dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 96.79dBuV/m (Average), so the maximum field strength in restrict band is 96.79-46.63=50.16dBuV/m which is under 54dBuV/m limit.

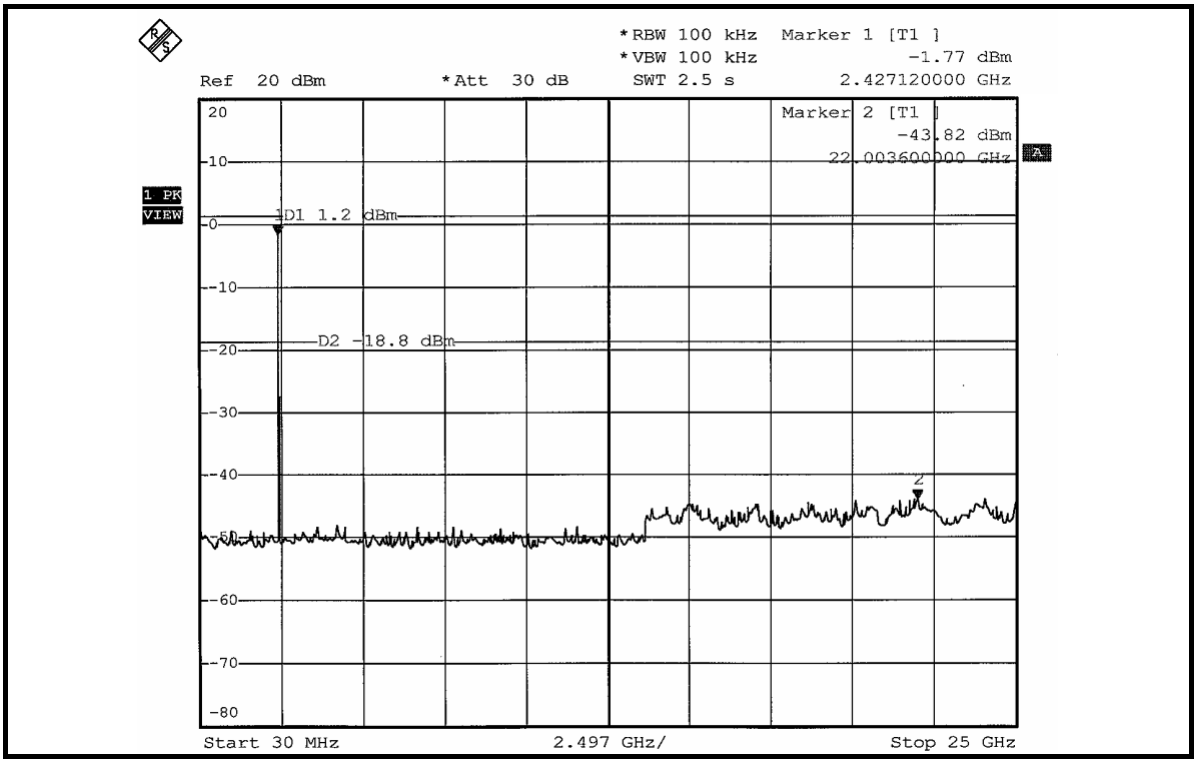

*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
1.67 dBm
2.414600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-29.63 dBm
2.400000000 GHz
Marker 3 [T1]
-40.00 dBm
Marker 4 [T1
-40.00 dBm
2.390000000 GHz
1 PK
VIEW
A
D1 1.67 dBm
D2 -18.33 dBm
F2
F1
Center 2.372 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 10 Hz
*SWT 25 s
Marker 1 [T1]
0.80 dBm
2.413600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-32.32 dBm
2.400000000 GHz
Marker 3 [T1]
-43.63 dBm
Marker 4 [T1]
-43.63 dBm
2.390000000 GHz
1 PK
VIEW
A
D1 0.8 dBm
D2 -19.2 dBm
F2
F1
Center 2.372 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-1.81 dBm
2.377180000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-43.85 dBm
23.951260000 GHz
1 PK
VIEW
D1 1.67 dBm
D2 -18.33 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
1.20 dBm
2.465600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-42.49 dBm
2.483500000 GHz
Marker 3 [T1]
-42.19 dBm
2.483700000 GHz
Marker 4 [T1]
-51.61 dBm
2.500000000 GHz
1 PK
VIEW
D1 1.2 dBm
D2 -18.8 dBm
F1
F2
Center 2.5004 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
0.47 dBm
2.458800000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-46.16 dBm
2.483500000 GHz
Marker 3 [T1]
-46.16 dBm
2.483500000 GHz
Marker 4 [T1]
-59.54 dBm
2.500000000 GHz
1 PK
VIEW
D1 0.47 dBm
D2 -19.53 dBm
F1
F2
Center 2.5004 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-1.77 dBm
2.427120000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-43.82 dBm
22.003600000 GHz
1 PK
VIEW
D1 1.2 dBm
D2 -18.8 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz

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 Integrated antenna with UFL connector. The maximum Gain of the antenna is 1.8dBi.

5. TEST TYPES AND RESULTS (FOR 802.11a 5745~5805MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
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 UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Nov. 02, 2006
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2007
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 09, 2007
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Jan. 22, 2007
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.

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.

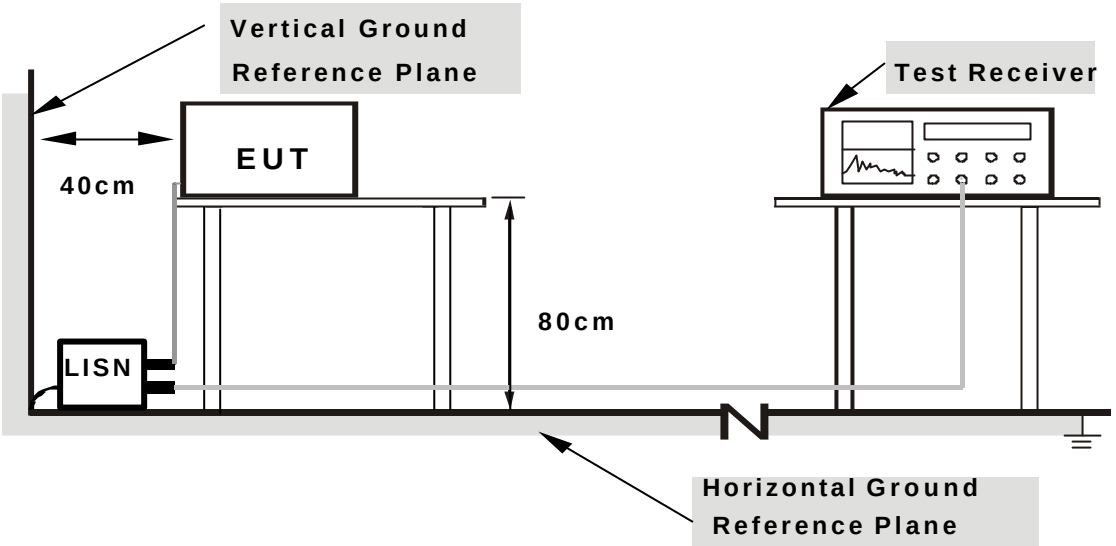
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit – 20dB) was not recorded.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



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

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

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

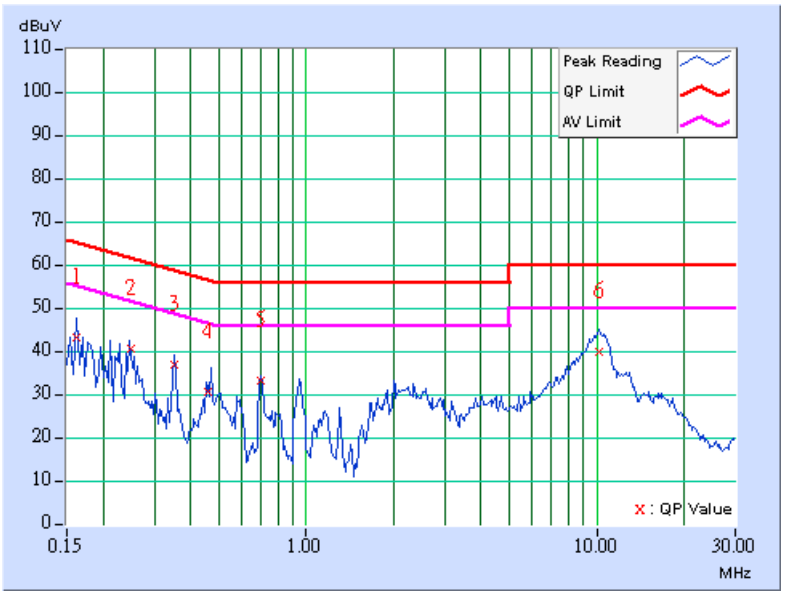
5.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	**PHASE**	Line 1
MODULATION TYPE	BPSK	**6dB BANDWIDTH**	9 kHz
TRANSFER RATE	6Mbps	**ENVIRONMENTAL CONDITIONS**	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TEST MODE**	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		**Factor**	**[dB (uV)]**		**[dB (uV)]**		**[dB (uV)]**		**(dB)**	
	[MHz]	**(dB)**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	0.162	0.10	42.78	-	42.88	-	65.34	55.34	-22.46	-
2	0.248	0.10	40.25	-	40.35	-	61.83	51.83	-21.48	-
3	0.349	0.10	36.63	-	36.73	-	58.98	48.98	-22.25	-
4	0.456	0.10	30.26	-	30.36	-	56.76	46.76	-26.40	-
5	0.702	0.10	32.81	-	32.91	-	56.00	46.00	-23.09	-
6	10.192	0.37	39.52	-	39.89	-	60.00	50.00	-20.11	-

