FCC TEST REPORT

REPORT NO.:	RF941122H03A
MODEL NO.:	HiveAP 20 ag
RECEIVED:	Nov. 25, 2005
TESTED:	Dec. 05 to 21, 2005
ISSUED:	Jan. 17, 2007

APPLICANT:	Accton Technology Corporation
ADDRESS:	No.1, Creation Rd. III, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.

ISSUED BY:	Advance Data Technology Corporation
TEST LOCATION:	No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

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0536

No.: 2177-01

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1. CERTIFICATION

PRODUCT:	HiveAP 20 ag
BRAND NAME:	AEROHIVE
MODEL NO.:	HiveAP 20 ag
TEST SAMPLE:	R&D SAMPLE
TESTED:	Dec. 05 to 21, 2005
APPLICANT:	Accton Technology Corporation
STANDARDS:	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-2003

The above equipment (Model: HiveAP 20 ag) 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 : _____ , **DATE:** Jan. 17, 2007
(Midoli Peng)

TECHNICAL ACCEPTANCE : _____ , **DATE:** Jan. 17, 2007
Responsible for RF
(Hank Chung)

APPROVED BY : _____ , **DATE:** Jan. 17, 2007
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 802.11b & g, 2412~2462MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is –1.56dB at 0.478MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is –5.8dB at 2483.5MHz
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.

For 802.11a, 5725~5850MHz Band

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	**Test Type and Limit**	**Result**	**Remark**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is –1.88dB at 0.4780MHz
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 –1.80dB at 11570.0MHz
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.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	HiveAP 20 ag
MODEL NO.	HiveAP 20 ag
POWER SUPPLY	DC 48V from power adapter or POE (Power over Ethernet)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11a: 54/48/36/24/18/12/9/6Mbps
FREQUENCY RANGE	802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.725 ~ 5.850GHz
NUMBER OF CHANNEL	802.11b & 802.11g: 11 802.11a: 5
CHANNEL SPACING	802.11b & 802.11g: 5MHz 802.11a: 20MHz for Normal mode
OUTPUT POWER	802.11b: 138.038mW 802.11g: 245.471mW 802.11a: 251.189mW
DATA CABLE	NA
ANTENNA TYPE	Please see note 3 (on next page)
I/O PORTS	RS232 Port x 1, POE port x 1, DC power Port x 1
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.

2. The EUT was operated with the following power adapter or POE(Power Over Ethernet):

ADAPTER	
BRAND:	PHIHONG
MODEL:	PSA 18U-480C
INPUT:	AC 100~240V, 0.5A, 50~60Hz
OUTPUT:	DC 48V, 0.38A , 1.5m/ nonshield/ with one core

POE (for test only)	
BRAND:	3Com
MODEL:	PW130
INPUT:	AC100-250V, 0.5A, 50/60Hz
OUTPUT:	DC 48V, 0.42A

3. There is one antenna provided to this EUT, please refer to the following table:

Model No.	Gain (dBi)	Antenna Type	Antenna Connector
FDS_2FED01+I3G	For 2.4GHz : 3 dBi For 5GHz : 5 dBi	Dual Band Antenna, Dipole	MMCX

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:

For 802.11b/g: Eleven channels are provided to this 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 5725 ~ 5850MHz band:

For 802.11a (5725 ~ 5850MHz band): Five channels are provided to this EUT.

Channel	Frequency
1	5745 MHz
2	5765 MHz
3	5785 MHz
4	5805 MHz
5	5825 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	NA

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

Power Line Conducted Emission Test:

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	11	OFDM	BPSK	6
802.11a	1 to 5	5	OFDM	BPSK	6

☒ EUT was tested with the following test modes:

Test Mode	Power
Mode 1	With Adapter
Mode 2	With POE

Radiated Emission Test (Below 1 GHz):

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11g	1 to 11	11	OFDM	BPSK	6
802.11a	1 to 5	5	OFDM	BPSK	6

☒ EUT was tested with the following test modes:

Test Mode	Power
Mode 1	With Adapter
Mode 2	With POE

Radiated Emission Test (Above 1 GHz):

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11a	1 to 5	1, 3, 5	OFDM	BPSK	6

☒ EUT was pre-tested in chamber as the following test modes:

Test Mode	Power
Mode 1	**With Adapter**
Mode 2	With POE

Mode 1, the worst case one, was chosen for final test.

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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 11	DSSS	CCK	11
802.11g	1 to 11	1, 11	OFDM	BPSK	6
802.11a	1 to 5	1, 5	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.

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
802.11a	1 to 5	1, 3, 5	OFDM	BPSK	6

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a HiveAP 20 ag. 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.

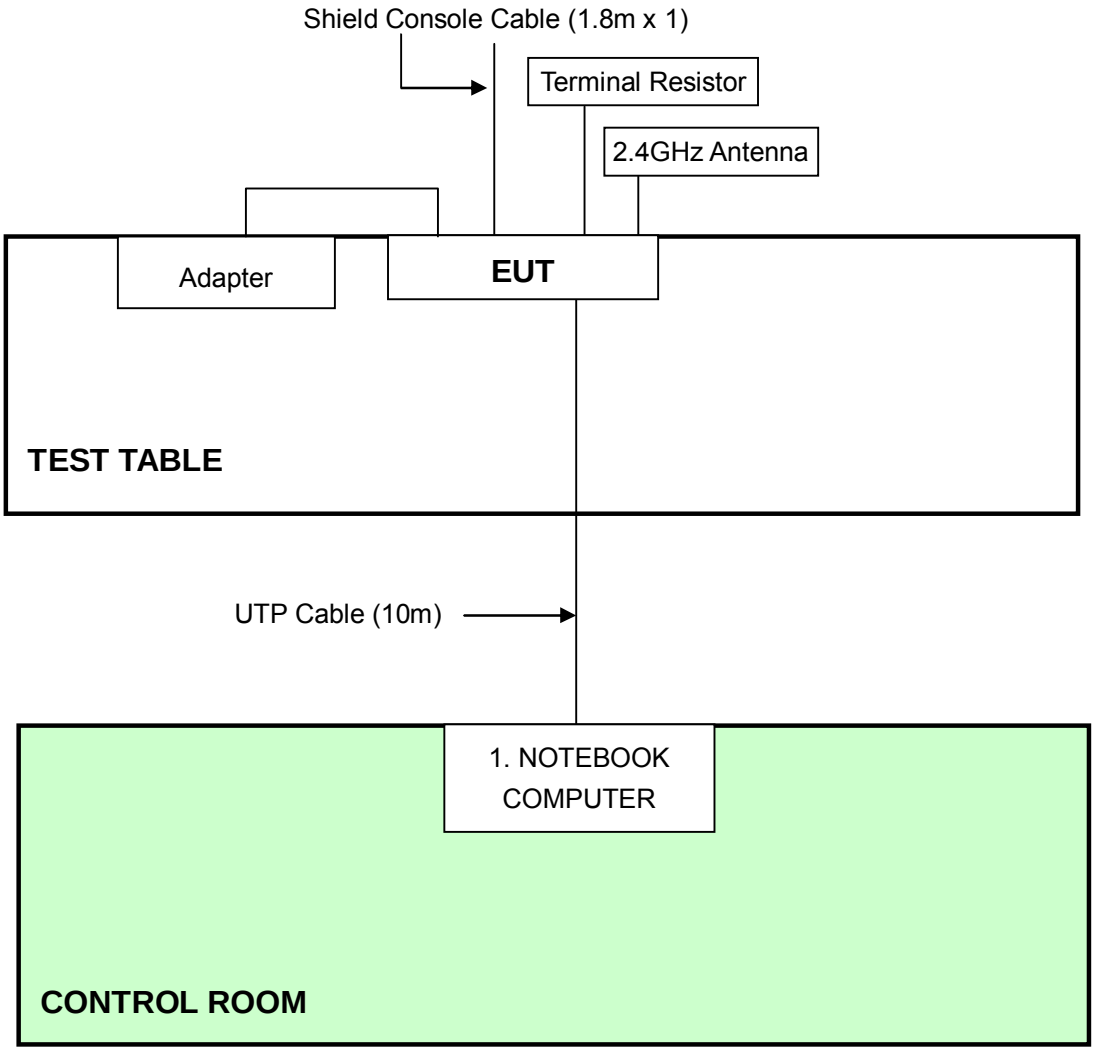
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP01L	TW-09c748-12800 -165-3171	FCC DoC
2	Terminal Resistor	SUHNER	50 Ohm	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

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

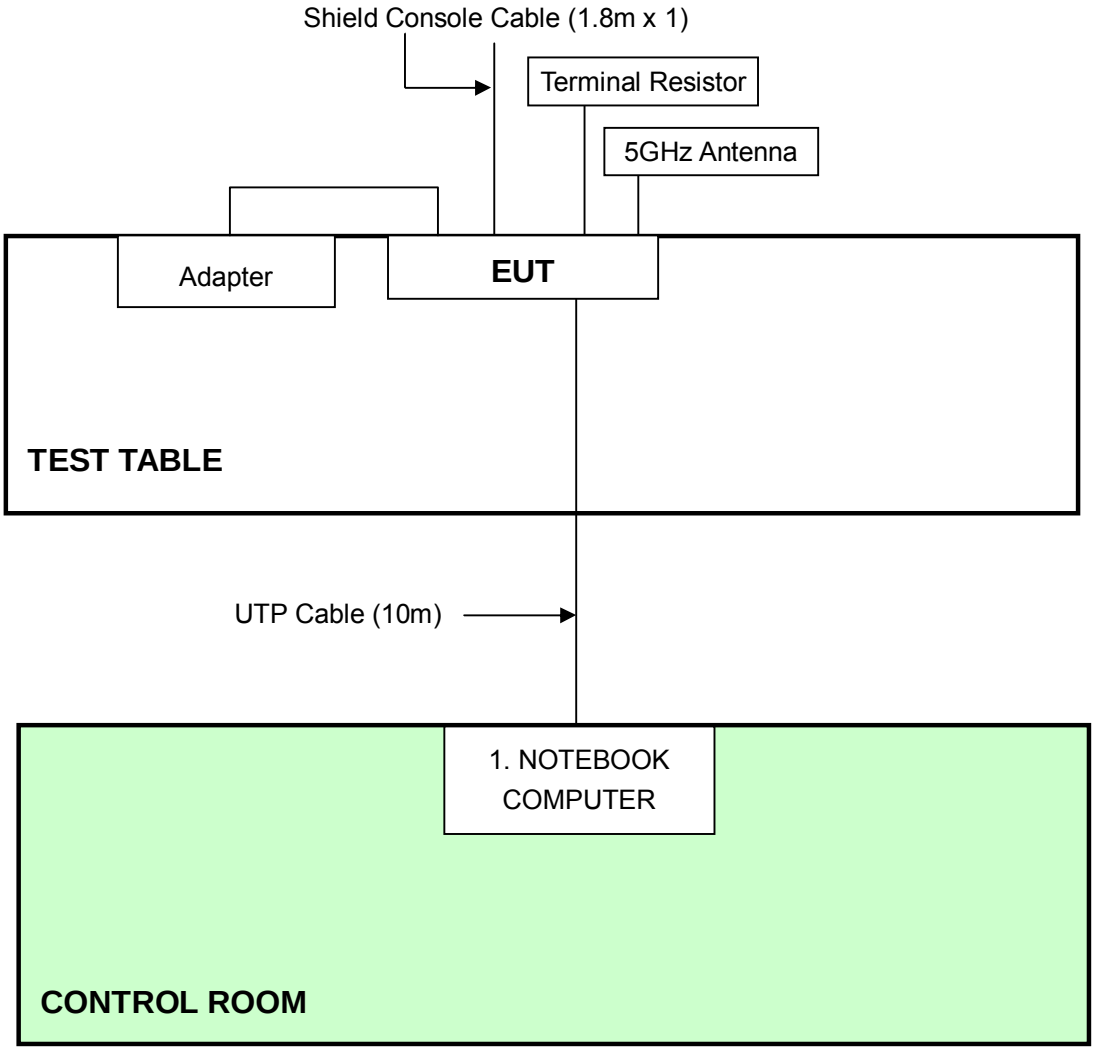
3.5 CONFIGURATION OF SYSTEM UNDER TEST

With ADAPTER: (2.4GHz Band)



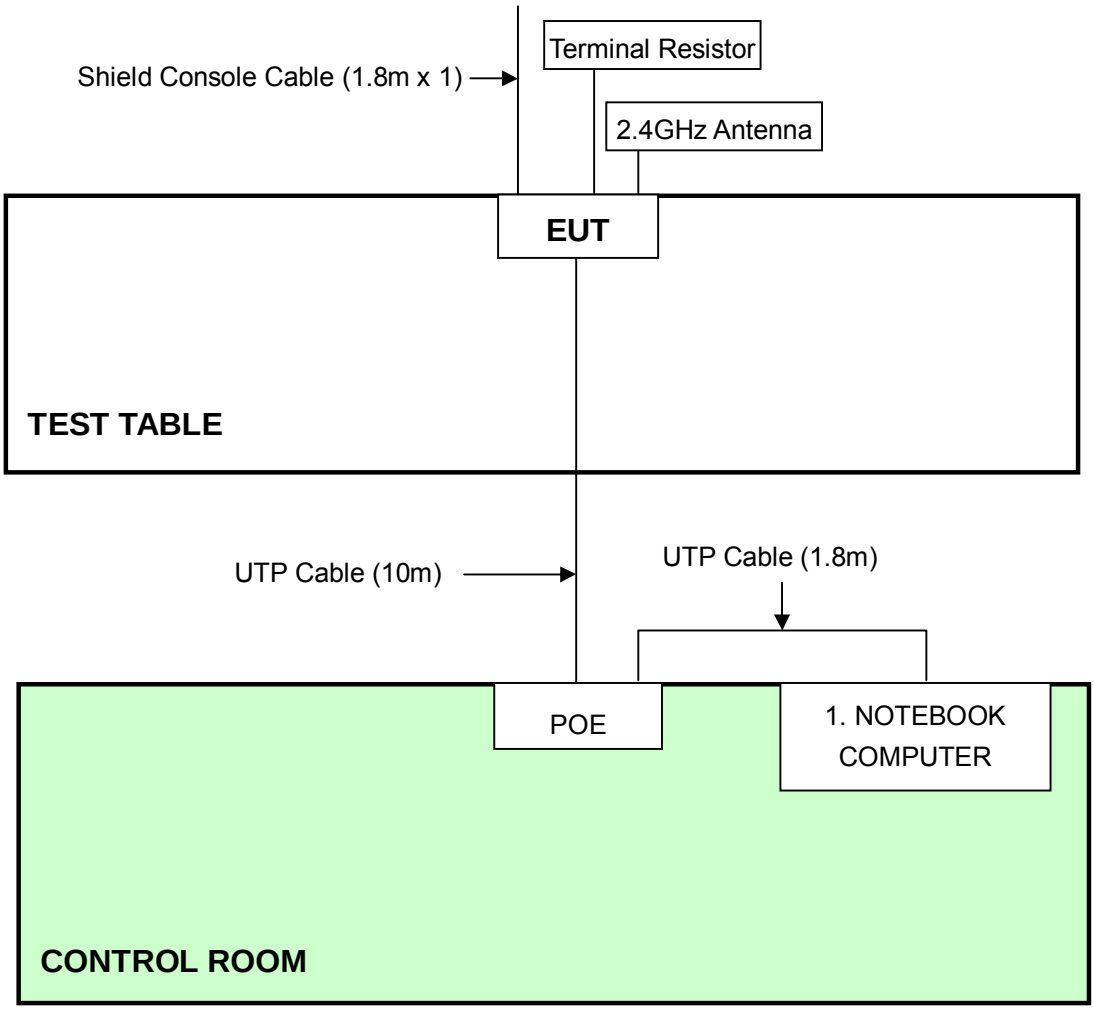
NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration.

With ADAPTER: (5GHz Band)



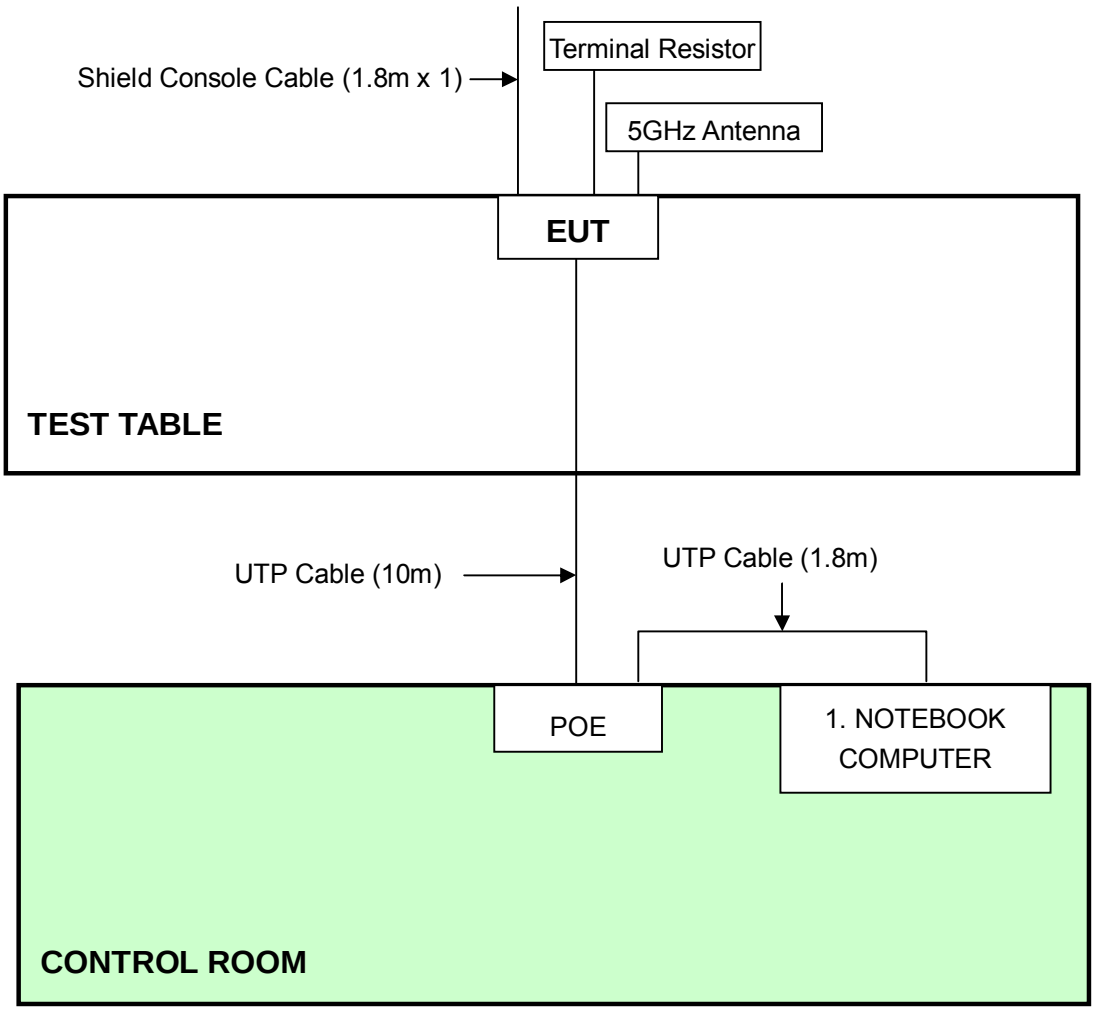
NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration.

