FCC TEST REPORT (15.407)

REPORT NO.: RF950518H03A
MODEL NO.: WMP-D16
RECEIVED: March 16, 2007
TESTED: March 22, 2007
ISSUED: March 26, 2007

APPLICANT: Alpha Networks Inc.

ADDRESS: No.8 Li-shing 7th Rd., Science-based Industrial Partk, Hsinchu, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

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

0536

No. 2177-01

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1. CERTIFICATION

PRODUCT:	IEEE802.11a/b/g mini PCI card
BRAND NAME:	Alpha
MODEL NO.:	WMP-D16
TEST SAMPLE:	ENGINEERING SAMPLE
TESTED:	March 22, 2007
APPLICANT:	Alpha Networks Inc.
STANDARDS:	FCC Part 15, Subpart E (Section 15.407) ANSI C63.4-2003

The above equipment (Model: WMP-D16) 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 : Midoli Peng , **DATE:** March 26, 2007
(Midoli Peng)

TECHNICAL ACCEPTANCE : Moris Lin , **DATE:** March 26, 2007
Responsible for RF
(Moris Lin)

APPROVED BY : Hank Chung , **DATE:** March 26, 2007
(Hank Chung, 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/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is –6.24dB at 217.38MHz
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.

NOTE:

1. The EUT was operating in 5.150 ~ 5.250GHz and 5.725 ~ 5.850GHz frequencies band. This report was recorded the RF parameters including 5.150 ~ 5.250GHz. For the 5.725 ~ 5.850GHz RF parameters was recorded in another test report.
2. This report is prepared for FCC class II permissive change. Only radiated emission, Maximum Peak Output Power and Band Edge Measurement were presented in this test report.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	IEEE802.11a/b/g mini PCI card
MODEL NO.	WMP-D16
FCC ID	RRK2005090049-1
POWER SUPPLY	DC 3.3V from host equipment
MODULATION TYPE	64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11a: 54/48/36/24/18/12/9/6Mbps
FREQUENCY RANGE	802.11a: 5.15 ~ 5.25GHz and 5.725 ~ 5.850GHz
NUMBER OF CHANNEL	802.11a: 9
CHANNEL SPACING	802.11a: 20MHz for Normal mode
OUTPUT POWER	For FCC15.247: 87.096mW For FCC15.407: 45.604mW
ANTENNA TYPE	Please see note 1

NOTE:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.:RF950518H03 design is as the following:
   - **u** Cancel Original model of WMP-D18 (with Turbo feature).
   - **u** Cancel Original frequency: 5250MHz-5350MHz.

u Add one antenna for 5GHz. (Only apply 5150MHz-5250MHz & 5725MHz-5850MHz band)

Original Report (Report No.:RF950518H03)						
For 2.4GHz						
No.	Model No.	Gain (dBi)	Antenna Type	Connector		
1	WSS001	2	Dipole	RP-SMA(M)		
2	WPB002-3	4.5	PCB	MHF		
Note: Antenna 1 is connected with Main port of EUT Antenna 2 is connected with AUX port of EUT						
For 5GHz						
No.	Model No.	Gain (dBi)	Cable Loss (dB)	Net Gain (dB)	Antenna Type	Connector
1	SAA04-220080	5	1.8	3.2	Dipole	RP-N plug
Note: Antenna 1 is connected with Main port of EUT						

Add one new antenna
< Only apply 5150MHz-5250MHz & 5725MHz-5850MHz band >

Model No.	Gain (dBi)	Cable Loss (dB)	Net Gain (dB)	Antenna Type	Connector	RF cable
MAF94192	**3**	**0.785**	**2.215**	PIFA	I-PEX MHF	**100 mm**
	3	0.785	2.215			100 mm
	3	1.1	1.9			120 mm
	3	1.5	1.5			160 mm

Note: 1. There will have four conditions for this antenna.
2. The bold type was chose for test.

2. 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 5150MHz ~ 5250MHz bands:

Eight channels are provided to this EUT for normal mode.

Channel	Frequency
1	5180 MHz
2	5200 MHz
3	5220 MHz
4	5240 MHz

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

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

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

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 4	4	OFDM	BPSK	6

Radiated Emission Test (Above 1 GHz):

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 4	1, 4	OFDM	BPSK	6

Bandedge Measurement:

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 4	1, 4	OFDM	BPSK	6

Antenna Port Conducted Measurement:

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	1 to 8	1, 4	OFDM	BPSK	6

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an IEEE802.11a/b/g mini PCI card. 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.