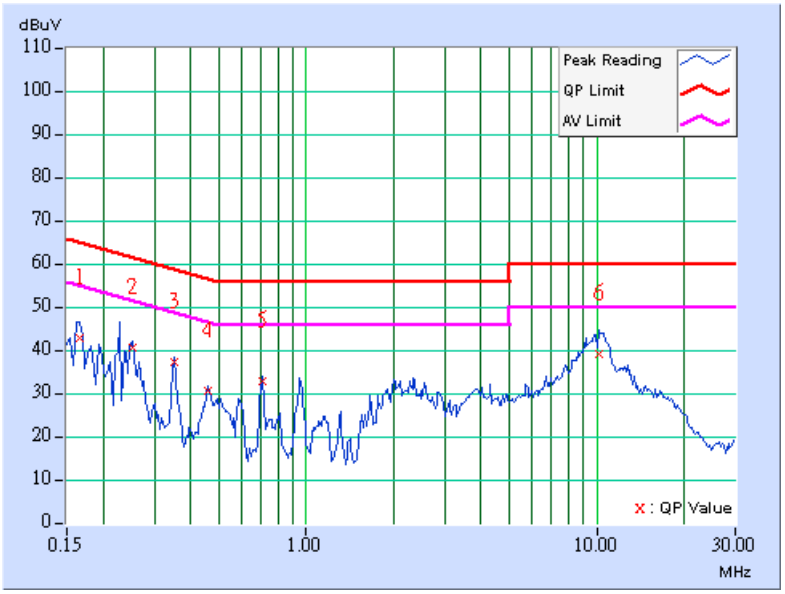
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	A
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.167	0.10	42.31	-	42.41	-	65.13	55.13	-22.72	-
2	0.252	0.10	40.38	-	40.48	-	61.68	51.68	-21.20	-
3	0.354	0.10	36.96	-	37.06	-	58.88	48.88	-21.82	-
4	0.459	0.11	30.09	-	30.20	-	56.72	46.72	-26.52	-
5	0.705	0.15	32.47	-	32.62	-	56.00	46.00	-23.38	-
6	10.236	0.47	38.72	-	39.19	-	60.00	50.00	-20.81	-

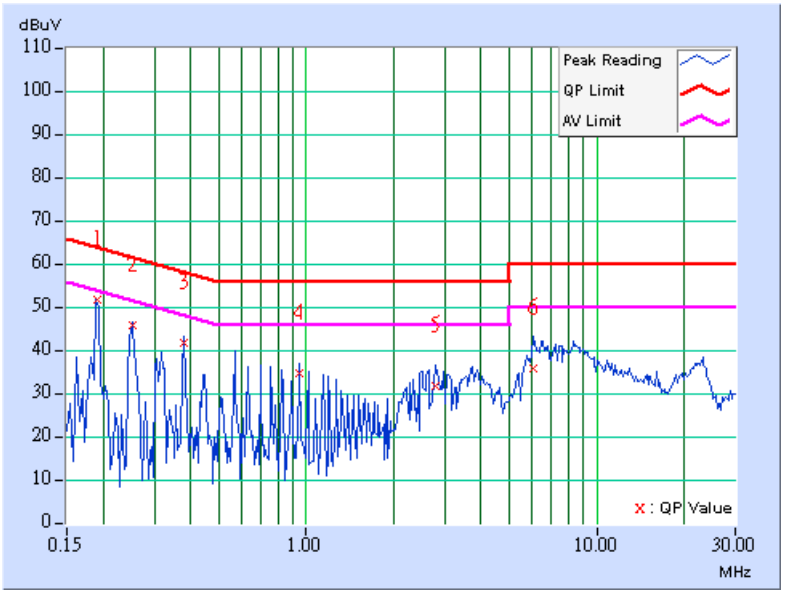
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.190	0.10	51.32	-	51.42	-	64.04	54.04	-12.62	-
2	0.252	0.10	45.47	-	45.57	-	61.68	51.68	-16.11	-
3	0.380	0.10	41.52	-	41.62	-	58.27	48.27	-16.65	-
4	0.952	0.10	34.41	-	34.51	-	56.00	46.00	-21.49	-
5	2.790	0.27	31.67	-	31.94	-	56.00	46.00	-24.06	-
6	6.078	0.37	35.54	-	35.91	-	60.00	50.00	-24.09	-

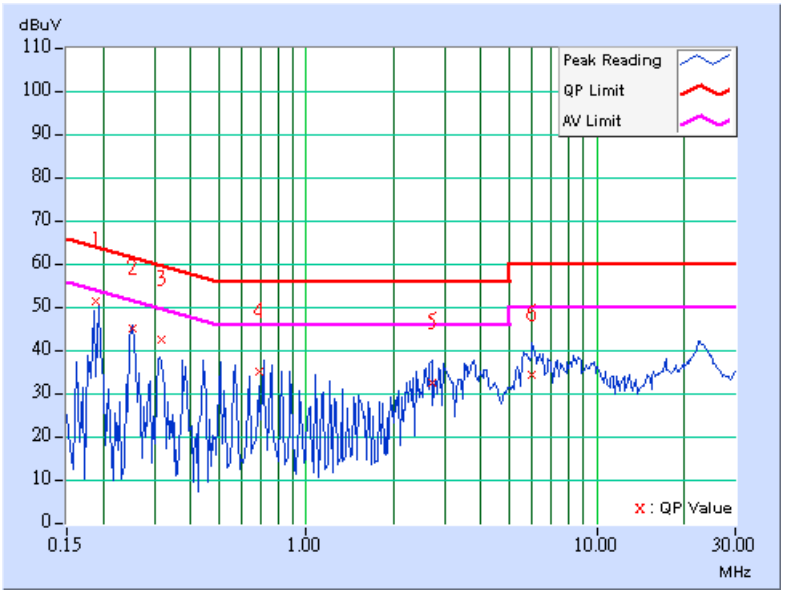
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Match Tsui		

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.190	0.10	51.24	-	51.34	-	64.05	54.05	-12.71	-
2	0.252	0.10	44.93	-	45.03	-	61.68	51.68	-16.65	-
3	0.316	0.10	42.36	-	42.46	-	59.82	49.82	-17.36	-
4	0.693	0.15	34.74	-	34.89	-	56.00	46.00	-21.11	-
5	2.719	0.26	32.28	-	32.54	-	56.00	46.00	-23.46	-
6	6.009	0.40	34.21	-	34.61	-	60.00	50.00	-25.39	-

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.

5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 01, 2007
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 04, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 15, 2007
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Jan. 01, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 19, 2007
Preamplifier Agilent	8449B	3008A1960	Oct. 30, 2007
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219268/4	Dec. 20, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	230129/4	Dec. 20, 2006
Software ADT.	ADT_Radiated_V5.14	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
26GHz ~ 40GHz Amplifier	AMF-6F-2600400	900619	Nov. 13, 2006

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 IC4924-4.