With POE : (2.4GHz Band)



NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration.

With POE : (5GHz Band)



NOTE: 1. Support unit 1 was kept in the control room during the test.
2. Please refer to the photos of test configuration.

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

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 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
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Dec. 14, 2006
Line-Impedance Stabilization Network(for EUT)	ENV-216	100072	Oct. 05, 2006
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 19, 2006
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 19, 2006
Terminator(for KYORITSU)	50	1	Oct. 08, 2006
Software	Cond-V2e	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 ADT Shielded Room No. A.
3 The VCCI Con A Registration No. is C-817.
4 The measurement uncertainty is 2.53 dB, which is calculated as per the document CISPR 16-4 This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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.

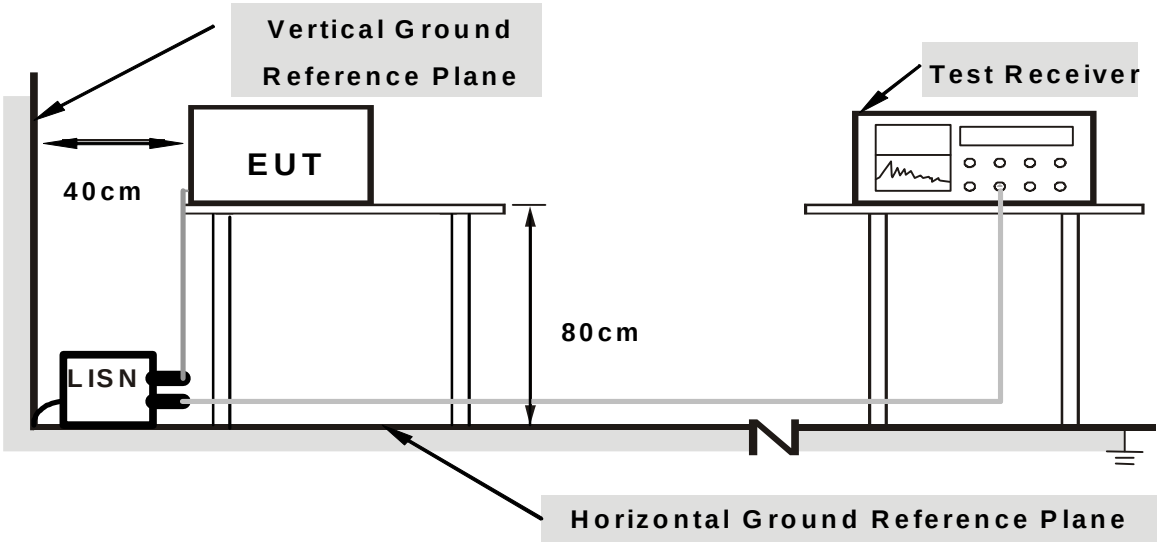
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150kHz to 30MHz was searched. Emission level 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

a. Placed the EUT on the testing table.

b. Prepared other computer systems to act as a communication partner and placed them outside of testing area.

c. The communication partner run test program “ART48 Build 10” to enable EUT under transmission/receiving condition continuously at specific channel frequency via UTP cable.

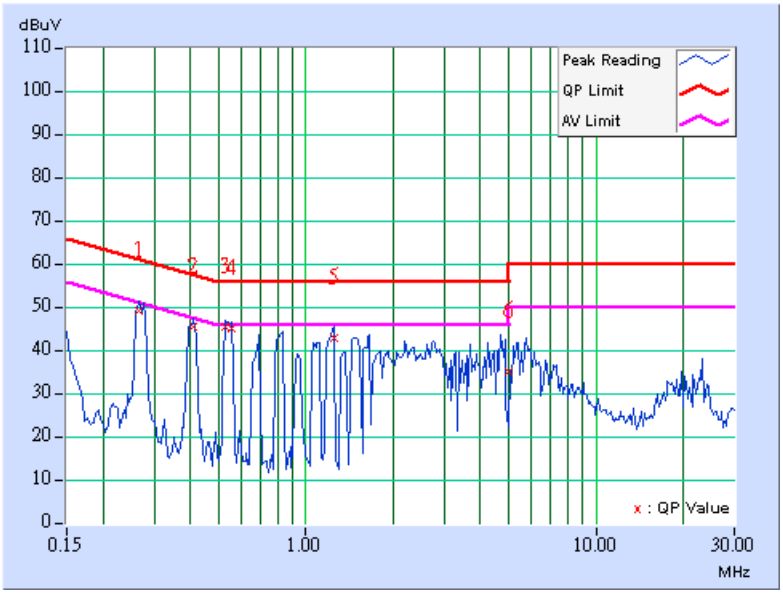
4.1.7 TEST RESULTS

Conducted Worst-Case Data

TEST MODE	With Adapter	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.267	0.60	48.41	-	49.01	-	61.20	51.20	-12.19	-
2	0.412	0.60	44.64	-	45.24	-	57.61	47.61	-12.37	-
3	0.529	0.62	44.52	-	45.14	-	56.00	46.00	-10.86	-
4	0.552	0.63	44.36	-	44.99	-	56.00	46.00	-11.01	-
5	1.248	0.70	41.97	-	42.67	-	56.00	46.00	-13.33	-
6	5.000	0.93	34.40	-	35.33	-	56.00	46.00	-20.67	-

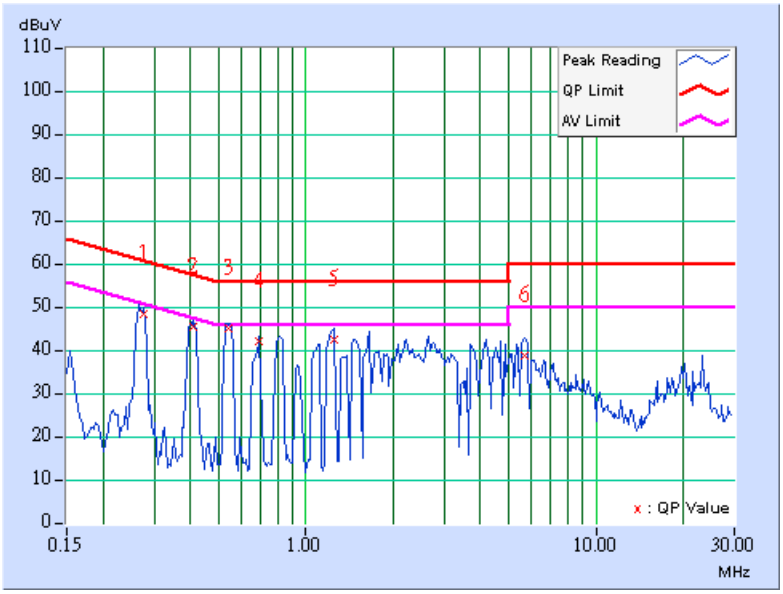
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST MODE	With Adapter	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.275	0.40	47.45	-	47.85	-	60.97	50.97	-13.12	-
2	0.412	0.40	44.72	-	45.12	-	57.61	47.61	-12.49	-
3	0.541	0.45	44.12	-	44.57	-	56.00	46.00	-11.43	-
4	0.693	0.50	41.43	-	41.93	-	56.00	46.00	-14.07	-
5	1.248	0.60	41.69	-	42.29	-	56.00	46.00	-13.71	-
6	5.672	0.91	38.00	-	38.91	-	60.00	50.00	-21.09	-

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.

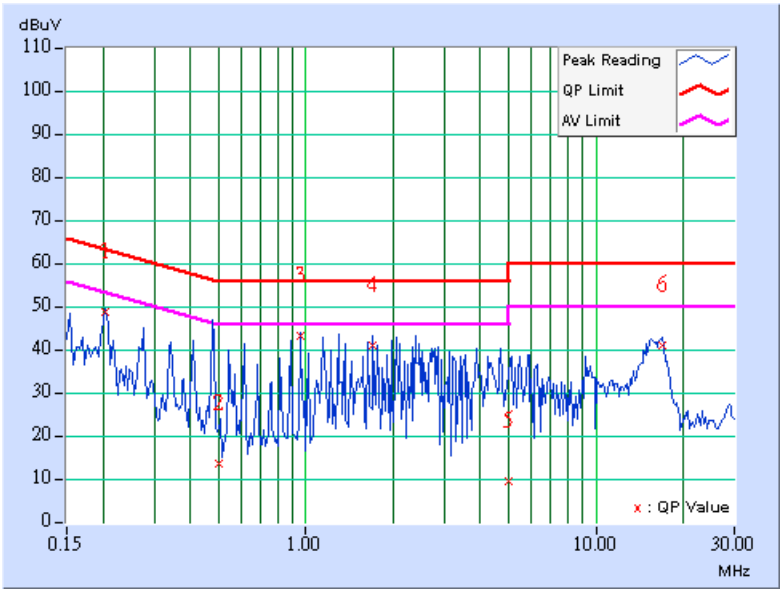


Conducted Worst-Case Data

TEST MODE	With POE	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	9.80	38.68	-	48.48	-	63.42	53.42	-14.94	-
2	0.500	9.82	3.46	-	13.28	-	56.00	46.00	-42.72	-
3	0.955	9.89	33.10	-	42.99	-	56.00	46.00	-13.01	-
4	1.709	9.90	31.13	-	41.03	-	56.00	46.00	-14.97	-
5	5.000	10.02	-0.56	-	9.46	-	56.00	46.00	-46.54	-
6	16.848	10.10	30.90	-	41.00	-	60.00	50.00	-19.00	-

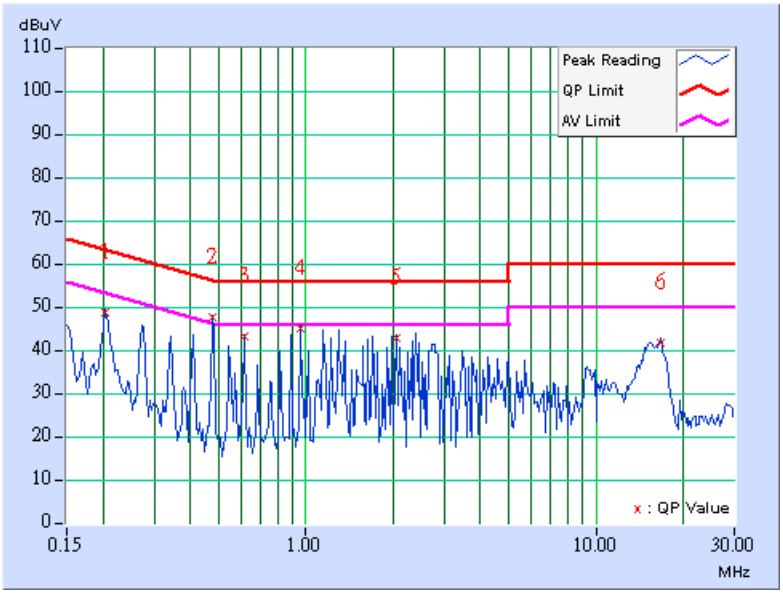
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST MODE	With POE	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	9.80	38.54	-	48.34	-	63.42	53.42	-15.08	-
2	**0.478**	**9.81**	**37.58**	**35.00**	**47.39**	**44.81**	**56.37**	**46.37**	**-8.98**	**-1.56**
3	0.615	9.84	33.06	-	42.90	-	56.00	46.00	-13.10	-
4	0.955	9.89	34.82	-	44.71	-	56.00	46.00	-11.29	-
5	2.048	10.00	32.58	-	42.58	-	56.00	46.00	-13.42	-
6	16.660	10.27	31.76	-	42.03	-	60.00	50.00	-17.97	-

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
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 07, 2006
HP Pre_Amplifier	8449B	3008A01922	Oct. 02, 2006
ROHDE & SCHWARZ Test Receiver	ESCS30	100287	Dec. 08, 2006
CHASE Broadband Antenna	VULB9168	138	Dec. 21, 2005
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 11, 2006
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 30, 2006
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 26, 2006
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 26, 2006
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek) 1GHz-20GHz	SF102	22054-2	Nov. 16. 2006
RF Cable(RICHTEC)	9913-30M	STCCAB-30M-1 GHz-021	Jul. 16, 2006
Software	ADT_Radiated_V 5.14	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824-3.
7. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Radiated emissions (30MHz-1GHz)	2.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~20GHz)	1.88 dB

4.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic. 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 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

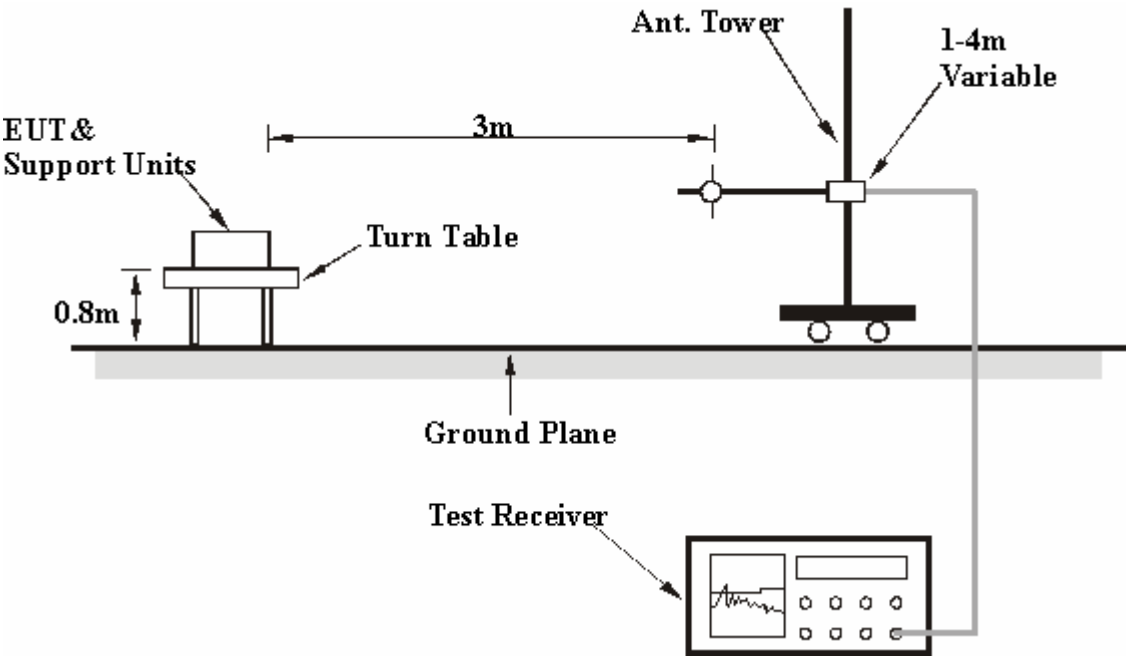
NOTE:

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 and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

Below 1GHz Worst-Case Data

TEST MODE	With Adapter	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 63%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	250.00	22.10 QP	46.00	-23.90	1.41 H	355	8.80	13.30
2	300.00	22.50 QP	46.00	-23.50	1.00 H	2	6.20	16.30
3	375.00	22.00 QP	46.00	-24.00	2.16 H	3	4.40	17.60
4	500.00	24.70 QP	46.00	-21.30	2.10 H	204	3.80	20.90
5	792.00	36.60 QP	46.00	-9.40	2.14 H	306	10.00	26.60
6	890.99	39.90 QP	46.00	-6.10	1.08 H	275	12.10	27.80
7	924.00	34.80 QP	46.00	-11.20	1.00 H	276	6.50	28.40
8	989.99	31.70 QP	54.00	-22.30	2.10 H	51	2.80	28.90

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	42.90	31.00 QP	40.00	-9.00	1.01 V	226	16.80	14.20
2	500.00	32.80 QP	46.00	-13.20	1.01 V	226	11.90	20.90
3	792.00	34.00 QP	46.00	-12.00	1.33 V	1	7.40	26.60
4	858.00	35.00 QP	46.00	-11.00	1.32 V	128	7.50	27.50
5	891.00	39.90 QP	46.00	-6.10	1.19 V	108	12.10	27.80
6	924.00	38.60 QP	46.00	-7.40	1.13 V	355	10.20	28.40
7	958.00	34.20 QP	46.00	-11.80	1.70 V	276	5.30	28.90
8	990.00	34.90 QP	54.00	-19.10	1.84 V	94	6.00	28.90

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

Below 1GHz Worst-Case Data

TEST MODE	With POE	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 63%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	250.00	23.00 QP	46.00	-23.00	1.76 H	176	9.70	13.30
2	300.00	21.70 QP	46.00	-24.30	1.15 H	342	5.40	16.30
3	375.00	24.90 QP	46.00	-21.10	1.11 H	224	7.30	17.60
4	500.00	24.70 QP	46.00	-21.30	1.00 H	6	3.80	20.90
5	792.00	37.10 QP	46.00	-8.90	1.26 H	277	10.50	26.60
6	891.00	39.60 QP	46.00	-6.40	1.03 H	278	11.80	27.80
7	924.00	37.60 QP	46.00	-8.40	1.05 H	269	9.30	28.40
8	990.00	39.60 QP	54.00	-14.40	1.00 H	261	10.70	28.90

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	43.51	32.80 QP	40.00	-7.20	1.24 V	28	18.50	14.20
2	249.99	27.40 QP	46.00	-18.60	1.17 V	49	14.10	13.30
3	500.00	26.50 QP	46.00	-19.50	1.04 V	210	5.70	20.90
4	792.00	34.80 QP	46.00	-11.20	1.00 V	261	8.20	26.60
5	858.00	34.10 QP	46.00	-11.90	1.29 V	2	6.60	27.50
6	891.00	38.00 QP	46.00	-8.00	1.16 V	109	10.20	27.80
7	924.00	38.90 QP	46.00	-7.10	1.05 V	1	10.60	28.40
8	990.00	37.00 QP	54.00	-17.00	1.00 V	105	8.10	28.90

