



# FCC TEST REPORT (15.407)

**REPORT NO.:** RF970216L05-2

**MODEL NO.:** MC7598

**RECEIVED:** Feb. 17, 2008

**TESTED:** Feb. 20 ~ Feb. 27, 2008

**ISSUED:** Feb. 29, 2008

**APPLICANT:** Symbol Technologies, Inc.

**ADDRESS:** One Symbol Plaza, Holtsville, NY  
11742-1300 USA

**ISSUED BY:** Advance Data Technology Corporation

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

**TEST LOCATION:** No. 19, Hwa Ya 2<sup>nd</sup> Rd., Kwei Shan Hsiang,  
Taoyuan Hsien 333, Taiwan, R.O.C.

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## 1. CERTIFICATION

**PRODUCT:** EDA (Enterprise Digital Assistant)

**MODEL:** MC7598

**BRAND:** Symbol

**APPLICANT:** Symbol Technologies, Inc.

**TESTED:** Feb. 20 ~ Feb. 27, 2008

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** FCC Part 15, Subpart E (Section 15.407)

ANSI C63.4-2003

The above equipment (Model: MC7598) 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** : Peggy Chen , **DATE:** Feb. 29, 2008  
Peggy Chen / Specialist

**TECHNICAL ACCEPTANCE** : Long Chen , **DATE:** Feb. 29, 2008  
Responsible for RF Long Chen / Senior Engineer

**APPROVED BY** : Gary Chang , **DATE:** Feb. 29, 2008  
Gary Chang / Assistant 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 AND LIMIT	RESULT	REMARK
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -14.54dB at 0.150MHz.
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 -8.19dB at 11200.00MHz.
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 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	2.93 dB
	200MHz ~1000MHz	2.95 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	EDA (Enterprise Digital Assistant)
<b>MODEL NO.</b>	MC7598
<b>FCC ID</b>	H9PMC7598
<b>POWER SUPPLY</b>	3.7Vdc from rechargeable lithium battery 5.4Vdc from power adapter
<b>MODULATION TYPE</b>	<b>Wireless LAN:</b> CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM <b>Bluetooth:</b> GFSK, $\pi/4$ -DQPSK, 8DPSK <b>GPS:</b> C/A code
<b>MODULATION TECHNOLOGY</b>	<b>Wireless LAN:</b> DSSS, OFDM <b>Bluetooth:</b> FHSS
<b>TRANSFER RATE</b>	<b>Wireless LAN:</b> 802.11b: 11, 5.5, 2, 1Mbps 802.11g: up to 54Mbps 802.11a: 54, 48, 36, 24, 18, 12, 9, 6Mbps <b>Bluetooth:</b> 1/2/3Mbps <b>GPS:</b> 50 bps
<b>FREQUENCY RANGE</b>	<b>Wireless LAN:</b> 2.4GHz: 2400 ~ 2483.5MHz 5.0GHz: 5150 ~ 5350MHz & 5470 ~ 5725MHz & 5725 ~ 5850MHz <b>Bluetooth:</b> 2402 ~ 2480MHz <b>GPS:</b> 1575.42 MHz
<b>NUMBER OF CHANNEL</b>	<b>Wireless LAN:</b> <b>2.4GHz:</b> 11 for 802.11b, 802.11g <b>5.0GHz:</b> 5150 ~ 5350MHz: 8 for 802.11a 5470 ~ 5725MHz: 11 for 802.11a 5725 ~ 5850MHz: 5 for 802.11a <b>Bluetooth:</b> 79 <b>GPS:</b> 1
<b>OUTPUT POWER</b>	<b>Wireless LAN:</b> 101.39mW for 2400 ~ 2483.5MHz 16.41mW for 5150 ~ 5350MHz 26.55mW for 5470 ~ 5725MHz 80.54mW for 5725 ~ 5850MHz <b>Bluetooth:</b> 1.82mW



<b>ANTENNA TYPE(S)</b>	<b>Wireless LAN:</b> Inverted F antenna Planar inverted antenna <b>Bluetooth:</b> Chip antenna		
<b>MAX. ANTENNA GAIN</b>	<b>2.4GHz:</b> 2.5dBi	<b>5.0GHz:</b> 3.5dBi	<b>Bluetooth:</b> -1.5dBi
<b>DATA CABLE</b>	NA		
<b>I/O PORTS</b>	Refer to user's manual		
<b>ACCESSORY DEVICES</b>	NA		

**NOTE:**

1. The models as identified below are identical to each other except of the following options:

- Keypad: Numeric / QWERTY
- Barcode reader: 1D laser scanner / 2D Imager

BRAND	MODEL	DESCRIPTION
Symbol	MC7598	EVDO 1D Numeric
<b>Symbol</b>	<b>MC7598</b>	<b>EVDO 2D QWERTY</b>

\*\*the worst case had been marked by boldface.

2. The EUT is an EDA (Enterprise Digital Assistant). The functions of EUT listed as below:

	TEST STANDARD	REFERENCE REPORT
<b>WLAN 802.11a/b/g</b> (802.11a follows standard 15.247)	FCC Part 15	RF970216L05
<b>WLAN 802.11a</b> (follows standard 15.407)		RF970216L05-2
<b>BLUETOOTH</b>		RF970216L05-3
<b>GSM 850 / WCDMA 850</b>	FCC Part 22	RF970216L05-1
<b>PCS 1900 / WCDMA 1900</b>	FCC Part 24	RF970216L05-4

3. The EUT has one lithium battery listed as below:

LI-LON BATTERY	
<b>BRAND:</b>	MOTOROLA
<b>MODEL:</b>	82-71364-05 Rev A
<b>RATING:</b>	3.7Vdc, 3600mAh

4. The following accessories are for support units only.

PRODUCT	BRAND	MODEL	DESCRIPTION
RS232 charging cable	Motorola	25-102776-01R	1.2m non-shielded cable with one core
USB charging cable	Motorola	25-102775-01R	1.5m shielded cable with one core
Headset	Motorola	50-11300-050R	VR10 headset 0.8m non-shielded cable with one core
Power Supply Adaptor	Motorola	EADP-16BB A	I/P: 100-240Vac, 50-60Hz, 0.4A O/P: 5.4Vdc, 3A 1.8m non-shielded cable without core



5. The EUT operates in both the 5GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.
6. The EUT operates in the 2.4GHz/5GHz frequency spectrum with throughput of up to 54Mbps.
7. The above EUT information was declared by 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 ~ 5350MHz

8 channels are provided to this EUT.

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

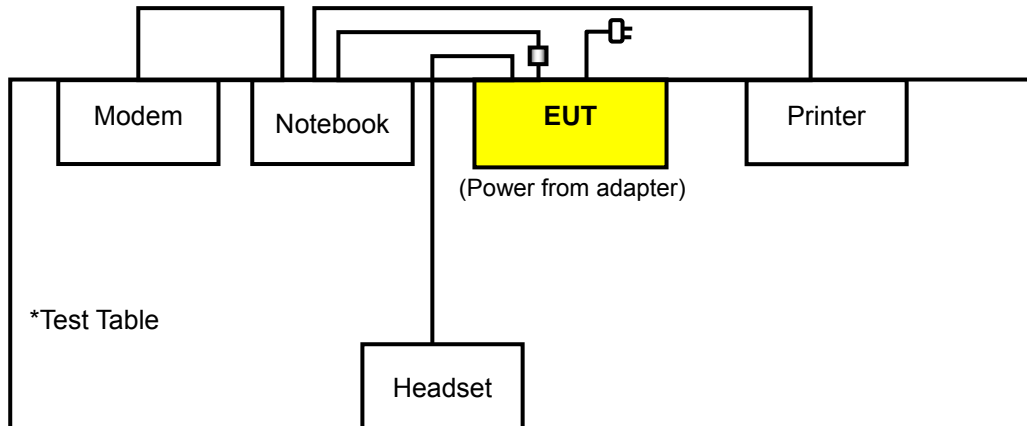
#### Operated in 5470 ~ 5725MHz:

11 channels are provided to this EUT.

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	5500 MHz	7	5620 MHz
2	5520 MHz	8	5640 MHz
3	5540 MHz	9	5660 MHz
4	5560 MHz	10	5680 MHz
5	5580 MHz	11	5700 MHz
6	5600 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
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

**RE<1G**: Radiated Emission below 1GHz

**PLC**: Power Line Conducted Emission

**APCM**: Antenna Port Conducted Measurement

#### **RADIATED EMISSION TEST (ABOVE 1GHz):**

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

MODE	FREQ. BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
802.11a	5150-5350	1 to 8	1, 2, 4, 5, 7, 8	OFDM	BPSK	6.0	Z
802.11a	5470-5725	1 to 11	1, 6, 11	OFDM	BPSK	6.0	Z

#### **RADIATED EMISSION TEST (BELOW 1GHz):**

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

MODE	FREQ. BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
802.11a	5150-5350	1 to 8	8	OFDM	BPSK	6.0	Z
802.11a	5470-5725	1 to 11	6	OFDM	BPSK	6.0	Z



**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	FREQ. BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5150-5350	1 to 8	8	OFDM	BPSK	6.0
802.11a	5470-5725	1 to 11	6	OFDM	BPSK	6.0

**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	FREQ. BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5150-5350	1 to 8	1, 8	OFDM	BPSK	6.0
802.11a	5470-5725	1 to 11	1, 11	OFDM	BPSK	6.0

**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	FREQ. BAND	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5150-5350	1 to 8	1, 2, 4, 5, 7, 8	OFDM	BPSK	6.0
802.11a	5470-5725	1 to 11	1, 6, 11	OFDM	BPSK	6.0



### 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	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054011	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008253	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.2m shielded USB cable with one core.
2	1.8m braid shielded wire, DB25 connector, w/o core.
3	1.2m braid shielded wire, DB25 & DB9 connector, w/o core.

**NOTE 1:** All power cords of the above support units are non shielded (1.8m).

**NOTE 2:** The 1.2m USB cable with one core was supplied from client, only for test.

## 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:**

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.

#### 4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

FREQUENCIES (MHz)	EIRP LIMIT (dBm)		EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m) *NOTE 3	
	PK	AV	PK	AV
5150 ~ 5250	-7	-27	88.3	68.3
5250 ~ 5350	-7	-27	88.3	68.3
5470 ~ 5725	-7	-27	88.3	68.3

**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:

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

#### 4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Jul. 27, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Aug. 05, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-153	Jan. 03, 2009
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-563	Jul. 30, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 06, 2009
Preamplifier Agilent	8449B	3008A01910	Sep. 19, 2008
Preamplifier Agilent	8447D	2944A10638	Dec. 19, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274039/223650	Nov. 07, 2008
RF signal cable Worken	8D-FB	Cable-HYCH9-01	Aug. 09, 2008
Software	ADT_Radiated_V7.6	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA
Turn Table EMCO	2087-2.03	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	07026401	Apr. 23, 2008

- 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 9.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC3789B-9.

#### 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 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.

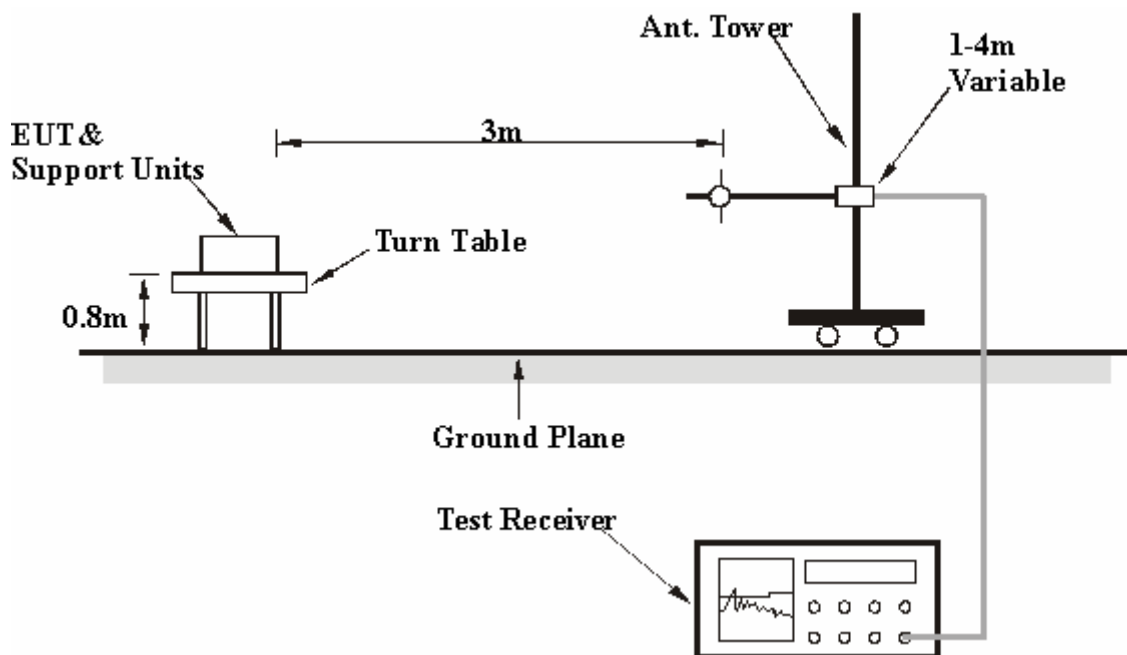
**NOTE:**

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 of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.5 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.6 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.7 EUT OPERATING CONDITION

- Connected the EUT to a notebook via a USB cable and placed on a testing table.
- The notebook system run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The necessary accessories enable the system in full functions.





#### 4.1.8 TEST RESULTS

##### ABOVE 1GHz DATA:

##### FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	#5150.00	58.98 PK	74.00	-15.02	1.23 H	208	20.39	38.59
2	#5150.00	39.46 AV	54.00	-14.54	1.23 H	208	0.87	38.59
3	*5180.00	100.80 PK			1.23 H	208	62.16	38.64
4	*5180.00	90.21 AV			1.23 H	208	51.57	38.64
5	10360.00	57.46 PK	88.30	-30.84	1.10 H	18	8.76	48.70
6	10360.00	44.53 AV	68.30	-23.77	1.10 H	18	-4.17	48.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5150.00	57.83 PK	74.00	-16.17	1.21 V	202	19.24	38.59
2	#5150.00	40.95 AV	54.00	-13.05	1.21 V	202	2.36	38.59
3	*5180.00	103.06 PK			1.21 V	202	64.42	38.64
4	*5180.00	92.38 AV			1.21 V	202	53.74	38.64
5	10360.00	57.95 PK	88.30	-30.35	1.05 V	34	9.25	48.70
6	10360.00	44.28 AV	68.30	-24.02	1.05 V	34	-4.42	48.70

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 2	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5220.00	100.32 PK			1.21 H	203	61.63	38.69
2	*5220.00	89.85 AV			1.21 H	203	51.16	38.69
3	#10440.00	57.81 PK	88.30	-30.49	1.00 H	129	8.92	48.89
4	#10440.00	43.82 AV	68.30	-24.48	1.00 H	129	-5.07	48.89
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	*5220.00	103.41 PK			1.19 V	210	64.72	38.69
2	*5220.00	93.12 AV			1.19 V	210	54.43	38.69
3	#10440.00	57.23 PK	88.30	-31.07	1.03 V	16	8.34	48.89
4	#10440.00	44.85 AV	68.30	-23.45	1.03 V	16	-4.04	48.89

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5240.00	100.36 PK			1.21 H	206	61.65	38.71
2	*5240.00	89.82 AV			1.21 H	206	51.11	38.71
3	10480.00	58.24 PK	88.30	-30.06	1.01 H	26	9.23	49.01
4	10480.00	44.21 AV	68.30	-24.09	1.01 H	26	-4.80	49.01
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	103.82 PK			1.19 V	205	65.11	38.71
2	*5240.00	93.29 AV			1.19 V	205	54.58	38.71
3	10480.00	57.36 PK	88.30	-30.94	1.14 V	23	8.35	49.01
4	10480.00	44.92 AV	68.30	-23.38	1.14 V	23	-4.09	49.01

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 5	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5260.00	100.45 PK			1.21 H	208	61.73	38.72
2	*5260.00	89.92 AV			1.21 H	208	51.20	38.72
3	10520.00	58.36 PK	88.30	-29.94	1.05 H	224	9.24	49.12
4	10520.00	44.35 AV	68.30	-23.95	1.05 H	224	-4.77	49.12
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	103.81 PK			1.19 V	209	65.09	38.72
2	*5260.00	93.35 AV			1.19 V	209	54.63	38.72
3	10520.00	57.36 PK	88.30	-30.94	1.05 V	233	8.24	49.12
4	10520.00	45.11 AV	68.30	-23.19	1.05 V	233	-4.01	49.12

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5300.00	100.26 PK			1.20 H	209	61.50	38.76
2	*5300.00	89.81 AV			1.20 H	209	51.05	38.76
3	#10600.00	58.24 PK	74.00	-15.76	1.02 H	142	8.94	49.30
4	#10600.00	44.21 AV	54.00	-9.79	1.02 H	142	-5.09	49.30
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	*5300.00	103.68 PK			1.18 V	205	64.92	38.76
2	*5300.00	93.29 AV			1.18 V	205	54.53	38.76
3	#10600.00	57.96 PK	74.00	-16.04	1.19 V	38	8.66	49.30
4	#10600.00	44.68 AV	54.00	-9.32	1.19 V	38	-4.62	49.30

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 8	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5320.00	100.12 PK			1.20 H	211	61.34	38.78
2	*5320.00	89.63 AV			1.20 H	211	50.85	38.78
3	#5350.00	60.24 PK	74.00	-13.76	1.20 H	211	21.43	38.81
4	#5350.00	40.06 AV	54.00	-13.94	1.20 H	211	1.25	38.81
5	#10640.00	58.36 PK	74.00	-15.64	1.15 H	96	9.03	49.33
6	#10640.00	44.52 AV	54.00	-9.48	1.15 H	96	-4.81	49.33
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	103.25 PK			1.15 V	204	64.47	38.78
2	*5320.00	92.83 AV			1.15 V	204	54.05	38.78
3	#5350.00	62.35 PK	74.00	-11.65	1.15 V	204	23.54	38.81
4	#5350.00	42.10 AV	54.00	-11.90	1.15 V	204	3.29	38.81
5	#10640.00	58.36 PK	74.00	-15.64	1.11 V	75	9.03	49.33
6	#10640.00	44.45 AV	54.00	-9.55	1.11 V	75	-4.88	49.33

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



**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	#5460.00	47.35 PK	74.00	-26.65	1.04 H	175	8.36	38.99
2	#5460.00	36.62 AV	54.00	-17.38	1.04 H	175	-2.37	38.99
3	5470.00	51.36 PK	88.30	-36.94	1.04 H	175	12.35	39.01
4	5470.00	37.52 AV	68.30	-30.78	1.04 H	175	-1.49	39.01
5	*5500.00	96.85 PK			1.04 H	175	57.77	39.07
6	*5500.00	86.46 AV			1.04 H	175	47.38	39.07
7	#11000.00	58.24 PK	74.00	-15.76	1.01 H	23	8.35	49.89
8	#11000.00	45.56 AV	54.00	-8.44	1.01 H	23	-4.33	49.89

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	#5460.00	53.56 PK	74.00	-20.44	1.21 V	169	14.57	38.99
2	#5460.00	38.81 AV	54.00	-15.19	1.21 V	169	-0.18	38.99
3	5470.00	57.56 PK	88.30	-30.74	1.21 V	169	18.55	39.01
4	5470.00	40.11 AV	68.30	-28.19	1.21 V	169	1.10	39.01
5	*5500.00	101.46 PK			1.21 V	169	62.38	39.07
6	*5500.00	90.88 AV			1.21 V	169	51.80	39.07
7	#11000.00	59.13 PK	74.00	-14.87	1.06 V	28	9.24	49.89
8	#11000.00	45.64 AV	54.00	-8.36	1.06 V	28	-4.25	49.89

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5600.00	99.43 PK			1.05 H	176	60.14	39.29
2	*5600.00	89.05 AV			1.05 H	176	49.76	39.29
3	#11200.00	58.45 PK	74.00	-15.55	1.05 H	29	8.67	49.78
4	#11200.00	45.81 AV	54.00	-8.19	1.05 H	29	-3.97	49.78
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	*5600.00	104.21 PK			1.21 V	182	64.92	39.29
2	*5600.00	93.45 AV			1.21 V	182	54.16	39.29
3	#11200.00	59.11 PK	74.00	-14.89	1.04 V	262	9.33	49.78
4	#11200.00	45.63 AV	54.00	-8.37	1.04 V	262	-4.15	49.78

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





EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH 1002hPa	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	*5700.00	94.56 PK			1.06 H	181	55.00	39.56
2	*5700.00	84.15 AV			1.06 H	181	44.59	39.56
3	5725.00	51.24 PK	88.30	-37.06	1.06 H	181	11.63	39.61
4	5725.00	35.76 AV	68.30	-32.54	1.06 H	181	-3.85	39.61
5	#11400.00	59.11 PK	74.00	-14.89	1.06 H	27	9.25	49.86
6	#11400.00	45.58 AV	54.00	-8.42	1.06 H	27	-4.28	49.86
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	*5700.00	99.12 PK			1.10 V	179	59.56	39.56
2	*5700.00	88.72 AV			1.10 V	179	49.16	39.56
3	5725.00	53.96 PK	88.30	-34.34	1.10 V	179	14.35	39.61
4	5725.00	38.46 AV	68.30	-29.84	1.10 V	179	-1.15	39.61
5	#11400.00	59.36 PK	74.00	-14.64	1.14 V	250	9.50	49.86
6	#11400.00	45.58 AV	54.00	-8.42	1.14 V	250	-4.28	49.86

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



**BELOW 1GHz WORST-CASE DATA:  
FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 8	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	22deg. C, 69%RH 1002hPa	TESTED BY	Lori Chiu

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	113.50	27.05 QP	43.50	-16.45	1.50 H	127	16.09	10.96
2	144.61	22.97 QP	43.50	-20.53	1.00 H	145	9.85	13.12
3	195.16	28.97 QP	43.50	-14.53	1.50 H	157	18.01	10.96
4	237.94	28.35 QP	46.00	-17.65	1.00 H	10	16.10	12.24
5	543.19	26.45 QP	46.00	-19.55	1.00 H	208	6.30	20.15
6	945.66	29.04 QP	46.00	-16.96	2.00 H	142	2.75	26.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	55.18	24.55 QP	40.00	-15.45	1.00 V	328	11.00	13.55
2	115.45	26.21 QP	43.50	-17.29	1.00 V	169	15.01	11.20
3	193.22	25.71 QP	43.50	-17.79	1.00 V	118	14.58	11.13
4	204.89	26.65 QP	43.50	-16.85	1.00 V	67	15.89	10.76
5	494.58	27.17 QP	46.00	-18.83	1.00 V	133	8.23	18.93
6	547.08	26.05 QP	46.00	-19.95	1.00 V	151	5.80	20.25
7	945.66	30.04 QP	46.00	-15.96	1.00 V	247	3.75	26.29

- 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.



**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	22deg. C, 69%RH 1002hPa	TESTED BY	Lori Chiu

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	113.50	28.13 QP	43.50	-15.37	1.50 H	121	17.16	10.96
2	144.61	23.44 QP	43.50	-20.06	1.50 H	121	10.32	13.12
3	193.22	29.85 QP	43.50	-13.65	2.00 H	172	18.72	11.13
4	239.88	27.24 QP	46.00	-18.76	1.00 H	184	14.92	12.33
5	494.58	25.24 QP	46.00	-20.76	1.50 H	121	6.30	18.93
6	543.19	25.72 QP	46.00	-20.28	1.00 H	10	5.56	20.15
7	945.66	30.03 QP	46.00	-15.97	2.00 H	292	3.74	26.29
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	55.18	25.59 QP	40.00	-14.41	1.50 V	142	12.04	13.55
2	115.45	27.15 QP	43.50	-16.35	1.50 V	202	15.95	11.20
3	195.16	25.99 QP	43.50	-17.51	1.00 V	112	15.03	10.96
4	337.10	26.43 QP	46.00	-19.57	1.50 V	55	11.94	14.49
5	442.09	25.38 QP	46.00	-20.62	1.00 V	208	8.10	17.28
6	494.58	26.06 QP	46.00	-19.94	1.00 V	133	7.12	18.93
7	545.14	25.05 QP	46.00	-20.95	1.00 V	151	4.85	20.20
8	945.66	29.89 QP	46.00	-16.11	1.00 V	10	3.60	26.29

- 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.

## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ 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 0.50MHz.
  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.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Sep. 21, 2008
RF signal cable Woken	5D-FB	Cable-HYCO3-01	Jan. 06, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Jan. 09, 2009
LISN SCHWARZBECK	NNBL 8226-2	8226-142	May 07, 2008
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Shielded Room 2.
  3. The VCCI Site Registration No. is C-2047.

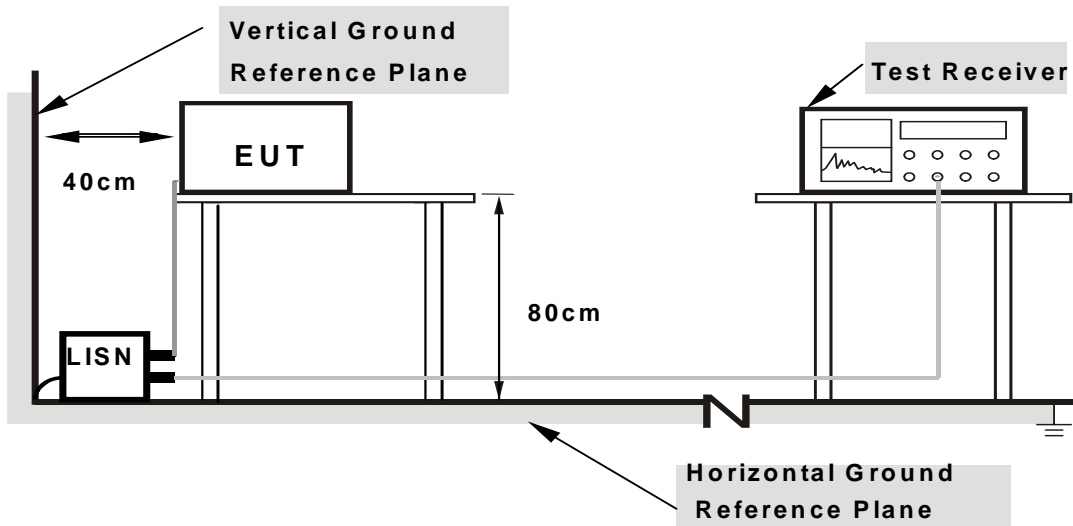
#### 4.2.3 TEST PROCEDURES

- 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.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 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.

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

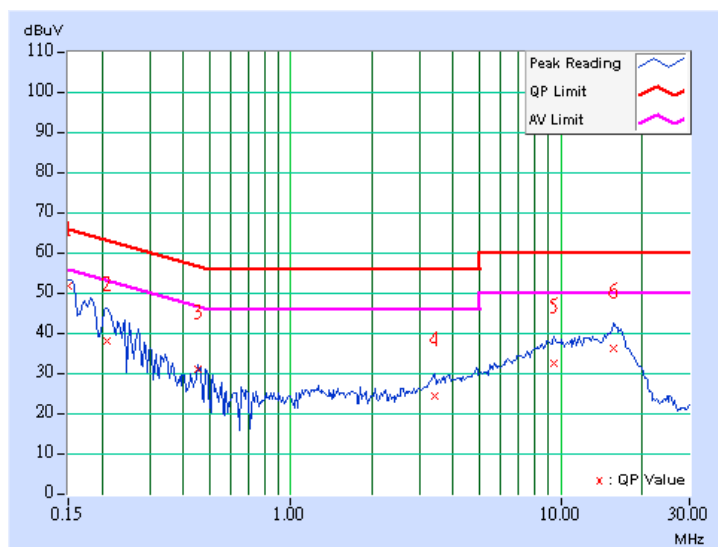
### CONDUCTED WORST-CASE DATA:

### FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 8	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	23deg. C, 65%RH, 991hPa	6dB BANDWIDTH	9kHz
TESTED BY	Match Tsui		

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	0.150	0.10	51.36	-	51.46	-	66.00	56.00	-14.54	-
2	0.209	0.10	37.68	-	37.78	-	63.26	53.26	-25.48	-
3	0.451	0.10	30.71	-	30.81	-	56.86	46.86	-26.05	-
4	3.414	0.26	24.09	-	24.35	-	56.00	46.00	-31.65	-
5	9.488	0.33	32.22	-	32.55	-	60.00	50.00	-27.45	-
6	15.703	0.49	35.68	-	36.17	-	60.00	50.00	-23.83	-

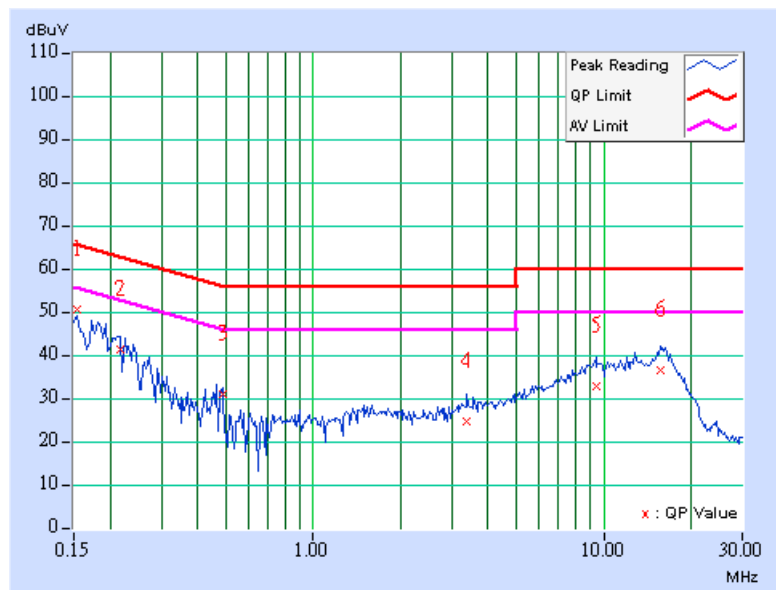
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = 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 8	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	23deg. C, 65%RH, 991hPa	6dB BANDWIDTH	9kHz
TESTED BY	Match Tsui		

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	0.154	0.10	50.22	-	50.32	-	65.79
2	0.216	0.10	40.85	-	40.95	-	62.96	52.96	-22.01	-
3	0.486	0.12	30.71	-	30.83	-	56.24	46.24	-25.41	-
4	3.379	0.26	24.44	-	24.70	-	56.00	46.00	-31.30	-
5	9.469	0.42	32.63	-	33.05	-	60.00	50.00	-26.95	-
6	15.699	0.49	36.31	-	36.80	-	60.00	50.00	-23.20	-

- 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.



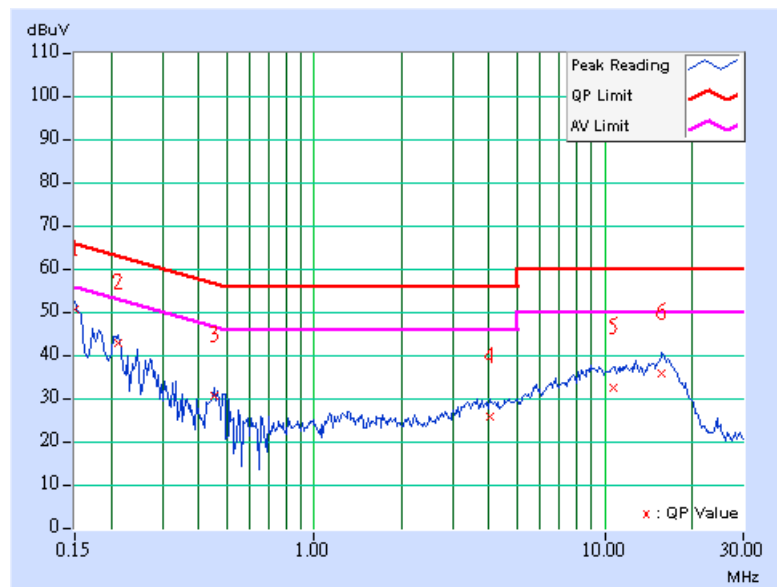


**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 1
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	23deg. C, 65%RH, 991hPa	6dB BANDWIDTH	9kHz
TESTED BY	Match Tsui		

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	0.150	0.10	50.20	-	50.30	-	66.00	56.00	-15.70	-
2	0.213	0.10	42.37	-	42.47	-	63.11	53.11	-20.64	-
3	0.455	0.10	30.25	-	30.35	-	56.79	46.79	-26.44	-
4	4.035	0.28	25.41	-	25.69	-	56.00	46.00	-30.31	-
5	10.738	0.35	31.92	-	32.27	-	60.00	50.00	-27.73	-
6	15.766	0.49	35.26	-	35.75	-	60.00	50.00	-24.25	-

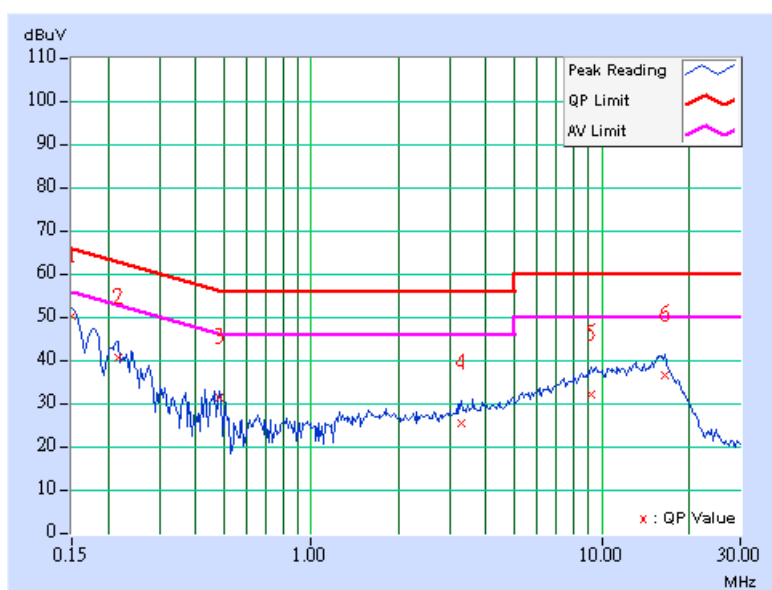
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line 2
MODULATION TYPE	BPSK	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	23deg. C, 65%RH, 991hPa	6dB BANDWIDTH	9kHz
TESTED BY	Match Tsui		

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	0.150	0.10	49.72	-	49.82	-	66.00
2	0.216	0.10	40.06	-	40.16	-	62.96	52.96	-22.80	-
3	0.486	0.12	31.16	-	31.28	-	56.24	46.24	-24.96	-
4	3.273	0.26	25.13	-	25.39	-	56.00	46.00	-30.61	-
5	9.211	0.41	31.80	-	32.21	-	60.00	50.00	-27.79	-
6	16.449	0.51	36.08	-	36.59	-	60.00	50.00	-23.41	-

- 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.





### 4.3 PEAK TRANSMIT POWER MEASUREMENT

#### 4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 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	FSP40	100040	Jun. 28, 2008

**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.

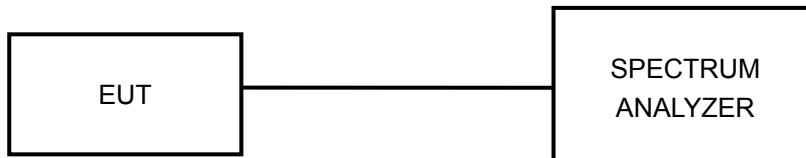
**NOTE:** The test is performed in accordance with FCC Public Notice: APPENDIX A Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, August 2002.

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.



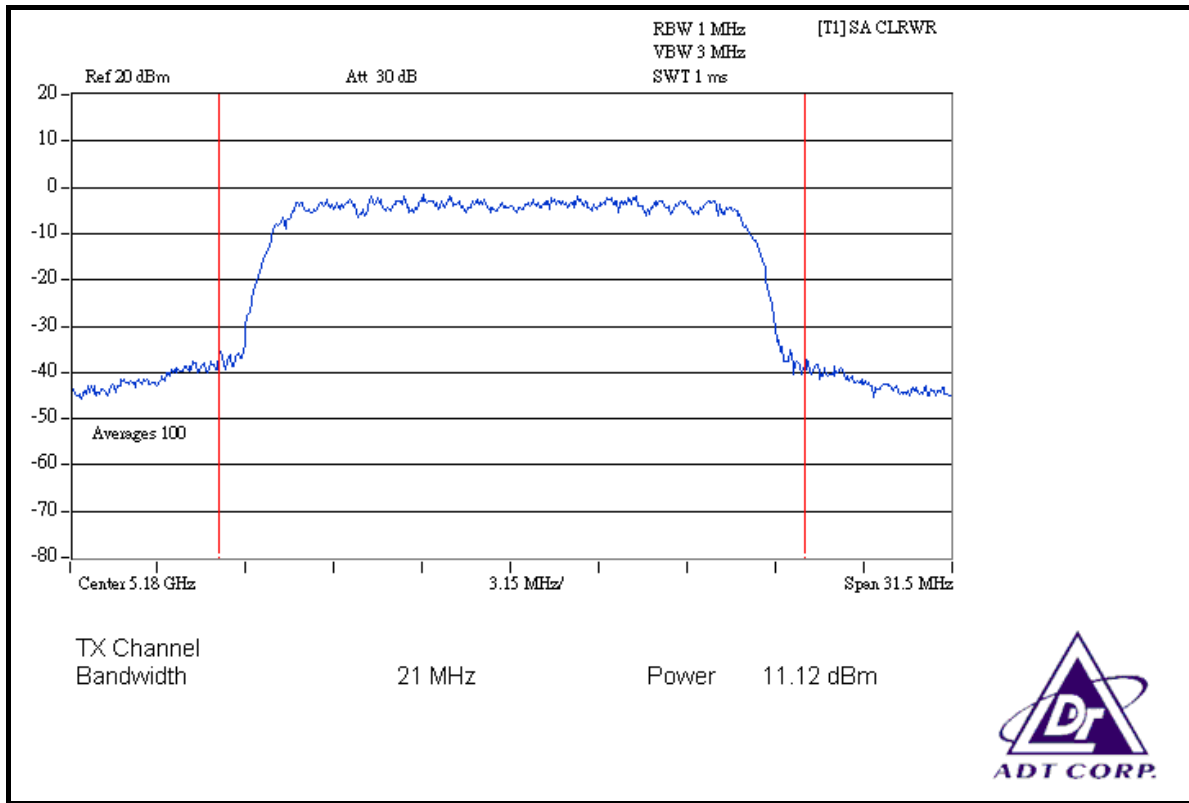
#### 4.3.7 TEST RESULTS

**PEAK POWER OUTPUT:  
FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:**

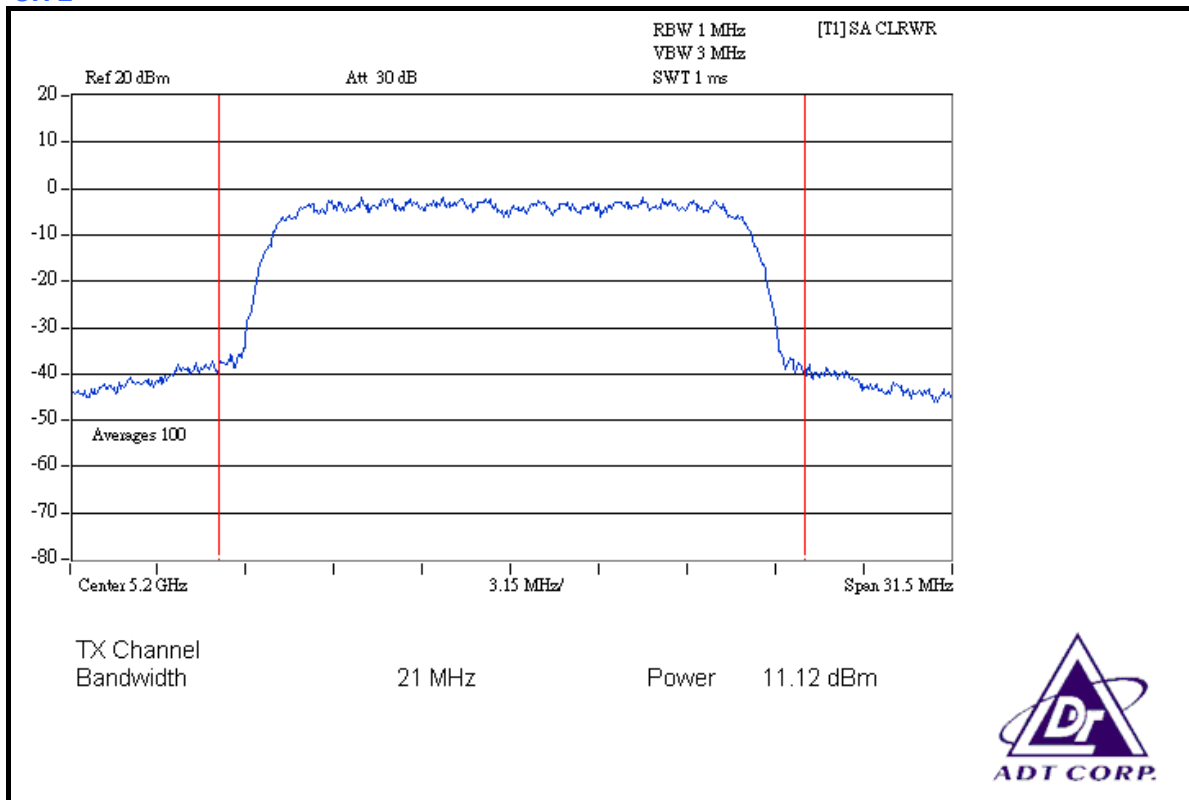
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER OUTPUT (mW)</b>	<b>PEAK POWER OUTPUT (dBm)</b>	<b>PEAK POWER LIMIT (dBm)</b>	<b>PASS / FAIL</b>
1	5180	12.94	11.12	17.00	PASS
2	5200	12.94	11.12	17.00	PASS
4	5240	12.79	11.07	17.00	PASS
5	5260	13.34	11.25	24.00	PASS
7	5300	15.14	11.80	24.00	PASS
8	5320	16.41	12.15	24.00	PASS

