FCC TEST REPORT (15.407)

for

Aisai Communication Technology Co., Ltd.

Wireless Radio

Model No.: IPLink

FCC ID: YHHIPLKA01

Prepared for	:	Aisai Communication Technology Co., Ltd.
Address	:	6/F, Block 4, Zhongxing Industrial Park, Chuangye Road, Nashan District, Shenzhen City, China

Prepared by	:	SHENZHEN LCS CERTIFICATION SERVICES INC.
Address	:	4F., No. 120, Xijing Industrial Zone, Gushutangxi, Bao'an Road, Xixiang Town, Bao'an District, Shenzhen, China

Report Number	:	KA100527107FC
Date of Test	:	May 27, 2010–June 22, 2010
Date of Report	:	June 25, 2010

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1. TEST CERTIFICATION

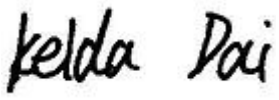
Applicant	Aisai Communication Technology Co., Ltd. 6/F, Block 4, Zhongxing Industrial Park, Chuangye Road, Nashan District, Shenzhen City, China
Manufacturer	Aisai Communication Technology Co., Ltd. 6/F, Block 4, Zhongxing Industrial Park, Chuangye Road, Nashan District, Shenzhen City, China
EUT	Wireless Radio
Model No.	IPLink
Power Adapter	Input: AC100-240V Output: DC 24V

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC PART 15 E	**No non-compliance noted**

The measurement results are contained in this test report and SHENZHEN EMTEK CO., LTD. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC part 15E requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of SHENZHEN LCS CERTIFICATION SERVICES INC.

Date of Test: May 27, 2010–June 22, 2010



Prepared by: _____

(Engineer)

Reviewed by: _____

(Quality Manager)

2. TEST RESULT SUMMARY

Test Items	Result	Remark
AC Power Conducted Emission	Pass	Meet the requirement of limit.
Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	Pass	Meet the requirement of limit.
Peak Transmit Power	Pass	Meet the requirement of limit.
Peak Power Excursion	Pass	Meet the requirement of limit.
Peak Power Spectral Density	Pass	Meet the requirement of limit.
Frequency Stability	Pass	Meet the requirement of limit.

Note: 1. The test result judgment is decided by the limit of test standard
2. The information of measurement uncertainty is available upon the customer's request.

3. EUT DESCRIPTION

Product	Wireless Radio
Trade Name	Aisai
Model Number	IPLink
Model Discrepancy	All the above models are identical except the model designation for different market.
Power Supply	Input: AC100-240V Output: DC 24V
Frequency Range	5180.0 ~ 5240.0MHz
Transmit Power	IEEE 802.11a:15.42dBm IEEE 802.11n (20 MHz): 15.06dBm IEEE 802.11n (40 MHz): 15.32dBm
Modulation Technique	OFDM
Transmit Data Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 270Mbps
Number of Channels	4 Channels for IEEE 802.11a, IEEE 802.11n (20MHz) 2 Channels for IEEE 802.11a (40MHz)
Antenna Specification	0dBi gain (Max)
Accessory Devices	AC Adapter
I/O Ports	RJ45

NOTE:

1. The EUT is a DUAL-BAND WIRELESS HD INTERNET ROUTER. The functions of EUT listed as below:

	TEST STANDARD	REFERENCE REPORT
WLAN 802.11a, 802.11n (5745~5825 MHz)	FCC Part 15, Subpart C (Section 15.247)	KA100527103FC
WLAN 802.11a, 802.11n (5180~ 5240MHz)	FCC Part 15, Subpart E (Section 15.407)	KA100527107FC

2. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz	5180~5240	5745~5825
802.11a	√	√
802.11n (20MHz)	√	√
802.11n (40MHz)	√	√

3. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

MODULATION MODE	TX FUNCTION
802.11a	2TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

4. The EUT uses following adapter.

Brand	Aisai
Model	ASW-IPLINK POE
Input Power	AC 100-240V
Output Power	DC 24V
Poewr Line	1.5m, Shielded

5. 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.

4. DESCRIPTION OF TEST MODES

4.1 TRANSMIT CHANNELS

802.11a and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
25	5180MHz	28	5220MHz
27	5200MHz	30	5240MHz

802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
26	5190MHz	29	5230MHz

4.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
--	√	√	√	√	--

Where RE≥1G: Radiated Emission above 1GHz RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission APCM: Antenna Port Conducted Measurement

4.3 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Axis
802.11a	25 to 30	25, 27, 30	OFDM	BPSK	6.0	Z
802.11n (20MHz)	25 to 30	25, 27, 30	OFDM	BPSK	7.2	Z
802.11n (40MHz)	26 to 29	26, 29	OFDM	BPSK	15.0	Z

4.4 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Axis
802.11a	25 to 30	4	OFDM	BPSK	6.0	Z

4.5 POWER LINE CONDUCTED EMISSION TEST:

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

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

Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	25 to 30	4	OFDM	BPSK	6.0

4.6 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	25 to 30	25, 27, 30	OFDM	BPSK	6.0
802.11n (20MHz)	25 to 30	25, 27, 30	OFDM	BPSK	7.2
802.11n (40MHz)	26 to 29	26, 29	OFDM	BPSK	15.0

4.7 ANTENNA PORT CONDUCTED MEASUREMENT:

☒This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒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	25 to 30	25, 27, 30	OFDM	BPSK	6.0
802.11n (20MHz)	25 to 30	25, 27, 30	OFDM	BPSK	7.2
802.11n (40MHz)	26 to 29	26, 29	OFDM	BPSK	15.0