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

802.11b DSSS modulation

CHANNEL	Channel 1	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2387.00	46.00 PK	74.00	-28.00	1.23 H	294	13.30	32.80
1	2387.00	33.80 AV	54.00	-20.20	1.23 H	294	1.00	32.80
2	2390.00	46.20 PK	74.00	-27.80	1.23 H	294	12.50	33.70
2	2390.00	34.40 AV	54.00	-19.60	1.23 H	294	0.70	33.70
3	*2412.00	103.30 PK			1.23 H	294	73.50	29.80
3	*2412.00	95.60 AV			1.23 H	294	65.80	29.80
4	4824.00	40.40 PK	74.00	-33.60	1.26 H	317	5.30	35.10
4	4824.00	30.60 AV	54.00	-23.40	1.26 H	317	-4.50	35.10
5	7236.00	46.30 PK	74.00	-27.70	1.18 H	218	5.80	40.50
5	7236.00	34.80 AV	54.00	-19.20	1.18 H	218	-5.70	40.50

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	2387.00	56.90 PK	74.00	-17.10	1.07 V	68	24.20	32.80
1	2387.00	44.60 AV	54.00	-9.40	1.07 V	68	11.80	32.80
2	2390.00	57.10 PK	74.00	-16.90	1.07 V	68	23.40	33.70
2	2390.00	45.20 AV	54.00	-8.80	1.07 V	68	11.50	33.70
3	*2412.00	114.20 PK			1.07 V	68	84.40	29.80
3	*2412.00	106.40 AV			1.07 V	68	76.60	29.80
4	4824.00	44.20 PK	74.00	-29.80	1.38 V	207	9.10	35.10
4	4824.00	32.30 AV	54.00	-21.70	1.38 V	207	-2.80	35.10
5	7236.00	45.00 PK	74.00	-29.00	1.20 V	119	4.50	40.50
5	7236.00	35.00 AV	54.00	-19.00	1.20 V	119	-5.50	40.50

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

CHANNEL	Channel 6	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	104.20 PK			1.62 H	34	74.30	29.90
1	*2437.00	96.70 AV			1.62 H	34	66.80	29.90
2	4874.00	40.90 PK	74.00	-33.10	1.14 H	17	5.60	35.30
2	4874.00	30.60 AV	54.00	-23.40	1.14 H	17	-4.70	35.30
3	7311.00	45.60 PK	74.00	-28.40	1.51 H	279	4.90	40.70
3	7311.00	34.40 AV	54.00	-19.60	1.51 H	279	-6.30	40.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	114.60 PK			1.37 V	344	84.70	29.90
1	*2437.00	107.30 AV			1.37 V	344	77.40	29.90
2	4874.00	44.50 PK	74.00	-29.50	1.32 V	278	9.20	35.30
2	4874.00	32.20 AV	54.00	-21.80	1.32 V	278	-3.10	35.30
3	7311.00	45.30 PK	74.00	-28.70	1.32 V	278	4.60	40.70
3	7311.00	35.00 AV	54.00	-19.00	1.32 V	278	-5.70	40.70

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

CHANNEL	Channel 11	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	99.80 PK			1.61 H	41	69.80	30.00
1	*2462.00	92.70 AV			1.61 H	41	62.70	30.00
2	2483.50	44.30 PK	74.00	-29.70	1.61 H	41	14.20	30.10
2	2483.50	37.00 AV	54.00	-17.00	1.61 H	41	6.90	30.10
3	4924.00	40.70 PK	74.00	-33.30	1.23 H	182	5.20	35.50
3	4924.00	30.70 AV	54.00	-23.30	1.23 H	182	-4.80	35.50
4	7386.00	46.50 PK	74.00	-27.50	1.46 H	323	5.70	40.80
4	7386.00	34.30 AV	54.00	-19.70	1.46 H	323	-6.50	40.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	111.00 PK			1.34 V	343	81.00	30.00
1	*2462.00	103.90 AV			1.34 V	343	73.90	30.00
2	2483.50	55.50 PK	74.00	-18.50	1.34 V	343	25.40	30.10
2	**2483.50**	**48.20 AV**	**54.00**	**-5.80**	**1.34 V**	**343**	**18.10**	**30.10**
3	4924.00	43.80 PK	74.00	-30.20	1.29 V	257	8.30	35.50
3	4924.00	32.10 AV	54.00	-21.90	1.29 V	257	-3.40	35.50
4	7386.00	47.00 PK	74.00	-27.00	1.39 V	325	6.20	40.80
4	7386.00	35.20 AV	54.00	-18.80	1.39 V	325	-5.60	40.80

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

802.11g OFDM modulation

CHANNEL	Channel 1	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	47.70 PK	74.00	-26.30	1.27 H	311	14.00	33.70
1	2390.00	33.40 AV	54.00	-20.60	1.27 H	311	-0.30	33.70
2	*2412.00	95.60 PK			1.27 H	311	65.80	29.80
2	*2412.00	86.10 AV			1.27 H	311	56.30	29.80
3	4824.00	40.40 PK	74.00	-33.60	1.27 H	311	5.30	35.10
3	4824.00	30.30 AV	54.00	-23.70	1.27 H	311	-4.80	35.10
4	7236.00	45.50 PK	74.00	-28.50	1.17 H	225	5.00	40.50
4	7236.00	34.50 AV	54.00	-19.50	1.17 H	225	-6.00	40.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	60.00 PK	74.00	-14.00	1.08 V	68	26.30	33.70
1	2390.00	45.90 AV	54.00	-8.10	1.08 V	68	12.20	33.70
2	*2412.00	107.90 PK			1.08 V	68	78.10	29.80
2	*2412.00	98.60 AV			1.08 V	68	68.80	29.80
3	4824.00	43.20 PK	74.00	-30.80	1.33 V	200	8.10	35.10
3	4824.00	31.60 AV	54.00	-22.40	1.33 V	200	-3.50	35.10
4	7236.00	45.40 PK	74.00	-28.60	1.21 V	116	4.90	40.50
4	7236.00	34.80 AV	54.00	-19.20	1.21 V	116	-5.70	40.50

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. The limit value is defined as per 15.247
6. " * " : Fundamental frequency

CHANNEL	Channel 6	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	102.10 PK			1.24 H	33	72.20	29.90
1	*2437.00	93.70 AV			1.24 H	33	63.80	29.90
2	4874.00	40.50 PK	74.00	-33.50	1.18 H	345	5.20	35.30
2	4874.00	30.40 AV	54.00	-23.60	1.18 H	345	-4.90	35.30
3	7311.00	45.40 PK	74.00	-28.60	1.43 H	321	4.70	40.70
3	7311.00	34.50 AV	54.00	-19.50	1.43 H	321	-6.20	40.70

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	112.50 PK			1.37 V	347	82.60	29.90
1	*2437.00	104.20 AV			1.37 V	347	74.30	29.90
2	4874.00	43.10 PK	74.00	-30.90	1.35 V	229	7.80	35.30
2	4874.00	31.50 AV	54.00	-22.50	1.35 V	229	-3.80	35.30
3	7311.00	44.90 PK	74.00	-29.10	1.49 V	314	4.20	40.70
3	7311.00	34.80 AV	54.00	-19.20	1.49 V	314	-5.90	40.70

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

CHANNEL	Channel 11	**FREQUENCY RANGE**	1 ~ 25GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Tony Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	94.80 PK			1.26 H	298	64.80	30.00
1	*2462.00	84.80 AV			1.26 H	298	54.80	30.00
2	2483.50	47.80 PK	74.00	-26.20	1.26 H	298	17.70	30.10
2	2483.50	35.90 AV	54.00	-18.10	1.26 H	298	5.70	30.10
3	4924.00	40.60 PK	74.00	-33.40	1.25 H	320	5.10	35.50
3	4924.00	30.80 AV	54.00	-23.20	1.25 H	320	-4.70	35.50
4	7386.00	45.90 PK	74.00	-28.10	1.19 H	218	5.10	40.80
4	7386.00	34.70 AV	54.00	-19.30	1.19 H	218	-6.10	40.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	106.20 PK			1.07 V	57	76.20	30.00
1	*2462.00	96.90 AV			1.07 V	57	66.90	30.00
2	2483.50	59.20 PK	74.00	-14.80	1.07 V	57	29.10	30.10
2	2483.50	47.70 AV	54.00	-6.30	1.07 V	57	17.50	30.10
3	4924.00	43.40 PK	74.00	-30.60	1.36 V	196	7.90	35.50
3	4924.00	31.90 AV	54.00	-22.10	1.36 V	196	-3.60	35.50
4	7386.00	45.60 PK	74.00	-28.40	1.22 V	115	4.80	40.80
4	7386.00	34.90 AV	54.00	-19.10	1.22 V	115	-5.90	40.80

REMARKS:
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. " * " : 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
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. 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.

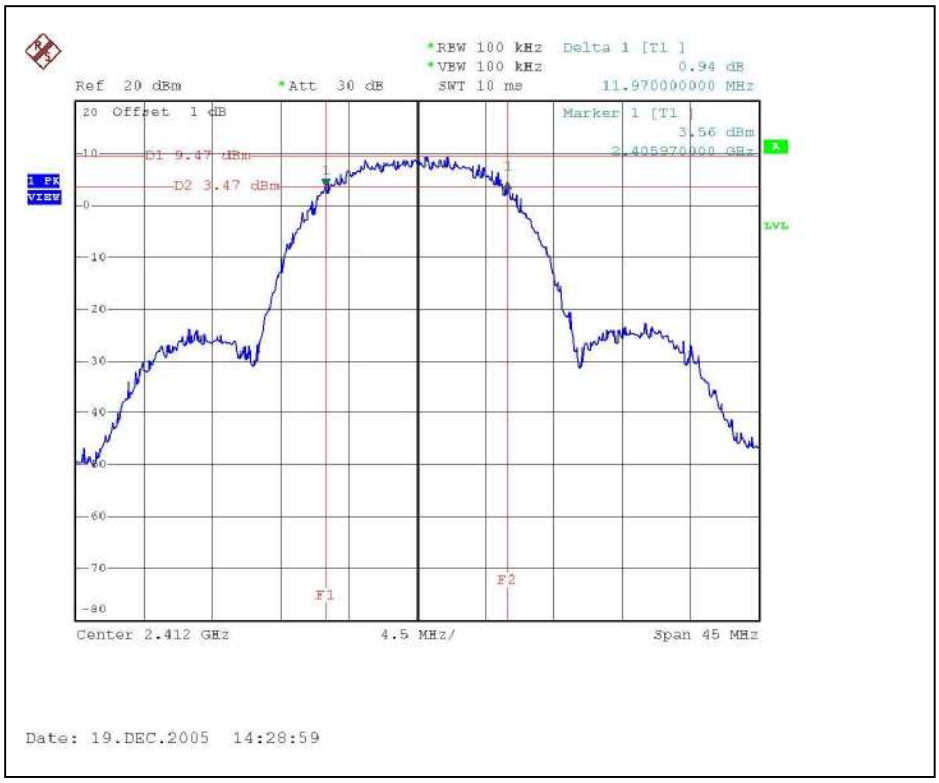
4.3.7 TEST RESULTS

802.11b DSSS modulation

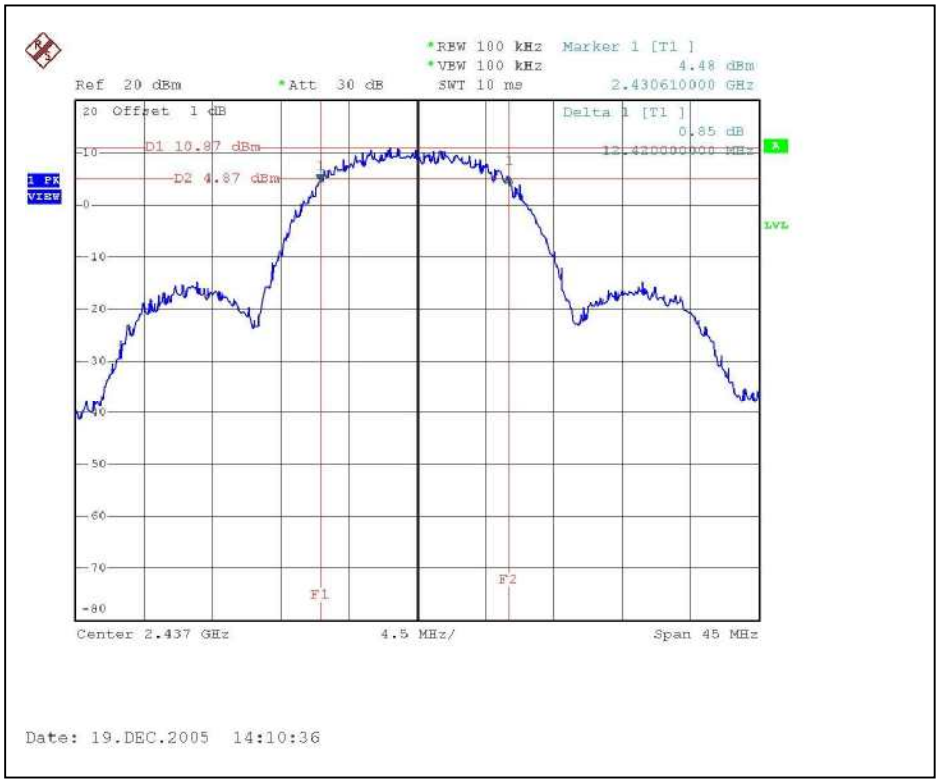
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.97	0.5	PASS
6	2437	12.42	0.5	PASS
11	2462	11.43	0.5	PASS

CH1


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
0.94 dB
11.970000000 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
3.56 dBm
2.405970000 GHz
D1 9.47 dBm
D2 3.47 dBm
1 PK VIEW
LVL
F1
F2
Center 2.412 GHz
4.5 MHz/
Span 45 MHz
Date: 19.DEC.2005 14:28:59

CH6


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
4.48 dBm
2.430610000 GHz
Delta 1 [T1]
0.85 dB
12.420000000 MHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 10.87 dBm
D2 4.87 dBm
1 PK VIEW
LVL
F1
F2
Center 2.437 GHz
4.5 MHz/
Span 45 MHz
Date: 19.DEC.2005 14:10:36

CH11

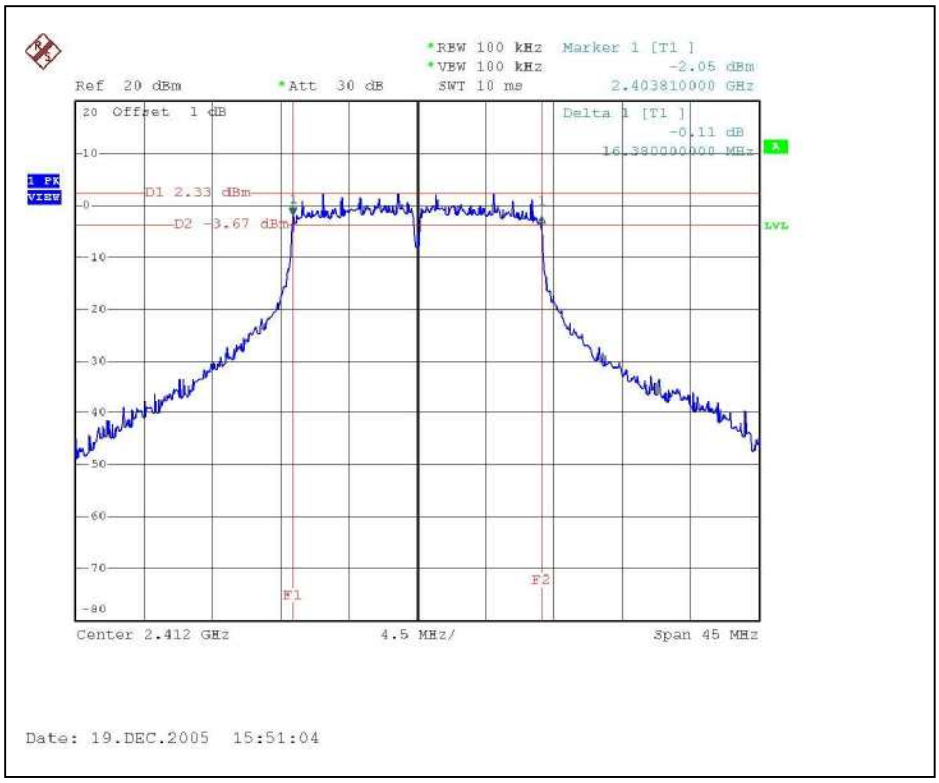

*RBW 100 kHz
Marker 1 [T1]
*VBW 100 kHz
0.86 dBm
Ref 20 dBm
*Att 30 dB
SWT 10 ms
2.456600000 GHz
20 Offset 1 dB
Delta 1 [T1]
0.06 dB
11.430000000 MHz
D1 6.4 dBm
D2 0.4 dBm
1 PK VIEW
LVL
Center 2.462 GHz
4.5 MHz/
Span 45 MHz
F1
F2
Date: 19.DEC.2005 14:24:25

802.11g OFDM modulation

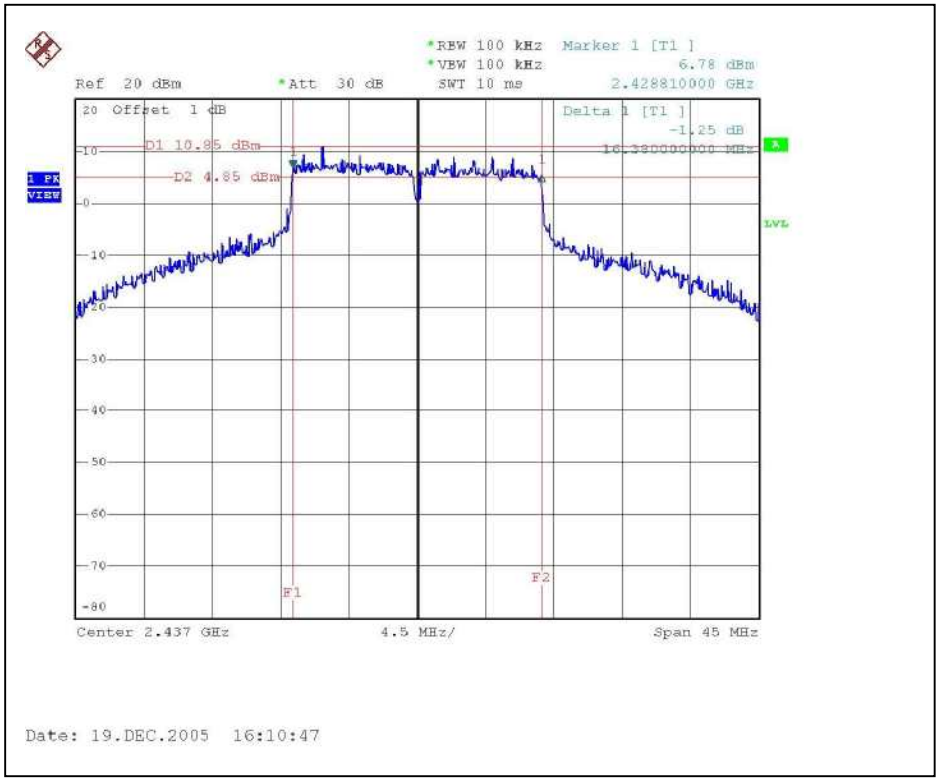
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.38	0.5	PASS
6	2437	16.38	0.5	PASS
11	2462	16.29	0.5	PASS