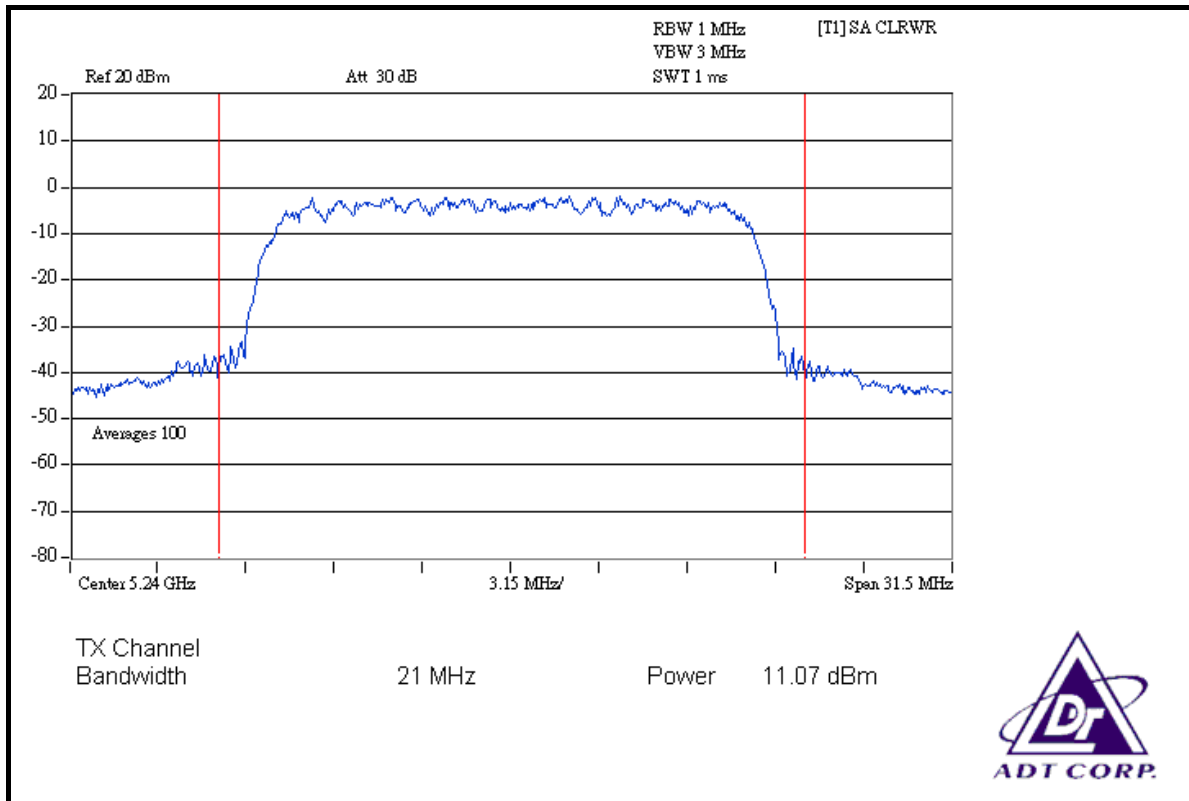
### CH 1



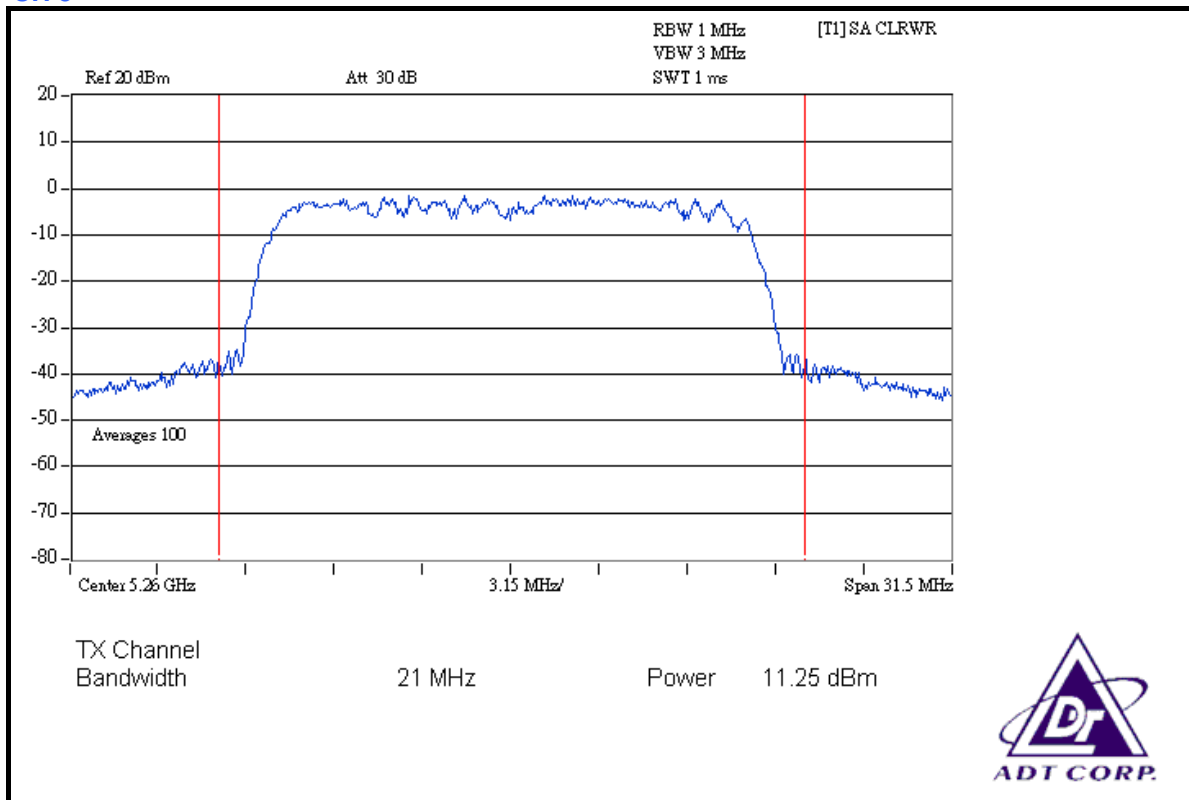
### CH 2



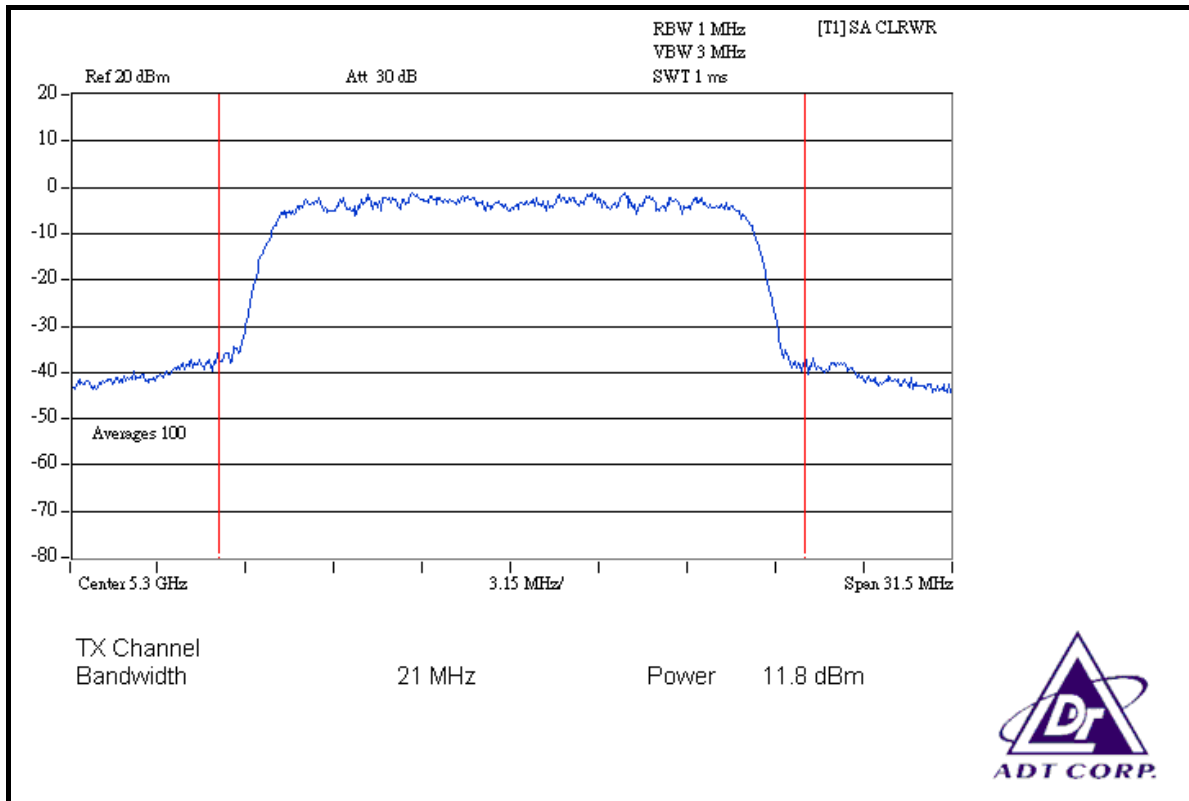
### CH 4



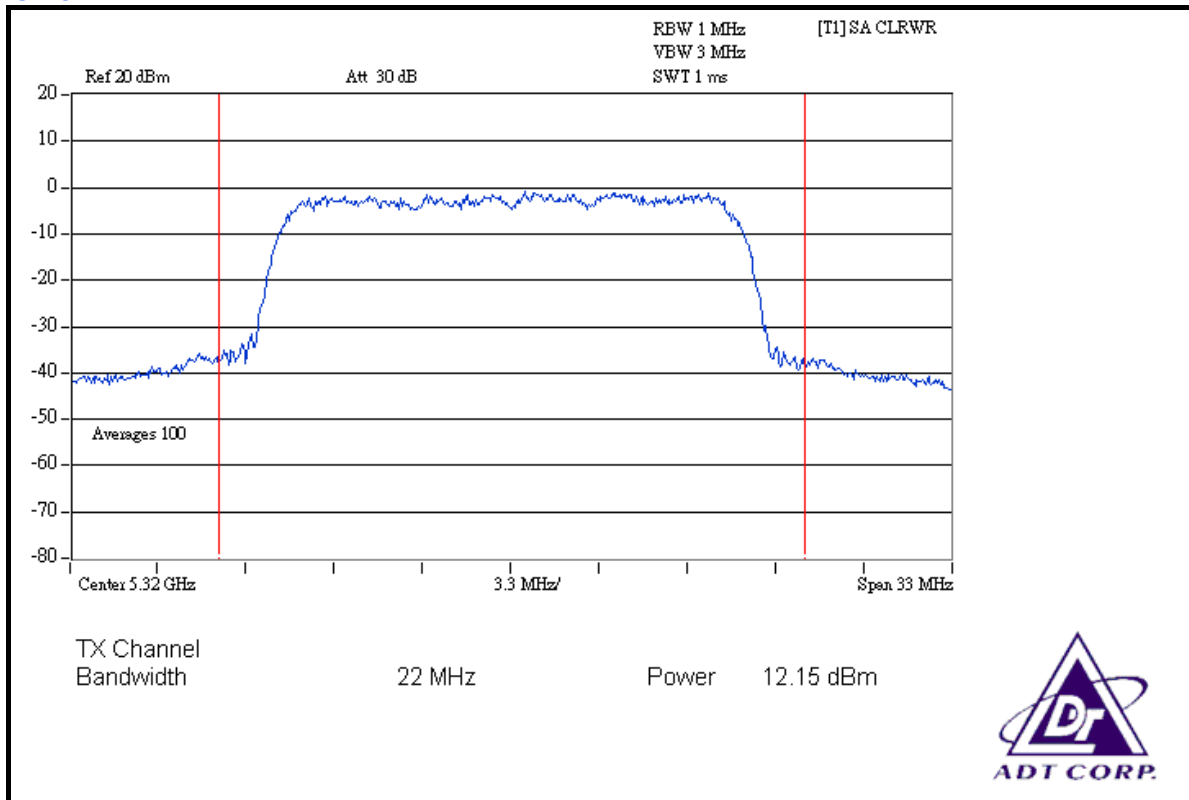
### CH 5



### CH 7



### CH 8





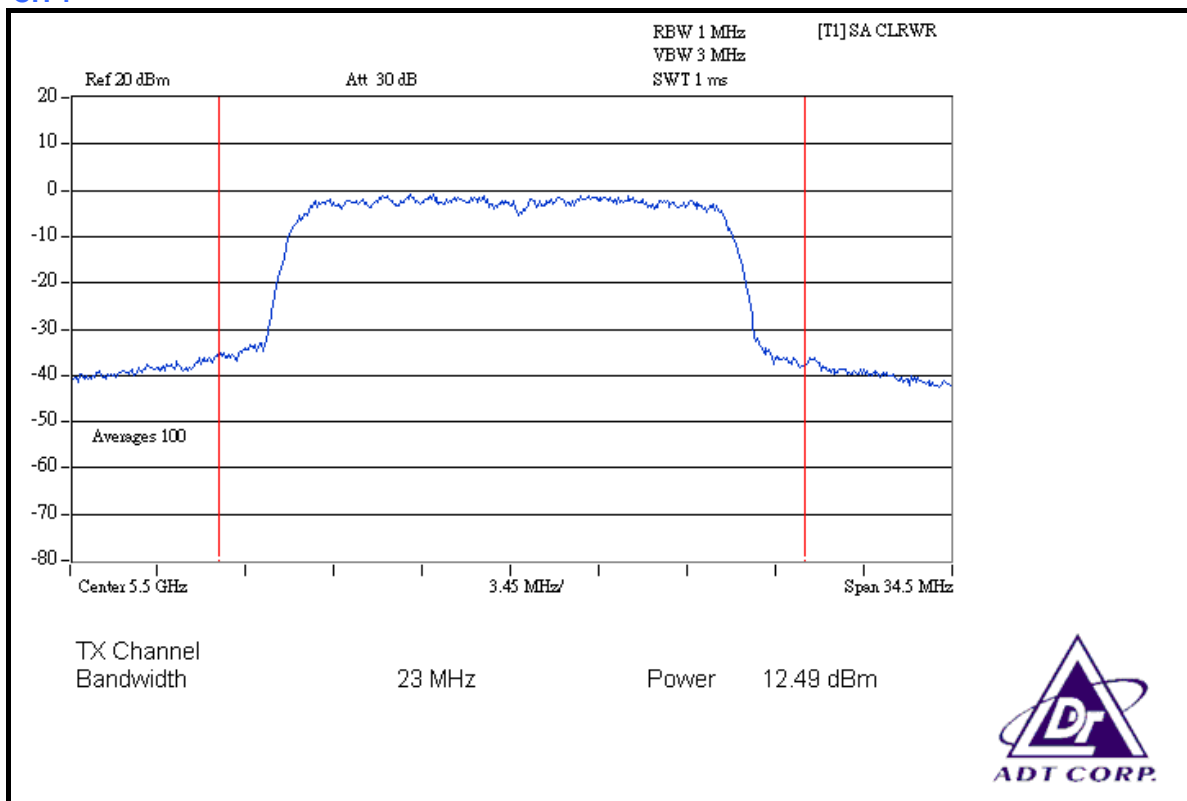


**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

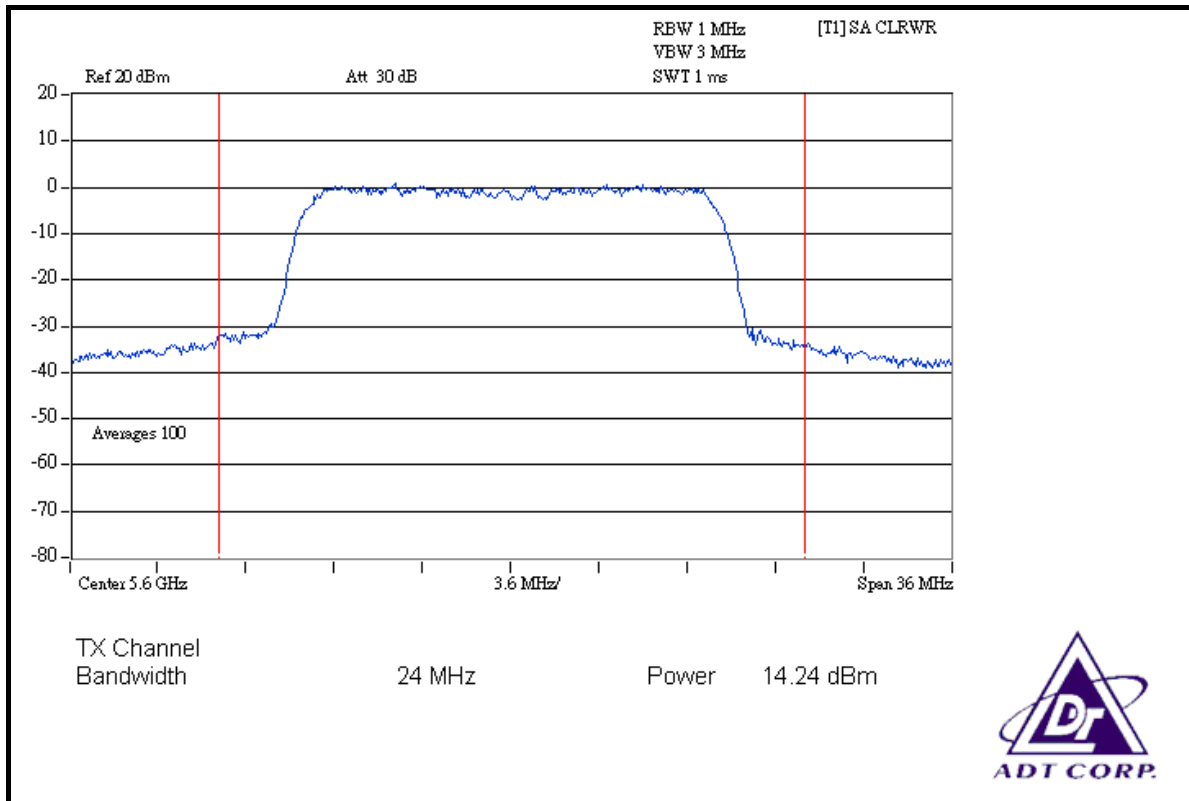
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 67%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	5500	17.74	12.49	24.00	PASS
6	5600	26.55	14.24	24.00	PASS
11	5700	8.09	9.08	24.00	PASS

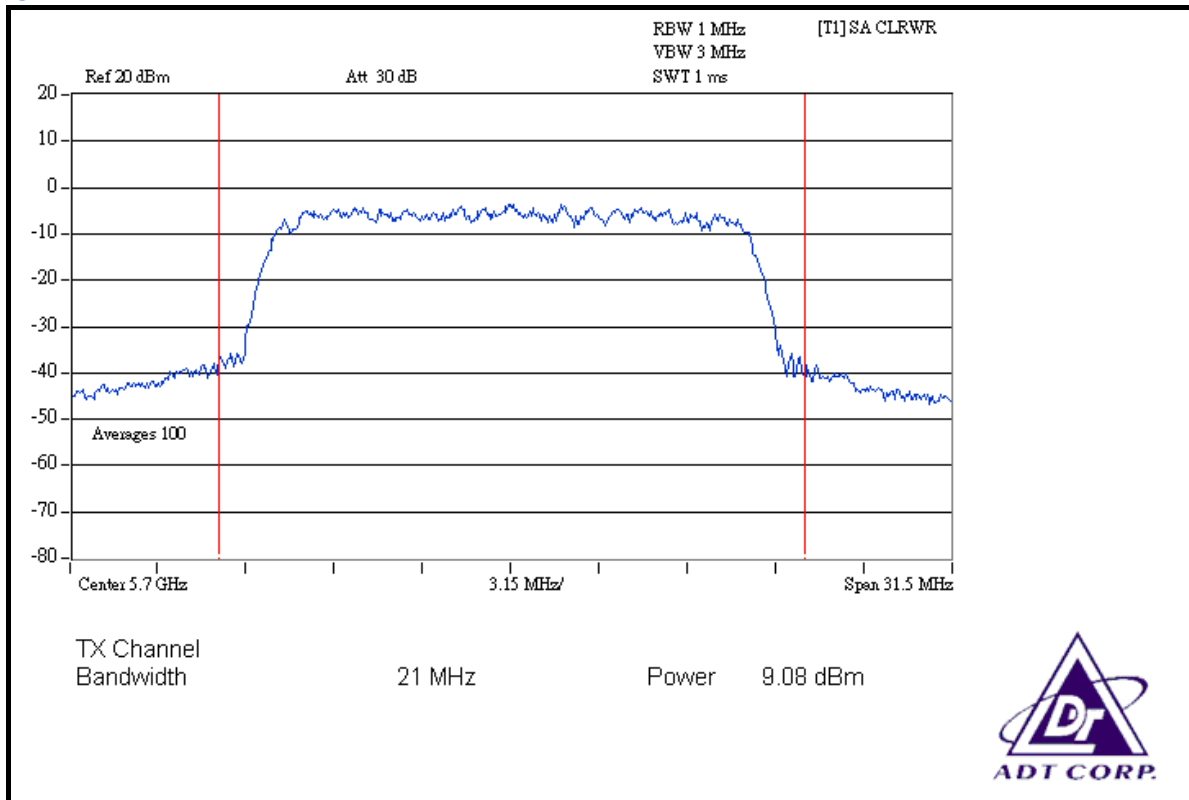
**CH 1**



### CH 6



### CH 11



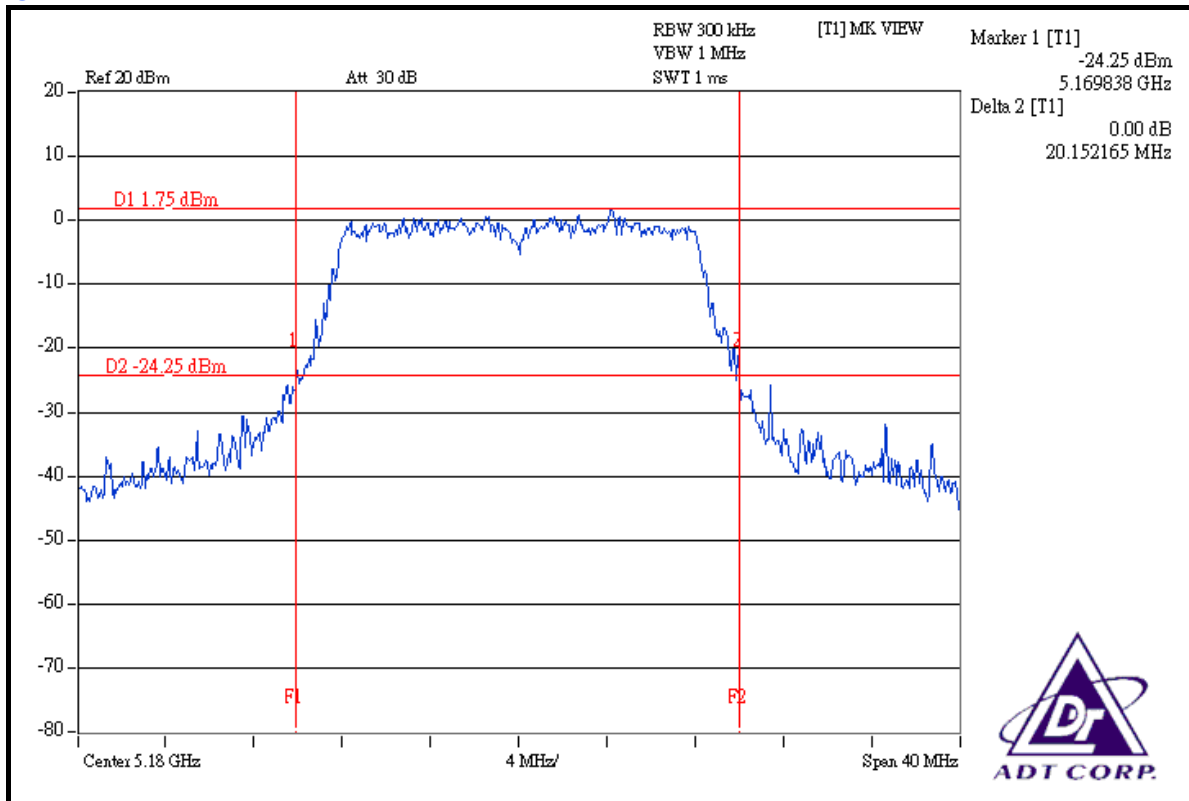


**26dB OCCUPIED BANDWIDTH:  
FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:**

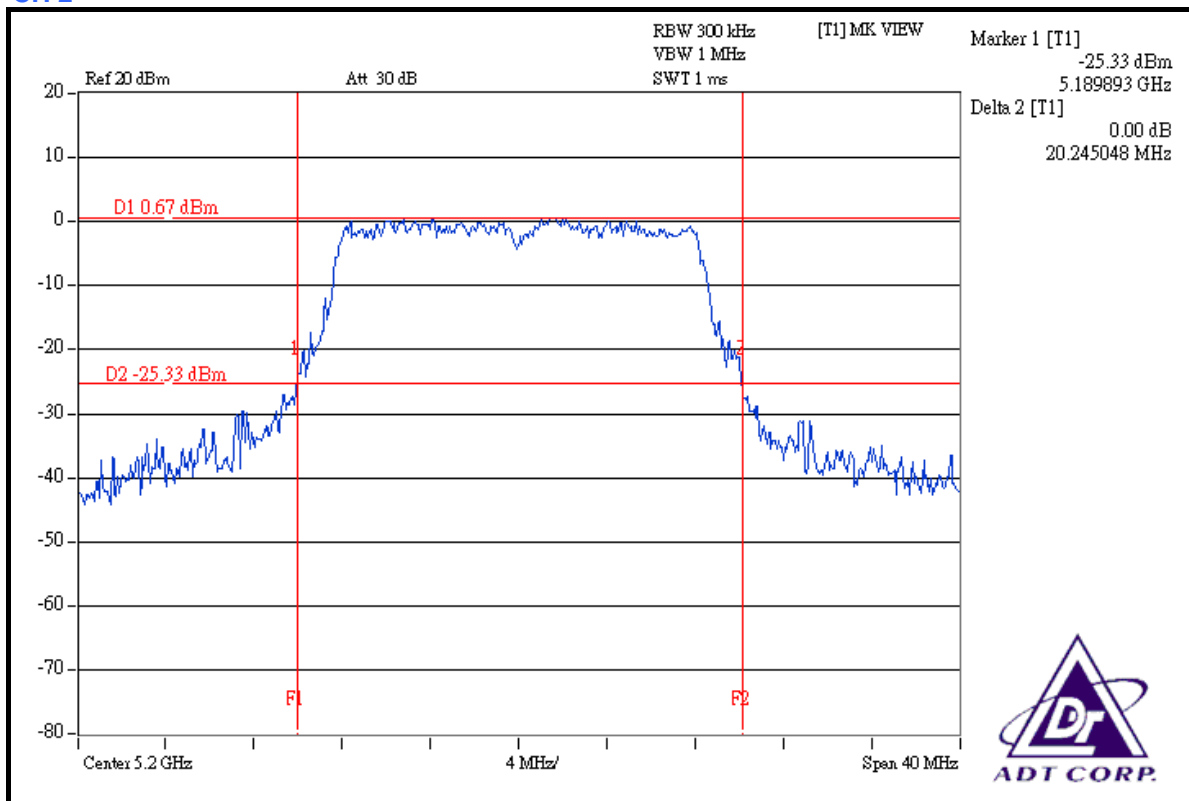
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	26deg.C, 67%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>26dBc OCCUPIED BANDWIDTH (MHz)</b>	<b>PASS / FAIL</b>
1	5180	20.15	PASS
2	5200	20.25	PASS
4	5240	20.04	PASS
5	5260	20.43	PASS
7	5300	20.27	PASS
8	5320	21.31	PASS