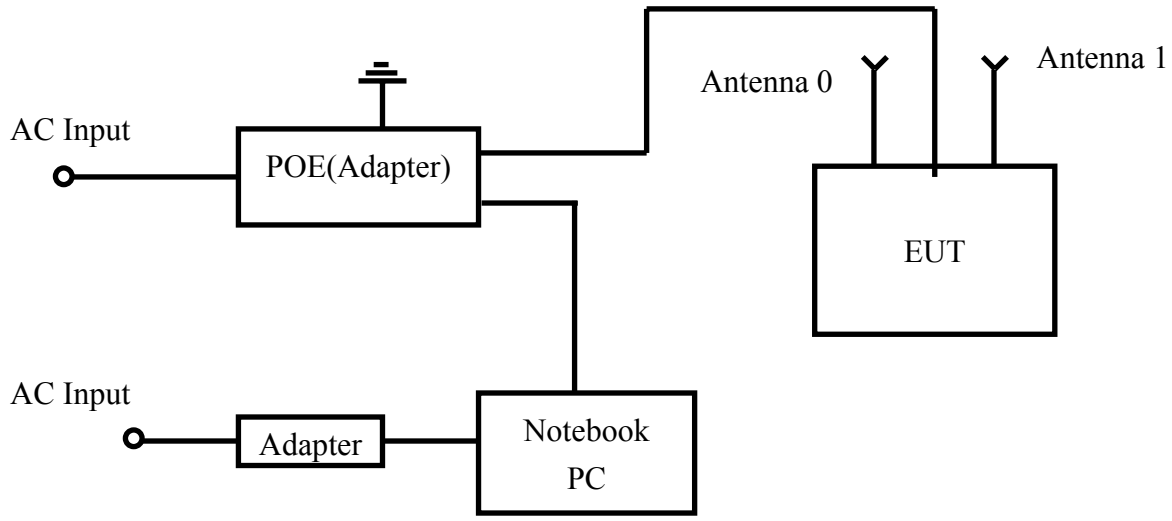
5. SETUP OF EQUIPMENT UNDER TEST

5.1 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.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1	Notebook PC	D610	DRMTH1S	E2K5HCKT	Dell	LAN shielded, 1.8m	Unshielded, 1.8m

5.2 CONFIGURATION OF SYSTEM UNDER TEST



6 FACILITIES AND UNCERTAINTY

6.1 FACILITIES

Site Description EMC Lab.	:	Accredited by CNAS, 2005.11.02 The certificate is valid until 2010.11 The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025:2005) The Certificate Registration Number is L2291. Accredited by TUV Rheinland Shenzhen, 2008.3 The Laboratory has been assessed according to the requirements ISO/IEC 17025 Accredited by FCC, March 18, 2008 The Certificate Registration Number is 709623. Accredited by Industry Canada, May 24, 2008 The Certificate Registration Number is 46405-4480.
Name of Firm	:	SHENZHEN EMTEK CO., LTD
Site Location	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

6.2 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:

Conduction Uncertainty (9K~30MHz)	: Ur = ±2.66dB
Radiation Uncertainty (30M~1GHz)	: Ur = ±4.26dB
Radiation Uncertainty (1G~3GHz)	: Ur = ±2.68dB
Radiation Uncertainty (3G~18GHz)	: Ur = ±2.83dB
Radiation Uncertainty (18G~40GHz)	: Ur = ±1.96dB

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

7. TEST TYPES AND RESULTS

7.1 RADIATED EMISSION MEASUREMENT

7.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

a. Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
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.

b. Limits Of Unwanted Emission Out Of The Restricted Bands

Frequencies (MHz)	EIRP LIMIT (dBm)	Equivalent Field Strength At 3m (dBμV/m) *
	PK	PK
5150 ~ 5250	-27	68.3

*NOTE: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{\sqrt{30P}}{3} * 10^6 \ \mu V/m$$, where P is the eirp (Watts).

7.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Mar 30, 2010	1 Year
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	Mar 30, 2010	1 Year
Antenna	Schwarzbeck	VULB9163	142	Mar 30, 2010	1 Year
Horn-antenna	Schwarzbeck	BBHA9120D	9120D-209	Mar 30, 2010	1 Year
Power Line Filter	DUOJI EME	FNF 201 B16	N/A	Mar 30, 2010	1 Year
Power Line Filter	JIANLI	DL-40C	N/A	Mar 30, 2010	1 Year

7.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters 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.

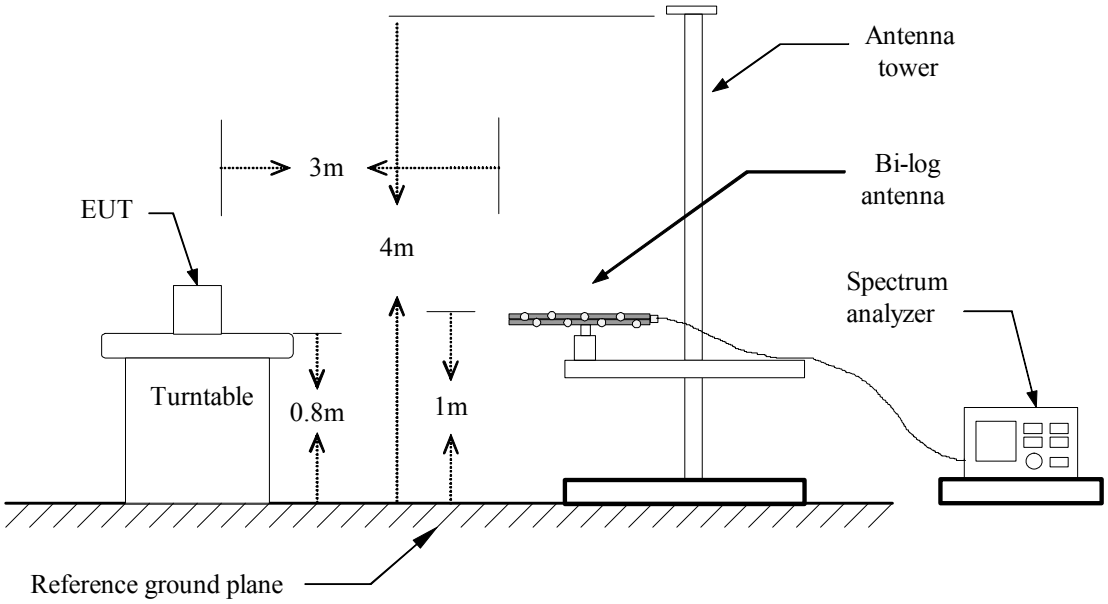
f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data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

NOTE:

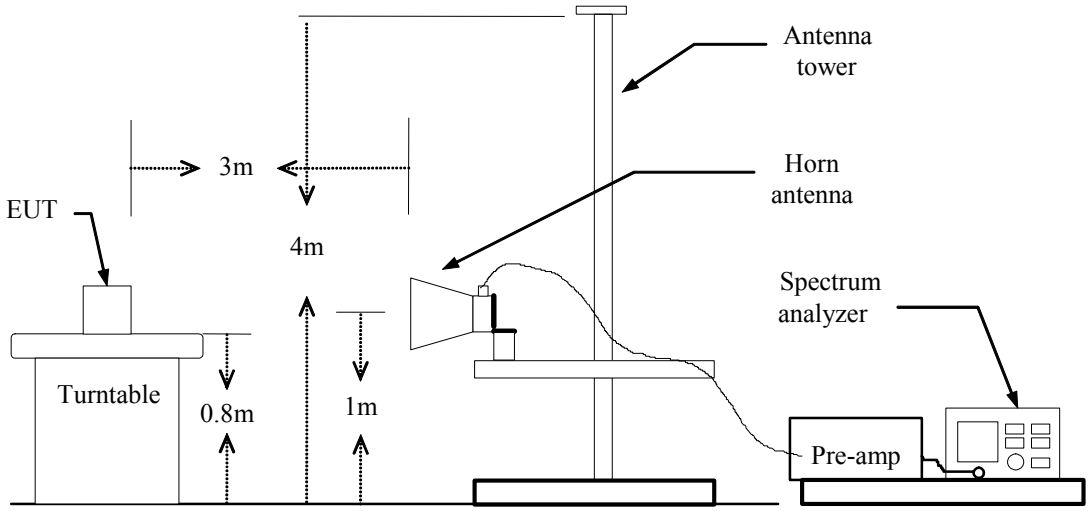
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

7.1.4 TEST SETUP

Below 1 GHz



Above 1 GHz



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

7.1.5 TEST RESULTS

PASS

The test results please refer to the following pages.

Below 1GHz

Worst-case：802.11n 40MHz

Operation Mode:	802.11n TX	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Correction Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
199.10	37.97	26.37	11.60	43.50	5.53	100	239	Ver
300.54	42.84	27.24	15.60	46.00	3.16	100	224	Ver
400.96	43.35	25.35	18.00	46.00	2.65	100	210	Ver
500.11	43.58	22.78	20.80	46.00	2.42	100	183	Ver
751.39	42.10	16.60	25.50	46.00	3.90	100	200	Ver
799.84	42.24	15.84	26.40	46.00	3.76	100	359	Ver
43.28	35.29	21.19	14.10	40.00	4.71	258	357	Hor
249.88	38.61	25.41	13.20	43.50	4.89	227	200	Hor
300.20	42.84	27.24	15.60	46.00	3.16	224	108	Hor
400.17	43.40	25.40	18.00	46.00	2.60	224	185	Hor
502.83	42.97	22.17	20.80	46.00	3.03	150	196	Hor
800.02	41.64	15.24	26.40	46.00	4.36	231	188	Hor

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.

Above 1GHz

802.11a

Operation Mode:	802.11a TX Channel 25	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
5150.00	54.25	13.55	40.70	74.00	19.75	100	180	Ver/PK
5150.00	43.94	3.24	40.70	54.00	10.06	100	180	Ver/AV
*5180.00	105.89	65.19	40.70			100	180	Ver/PK
*5180.00	92.87	52.17	40.70			100	180	Ver/AV
#10360.00	64.10	12.30	51.80	68.30	4.20	100	180	Ver/PK
5150.00	53.40	12.70	40.70	74.00	20.60	100	180	Hor/PK
5150.00	42.78	2.08	40.70	54.00	11.22	100	180	Hor/AV
*5180.00	105.20	64.50	40.70			100	180	Hor/PK
*5180.00	93.05	52.35	40.70			100	180	Hor/AV
#10360.00	64.14	12.34	51.80	68.30	4.16	100	180	Hor/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

Operation Mode:	802.11a TX Channel 27	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
*5200.00	104.28	63.48	40.80			100	180	Ver/PK
*5200.00	92.91	52.11	40.80			100	180	Ver/AV
#10400.00	65.15	13.25	51.90	68.30	3.15	100	180	Ver/PK
*5200.00	102.07	61.27	40.80			100	180	Hor/PK
*5200.00	93.10	52.30	40.80			100	180	Hor/AV
#10400.00	64.95	13.05	51.90	68.30	3.35	100	180	Hor/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

Operation Mode: 802.11a TX Channel 30 **Test Date:** May 28, 2010

Test Conditions: 22°C / 51 % RH / 1020hPa **Test By:** Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
*5240.00	104.98	64.18	40.80			100	180	Ver/PK
*5240.00	93.80	53.00	40.80			100	180	Ver/AV
5350.00	51.88	10.98	40.90	74.00	22.12	100	180	Ver/PK
5350.00	42.76	1.86	40.90	54.00	11.24	100	180	Ver/AV
#10460.00	63.08	11.08	52.00	68.30	5.22	100	180	Ver/PK
*5240.00	103.18	62.38	40.80			100	180	Ver/PK
*5240.00	92.75	51.95	40.80			100	180	Ver/AV
5350.00	51.57	10.67	40.90	74.00	22.43	100	180	Ver/PK
5350.00	42.15	1.25	40.90	54.00	11.85	100	180	Ver/AV
#10460.00	62.50	10.50	52.00	68.30	5.80	100	180	Ver/PK

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 is out the restricted band.

802.11n (20MHz)

Operation Mode:	802.11n TX Channel 25	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
5150.00	53.08	12.38	40.70	74.00	20.92	100	180	Ver/PK
5150.00	43.34	2.64	40.70	54.00	10.66	100	180	Ver/AV
*5180.00	104.89	64.19	40.70			100	180	Ver/PK
*5180.00	91.56	50.86	40.70			100	180	Ver/AV
#10360.00	62.47	10.67	51.80	68.30	5.83	100	180	Ver/PK
5150.00	52.67	11.97	40.70	74.00	21.33	100	180	Hor/PK
5150.00	42.69	1.99	40.70	54.00	11.31	100	180	Hor/AV
*5180.00	103.77	63.07	40.70			100	180	Hor/PK
*5180.00	91.70	51.00	40.70			100	180	Hor/AV
#10360.00	62.90	11.10	51.80	68.30	5.40	100	180	Hor/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

Operation Mode:	802.11n TX Channel 27	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
*5200.00	103.62	62.82	40.80			100	180	Ver/PK
*5200.00	91.88	51.08	40.80			100	180	Ver/AV
#10400.00	63.90	12.00	51.90	68.30	4.40	100	180	Ver/PK
*5200.00	131.68	90.88	40.80			100	180	Hor/PK
*5200.00	120.89	80.09	40.80			100	180	Hor/AV
#10400.00	64.03	12.13	51.90	68.30	4.27	100	180	Hor/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