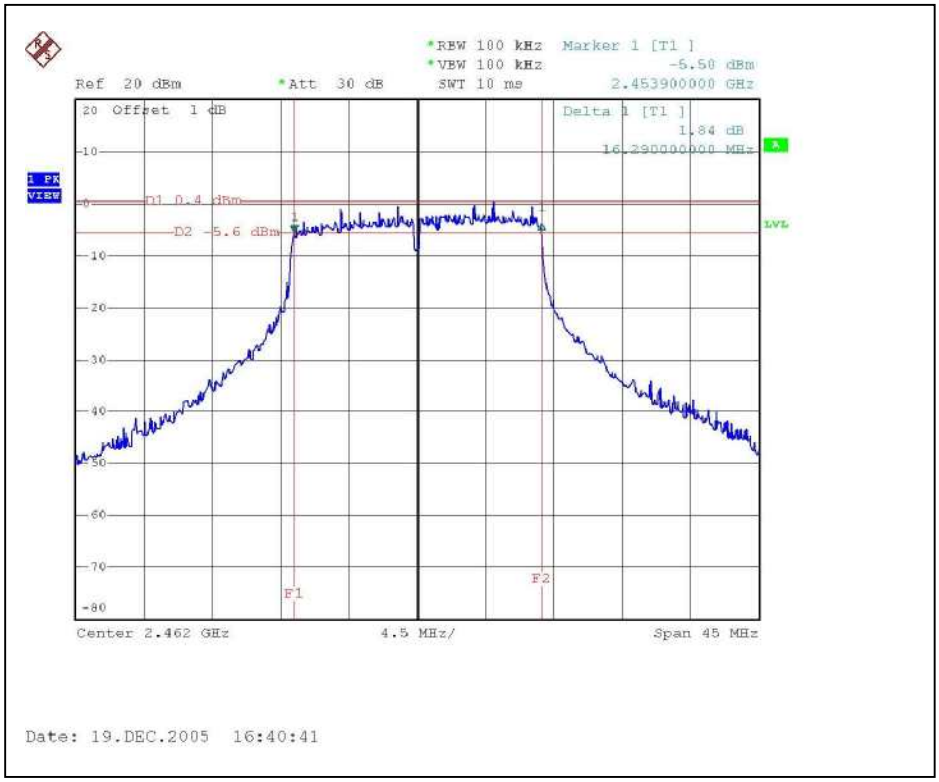
CH1


*RBW 100 kHz
Marker 1 [T1]
*VBW 100 kHz
-2.05 dBm
Ref 20 dBm
*Att 30 dB
SWT 10 ms
2.403810000 GHz
20 Offset 1 dB
Delta 1 [T1]
-0.11 dB
16.380000000 MHz
D1 2.33 dBm
D2 -3.67 dBm
F1
F2
Center 2.412 GHz
4.5 MHz/
Span 45 MHz
Date: 19.DEC.2005 15:51:04

CH6


*RBW 100 kHz
Marker 1 [T1]
*VBW 100 kHz
6.78 dBm
Ref 20 dBm
*Att 30 dB
SWT 10 ms
2.428810000 GHz
20 Offset 1 dB
Delta 1 [T1]
-1.25 dB
16.380000000 MHz
D1 10.95 dBm
D2 4.85 dBm
F1
F2
Center 2.437 GHz
4.5 MHz/
Span 45 MHz
Date: 19.DEC.2005 16:10:47

CH11


*RBW 100 kHz
Marker 1 [T1]
*VBW 100 kHz
-5.50 dBm
Ref 20 dBm
*Att 30 dB
SWT 10 ms
2.453900000 GHz
20 Offset 1 dB
Delta 1 [T1]
1.84 dB
16.290000000 MHz
1 PK VIEW
T1 0.4 dBm
D2 -5.6 dBm
LVL
F1
F2
Center 2.462 GHz
4.5 MHz/
Span 45 MHz
Date: 19.DEC.2005 16:40:41

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	FSP40	100036	Nov. 23, 2006
Agilent SIGNAL GENERATOR	E8257C	MY43320668	Dec. 07, 2006
TEKTRONIX OSCILLOSCOPE	TDS380	B016335	Jun. 22, 2006
NARDA DETECTOR	4503A	FSCM99899	NA

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

4.4.3 TEST PROCEDURES

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.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP

4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS modulation

MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	123.027	20.90	29	PASS
6	2437	138.038	21.40	29	PASS
11	2462	56.234	17.50	29	PASS

802.11g OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	70.795	18.50	29	PASS
6	2437	245.471	23.90	29	PASS
11	2462	36.308	15.60	29	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

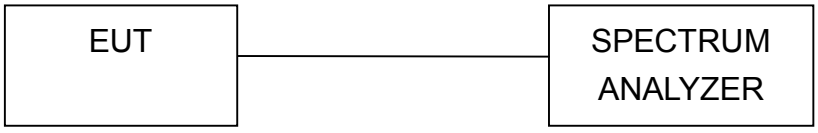
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

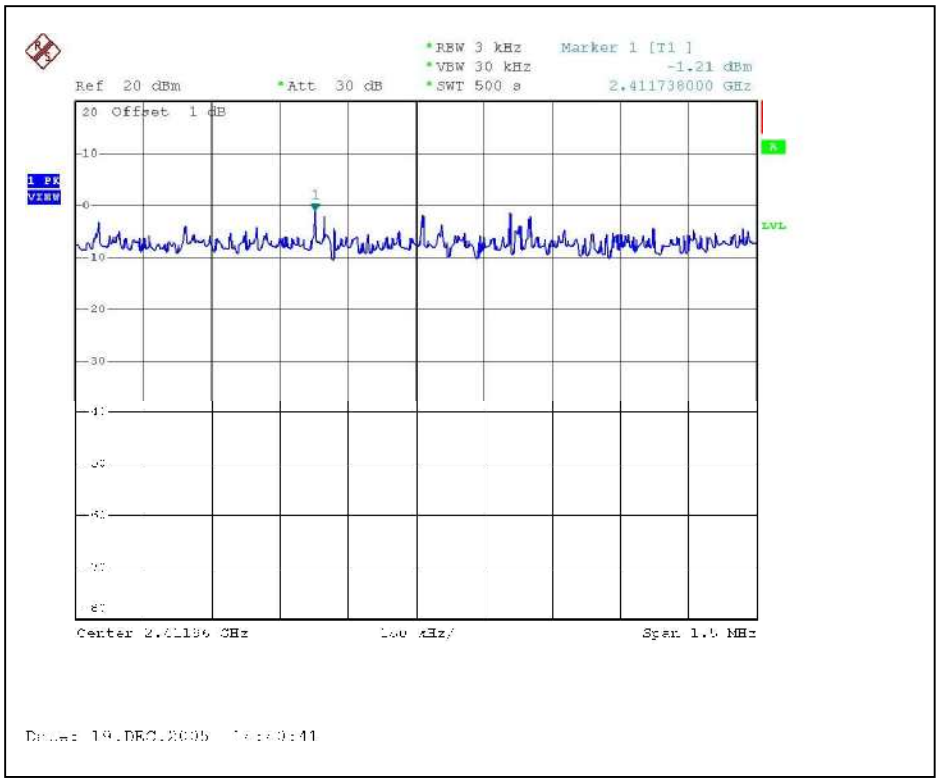
4.5.7 TEST RESULTS

802.11b DSSS modulation

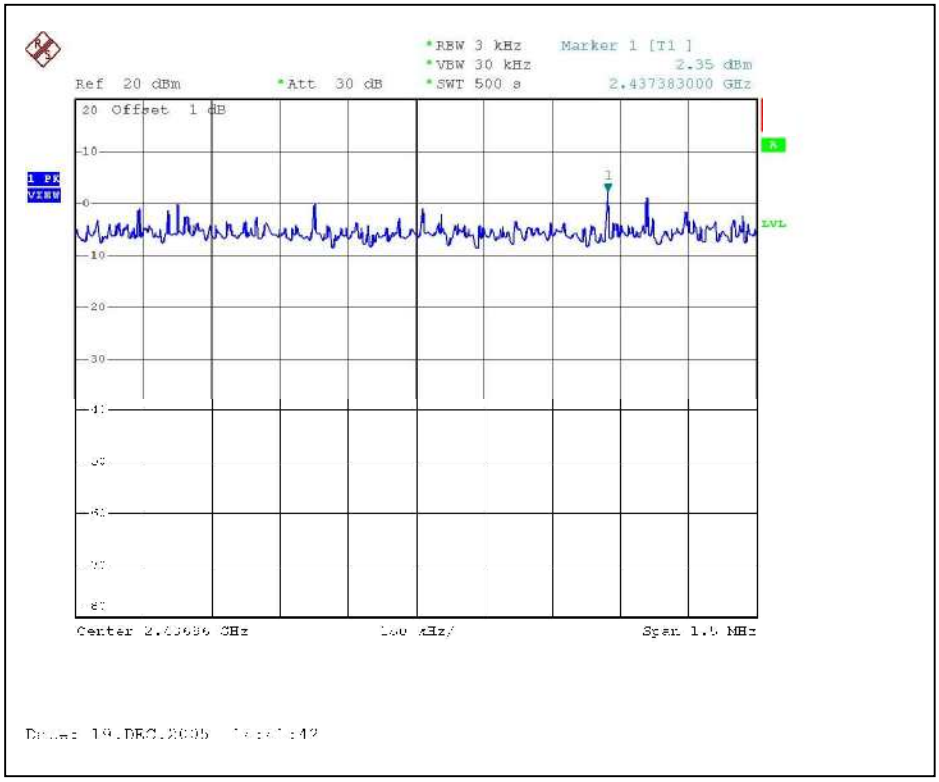
MODULATION TYPE	CCK	**TRANSFER RATE**	11Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg.C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-1.21	8	PASS
6	2437	2.35	8	PASS
11	2462	-4.66	8	PASS

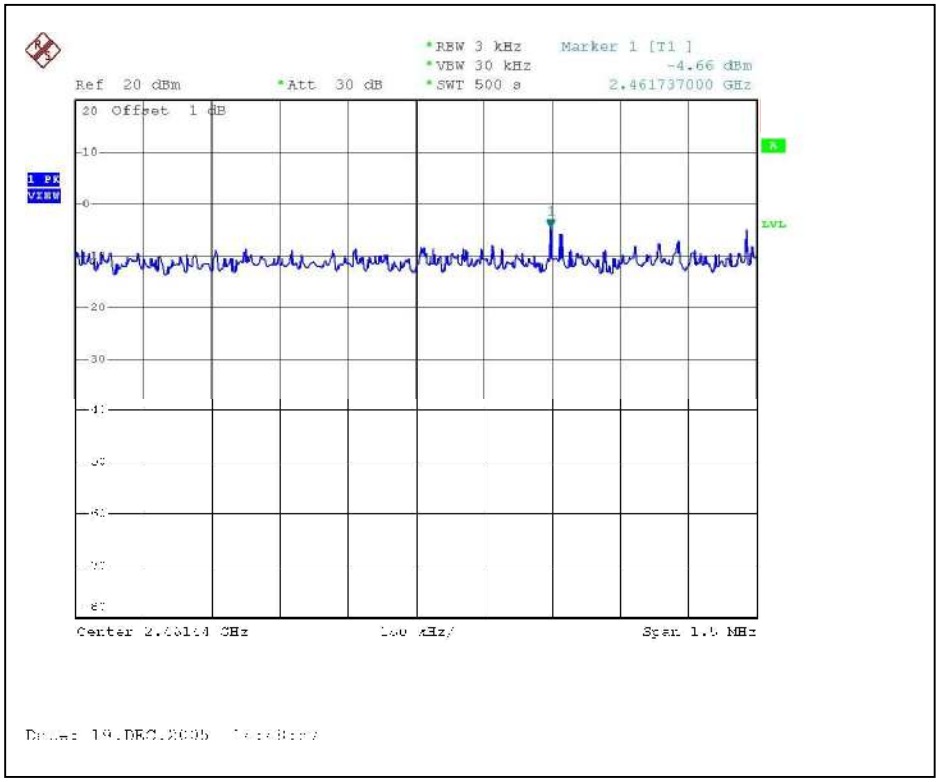
CH1


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-1.21 dBm
Ref 20 dBm
*Att 30 dB
*SWT 500 s
2.411738000 GHz
20 Offset 1 dB
1 PK
VIEW
LVL
Center 2.41186 GHz
Span 1.5 MHz

CH6


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
2.35 dBm
Ref 20 dBm
*Att 30 dB
*SWT 500 s
2.437383000 GHz
20 Offset 1 dB
1 PK
VIEW
LVL
Center 2.43686 GHz
Span 1.5 MHz

CH11

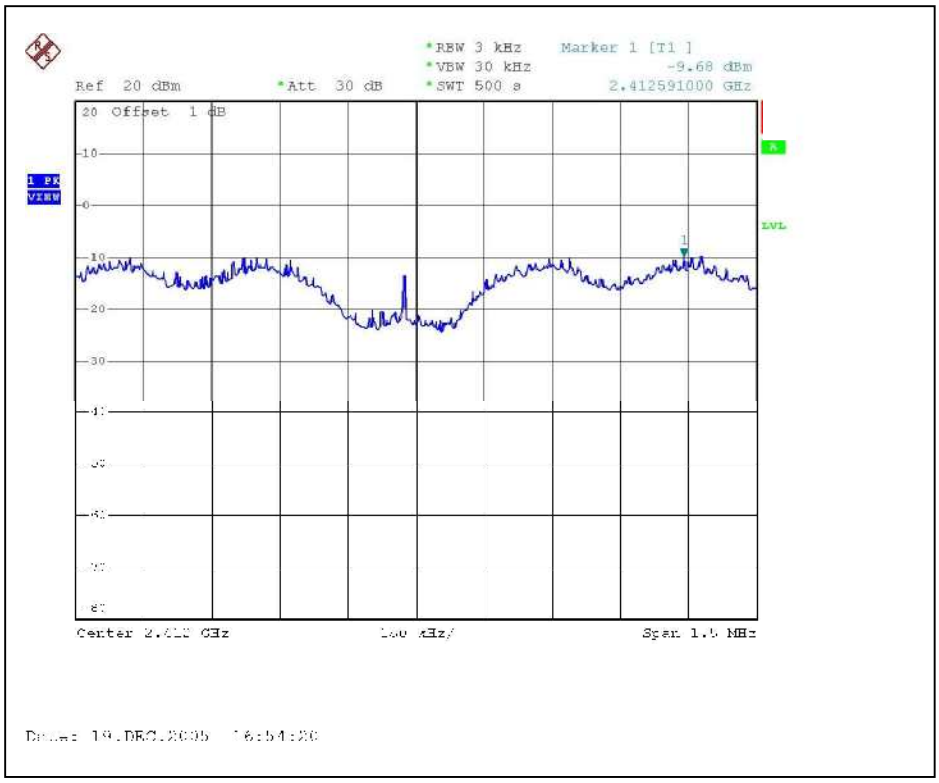

*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-4.66 dBm
Ref 20 dBm
*Att 30 dB
*SWT 500 s
2.461737000 GHz
20 Offset 1 dB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1 PK
VIEW
A
LVL
Center 2.461737 GHz
Span 1.5 MHz

802.11g OFDM modulation

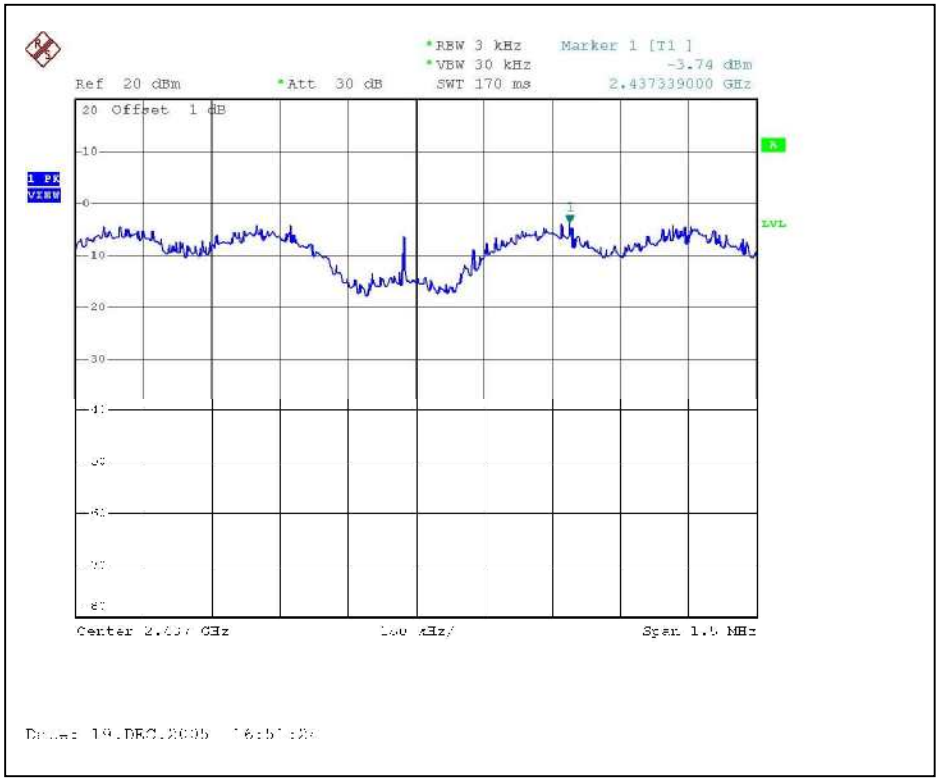
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg.C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.68	8	PASS
6	2437	-3.74	8	PASS
11	2462	-12.35	8	PASS