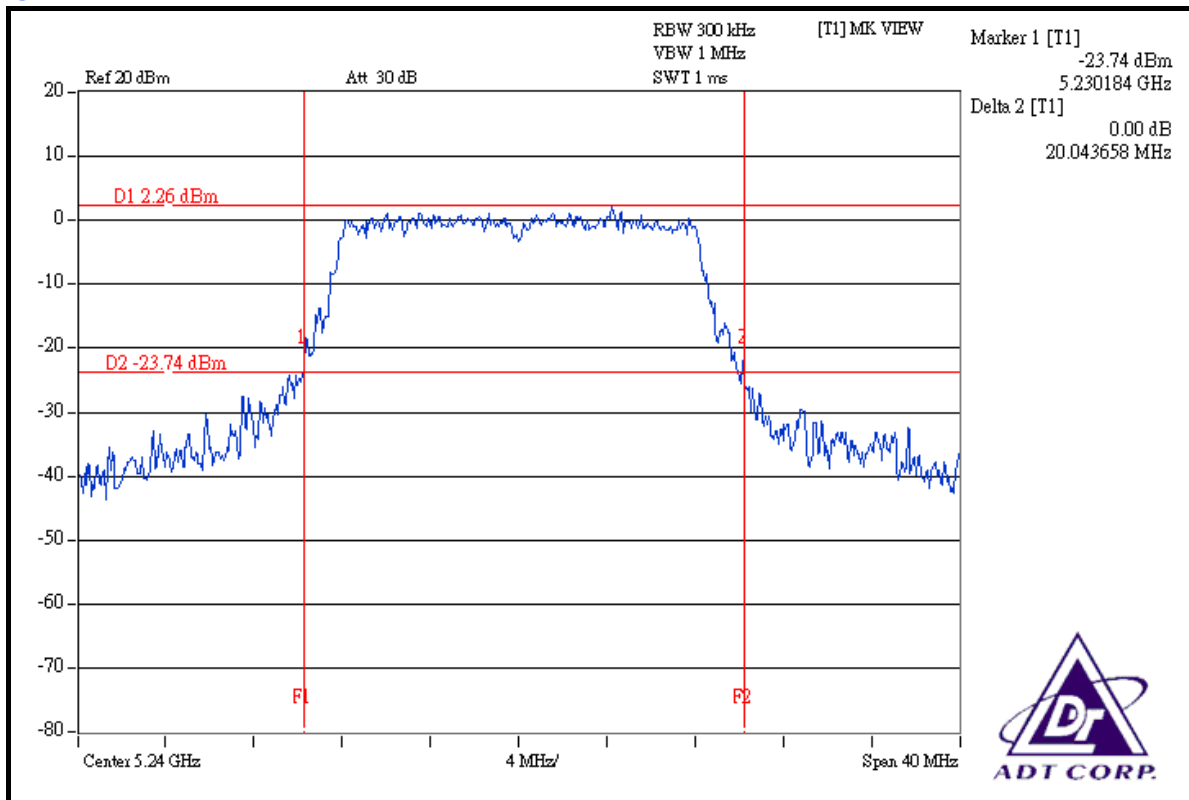
### CH 1



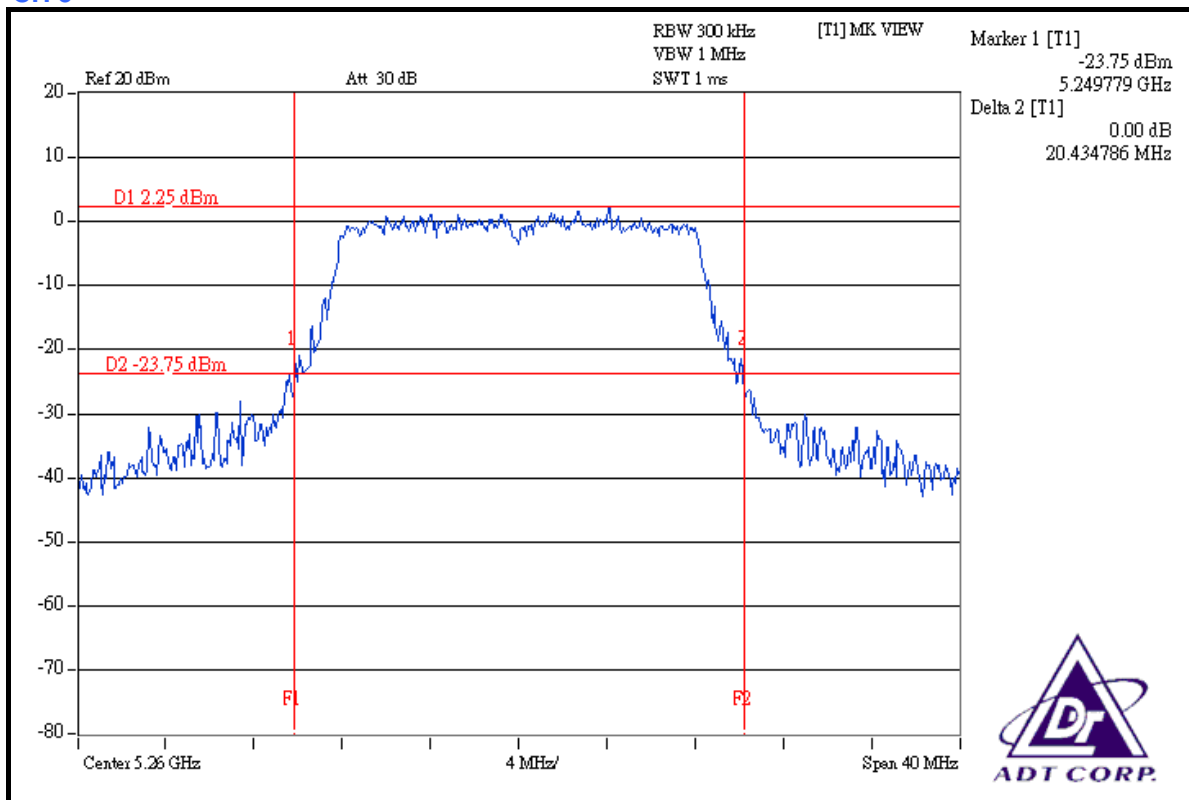
### CH 2



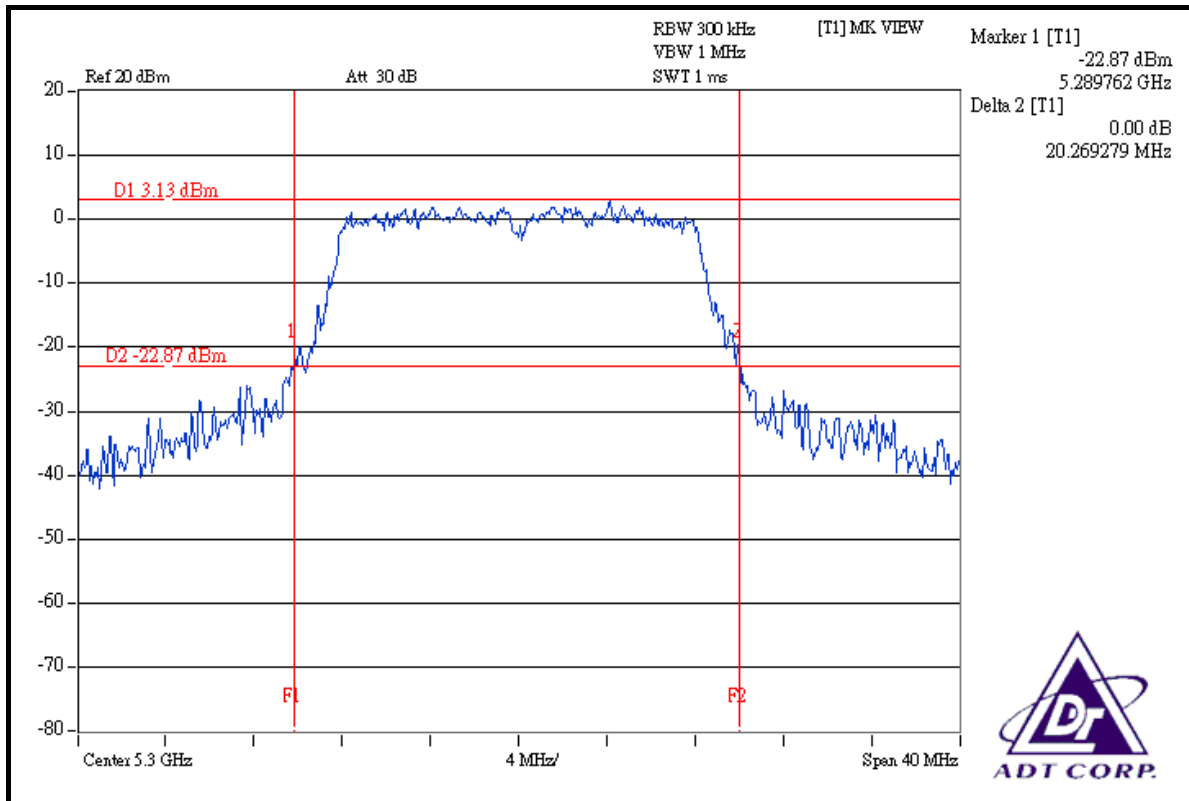
### CH 4



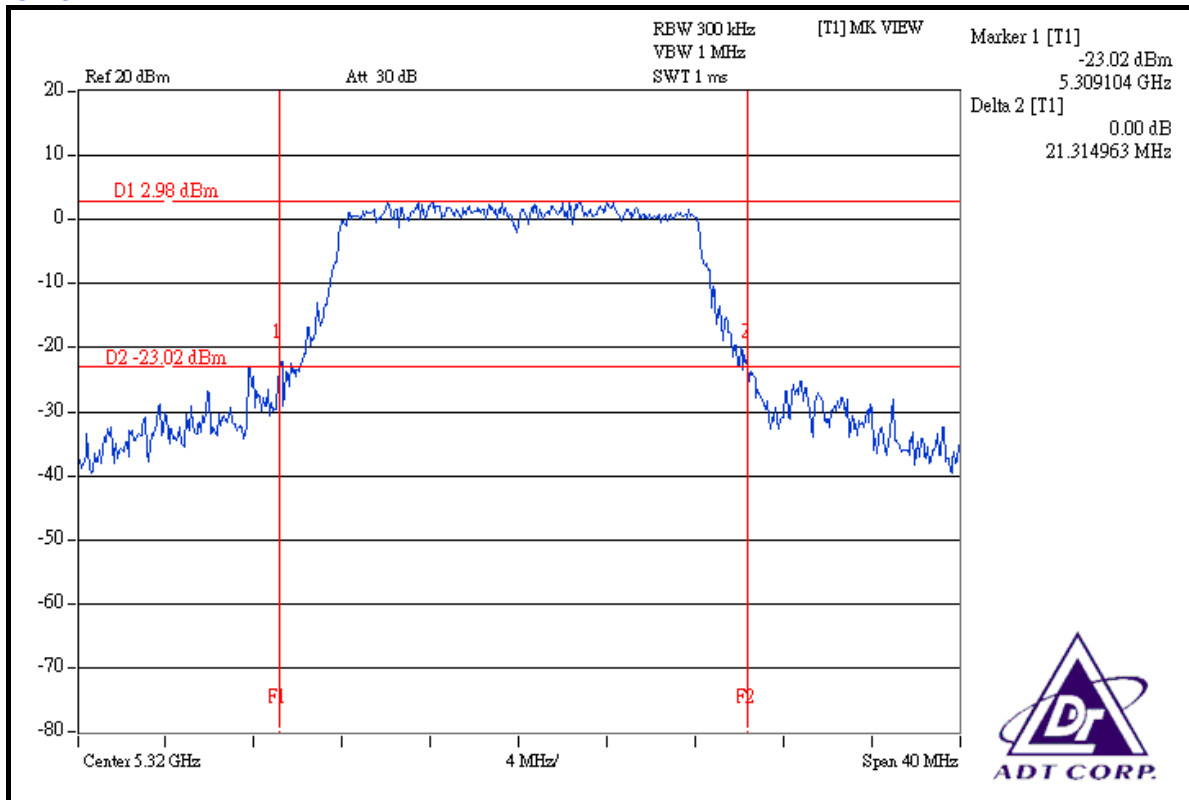
### CH 5



### CH 7



### CH 8



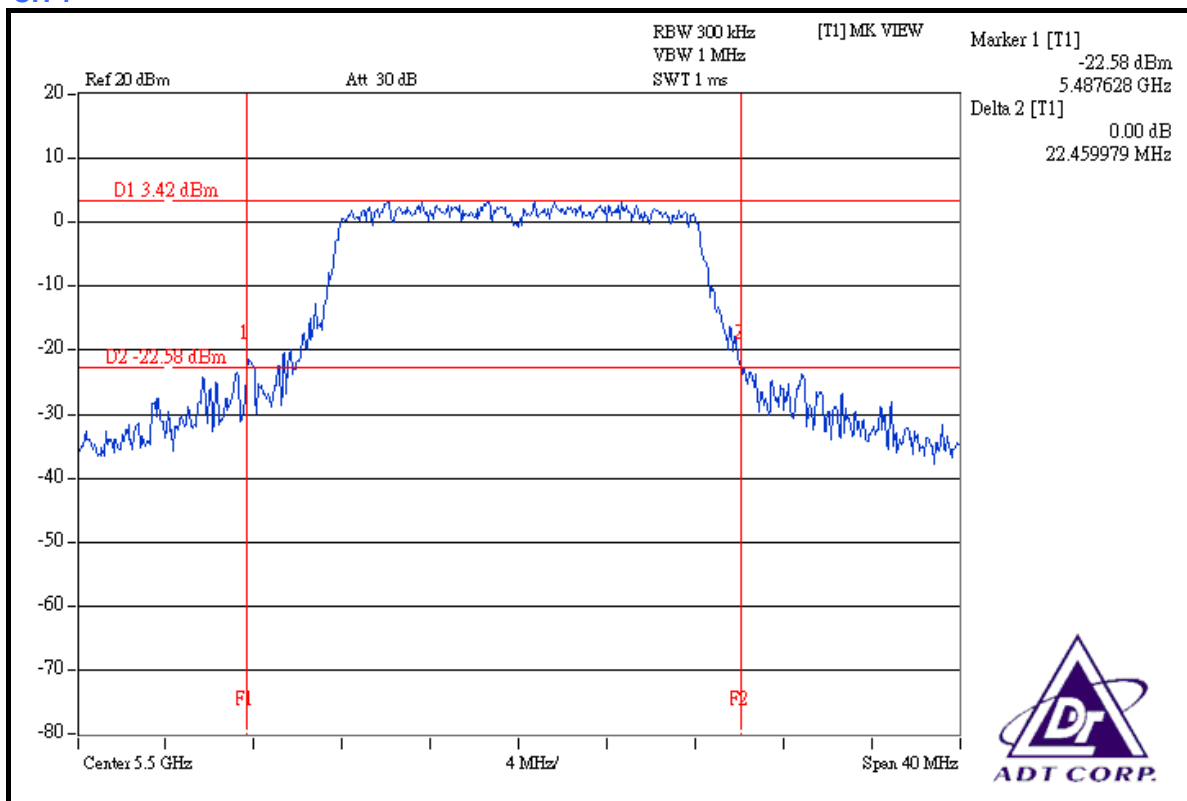


**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

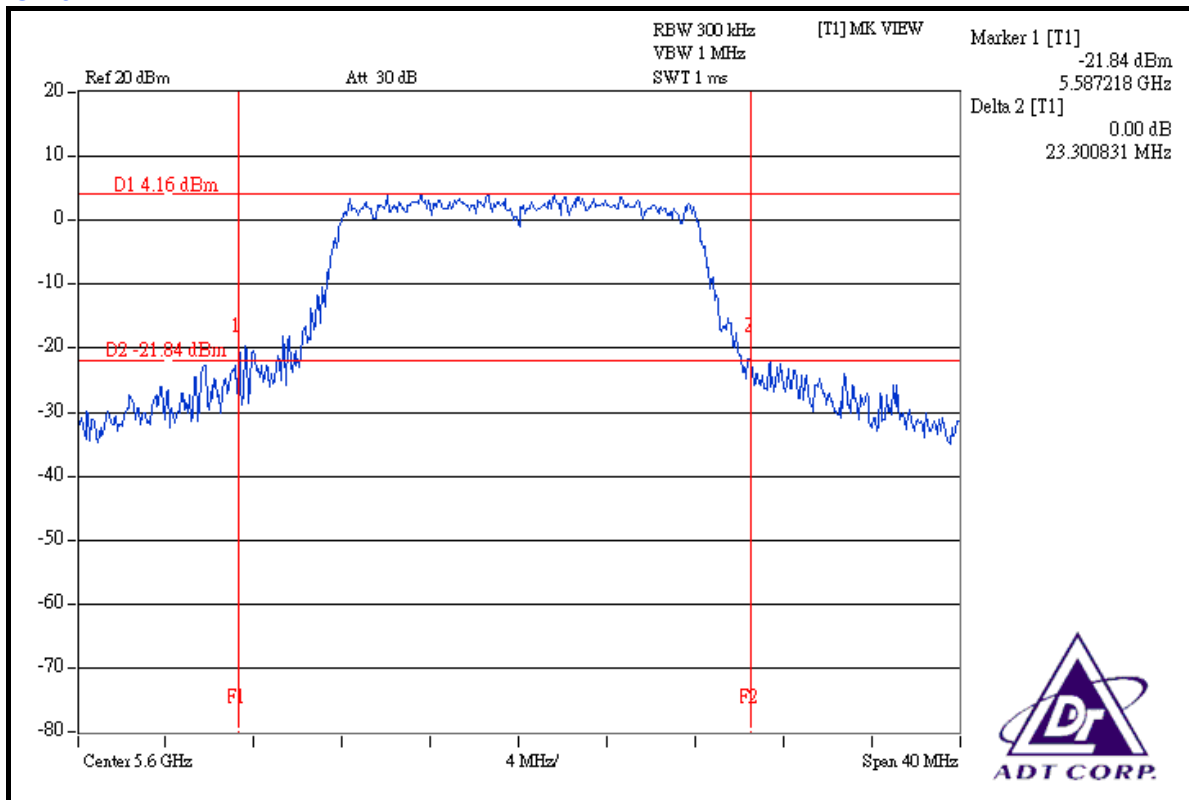
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	26deg.C, 67%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)	PASS / FAIL
1	5500	22.46	PASS
6	5600	23.30	PASS
11	5700	20.42	PASS

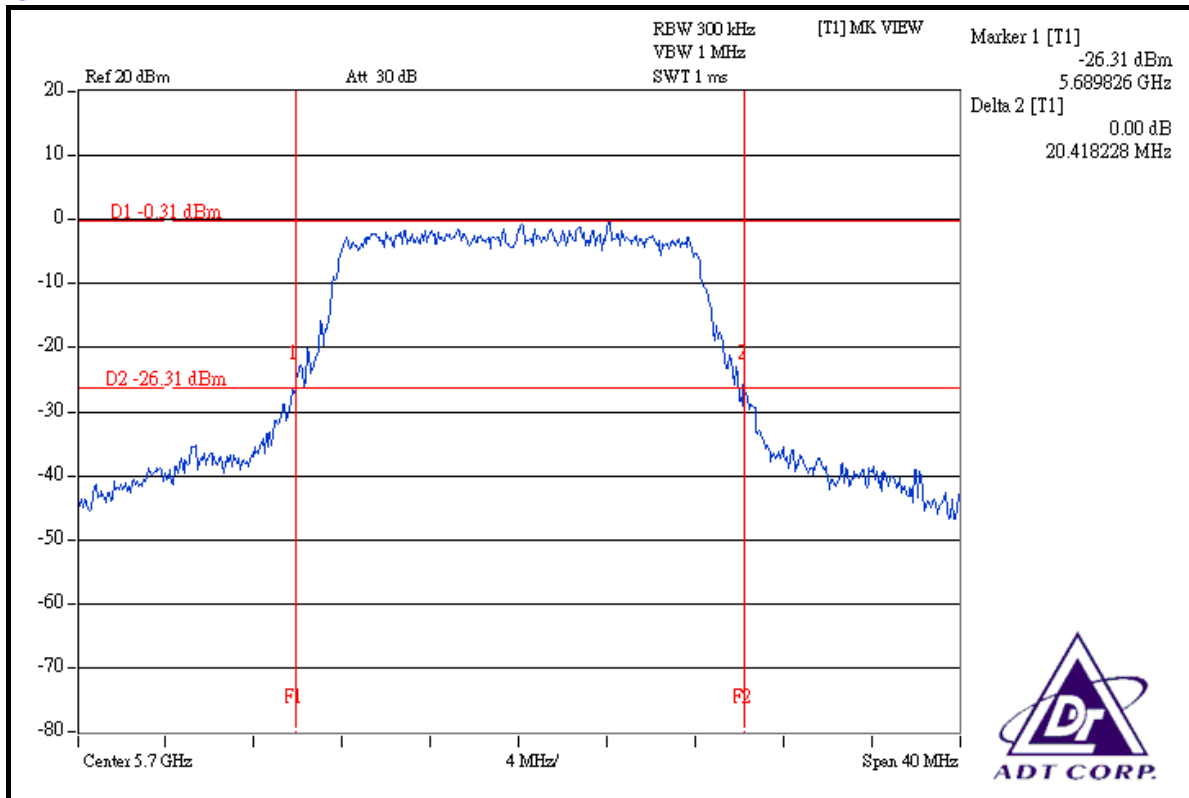
**CH 1**



### CH 6



### CH 11





#### 4.4 PEAK POWER EXCURSION MEASUREMENT

##### 4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	13dB
5.250 ~ 5.350GHz	13dB
5.470 ~ 5.725GHz	13dB

##### 4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

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

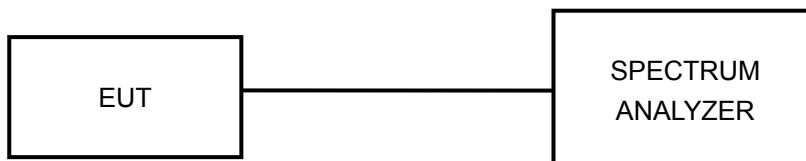
##### 4.4.3 TEST PROCEDURE

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

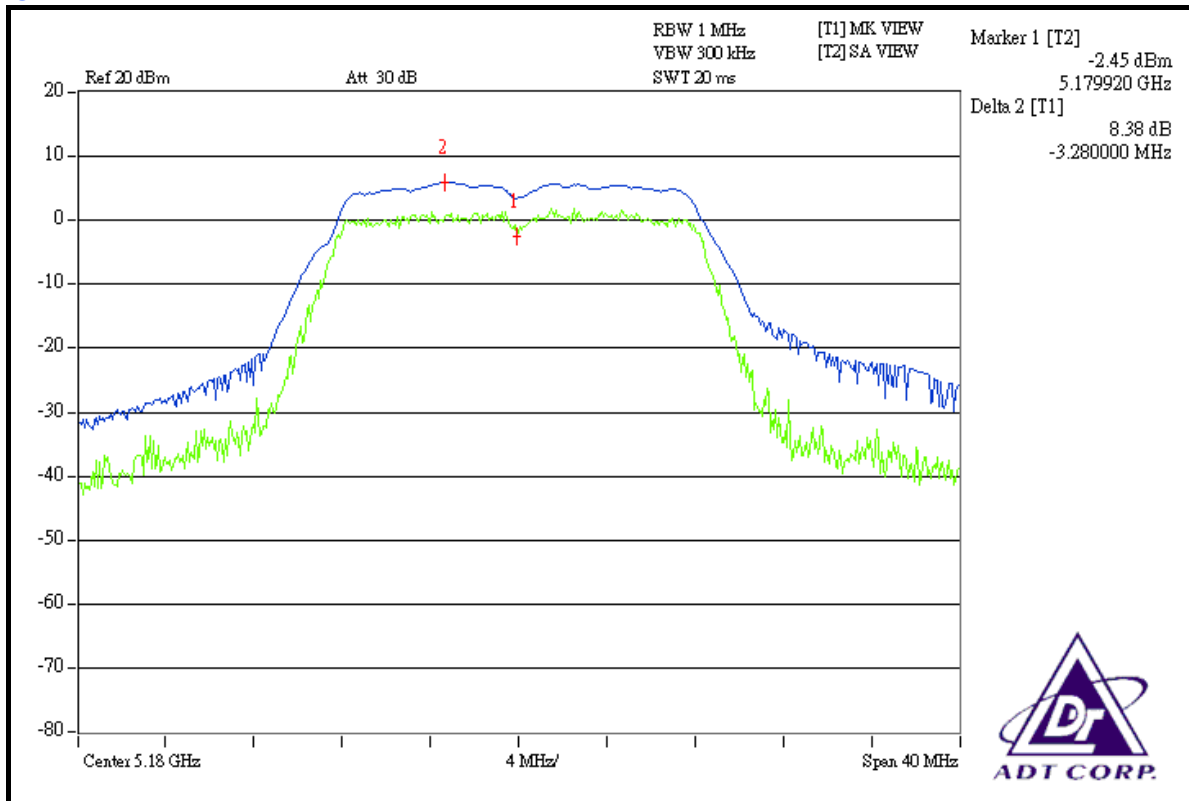
##### FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