5.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

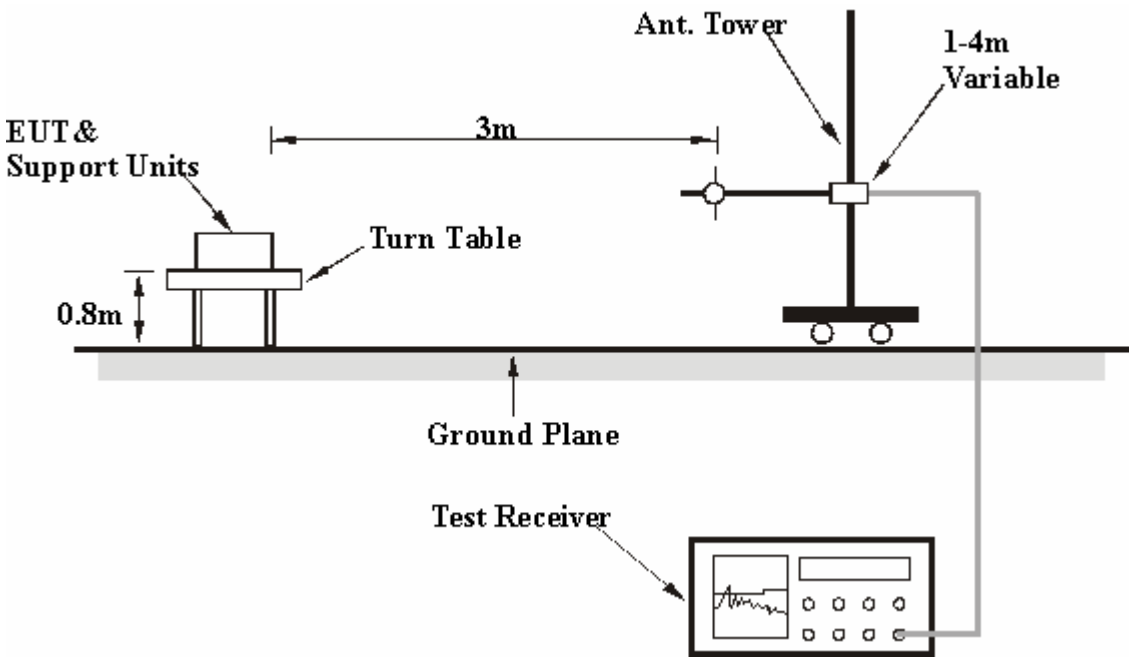
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for 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 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.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

5.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**DETECTOR FUNCTION**	Quasi-Peak
TRANSFER RATE	6Mbps	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TEST MODE**	A
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	267.35	40.40 QP	46.00	-5.60	1.50 H	195	26.73	13.67
2	712.46	42.84 QP	46.00	-3.16	1.00 H	130	18.29	24.55
3	799.72	39.84 QP	46.00	-6.16	1.25 H	181	13.73	26.11
4	858.25	39.76 QP	46.00	-6.24	1.50 H	249	12.90	26.86
5	**900.95**	**44.84 QP**	**46.00**	**-1.16**	**1.50 H**	**208**	**17.35**	**27.49**
6	933.85	42.95 QP	46.00	-3.05	1.25 H	118	13.92	29.03

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	37.71	36.84 QP	40.00	-3.16	1.25 V	71	23.01	13.83
2	249.70	36.82 QP	46.00	-9.18	1.50 V	109	24.39	12.43
3	500.41	35.82 QP	46.00	-10.18	1.25 V	191	15.87	19.95
4	799.77	37.51 QP	46.00	-8.49	1.25 V	305	11.40	26.11
5	900.92	44.75 QP	46.00	-1.25	1.00 V	144	17.26	27.49
6	939.82	43.59 QP	46.00	-2.41	1.00 V	184	14.28	29.31

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	B
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	267.41	36.39 QP	46.00	-9.61	1.25 H	201	22.71	13.68
2	688.84	44.59 QP	46.00	-1.41	1.50 H	209	20.68	23.91
3	799.95	38.92 QP	46.00	-7.08	1.25 H	161	12.81	26.11
4	867.72	40.89 QP	46.00	-5.11	1.25 H	121	13.90	26.99
5	900.84	44.59 QP	46.00	-1.41	1.50 H	161	17.10	27.49
6	933.72	42.45 QP	46.00	-3.55	1.50 H	221	13.42	29.03

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	37.96	37.26 QP	40.00	-2.74	1.00 V	124	23.36	13.90
2	249.72	36.81 QP	46.00	-9.19	1.25 V	182	24.38	12.43
3	599.78	33.62 QP	46.00	-12.38	1.25 V	195	11.08	22.54
4	799.95	37.51 QP	46.00	-8.49	1.25 V	65	11.40	26.11
5	900.84	44.75 QP	46.00	-1.25	1.00 V	208	17.26	27.49
6	933.96	41.88 QP	46.00	-4.12	1.25 V	76	12.84	29.04

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 4	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TEST MODE	C
TESTED BY	Brad Wu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	249.88	37.48 QP	46.00	-8.52	1.50 H	101	25.05	12.43
2	399.42	32.57 QP	46.00	-13.43	1.00 H	119	14.79	17.78
3	751.34	43.26 QP	46.00	-2.74	1.00 H	101	17.47	25.79
4	867.94	41.10 QP	46.00	-4.90	1.25 H	86	14.10	27.00
5	933.90	44.65 QP	46.00	-1.35	1.50 H	100	15.61	29.04
6	949.66	40.28 QP	46.00	-5.72	1.50 H	101	10.51	29.77

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	55.51	38.42 QP	40.00	-1.58	1.50 V	105	24.53	13.89
2	249.83	34.31 QP	46.00	-11.69	1.00 V	98	21.88	12.43
3	799.86	38.70 QP	46.00	-7.30	1.25 V	129	12.59	26.11
4	867.75	40.36 QP	46.00	-5.64	1.00 V	74	13.37	26.99
5	900.77	44.61 QP	46.00	-1.39	1.25 V	55	17.12	27.49
6	933.81	44.62 QP	46.00	-1.38	1.00 V	51	15.59	29.03

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.

802.11a OFDM modulation

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1200.00	51.96 PK	74.00	-22.04	1.14 H	183	23.55	28.41
1	#1200.00	48.83 AV	54.00	-5.17	1.14 H	183	20.42	28.41
2	5725.00	64.16 PK	76.35	-12.19	1.30 H	90	23.97	40.19
2	5725.00	49.72 AV	65.72	-16.00	1.30 H	90	9.53	40.19
3	*5745.00	96.35 PK			1.30 H	90	56.10	40.25
3	*5745.00	85.72 AV			1.30 H	90	45.47	40.25
4	#11490.00	59.26 PK	74.00	-14.74	1.02 H	61	7.41	51.84
4	#11490.00	46.52 AV	54.00	-7.48	1.02 H	61	-5.32	51.84

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	#1200.00	48.71 PK	74.00	-25.29	1.10 V	46	20.30	28.41
1	#1200.00	43.35 AV	54.00	-10.65	1.10 V	46	14.94	28.41
2	5725.00	74.39 PK	86.49	-12.10	1.31 V	84	34.20	40.19
2	5725.00	59.90 AV	75.87	-15.97	1.31 V	84	19.71	40.19
3	*5745.00	106.49 PK			1.31 V	84	66.24	40.25
3	*5745.00	95.87 AV			1.31 V	84	55.62	40.25
4	#11490.00	59.46 PK	74.00	-14.54	1.05 V	62	7.62	51.84
4	#11490.00	47.03 AV	54.00	-6.97	1.05 V	62	-4.81	51.84

NOTE:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.
7. The limit value is defined as per 15.247

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1200.00	51.64 PK	74.00	-22.36	1.10 H	176	23.23	28.41
1	#1200.00	48.52 AV	54.00	-5.48	1.10 H	176	20.11	28.41
2	*5785.00	95.84 PK			1.28 H	100	55.49	40.35
2	*5785.00	85.26 AV			1.28 H	100	44.91	40.35
3	#11570.00	59.35 PK	74.00	-14.65	1.05 H	74	7.67	51.68
3	#11570.00	46.61 AV	54.00	-7.39	1.05 H	74	-5.07	51.68

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	#1200.00	48.78 PK	74.00	-25.22	1.01 V	73	20.37	28.41
1	#1200.00	43.52 AV	54.00	-10.48	1.01 V	73	15.11	28.41
2	*5785.00	106.03 PK			1.34 V	102	65.68	40.35
2	*5785.00	95.45 AV			1.34 V	102	55.10	40.35
3	#11570.00	59.38 PK	74.00	-14.62	1.12 V	203	7.70	51.68
3	#11570.00	46.97 AV	54.00	-7.03	1.12 V	203	-4.71	51.68

NOTE:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.
7. The limit value is defined as per 15.247