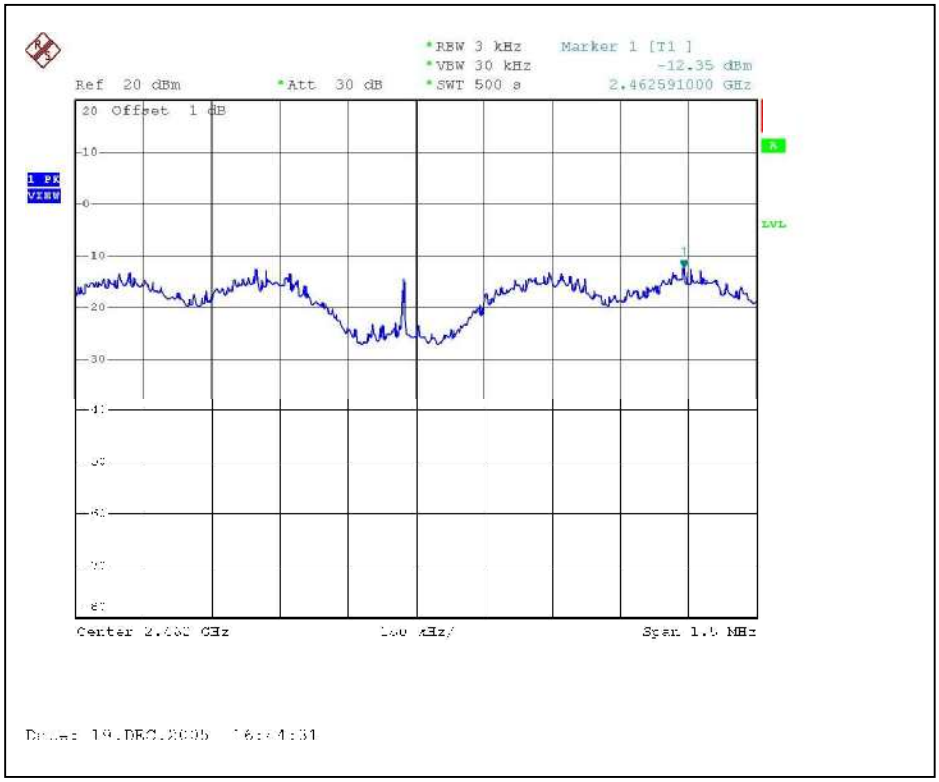
CH1


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-9.68 dBm
Ref 20 dBm
*Att 30 dB
*SWT 500 s
2.412591000 GHz
20 Offset 1 dB
1 PK
VIEW
LVL
Center 2.412 GHz
Span 1.5 MHz

CH6


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-3.74 dBm
Ref 20 dBm
*Att 30 dB
SWT 170 ms
2.437339000 GHz
20 Offset 1 dB
1 PK
VIEW
LVL
Span 1.5 MHz

CH11


*RBW 3 kHz
Marker 1 [T1]
*VBW 30 kHz
-12.35 dBm
Ref 20 dBm
*Att 30 dB
*SWT 500 s
2.462591000 GHz
20 Offset 1 dB
10
0
-10
-20
-30
1 PK
VIEW
A
LVL
Center 2.462 GHz
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 1MHz Resolution Bandwidth).

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set RBW spectrum analyzer to 1 MHz and set VBW spectrum analyzer to 10 Hz with suitable frequency span including 1 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 EUT OPERATING CONDITION

Same as Item 4.1.6

4.6.5 TEST RESULTS – DSSS

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

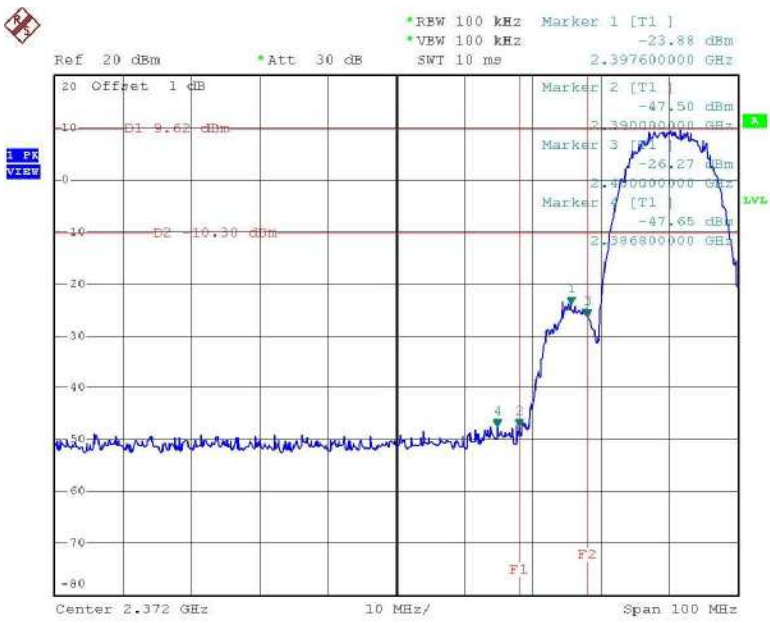
Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

NOTE (Peak):
The band edge emission plot of DSSS technique on the following first page show 57.12dB delta 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 is 114.2dBuV/m, so the maximum field strength in restrict band is 114.2-57.12=57.08dBuV/m which is under 74 dBuV/m limit.

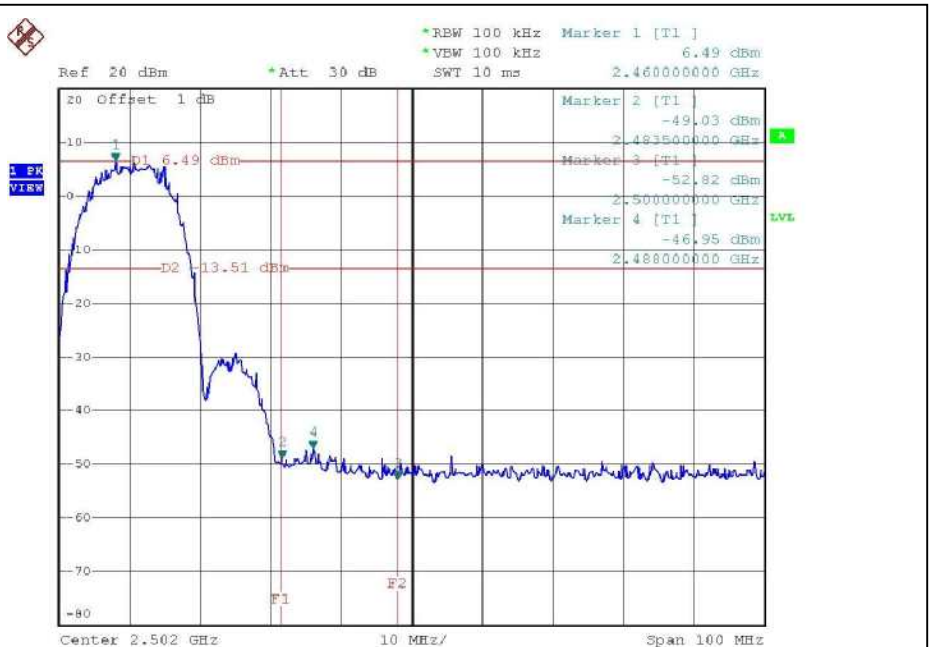
The band edge emission plot of DSSS technique on the following first page shows 55.52dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 111.0dBuV/m, so the maximum field strength in restrict band is 111.0-55.52=55.48dBuV/m which is under 74 dBuV/m limit.

NOTE (Average):
The band edge emission plot of DSSS technique on the following second page shows 61.22dB delta 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 is 106.4dBuV/m, so the maximum field strength in restrict band is 106.4-61.22=45.18dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot of DSSS technique on the following second page shows 57.5dB delta 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 is 103.9dBuV/m, so the maximum field strength in restrict band is 103.9-57.5=46.4dBuV/m which is under 54 dBuV/m limit.



Date: 9.DEC.2005 17:09:01

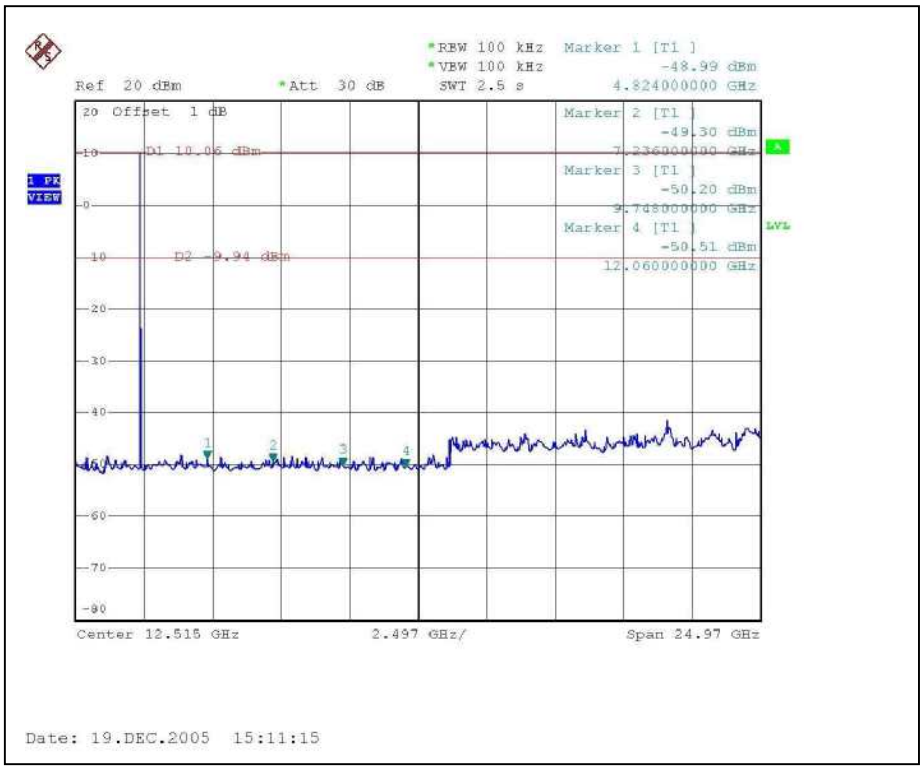


Date: 9.DEC.2005 17:26:18

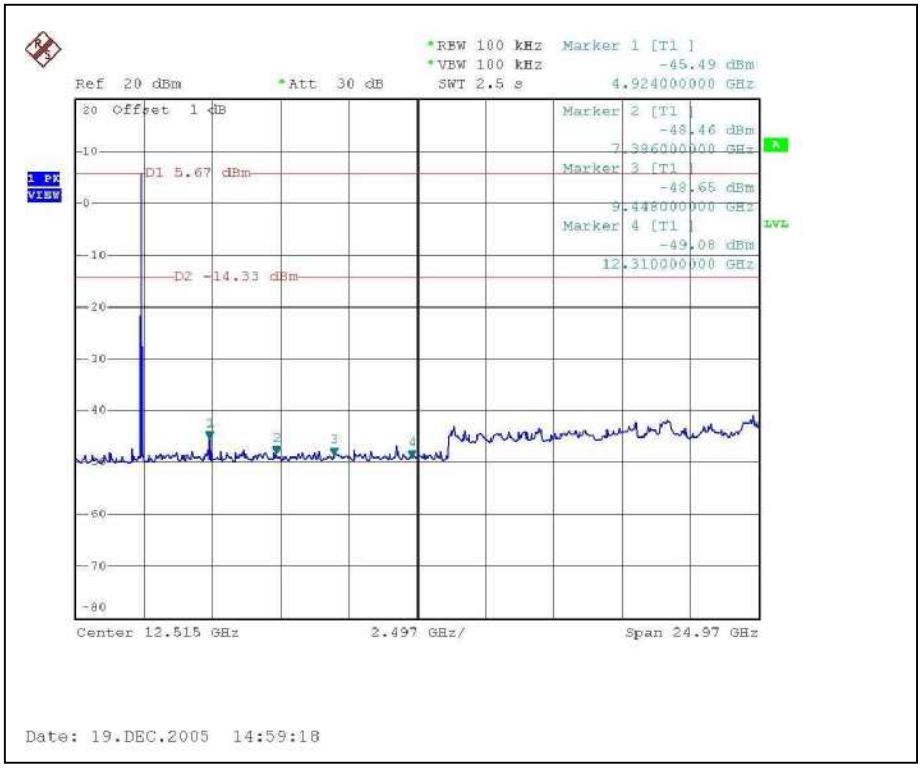

*RBW 1 MHz
*VBW 100 Hz
SWT 2.5 s
Marker 1 [T1]
8.88 dBm
2.414400000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-52.34 dBm
Marker 3 [T1]
-26.96 dBm
Marker 4 [T1]
-52.95 dBm
D1 8.88 dBm
D2 -11.12 dBm
1 PK VIEW
LVL
F1
F2
Center 2.372 GHz
10 MHz/
Span 100 MHz
Date: 7.DEC.2005 22:26:46


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
5.38 dBm
2.463600000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-52.12 dBm
Marker 3 [T1]
-58.82 dBm
D1 5.38 dBm
D2 -14.62 dBm
1 PK VIEW
LVL
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
Date: 8.DEC.2005 09:57:54

CH 1


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-48.99 dBm
4.824000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 10.06 dBm
D2 -9.94 dBm
Marker 2 [T1]
-49.30 dBm
7.236000000 GHz
Marker 3 [T1]
-50.20 dBm
9.648000000 GHz
Marker 4 [T1]
-50.51 dBm
12.060000000 GHz
1 PK VIEW
LVL
Center 12.515 GHz
2.497 GHz/
Span 24.97 GHz
Date: 19.DEC.2005 15:11:15

CH 11


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-45.49 dBm
4.924000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 5.67 dBm
D2 -14.33 dBm
Marker 2 [T1]
-48.46 dBm
7.396000000 GHz
Marker 3 [T1]
-48.65 dBm
9.448000000 GHz
Marker 4 [T1]
-49.08 dBm
12.310000000 GHz
1 PK VIEW
LVL
Center 12.515 GHz
2.497 GHz/
Span 24.97 GHz
Date: 19.DEC.2005 14:59:18

4.6.6 TEST RESULTS – OFDM

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

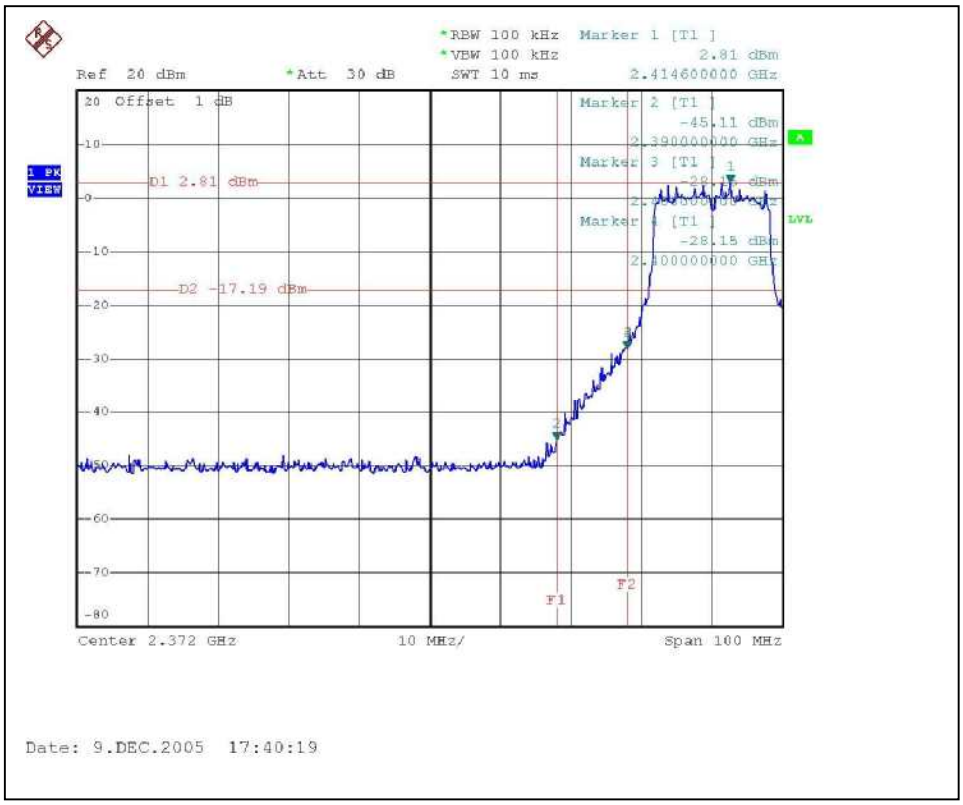
Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

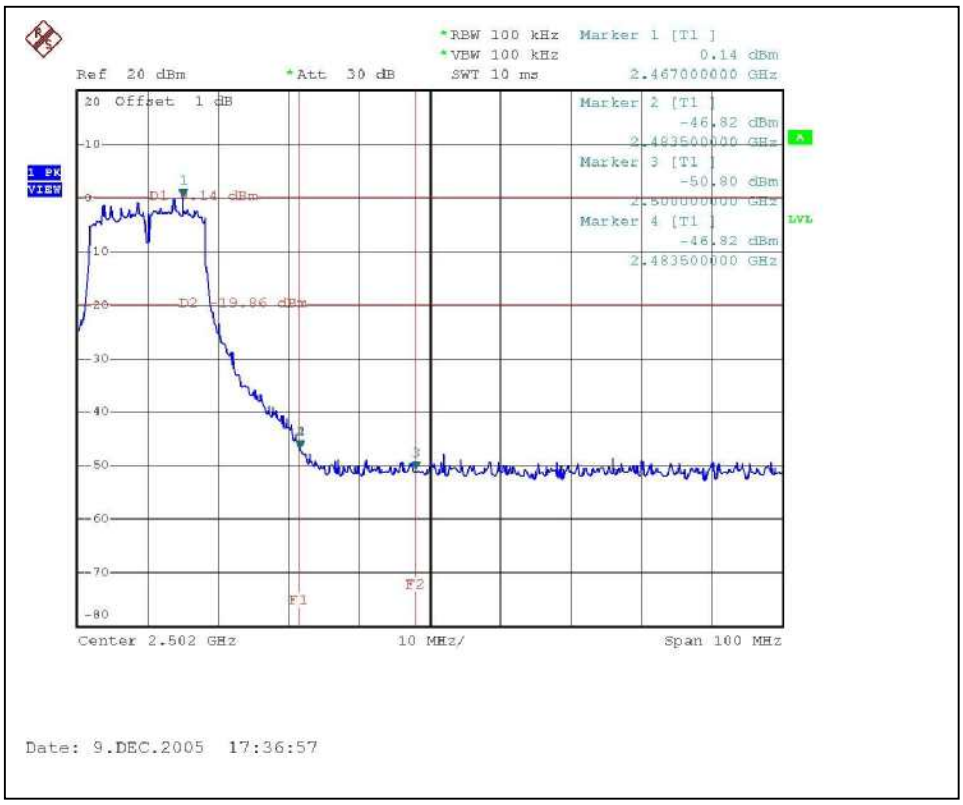
NOTE (Peak):
The band edge emission plot of OFDM technique on the following first page show 47.92dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 107.9dBuV/m, so the maximum field strength in restrict band is 107.9-47.92=59.98dBuV/m which is under 74 dBuV/m limit.