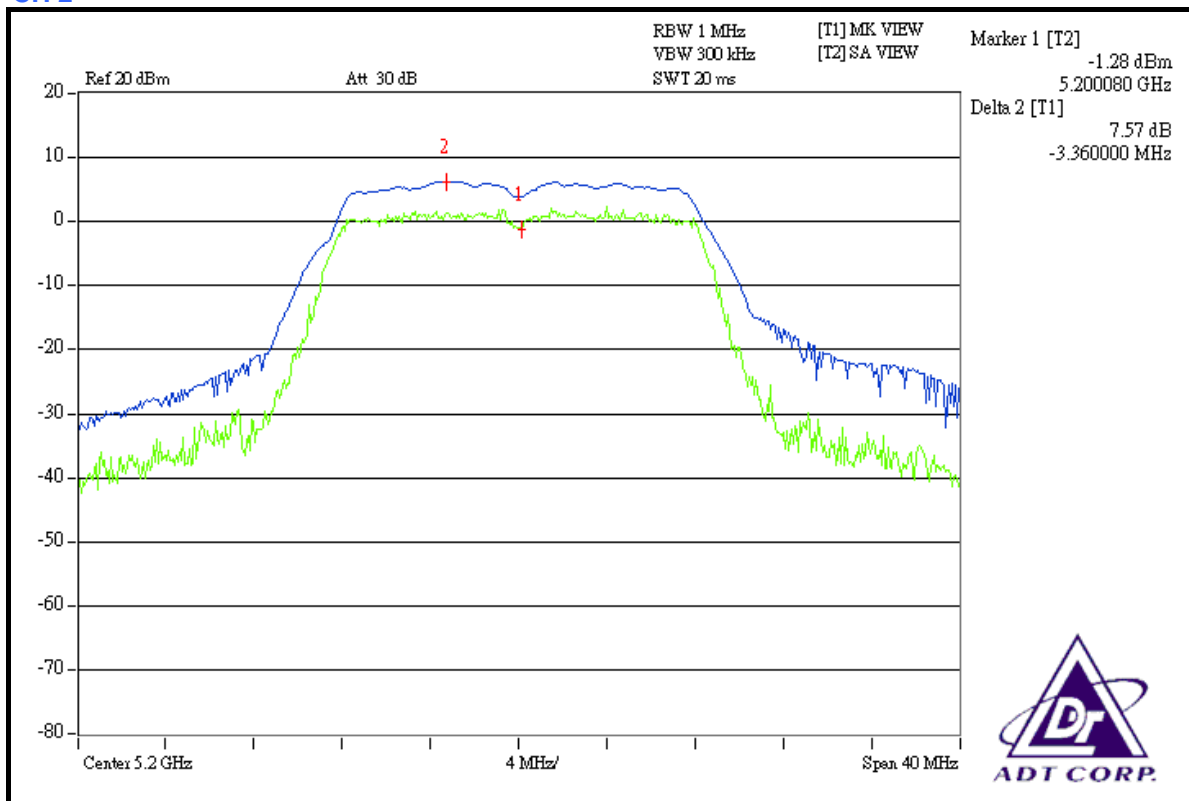
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER EXCURSION (dB)</b>	<b>PEAK TO AVERAGE EXCURSION LIMIT (dB)</b>	<b>PASS / FAIL</b>
1	5180	8.38	13	PASS
2	5200	7.57	13	PASS
4	5240	7.36	13	PASS
5	5260	6.63	13	PASS
7	5300	7.24	13	PASS
8	5320	7.15	13	PASS



### CH 1

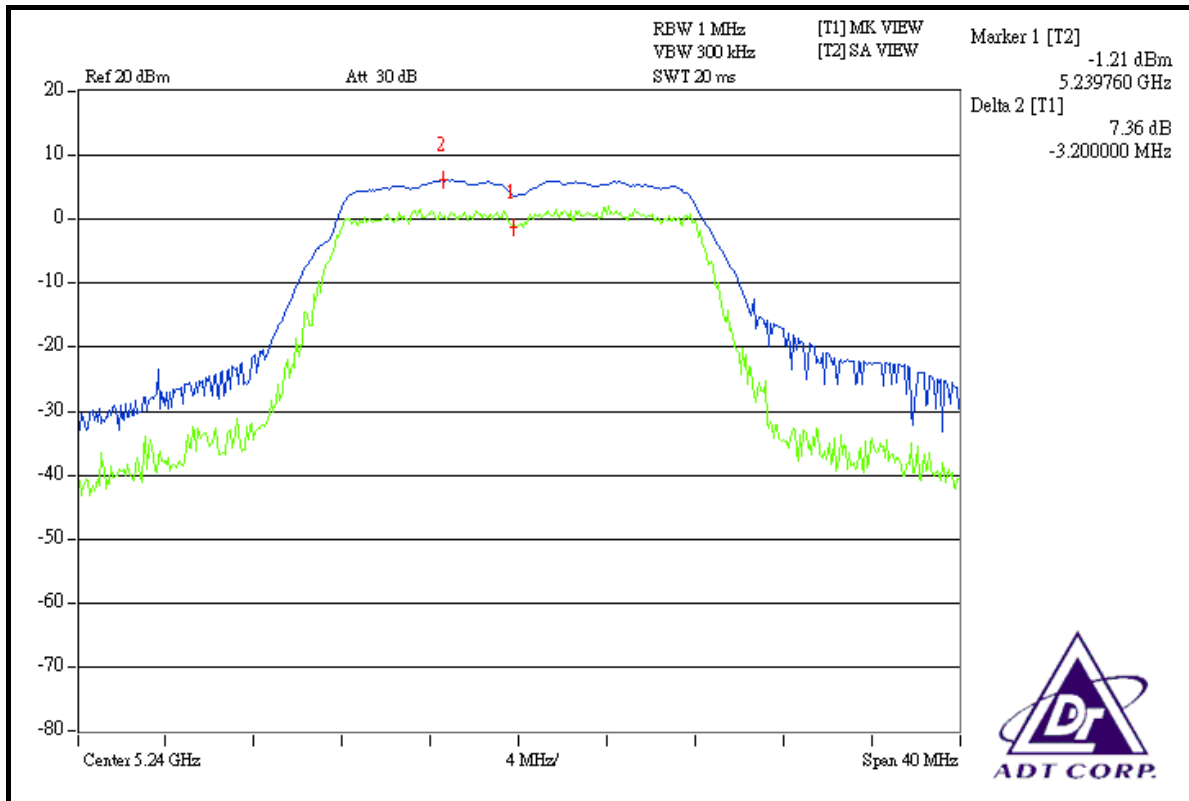


### CH 2

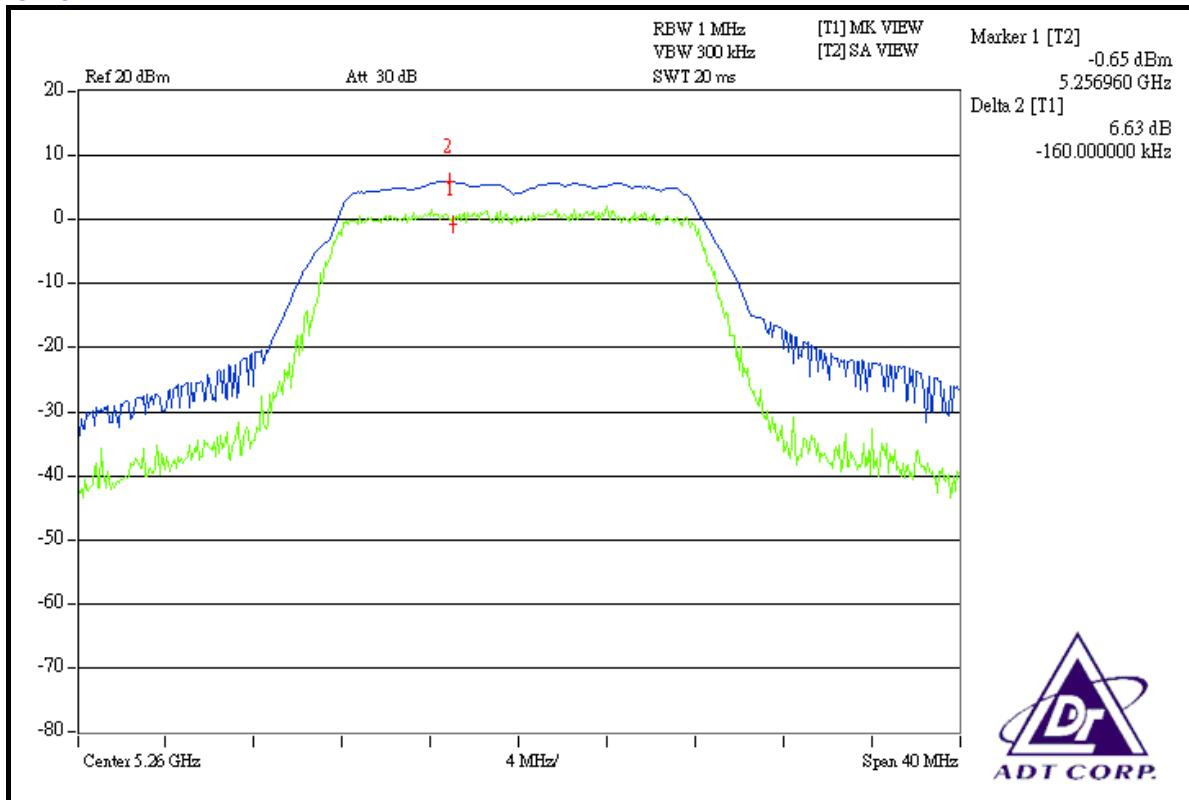




### CH 4

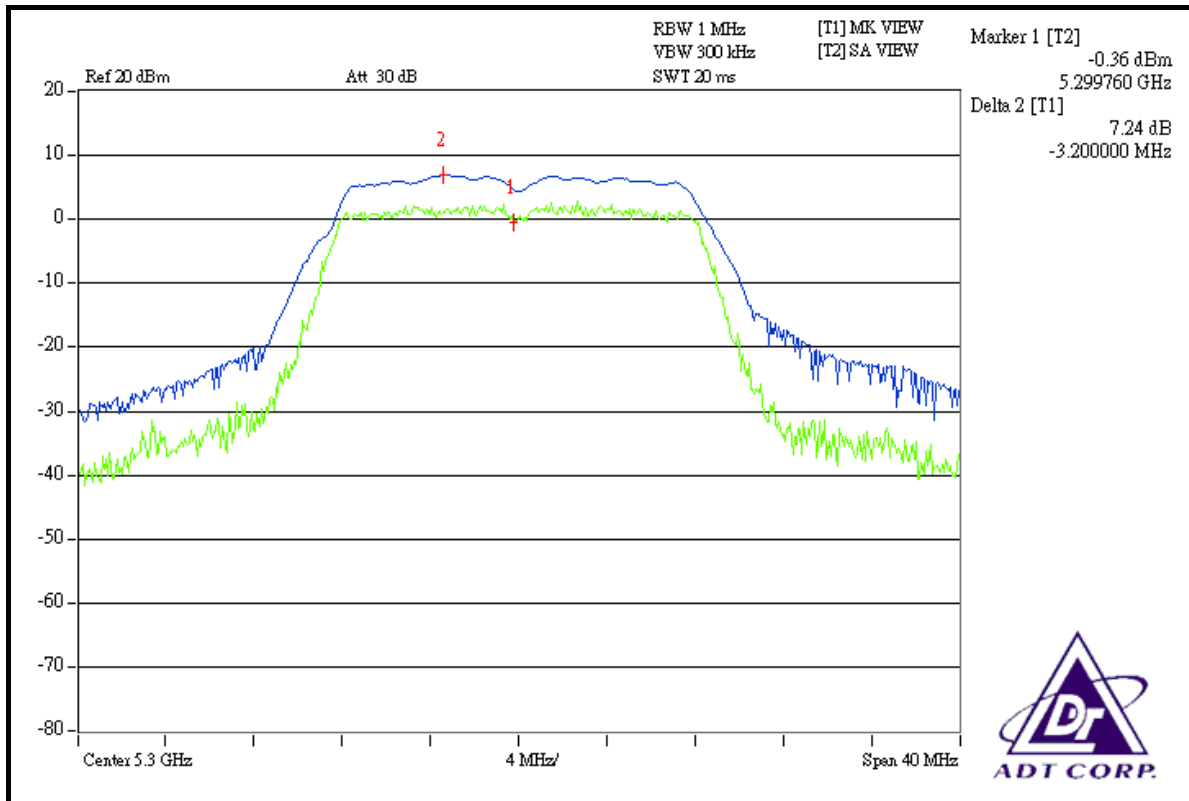


### CH 5

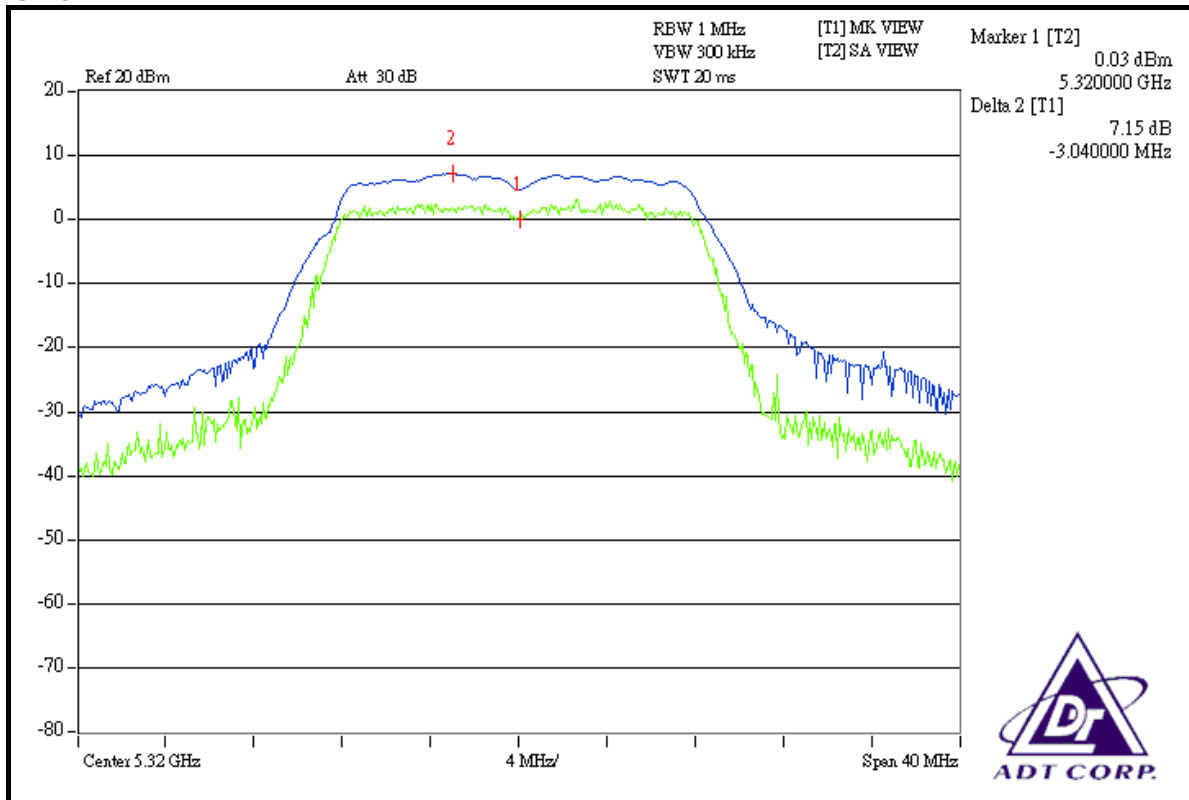




### CH 7



### CH 8



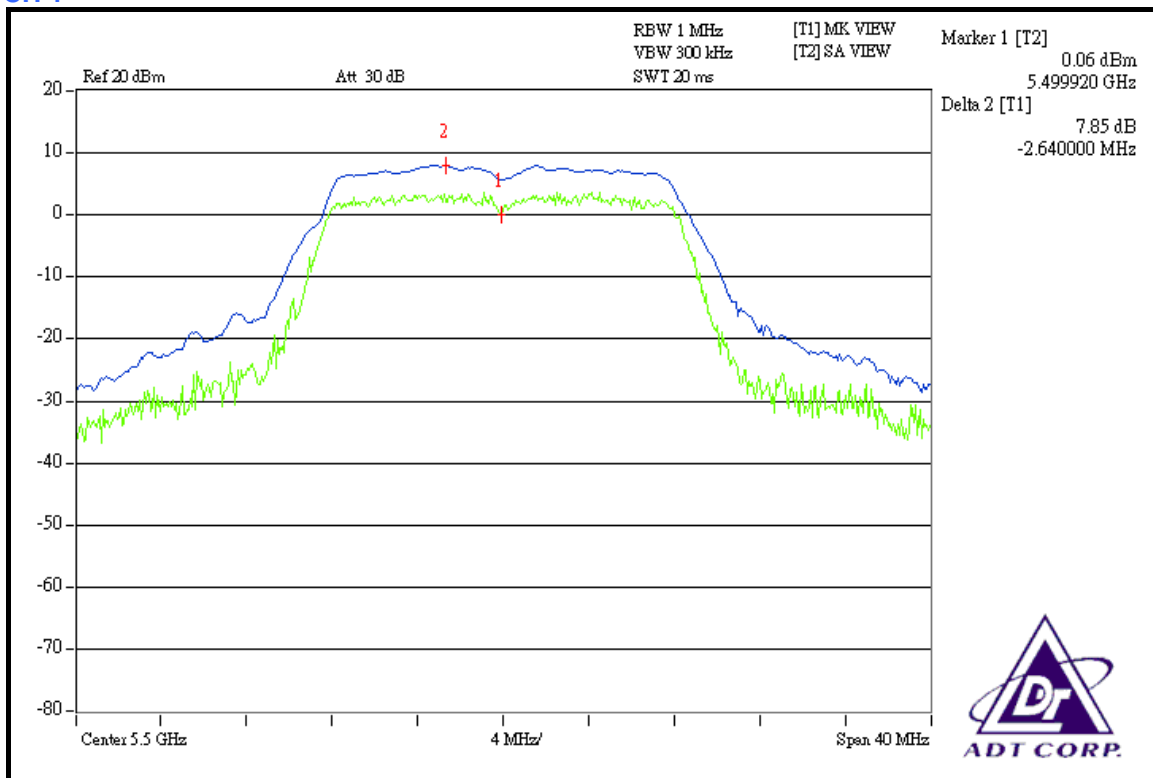


**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

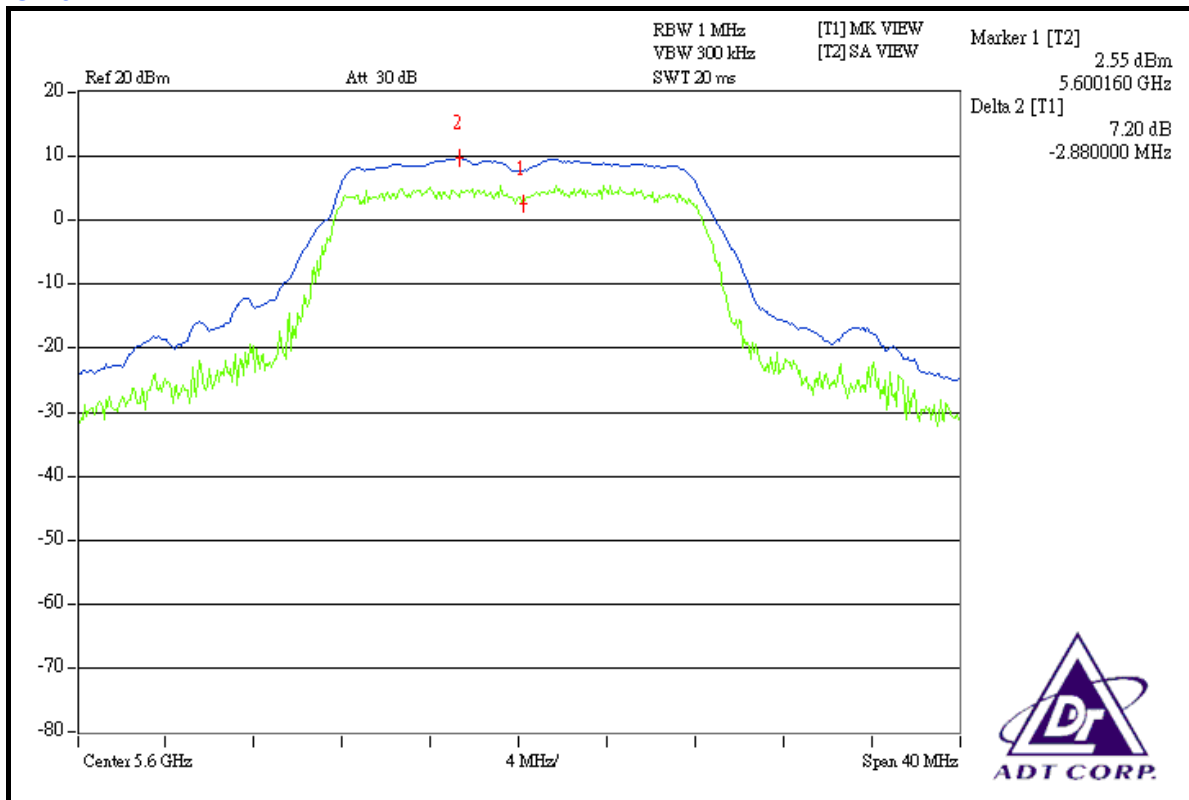
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 67%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK TO AVERAGE EXCURSION LIMIT (dB)	PASS / FAIL
1	5500	7.85	13	PASS
6	5600	7.20	13	PASS
11	5700	6.46	13	PASS

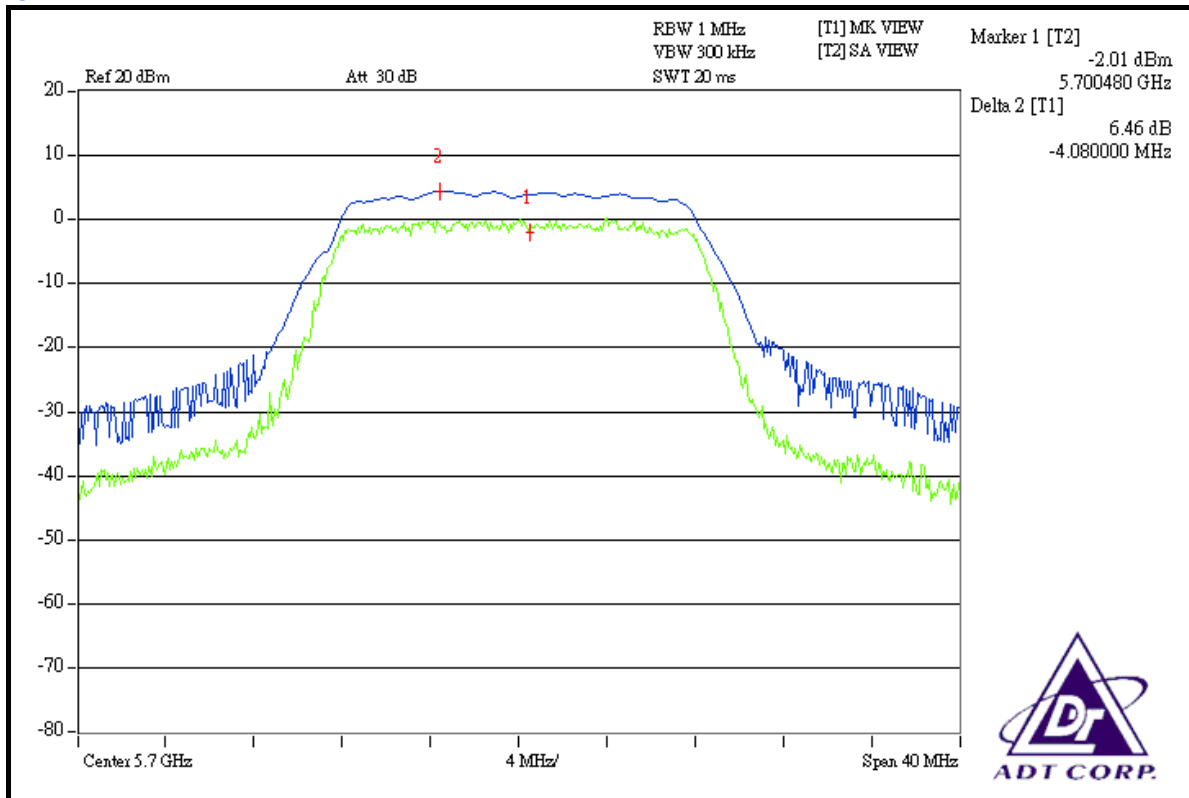
**CH 1**



### CH 6



### CH 11







## 4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	4dBm
5.250 ~ 5.350GHz	11dBm
5.470 ~ 5.725GHz	11dBm

### 4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

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

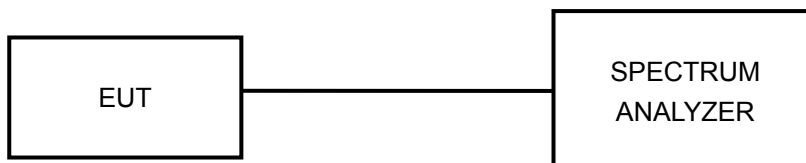
### 4.5.3 TEST PROCEDURES

- a. The transmitter output was connected to the spectrum analyzer.
- b. 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