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	**ENVIRONMENTAL CONDITIONS**	25deg. C, 65%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**TESTED BY**	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1200.00	51.87 PK	74.00	-22.13	1.16 H	174	23.46	28.41
1	#1200.00	48.72 AV	54.00	-5.28	1.16 H	174	20.31	28.41
2	*5805.00	95.14 PK			1.40 H	118	54.74	40.40
2	*5805.00	84.56 AV			1.40 H	118	44.16	40.40
3	5850.00	59.43 PK	75.14	-15.71	1.40 H	118	18.91	40.52
3	5850.00	47.21 AV	64.56	-17.35	1.40 H	118	6.70	40.52
4	#11610.00	59.11 PK	74.00	-14.89	1.05 H	48	7.53	51.58
4	#11610.00	46.38 AV	54.00	-7.62	1.05 H	48	-5.20	51.58

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	#1200.00	48.96 PK	74.00	-25.04	1.09 V	22	20.55	28.41
1	#1200.00	43.58 AV	54.00	-10.42	1.09 V	22	15.17	28.41
2	*5805.00	105.38 PK			1.42 V	116	64.98	40.40
2	*5805.00	94.72 AV			1.42 V	116	54.32	40.40
3	5850.00	69.66 PK	85.38	-15.72	1.42 V	116	29.15	40.52
3	5850.00	57.44 AV	74.72	-17.28	1.42 V	116	16.92	40.52
4	#11610.00	59.24 PK	74.00	-14.76	1.03 V	34	7.66	51.58
4	#11610.00	46.85 AV	54.00	-7.15	1.03 V	34	-4.73	51.58

NOTE: 1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.
7. 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 Until
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

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

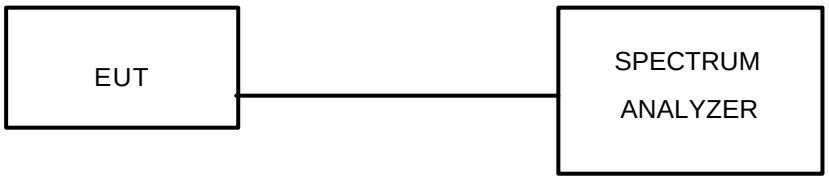
5.3.3 TEST PROCEDURE

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.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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

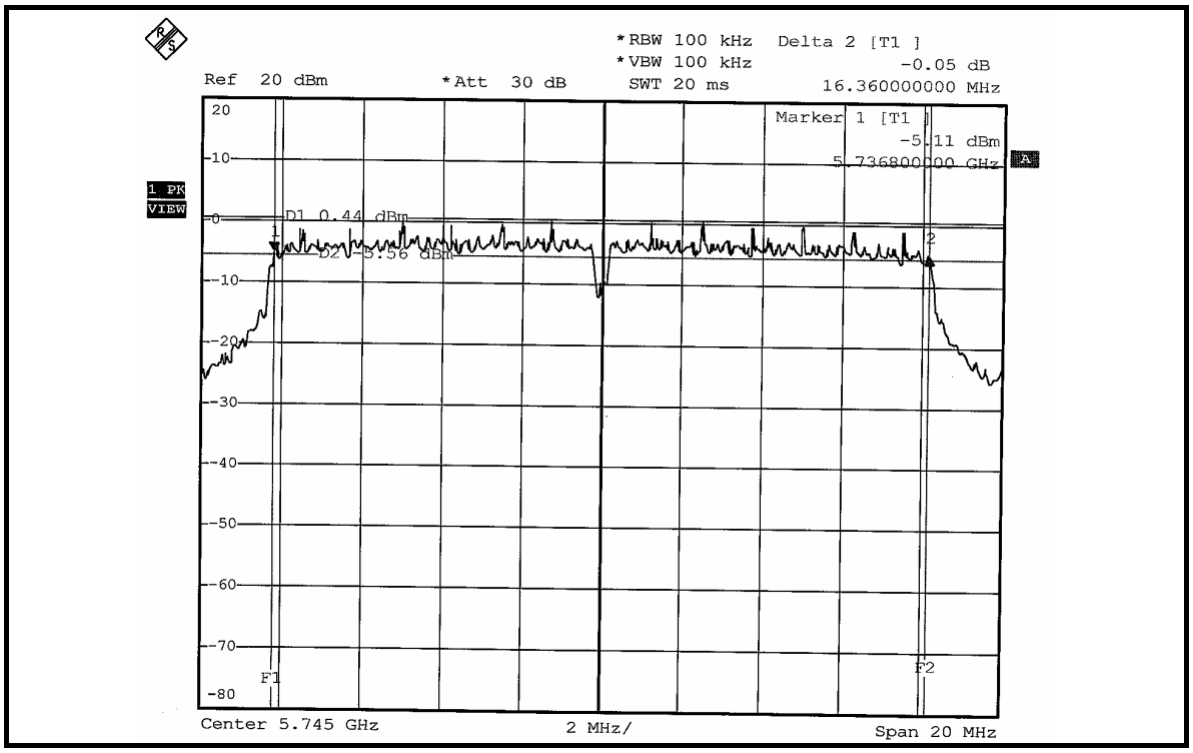
5.3.7 TEST RESULTS

802.11a OFDM Modulation

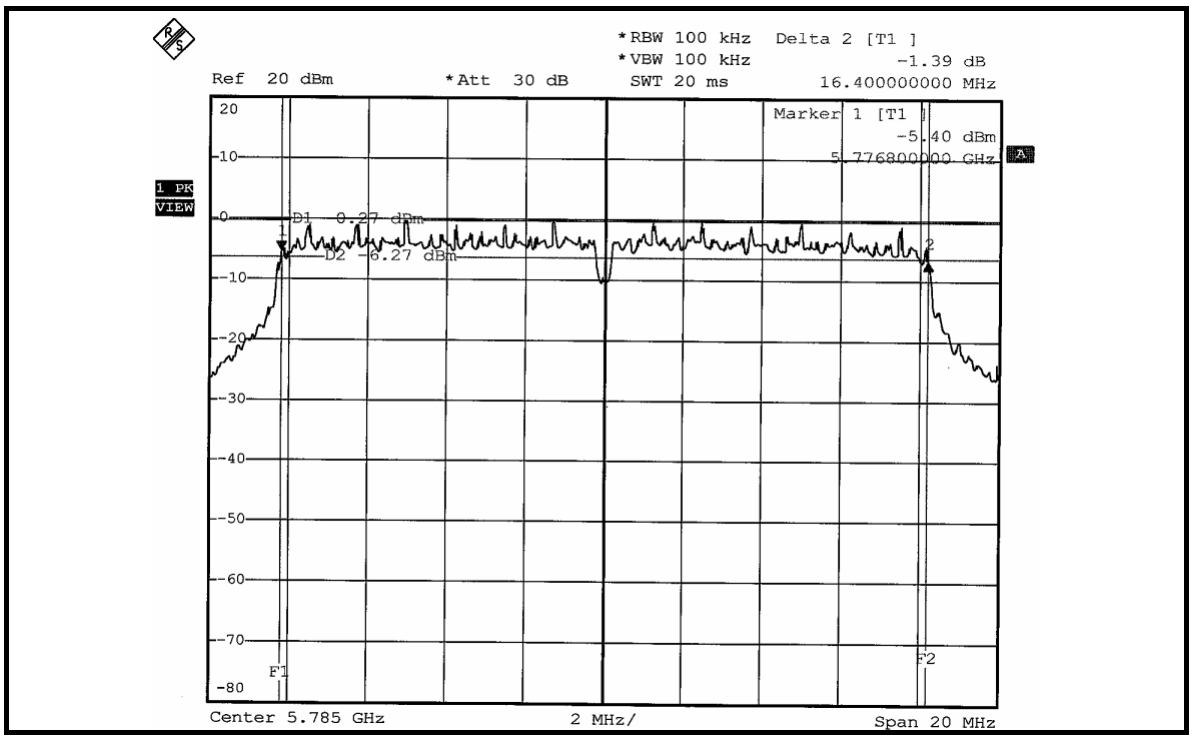
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	5745	16.36	0.5	PASS
3	5785	16.40	0.5	PASS
4	5805	16.36	0.5	PASS

