FCC ID: NI3-UB83005001

FCC TEST REPORT (15.407)

REPORT NO.:	RF940617L13
MODEL NO.:	NUB-8301
RECEIVED:	Jun. 15, 2005
TESTED:	Jun. 15 ~ Jun. 27, 2005
ISSUED:	Jun. 29, 2005

APPLICANT:	SENAO INTERNATIONAL CO., LTD.
ADDRESS:	No. 500, Fusing 3rd Rd., Hwa-Ya Technical Park, Kuei-Shan Hsiang, Taoyuan County 333, 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.

0528
ILAC MRA

No. 2177-01

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1. CERTIFICATION

PRODUCT:	Wireless 802.11a/g/b USB Dongle
BRAND NAME:	SENAO
OEM BRAND NAME:	EnGenius
MODEL NO.:	NUB-8301
APPLICANT:	SENAO INTERNATIONAL CO., LTD.
TEST SAMPLE:	ENGINEERING SAMPLE
TESTED:	Jun. 15 ~ Jun. 27, 2005
TESTED:	Jun. 16 ~ Jun. 22, 2005
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:** Jun. 29, 2005
(Andrea Hsia)

TECHNICAL ACCEPTANCE : Gary Chang , **DATE:** Jun. 29, 2005
Responsible for RF (Gary Chang)

APPROVED BY : , **DATE:** Jun. 29, 2005
(Cody Chang, Deputy Manager)

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 –18.73dB at 0.201MHz
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 –2.12dB at 10640.00MHz
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	3.73 dB
	200MHz ~1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Wireless 802.11a/g/b USB Dongle
MODEL NO.	NUB-8301
POWER SUPPLY	5Vdc from host equipment
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: 2.412 ~ 2.462GHz 802.11a: 5.150 ~ 5.350GHz and 5.725 ~ 5.850GHz
NUMBER OF CHANNEL	802.11b & 802.11g: 11 802.11a: 12
CHANNEL SPACING	802.11b & 802.11g: 5MHz 802.11a: 20MHz
OUTPUT POWER	59.841mW for 802.11b 57.412mW for 802.11g 28.510mW for 5.150 ~ 5.350GHz 45.604mW for 5.725 ~ 5.850GHz
ANTENNA TYPE	Printed antenna with 2.0dBi gain (for 2.4GHz) Printed antenna with 0dBi gain (for 5.0GHz)
DATA CABLE	NA
I/O PORTS	USB
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 operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.
3. 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.

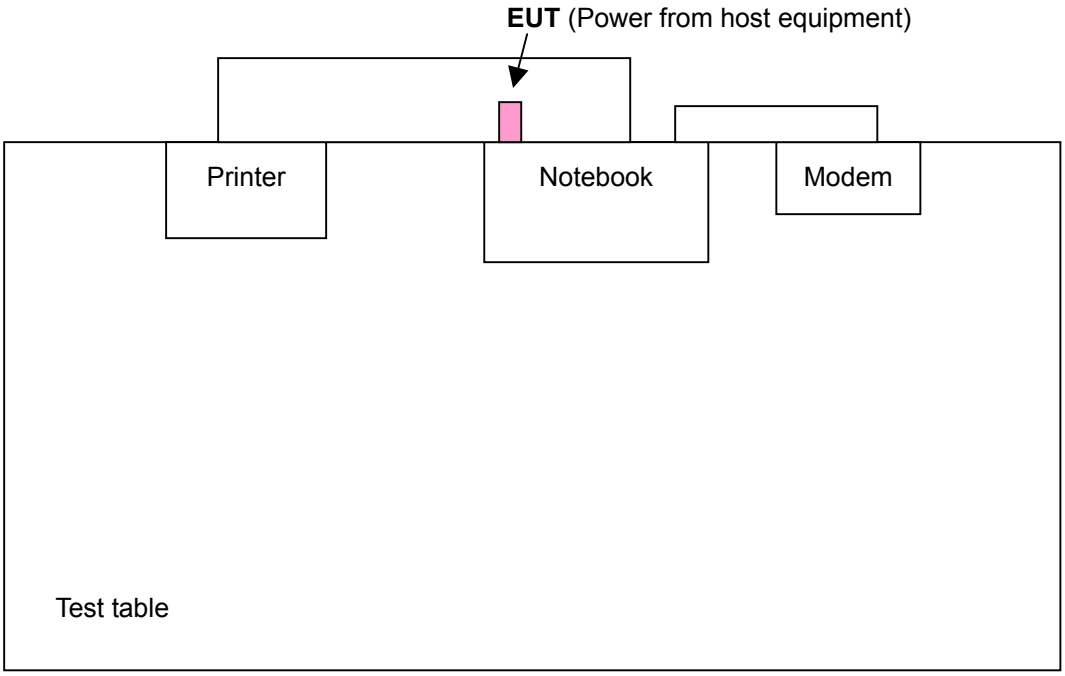
3.2 DESCRIPTION OF TEST MODES

Operated in 5150 ~ 5250MHz, 5250MHz ~ 5350MHz bands:

Eight 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 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)
802.11a	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 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 (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 Wireless 802.11a/g/b USB Dongle. 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	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY047265	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008248	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8 m shielded cable without core
3	1.2 m shielded cable without core

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

4. TEST TYPES AND RESULTS (5150 ~ 5350MHz Band)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 16, 2005
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 09, 2006
LISN SCHWARZBECK	NNBL 8226-2	8226-142	May. 02, 2006
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Feb. 15, 2006
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.

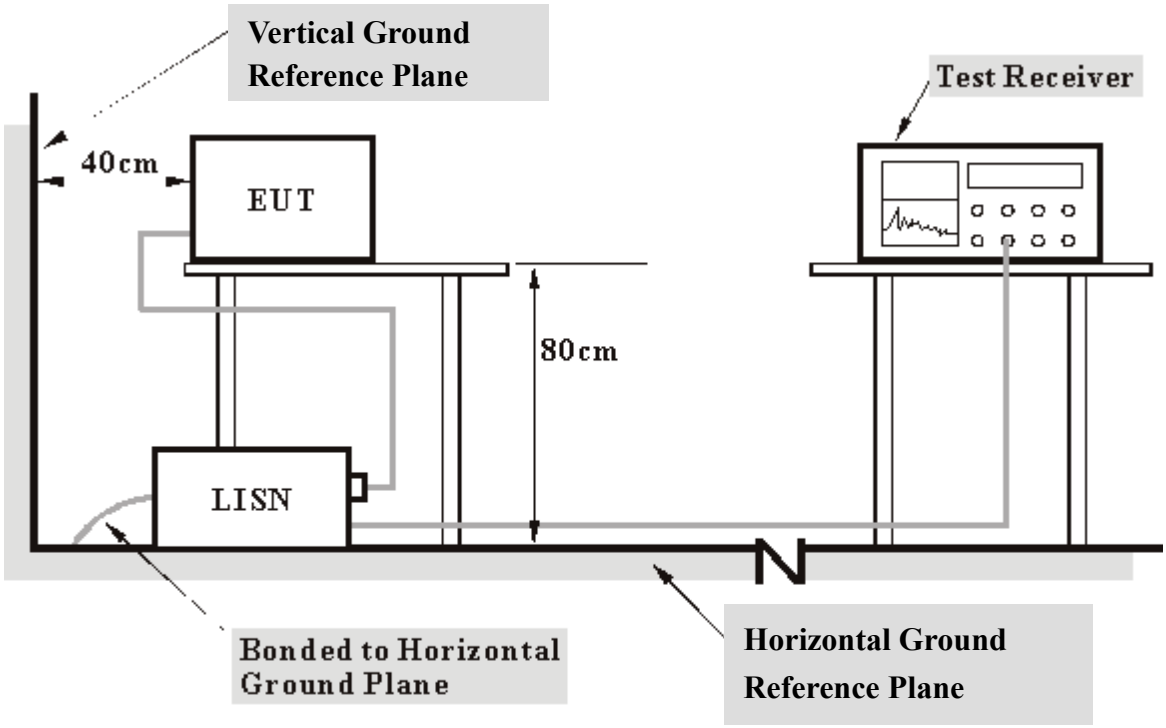
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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

4.1.6 EUT OPERATING CONDITIONS

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

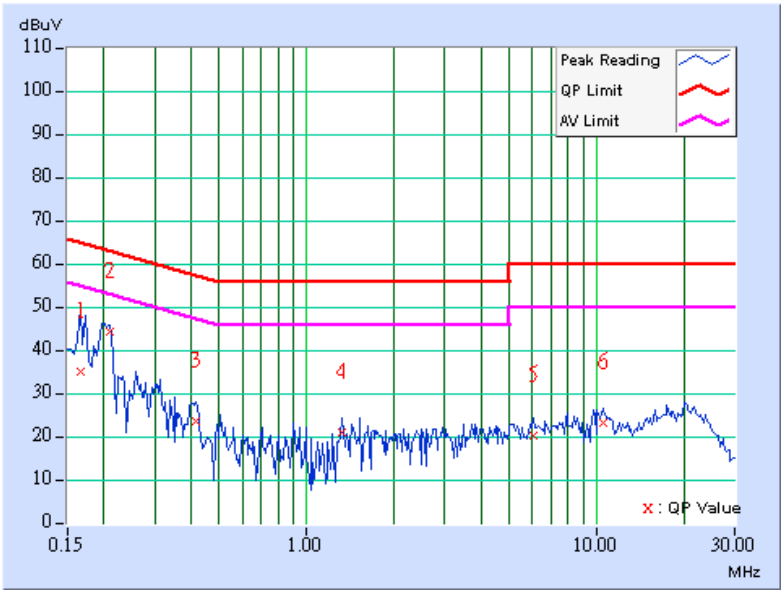
4.1.7 TEST RESULTS

Conducted Worst-Case Data

EUT	Wireless 802.11a/g/b USB Dongle	MEASUREMENT DETAIL	
MODEL	NUB-8301	PHASE	Line 1
CHANNEL	Channel 5	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Brad Wu		

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	0.166	0.11	34.60	-	34.71	-	65.18	55.18	-30.47	-
2	0.209	0.11	44.02	-	44.13	-	63.26	53.26	-19.13	-
3	0.416	0.11	23.22	-	23.33	-	57.54	47.54	-34.20	-
4	1.332	0.25	20.59	-	20.84	-	56.00	46.00	-35.16	-
5	6.043	0.44	19.99	-	20.43	-	60.00	50.00	-39.57	-
6	10.512	0.54	22.77	-	23.31	-	60.00	50.00	-36.69	-

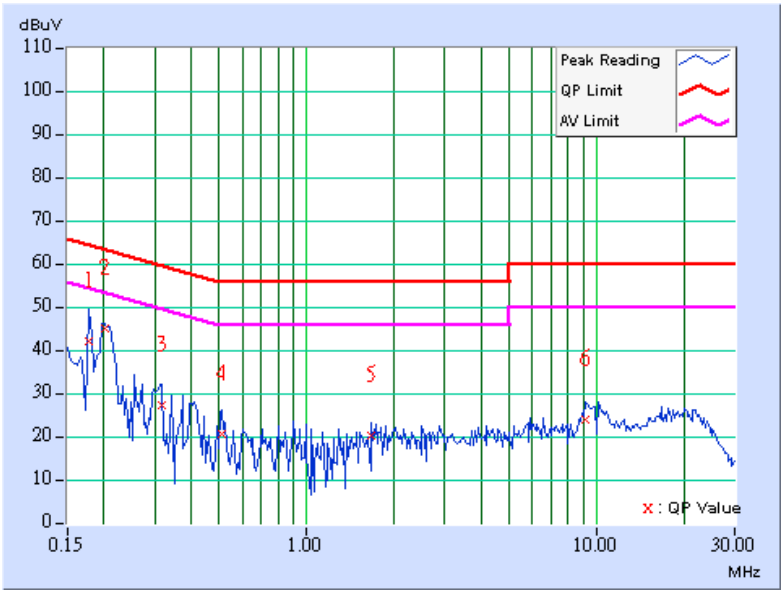
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Wireless 802.11a/g/b USB Dongle	MEASUREMENT DETAIL	
MODEL	NUB-8301	PHASE	Line 2
CHANNEL	Channel 5	6dB BANDWIDTH	9 kHz
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 991hPa
TRANSFER RATE	6Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY	Brad Wu		

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	0.177	0.11	41.82	-	41.93	-	64.61	54.61	-22.68	-
2	0.201	0.11	44.74	-	44.85	-	63.58	53.58	-18.73	-
3	0.318	0.11	26.96	-	27.07	-	59.76	49.76	-32.69	-
4	0.509	0.13	20.32	-	20.45	-	56.00	46.00	-35.55	-
5	1.672	0.25	20.03	-	20.28	-	56.00	46.00	-35.72	-
6	9.195	0.43	23.56	-	23.99	-	60.00	50.00	-36.01	-

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



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

$$E=\frac{1000000\sqrt{30P}}{3}$$ μV/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	100039	Nov. 21, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Jun. 01, 2006
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 17, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 23, 2006
Preamplifier Agilent	8447D	2944A10633	Nov. 09, 2005
Preamplifier Agilent	8449B	3008A01964	Nov. 06, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218183/4	Jan. 26, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218195/4	Jan. 26, 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

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 camber. The table was rotated 360 degrees to determine the position of the highest radiation.