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



#### 4.5.7 TEST RESULTS

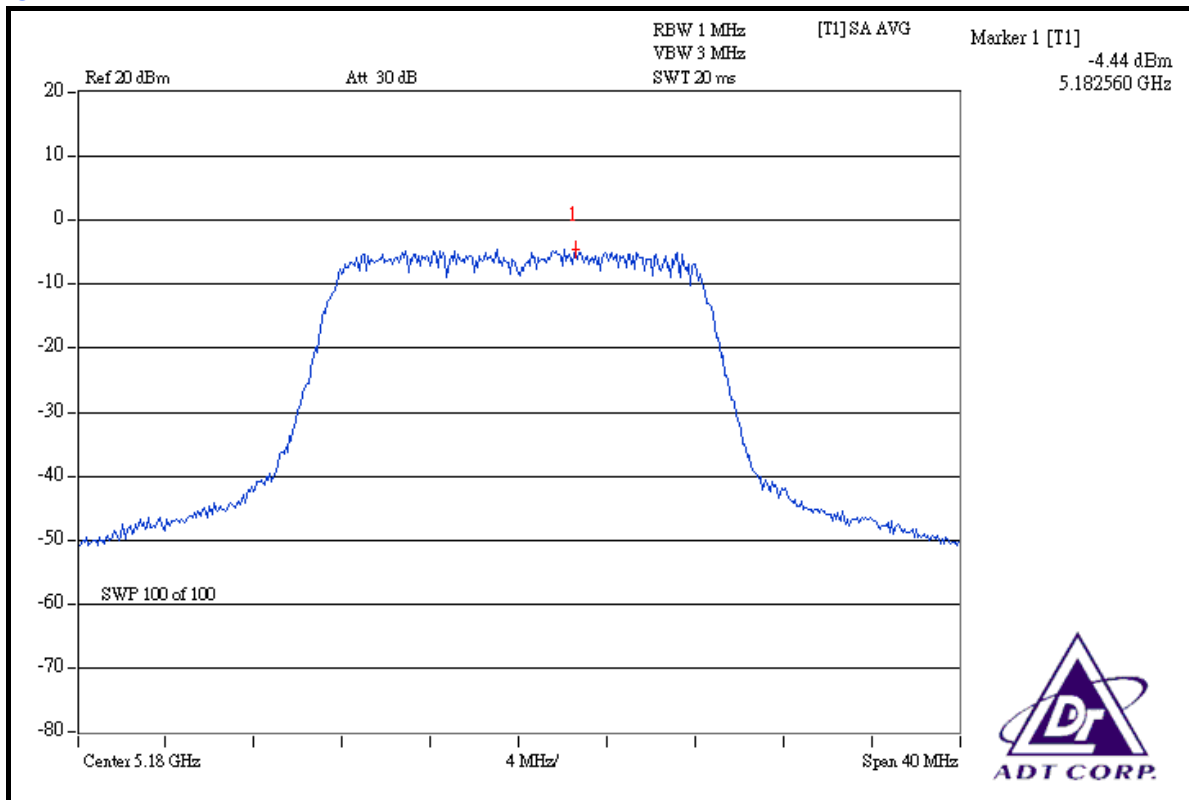
##### FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

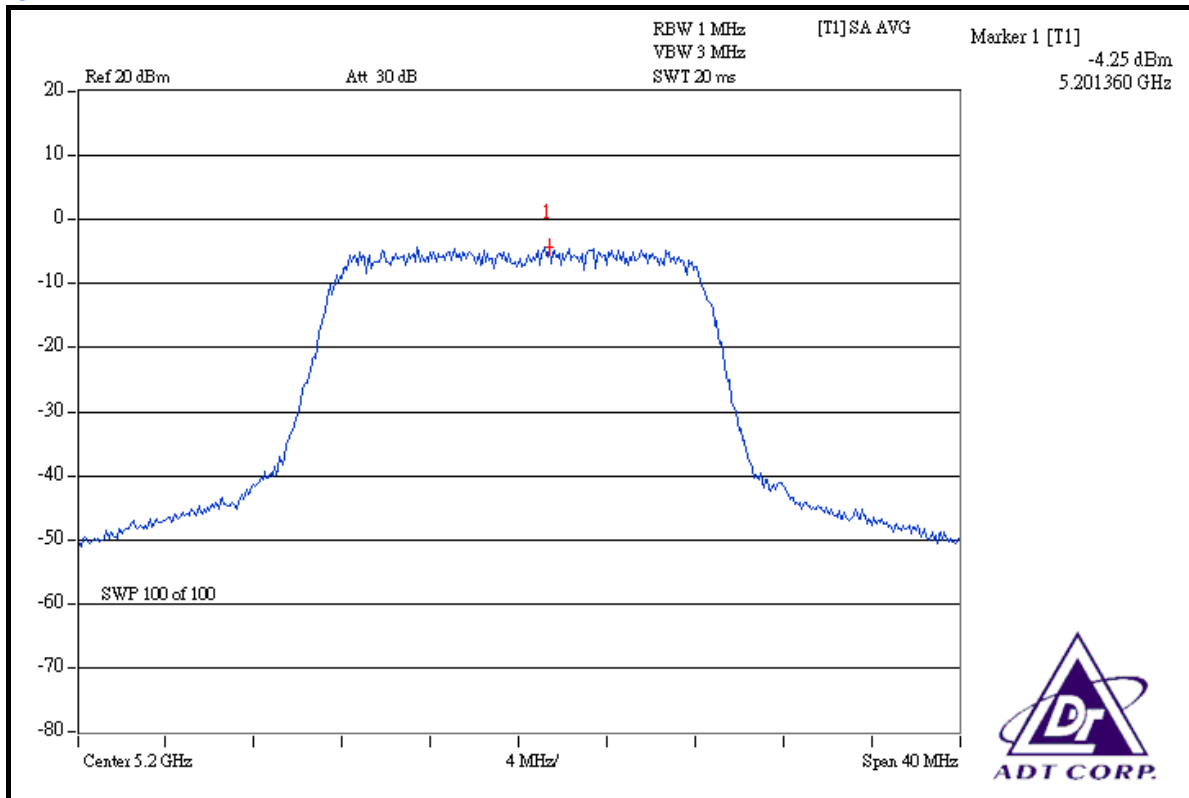
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 1MHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS / FAIL</b>
1	5180	-4.44	4	PASS
2	5200	-4.25	4	PASS
4	5240	-4.21	4	PASS
5	5260	-4.32	11	PASS
7	5300	-3.59	11	PASS
8	5320	-3.13	11	PASS



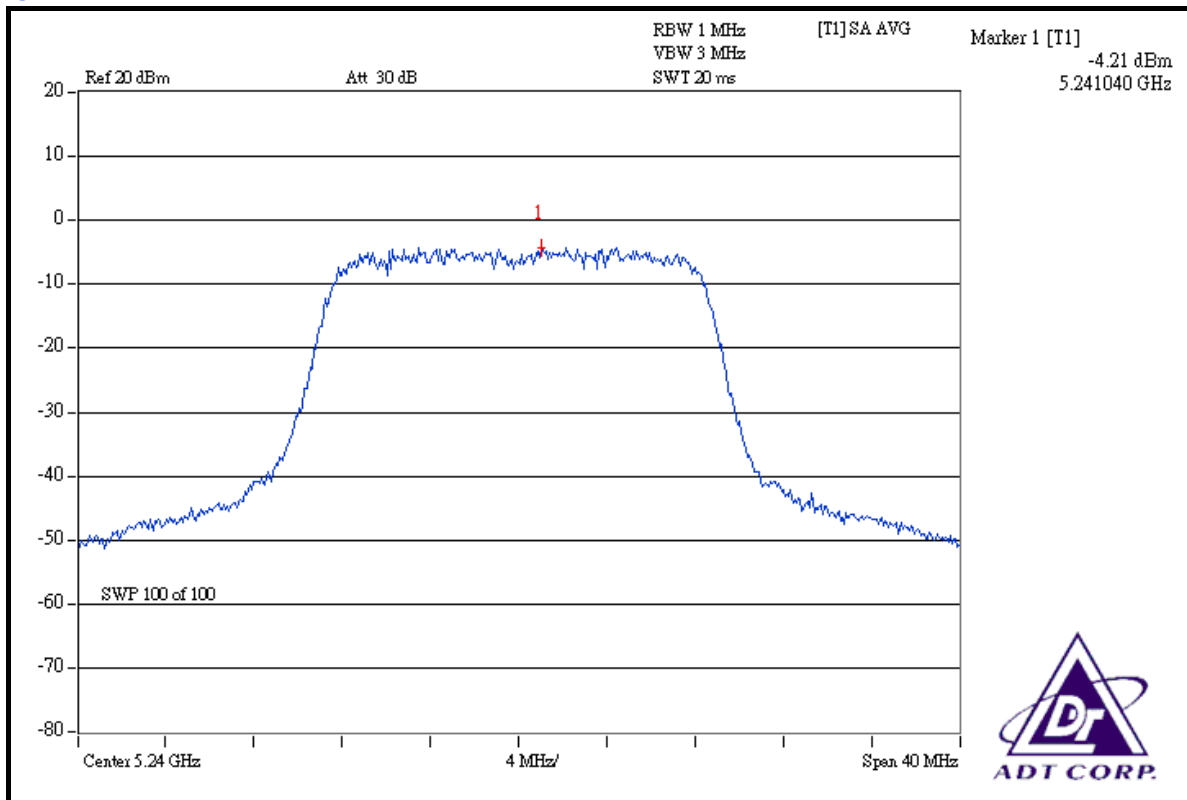
### CH 1



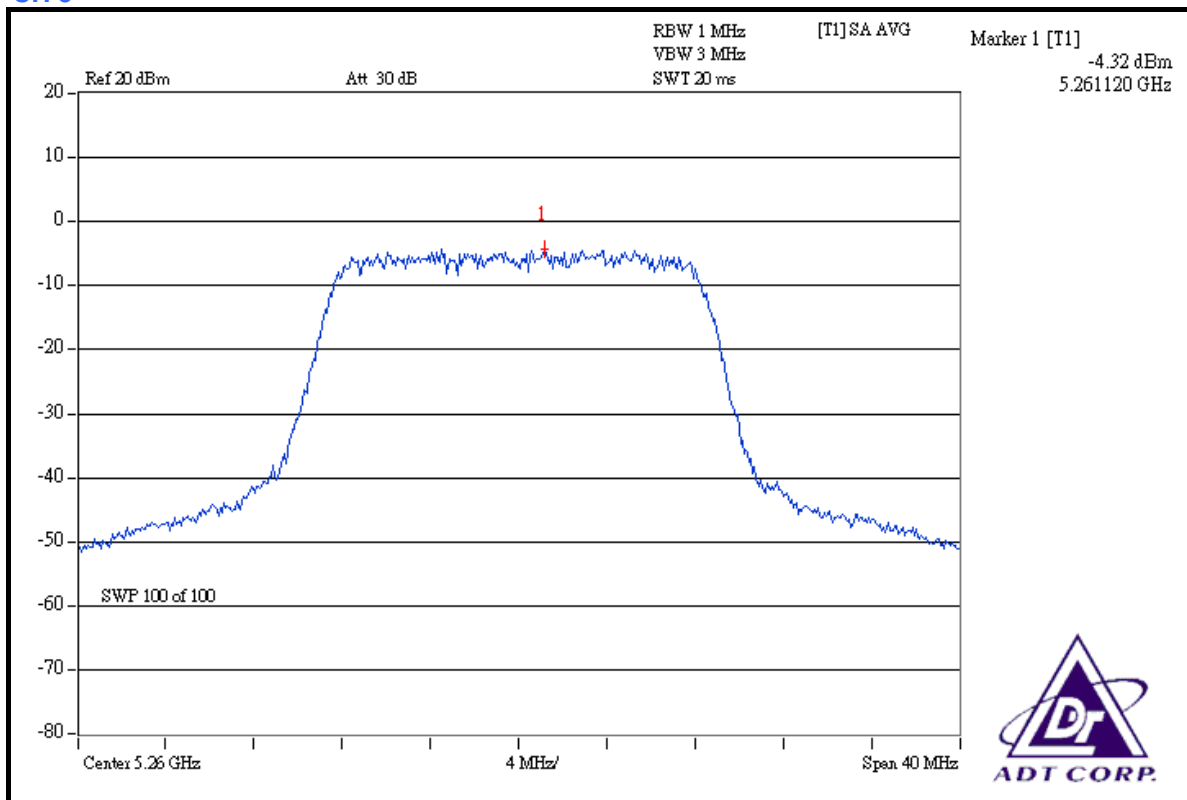
### CH 2



### CH 4

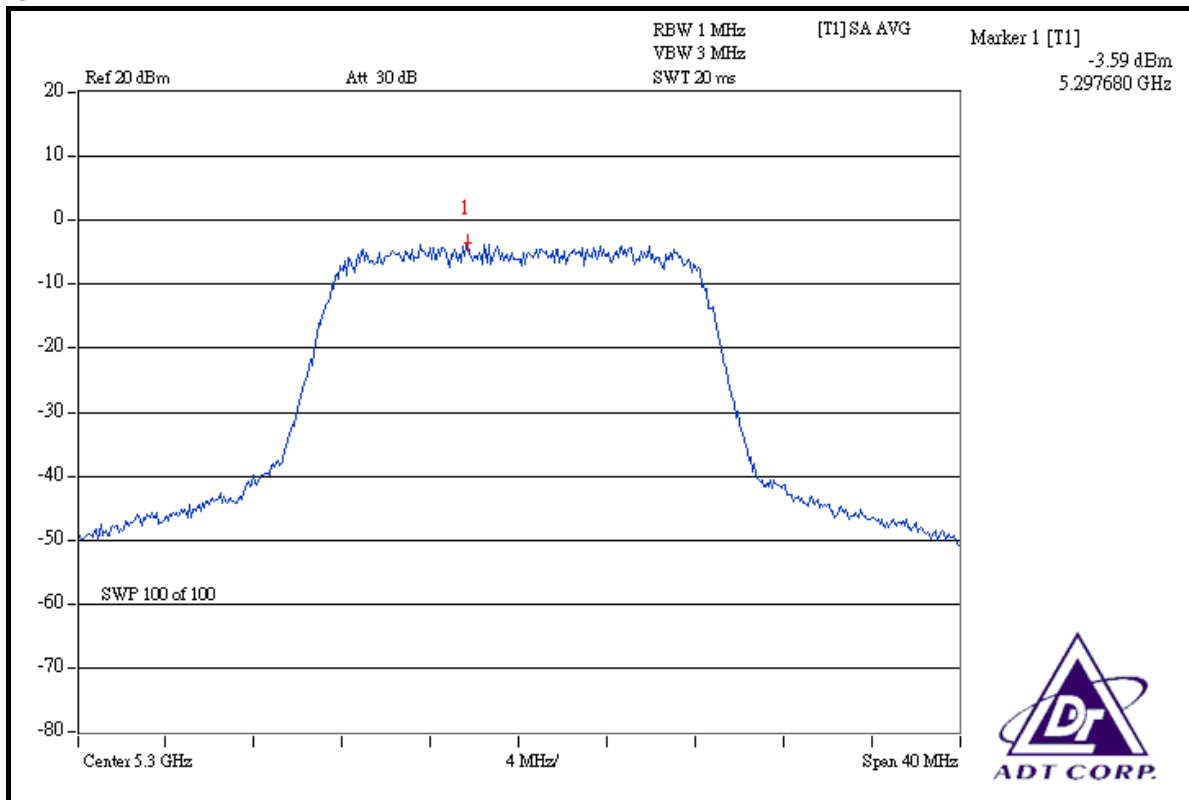


### CH 5

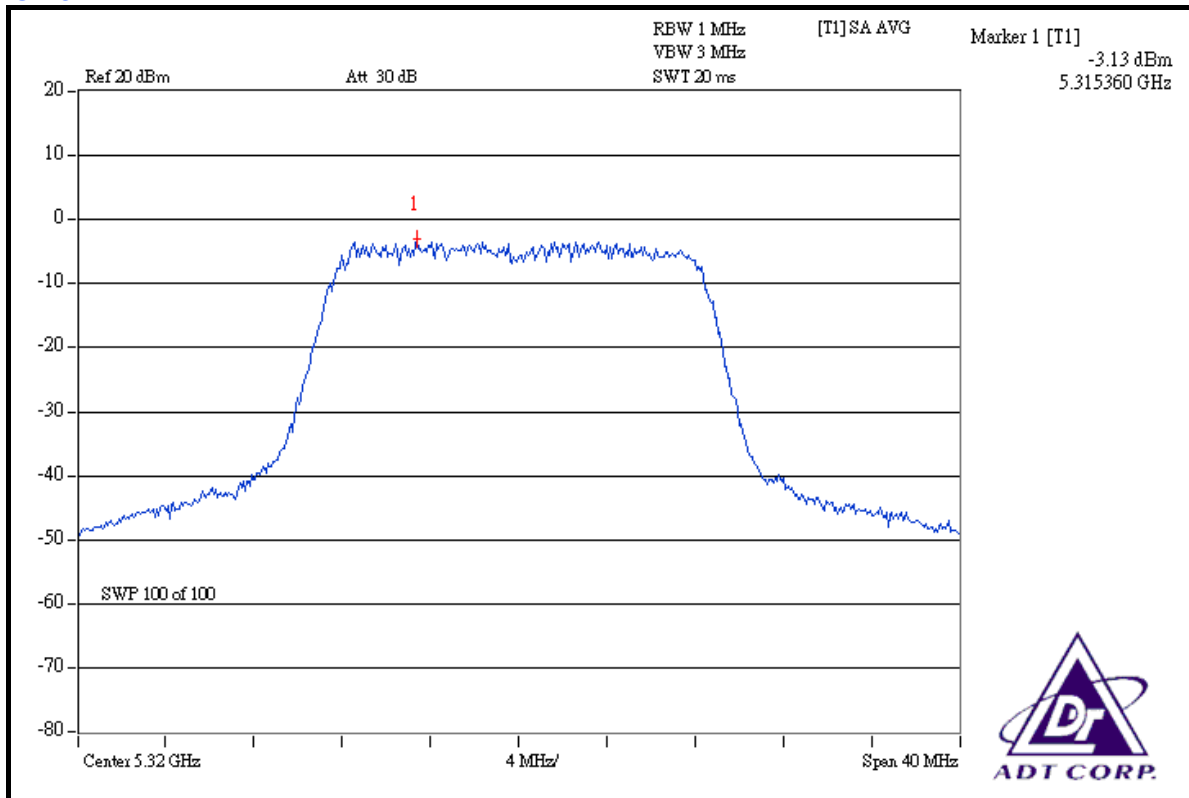




### CH 7



### CH 8



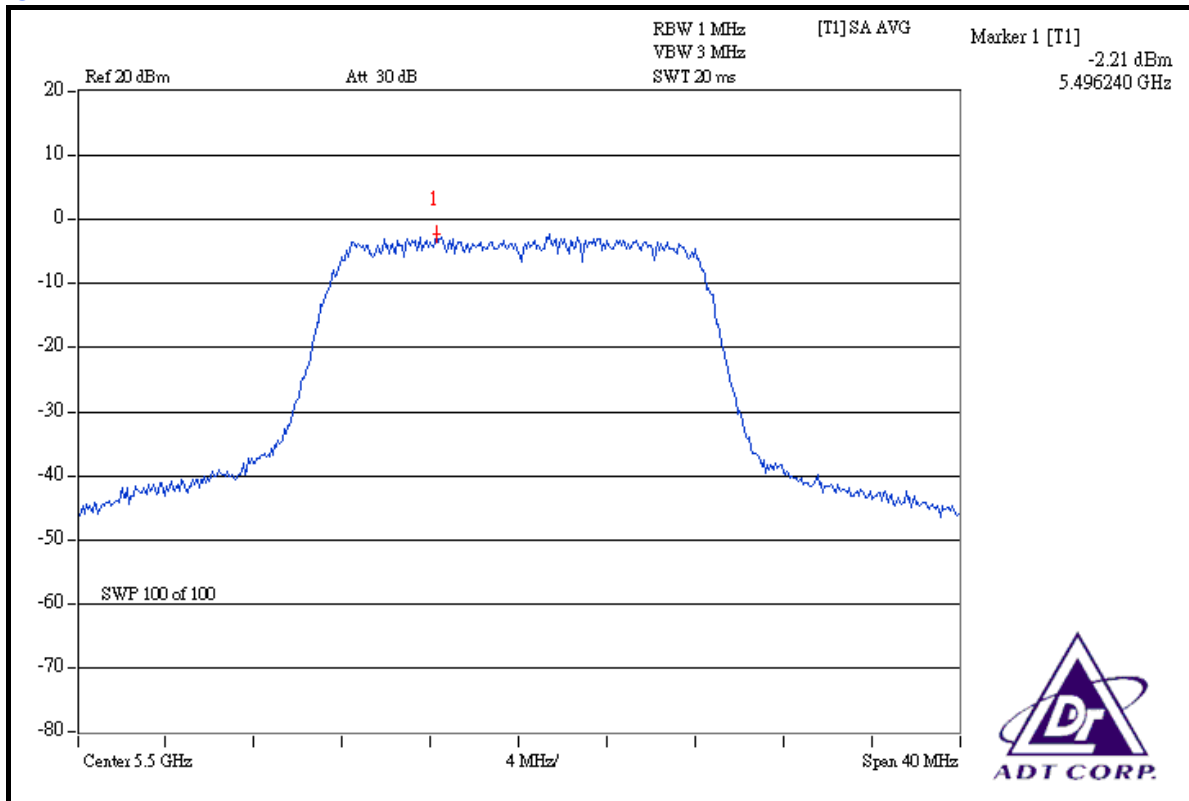


**FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

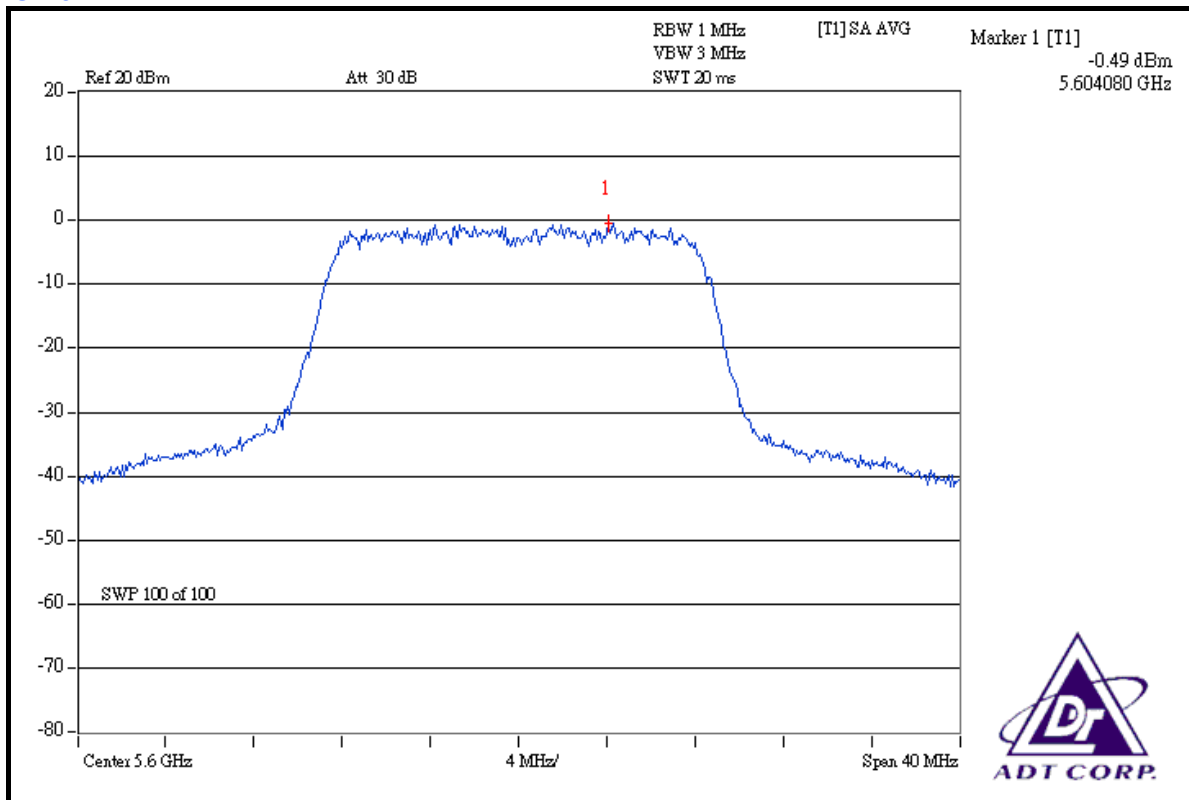
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 67%RH, 991hPa
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>TESTED BY</b>	Brad Wu

