

FCC TEST REPORT (15.407)

REPORT NO.: RF950313L02

MODEL NO.: R1F

RECEIVED: Mar. 14, 2006

TESTED: Mar. 15 ~ Mar. 27, 2006

ISSUED: Mar. 28, 2006

APPLICANT: ASUSTeK COMPUTER INC.

ADDRESS: 4F. NO. 150, LI-TE RD., PEITOU, TAIPEI,
TAIWAN, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou
Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

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

This test report consists of 56 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, A2LA or any government agencies. The test results in the report only apply to the tested sample.



No. 2177-01



0528

Table of Contents

1.	CERTIFICATION	4
2.	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY	5
3.	GENERAL INFORMATION.....	6
3.1	GENERAL DESCRIPTION OF EUT	6
3.2	DESCRIPTION OF TEST MODES	7
3.2.1	CONFIGURATION OF SYSTEM UNDER TEST	8
3.2.2	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:	9
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS	11
3.4	DESCRIPTION OF SUPPORT UNITS	11
4.	TEST TYPES AND RESULTS	12
4.1	CONDUCTED EMISSION MEASUREMENT	12
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	12
4.1.2	TEST INSTRUMENTS.....	12
4.1.3	TEST PROCEDURES	13
4.1.4	DEVIATION FROM TEST STANDARD	13
4.1.5	TEST SETUP	14
4.1.6	EUT OPERATING CONDITIONS	14
4.1.7	TEST RESULTS	15
4.2	RADIATED EMISSION MEASUREMENT	17
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	17
4.2.2	LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS.....	18
4.2.3	TEST INSTRUMENTS.....	19
4.2.4	TEST PROCEDURES	20
4.2.5	DEVIATION FROM TEST STANDARD	20
4.2.6	TEST SETUP	21
4.2.7	EUT OPERATING CONDITION	21
4.2.8	TEST RESULTS	22
4.3	PEAK TRANSMIT POWER MEASUREMENT	27
4.3.1	LIMITS OF PEAK TRANSMIT POWER MEASUREMENT.....	27
4.3.2	TEST INSTRUMENTS.....	27
4.3.3	TEST PROCEDURE.....	28
4.3.4	DEVIATION FROM TEST STANDARD	28
4.3.5	TEST SETUP	28
4.3.6	EUT OPERATING CONDITIONS	28
4.3.7	TEST RESULTS	29
4.4	PEAK POWER EXCURSION MEASUREMENT	34
4.4.1	LIMITS OF PEAK POWER EXCURSION MEASUREMENT.....	34
4.4.2	TEST INSTRUMENTS.....	34
4.4.3	TEST PROCEDURE.....	35
4.4.4	DEVIATION FROM TEST STANDARD	35

4.4.5	TEST SETUP	35
4.4.6	EUT OPERATING CONDITIONS	35
4.4.7	TEST RESULTS	36
4.5	PEAK POWER SPECTRAL DENSITY MEASUREMENT	39
4.5.1	LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	39
4.5.2	TEST INSTRUMENTS.....	39
4.5.3	TEST PROCEDURES	40
4.5.4	DEVIATION FROM TEST STANDARD	40
4.5.5	TEST SETUP	40
4.5.6	EUT OPERATING CONDITIONS	40
4.5.7	TEST RESULTS	41
4.6	FREQUENCY STABILITY	44
4.6.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT	44
4.6.2	TEST INSTRUMENTS.....	44
4.6.3	TEST PROCEDURE.....	44
4.6.4	DEVIATION FROM TEST STANDARD	44
4.6.5	TEST SETUP	45
4.6.6	EUT OPERATING CONDITION	45
4.6.7	TEST RESULTS	46
4.7	BAND EDGES MEASUREMENT	47
4.7.1	TEST INSTRUMENTS.....	47
4.7.2	TEST PROCEDURE.....	47
4.7.3	EUT OPERATING CONDITION	47
4.7.4	TEST RESULTS	47
4.8	ANTENNA REQUIREMENT	52
4.8.1	STANDARD APPLICABLE	52
4.8.2	ANTENNA CONNECTED CONSTRUCTION	52
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	53
6.	INFORMATION ON THE TESTING LABORATORIES	55
APPENDIX-A		A-1

1. CERTIFICATION

PRODUCT: Notebook

MODEL: R1F

BRAND: ASUS

APPLICANT: ASUSTeK COMPUTER INC.

TEST SAMPLE: ENGINEERING SAMPLE

TESTED: Mar. 15 ~ Mar. 27, 2006

STANDARDS: FCC Part 15, Subpart E (Section 15.407)
ANSI C63.4-2003

The above equipment has been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Andrea Hsia , **DATE:** Mar. 28, 2006
Andrea Hsia

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Mar. 28, 2006
Responsible for RF Long Chen

APPROVED BY : Gary Chang , **DATE:** Mar. 28, 2006
Gary Chang / Supervisor

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart E (Section 15.407)			
Standard Section	Test Type	Result	Remark
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -16.56dB at 0.203MHz
15.407(b)(1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -3.65dB at 11480.00MHz
15.407(a)(1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.55 dB
	200MHz ~ 1000MHz	3.58 dB
	1GHz ~ 18GHz	1.10 dB
	18GHz ~ 40GHz	0.91 dB

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

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Notebook PC
MODEL NO.	R1F
FCC ID	MSQR1F
POWER SUPPLY	19.0Vdc from AC Adapter
MODULATION TYPE	Wireless LAN: CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM Bluetooth: GFSK, $\pi/4$ -DQPSK, 8DPSK
MODULATION TECHNOLOGY	DSSS, OFDM, FHSS
TRANSFER RATE	Wireless LAN: 802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11a: 54/48/36/24/18/12/9/6Mbps Bluetooth: 1/2/3Mbps
FREQUENCY RANGE	Wireless LAN: 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.180 ~ 5.320GHz, 5.745 ~ 5.825GHz Bluetooth: 2.402 ~ 2.480GHz
NUMBER OF CHANNEL	Wireless LAN: 802.11b & 802.11g: 11 802.11a: 13 Bluetooth: 79
CHANNEL SPACING	Wireless LAN: 802.11b & 802.11g: 5MHz 802.11a: 20MHz Bluetooth: 1MHz
OUTPUT POWER	Wireless LAN: 50.350mW for 802.11b 40.179mW for 802.11g 32.063mW for 5.180 ~ 5.320GHz 39.902mW for 5.745 ~ 5.825GHz Bluetooth: 1.774mW
ANTENNA TYPE	Refer to Note 3 as below
DATA CABLE	NA
I/O PORTS	Refer to user's manual

NOTE:

1. The EUT is a Notebook PC with wireless LAN and bluetooth functions.
2. The adapter were operated with following power adapters:

For 2 pin power adapter

BRAND:	Delta Electronic Inc.
MODEL:	SADP-65KB A
INPUT:	100-240Vac, 50-60Hz, 1.5A
OUTPUT:	19Vdc, 3.42A
POWER LINE:	AC 1.8m non-shielded cable without core DC 2.0m shielded cable with one core

For 3 pin power adapter

BRAND:	Delta Electronic Inc.
MODEL:	SADP-65KB B
INPUT:	100-240Vac, 50-60Hz, 1.5A
OUTPUT:	19Vdc, 3.42A
POWER LINE:	AC 1.8m non-shielded cable without core DC 2.0m shielded cable with one core

* Two of those adapters are only different to pin type so only adapter: SADP-65KB B was for final test and presented in the test report.

3. The following antennas were provided to the EUT.

FOR WLAN FUNCTION				
ITEM	MODEL NAME	ANTENNA TYPE	MAXIMUM GAIN (dBi)	
			2.40GHz	5.0GHz
1	CAN4313 537 012501B	PIFA	-0.24	0.04
2	81.EE615.004	PIFA	-1.68	-1.37
FOR BLUETOOTH FUNCTION				
ITEM	MODEL NAME	ANTENNA TYPE	MAXIMUM GAIN (dBi)	
1	BT-183	Chip	2.00	

*After pre-testing each antenna, highest one was chosen for the final test and recorded in the report.

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

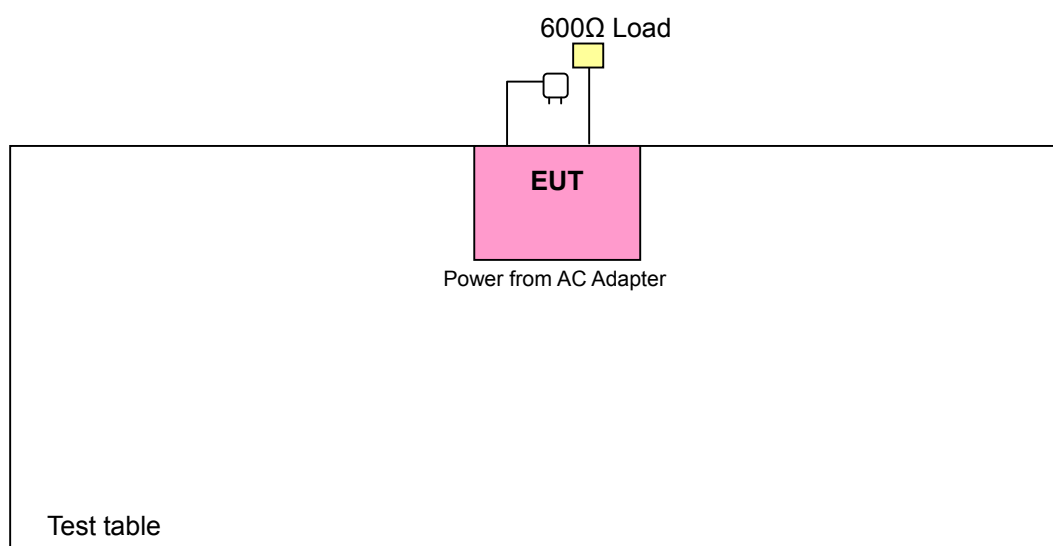
Operated in 5180 ~ 5320MHz

8 channels are provided to this EUT.

CHANNEL	FREQUENCY
---------	-----------

1	5180 MHz
2	5200 MHz
3	5220 MHz
4	5240 MHz
5	5260 MHz
6	5280 MHz
7	5300 MHz
8	5320 MHz

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

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

Where **PLC**: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

RE≥1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

NOTE: “-” means no effect.

Power Line Conducted Emission Test:

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

Mode	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 8	5	OFDM	BPSK	6

Radiated Emission Test (Below 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 8	5	OFDM	BPSK	6

Radiated Emission Test (Above 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 8	1, 4, 5, 8	OFDM	BPSK	6

Bandedge Measurement:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	1 to 8	1, 8	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)
802.11a	1 to 8	1, 4, 5, 8	OFDM	BPSK	6

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart E (15.407)

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	600Ω Load	NA	NA	NA	NA

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

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

4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 11, 2006
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 06, 2007
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Feb. 15, 2007
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Feb. 07, 2007
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-2040.

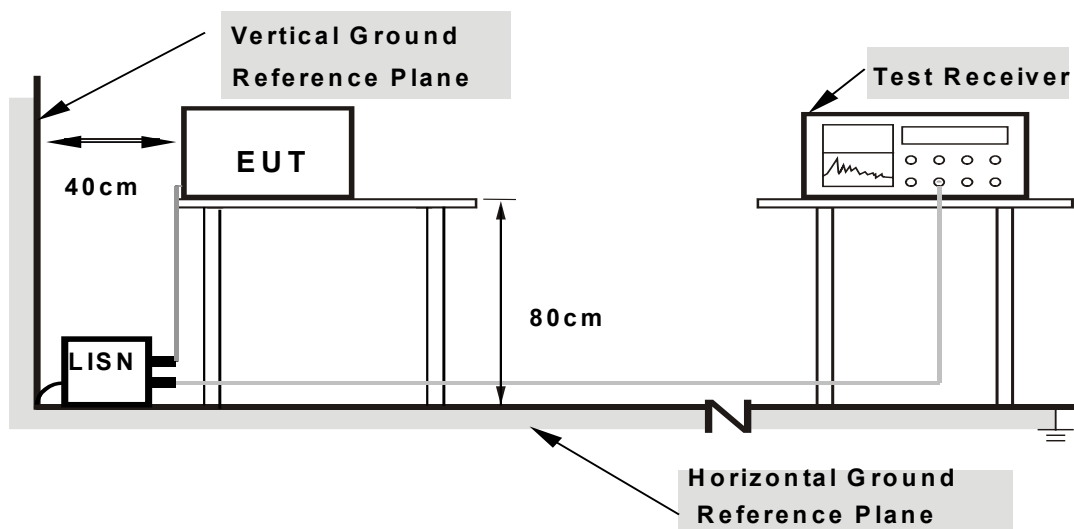
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. The EUT ran a test program (provided by manufacturer) to enable all functions under transmission condition continuously at specific channel frequency.
- c. The EUT sent "H" messages to monitor.
- d. Step c was repeated.