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

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

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

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

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

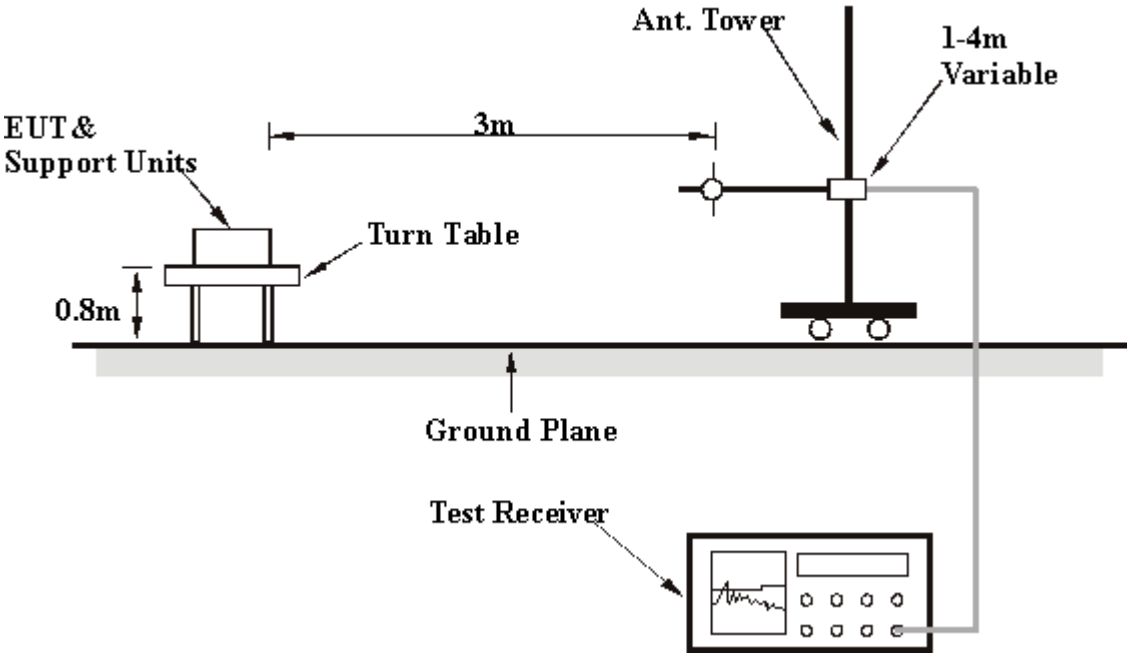
NOTE:

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

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	Wireless 802.11a/g/b USB Dongle	**MEASUREMENT DETAIL**	
MODEL	NUB-8301	**FREQUENCY RANGE**	Below 1000MHz
CHANNEL	Channel 5	**DETECTOR FUNCTION**	Quasi-Peak
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	22deg. C, 63%RH, 991hPa
TRANSFER RATE	6Mbps	**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	113.59	38.84 QP	43.50	-4.66	1.50 H	277	26.14	12.70
2	166.07	35.56 QP	43.50	-7.94	1.00 H	64	20.90	14.67
3	199.12	38.03 QP	43.50	-5.47	1.00 H	37	26.10	11.93
4	720.08	36.33 QP	46.00	-9.67	1.00 H	22	12.85	23.48
5	799.78	35.75 QP	46.00	-10.25	1.00 H	232	11.17	24.57
6	881.42	40.97 QP	46.00	-5.03	1.50 H	220	15.40	25.57

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	31.94	27.67 QP	40.00	-12.33	1.00 V	349	13.49	14.19
2	457.66	34.55 QP	46.00	-11.45	1.00 V	349	15.81	18.74
3	560.68	32.90 QP	46.00	-13.10	1.00 V	121	12.30	20.59
4	640.38	33.37 QP	46.00	-12.63	1.00 V	127	11.20	22.17
5	720.08	35.62 QP	46.00	-10.38	1.00 V	322	12.14	23.48
6	881.42	38.00 QP	46.00	-8.00	1.00 V	349	12.43	25.57

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	Wireless 802.11a/g/b USB Dongle	**MEASUREMENT DETAIL**	
MODEL	NUB-8301	**FREQUENCY RANGE**	1 ~ 40 GHz
CHANNEL	Channel 1	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	25deg.C, 75%RH, 991hPa
TRANSFER RATE	6Mbps	**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	55.58 PK	74.00	-18.42	1.27 H	0	18.10	37.48
1	#5150.00	46.26 AV	54.00	-7.74	1.27 H	0	8.78	37.48
2	*5180.00	110.90 PK			1.27 H	0	73.40	37.50
2	*5180.00	101.58 AV			1.27 H	0	64.08	37.50
3	10360.00	65.79 PK	68.30	-2.51	1.19 H	0	18.21	47.58

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5150.00	51.67 PK	74.00	-22.33	1.10 V	349	14.19	37.48
1	#5150.00	42.37 AV	54.00	-11.63	1.10 V	349	4.89	37.48
2	*5180.00	105.96 PK			1.10 V	349	68.46	37.50
2	*5180.00	96.86 AV			1.10 V	349	59.36	37.50
3	10360.00	65.98 PK	68.30	-2.32	1.21 V	345	18.40	47.58

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

EUT	Wireless 802.11a/g/b USB Dongle	MEASUREMENT DETAIL	
MODEL	NUB-8301	FREQUENCY RANGE	1 ~ 40 GHz
CHANNEL	Channel 4	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	25deg.C, 75%RH, 991hPa
TRANSFER RATE	6Mbps	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	110.93 PK			1.25 H	1	73.35	37.58
1	*5240.00	101.63 AV			1.25 H	1	64.05	37.58
2	10480.00	65.89 PK	68.30	-2.41	1.15 H	3	18.03	47.86

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	106.02 PK			1.13 V	325	68.44	37.58
1	*5240.00	69.98 AV			1.13 V	325	32.40	37.58
2	10480.00	66.07 PK	68.30	-2.23	1.23 V	317	18.21	47.86

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	Wireless 802.11a/g/b USB Dongle	**MEASUREMENT DETAIL**	
MODEL	NUB-8301	**FREQUENCY RANGE**	1 ~ 40 GHz
CHANNEL	Channel 5	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	**ENVIRONMENTAL CONDITIONS**	25deg.C, 75%RH, 991hPa
TRANSFER RATE	6Mbps	**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	110.97 PK			1.24 H	3	73.37	37.60
1	*5260.00	101.68 AV			1.24 H	3	64.08	37.60
2	10520.00	65.83 PK	68.30	-2.47	1.18 H	32	17.91	47.92

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	105.99 PK			1.07 V	358	68.39	37.60
1	*5260.00	96.89 AV			1.07 V	358	59.29	37.60
2	10520.00	66.02 PK	68.30	-2.28	1.09 V	351	18.10	47.92

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	Wireless 802.11a/g/b USB Dongle	MEASUREMENT DETAIL	
MODEL	NUB-8301	FREQUENCY RANGE	1 ~ 40 GHz
CHANNEL	Channel 8	DETECTOR FUNCTION	Peak(PK) Average (AV)
MODULATION TYPE	BPSK	ENVIRONMENTAL CONDITIONS	25deg.C, 75%RH, 991hPa
TRANSFER RATE	6Mbps	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	108.75 PK			1.03 H	5	71.08	37.67
1	*5320.00	99.56 AV			1.03 H	5	61.89	37.67
2	#5350.00	54.61 PK	74.00	-19.39	1.03 H	5	16.92	37.69
2	#5350.00	44.27 AV	54.00	-9.73	1.03 H	5	6.59	37.69
3	#10640.00	63.95 PK	74.00	-10.05	1.21 H	349	16.02	47.93
3	#10640.00	51.31 AV	54.00	-2.69	1.21 H	349	3.38	47.93

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	103.81 PK			1.13 V	345	66.14	37.67
1	*5320.00	94.65 AV			1.13 V	345	56.98	37.67
2	#5350.00	52.30 PK	74.00	-21.70	1.13 V	345	14.61	37.69
2	#5350.00	42.56 AV	54.00	-11.44	1.13 V	345	4.87	37.69
3	#10640.00	64.32 PK	74.00	-9.68	1.25 V	355	16.39	47.93
3	**#10640.00**	**51.88 AV**	**54.00**	**-2.12**	**1.25 V**	**355**	**3.95**	**47.93**

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. 12, 2005

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.

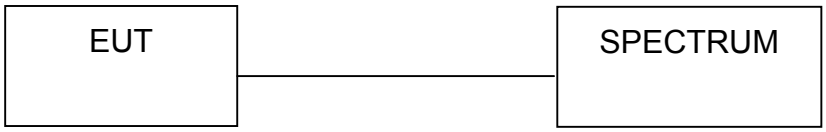
NOTE:
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

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

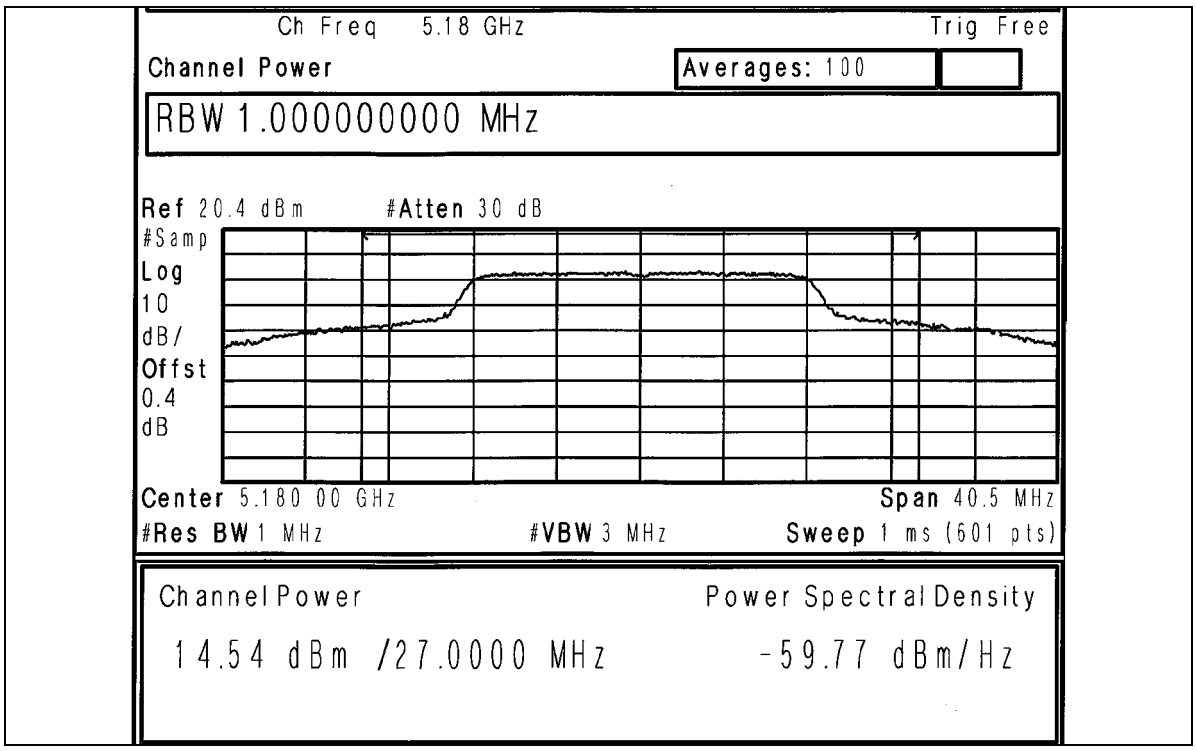
EUT	Wireless 802.11a/g/b USB Dongle	**MODEL**	NUB-8301
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	28.445	14.54	17.00	26.19	PASS
4	5240	28.379	14.53	17.00	26.28	PASS
5	5260	28.510	14.55	24.00	26.55	PASS
8	5320	18.113	12.58	24.00	22.23	PASS