CHANNEL	CHANNEL FREQUENCY (MHz )	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	5500	-2.21	11	PASS
6	5600	-0.49	11	PASS
11	5700	-5.67	11	PASS

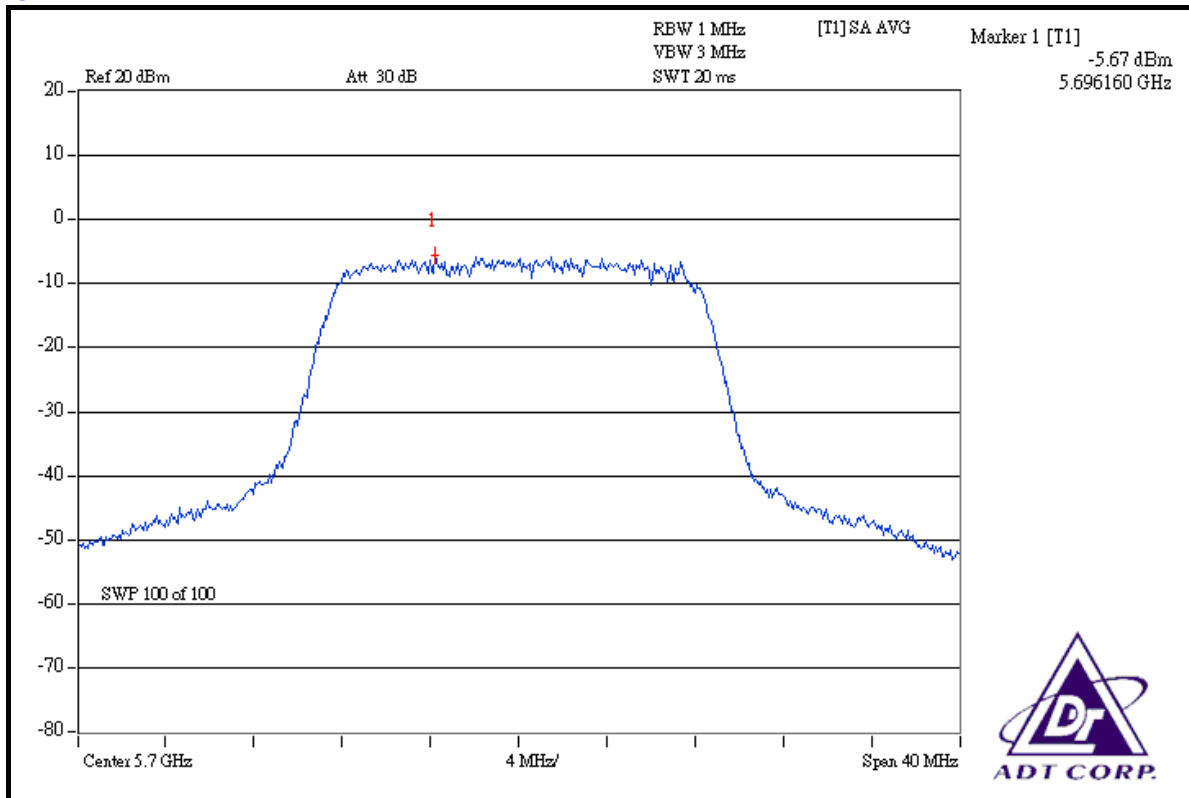
**CH 1**



### CH 6



### CH 11







## 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	Mar. 07, 2008
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	Jun. 28, 2008

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

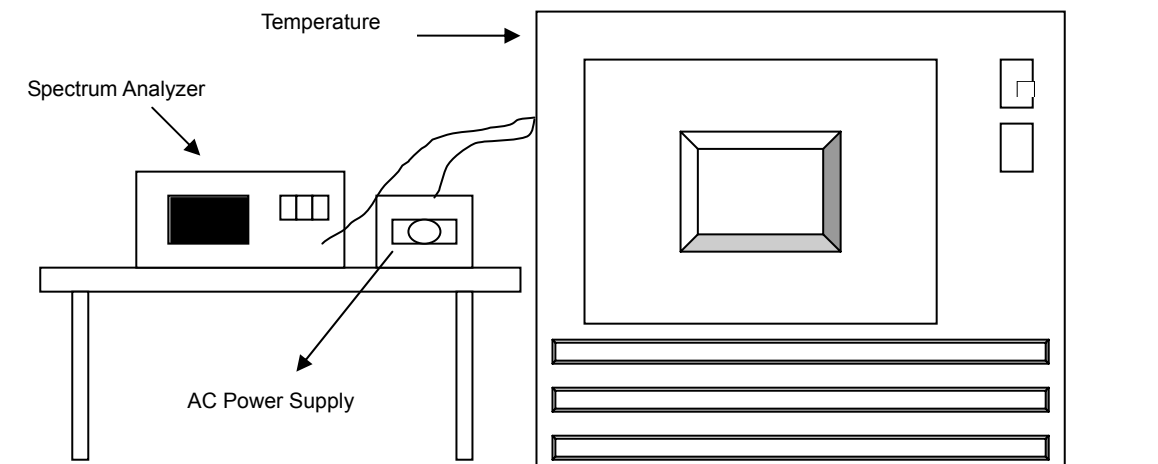
### 4.6.3 TEST PROCEDURE

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: ± 0.01%			
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5319.885403	-0.0021541	5319.888831	-0.0020896	5319.924247	-0.0014239	5319.927257	-0.0013674
	110.0	5319.901403	-0.0018533	5319.900831	-0.0018641	5319.927647	-0.0013600	5319.931157	-0.0012940
	93.5	5319.904203	-0.0018007	5319.901231	-0.0018566	5319.932847	-0.0012623	5319.938357	-0.0011587
40	126.5	5319.896503	-0.0019454	5319.897831	-0.0019205	5319.928647	-0.0013412	5319.932157	-0.0012753
	110.0	5319.902703	-0.0018289	5319.906631	-0.0017551	5319.933447	-0.0012510	5319.936257	-0.0011982
	93.5	5319.914303	-0.0016109	5319.914531	-0.0016066	5319.936347	-0.0011965	5319.942857	-0.0010741
30	126.5	5319.897803	-0.0019210	5319.903931	-0.0018058	5319.934347	-0.0012341	5319.938357	-0.0011587
	110.0	5319.903603	-0.0018120	5319.919531	-0.0015126	5319.941947	-0.0010912	5319.938357	-0.0011587
	93.5	5319.921703	-0.0014718	5319.927931	-0.0013547	5319.943047	-0.0010706	5319.948557	-0.0009670
20	126.5	5319.904803	-0.0017894	5319.907831	-0.0017325	5319.937647	-0.0011721	5319.943457	-0.0010628
	110.0	5319.905103	-0.0017838	5319.925231	-0.0014054	5319.945447	-0.0010254	5319.947857	-0.0009801
	93.5	5319.929403	-0.0013270	5319.936431	-0.0011949	5319.946947	-0.0009972	5319.951257	-0.0009162
10	126.5	5319.912003	-0.0016541	5319.918631	-0.0015295	5319.945047	-0.0010330	5319.949857	-0.0009425
	110.0	5319.920603	-0.0014924	5319.929531	-0.0013246	5319.947347	-0.0009897	5319.951257	-0.0009162
	93.5	5319.935503	-0.0012124	5319.941231	-0.0011047	5319.955047	-0.0008450	5319.961257	-0.0007283
0	126.5	5319.915703	-0.0015845	5319.925631	-0.0013979	5319.948647	-0.0009653	5319.955257	-0.0008410
	110.0	5319.927203	-0.0013684	5319.935031	-0.0012212	5319.955447	-0.0008375	5319.958357	-0.0007828
	93.5	5319.941803	-0.0010939	5319.944331	-0.0010464	5319.957447	-0.0007999	5319.963957	-0.0006775
-10	126.5	5319.927803	-0.0013571	5319.931131	-0.0012945	5319.955447	-0.0008375	5319.960157	-0.0007489
	110.0	5319.934303	-0.0012349	5319.941131	-0.0011066	5319.958647	-0.0007773	5319.965057	-0.0006568
	93.5	5319.948903	-0.0009605	5319.947531	-0.0009863	5319.962347	-0.0007078	5319.968357	-0.0005948
-20	126.5	5319.932703	-0.0012650	5319.937531	-0.0011742	5319.958947	-0.0007717	5319.965257	-0.0006531
	110.0	5319.938103	-0.0011635	5319.945531	-0.0010239	5319.965147	-0.0006551	5319.968257	-0.0005967
	93.5	5319.952903	-0.0008853	5319.954931	-0.0008472	5319.966347	-0.0006326	5319.969257	-0.0005779
-30	126.5	5319.938003	-0.0011654	5319.944331	-0.0010464	5319.965247	-0.0006533	5319.967657	-0.0006080
	110.0	5319.952403	-0.0008947	5319.950631	-0.0009280	5319.967647	-0.0006081	5319.972257	-0.0005215
	93.5	5319.955503	-0.0008364	5319.960131	-0.0007494	5319.971747	-0.0005311	5319.975457	-0.0004613



## 4.7 BAND EDGES MEASUREMENT

### 4.7.1 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100040	Jun. 28, 2008

**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 / 3MHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

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

### 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 and 5.47 to 5.725GHz 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 = 1MHz, VBW = 3MHz) are attached on the following pages.

## **FOR 5150-5350MHz BAND: 802.11a OFDM MODULATION:**

### **Channel 1 (5180MHz)**

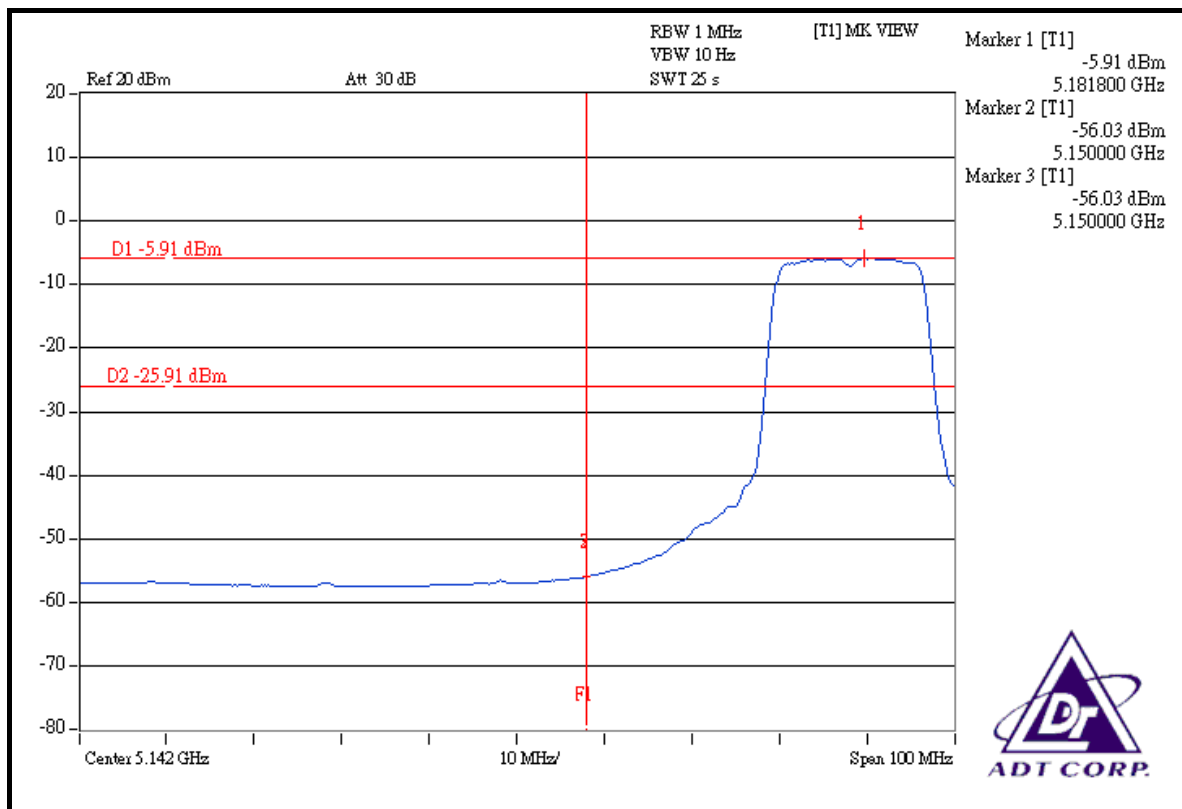
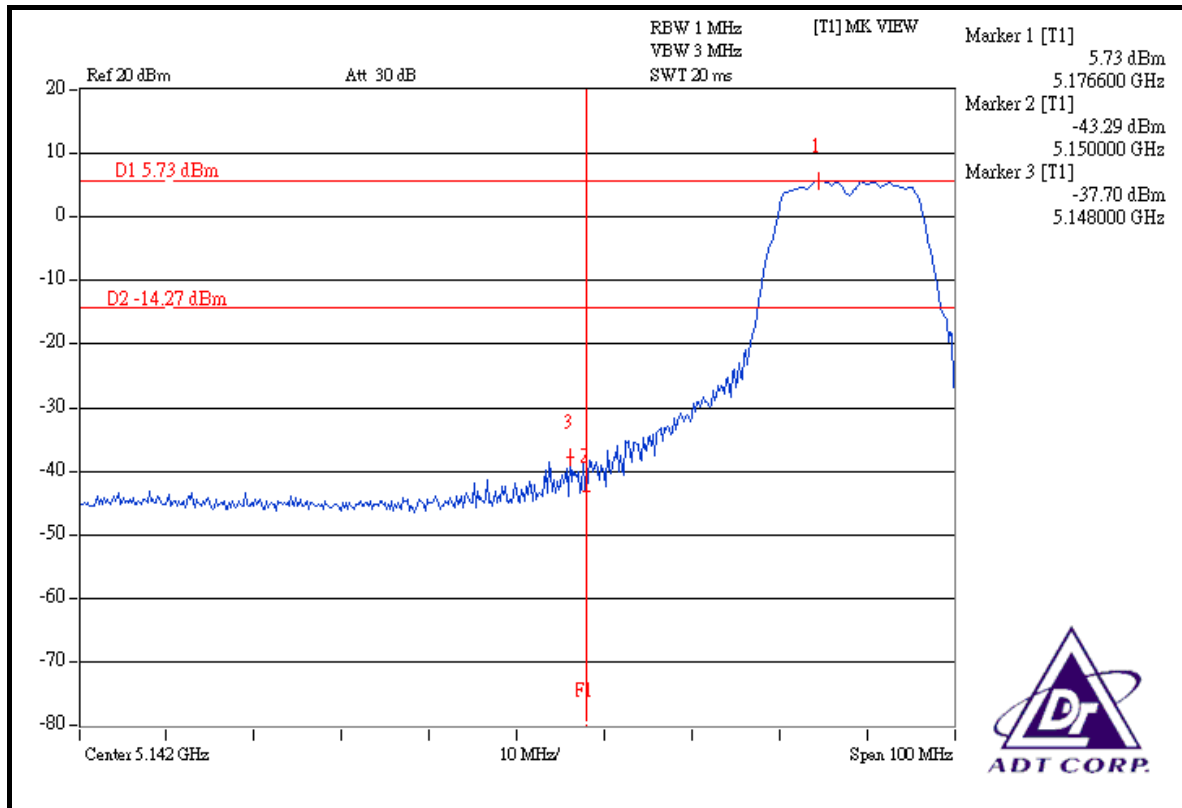
The band edge emission plot on the next page shows 43.43dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 103.06dBuV/m (Peak), so the maximum field strength in restrict band is  $103.06 - 43.43 = 59.63$ dBuV/m which is under 74dBuV/m limit.

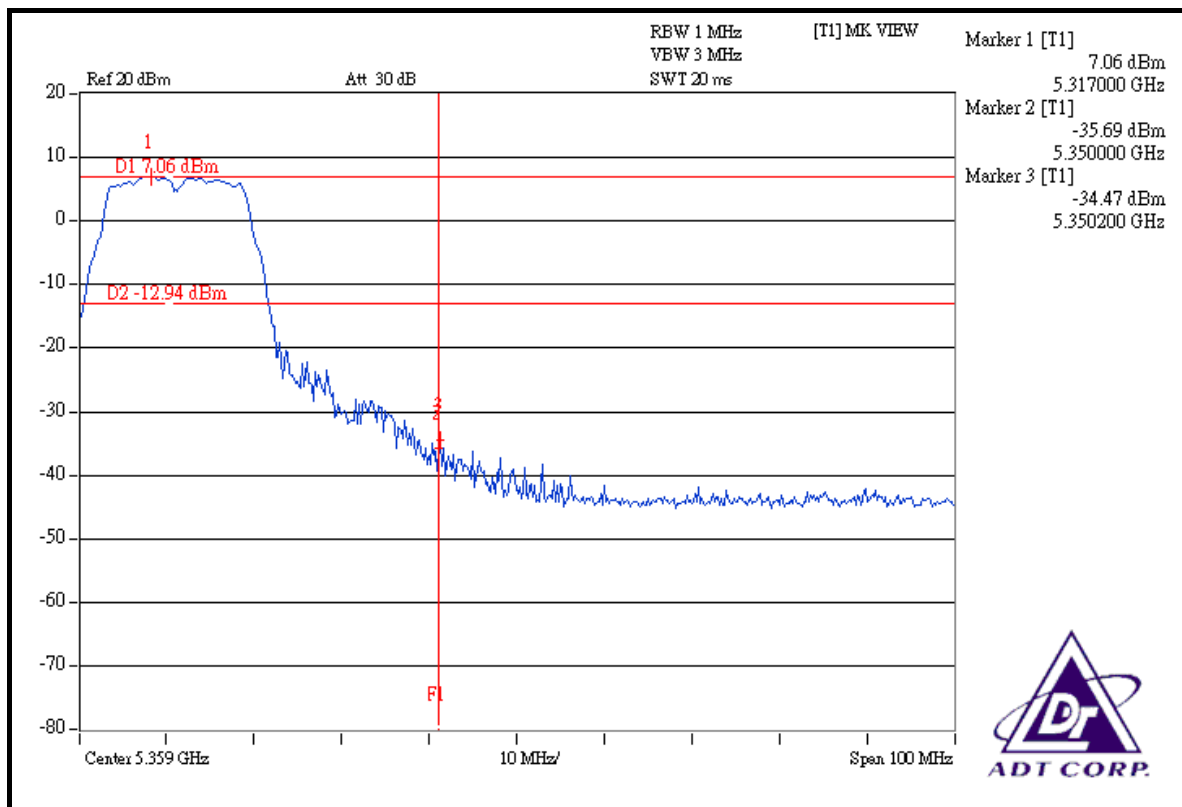
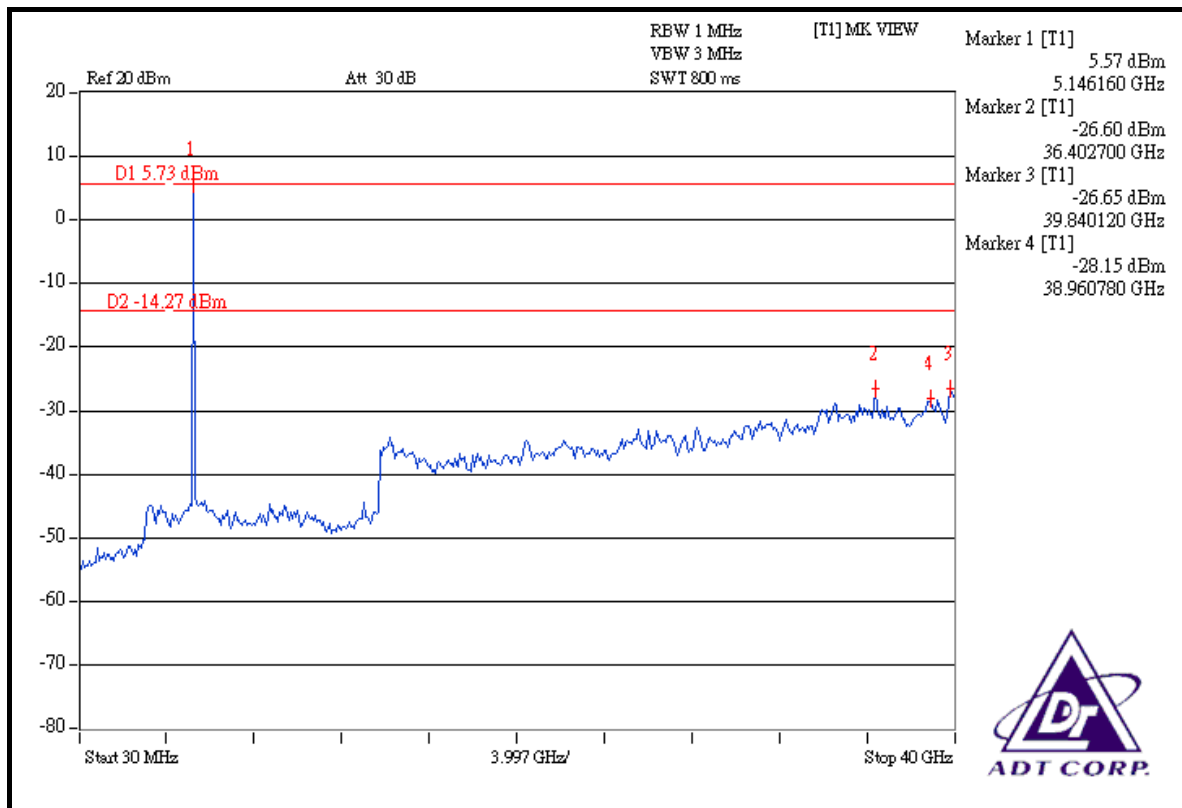
The band edge emission plot on the next page shows 50.12dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 92.38dBuV/m (Average), so the maximum field strength in restrict band is  $92.38 - 50.12 = 42.26$ dBuV/m which is under 54dBuV/m limit.