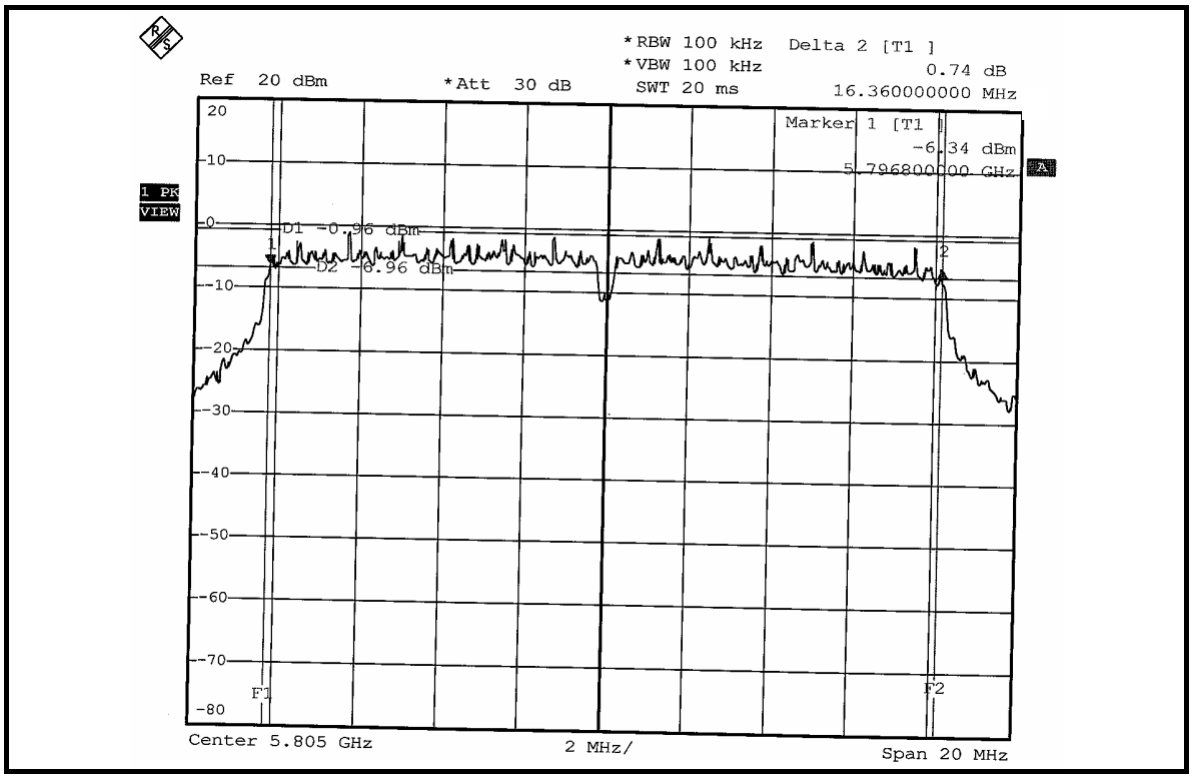
CH 1


*RBW 100 kHz
*VBW 100 kHz
SWT 20 ms
Delta 2 [T1]
-0.05 dB
16.360000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-5.11 dBm
5.736800000 GHz
1 PK
VIEW
D1 0.44 dBm
D2 -5.56 dBm
F1
F2
Center 5.745 GHz
2 MHz/
Span 20 MHz

CH 3


*RBW 100 kHz
*VBW 100 kHz
SWT 20 ms
Delta 2 [T1]
-1.39 dB
16.400000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-5.40 dBm
5.776800000 GHz
1 PK
VIEW
D1 0.27 dBm
D2 -6.27 dBm
F1
F2
Center 5.785 GHz
2 MHz/
Span 20 MHz

CH 4


*RBW 100 kHz
*VBW 100 kHz
SWT 20 ms
Delta 2 [T1]
0.74 dB
16.360000000 MHz
Ref 20 dBm
*Att 30 dB
Marker 1 [T1]
-6.34 dBm
5.796800000 GHz
1 PK
VIEW
D1 -0.96 dBm
D2 -6.96 dBm
F1
F2
Center 5.805 GHz
2 MHz/
Span 20 MHz

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 Until
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 30, 2006
TEKTRONIX OSCILLOSCOPE	TDS 1012	C019167	Jan. 16, 2007
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..

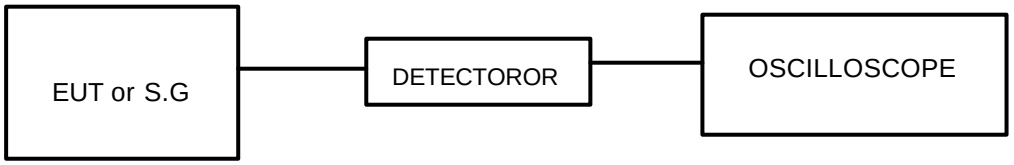
5.4.3 TEST PROCEDURES

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

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6

5.4.7 TEST RESULTS

802.11a OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	5745	36.058	15.57	30	PASS
3	5785	35.892	15.55	30	PASS
4	5805	31.915	15.04	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 Until
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

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

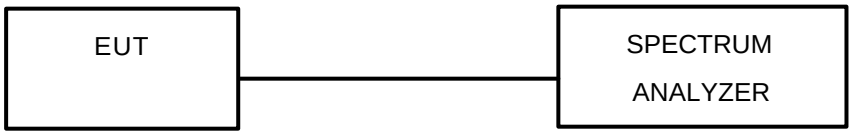
5.5.3 TEST PROCEDURE

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.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 5.3.6