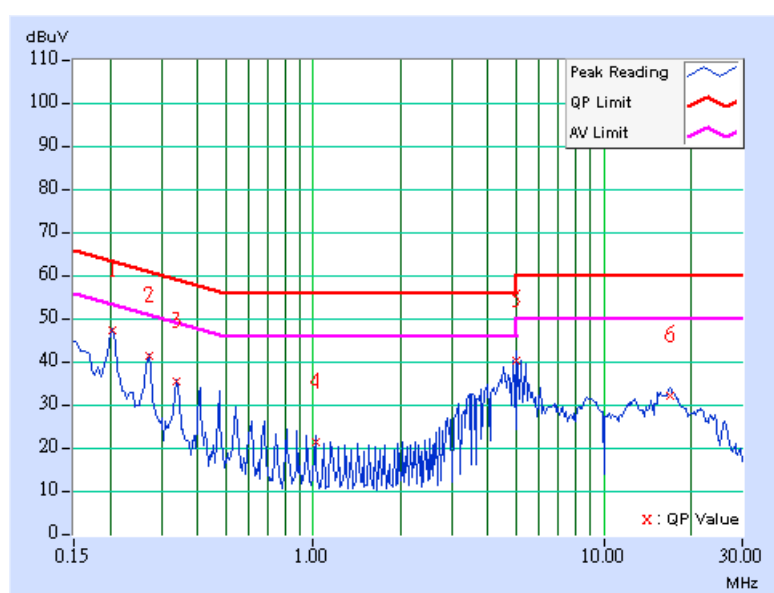
4.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 73%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Jacky Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.203	0.10	46.82	-	46.92	-	63.48	53.48	-16.56	-
2	0.271	0.10	40.90	-	41.00	-	61.08	51.08	-20.08	-
3	0.340	0.10	34.76	-	34.86	-	59.20	49.20	-24.34	-
4	1.017	0.20	20.65	-	20.85	-	56.00	46.00	-35.15	-
5	5.012	0.47	39.79	-	40.26	-	60.00	50.00	-19.74	-
6	16.937	0.71	31.35	-	32.06	-	60.00	50.00	-27.94	-

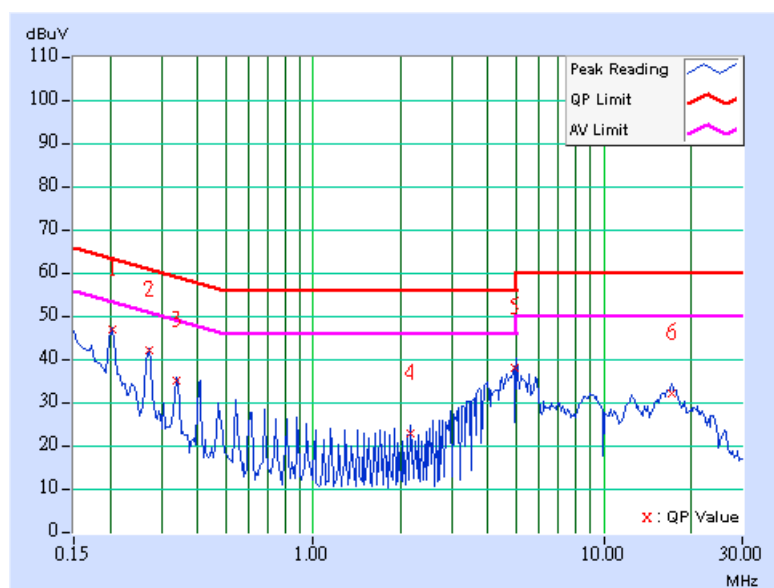
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Jacky Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.203	0.10	46.46	-	46.56	-	63.50	53.50	-16.94	-
2	0.271	0.10	41.60	-	41.70	-	61.08	51.08	-19.38	-
3	0.340	0.10	34.64	-	34.74	-	59.20	49.20	-24.46	-
4	2.169	0.21	22.53	-	22.74	-	56.00	46.00	-33.26	-
5	4.947	0.38	37.43	-	37.81	-	56.00	46.00	-18.19	-
6	17.073	0.57	31.71	-	32.28	-	60.00	50.00	-27.72	-

- 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 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dBμV/m) *note 3
5150~5250	-27	68.3
5250~5350	-27	68.3
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$

4.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	100033	May. 19, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100025	Dec. 05, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Jun. 01, 2006
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 08, 2007
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 19, 2007
Preamplifier Agilent	8447D	2944A10633	Nov. 04, 2006
Preamplifier Agilent	8449B	3008A01964	Oct. 30, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214377/4	Dec. 13, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	219272/4	Dec. 13, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA
26GHz ~ 40GHz Amplifier	AMF-6F-2600400	900619	Nov. 13, 2006

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 2.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The VCCI Site Registration No. is R-237.
5. The IC Site Registration No. is IC4924-3.

4.2.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 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.

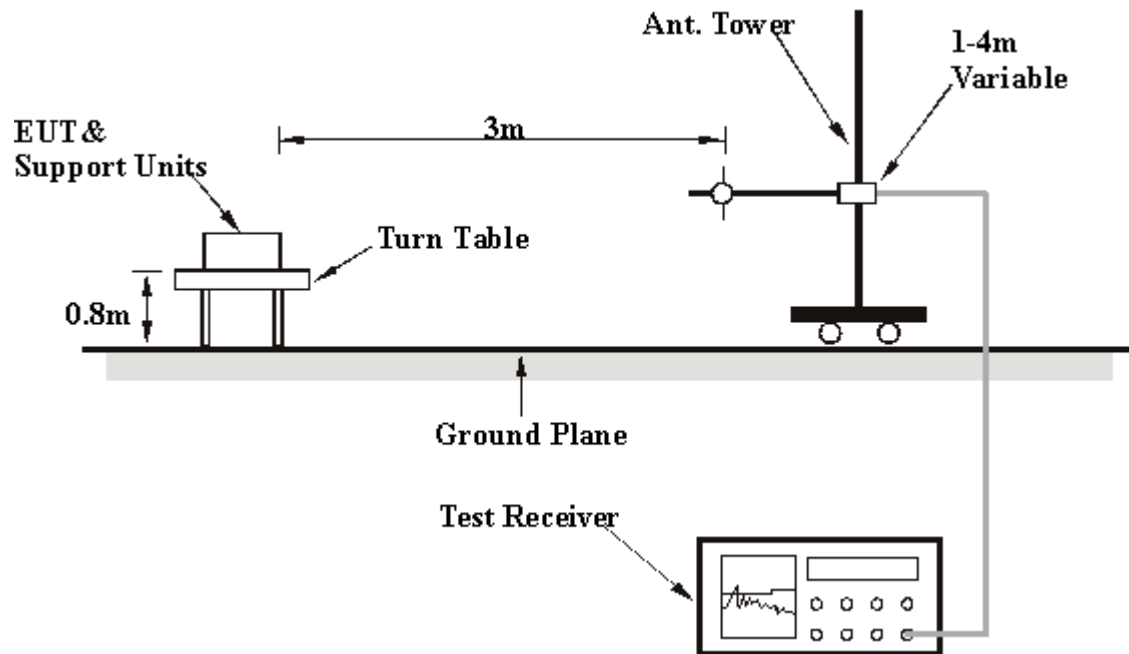
NOTE:

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 1kHz for Average detection (AV) at frequency above 1GHz.

4.2.5 DEVIATION FROM TEST STANDARD

No deviation

4.2.6 TEST SETUP



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

4.2.7 EUT OPERATING CONDITION

Same as 4.1.6

4.2.8 TEST RESULTS

Below 1GHz Worst-Case Data

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	FREQUENCY RANGE	Below 1000MHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Quasi-Peak
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 62%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	166.07	28.26 QP	43.50	-15.24	1.25 H	325	15.43	12.83
2	249.66	30.50 QP	46.00	-15.50	1.00 H	172	18.07	12.43
3	430.44	30.70 QP	46.00	-15.30	1.50 H	325	12.35	18.35
4	667.60	30.79 QP	46.00	-15.21	1.00 H	241	7.31	23.48
5	696.75	34.34 QP	46.00	-11.66	1.00 H	130	10.27	24.07
6	955.29	34.54 QP	46.00	-11.46	1.00 H	94	4.86	29.67

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	166.07	28.63 QP	43.50	-14.87	1.00 V	328	15.80	12.83
2	432.38	36.12 QP	46.00	-9.88	1.00 V	85	17.74	18.38
3	500.42	29.37 QP	46.00	-16.63	1.50 V	343	9.42	19.95
4	599.56	31.60 QP	46.00	-14.40	1.00 V	343	9.07	22.54
5	632.61	29.31 QP	46.00	-16.69	1.50 V	343	6.39	22.92
6	953.35	33.29 QP	46.00	-12.71	1.00 V	217	3.57	29.72

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

802.11a OFDM modulation

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	52.77 PK	74.00	-21.23	1.41 H	11	14.95	37.82
1	#5150.00	43.77 AV	54.00	-10.23	1.41 H	11	5.95	37.82
2	*5180.00	102.85 PK			1.41 H	11	64.98	37.87
2	*5180.00	93.77 AV			1.41 H	11	55.90	37.87
3	10360.00	62.03 PK	68.30	-6.27	1.22 H	328	12.96	49.07

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	#5150.00	52.25 PK	74.00	-21.75	1.03 V	318	14.43	37.82
1	#5150.00	43.19 AV	54.00	-10.81	1.03 V	318	5.37	37.82
2	*5180.00	102.26 PK			1.03 V	318	64.39	37.87
2	*5180.00	93.19 AV			1.03 V	318	55.32	37.87
3	10360.00	62.55 PK	68.30	-5.75	1.02 V	309	13.48	49.07

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	102.81 PK			1.39 H	9	64.80	38.01
1	*5240.00	93.72 AV			1.39 H	9	55.71	38.01
2	#11480.00	62.15 PK	74.00	-11.85	1.18 H	335	12.12	50.03
2	#11480.00	49.62 AV	54.00	-4.38	1.18 H	335	-0.41	50.03

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	102.29 PK			1.05 V	322	64.28	38.01
1	*5240.00	93.21 AV			1.05 V	322	55.20	38.01
2	#11480.00	62.66 PK	74.00	-11.34	1.11 V	325	12.63	50.03
2	#11480.00	50.35 AV	54.00	-3.65	1.11 V	325	0.32	50.03

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5260.00	102.78 PK			1.33 H	7	64.71	38.07
1	*5260.00	93.69 AV			1.33 H	7	55.62	38.07
2	#11520.00	62.05 PK	74.00	-11.95	1.12 H	325	12.08	49.97
2	#11520.00	49.57 AV	54.00	-4.43	1.12 H	325	-0.40	49.97

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5260.00	102.19 PK			1.02 V	315	64.12	38.07
1	*5260.00	93.09 AV			1.02 V	315	55.02	38.07
2	#11520.00	62.58 PK	74.00	-11.42	1.05 V	328	12.61	49.97
2	#11520.00	50.28 AV	54.00	-3.72	1.05 V	328	0.31	49.97

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 8	FREQUENCY RANGE	1 ~ 40 GHz
MODULATION TYPE	BPSK	DETECTOR FUNCTION	Peak(PK) Average (AV)
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	25deg. C, 68%RH, 991hPa
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Morgan Chen

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	102.79 PK			1.45 H	5	64.57	38.22
1	*5320.00	93.70 AV			1.45 H	5	55.48	38.22
2	#5350.00	52.65 PK	74.00	-21.35	1.45 H	5	14.37	38.28
2	#5350.00	43.58 AV	54.00	-10.42	1.45 H	5	5.30	38.28
3	#10640.00	62.02 PK	74.00	-11.98	1.15 H	325	12.51	49.51
3	#10640.00	49.42 AV	54.00	-4.58	1.15 H	325	-0.09	49.51

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	*5320.00	102.02 PK			1.05 V	324	63.80	38.22
1	*5320.00	93.01 AV			1.05 V	324	54.79	38.22
2	#5350.00	52.12 PK	74.00	-21.88	1.05 V	324	13.84	38.28
2	#5350.00	43.08 AV	54.00	-10.92	1.05 V	324	4.80	38.28
3	#10640.00	62.53 PK	74.00	-11.47	1.04 V	332	13.02	49.51
3	#10640.00	50.15 AV	54.00	-3.85	1.04 V	332	0.64	49.51

- 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.