The band edge emission plot of OFDM technique on the following first page shows 46.96dB delta 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 is 106.2dBuV/m, so the maximum field strength in restrict band is 106.2-46.96=59.24dBuV/m which is under 74 dBuV/m limit.

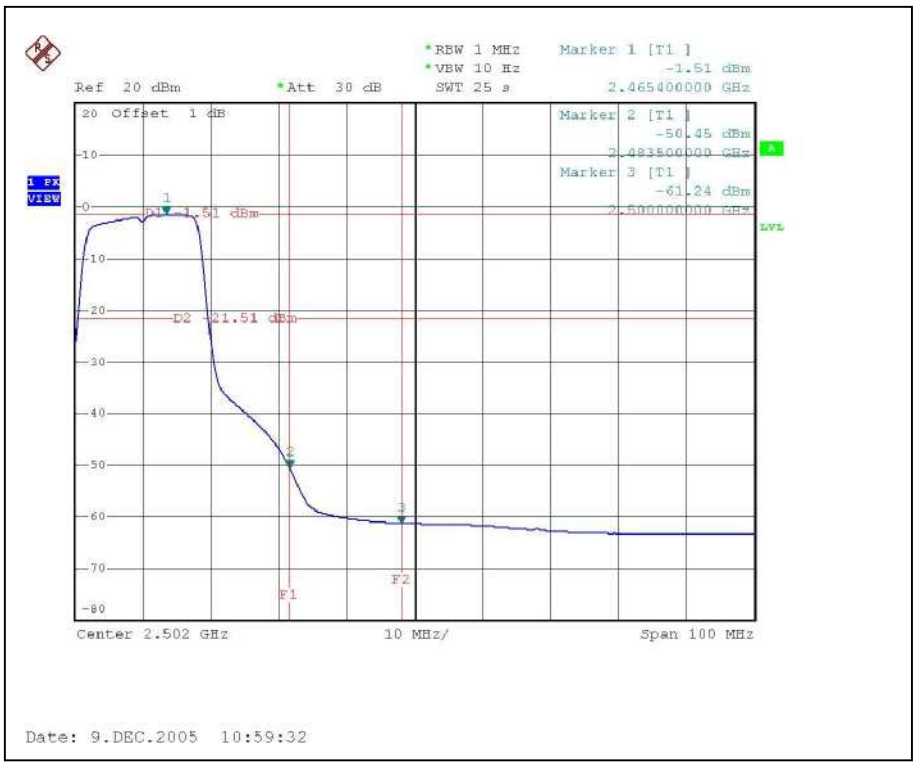
NOTE (Average):
The band edge emission plot of OFDM technique on the following second page shows 52.69dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 98.6dBuV/m, so the maximum field strength in restrict band is 98.6-52.69=45.91dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot of OFDM technique on the following second page shows 48.94dB delta 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 is 96.9dBuV/m, so the maximum field strength in restrict band is 96.9-48.94=47.96dBuV/m which is under 54 dBuV/m limit.

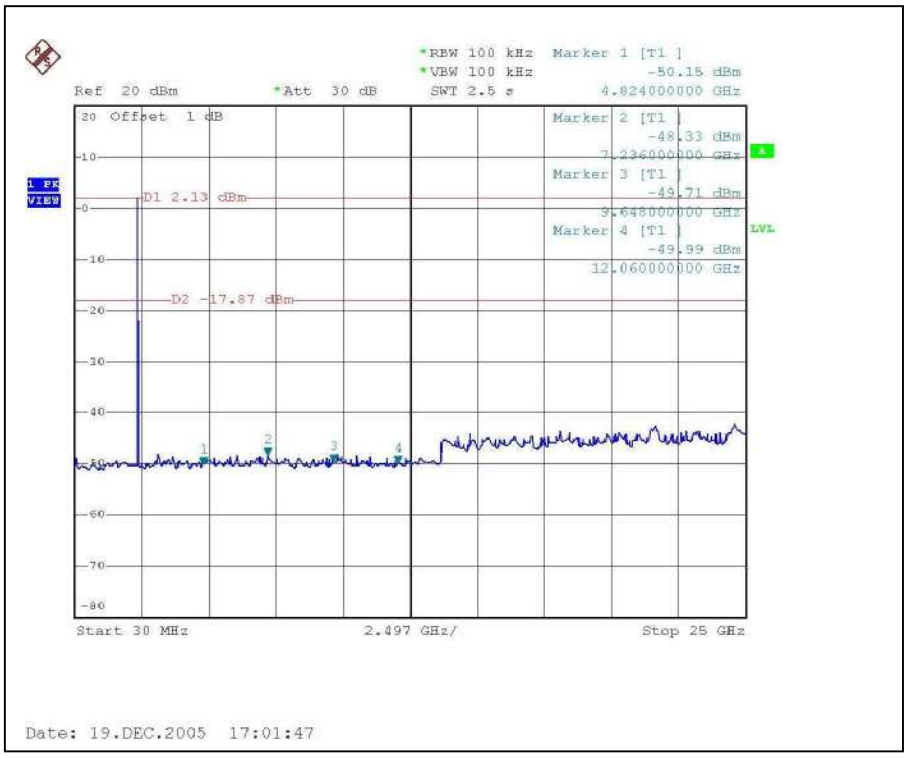

RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
2.81 dBm
2.414600000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-45.11 dBm
2.390000000 GHz
Marker 3 [T1]
Marker 4 [T1]
-28.15 dBm
2.400000000 GHz
D1 2.81 dBm
D2 -17.19 dBm
1 PK VIEW
LVL
F1
F2
Center 2.372 GHz
10 MHz/
Span 100 MHz
Date: 9.DEC.2005 17:40:19


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
0.14 dBm
2.467000000 GHz
Ref 20 dBm
Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-46.82 dBm
2.483500000 GHz
Marker 3 [T1]
-50.80 dBm
Marker 4 [T1]
-46.82 dBm
2.483500000 GHz
D1 0.14 dBm
D2 -19.86 dBm
1 PK VIEW
LVL
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
Date: 9.DEC.2005 17:36:57

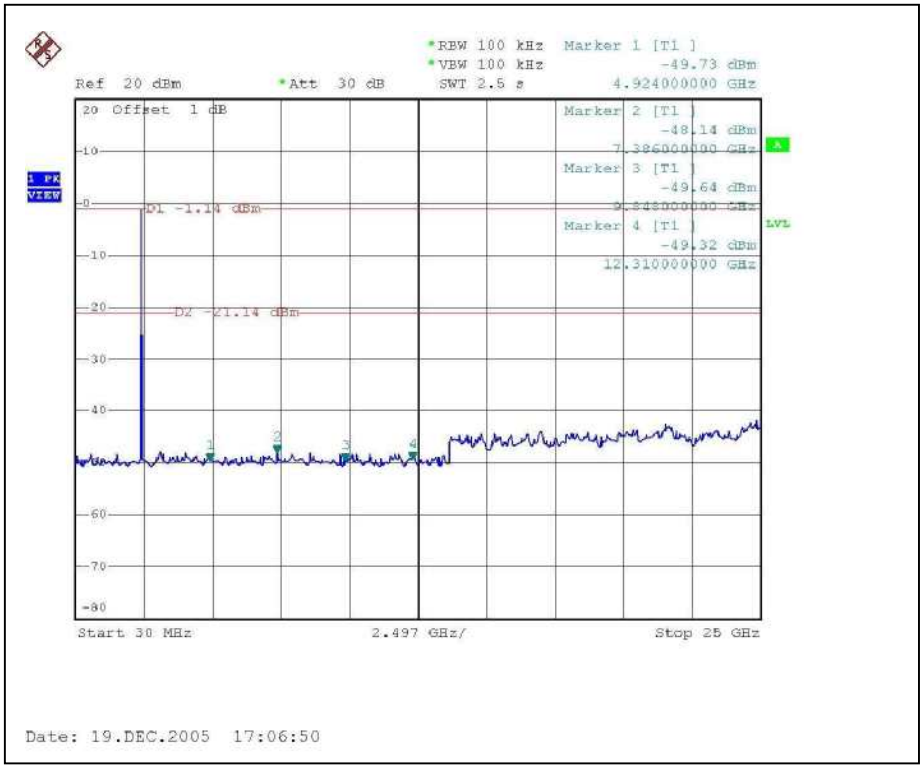

*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
0.20 dBm
2.410400000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-52.49 dBm
2.390000000 GHz
Marker 3 [T1]
-55.11 dBm
2.483500000 GHz
1 PK VIEW
D1 0.2 dBm
D2 -19.8 dBm
LVL
F1
F2
Center 2.372 GHz
10 MHz/
Span 100 MHz
Date: 8.DEC.2005 00:09:02


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
-1.51 dBm
2.465400000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-50.45 dBm
2.483500000 GHz
Marker 3 [T1]
-61.24 dBm
2.500000000 GHz
1 PK VIEW
D1 -1.51 dBm
D2 -21.51 dBm
LVL
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
Date: 9.DEC.2005 10:59:32

CH 1


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-50.15 dBm
4.824000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-48.33 dBm
7.236000000 GHz
Marker 3 [T1]
-49.71 dBm
9.648000000 GHz
Marker 4 [T1]
-49.99 dBm
12.060000000 GHz
D1 2.13 dBm
D2 -17.87 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 19.DEC.2005 17:01:47

CH 11


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 s
Marker 1 [T1]
-49.73 dBm
4.924000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 2 [T1]
-48.14 dBm
7.386000000 GHz
Marker 3 [T1]
-49.64 dBm
9.848000000 GHz
Marker 4 [T1]
-49.32 dBm
12.310000000 GHz
D1 -1.14 dBm
D2 -21.14 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
Date: 19.DEC.2005 17:06:50

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 antennas used in this product are as following:

Model No.	Gain (dBi)	Antenna Type	Antenna Connector
FDS_2FED01+I3G	3 dBi	Dual Band Antenna, Dipole	MMCX

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

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (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
ROHDE & SCHWARZ Test Receiver	ESCS 30	847124/029	Dec. 14, 2006
Line-Impedance Stabilization Network(for EUT)	ENV-216	100072	Oct. 05, 2006
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 19, 2006
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 19, 2006
Terminator(for KYORITSU)	50	1	Oct. 08, 2006
Software	Cond-V2e	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 ADT Shielded Room No. A.
3 The VCCI Con A Registration No. is C-817.
4 The measurement uncertainty is 2.53 dB, which is calculated as per the document CISPR 16-4 This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

b. provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

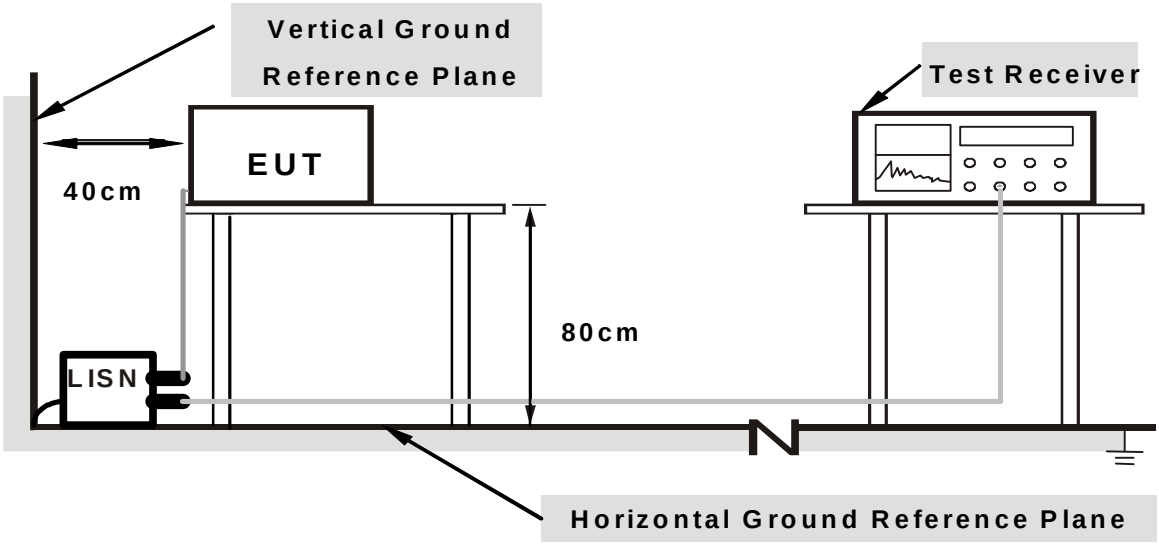
c. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

d. The frequency range from 150kHz to 30MHz was searched. Emission level 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

a. Placed the EUT on the testing table.

b. Prepared other computer systems to act as a communication partner and placed them outside of testing area.

c. The communication partner run test program “ART48 Build 10” to enable EUT under transmission/receiving condition continuously at specific channel frequency via UTP cable.

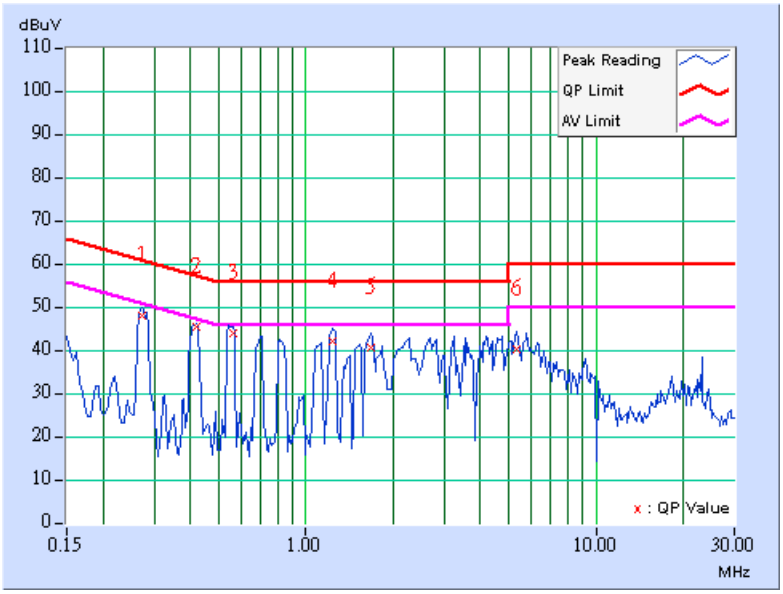
5.1.7 TEST RESULTS

Conducted Worst-Case Data

TEST MODE	With Adapter	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.60	47.17	-	47.77	-	61.08	51.08	-13.31	-
2	0.420	0.60	44.63	-	45.23	-	57.46	47.46	-12.22	-
3	0.560	0.63	43.18	-	43.81	-	56.00	46.00	-12.19	-
4	1.236	0.70	41.45	-	42.15	-	56.00	46.00	-13.85	-
5	1.677	0.70	39.75	-	40.45	-	56.00	46.00	-15.55	-
6	5.316	0.94	39.54	-	40.48	-	60.00	50.00	-19.52	-

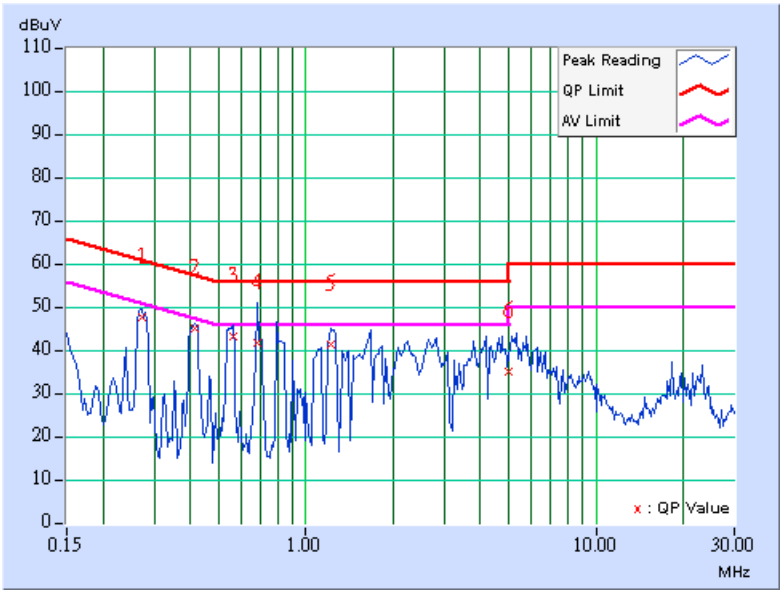
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST MODE	With Adapter	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.271	0.40	46.89	-	47.29	-	61.08	51.08	-13.79	-
2	0.416	0.41	44.43	-	44.84	-	57.54	47.54	-12.70	-
3	0.564	0.45	42.60	-	43.05	-	56.00	46.00	-12.95	-
4	0.681	0.49	41.05	-	41.54	-	56.00	46.00	-14.46	-
5	1.228	0.60	40.69	-	41.29	-	56.00	46.00	-14.71	-
6	5.000	0.87	34.46	-	35.33	-	56.00	46.00	-20.67	-

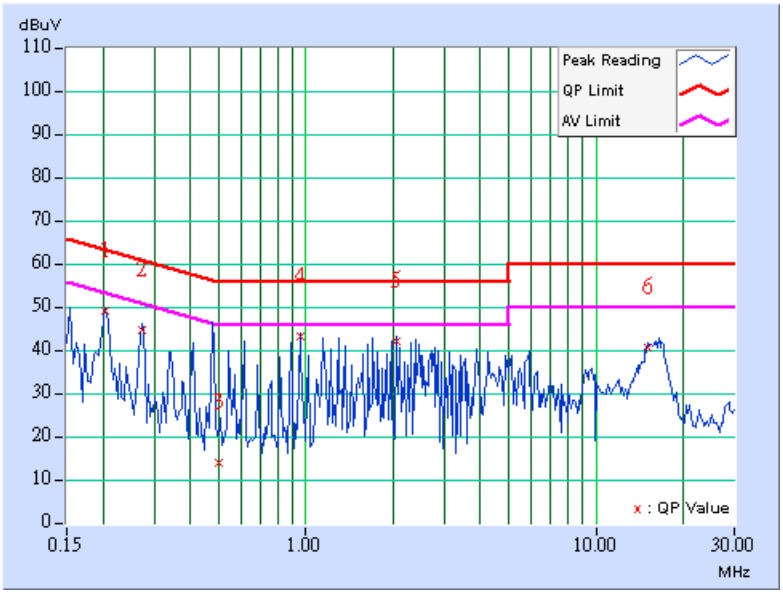
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST MODE	With POE	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	TESTED BY	Eric Lee