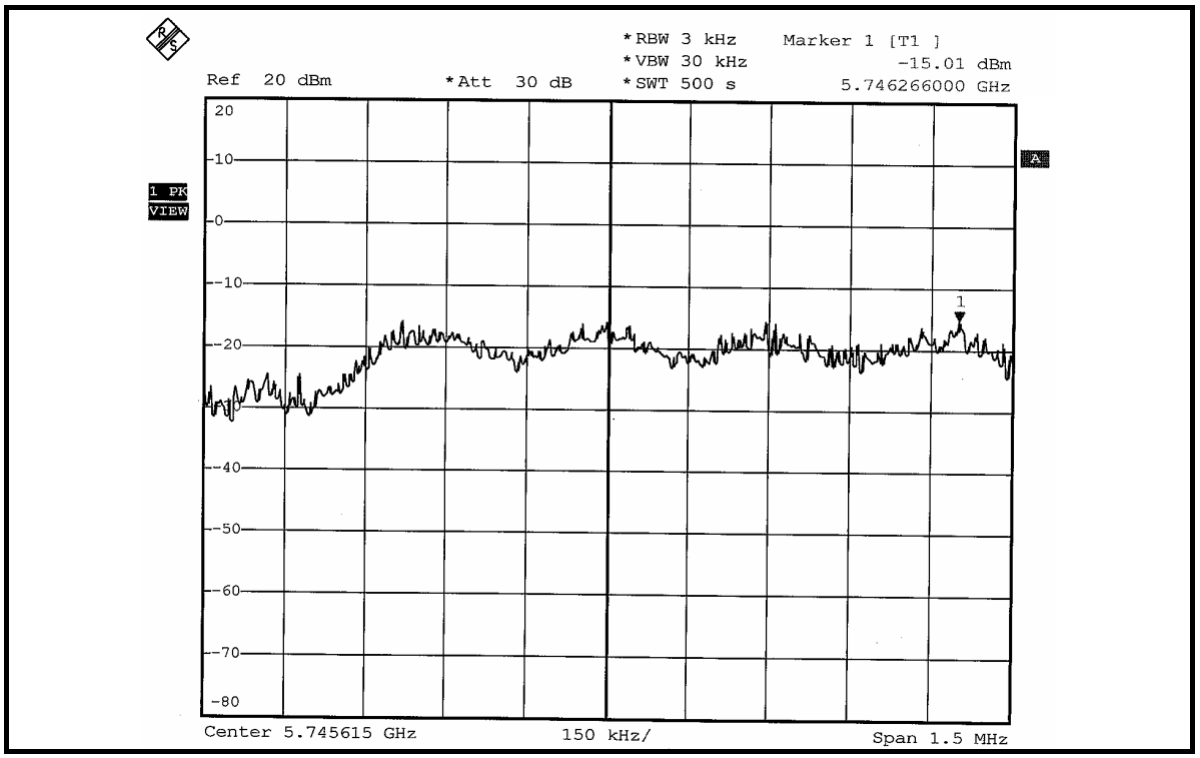
5.5.7 TEST RESULTS

802.11a OFDM modulation

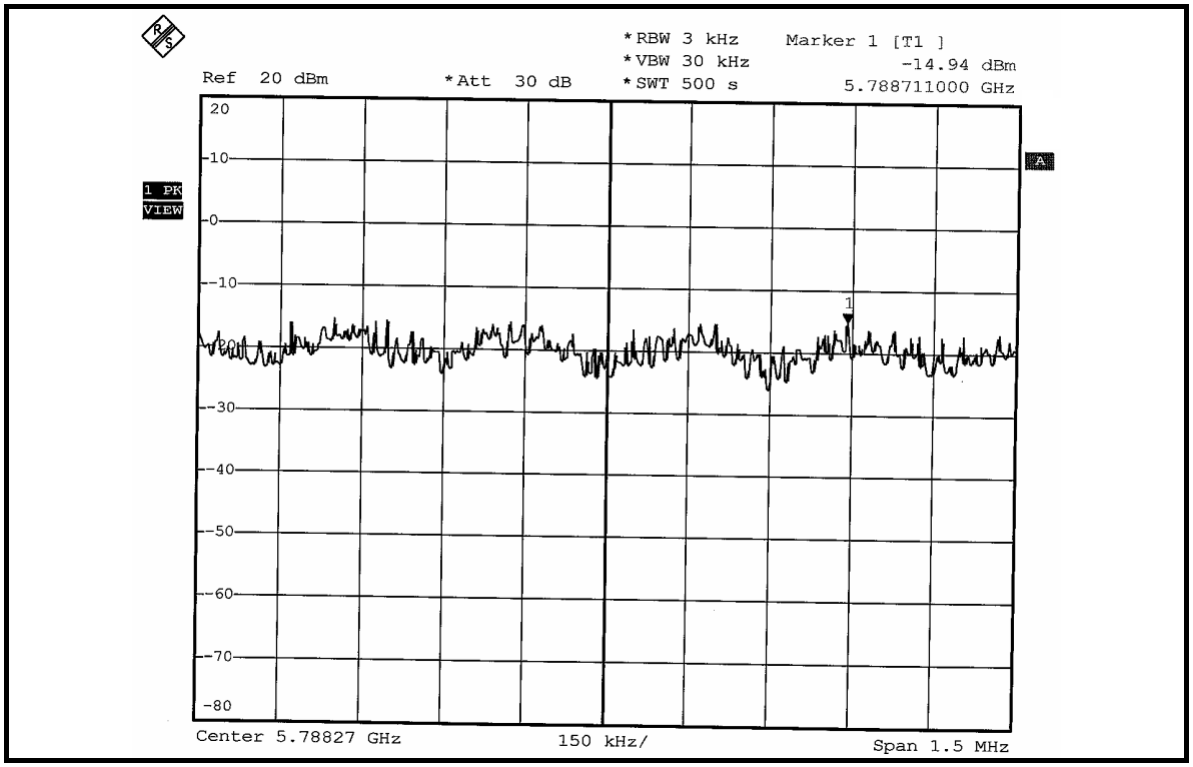
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Long Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5745	-15.01	8	PASS
3	5785	-14.94	8	PASS
4	5805	-15.41	8	PASS

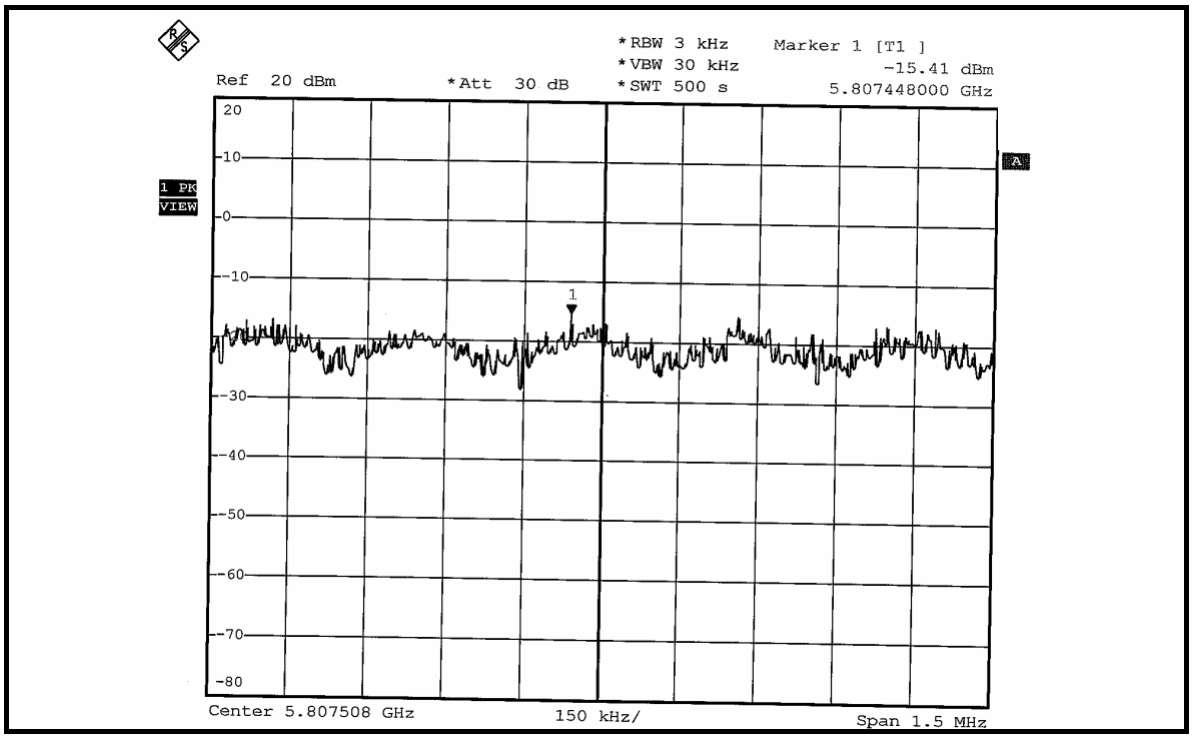
CH 1


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-15.01 dBm
5.746266000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-20
-40
-50
-60
-70
-80
1
Center 5.745615 GHz
150 kHz/
Span 1.5 MHz

CH 3


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-14.94 dBm
5.788711000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-30
-40
-50
-60
-70
-80
1
Center 5.78827 GHz
150 kHz/
Span 1.5 MHz

CH 4


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-15.41 dBm
5.807448000 GHz
Ref 20 dBm
*Att 30 dB
1 PK
VIEW
A
20
10
0
-10
-30
-40
-50
-60
-70
-80
1
Center 5.807508 GHz
150 kHz/
Span 1.5 MHz

5.6 BAND EDGES MEASUREMENT

5.6.1 LIMITS OF BAND EDGES 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 Until
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 07, 2007

NOTES:
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 both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