4.3 PEAK TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 ~ 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 ~ 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

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

4.3.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 3MHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

NOTE:

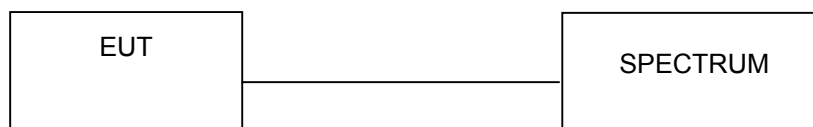
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

The transmitter output operates continuously therefore Method # 1 is used.

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 specific channel frequencies individually.

4.3.7 TEST RESULTS

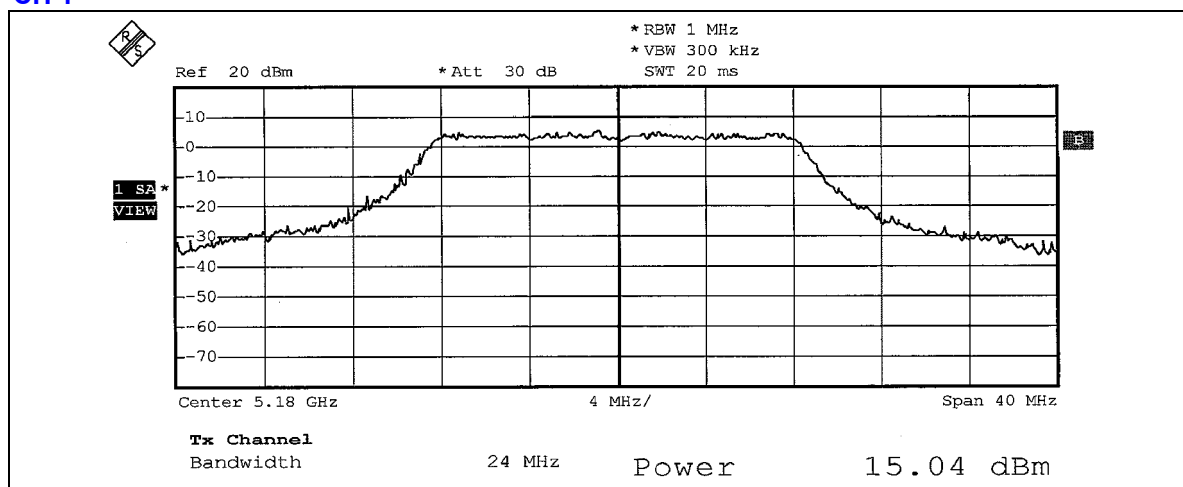
802.11a OFDM modulation

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 68%RH, 991hPa
TESTED BY	Morgan Chen		

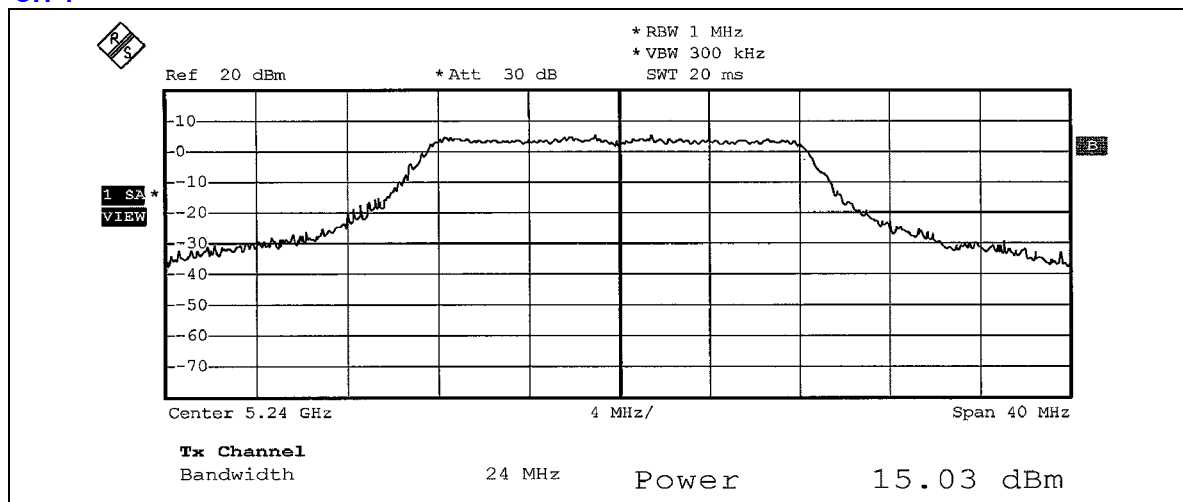
CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	31.915	15.04	17.00	23.44	PASS
4	5240	31.842	15.03	17.00	23.28	PASS
5	5260	32.063	15.06	24.00	23.28	PASS
8	5320	31.696	15.01	24.00	23.36	PASS

NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

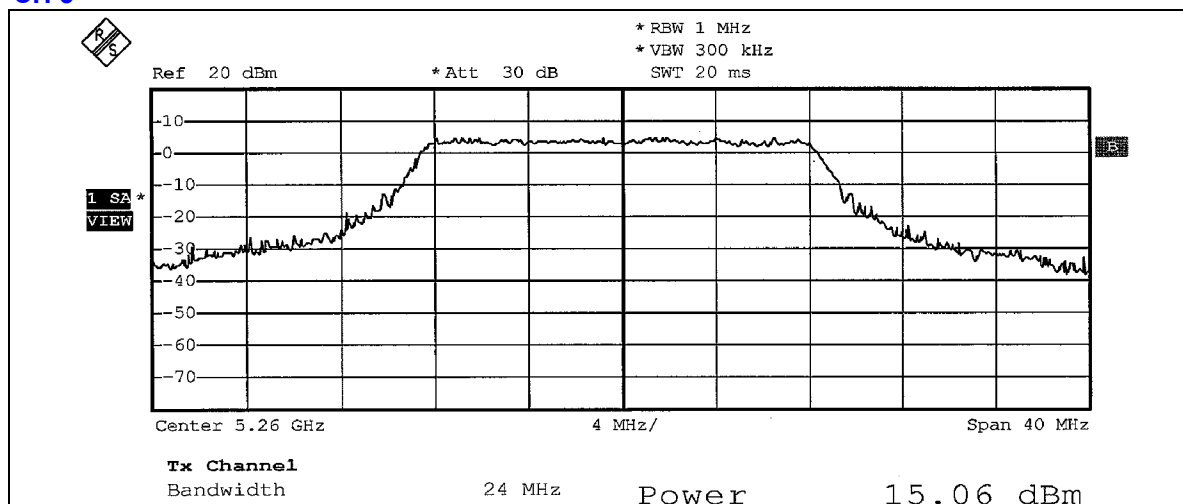
Peak Power Output: CH 1



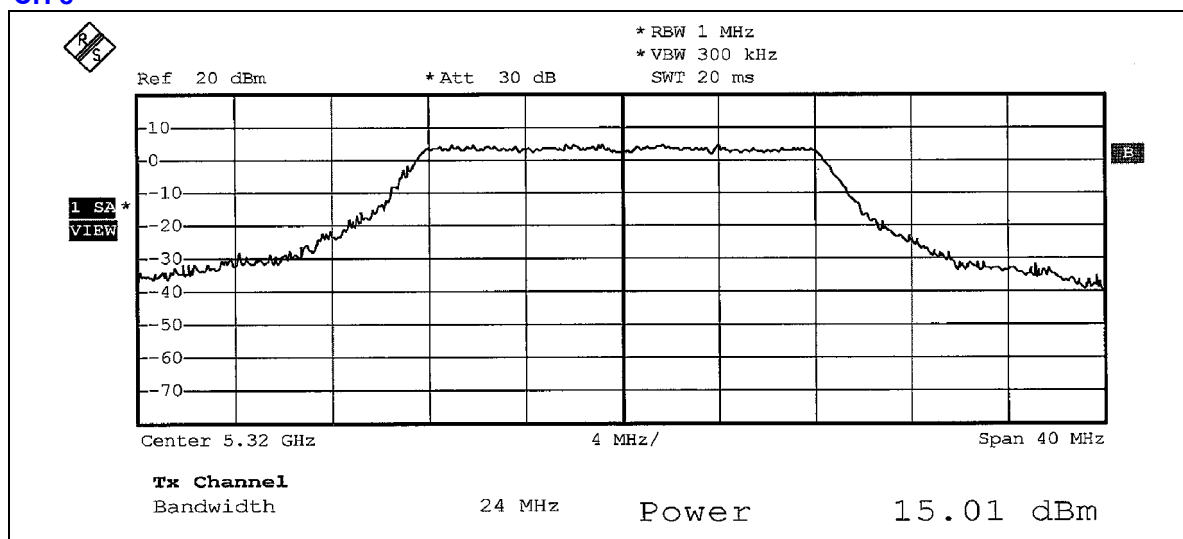
CH 4



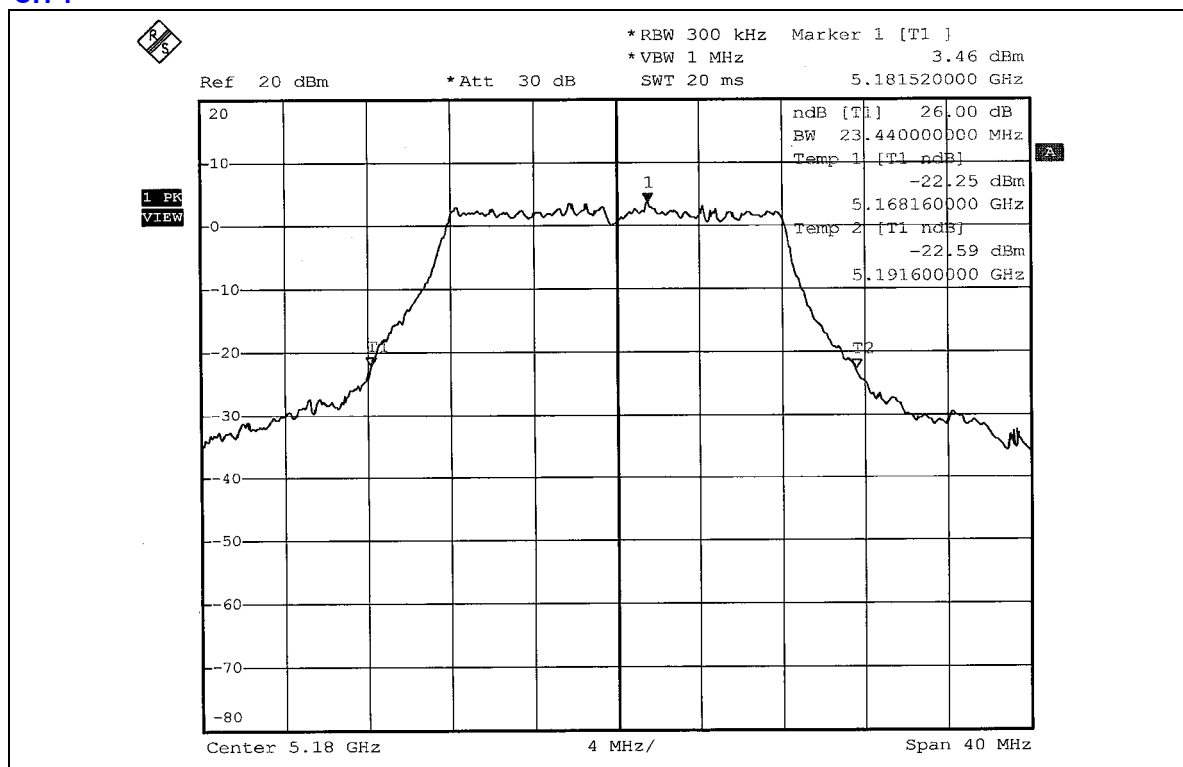
CH 5



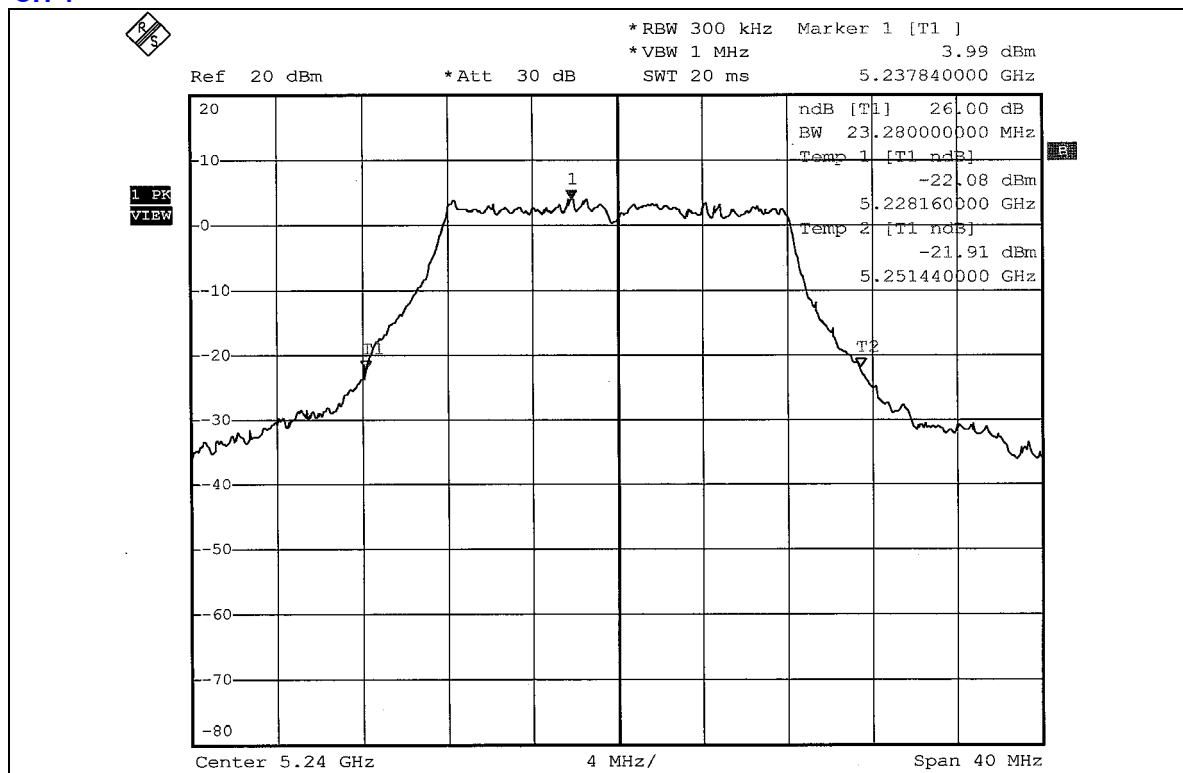
CH 8



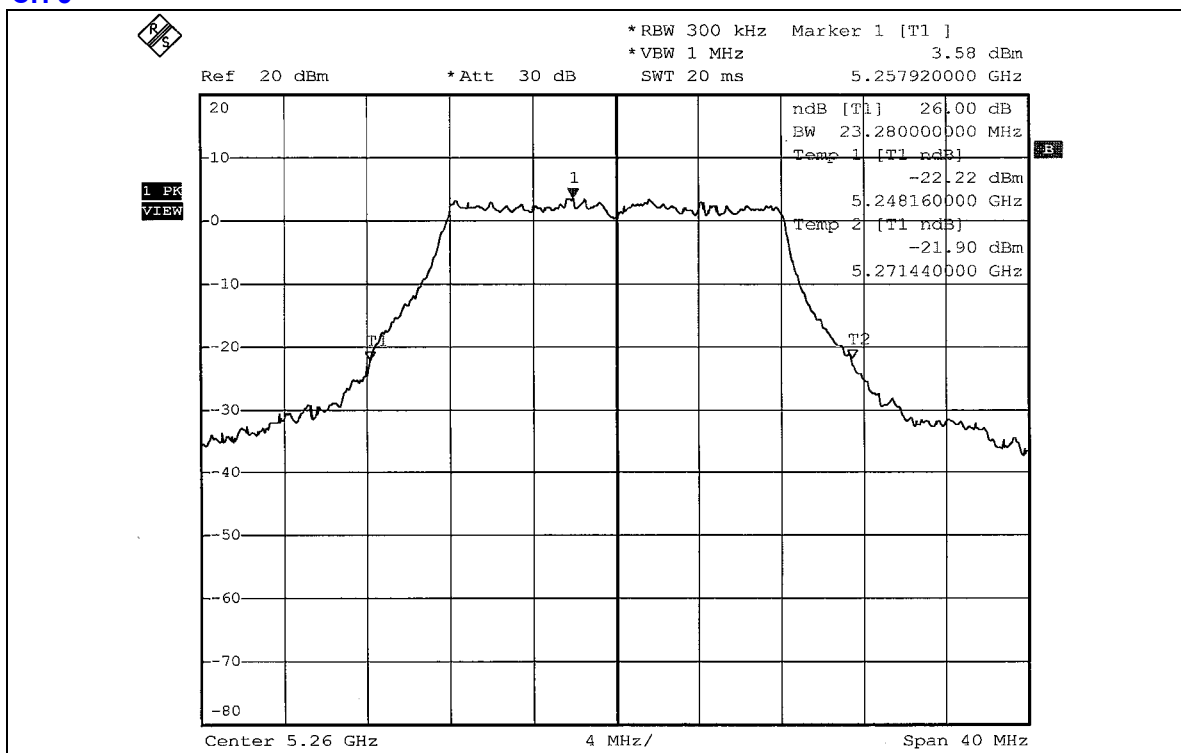
26dB Occupied Bandwidth: CH 1



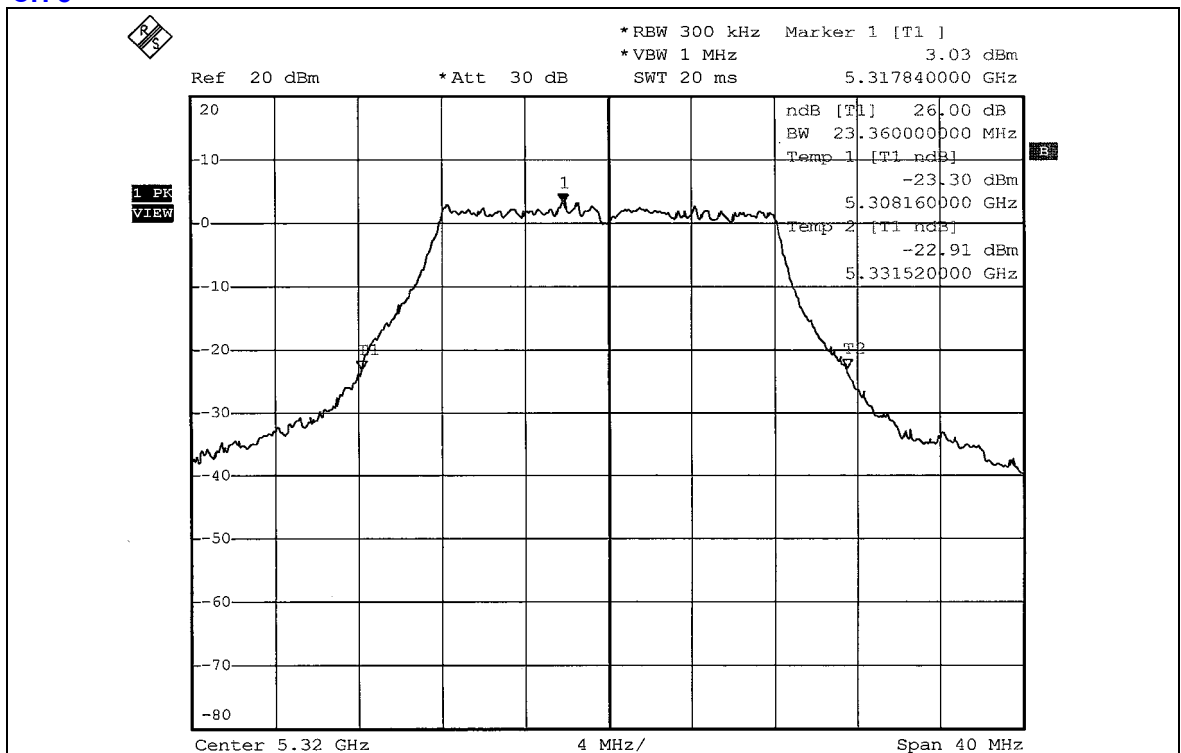
CH 4



CH 5



CH 8



4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25 GHz	13dB
5.25 ~ 5.35 GHz	13dB
5.725 ~ 5.825 GHz	13dB

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

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 PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum bandwidth span to view the entire spectrum.
3. Using peak detector and Max-hold function for Trace 1 (RB=1MHz, VB=3MHz) and 2 (RB=1MHz, VB=300kHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