Operation Mode:	802.11a TX Channel 30	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
*5240.00	103.92	63.12	40.80			100	180	Ver/PK
*5240.00	92.63	51.83	40.80			100	180	Ver/AV
5350.00	50.95	10.05	40.90	74.00	23.05	100	180	Ver/PK
5350.00	42.42	1.52	40.90	54.00	11.58	100	180	Ver/AV
#10460.00	63.00	11.00	52.00	68.30	5.30	100	180	Ver/PK
*5240.00	102.48	61.68	40.80			100	180	Ver/PK
*5240.00	91.82	51.02	40.80			100	180	Ver/AV
5350.00	51.18	10.28	40.90	74.00	22.82	100	180	Ver/PK
5350.00	41.96	1.06	40.90	54.00	12.04	100	180	Ver/AV
#10460.00	62.69	10.69	52.00	68.30	5.61	100	180	Ver/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

802.11n (40MHz)

Operation Mode:	802.11n TX Channel 26	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
5150.00	55.55	14.85	40.70	74.00	18.45	100	180	Ver/PK
5150.00	43.75	3.05	40.70	54.00	10.25	100	180	Ver/AV
*5190.00	104.65	63.85	40.80			100	180	Ver/PK
*5190.00	92.04	51.24	40.80			100	180	Ver/AV
#10380.00	64.28	12.38	51.90	68.30	4.02	100	180	Ver/PK
5150.00	54.25	13.55	40.70	74.00	19.75	100	180	Hor/PK
5150.00	43.56	2.86	40.70	54.00	10.44	100	180	Hor/AV
*5190.00	103.91	63.11	40.80			100	180	Hor/PK
*5190.00	91.88	51.08	40.80			100	180	Hor/AV
#10380.00	63.14	11.24	51.90	68.30	5.16	100	180	Hor/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

Operation Mode:	802.11n TX Channel 29	**Test Date:**	May 28, 2010
Test Conditions:	22°C / 51 % RH / 1020hPa	**Test By:**	Wendy

Freq (MHz)	Emission Level (dBuV/m)	Raw Value (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Hight (cm)	Table Angle (Degree)	Note
*5230.00	103.65	62.85	40.80			100	180	Ver/PK
*5230.00	90.91	50.11	40.80			100	180	Ver/AV
5350.00	52.18	11.28	40.90	74.00	21.82	100	180	Ver/PK
5350.00	42.98	2.08	40.90	54.00	11.02	100	180	Ver/AV
#10460.00	63.22	11.22	52.00	68.30	5.08	100	180	Ver/PK
*5230.00	102.76	61.96	40.80			100	180	Ver/PK
*5230.00	91.87	51.07	40.80			100	180	Ver/AV
5350.00	51.94	11.04	40.90	74.00	22.06	100	180	Ver/PK
5350.00	42.88	1.98	40.90	54.00	11.12	100	180	Ver/AV
#10460.00	62.95	10.95	52.00	68.30	5.35	100	180	Ver/PK

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Factor (dB/m).
2. 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 is out the restricted band.

7.2 POWER LINE CONDUCTED EMISSIONS MEASUREMENT

7.2.1 LIMITS

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

Note:

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

7.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	Mar 30, 2010	1 Year
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	Mar 30, 2010	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	Mar 30, 2010	1 Year
50Coaxial Switch	Anritsu	MP59B	M20531	Mar 30, 2010	1 Year

7.2.3 TEST PROCEDURES

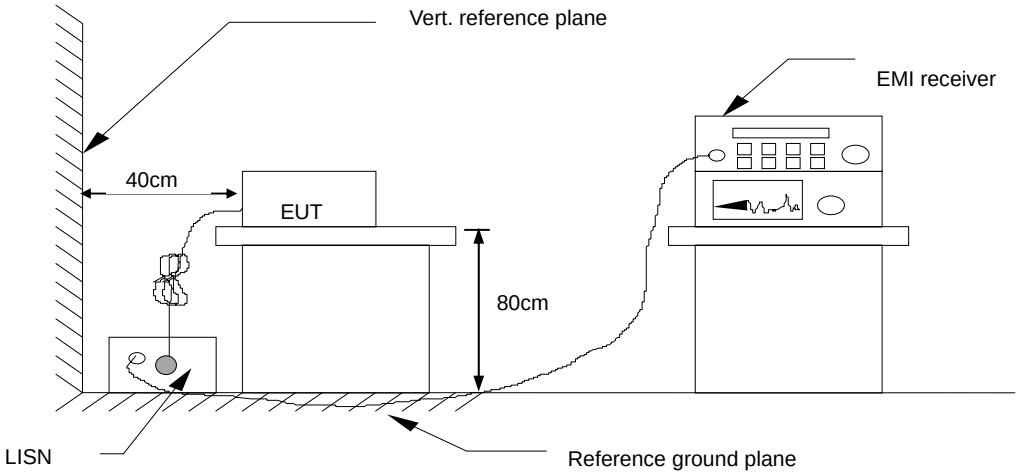
a) The EUT and Support equipment, if needed, was placed on a non-conducted table, which is 0.8m above the ground plane and 0.4m away from the conducted wall.

b) The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane. All support equipment power received from a second LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

c) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.

d) The frequency range from 150 kHz to 30 MHz was searched. The test data of the worst-case condition(s) was recorded. Emission levels under limit 20dB were not recorded.

7.2.4 TEST SETUP



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

7.2.5 TEST RESULTS

PASS.

The worst-case mode is 802.11n 40MHz, The test data please refer to following page.