3.4 DESCRIPTION OF SUPPORT UNITS

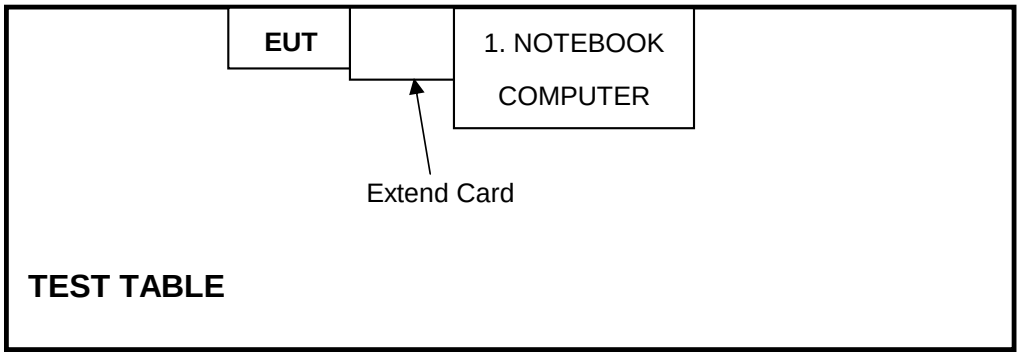
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	HP	HSTNN-S19C	WFY93-WQ98K-BH 87F-KD366-RB773	DoC
2	Extend Card	ADT	NA	NA	NA

No.	Signal cable description
1	NA
2	NA

Note: 1. All power cords of the above support units are unshielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



NOTE: 1. Please refer to the photos of test configuration.

4. TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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:

3. The lower limit shall apply at the transition frequencies.
4. Emission level (dBuV/m) = 20 log Emission level (uV/m).
5. 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.

4.1.2 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)

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	R3271A	85060311	July 03, 2007
HP Pre_Amplifier	8449B	3008A01922	Sep. 18, 2007
ROHDE & SCHWARZ Test Receiver	ESCS30	100375	Sep. 20, 2007
CHASE Broadband Antenna	VULB 9168	138	July 17, 2007
Schwarzbeck Horn_Antenna	BBHA9120	D124	Jan. 01, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 05, 2008
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 08, 2009
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 08, 2009
RF Switches (ARNITSU)	CS-201	1565157	NA
RF CABLE (Chaintek)	SF102	22054-2	Nov. 14. 2007
RF Cable(RICHTEC)	9913-30M N-N Cable	STCCAB-30M-1 GHz	Jul. 15, 2007
Software	ADT_Radiated_V 5.14	NA	NA
CHANCE MOST Antenna Tower	AT-100	0203	NA
CHANCE MOST Turn Table	TT-100	0203	NA

Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Biconical and Periodic Antenna)and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in ADT Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 4824A-3.
7. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Measurement	Value
Radiated emissions (30MHz-1GHz)	3.89 dB
Radiated emissions (1GHz ~18GHz)	2.21 dB
Radiated emissions (18GHz ~40GHz)	1.88 dB

4.1.4 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 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.

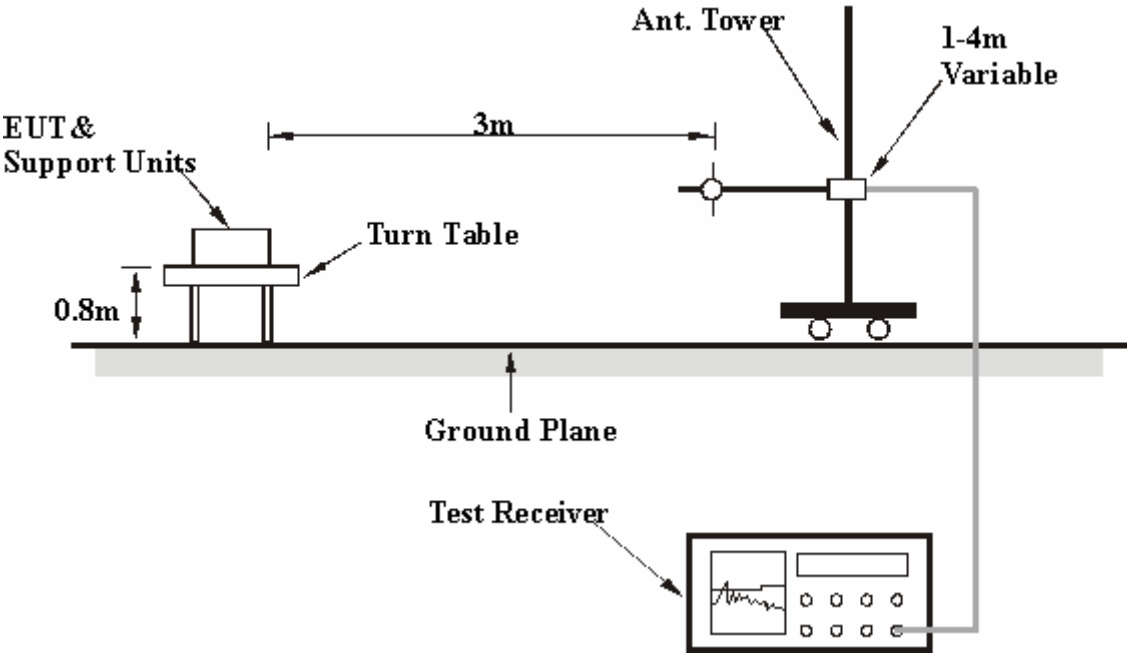
NOTE:

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

4.1.5 DEVIATION FROM TEST STANDARD

No deviation

4.1.6 TEST SETUP



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

4.1.7 EUT OPERATING CONDITION

a. Connect the EUT with the support unit 1 (Notebook computer) which placed on a testing table.

b. The support unit 1 (Notebook computer) ran a test program “Art 52 Build 13” to enable EUT under transmission condition continuously.