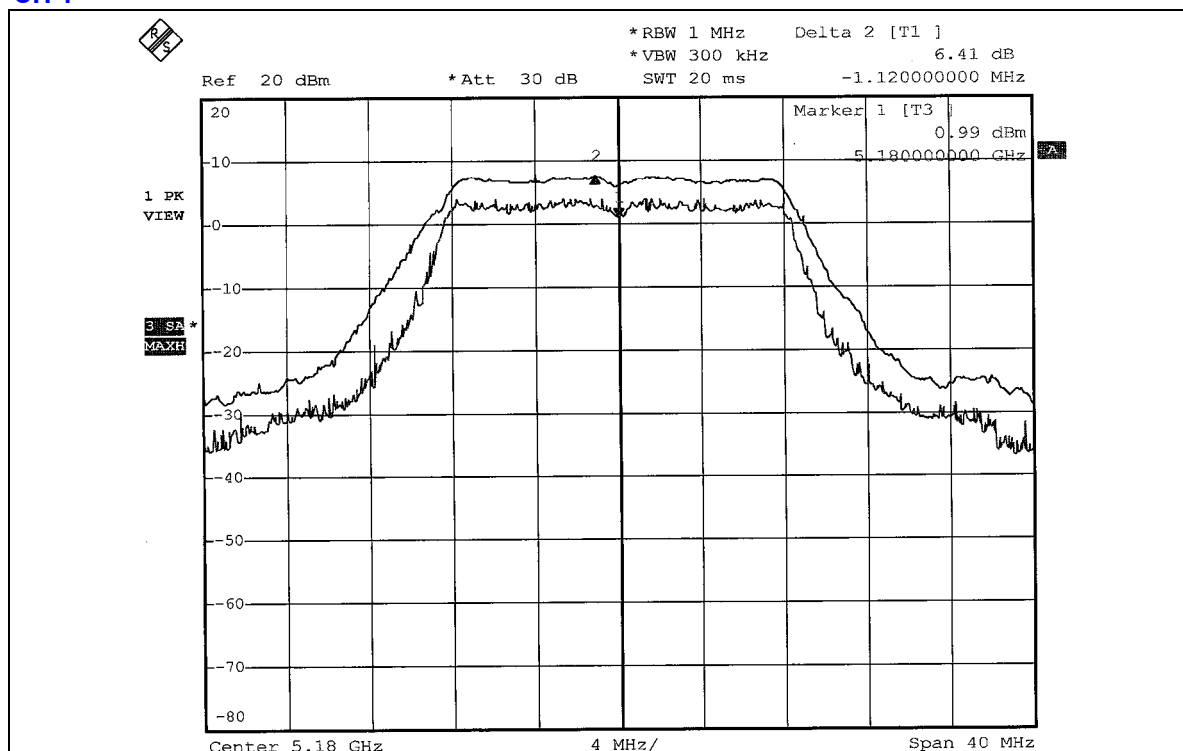
4.4.7 TEST RESULTS

802.11a OFDM modulation

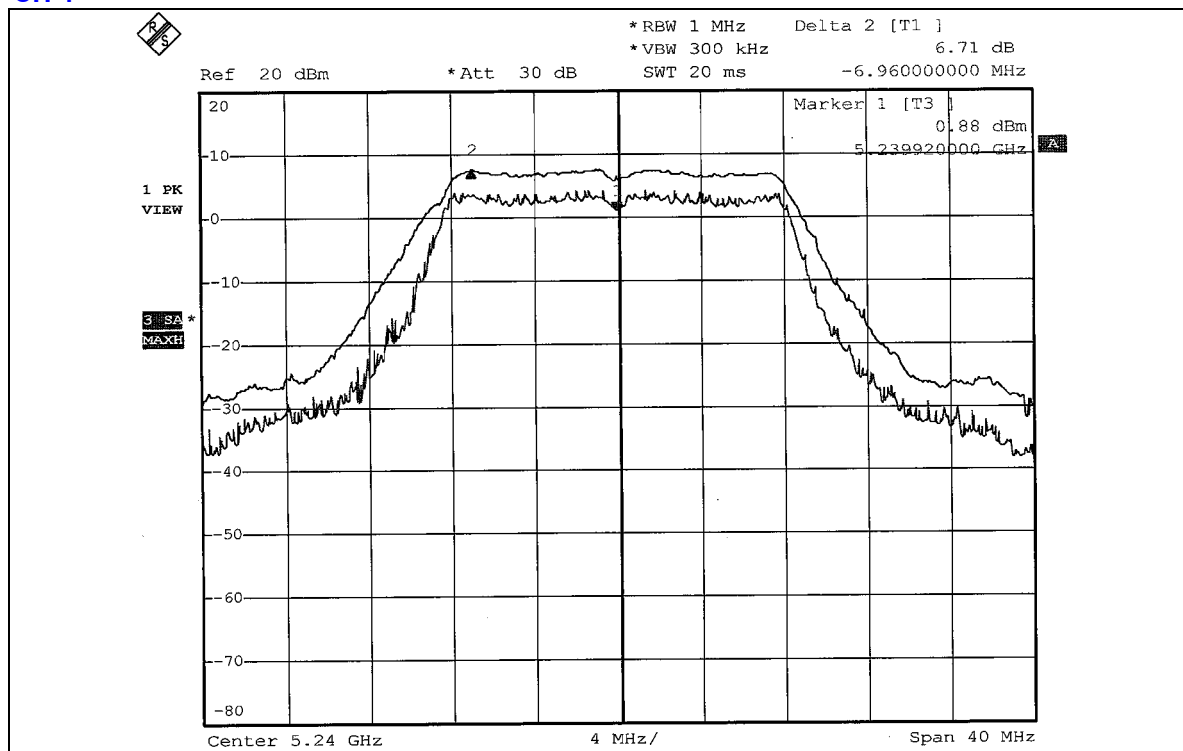
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 68%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.41	13	PASS
4	5240	6.71	13	PASS
5	5260	6.25	13	PASS
8	5320	5.70	13	PASS

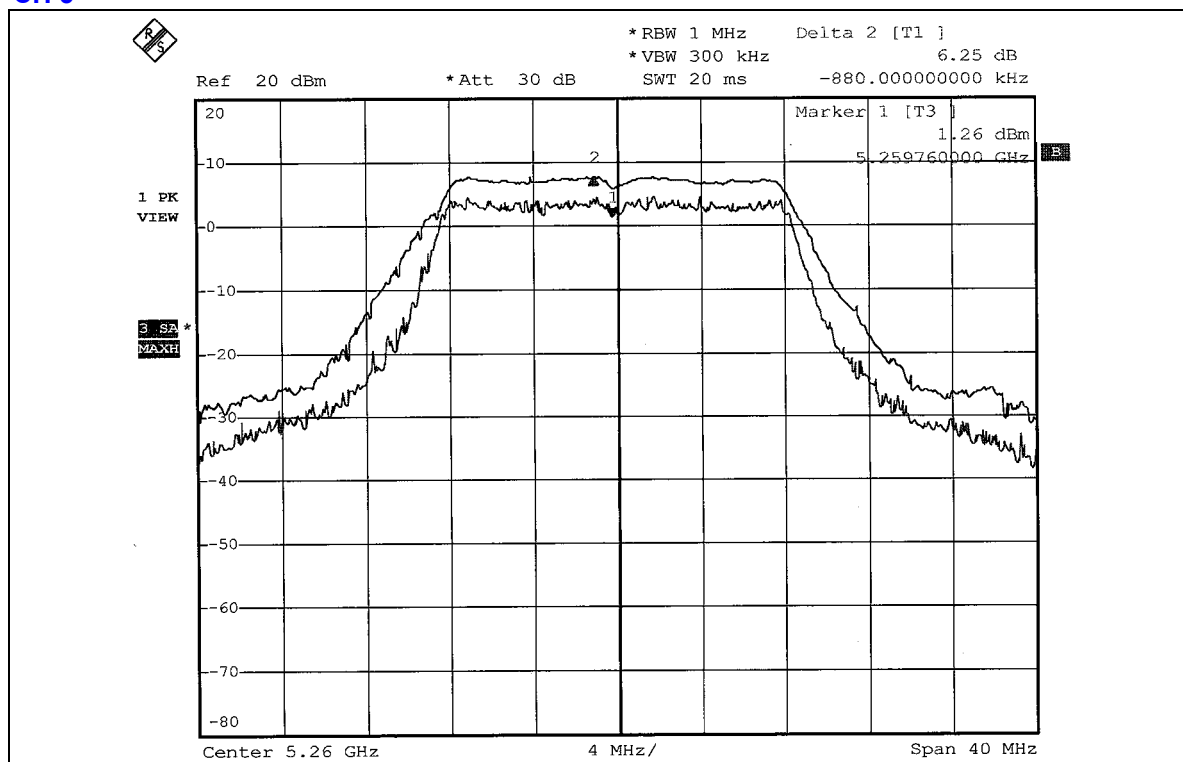
CH 1



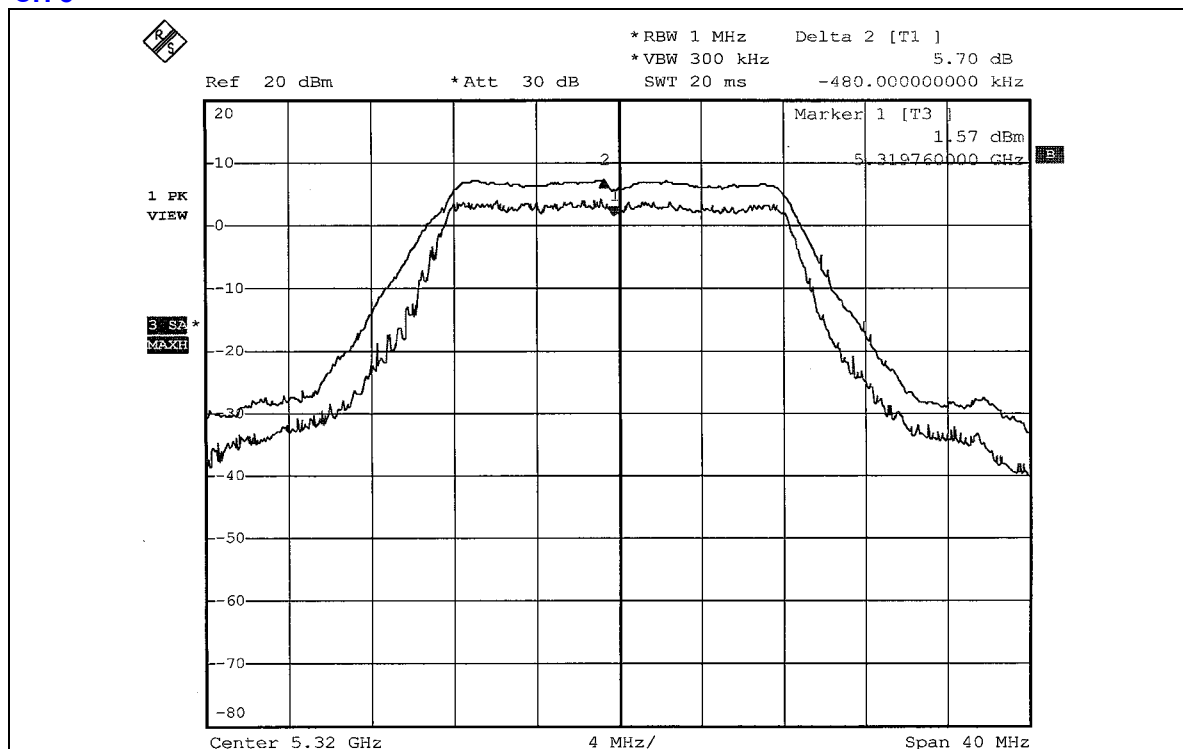
CH 4



CH 5



CH 8



4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25GHz	4dBm
5.25 ~ 5.35GHz	11dBm
5.725 ~ 5.825GHz	17dBm

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

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

4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer.
2. Set RBW=1MHz, VBW=3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as 5.3.6