Operation Mode: 802.11n TX **Test Date:** May 28, 2010

Test Conditions: 22°C / 51 % RH / 1020hPa **Test By:** Wendy

Freq. (MHz)	Q.P. Amptd. (dBuV)	AVG Amptd. (dBuV)	Correction factor(dB)	Q.P. Limit (dBuV)	AVG Limit (dBuV)	Q.P. Margin (dB)	AVG Margin (dB)	Line/ Neutral
0.178	52.49	39.51	0.00	64.72	54.72	12.23	15.21	Neutral
0.221	51.86	42.77	0.00	62.82	52.82	10.96	10.05	Neutral
0.265	45.88	35.07	0.00	61.27	51.27	15.39	16.20	Neutral
0.315	41.86	42.65	0.00	59.97	49.97	18.11	7.32	Neutral
0.355	45.99	31.00	0.00	58.84	48.84	12.85	17.84	Neutral
24.360	50.18	43.51	0.00	60.00	50.00	9.82	6.49	Neutral
0.175	58.04	43.68	0.00	64.72	54.72	6.68	11.04	Line
0.225	55.98	48.37	0.00	62.82	52.82	6.84	4.45	Line
0.260	49.66	44.50	0.00	61.27	51.27	11.61	6.77	Line
0.354	45.13	39.05	0.00	58.84	48.84	13.71	9.79	Line
0.448	45.26	43.21	0.00	57.85	47.85	12.59	4.64	Line
18.420	52.33	45.00	0.00	60.00	50.00	7.67	5.00	Line

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 = Limit value -Emission level
5. Correction factor = Insertion loss + Cable loss
6. Emission Level = Correction Factor + Reading Value.

7.3 MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

7.3.1 LIMITS OF MAXIMUM CONDUCTED OUTPUT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB

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

7.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum Analyzer	R&S	FSP40	100040	Mar 30, 2010	1 Year
Power Meter	Anritsu	ML2495A	0824012	Mar 30, 2010	1 Year
Power Sensor	Anritsu	MA2411B	0738138	Mar 30, 2010	1 Year

7.3.3 TEST PROCEDURES

FOR POWER OUTPUT MEASUREMENT

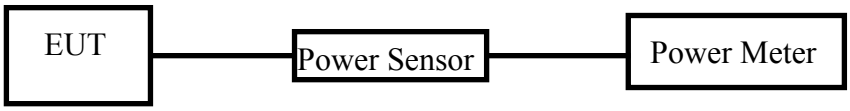
A power sensor was used on the output port of the EUT. A power meter was used to read the response of the power sensor. Record the power level.

FOR 26dB OCCUPIED BANDWIDTH

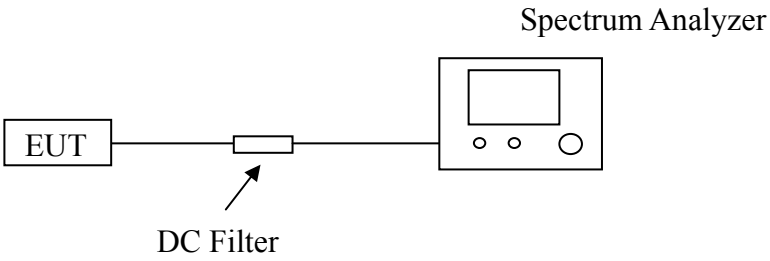
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 300kHz RBW and 1MHz VBW. The 26dB bandwidth is defined as

7.3.4 TEST SETUP

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



7.3.5 TEST RESULTS

The test result please refer to the following page.

Test Data

Peak Power Out:

IEEE 802.11a

Channel	Frequency (MHz)	Output Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1				
25	5180	12.43	12.38	34.80	15.42	17	PASS
27	5200	12.40	12.36	34.60	15.39		PASS
30	5240	12.41	12.37	34.68	15.40		PASS

IEEE 802.11n 20 MHz

Channel	Frequency (MHz)	Output Power (dBm)		Total Power (W)	Total Power (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1				
25	5180	12.08	12.01	32.03	15.06	17	PASS
27	5200	12.04	11.98	31.77	15.02		PASS
30	5240	12.07	12.00	31.96	15.05		PASS

IEEE 802.11n 40 MHz

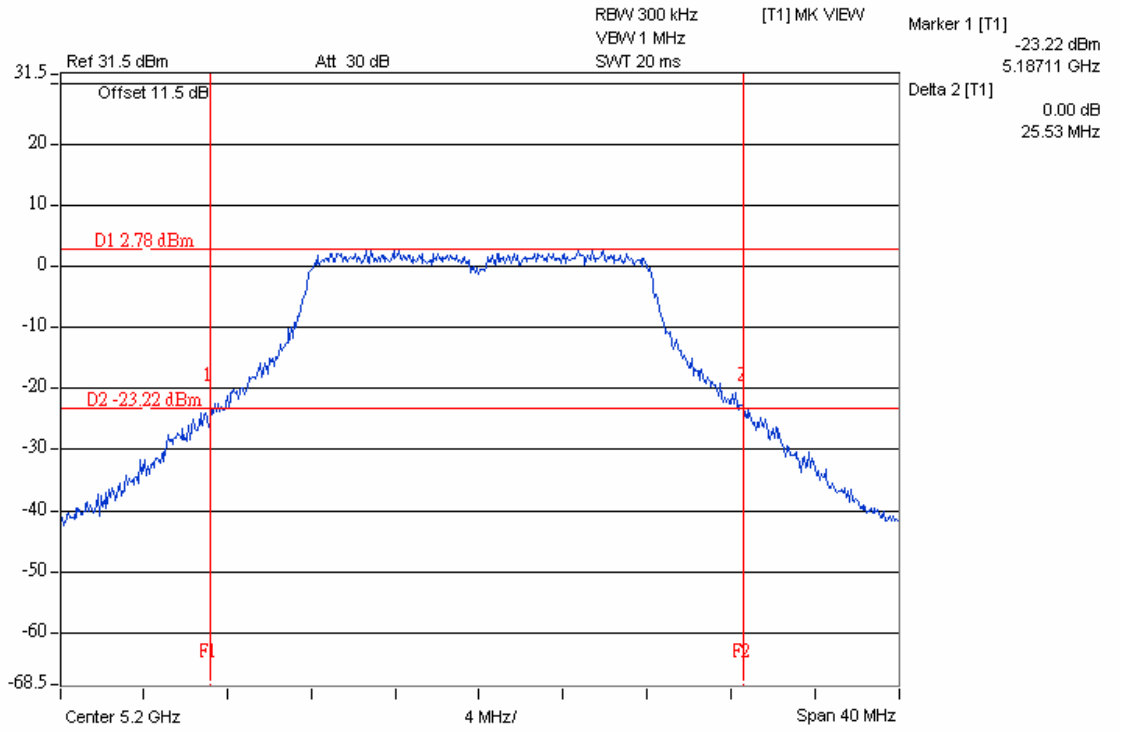
Channel	Frequency (MHz)	Output Power (dBm)		Total Power (W)	Total Power (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1				
26	5190	12.35	12.27	34.04	15.32	17	PASS
29	5230	12.31	12.24	33.77	15.29		PASS