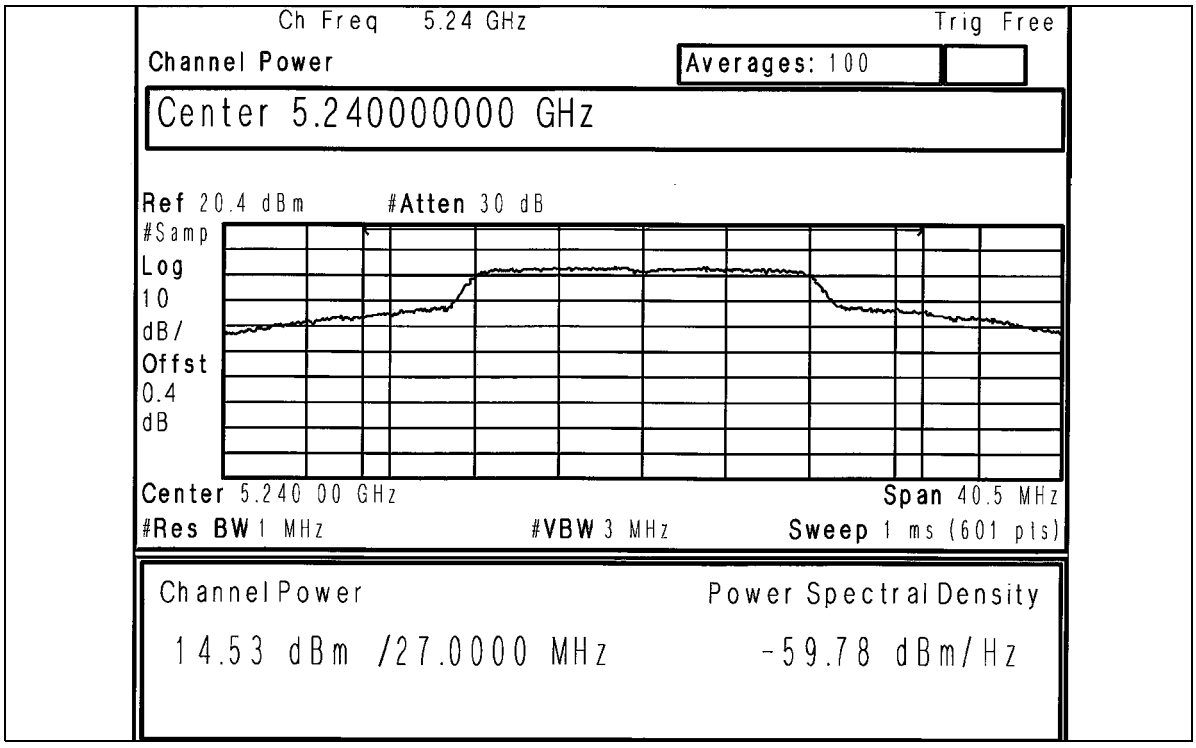
NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output:

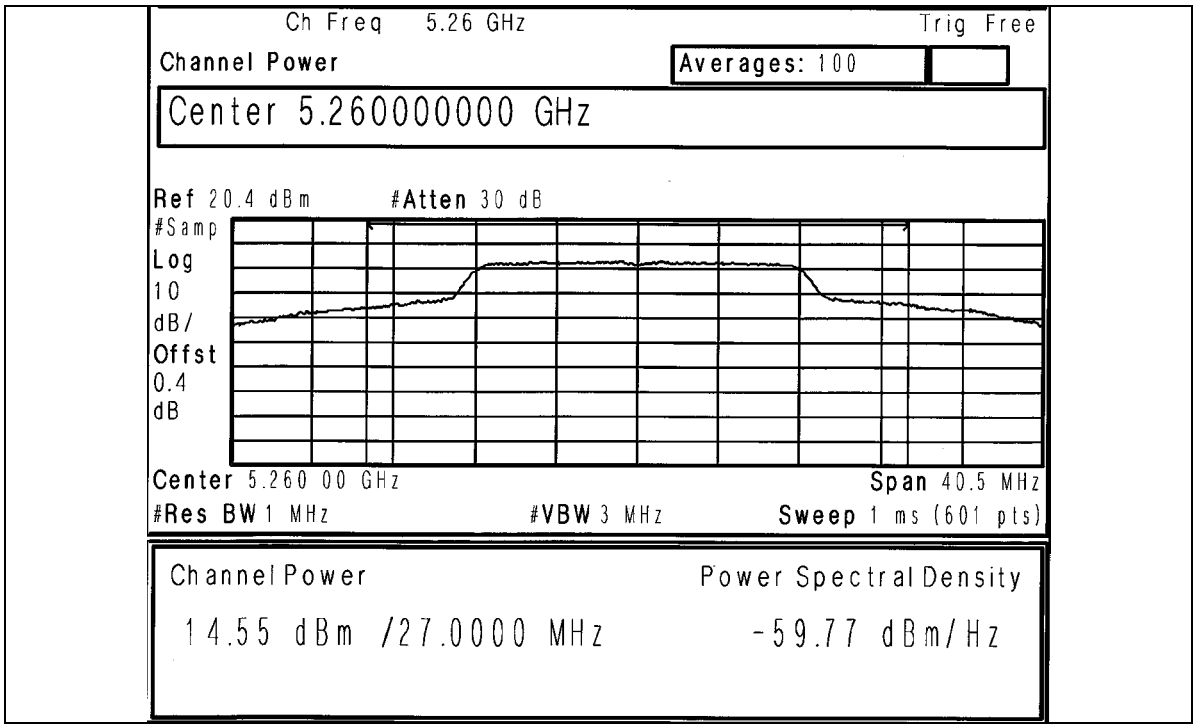
CH 1



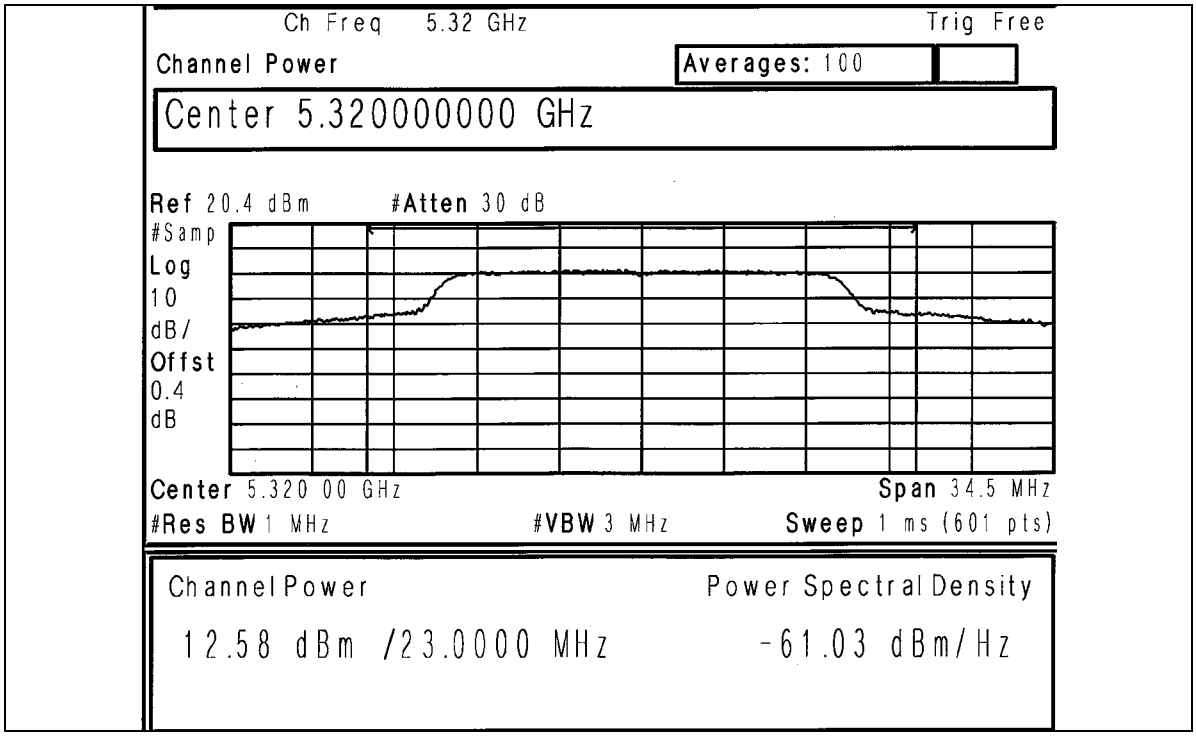
CH 4



CH 5

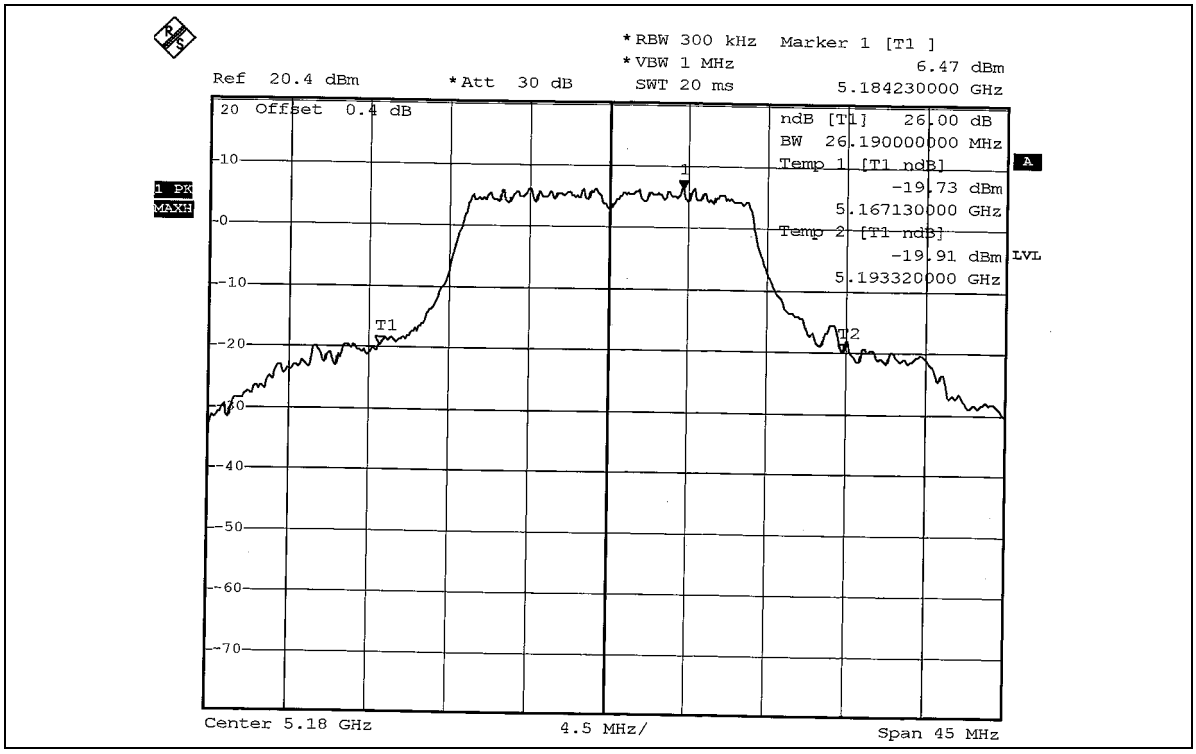

Ch Freq 5.26 GHz
Trig Free
Channel Power
Averages: 100
Center 5.260000000 GHz
Ref 20.4 dBm
#Atten 30 dB
#Samp
Log
10
dB/
Offst
0.4
dB
Center 5.260 00 GHz
Span 40.5 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
Power Spectral Density
14.55 dBm /27.0000 MHz
-59.77 dBm/Hz

CH 8

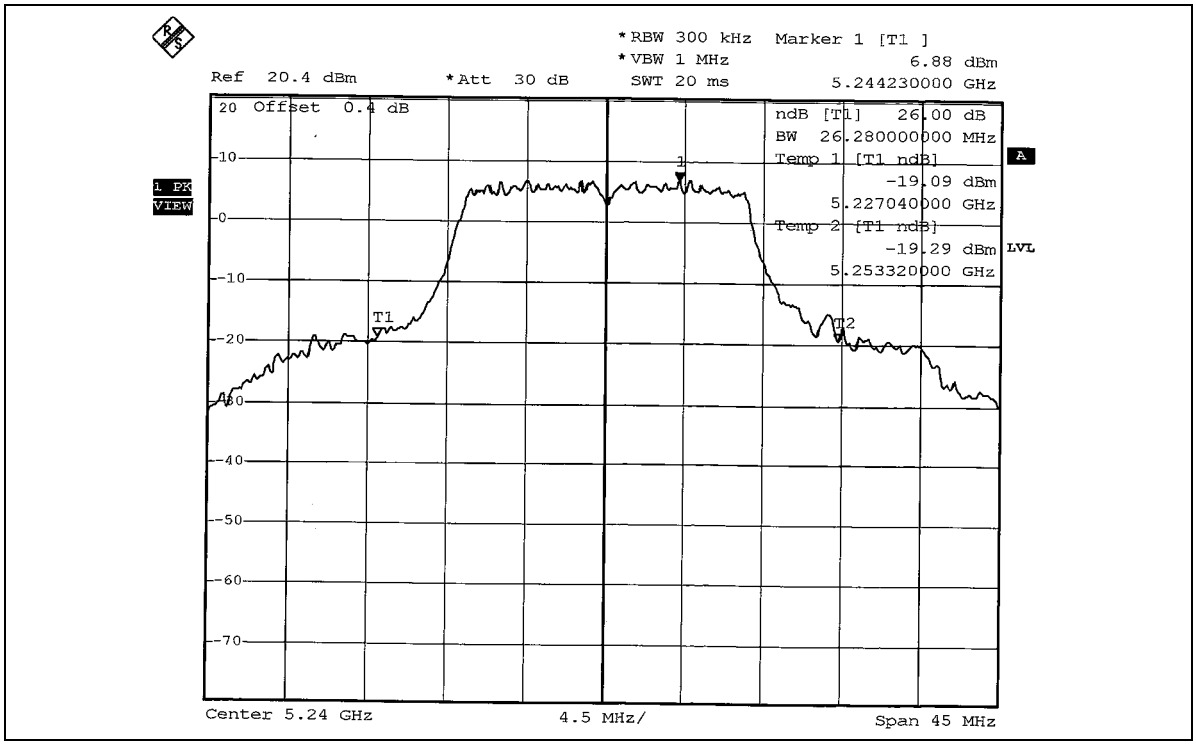

Ch Freq 5.32 GHz
Trig Free
Channel Power
Averages: 100
Center 5.320000000 GHz
Ref 20.4 dBm
#Atten 30 dB
#Samp
Log
10
dB/
Offst
0.4
dB
Center 5.320 00 GHz
Span 34.5 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
Power Spectral Density
12.58 dBm /23.0000 MHz
-61.03 dBm/Hz