4.1.8 TEST RESULTS

Below 1GHz Worst-Case Data

MODE	Channel 4	**FREQUENCY RANGE**	Below 1000MHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	22deg. C, 60%RH, 955hPa	**TESTED BY**	Eric Lee

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	129.52	37.73 QP	43.50	-5.77	1.45 H	20	25.36	12.37
2	193.38	34.96 QP	43.50	-8.54	1.53 H	170	24.07	10.89
3	199.79	33.12 QP	43.50	-10.38	1.25 H	31	21.97	11.15
4	209.88	34.40 QP	43.50	-9.10	1.84 H	231	22.72	11.68
5	**217.38**	**39.76 QP**	**46.00**	**-6.24**	**1.16 H**	**148**	**27.69**	**12.07**
6	268.99	30.91 QP	46.00	-15.09	1.26 H	149	15.70	15.21
7	301.00	34.88 QP	46.00	-11.12	1.09 H	344	18.88	16.00
8	368.88	34.48 QP	46.00	-11.52	1.49 H	268	16.92	17.56
9	399.99	29.31 QP	46.00	-16.69	1.58 H	184	10.61	18.70
10	426.88	34.47 QP	46.00	-11.53	1.24 H	0	15.56	18.91

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	114.62	36.81 QP	43.50	-6.69	1.29 V	240	24.73	12.08
2	118.92	34.14 QP	43.50	-9.36	1.52 V	95	21.93	12.21
3	133.49	37.01 QP	43.50	-6.49	1.00 V	4	24.58	12.43
4	199.74	32.19 QP	43.50	-11.31	1.67 V	20	21.05	11.14
5	229.00	34.93 QP	46.00	-11.07	1.36 V	233	22.24	12.69
6	231.38	39.18 QP	46.00	-6.82	1.36 V	178	26.37	12.81
7	267.01	31.19 QP	46.00	-14.81	1.31 V	145	16.06	15.13
8	280.00	35.25 QP	46.00	-10.75	1.37 V	89	19.76	15.49
9	339.30	37.71 QP	46.00	-8.29	1.29 V	253	21.04	16.67
10	420.80	35.48 QP	46.00	-10.52	1.08 V	20	16.61	18.87

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

MODE	Channel 1	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 60%RH, 955hPa	**TESTED BY**	Eric Lee

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	3453.00	47.56 PK	68.30	-20.74	1.02 H	56	14.71	32.85
3	#5147.40	48.82 PK	74.00	-25.18	1.45 H	236	11.23	37.59
4	#5147.40	38.35 AV	54.00	-15.65	1.45 H	236	0.76	37.59
5	#5150.00	49.10 PK	74.00	-24.90	1.52 H	256	11.51	37.59
6	#5150.00	36.24 AV	54.00	-17.76	1.52 H	256	-1.35	37.59
7	5180.00	101.02 PK			1.23 H	321	63.38	37.64
8	5180.00	92.84 AV			1.23 H	321	55.20	37.64
9	10360.00	40.24 PK	68.30	-28.06	1.45 H	55	-5.85	46.09

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	3453.00	49.53 PK	68.30	-18.77	1.02 V	360	16.68	32.85
3	#5147.40	55.78 PK	74.00	-18.22	1.54 V	256	18.19	37.59
4	#5147.40	44.48 AV	54.00	-9.52	1.54 V	256	6.89	37.59
5	#5150.00	55.48 PK	74.00	-18.52	1.25 V	246	17.89	37.59
6	#5150.00	42.01 AV	54.00	-11.99	1.25 V	246	4.42	37.59
7	*5180.00	107.58 PK			2.69 V	228	69.94	37.64
8	*5180.00	98.61 AV			2.69 V	228	60.97	37.64
9	10360.00	42.24 PK	68.30	-26.06	1.56 V	65	-3.85	46.09

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.

MODE	Channel 4	**FREQUENCY RANGE**	1 ~ 40 GHz
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 60%RH, 955hPa	**TESTED BY**	Eric Lee

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	3493.30	48.30 PK	68.30	-20.00	1.33 H	63	14.95	33.35
3	*5240.00	100.15 PK			1.34 H	56	63.36	36.79
4	*5240.00	92.07 AV			1.34 H	56	55.28	36.79
5	10480.00	42.20 PK	68.30	-26.10	1.54 H	24	-3.53	45.73

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	3493.30	49.41 PK	68.30	-18.89	1.11 V	230	16.50	32.91
3	*5240.00	106.92 PK			1.54 V	78	69.22	37.70
4	*5240.00	97.87 AV			1.54 V	78	60.17	37.70
5	10480.00	43.23 PK	68.30	-25.07	1.02 V	136	-2.96	46.19

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.