26dB OCCUPIED BANDWIDTH:

802.11a

Channel	Frequency (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		Result
		Chain 0	Chain 1	
25	5180	25.02	24.98	PASS
27	5200	25.53	25.46	PASS
30	5240	25.19	25.10	PASS

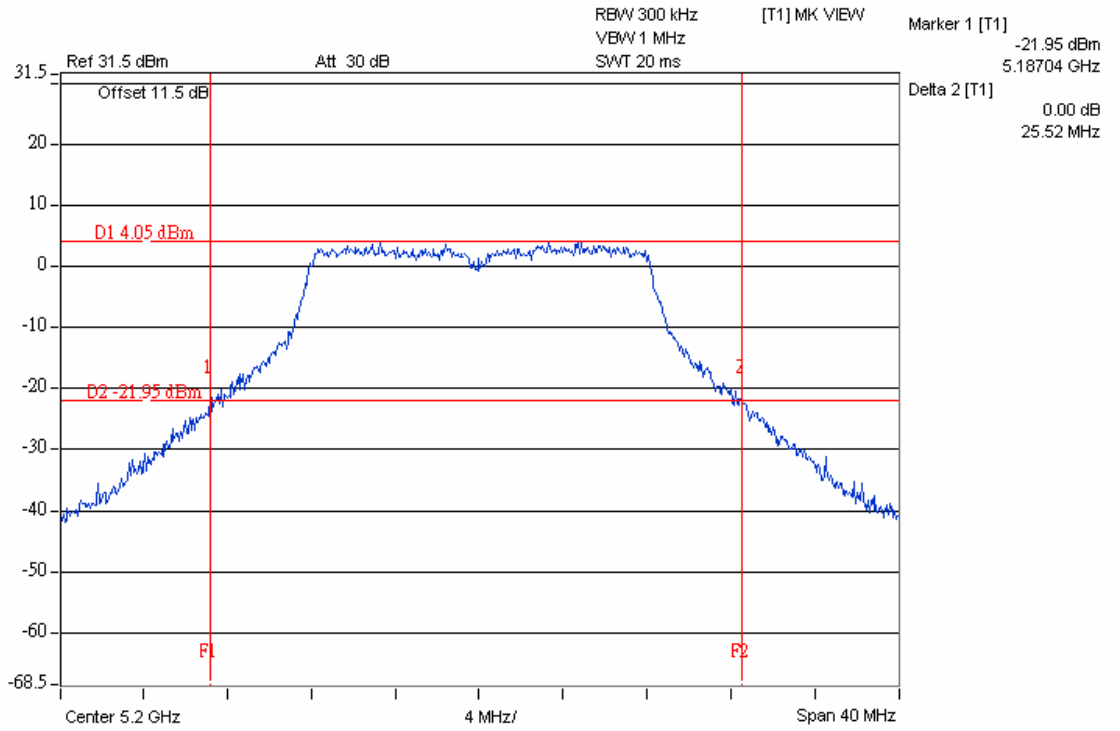
FOR CHAIN 0: CH 27



802.11n (20MHz)

Channel	Frequency (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		Result
		Chain 0	Chain 1	
25	5180	25.07	25.01	PASS
27	5200	25.52	25.48	PASS
30	5240	25.24	25.20	PASS

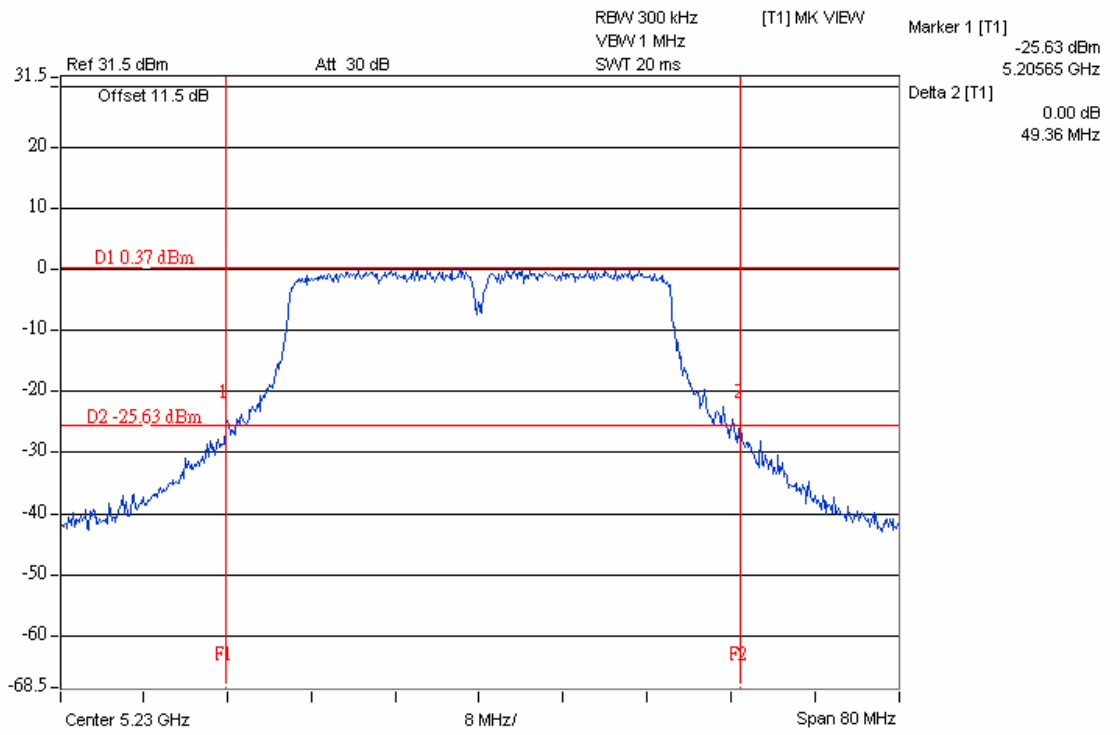
FOR CHAIN 0: CH 27



802.11n (40MHz)

Channel	Frequency (MHz)	26dBc OCCUPIED BANDWIDTH (MHz)		Result
		Chain 0	Chain 1	
26	5190	49.10	49.28	PASS
29	5230	49.15	49.36	PASS