26dB Occupied Bandwidth:

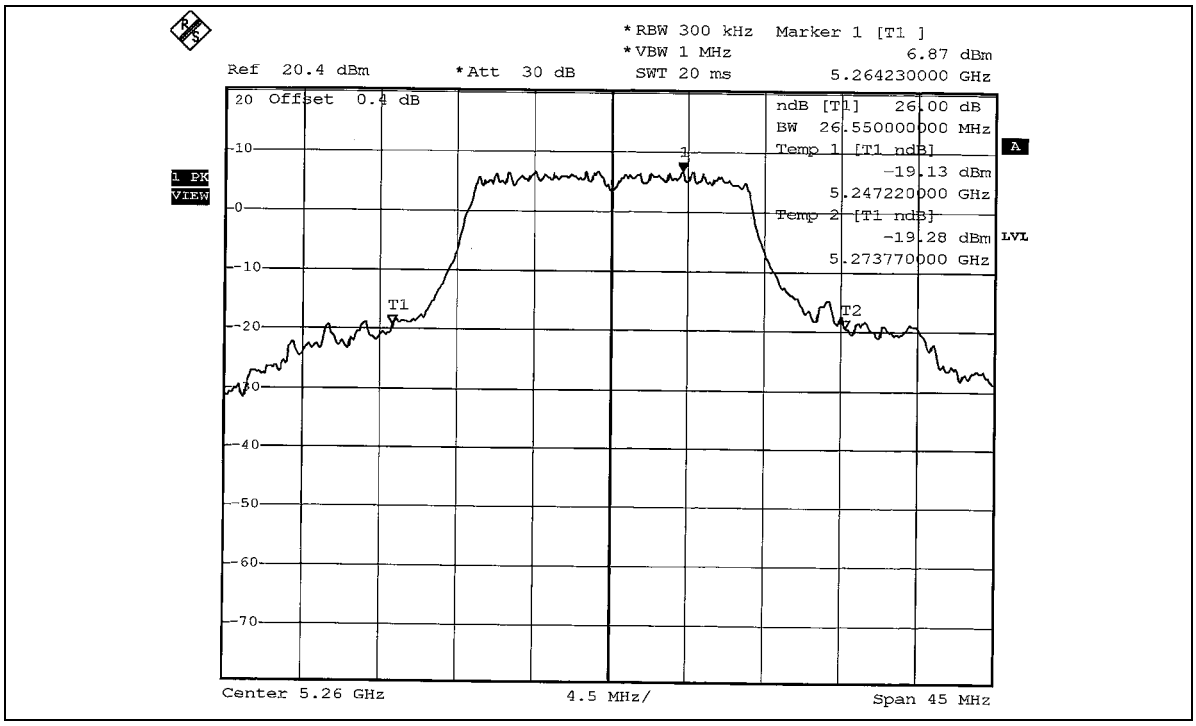
CH 1



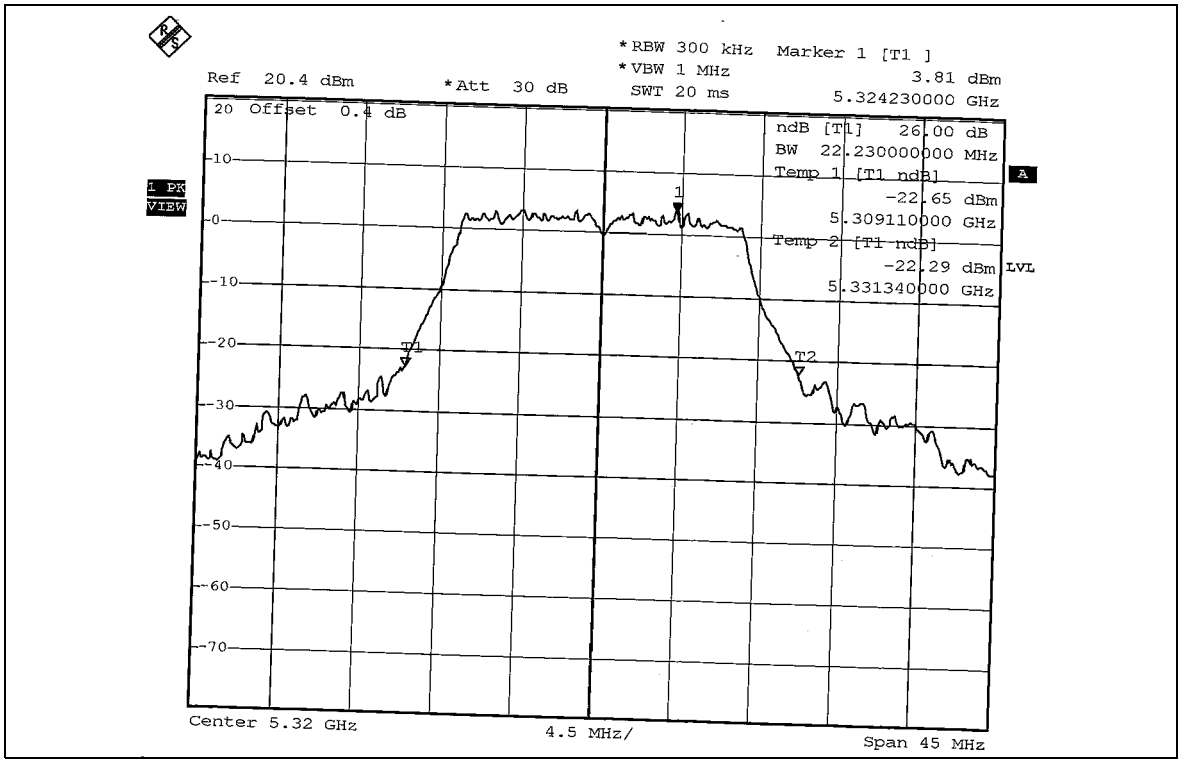
CH 4



CH 5


*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Marker 1 [T1]
6.87 dBm
5.264230000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
ndB [T1] 26.00 dB
BW 26.550000000 MHz
Temp 1 [T1 ndB]
-19.13 dBm
5.247220000 GHz
Temp 2 [T1 ndB]
-19.28 dBm
5.273770000 GHz
1 PK
VIEW
A
LVL
T1
T2
Center 5.26 GHz
4.5 MHz/
Span 45 MHz

CH 8


*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Marker 1 [T1]
3.81 dBm
5.324230000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
ndB [T1] 26.00 dB
BW 22.230000000 MHz
Temp 1 [T1 ndB]
-22.65 dBm
5.309110000 GHz
Temp 2 [T1 ndB]
-22.29 dBm
5.331340000 GHz
1 PK
VIEW
A
LVL
T1
T2
Center 5.32 GHz
4.5 MHz/
Span 45 MHz

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. 12, 2005

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

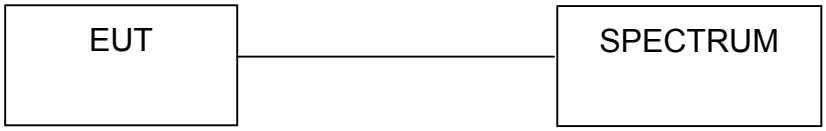
4.4.3 TEST PROCEDURE

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.

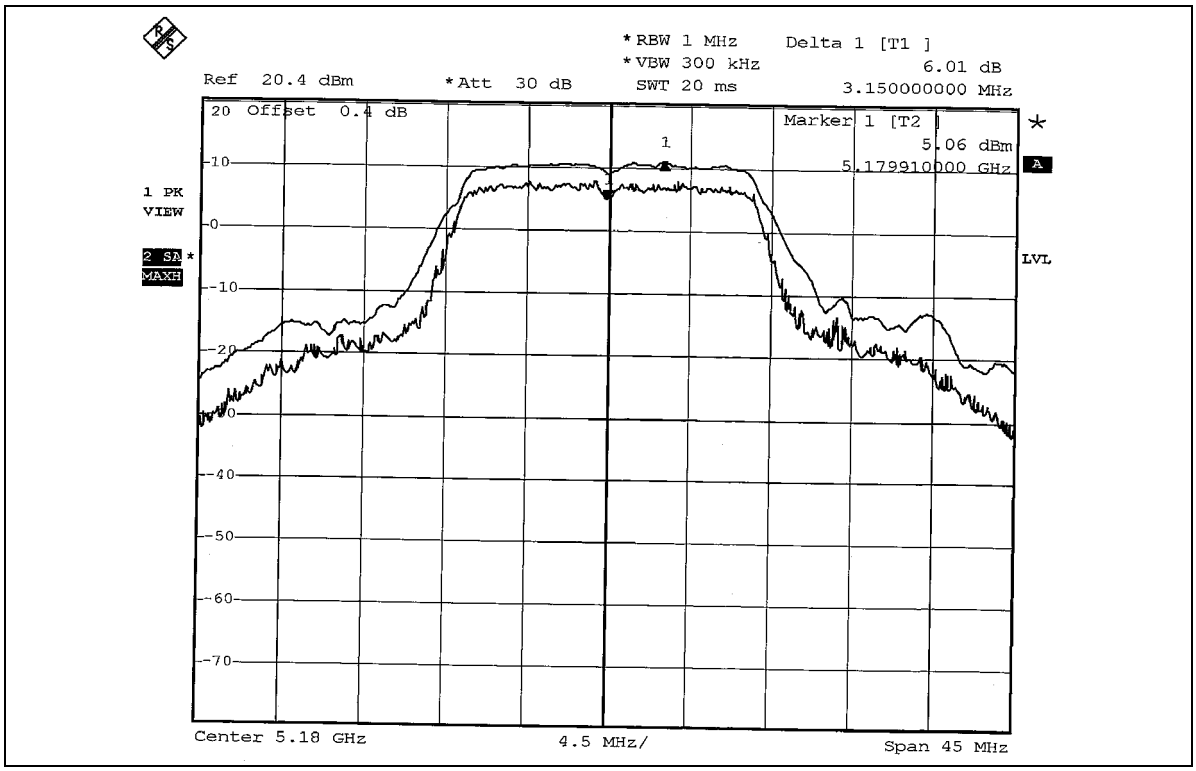
4.4.7 TEST RESULTS

802.11a OFDM modulation

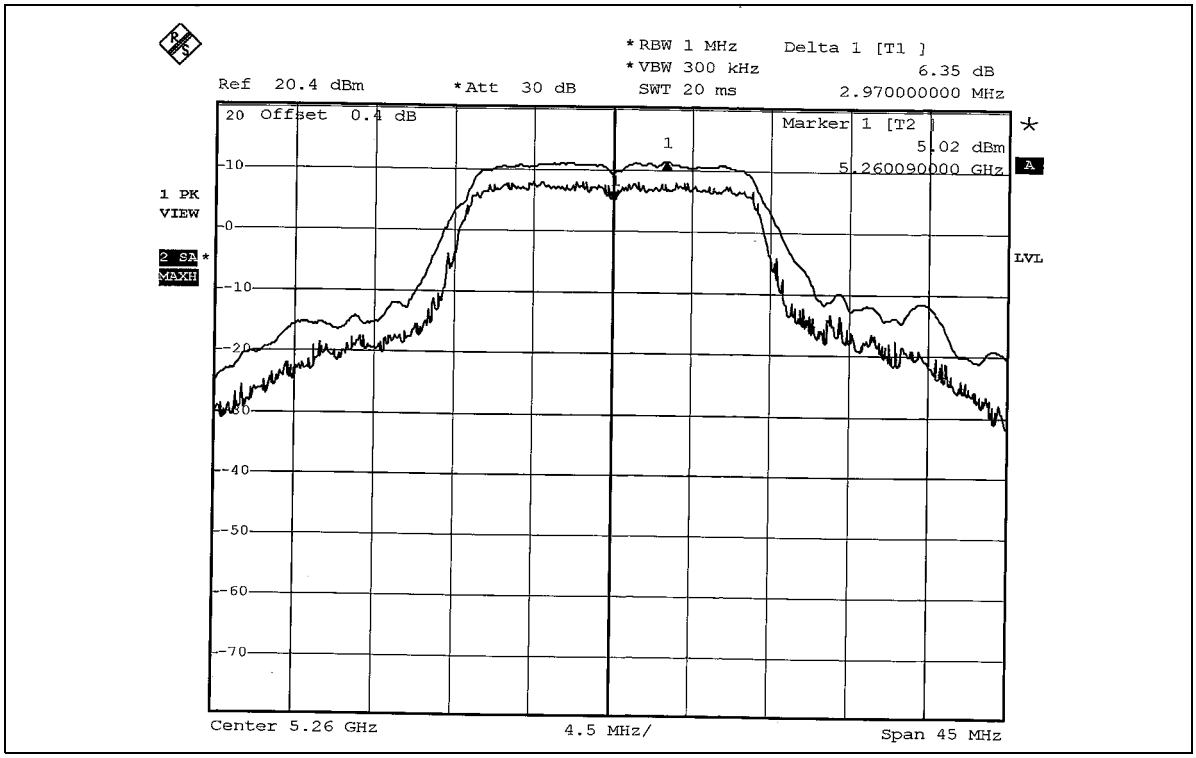
EUT	Wireless 802.11a/g/b USB Dongle	MODEL	NUB-8301
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 65%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.01	13	PASS
4	5240	6.35	13	PASS
5	5260	5.14	13	PASS
8	5320	5.69	13	PASS