4.2 PEAK TRANSMIT POWER MEASUREMENT

4.2.1 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.

4.2.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 15, 2007

NOTE:

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

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

4.2.3 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 300kHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

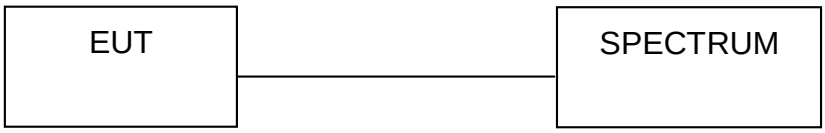
NOTE:
The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



4.2.6 EUT OPERATING CONDITIONS

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

4.2.7 TEST RESULTS

802.11a OFDM modulation

MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg.C, 62%RH, 955hPa
TESTED BY	Wen Yu		

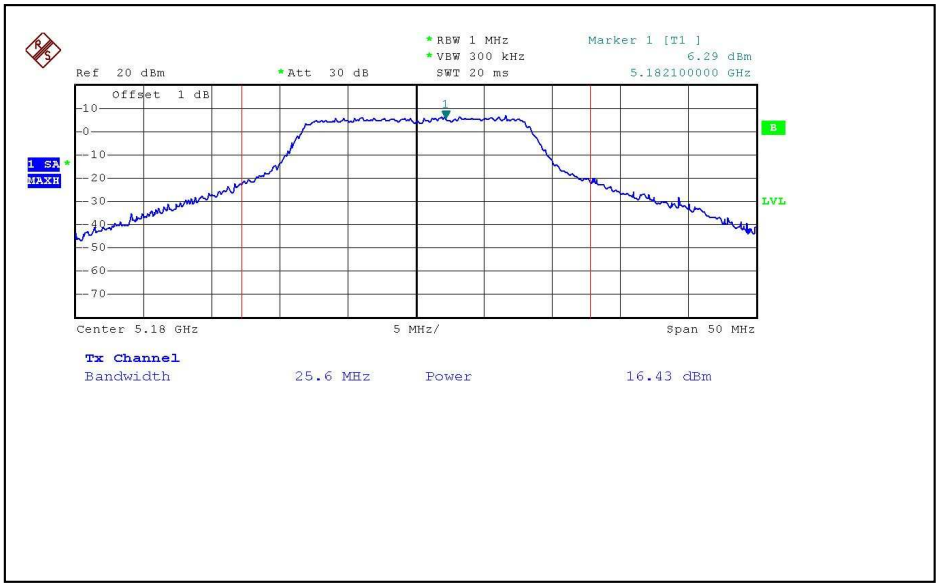
Antenna (Gain : 3 dBi) +Cable loss (0.785dB)

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	16.43	17	25.6	PASS
4	5240	16.59	17	25.4	PASS

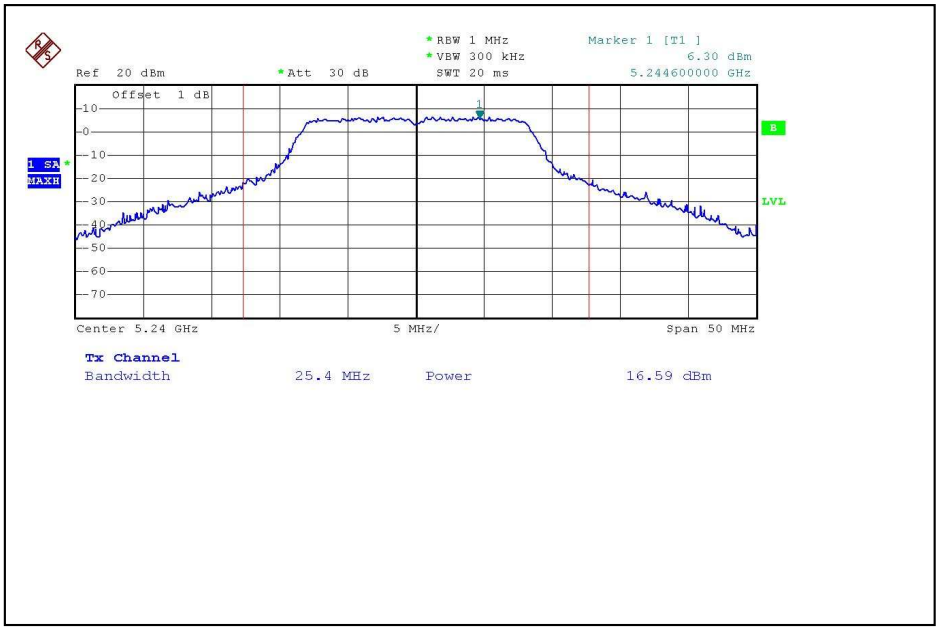
NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output:

CH1

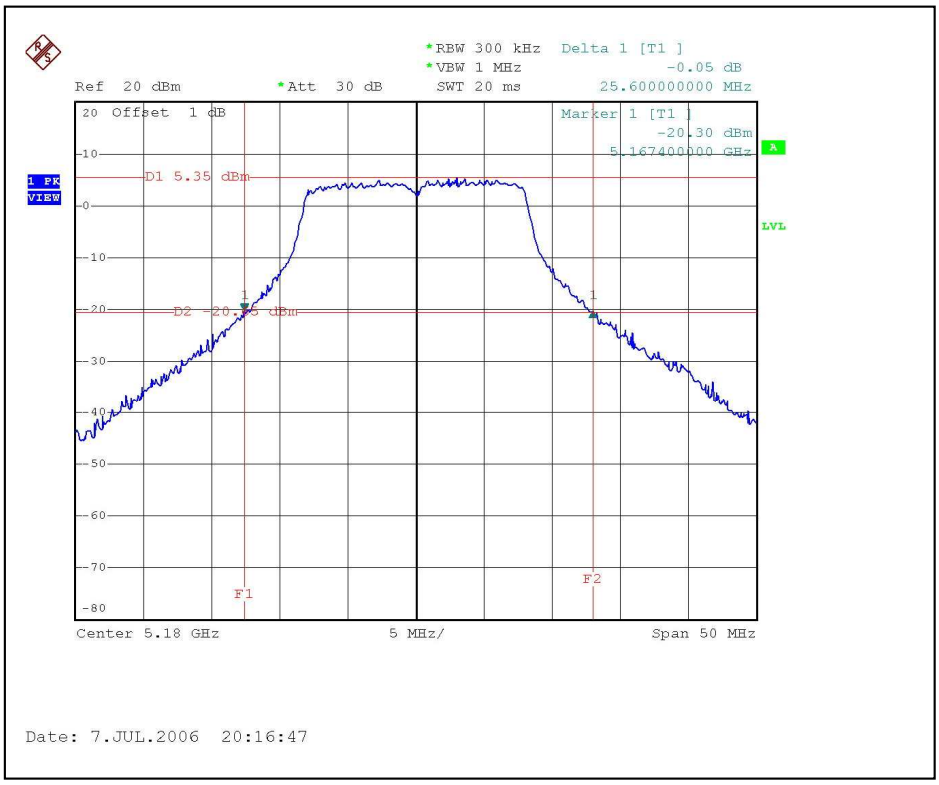


CH4

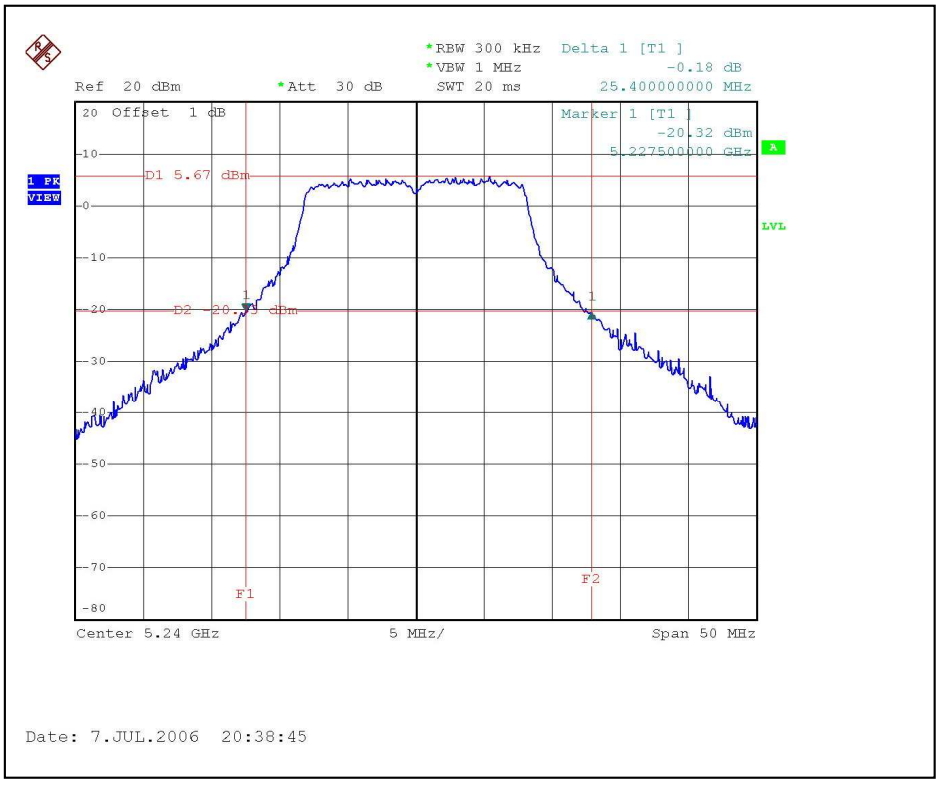


26dB Occupied Bandwidth:

CH1



CH4



4.3 BAND EDGES MEASUREMENT

4.3.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 15, 2007

NOTE:

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

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

4.3.2 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.