FOR CHAIN 1: CH 29



7.4 PEAK POWER EXCURSION MEASUREMENT

7.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	13dB

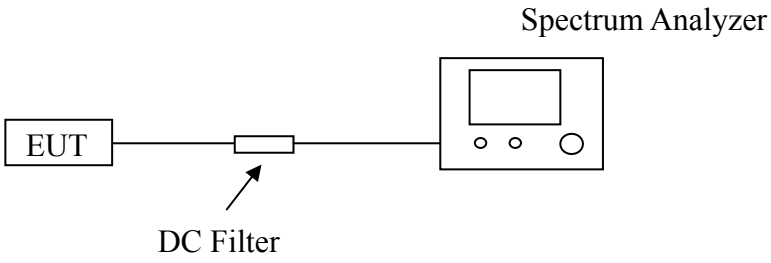
7.4.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum Analyzer	R&S	FSP40	100040	Mar 30, 2010	1 Year
Power Meter	Anritsu	ML2495A	0824012	Mar 30, 2010	1 Year
Power Sensor	Anritsu	MA2411B	0738138	Mar 30, 2010	1 Year

7.4.3 TEST PROCEDURE

a. The transmitter output was connected to the spectrum analyzer.
b. Set the spectrum bandwidth span to view the entire spectrum.
c. Using peak detector and Max-hold function for Trace 1 (RB = 1MHz, VB = 3MHz) and 2 (RB = 1MHz, VB = 300kHz).
d. The differences between Trace1 and Trace 2 in any 1MHz band at f1 to f2 range were recorded and showed to another trace.

7.4.4 TEST SETUP



7.4.5 TEST RESULTS

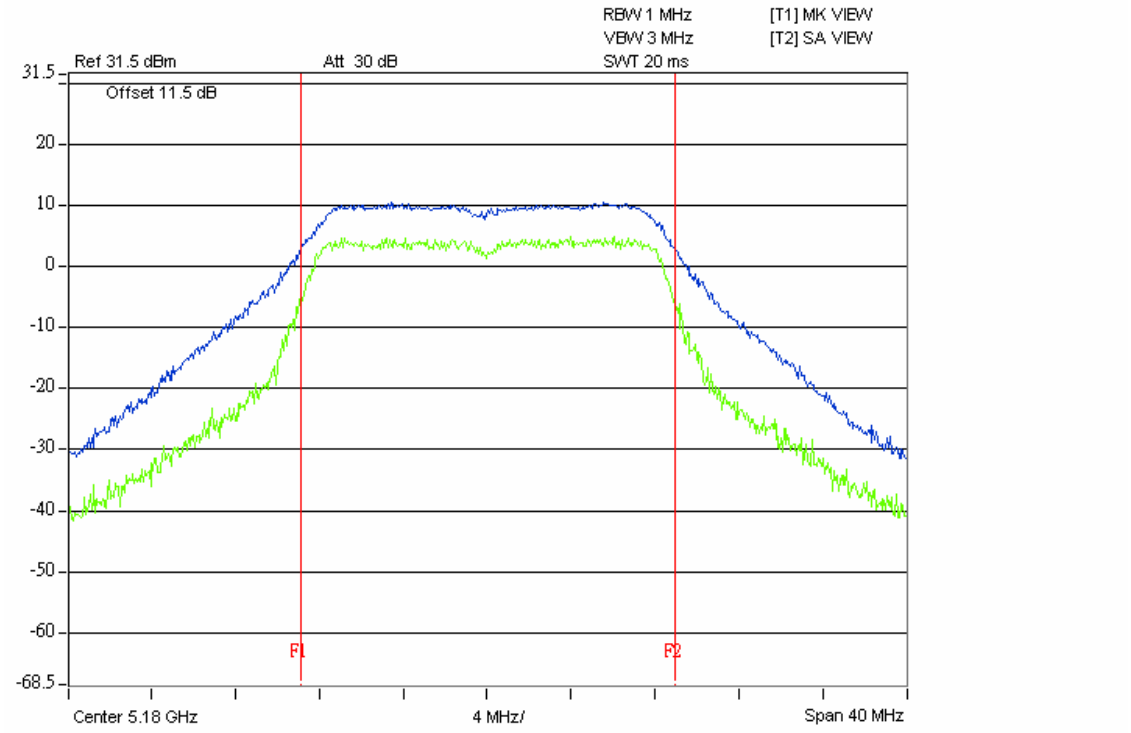
The test result please refer to the following page.

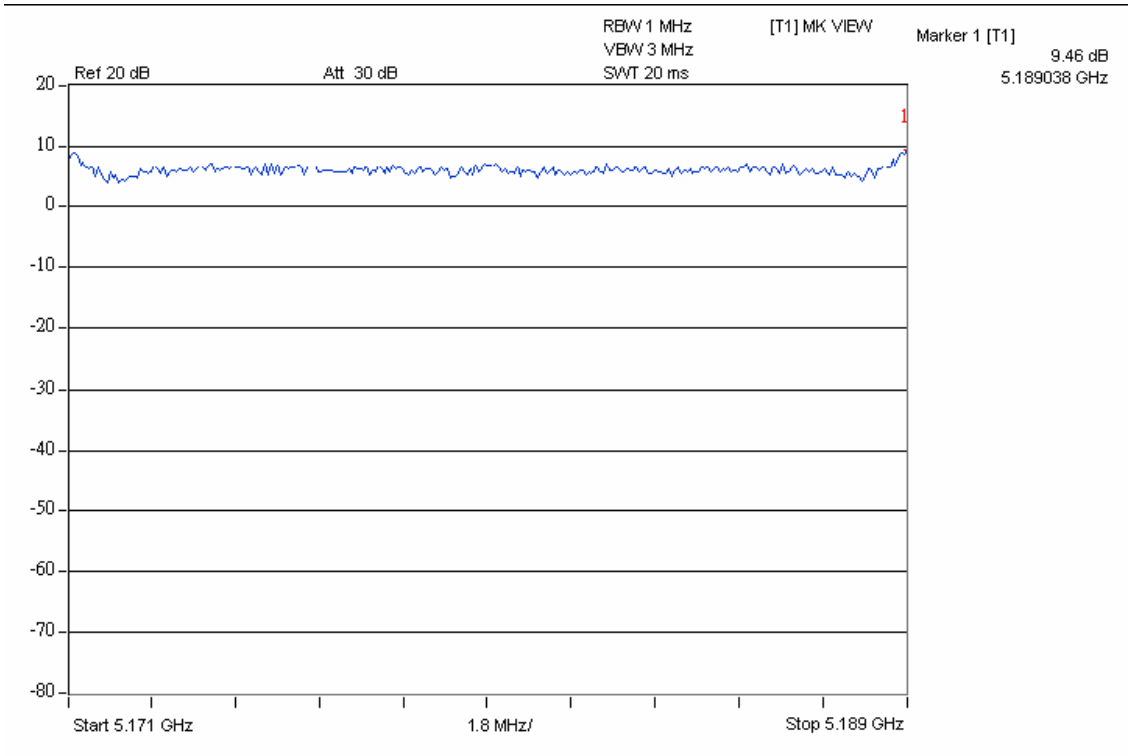
802.11a

Channel	Frequency (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	Result
		Chain 0	Chain 1		
25	5180	9.46	9.35	13.00	PASS
27	5200	9.36	9.29	13.00	PASS
30	5240	9.30	9.22	13.00	PASS