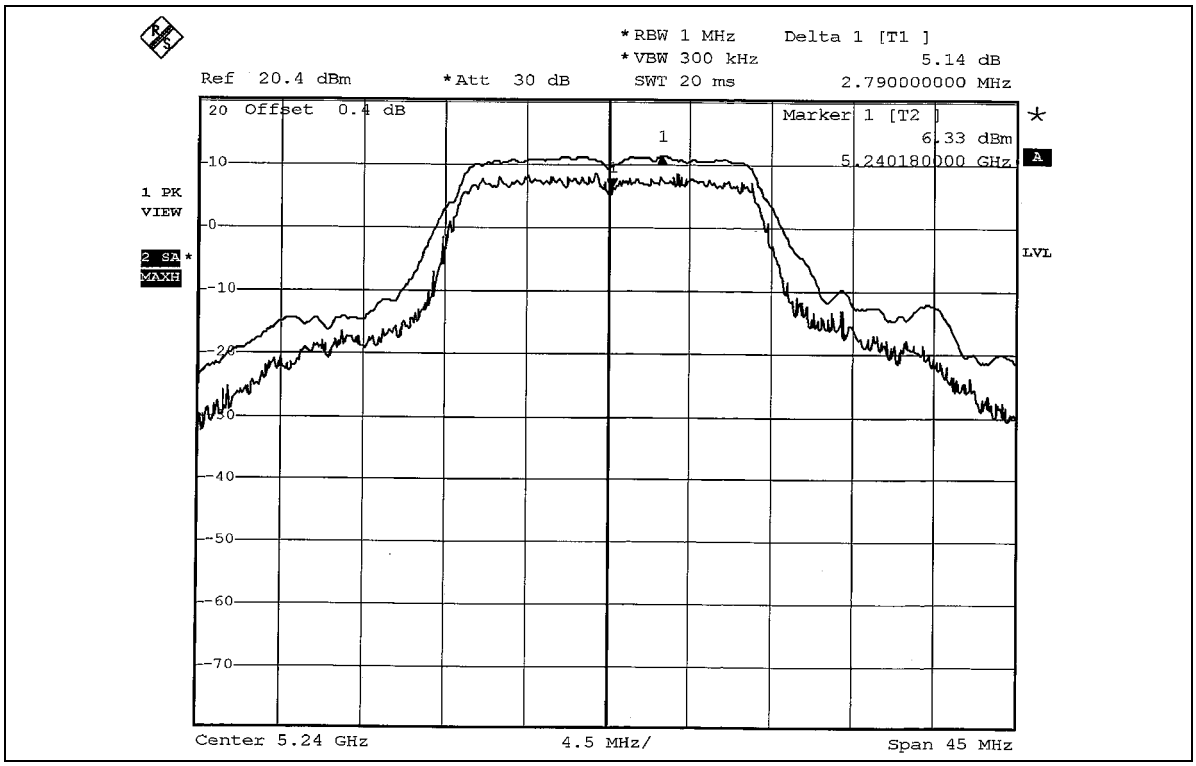
CH 1


*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
6.01 dB
3.150000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T2]
5.06 dBm
5.179910000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.18 GHz
4.5 MHz/
Span 45 MHz

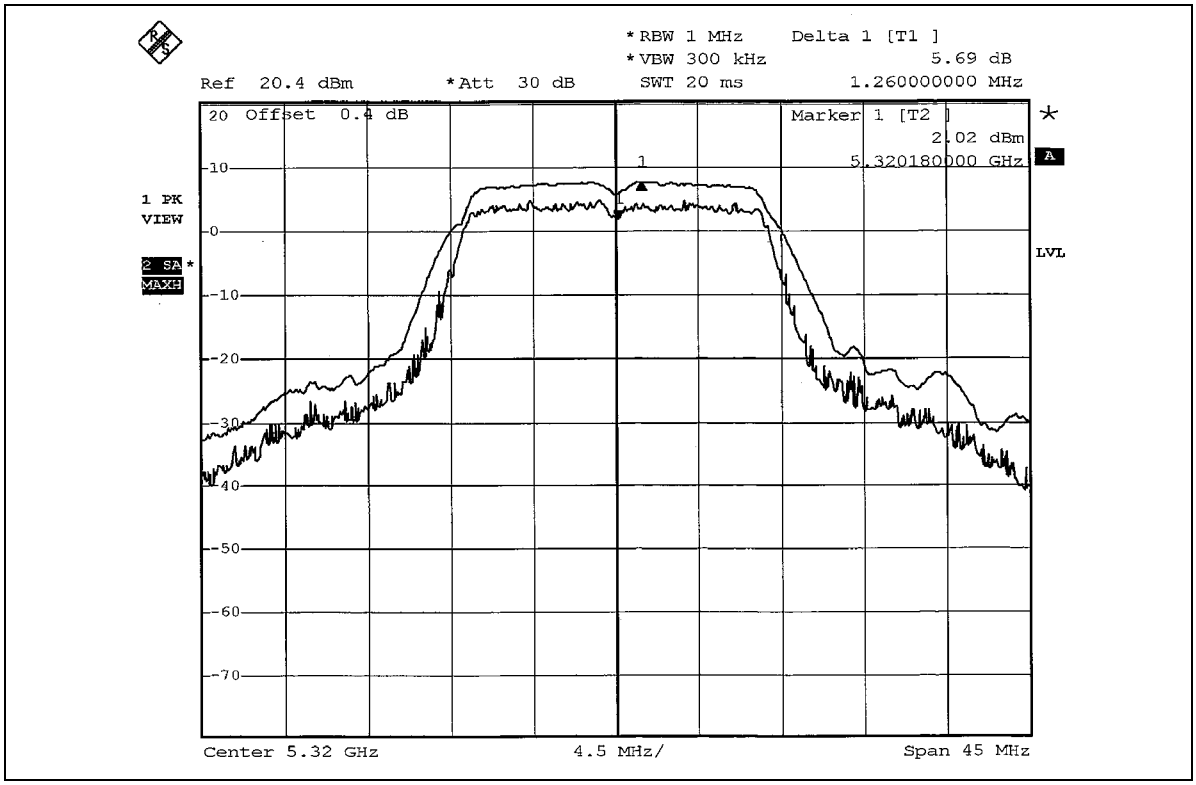
CH 4


*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
6.35 dB
2.970000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T2]
5.02 dBm
5.260090000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.26 GHz
4.5 MHz/
Span 45 MHz

CH 5


*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
5.14 dB
2.790000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T2]
6.33 dBm
5.240180000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.24 GHz
4.5 MHz/
Span 45 MHz

CH 8


*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
5.69 dB
1.260000000 MHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 1 [T2]
2.02 dBm
5.320180000 GHz
1 PK
VIEW
2 SA
MAXH
LVL
Center 5.32 GHz
4.5 MHz/
Span 45 MHz

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. 12, 2005

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

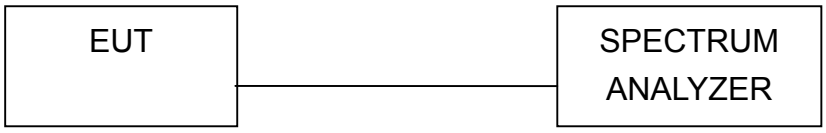
4.5.3 TEST PROCEDURES

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

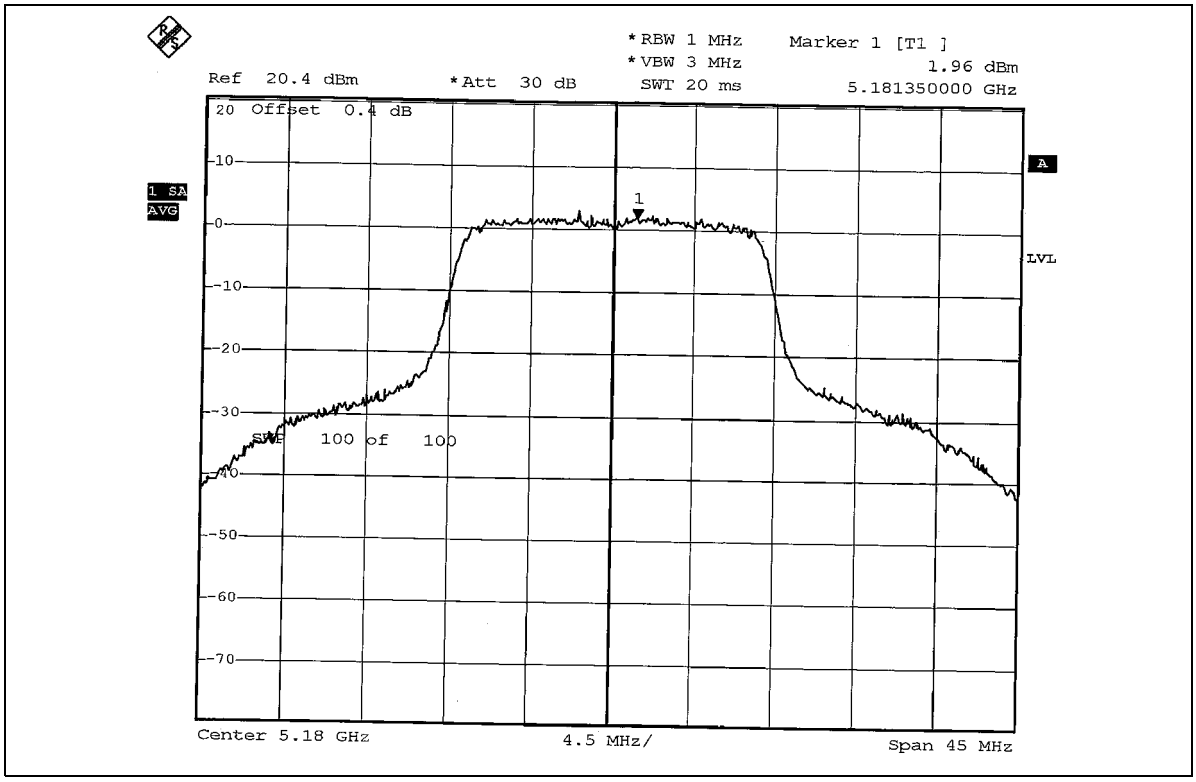
4.5.7 TEST RESULTS

802.11a OFDM modulation

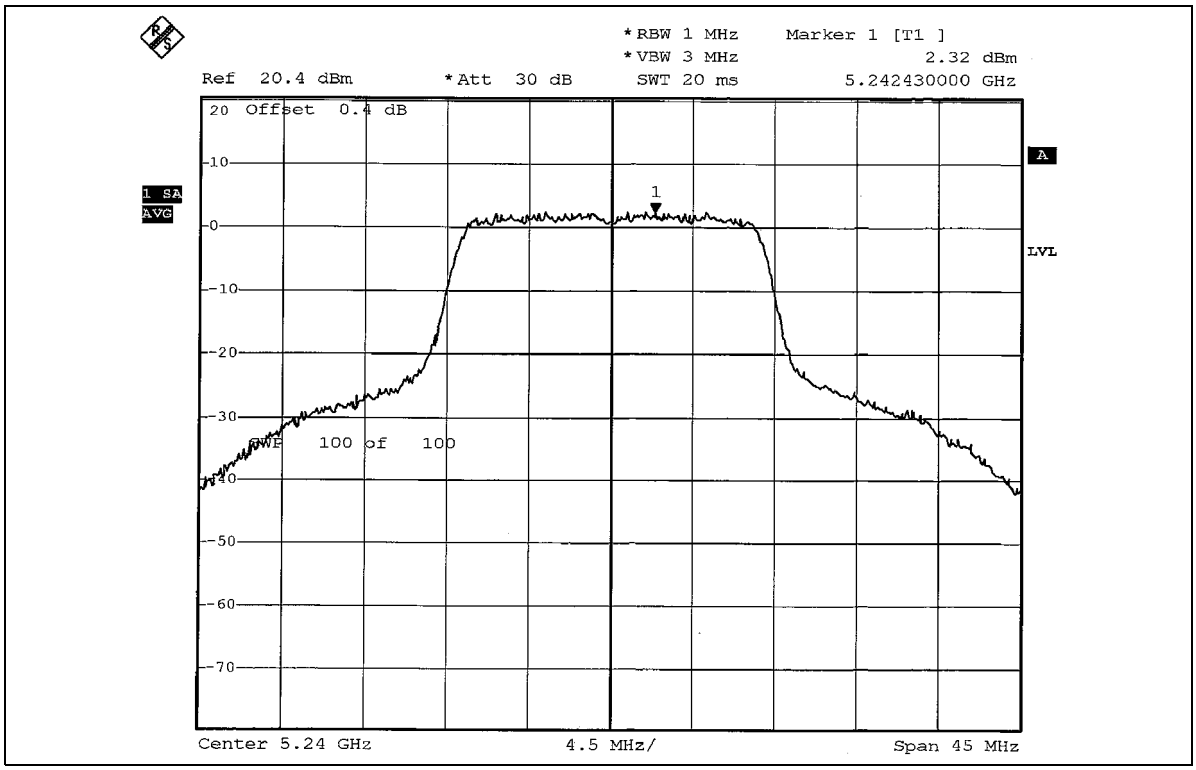
EUT	Wireless 802.11a/g/b USB Dongle	**MODEL**	NUB-8301
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	25deg.C, 65%RH, 991hPa
TESTED BY	Morgan Chen		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	1.96	4	PASS
4	5240	2.32	4	PASS
5	5260	1.77	11	PASS
8	5320	-1.01	11	PASS