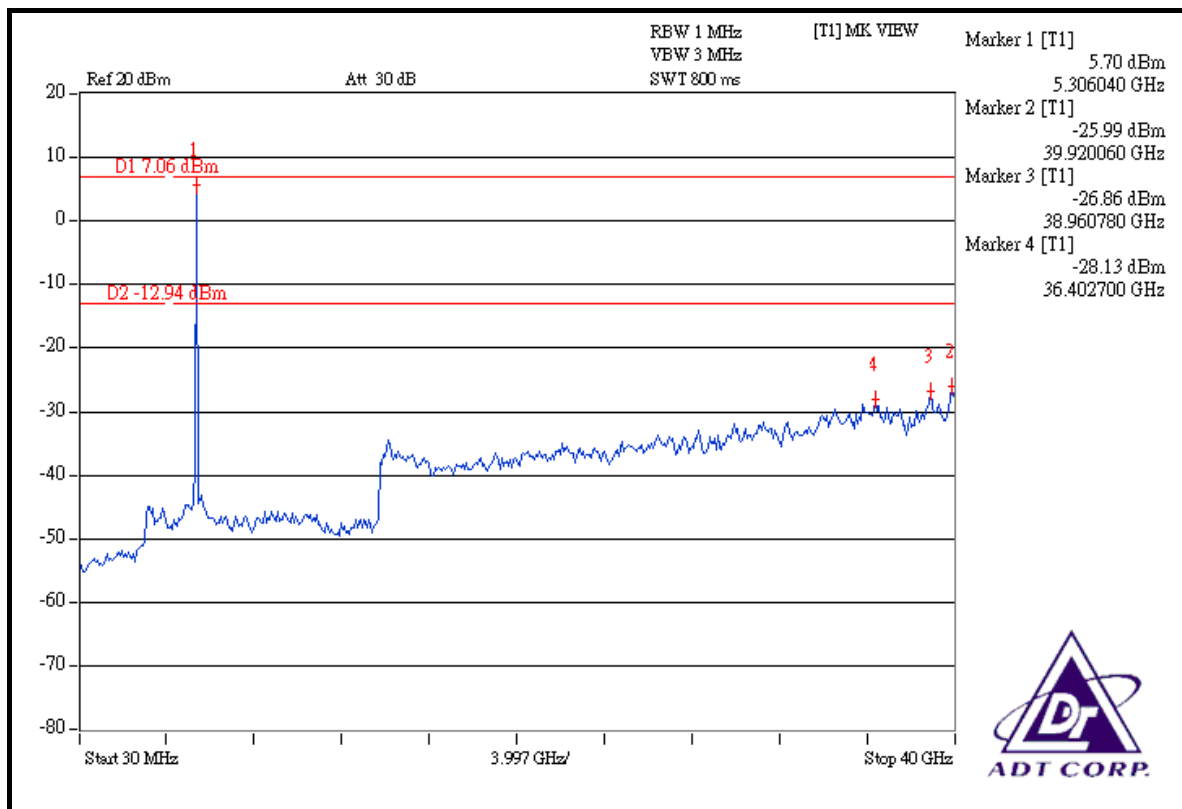
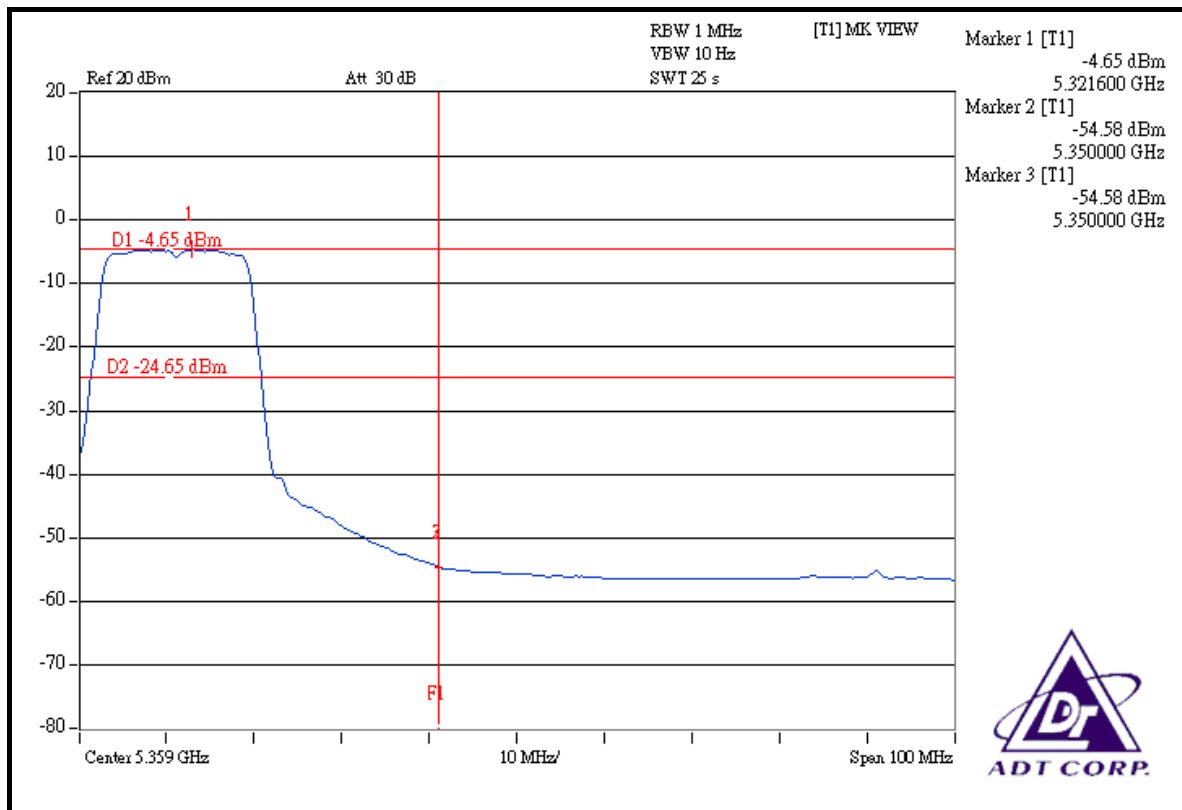
### **Channel 8 (5320MHz)**

The band edge emission plot on the next second page shows 41.53dBc 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 103.25dBuV/m (Peak), so the maximum field strength in restrict band is  $103.25 - 41.53 = 61.72$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 49.93dBc 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 92.83dBuV/m (Average), so the maximum field strength in restrict band is  $92.83 - 49.93 = 42.90$ dBuV/m which is under 54dBuV/m limit.









## **FOR 5470-5725MHz BAND: 802.11a OFDM MODULATION:**

### **Channel 1 (5500MHz)**

The band edge emission plot (5.470GHz) on the next page shows 43.34dBc between carrier maximum power and local maximum emission out of band emission. The emission of carrier strength list in the test result of channel 1 is 101.46dBuV/m (Peak), so the maximum field strength out of band emission is  $101.46 - 43.34 = 58.12$ dBuV/m which is under 88.3dBuV/m limit.

The band edge emission plot (5.470GHz) on the next page shows 49.27dBc 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 90.88dBuV/m (Average), so the maximum field strength in restrict band is  $90.88 - 49.27 = 41.61$ dBuV/m which is under 68.3dBuV/m limit.

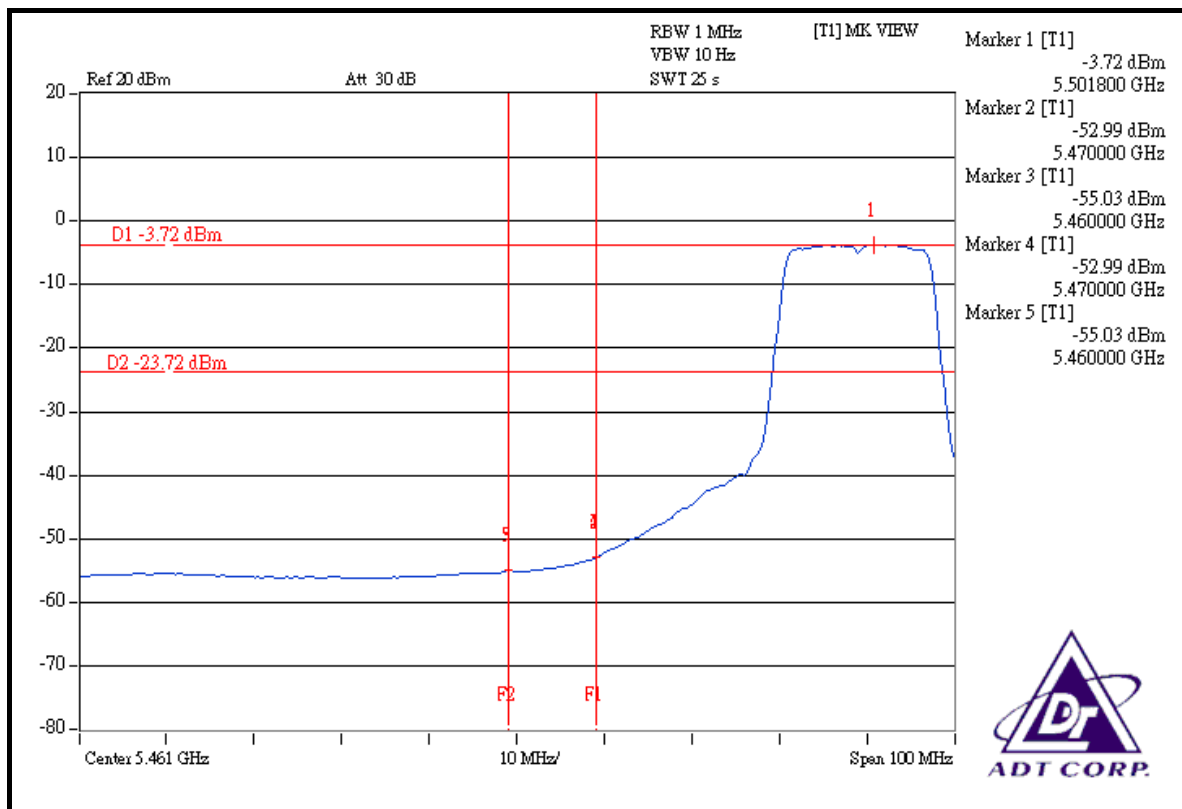
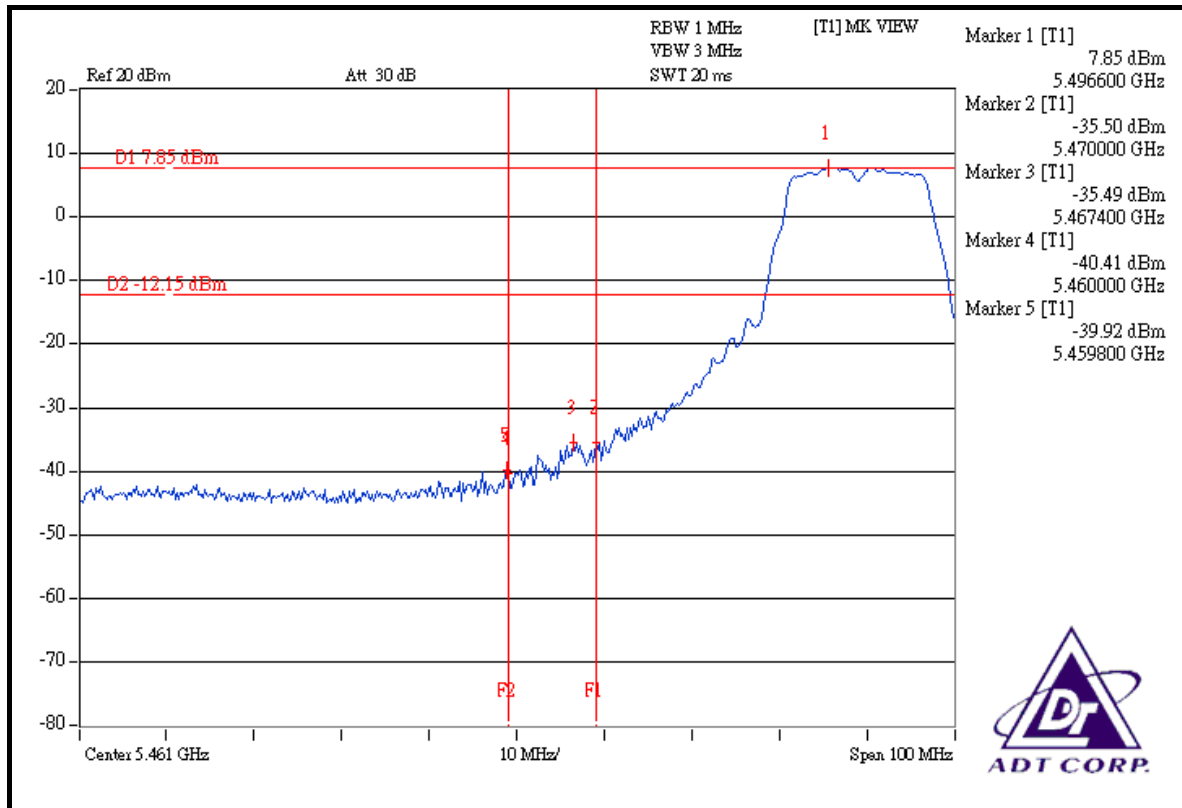
The band edge emission plot (5.460GHz) on the next page shows 47.77dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 101.46dBuV/m (Peak), so the maximum field strength in restrict band is  $101.46 - 47.77 = 53.69$ dBuV/m which is under 74dBuV/m limit.

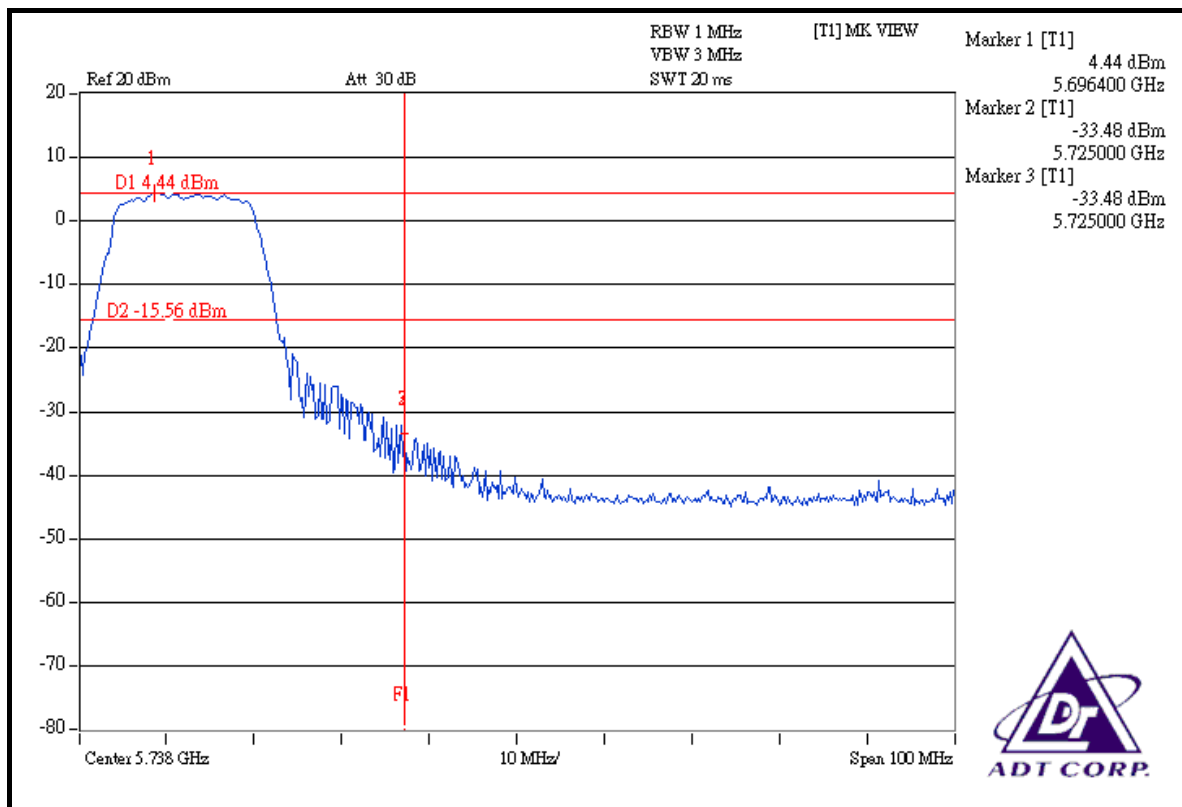
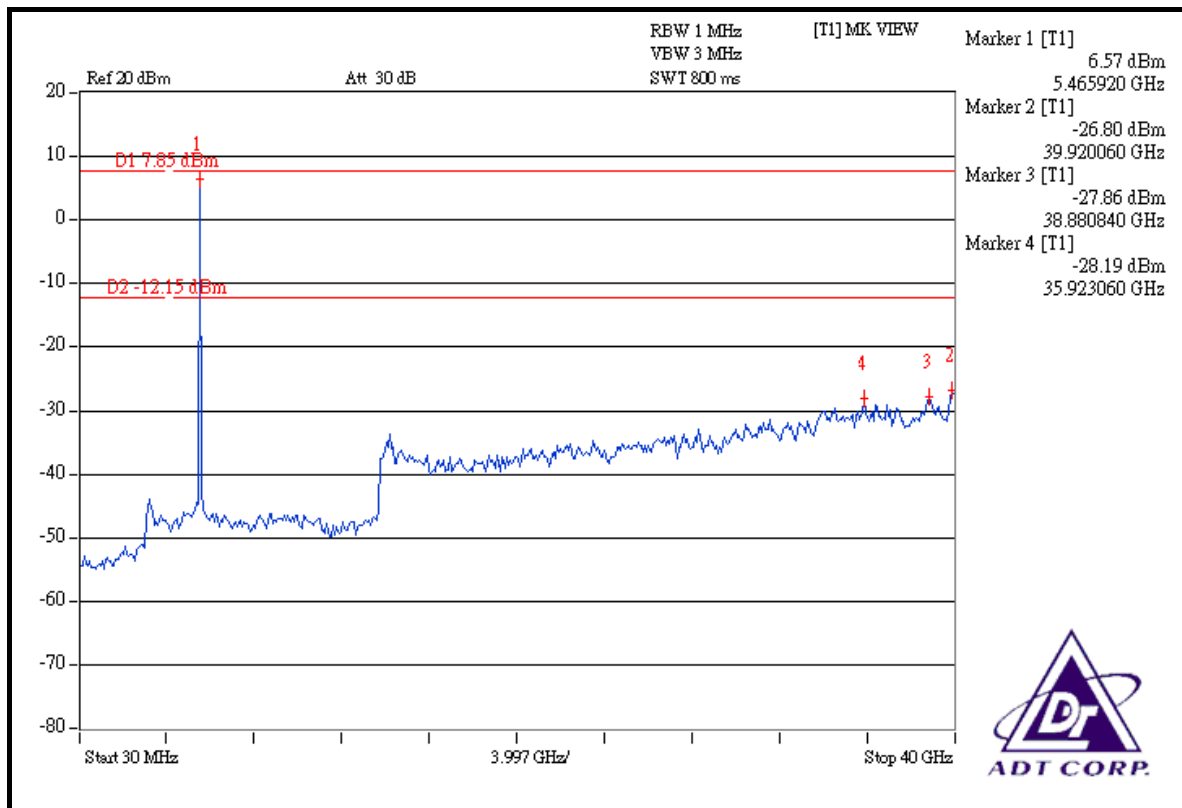
The band edge emission plot (5.460GHz) on the next page shows 51.31dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 90.88dBuV/m (Average), so the maximum field strength in restrict band is  $90.88 - 51.31 = 39.57$ dBuV/m which is under 54dBuV/m limit.

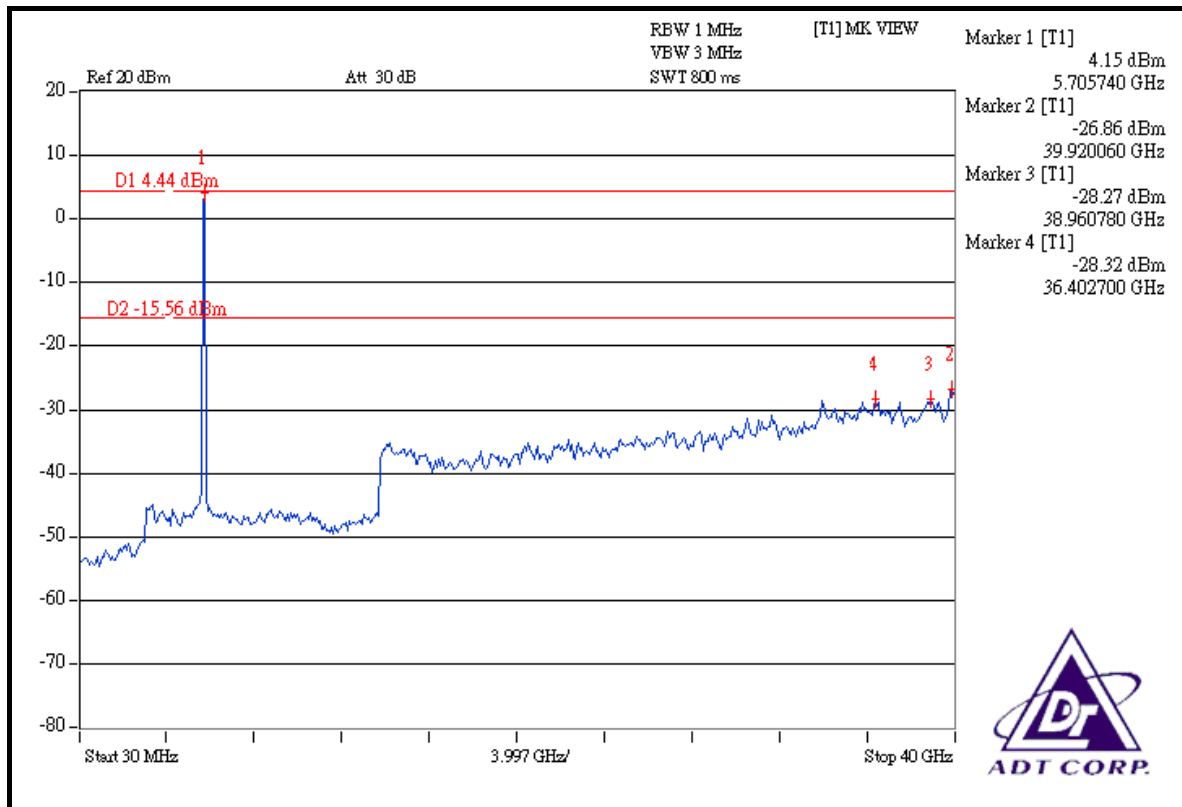
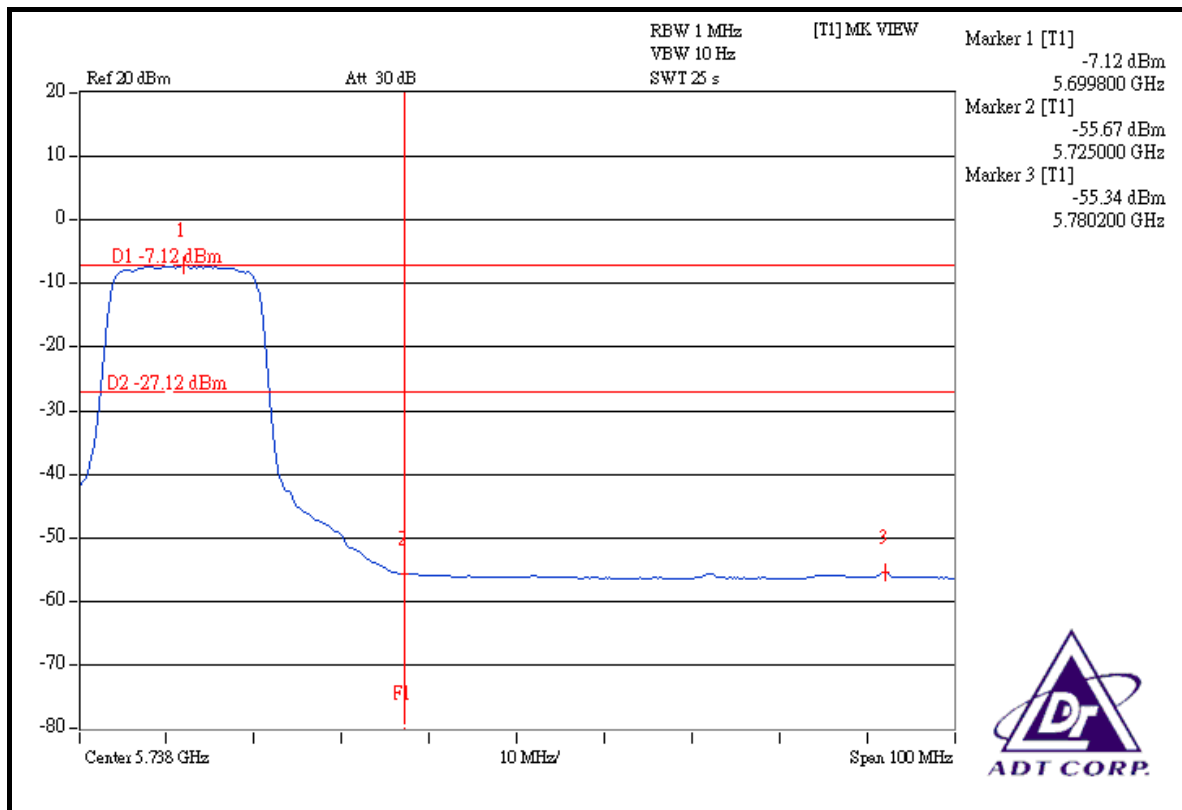
### **Channel 11 (5700MHz)**

The band edge emission plot on the next second page shows 37.92dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 11 is 99.12dBuV/m (Peak), so the maximum field strength in restrict band is  $99.12 - 37.92 = 61.20$ dBuV/m which is under 88.3dBuV/m limit.

The band edge emission plot on the next third page shows 48.22dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 11 is 88.72dBuV/m (Average), so the maximum field strength in restrict band is  $88.72 - 48.22 = 40.50$ dBuV/m which is under 68.3dBuV/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 Inverted F antenna and Planar inverted antenna without antenna connector. The maximum gain of the antenna is 3.5dBi.



## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



## 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.

<b>USA</b>	FCC, UL, A2LA
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA, CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<b>Netherlands</b>	Telefication
<b>Singapore</b>	GOST-ASIA(MOU)
<b>Russia</b>	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](http://www.adt.com.tw/index.5/phtml). If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26051924

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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



## **7. 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.