5.6.4 DEVIATION FROM TEST STANDARD

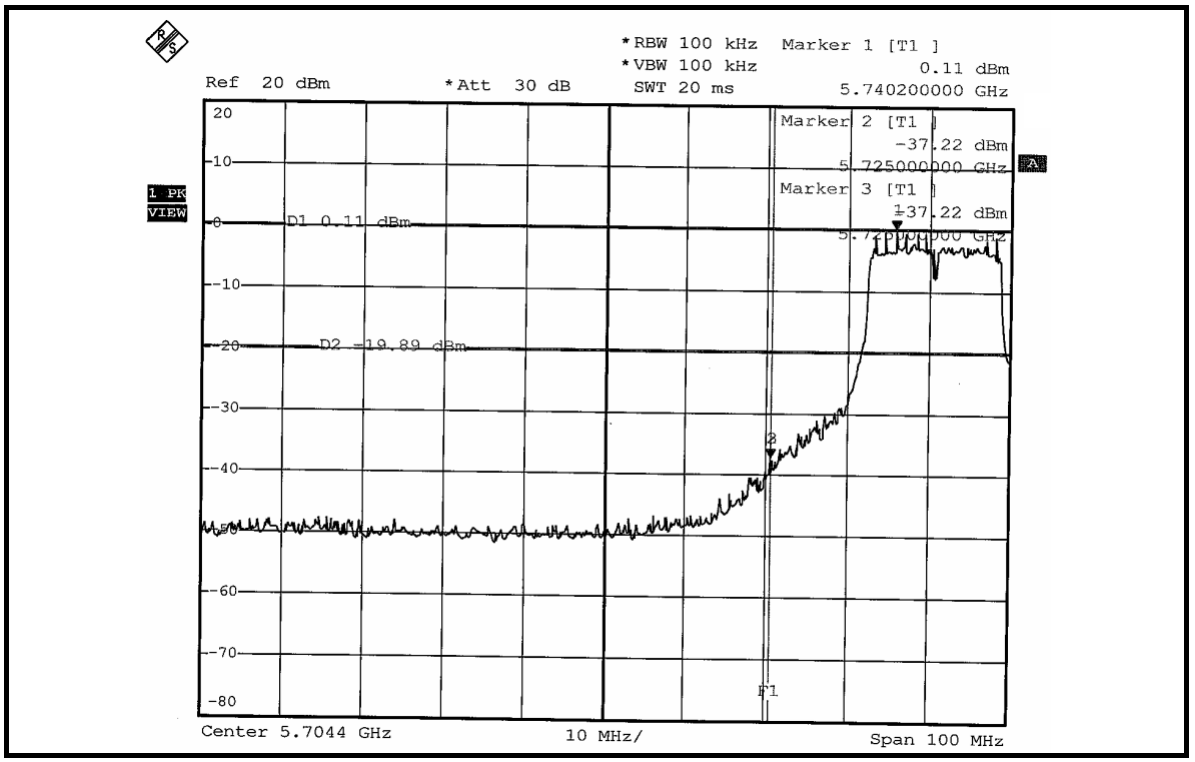
No deviation

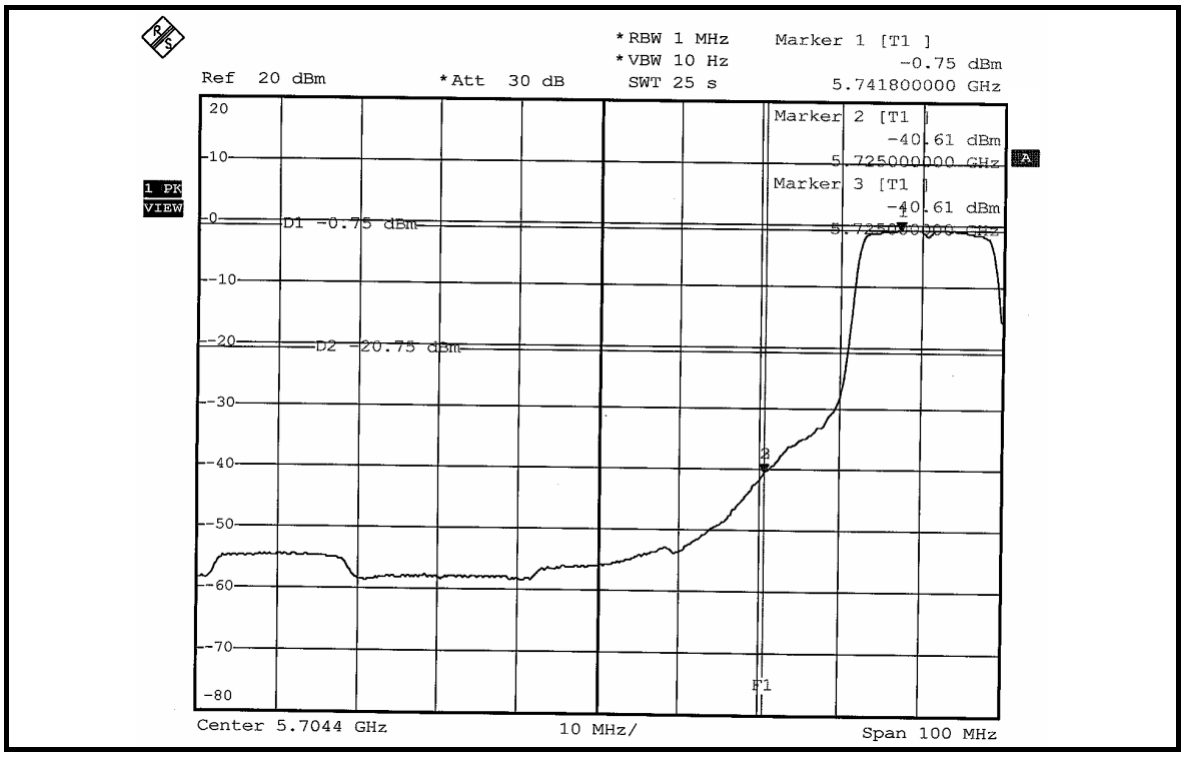
5.6.5 EUT OPERATING CONDITION

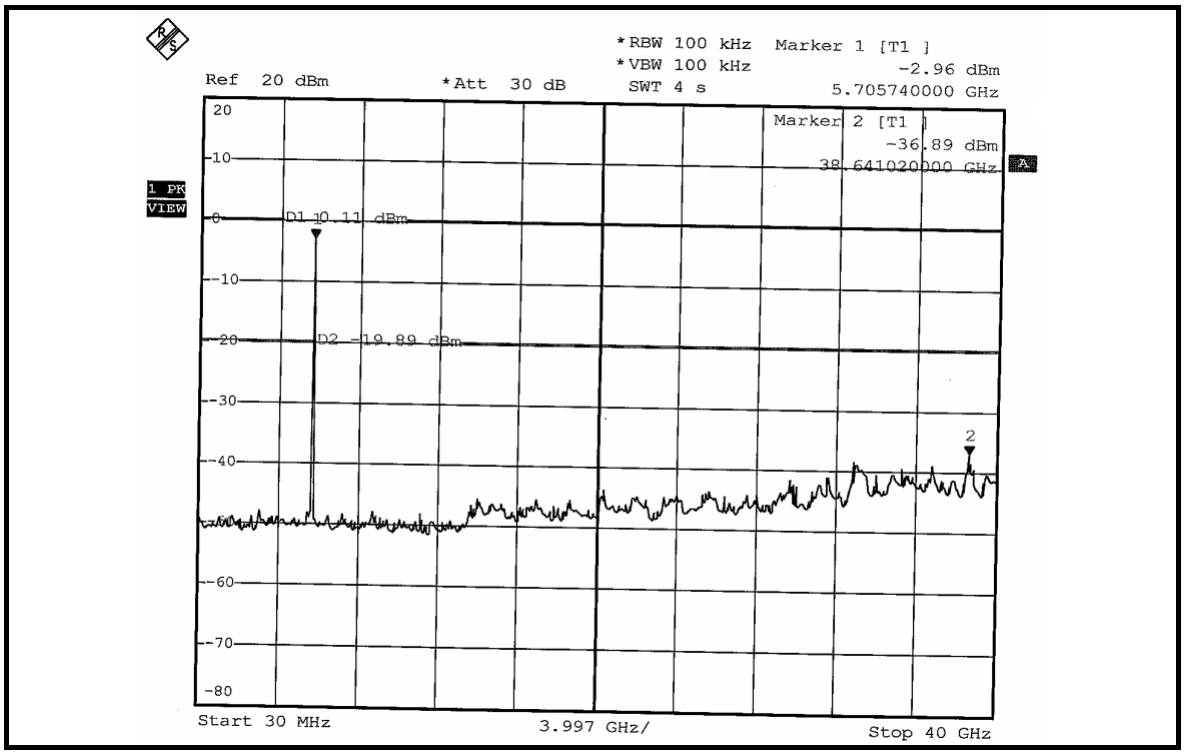
Same as Item 5.9.6

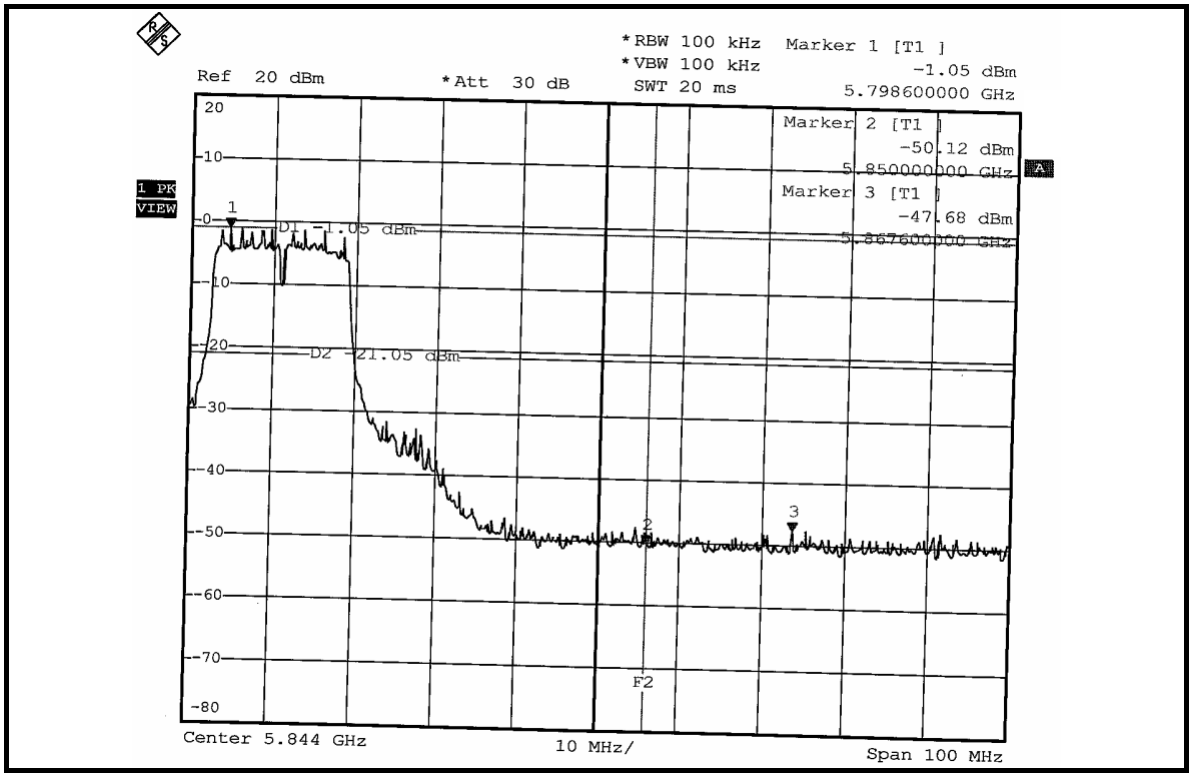
5.6.6 TEST RESULTS

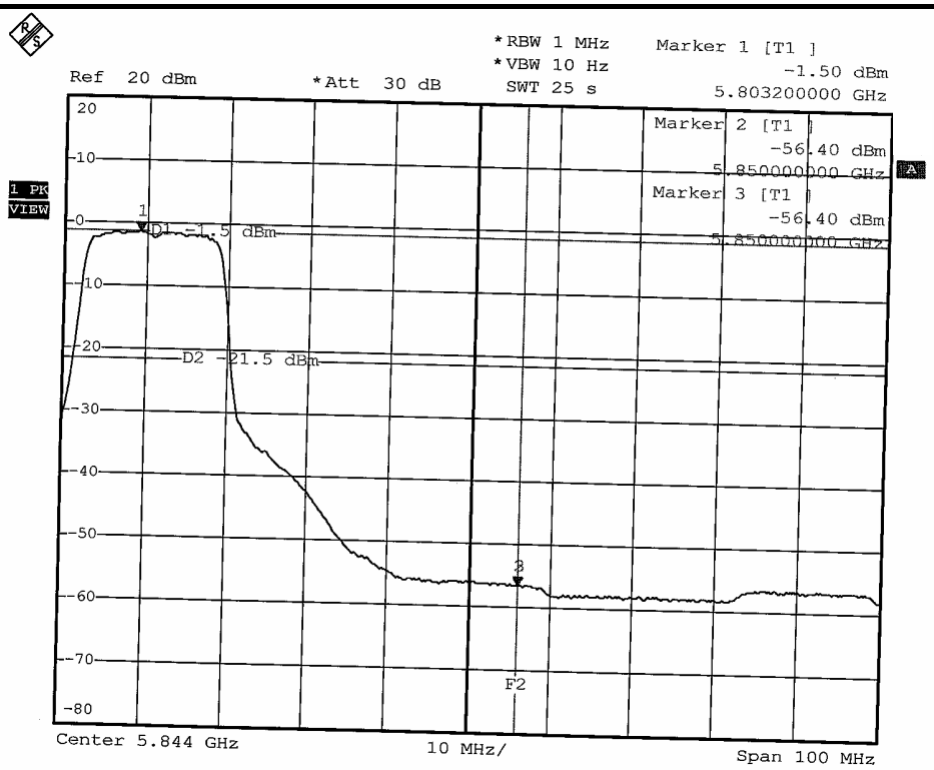
The spectrum plots are attached on the following pages. D1 line indicates the highest level, D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

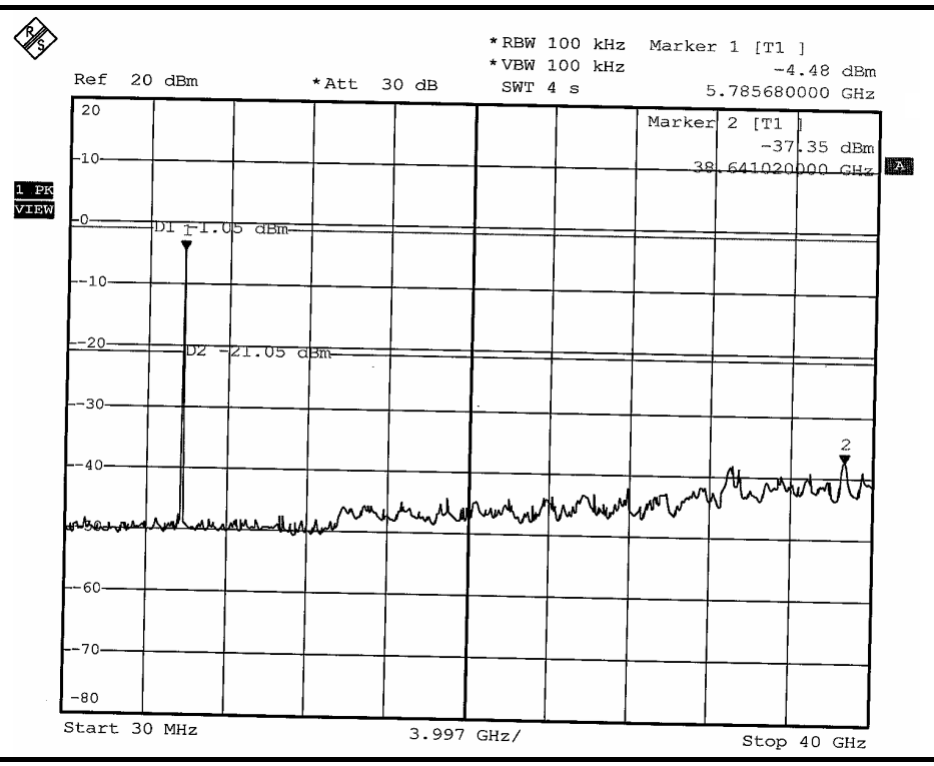

*RBW 100 kHz
*VBW 100 kHz
SWT 20 ms
Marker 1 [T1]
0.11 dBm
5.740200000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-37.22 dBm
5.725000000 GHz
Marker 3 [T1]
-37.22 dBm
5.725000000 GHz
1 PK
VIEW
A
D1 0.11 dBm
D2 -19.89 dBm
Center 5.7044 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
-0.75 dBm
5.741800000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-40.61 dBm
5.725000000 GHz
Marker 3 [T1]
-40.61 dBm
5.725000000 GHz
1 PK
VIEW
A
D1 -0.75 dBm
D2 -20.75 dBm
Center 5.7044 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 4 s
Marker 1 [T1]
-2.96 dBm
5.705740000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-36.89 dBm
38.641020000 GHz
1 PK
VIEW
D1 10.11 dBm
D2 -19.89 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 20 ms
Marker 1 [T1]
-1.05 dBm
5.798600000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-50.12 dBm
5.850000000 GHz
Marker 3 [T1]
-47.68 dBm
5.867600000 GHz
1 PK
VIEW
D1 -1.05 dBm
D2 -21.05 dBm
F2
Center 5.844 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
-1.50 dBm
5.803200000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-56.40 dBm
5.850000000 GHz
Marker 3 [T1]
-56.40 dBm
5.850000000 GHz
1 PK
VIEW
D1 -1.5 dBm
D2 -21.5 dBm
F2
Center 5.844 GHz
10 MHz/
Span 100 MHz


*RBW 100 kHz
*VBW 100 kHz
SWT 4 s
Marker 1 [T1]
-4.48 dBm
5.785680000 GHz
Ref 20 dBm
*Att 30 dB
Marker 2 [T1]
-37.35 dBm
38.641020000 GHz
1 PK
VIEW
D1 -1.05 dBm
D2 -21.05 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz

5.7 ANTENNA REQUIREMENT

5.7.1 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(a), 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.

5.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Integrated antenna with UFL connector. The maximum Gain of the antenna is 1.8dBi.

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.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB , 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.

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.