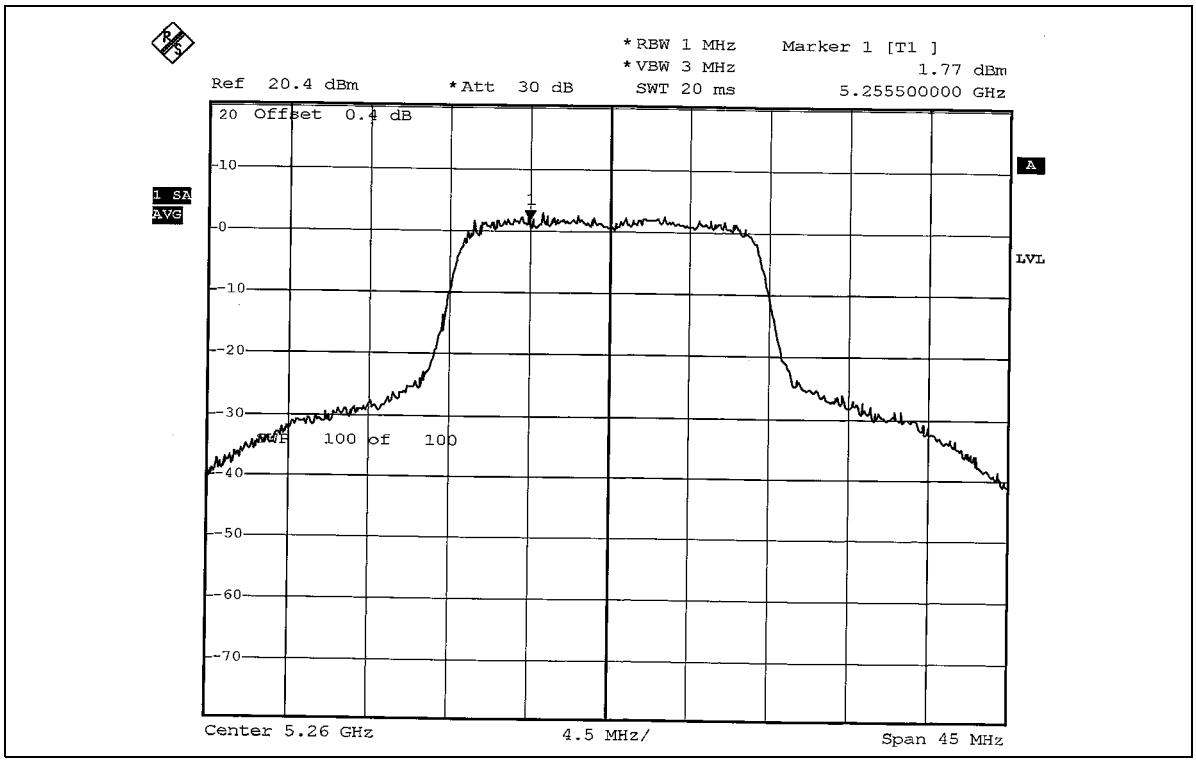
CH 1


*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
1.96 dBm
5.181350000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 SA
AVG
A
LVL
SWP 100 of 100
Center 5.18 GHz
4.5 MHz/
Span 45 MHz

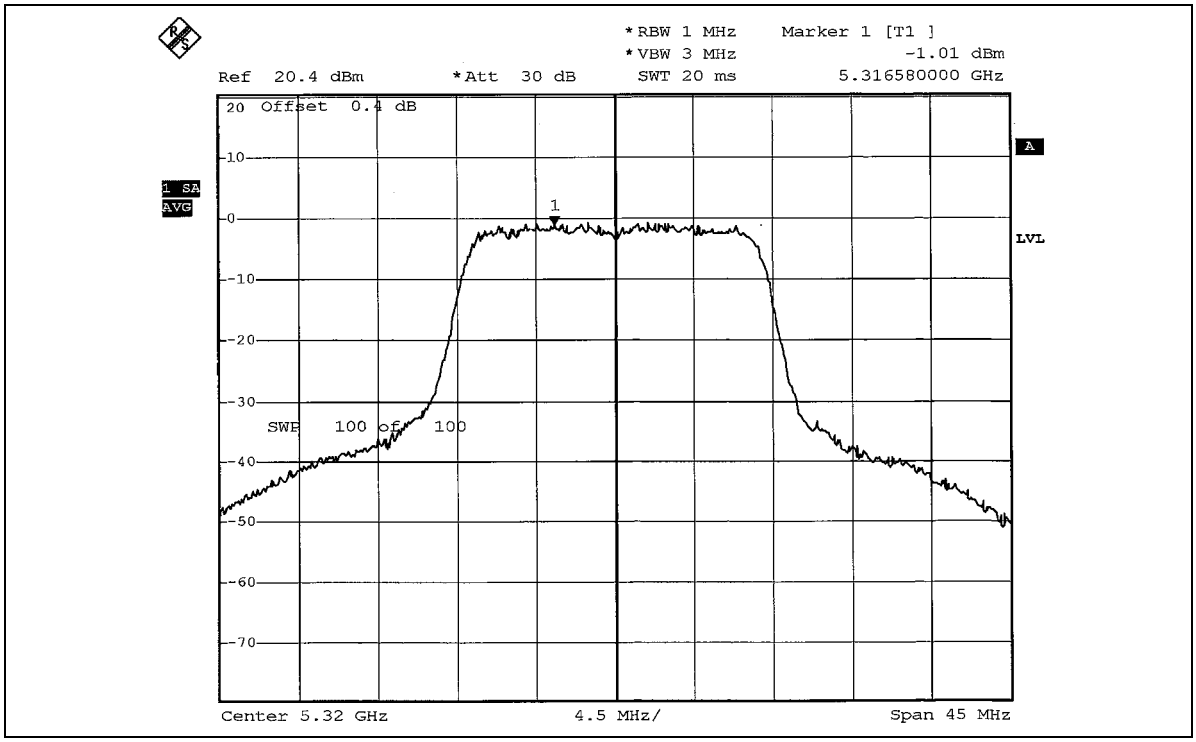
CH 4


*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
2.32 dBm
5.242430000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 SA
AVG
A
LVL
SWP 100 of 100
Center 5.24 GHz
4.5 MHz/
Span 45 MHz

CH 5


*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
1.77 dBm
5.255500000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 SA
AVG
A
LVL
SWP 100 of 100
Center 5.26 GHz
4.5 MHz/
Span 45 MHz

CH 8


*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-1.01 dBm
5.316580000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
1 SA
AVG
A
LVL
SWP 100 of 100
Center 5.32 GHz
4.5 MHz/
Span 45 MHz

4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 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	Aug. 12, 2005
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W901030	Aug. 12, 2005

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

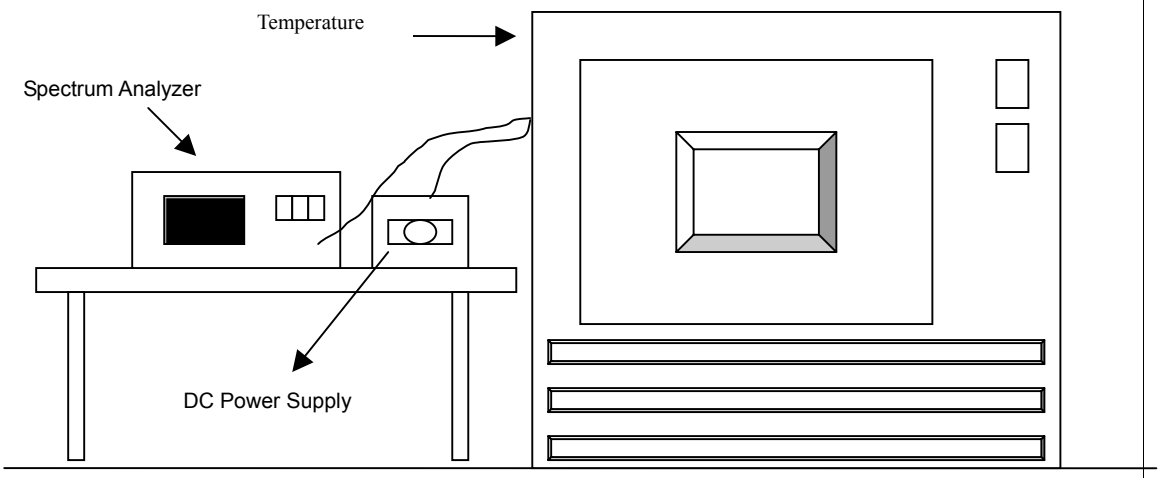
4.6.3 TEST PROCEDURE

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 4.3.6

4.6.7 TEST RESULTS

Operating frequency: 5320MHz						Limit : ± 0.015%			
Temp. (℃)	Power supply (Vac)	0 minute		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	138	5319.9773	-0.0004262	5319.9774	-0.0004251	5319.9774	-0.0004253	5319.9774	-0.0004249
	120	5319.9773	-0.0004258	5319.9773	-0.0004262	5319.9774	-0.0004255	5319.9774	-0.0004254
	102	5319.9773	-0.0004262	5319.9773	-0.0004258	5319.9773	-0.0004262	5319.9774	-0.0004256
40	138	5319.9759	-0.0004525	5319.9758	-0.0004541	5319.9756	-0.0004593	5319.9758	-0.0004543
	120	5319.9759	-0.0004522	5319.9758	-0.0004542	5319.9756	-0.0004580	5319.9758	-0.0004540
	102	5319.9760	-0.0004518	5319.9758	-0.0004542	5319.9757	-0.0004575	5319.9779	-0.0004155
30	138	5319.9775	-0.0004228	5319.9776	-0.0004214	5319.9776	-0.0004212	5319.9775	-0.0004223
	120	5319.9776	-0.0004217	5319.9776	-0.0004211	5319.9775	-0.0004222	5319.9775	-0.0004225
	102	5319.9776	-0.0004211	5319.9775	-0.0004223	5319.9775	-0.0004223	5319.9776	-0.0004217
20	138	5319.9774	-0.0004254	5319.9774	-0.0004252	5319.9774	-0.0004257	5319.9773	-0.0004258
	120	5319.9774	-0.0004249	5319.9774	-0.0004258	5319.9774	-0.0004256	5319.9774	-0.0004254
	102	5319.9774	-0.0004248	5319.9773	-0.0001399	5319.9774	-0.0004256	5319.9774	-0.0004251
10	138	5319.9924	-0.0001425	5319.9926	-0.0001583	5319.9929	-0.0001341	5319.9928	-0.0001360
	120	5319.9925	-0.0001404	5319.9916	-0.0001587	5319.9929	-0.0001339	5319.9928	-0.0001363
	102	5319.9929	-0.0001327	5319.9916	-0.0001772	5319.9939	-0.0001151	5319.9924	-0.0001428
0	138	5319.9906	-0.0001776	5319.9906	-0.0001773	5319.9916	-0.0001570	5319.9917	-0.0001565
	120	5319.9905	-0.0001778	5319.9906	-0.0001776	5319.9917	-0.0001567	5319.9918	-0.0001545
	102	5319.9905	-0.0001781	5319.9906	-0.0001160	5319.9917	-0.0001569	5319.9915	-0.0001603
-10	138	5319.9938	-0.0001164	5319.9938	-0.0001153	5319.9934	-0.0001248	5319.9935	-0.0001226
	120	5319.9939	-0.0001141	5319.9939	-0.0001154	5319.9932	-0.0001274	5319.9934	-0.0001247
	102	5319.9938	-0.0001161	5319.9939	0.0004106	5319.9935	-0.0001226	5319.9932	-0.0001271
-20	138	5320.0211	0.0003967	5320.0218	0.0004078	5320.0220	0.0004128	5320.0219	0.0004118
	120	5320.0211	0.0003973	5320.0217	0.0004087	5320.0219	0.0004124	5320.0219	0.0004124
	102	5320.0212	0.0003983	5320.0217	0.0004164	5320.0219	0.0004125	5320.0219	0.0004125
-30	138	5320.0221	0.0004162	5320.0222	0.0000404	5320.0221	0.0004163	5320.0222	0.0004168
	120	5320.0222	0.0004166	5320.0021	0.0000404	5320.0221	0.0004161	5320.0222	0.0004167
	102	5320.0222	0.0004164	5320.0021	0.0000404	5320.0221	0.0004158	5320.0222	0.0004167

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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=10Hz) are attached on the following pages.