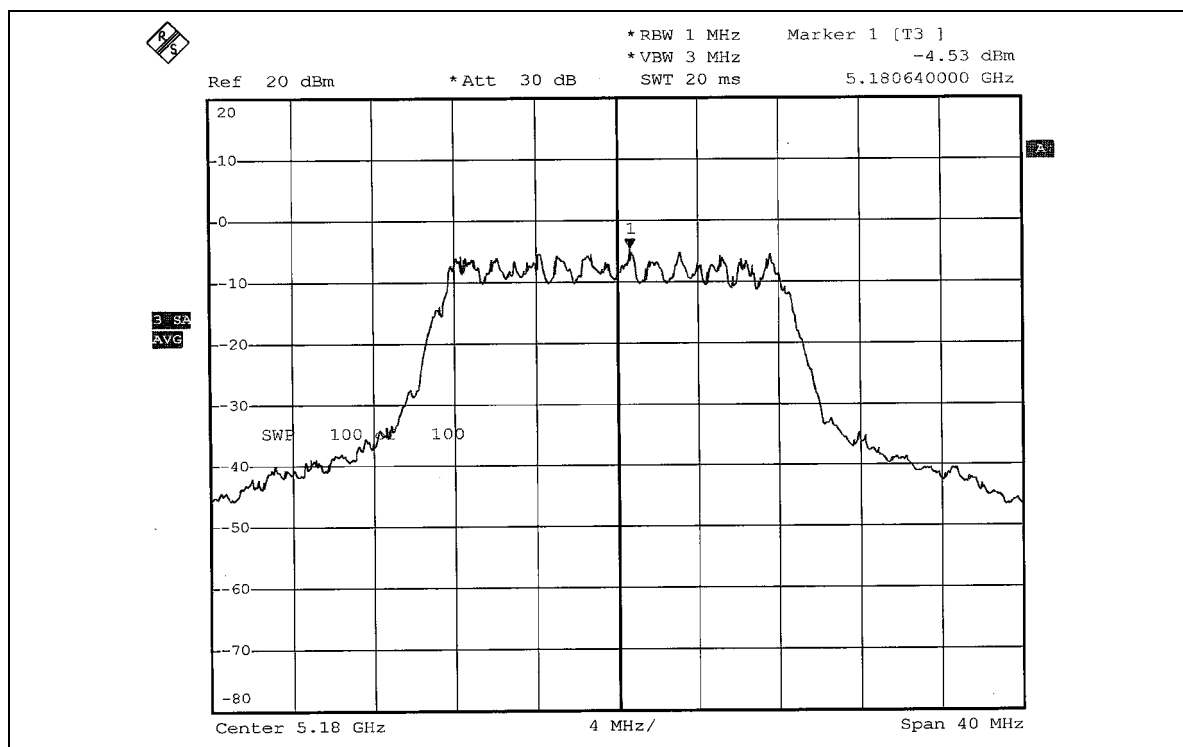
4.5.7 TEST RESULTS

802.11a OFDM modulation

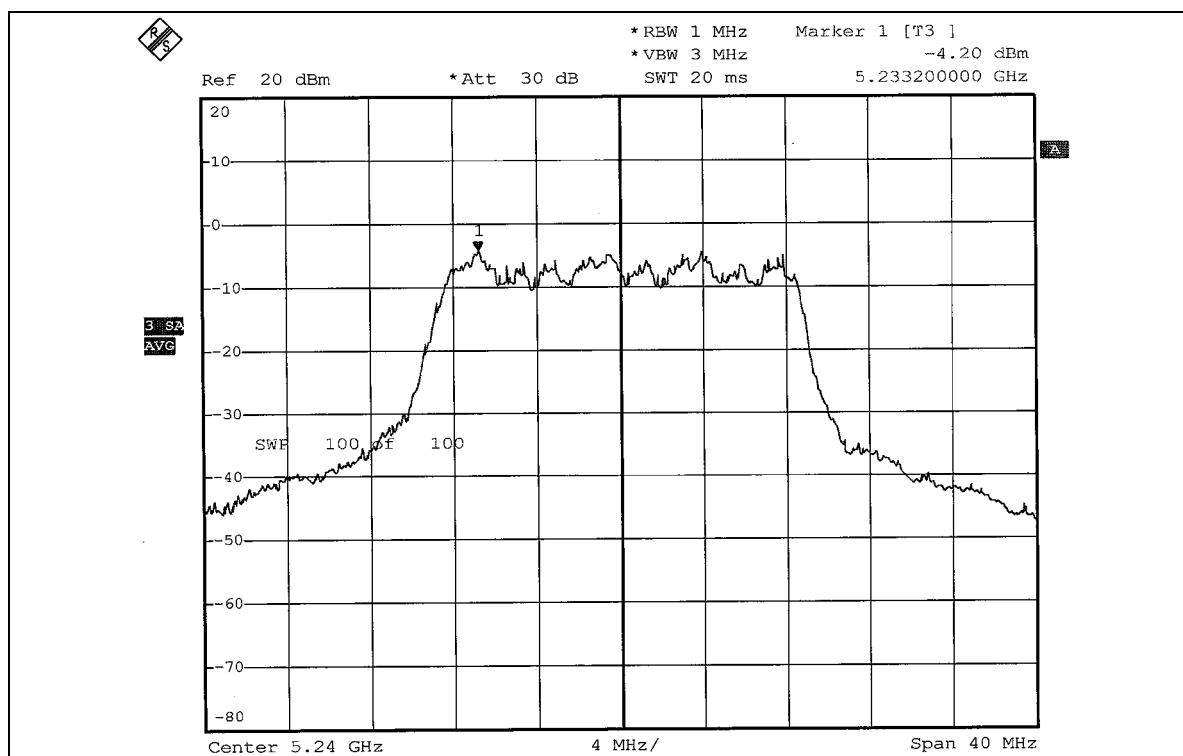
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 68%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-4.53	4	PASS
4	5240	-4.20	4	PASS
5	5260	-4.51	11	PASS
8	5320	-4.40	11	PASS

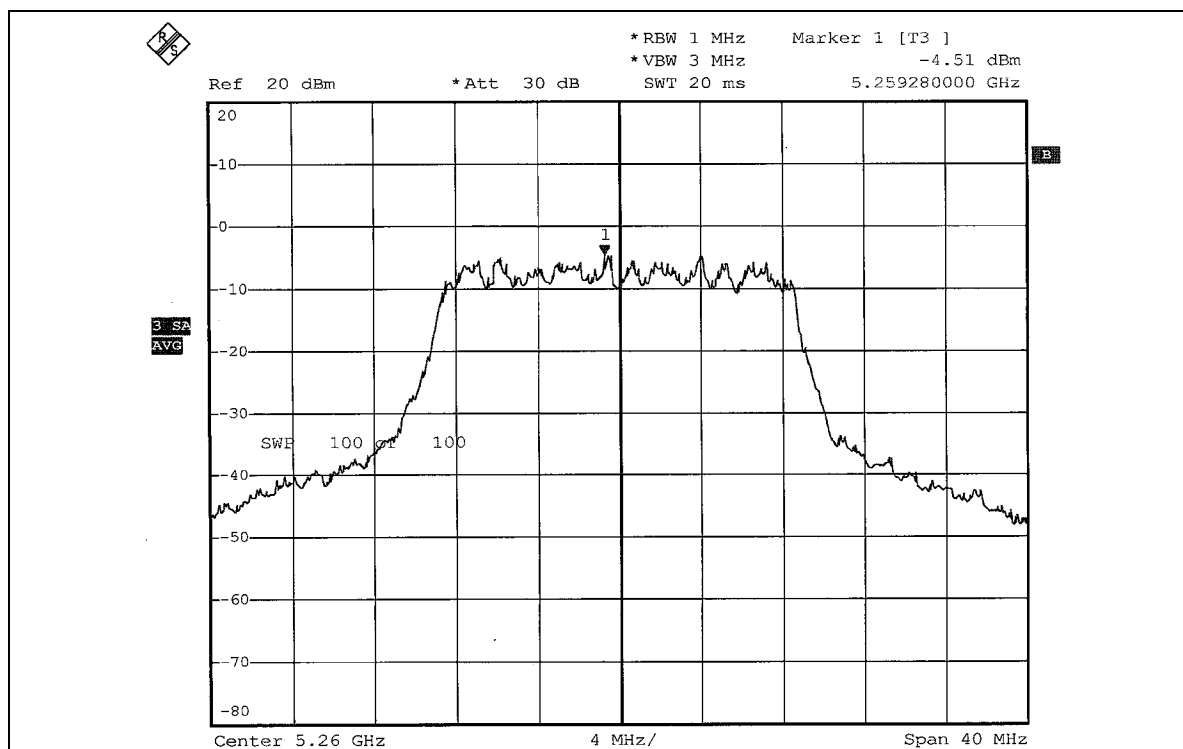
CH 1



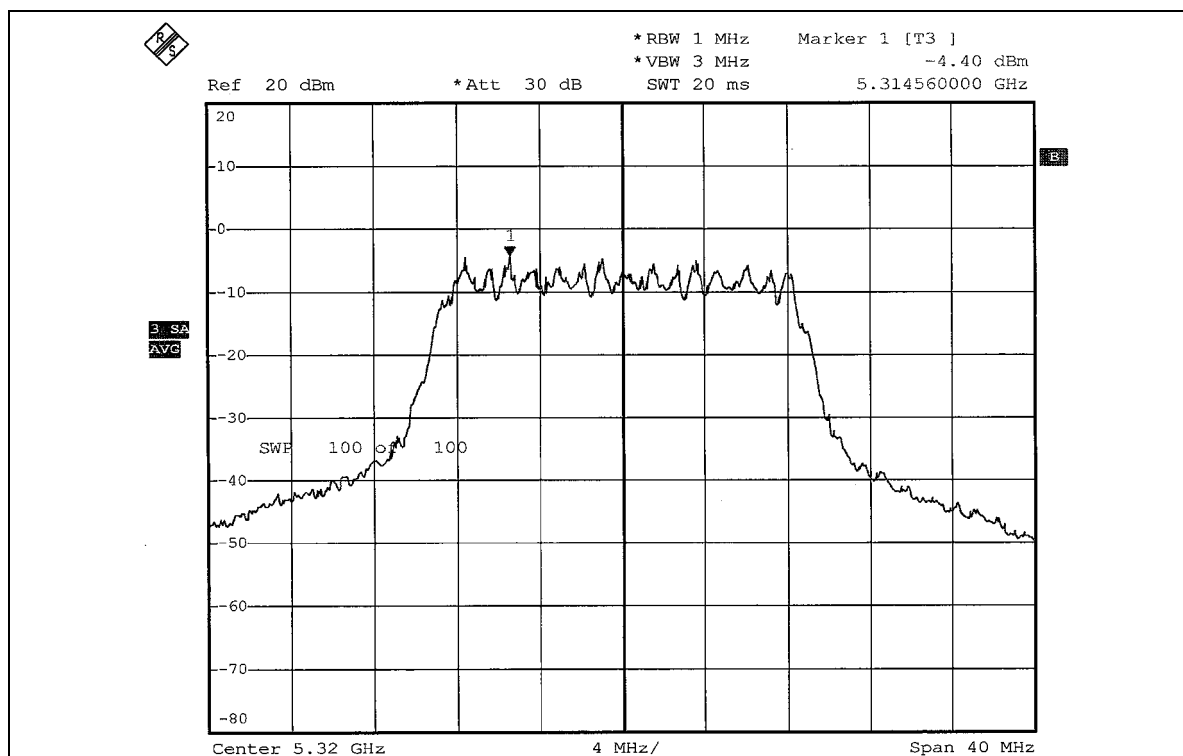
CH 4



CH 5



CH 8



4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.02\%$ of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ANRITSU SPECTRUM ANALYZER	MS2667C	M10281	Mar. 08, 2007
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jul. 18, 2006

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

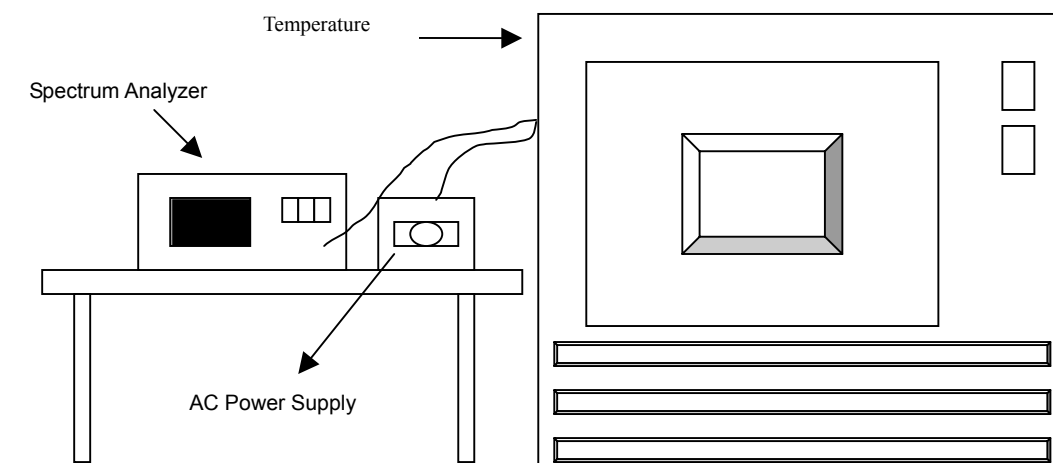
4.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at $+20$ degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6

4.6.7 TEST RESULTS

Operating frequency: 5320MHz						Limit : $\pm 0.01\%$			
Temp. (°C)	Power supply (Vac)	0 minute		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	138	5320.05748	0.0010805	5320.05719	0.0010750	5320.05751	0.0010810	5320.05713	0.0010739
	120	5320.05742	0.0010793	5320.05736	0.0010782	5320.05722	0.0010756	5320.05733	0.0010776
	102	5320.05715	0.0010742	5320.05724	0.0010759	5320.05768	0.0010842	5320.05751	0.0010810
40	138	5320.05669	0.0010656	5320.05662	0.0010643	5320.05685	0.0010686	5320.05651	0.0010622
	120	5320.05689	0.0010694	5320.05638	0.0010598	5320.05683	0.0010682	5320.05652	0.0010624
	102	5320.05677	0.0010671	5320.05661	0.0010641	5320.05689	0.0010694	5320.05693	0.0010701
30	138	5320.03948	0.0007421	5320.03992	0.0007504	5320.03967	0.0007457	5320.03955	0.0007434
	120	5320.03899	0.0007329	5320.03896	0.0007323	5320.03909	0.0007348	5320.03924	0.0007376
	102	5320.03991	0.0007502	5320.03989	0.0007498	5320.03979	0.0007479	5320.03984	0.0007489
20	138	5320.02884	0.0005421	5320.02885	0.0005423	5320.02883	0.0005419	5320.02882	0.0005417
	120	5320.02881	0.0005415	5320.02846	0.0005350	5320.02954	0.0005553	5320.02966	0.0005575
	102	5320.02871	0.0005397	5320.02874	0.0005402	5320.02873	0.0005400	5320.02871	0.0005397
10	138	5320.01625	0.0003055	5320.01629	0.0003062	5320.01622	0.0003049	5320.0162	0.0003045
	120	5320.01644	0.0003090	5320.01645	0.0003092	5320.0164	0.0003083	5320.01648	0.0003098
	102	5320.01642	0.0003086	5320.01643	0.0003088	5320.01641	0.0003085	5320.01644	0.0003090
0	138	5320.00065	0.0000122	5320.00064	0.0000120	5320.00066	0.0000124	5320.00068	0.0000128
	120	5320.00069	0.0000130	5320.00065	0.0000122	5320.00063	0.0000118	5320.00072	0.0000135
	102	5320.00065	0.0000122	5320.00063	0.0000118	5320.00068	0.0000128	5320.00078	0.0000147
-10	138	5319.99834	-0.0000312	5319.99839	-0.0000303	5319.99842	-0.0000297	5319.99838	-0.0000305
	120	5319.99947	-0.0000100	5319.99862	-0.0000259	5319.99844	-0.0000293	5319.99942	-0.0000109
	102	5319.99849	-0.0000284	5319.99847	-0.0000288	5319.99849	-0.0000284	5319.99846	-0.0000289
-20	138	5319.99036	-0.0001812	5319.99031	-0.0001821	5319.99048	-0.0001789	5319.99031	-0.0001821
	120	5319.99047	-0.0001791	5319.99066	-0.0001756	5319.99044	-0.0001797	5319.99046	-0.0001793
	102	5319.99046	-0.0001793	5319.99045	-0.0001795	5319.99043	-0.0001799	5319.99045	-0.0001795
-30	138	5319.98946	-0.0001981	5319.9894	-0.0001992	5319.98939	-0.0001994	5319.98932	-0.0002008
	120	5319.98952	-0.0001970	5319.98955	-0.0001964	5319.98956	-0.0001962	5319.98961	-0.0001953
	102	5319.98966	-0.0001944	5319.98969	-0.0001938	5319.98964	-0.0001947	5319.98963	-0.0001949