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]	(dB)	[dB (uV)] Q.P.	AV.	[dB (uV)] Q.P.	AV.	[dB (uV)] Q.P.	AV.	(dB) Q.P.	AV.
1	0.205	9.80	39.08	-	48.88	-	63.42	53.42	-14.54	-
2	0.271	9.80	34.87	-	44.67	-	61.08	51.08	-16.41	-
3	0.500	9.82	3.84	-	13.66	-	56.00	46.00	-42.34	-
4	0.955	9.89	33.08	-	42.97	-	56.00	46.00	-13.03	-
5	2.045	9.90	32.13	-	42.03	-	56.00	46.00	-13.97	-
6	15.141	10.10	30.73	-	40.83	-	60.00	50.00	-19.17	-

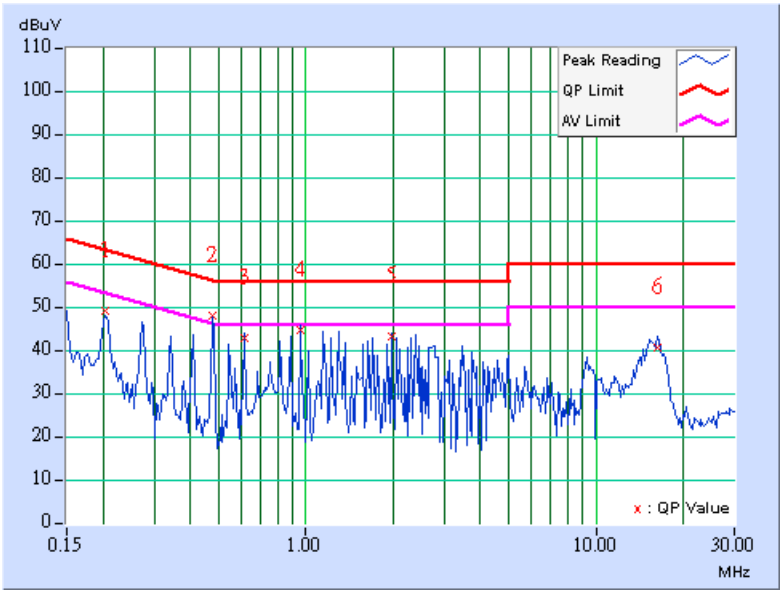
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST MODE	With POE	**6dB BANDWIDTH**	9 kHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 980hPa	**TESTED BY**	Eric Lee

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	9.80	38.91	-	48.71	-	63.42	53.42	-14.71	-
2	**0.478**	**9.81**	**37.75**	**34.68**	**47.56**	**44.49**	**56.37**	**46.37**	**-8.81**	**-1.88**
3	0.615	9.84	32.53	-	42.37	-	56.00	46.00	-13.63	-
4	0.955	9.89	34.41	-	44.30	-	56.00	46.00	-11.70	-
5	1.978	10.00	32.91	-	42.91	-	56.00	46.00	-13.09	-
6	16.383	10.26	30.34	-	40.60	-	60.00	50.00	-19.40	-

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



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
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 07, 2006
HP Pre_Amplifier	8449B	3008A01922	Oct. 02, 2006
ROHDE & SCHWARZ Test Receiver	ESCS30	100287	Dec. 08, 2006
CHASE Broadband Antenna	VULB9168	138	Dec. 21, 2005
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 11, 2006
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 30, 2006
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 26, 2006
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 26, 2006
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek) 1GHz-20GHz	SF102	22054-2	Nov. 16. 2006
RF Cable(RICHTEC)	9913-30M	STCCAB-30M-1 GHz-021	Jul. 16, 2006
Software	ADT_Radiated_V 5.14	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824-3.
7. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Radiated emissions (30MHz-1GHz)	2.98 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~20GHz)	1.88 dB

5.2.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

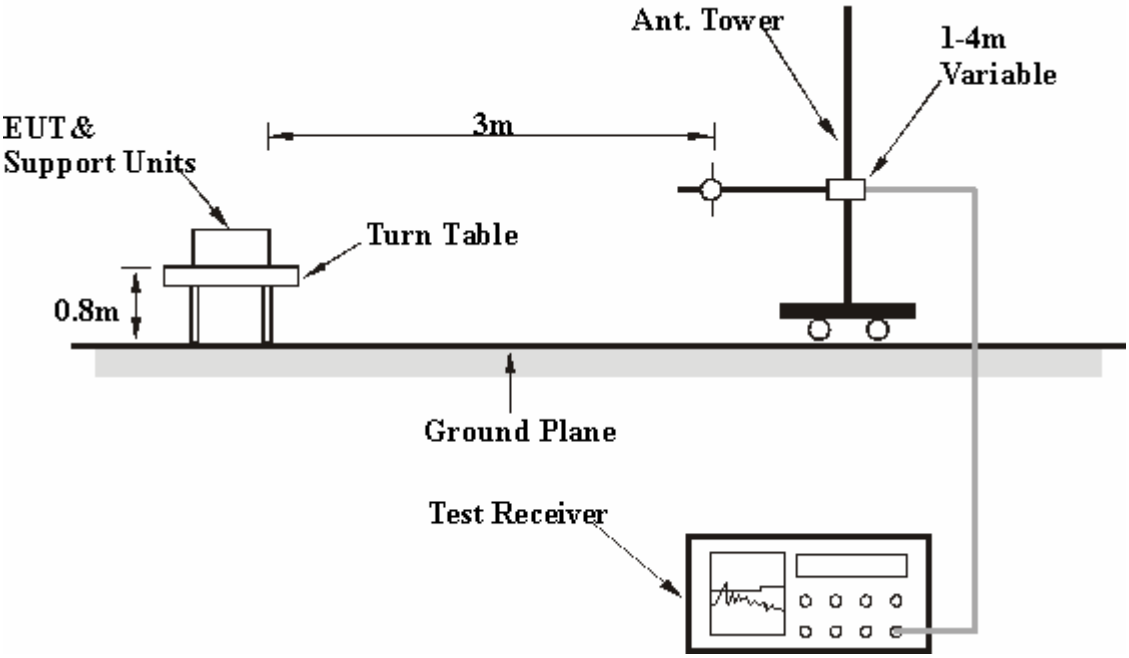
NOTE:

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

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

TEST MODE	With Adapter	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 63%RH, 980hPa	**TESTED BY**	Sky Liao

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	250.00	23.80 QP	46.00	-22.20	1.82 H	287	10.50	13.30
2	300.00	23.70 QP	46.00	-22.30	1.28 H	322	7.40	16.30
3	375.00	26.20 QP	46.00	-19.80	1.05 H	307	8.60	17.60
4	500.00	26.00 QP	46.00	-20.00	1.12 H	216	5.10	20.90
5	792.00	37.10 QP	46.00	-8.90	1.06 H	187	10.50	26.60
6	891.00	38.90 QP	46.00	-7.10	1.03 H	274	11.10	27.80
7	924.00	38.50 QP	46.00	-7.50	1.54 H	321	10.10	28.40
8	990.00	40.10 QP	54.00	-13.90	1.72 H	243	11.20	28.90

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	43.10	25.50 QP	40.00	-14.50	1.13 V	275	11.30	14.20
2	250.00	28.50 QP	46.00	-17.50	1.07 V	238	15.20	13.30
3	500.00	26.30 QP	46.00	-19.70	1.31 V	143	5.40	20.90
4	792.00	33.70 QP	46.00	-12.30	1.15 V	246	7.10	26.60
5	858.00	33.60 QP	46.00	-12.40	1.22 V	48	6.10	27.50
6	891.00	38.50 QP	46.00	-7.50	1.25 V	210	10.70	27.80
7	924.00	37.20 QP	46.00	-8.80	1.00 V	54	8.80	28.40
8	990.00	38.10 QP	54.00	-15.90	1.09 V	219	9.20	28.90

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

Below 1GHz Worst-Case Data

TEST MODE	With POE	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	21deg. C, 63%RH, 980hPa	**TESTED BY**	Sky Liao

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	250.00	23.40 QP	46.00	-22.60	1.84 H	203	10.10	13.30
2	300.00	21.90 QP	46.00	-24.10	1.19 H	324	5.60	16.30
3	375.00	24.70 QP	46.00	-21.30	1.21 H	176	7.10	17.60
4	500.00	25.20 QP	46.00	-20.80	1.01 H	84	4.30	20.90
5	792.00	36.80 QP	46.00	-9.20	1.31 H	305	10.20	26.60
6	891.00	39.90 QP	46.00	-6.10	1.13 H	249	12.10	27.80
7	924.00	37.50 QP	46.00	-8.50	1.06 H	278	9.10	28.40
8	990.00	39.30 QP	54.00	-14.70	1.00 H	302	10.40	28.90

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	42.10	32.10 QP	40.00	-7.90	1.00 V	342	17.90	14.20
2	250.00	26.50 QP	46.00	-19.50	1.01 V	296	13.20	13.30
3	500.00	26.10 QP	46.00	-19.90	1.31 V	58	5.20	20.90
4	792.00	35.50 QP	46.00	-10.50	1.25 V	264	8.90	26.60
5	858.00	33.50 QP	46.00	-12.50	1.28 V	172	6.00	27.50
6	891.00	37.20 QP	46.00	-8.80	1.21 V	273	9.40	27.80
7	924.00	38.30 QP	46.00	-7.70	1.14 V	84	9.90	28.40
8	990.00	37.00 QP	54.00	-17.00	1.03 V	209	8.10	28.90

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

802.11a OFDM modulation

CHANNEL	Channel 1	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Moris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5745.00	103.50 PK			1.28 H	246	67.10	36.40
1	*5745.00	95.00 AV			1.28 H	246	58.60	36.40
2	#11490.00	62.50 PK	74.00	-11.50	1.54 H	142	11.40	51.10
2	#11490.00	51.20 AV	54.00	-2.80	1.54 H	142	0.10	51.10

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5745.00	113.90 PK			1.25 V	278	77.50	36.40
1	*5745.00	105.70 AV			1.25 V	278	69.30	36.40
2	#11490.00	62.90 PK	74.00	-11.10	1.38 V	314	11.80	51.10
2	#11490.00	51.80 AV	54.00	-2.20	1.38 V	314	0.70	51.10

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

CHANNEL	Channel 3	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Moris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5785.00	103.60 PK			1.21 H	287	67.10	36.50
1	*5785.00	94.90 AV			1.21 H	287	58.40	36.50
2	#11570.00	62.50 PK	74.00	-11.50	1.51 H	3	11.60	50.90
2	#11570.00	51.50 AV	54.00	-2.50	1.51 H	3	0.60	50.90

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	*5785.00	114.30 PK			1.17 V	265	77.80	36.50
1	*5785.00	105.50 AV			1.17 V	265	69.00	36.50
2	#11570.00	63.10 PK	74.00	-10.90	1.42 V	343	12.20	50.90
2	**#11570.00**	**52.20 AV**	**54.00**	**-1.80**	**1.42 V**	**343**	**1.30**	**50.90**

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

CHANNEL	Channel 5	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	14deg. C, 57%RH, 980hPa	**TESTED BY**	Moris Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5825.00	103.30 PK			1.26 H	274	66.70	36.60
1	*5825.00	95.00 AV			1.26 H	274	58.40	36.60
2	#11650.00	62.20 PK	74.00	-11.80	1.47 H	335	11.60	50.60
2	#11650.00	51.40 AV	54.00	-2.60	1.47 H	335	0.80	50.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5825.00	114.70 PK			1.17 V	270	78.10	36.60
1	*5825.00	106.10 AV			1.17 V	270	69.50	36.60
2	#11650.00	62.30 PK	74.00	-11.70	1.39 V	26	11.70	50.60
2	#11650.00	51.20 AV	54.00	-2.80	1.39 V	26	0.60	50.60

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	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. 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.

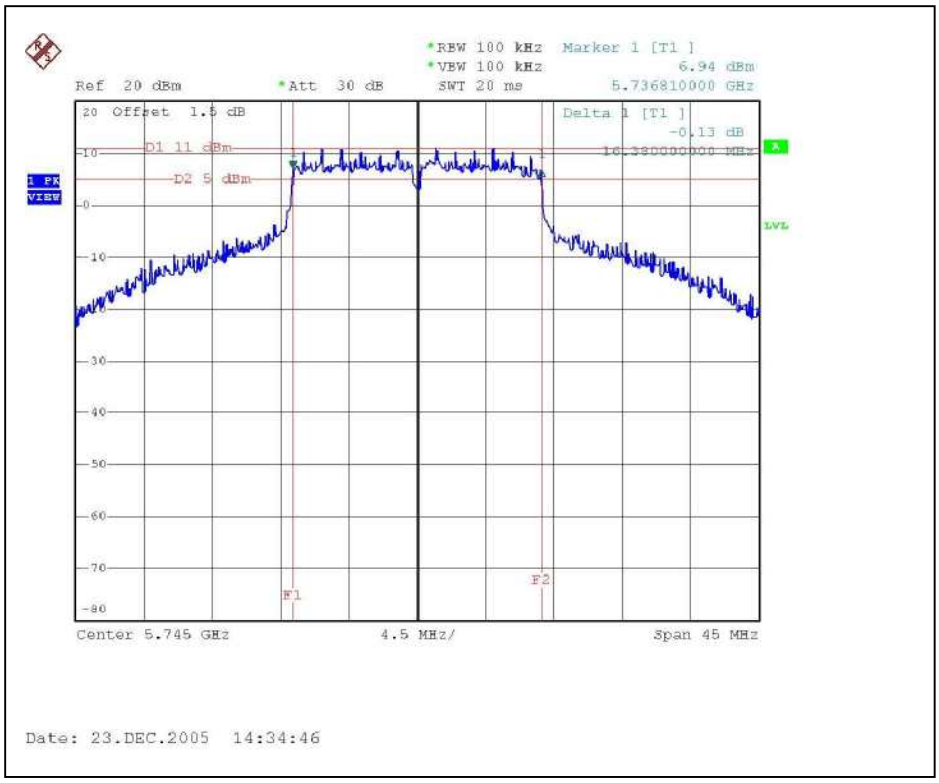
5.3.7 TEST RESULTS

802.11a OFDM modulation

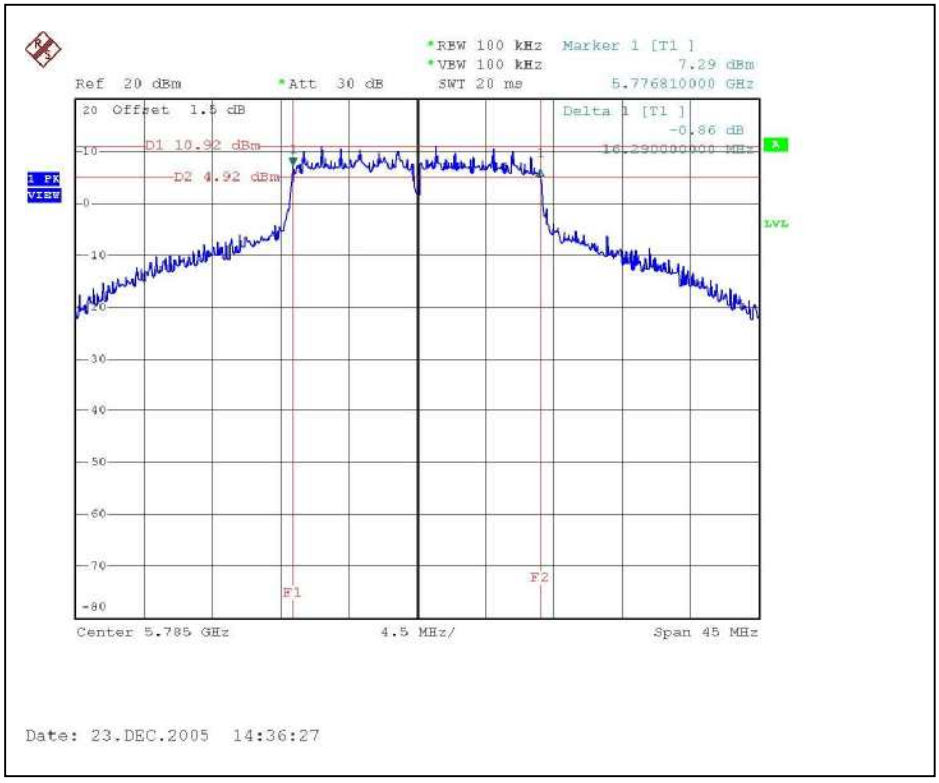
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	5745	16.38	0.5	PASS
3	5785	16.29	0.5	PASS
5	5825	16.47	0.5	PASS

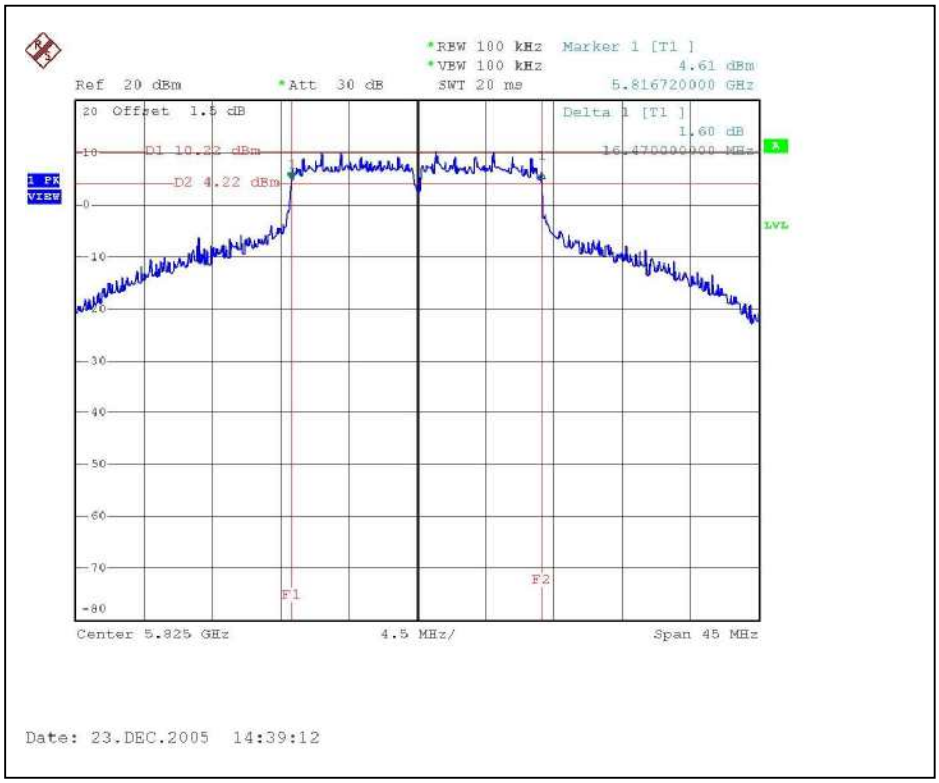
CH1


*RBW 100 kHz
Marker 1 [T1]
*VBW 100 kHz
6.94 dBm
Ref 20 dBm
*Att 30 dB
SWT 20 ms
5.736810000 GHz
20 Offset 1.5 dB
Delta 1 [T1]
-0.13 dB
D1 11 dBm
D2 5 dBm
1 PK VIEW
LVL
F1
F2
Center 5.745 GHz
4.5 MHz/
Span 45 MHz
Date: 23.DEC.2005 14:34:46