802.11a OFDM modulation

Channel 1 (5180MHz)

The band edge emission plot on page 49 shows 47.73dBc 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 110.90dBuV/m (Peak), so the maximum field strength in restrict band is 110.90-47.73=63.17dBuV/m which is under 74dBuV/m limit.

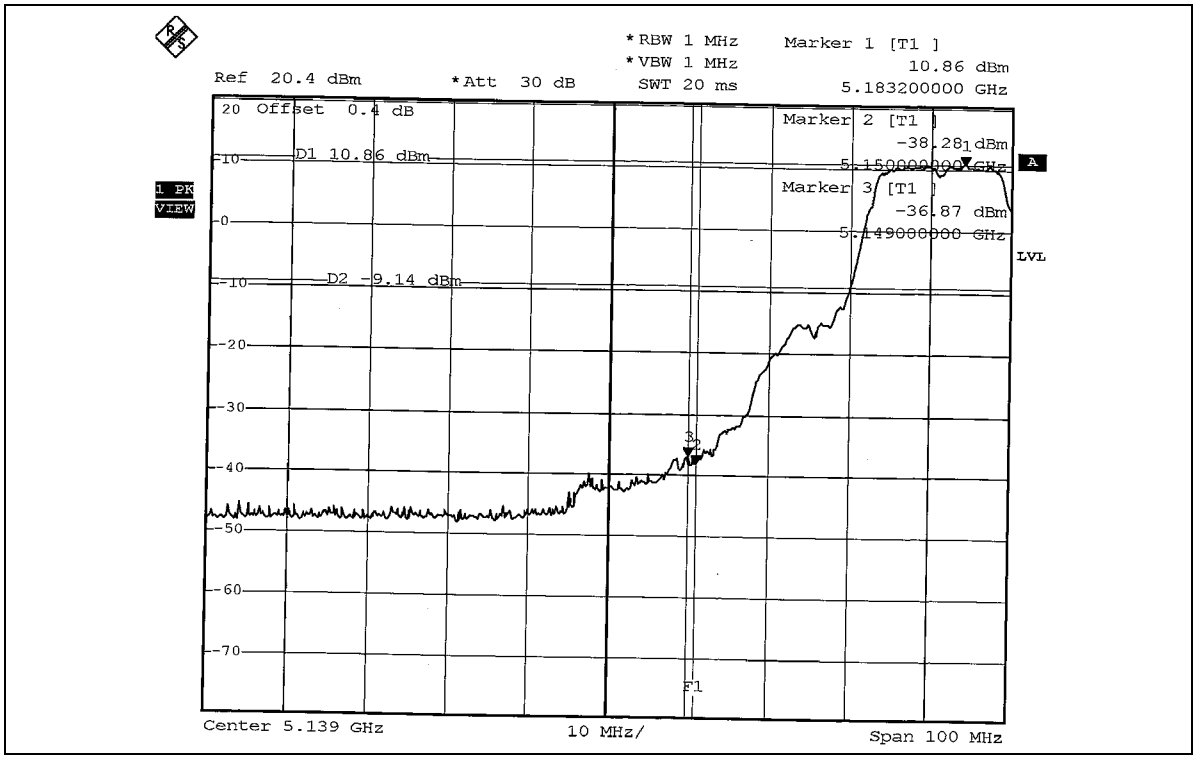
The band edge emission plot on page 49 shows 53.71dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 101.58dBuV/m (Average), so the maximum field strength in restrict band is 101.58-53.71=47.87dBuV/m which is under 54dBuV/m limit.

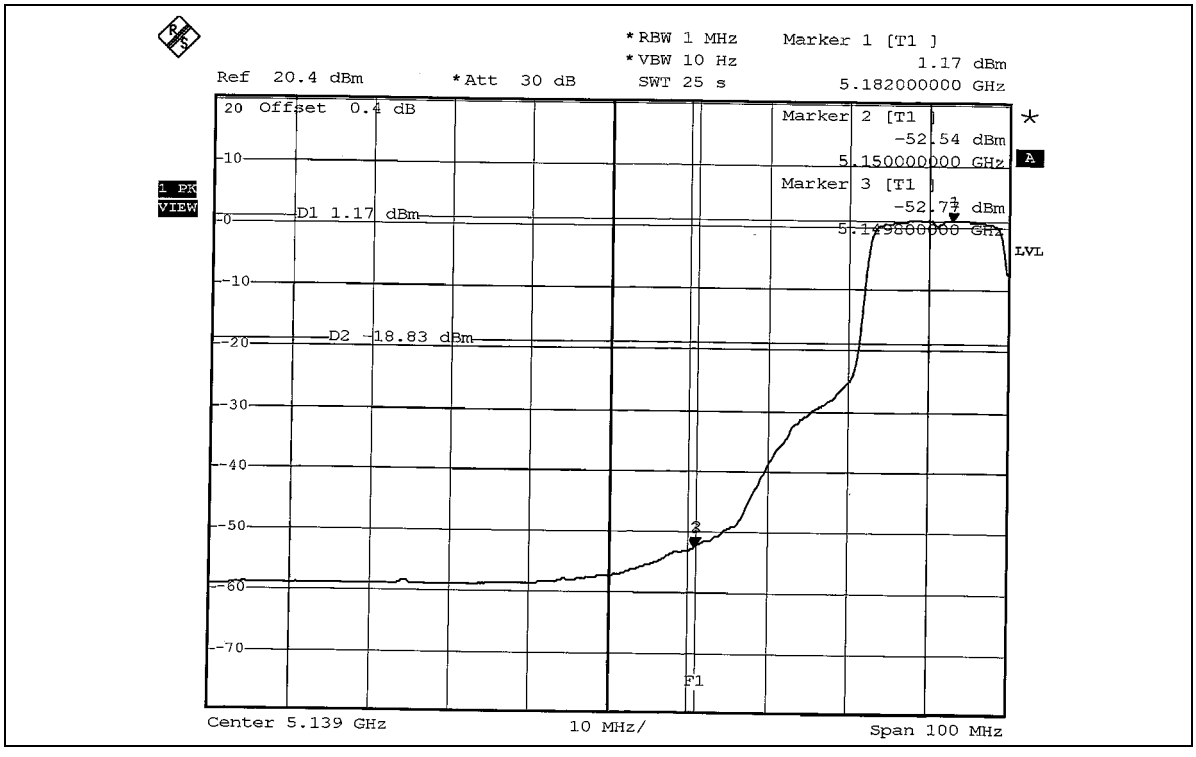
Channel 8 (5320MHz)

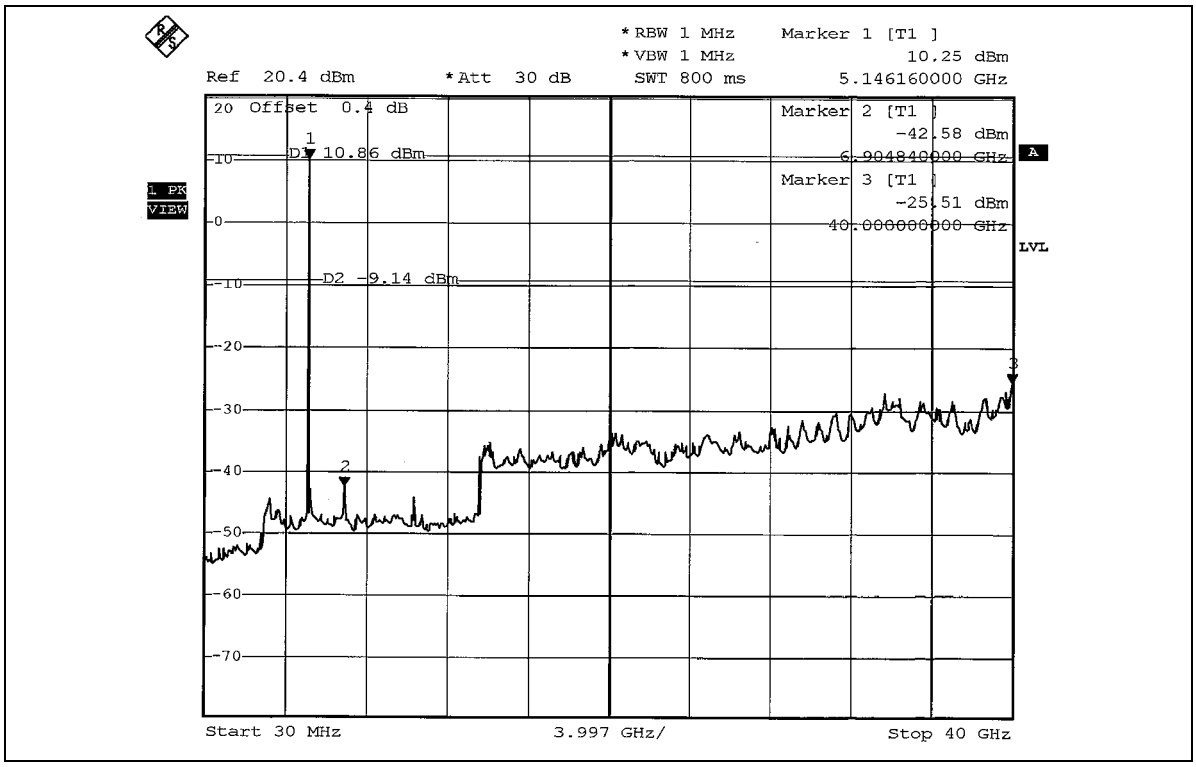
The band edge emission plot on page 50 shows 48.12dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 108.75dBuV/m (Peak), so the maximum field strength in restrict band is 108.75-48.12=60.63dBuV/m which is under 74dBuV/m limit.

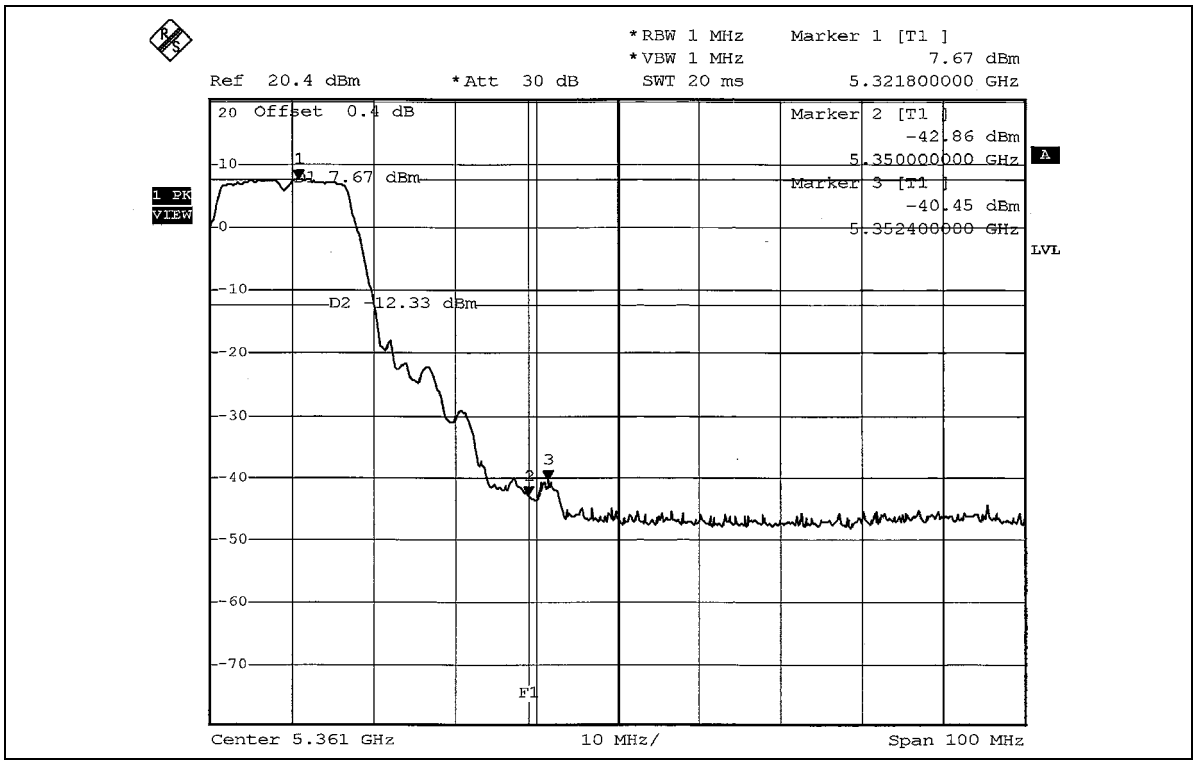
The band edge emission plot on page 51 shows 55.75dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 99.56dBuV/m (Average), so the maximum field strength in restrict band is 99.56-55.75=43.81dBuV/m which is under 54dBuV/m limit.