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 14, 2006

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

4.7.2 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 1MHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

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

Channel 1 (5180MHz)

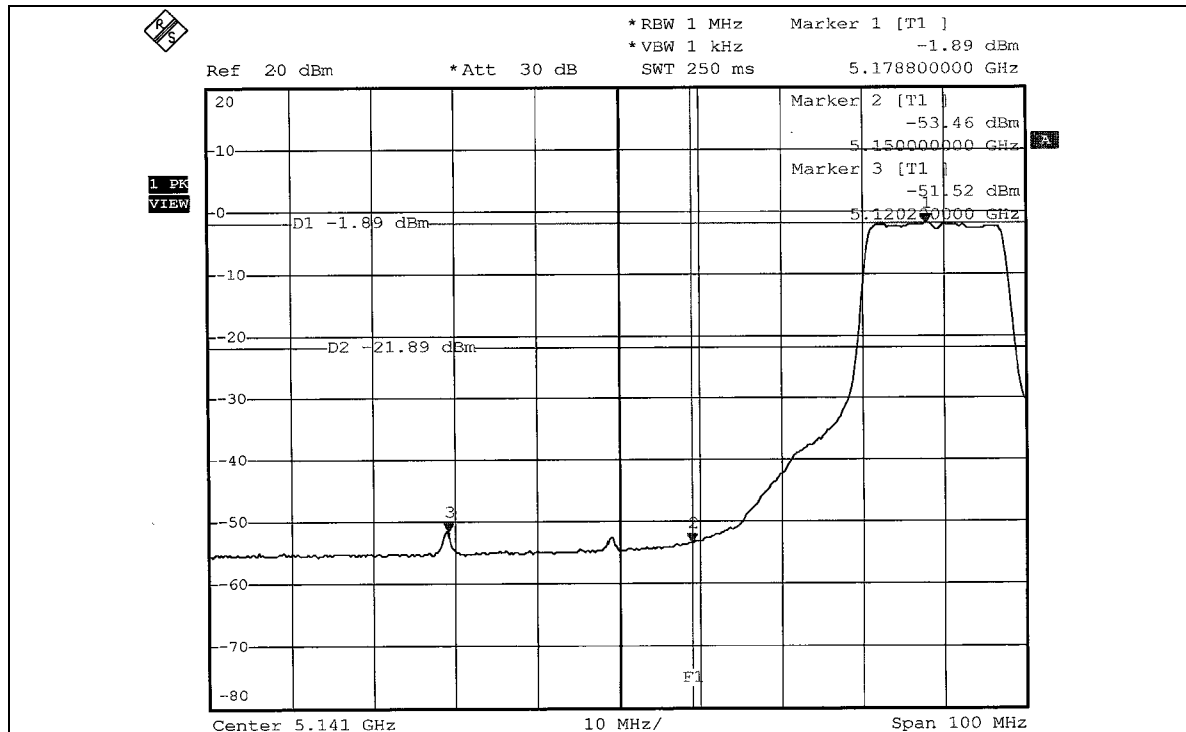
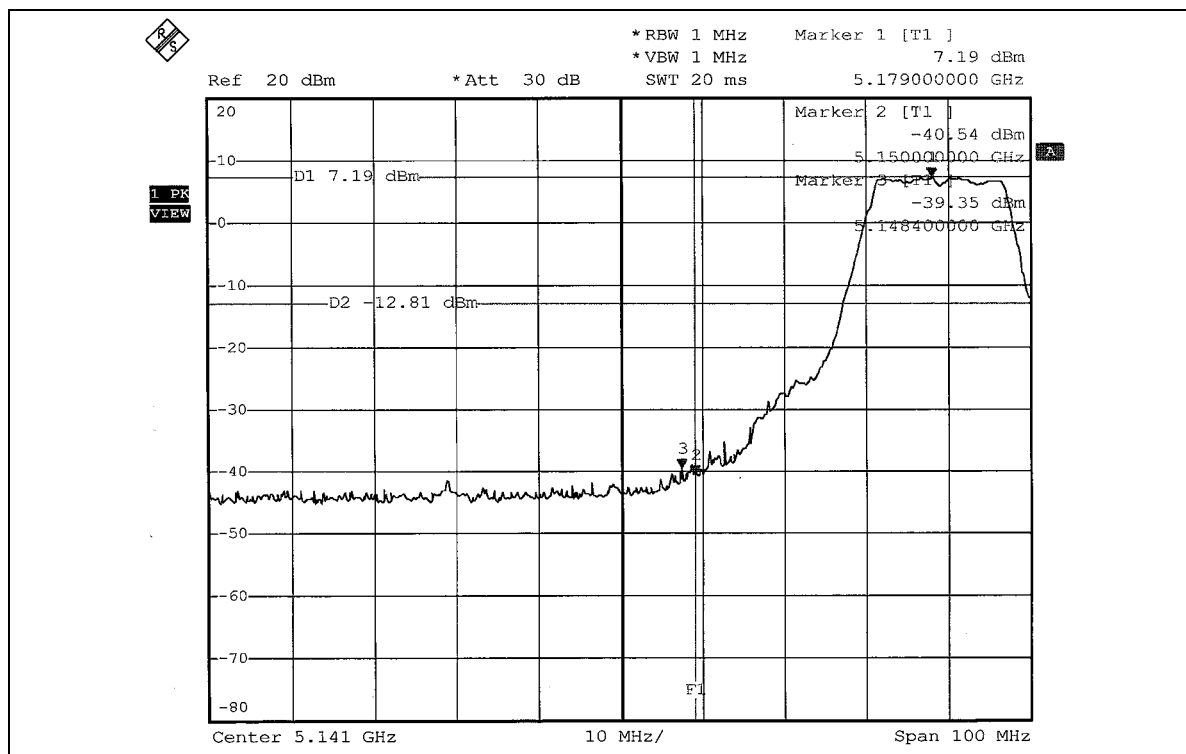
The band edge emission plot on the next page shows 46.54Bc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 102.85dBuV/m (Peak), so the maximum field strength in restrict band is $102.85 - 46.54 = 56.31$ dBuV/m which is under 74dBuV/m limit.

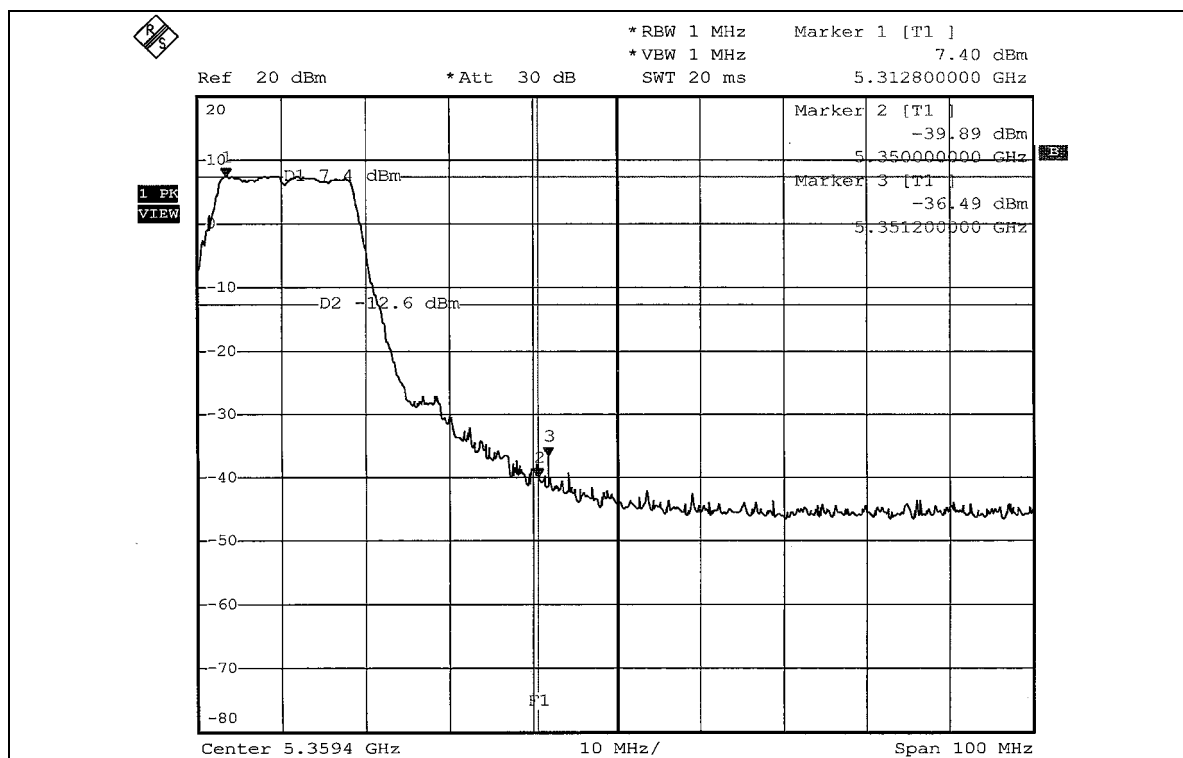
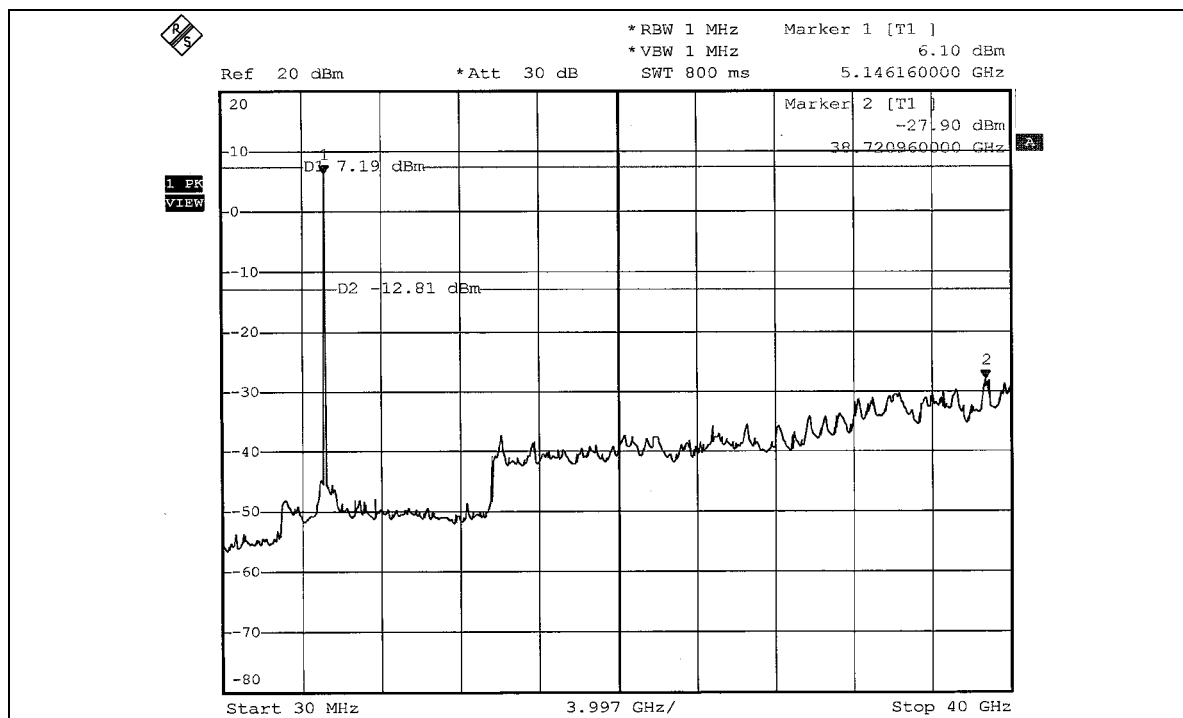
The band edge emission plot on the next page shows 49.63dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 93.77dBuV/m (Average), so the maximum field strength in restrict band is $93.77 - 49.63 = 44.14$ dBuV/m which is under 54dBuV/m limit.