4.3.3 EUT OPERATING CONDITION

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

4.3.4 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

NOTE (Peak):

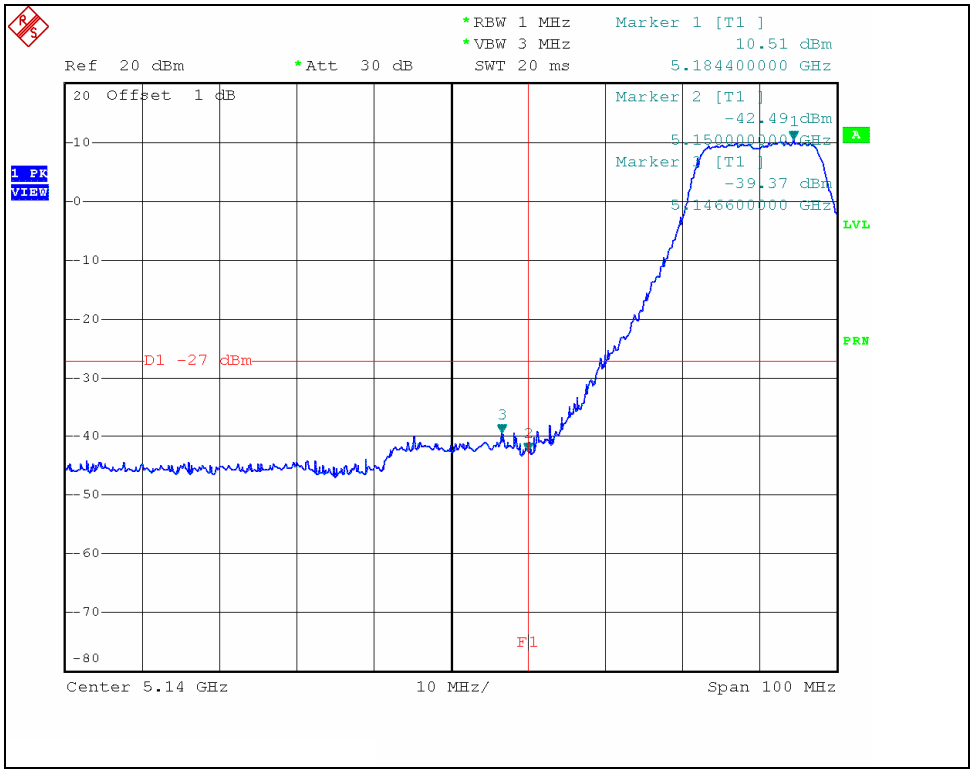
The band edge emission plot on the following first page shows 42.49dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 107.58dBuV/m (Peak), so the maximum field strength in restrict band is 107.58-42.49=65.09dBuV/m which is under 74dBuV/m limit.

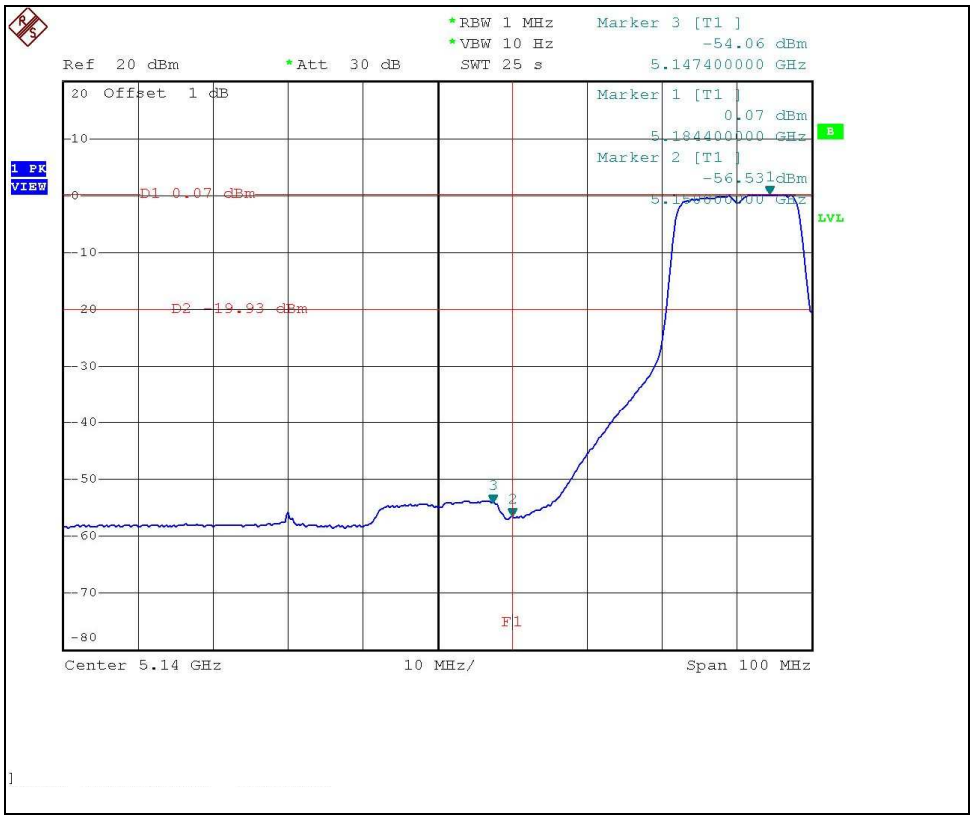
NOTE (Average):

The band edge emission plot on the following second page shows 54.13dBc 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 98.61dBuV/m (Average), so the maximum field strength in restrict band is 98.61-54.13=44.48dBuV/m which is under 54dBuV/m limit.