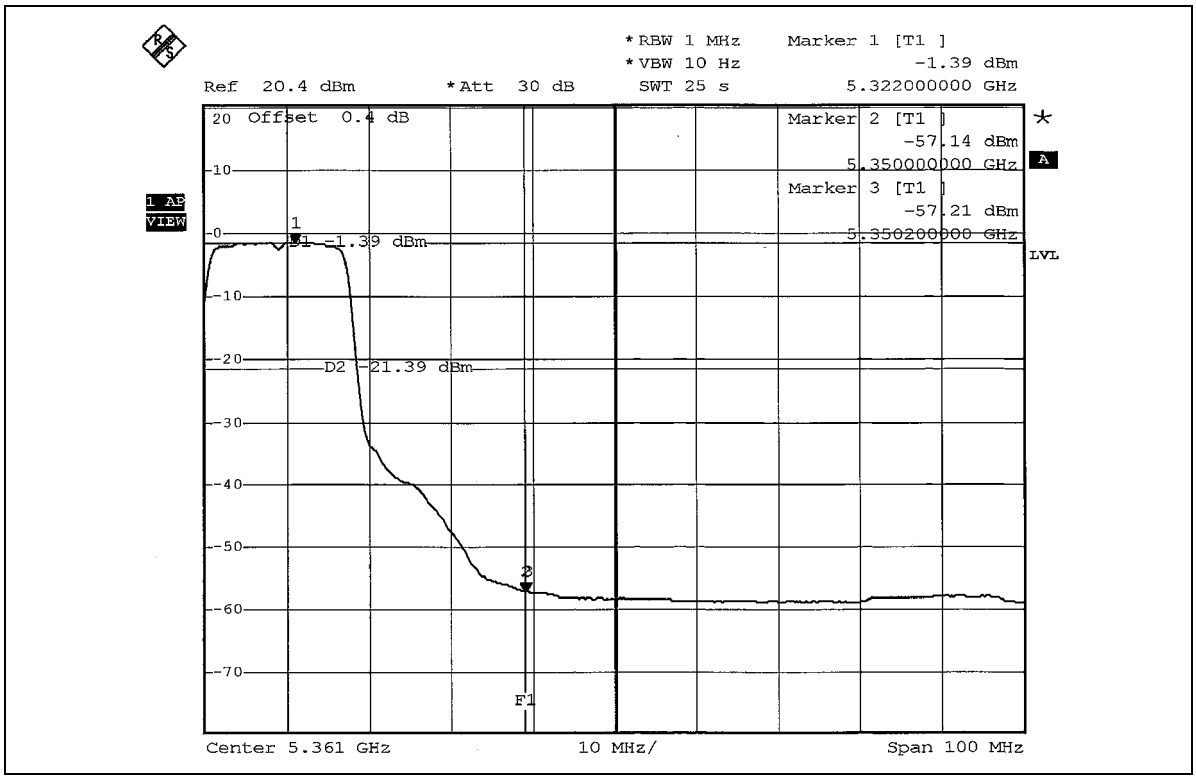
802.11a OFDM modulation

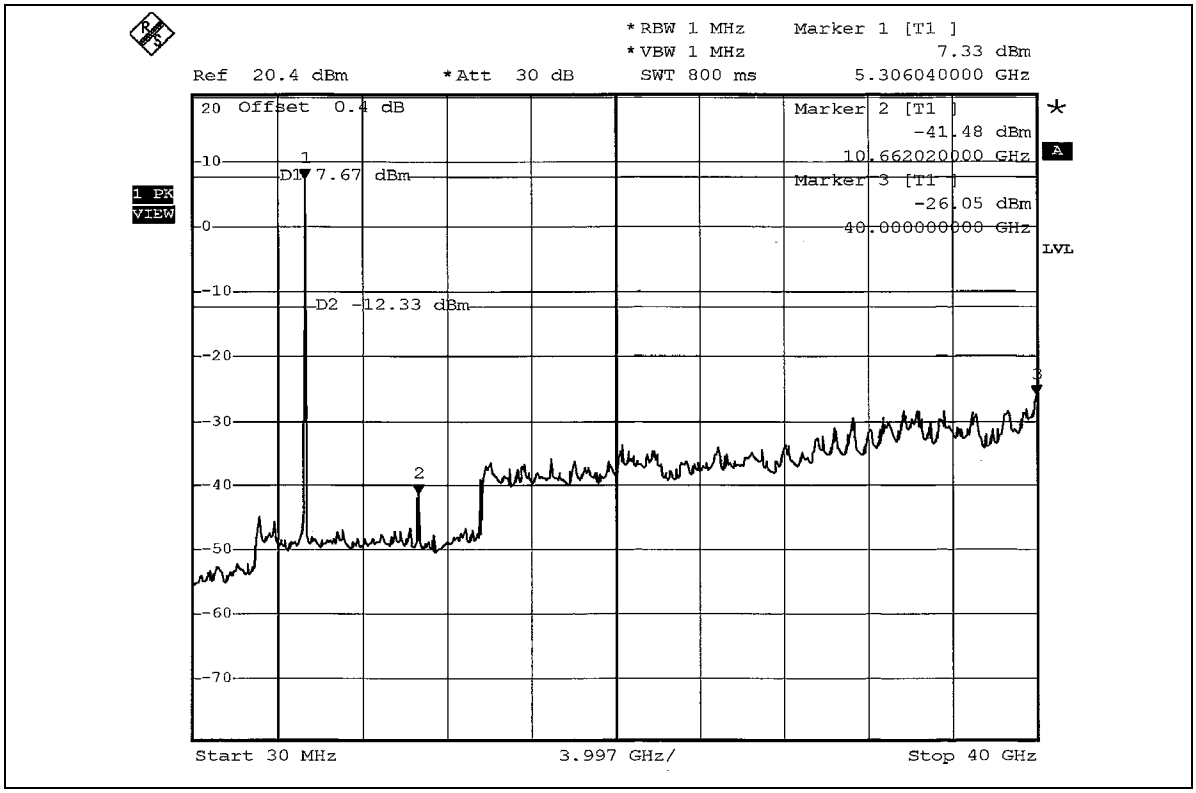





*RBW 1 MHz
*VBW 1 MHz
Ref 20.4 dBm
*Att 30 dB
SWT 800 ms
Marker 1 [T1]
10.25 dBm
5.146160000 GHz
20 Offset 0.4 dB
D1 10.86 dBm
D2 -9.14 dBm
Marker 2 [T1]
-42.58 dBm
6.904840000 GHz
Marker 3 [T1]
-25.51 dBm
40.000000000 GHz
1 PK
VIEW
A
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz


*RBW 1 MHz
*VBW 1 MHz
Ref 20.4 dBm
*Att 30 dB
SWT 20 ms
Marker 1 [T1]
7.67 dBm
5.321800000 GHz
20 Offset 0.4 dB
D1 7.67 dBm
D2 -12.33 dBm
Marker 2 [T1]
-42.86 dBm
5.350000000 GHz
Marker 3 [T1]
-40.45 dBm
5.352400000 GHz
1 PK
VIEW
A
LVL
F1
Center 5.361 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 1 [T1]
-1.39 dBm
5.322000000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 2 [T1]
-57.14 dBm
5.350000000 GHz
Marker 3 [T1]
-57.21 dBm
5.350200000 GHz
1 AP
VIEW
D1 -1.39 dBm
D2 -21.39 dBm
LVL
Center 5.361 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 1 MHz
SWT 800 ms
Marker 1 [T1]
7.33 dBm
5.306040000 GHz
Ref 20.4 dBm
*Att 30 dB
20 Offset 0.4 dB
Marker 2 [T1]
-41.48 dBm
10.662020000 GHz
Marker 3 [T1]
-26.05 dBm
40.000000000 GHz
1 PK
VIEW
D1 7.67 dBm
D2 -12.33 dBm
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz

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.

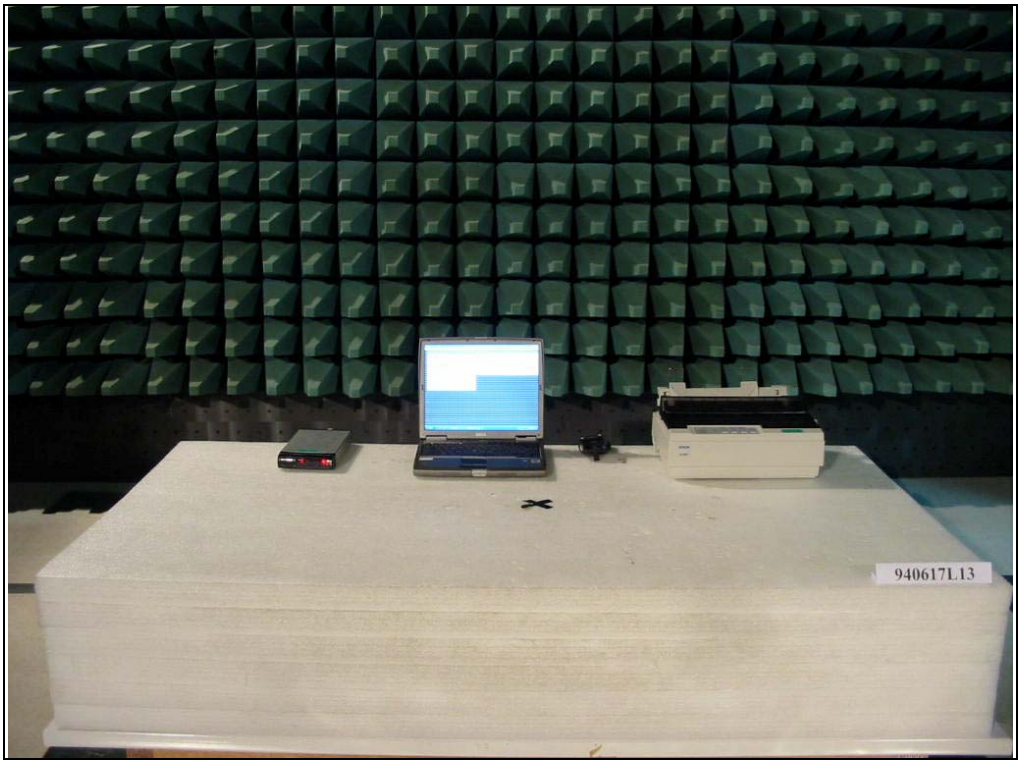
4.8.2 ANTENNA CONNECTED CONSTRUCTION

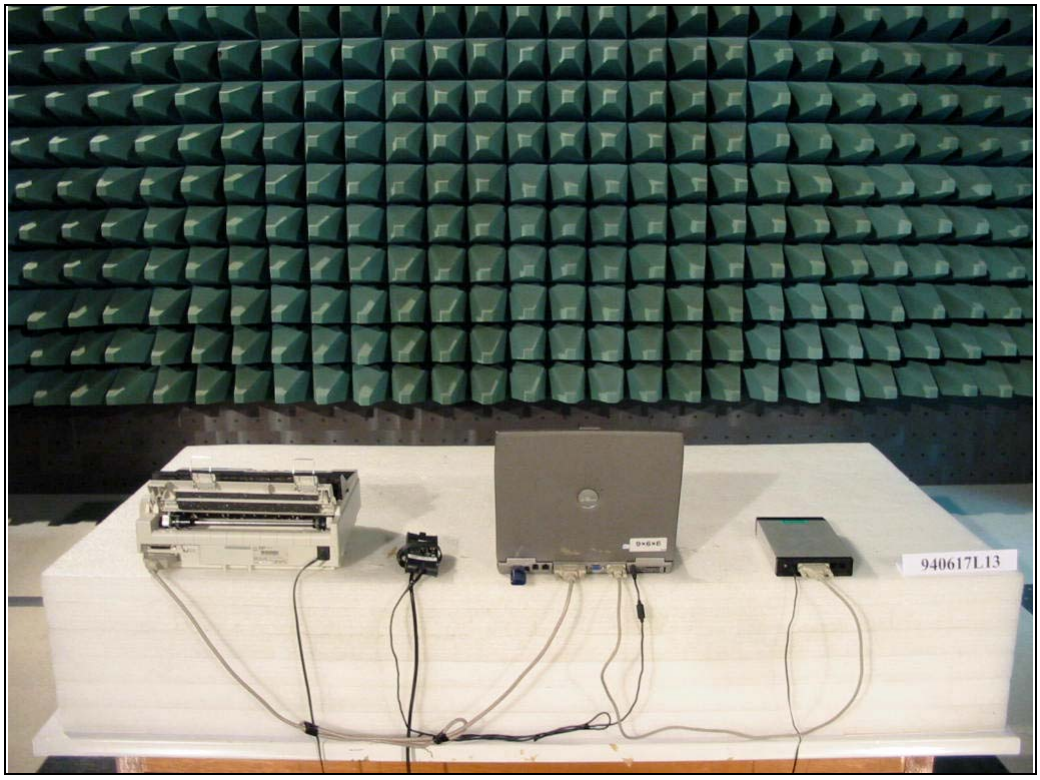
The antenna used in this product is Printed antenna without connector. The maximum Gain of the antenna is 0dBi.

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, NVLAP, 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