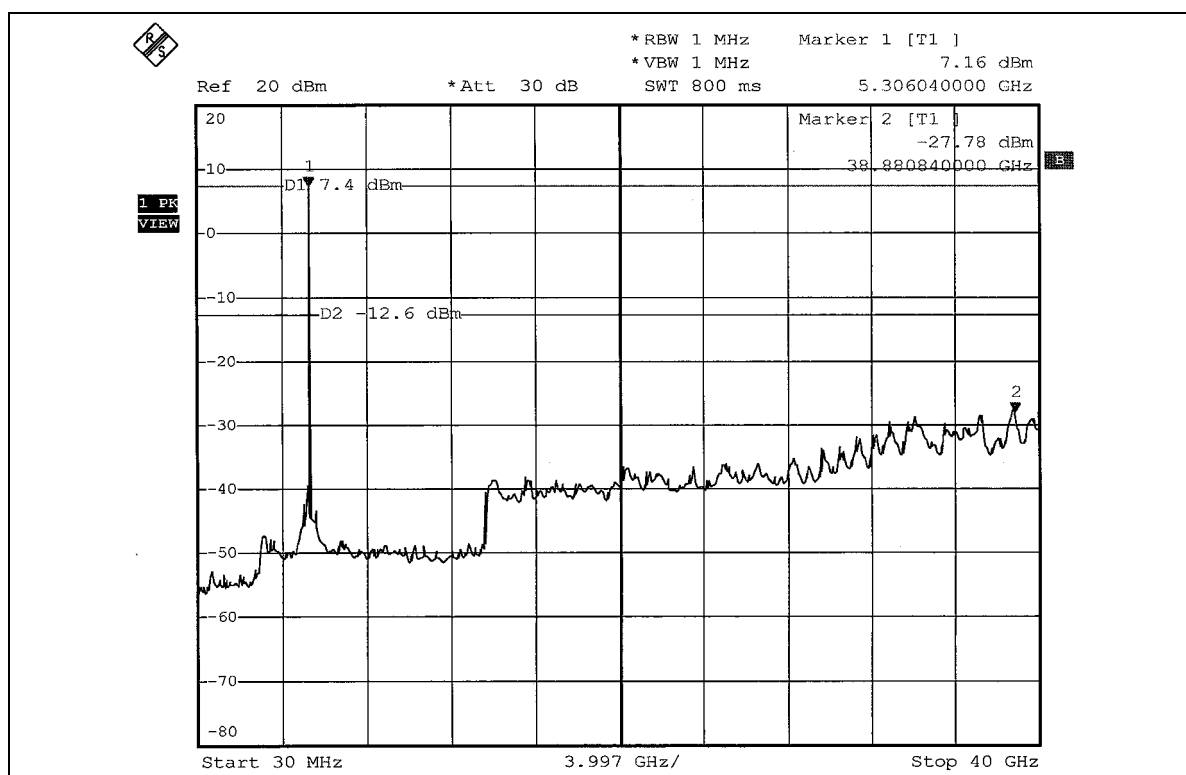
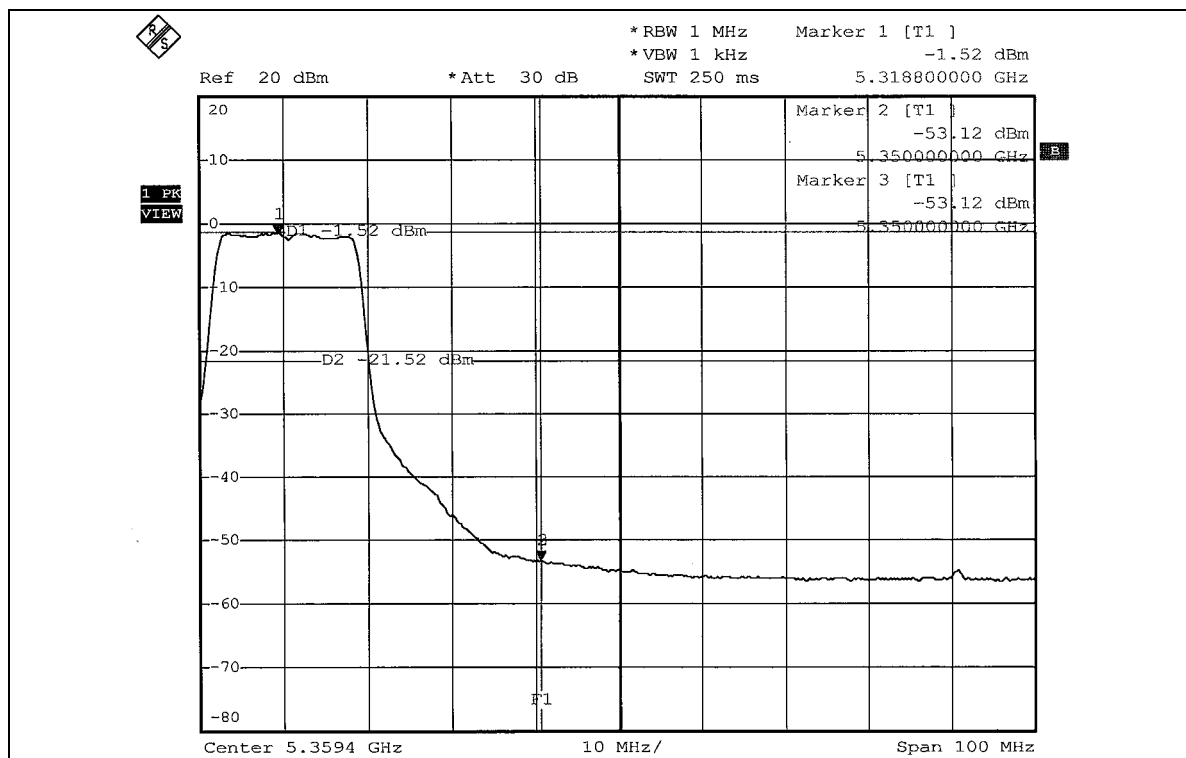
Channel 8 (5320MHz)

The band edge emission plot on the next second page shows 43.89dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 102.79dBuV/m (Peak), so the maximum field strength in restrict band is $102.79 - 43.89 = 58.90$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 51.60dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 93.70dBuV/m (Average), so the maximum field strength in restrict band is $93.70 - 51.60 = 42.10$ dBuV/m which is under 54dBuV/m limit.







4.8 ANTENNA REQUIREMENT

4.8.1 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 15.407(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.

4.8.2 ANTENNA CONNECTED CONSTRUCTION

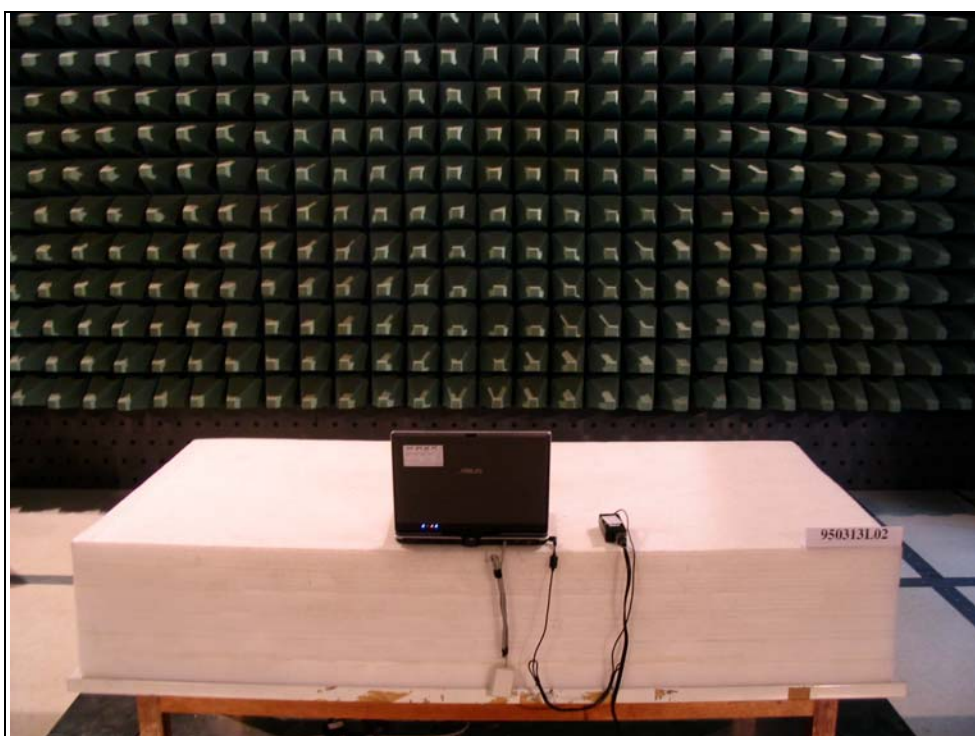
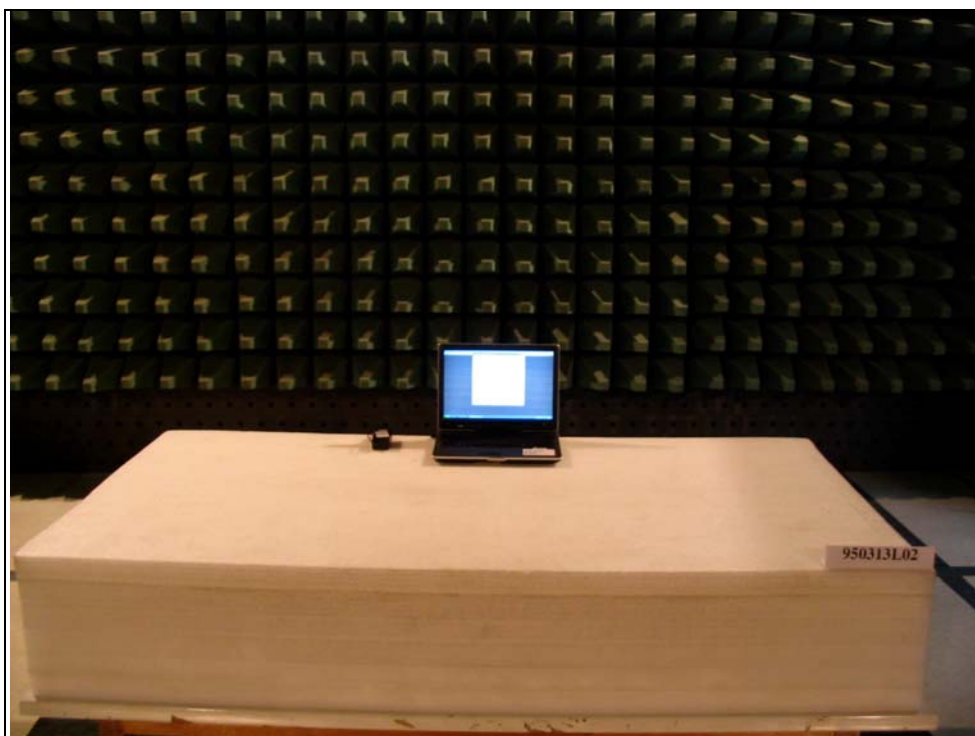
The antenna used in this product is PIFA antenna with UFL connector. The maximum Gain of the antenna is 0.04dBi.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST



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, DGT
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

Linko RF Lab.

Tel: 886-3-3270910

Fax: 886-3-3270892

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.