CH3


*RBW 100 kHz
Marker 1 [T1]
*VBW 100 kHz
7.29 dBm
Ref 20 dBm
*Att 30 dB
SWT 20 ms
5.776810000 GHz
20 Offset 1.5 dB
Delta 1 [T1]
-0.86 dB
D1 10.92 dBm
D2 4.92 dBm
1 PK VIEW
LVL
F1
F2
Center 5.785 GHz
4.5 MHz/
Span 45 MHz
Date: 23.DEC.2005 14:36:27

CH5


*RBW 100 kHz
*VBW 100 kHz
SWT 20 ms
Marker 1 [T1]
4.61 dBm
5.816720000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1.5 dB
Delta 1 [T1]
1.60 dB
16.470000000 MHz
D1 10.22 dBm
D2 4.22 dBm
1 PK
VIEW
LVL
F1
F2
Center 5.825 GHz
4.5 MHz/
Span 45 MHz
Date: 23.DEC.2005 14:39:12

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	100036	Nov. 23, 2006
Agilent SIGNAL GENERATOR	E8257C	MY43320668	Dec. 07, 2006
TEKTRONIX OSCILLOSCOPE	TDS380	B016335	Jun. 22, 2006
NARDA DETECTOR	4503A	FSCM99899	NA

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

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 4.3.6

5.4.7 TEST RESULTS

802.11a OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	5745	251.189	24	28	PASS
3	5785	218.776	23.4	28	PASS
5	5825	213.796	23.3	28	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	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

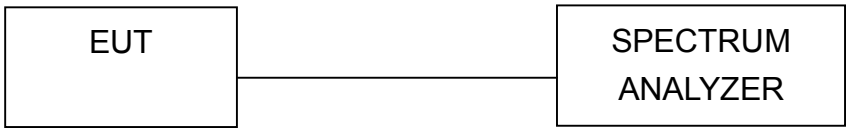
5.5.3 TEST PROCEDURE

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 4.3.6

5.5.7 TEST RESULTS

802.11a OFDM modulation

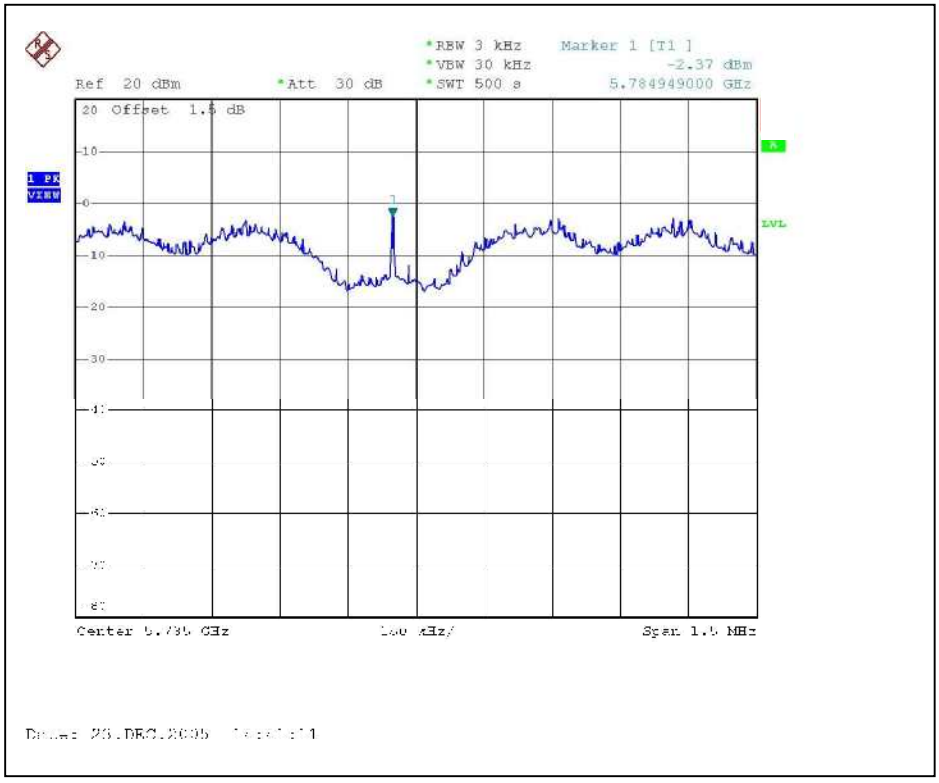
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	20deg. C, 50%RH, 980hPa
TESTED BY	Moris Lin		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5745	-3.08	8	PASS
3	5785	-2.37	8	PASS
5	5825	-3.08	8	PASS

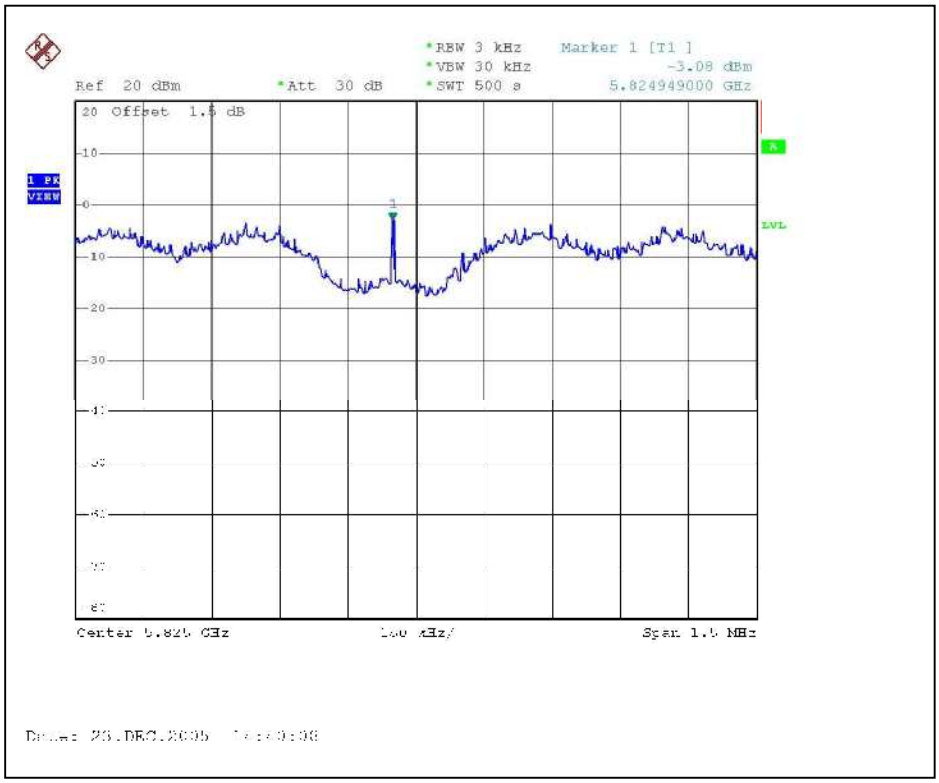
CH1


RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-3.08 dBm
5.745315000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
1 PK
VIEW
LVL
Center 5.795 GHz
Span 1.5 MHz

CH3


RBW 3 kHz
VBW 30 kHz
SWT 500 s
Marker 1 [T1]
-2.37 dBm
5.784949000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
1 PK
VIEW
LVL
Center 5.795 GHz
Span 1.5 MHz

CH5


*RBW 3 kHz
*VBW 30 kHz
*SWT 500 s
Marker 1 [T1]
-3.08 dBm
5.824949000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1.5 dB
1 PK
VIEW
LVL
Center 5.825 GHz
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	100036	Nov. 23, 2006

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2. 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

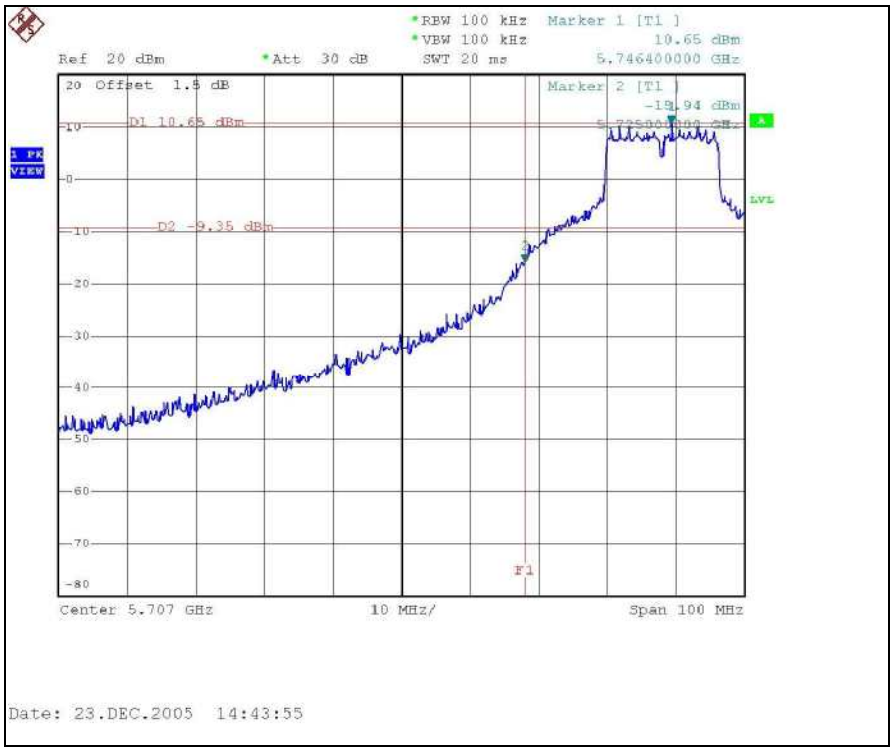
5.6.5 EUT OPERATING CONDITION

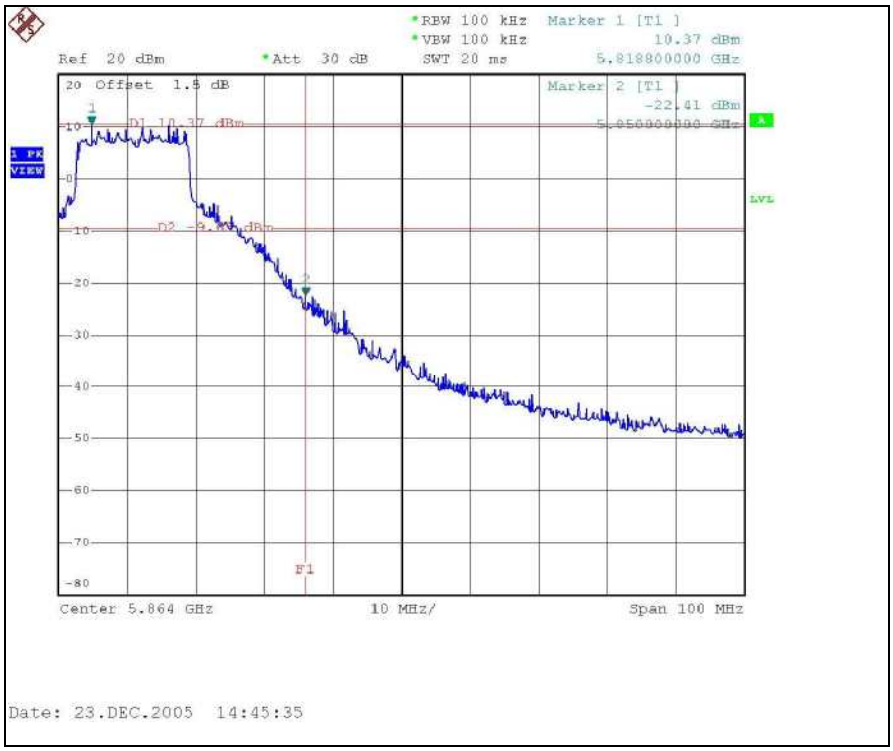
Same as Item 4.3.6

5.6.6 TEST RESULTS

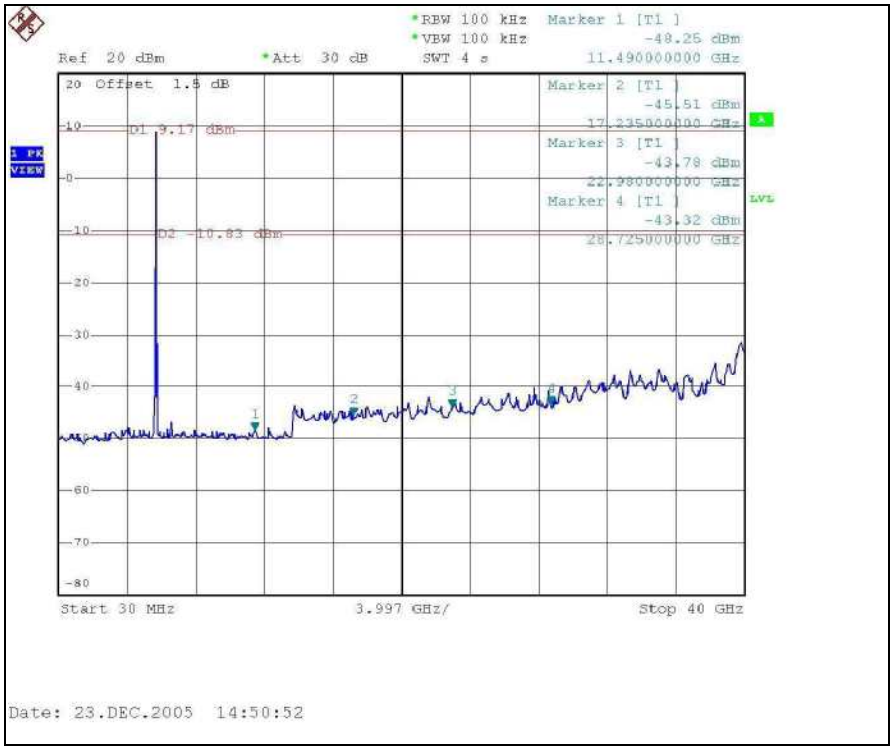
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

802.11a OFDM modulation

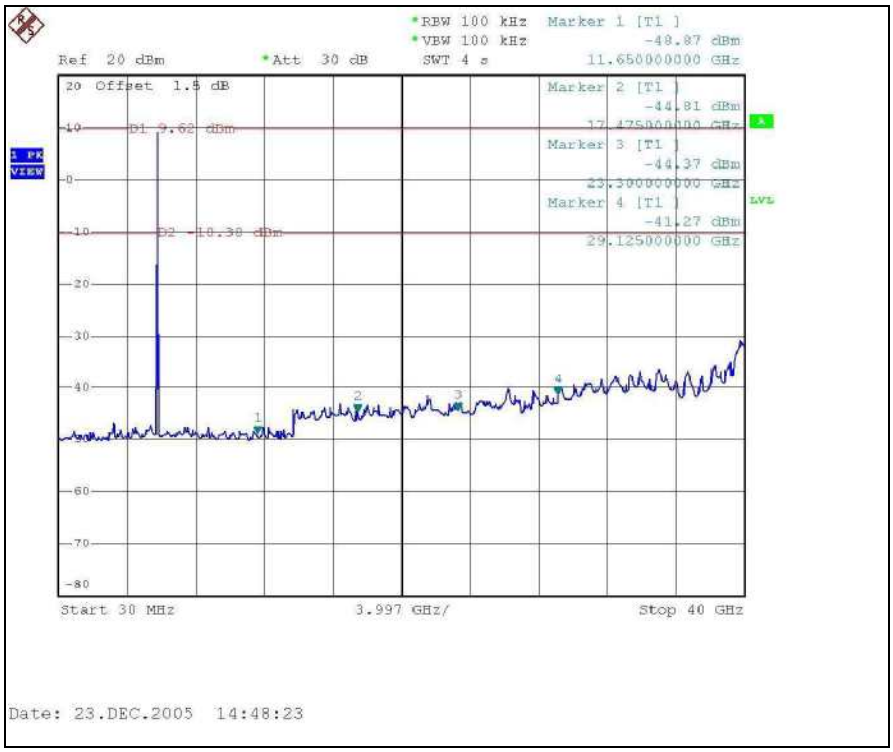




CH 1


RBW 100 kHz
VBW 100 kHz
SWT 4 s
Marker 1 [T1]
-48.25 dBm
11.490000000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
D1 9.17 dBm
D2 -10.83 dBm
Marker 2 [T1]
-45.51 dBm
17.235000000 GHz
Marker 3 [T1]
-43.78 dBm
22.980000000 GHz
Marker 4 [T1]
-43.32 dBm
28.725000000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 23.DEC.2005 14:50:52

CH 5


RBW 100 kHz
VBW 100 kHz
SWT 4 s
Marker 1 [T1]
-48.87 dBm
11.650000000 GHz
Ref 20 dBm
Att 30 dB
Offset 1.5 dB
D1 9.62 dBm
D2 -10.38 dBm
Marker 2 [T1]
-44.81 dBm
17.475000000 GHz
Marker 3 [T1]
-44.37 dBm
23.300000000 GHz
Marker 4 [T1]
-41.27 dBm
29.125000000 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 23.DEC.2005 14:48:23

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 are as following:

Model No.	Gain (dBi)	Antenna Type	Antenna Connector
FDS_2FED01+I3G	5 dBi	Dual Band Antenna, Dipole	MMCX

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: 886-2-26052943

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

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

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.