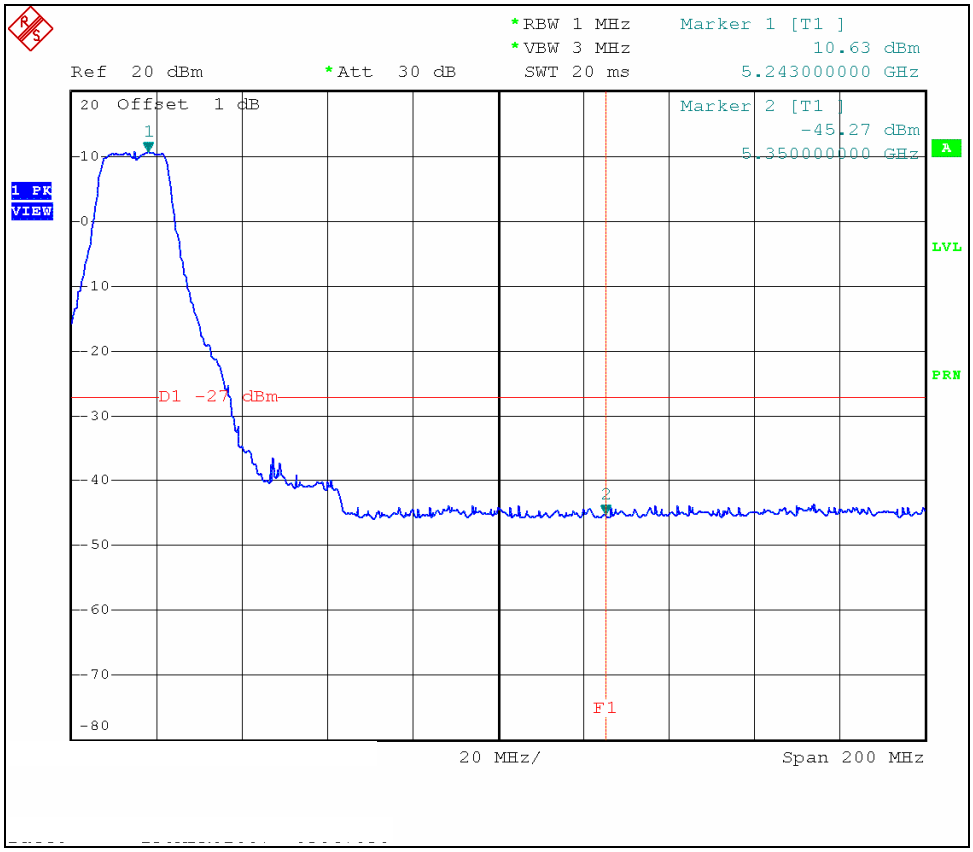
802.11a OFDM modulation

CH1

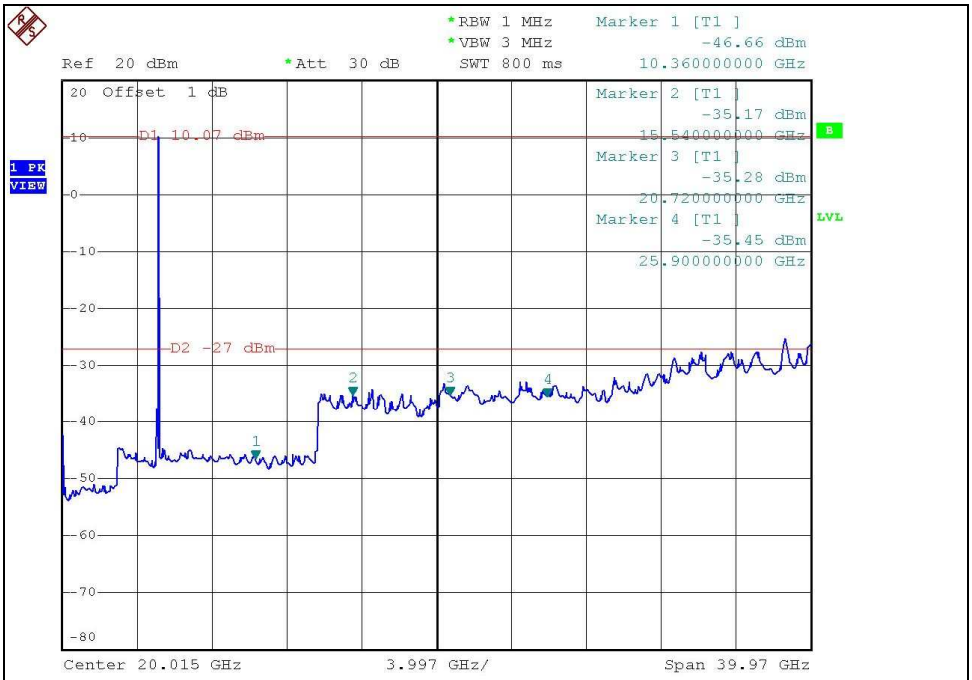




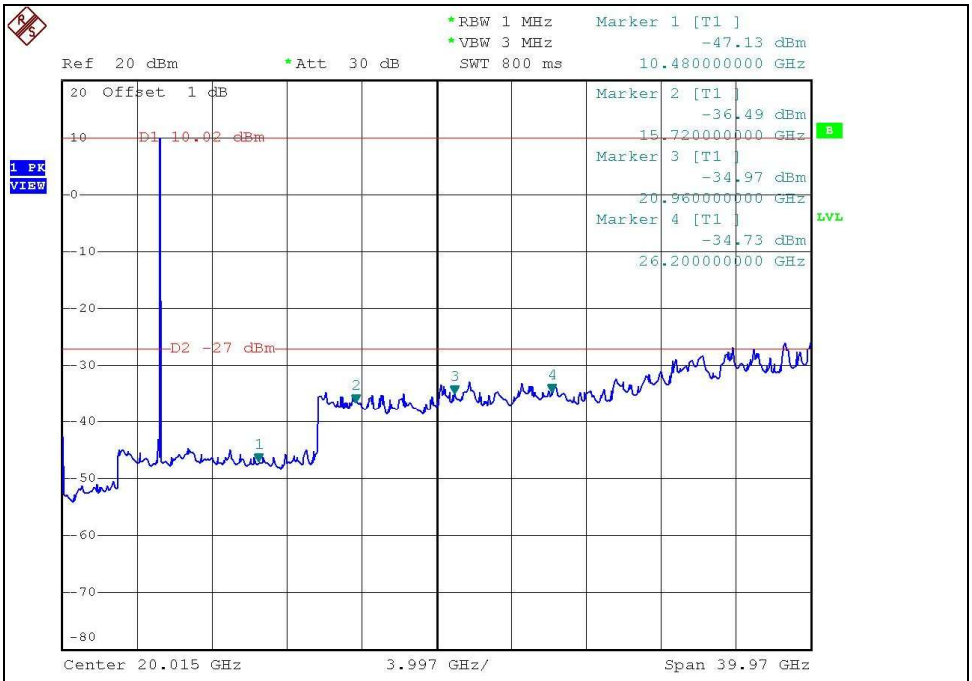
CH4


*RBW 1 MHz
*VBW 3 MHz
Ref 20 dBm
*Att 30 dB
SWT 20 ms
Marker 1 [T1]
10.63 dBm
5.243000000 GHz
Marker 2 [T1]
-45.27 dBm
5.350000000 GHz
20 Offset 1 dB
1 PK
VIEW
A
LVL
PRN
D1 -27 dBm
F1
20 MHz/
Span 200 MHz

CH 1


*RBW 1 MHz
*VBW 3 MHz
SWT 800 ms
Marker 1 [T1]
-46.66 dBm
10.360000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 10.07 dBm
D2 -27 dBm
Marker 2 [T1]
-35.17 dBm
15.540000000 GHz
Marker 3 [T1]
-35.28 dBm
20.720000000 GHz
Marker 4 [T1]
-35.45 dBm
25.900000000 GHz
1 PK VIEW
B
LVL
Center 20.015 GHz
3.997 GHz/
Span 39.97 GHz
Date: 21.MAR.2007 16:43:49

CH 4


*RBW 1 MHz
*VBW 3 MHz
SWT 800 ms
Marker 1 [T1]
-47.13 dBm
10.480000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
D1 10.02 dBm
D2 -27 dBm
Marker 2 [T1]
-36.49 dBm
15.720000000 GHz
Marker 3 [T1]
-34.97 dBm
20.960000000 GHz
Marker 4 [T1]
-34.73 dBm
26.200000000 GHz
1 PK VIEW
B
LVL
Center 20.015 GHz
3.997 GHz/
Span 39.97 GHz
Date: 21.MAR.2007 16:41:45

4.4 ANTENNA REQUIREMENT

4.4.1 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.

4.4.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is as following:

Model No.	Gain (dBi)	Cable Loss (dB)	Net Gain (dB)	Antenna Type	Connector
MAF94192	3	0.785	2.215	PIFA	I-PEX MHF

5. INFORMATION ON THE TESTING LABORATORIES

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

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	CNLA, BSMI, NCC
Netherlands	Telefication
Singapore	PSB , GOST-ASIA(MOU)
Russia	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

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

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

Web Site: www.adt.com.tw

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

APPENDIX-A

MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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