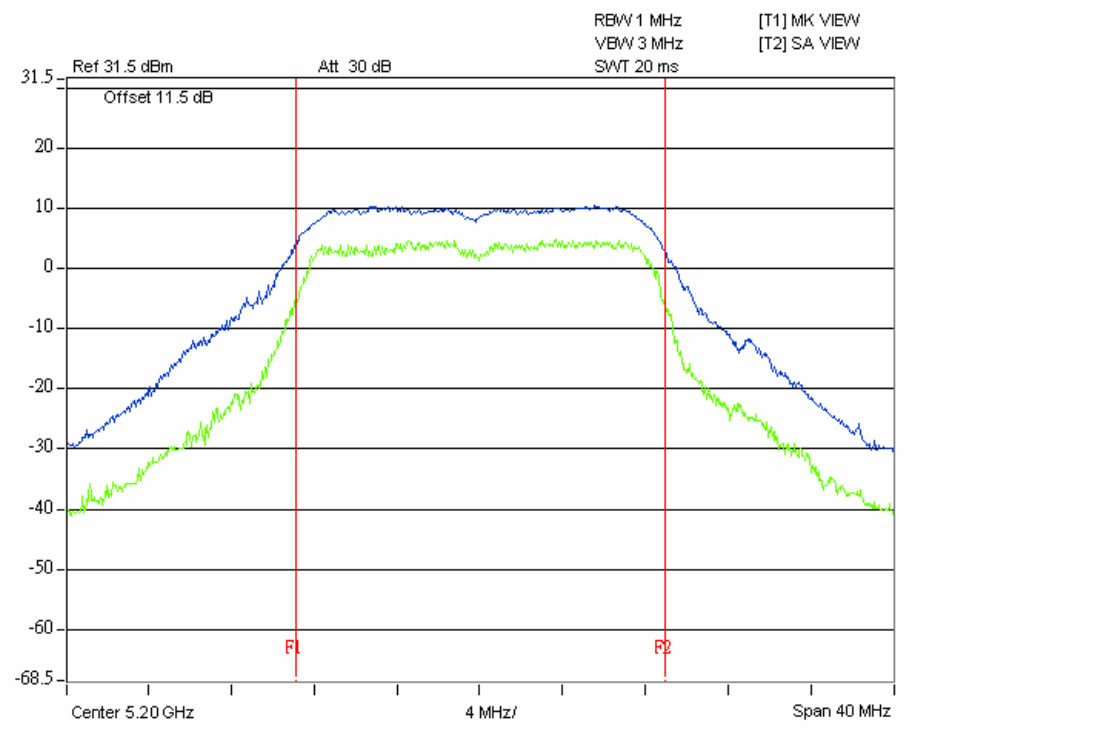
FOR CHAIN 0:

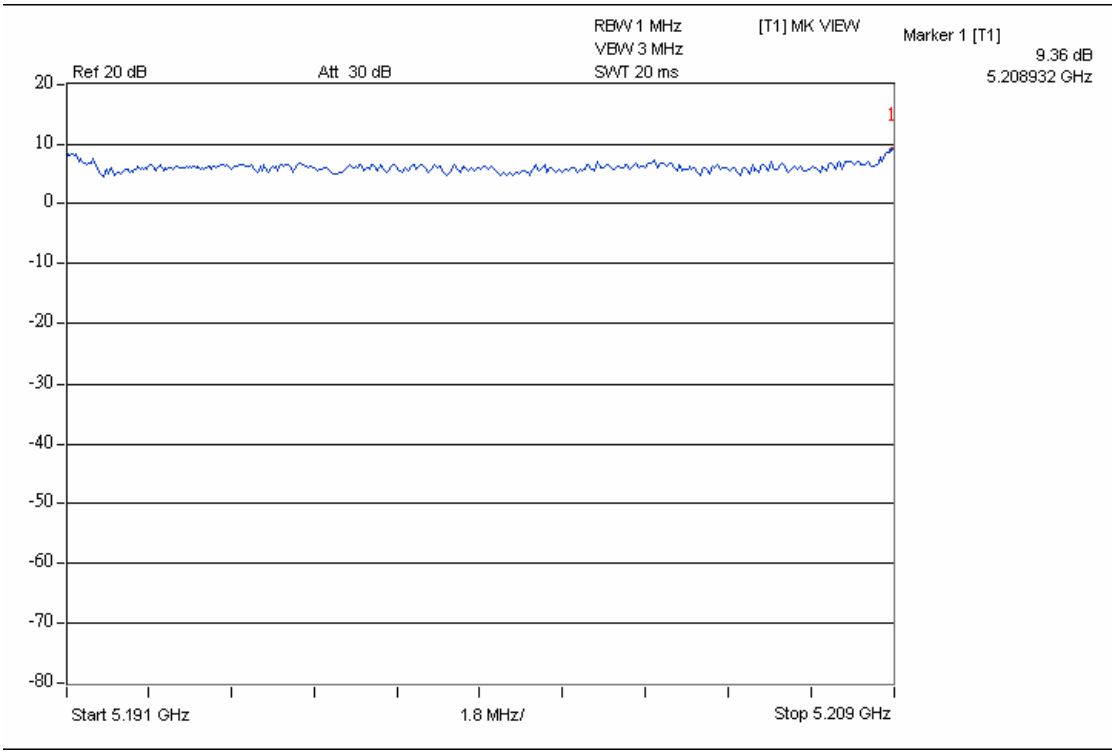
CH 25



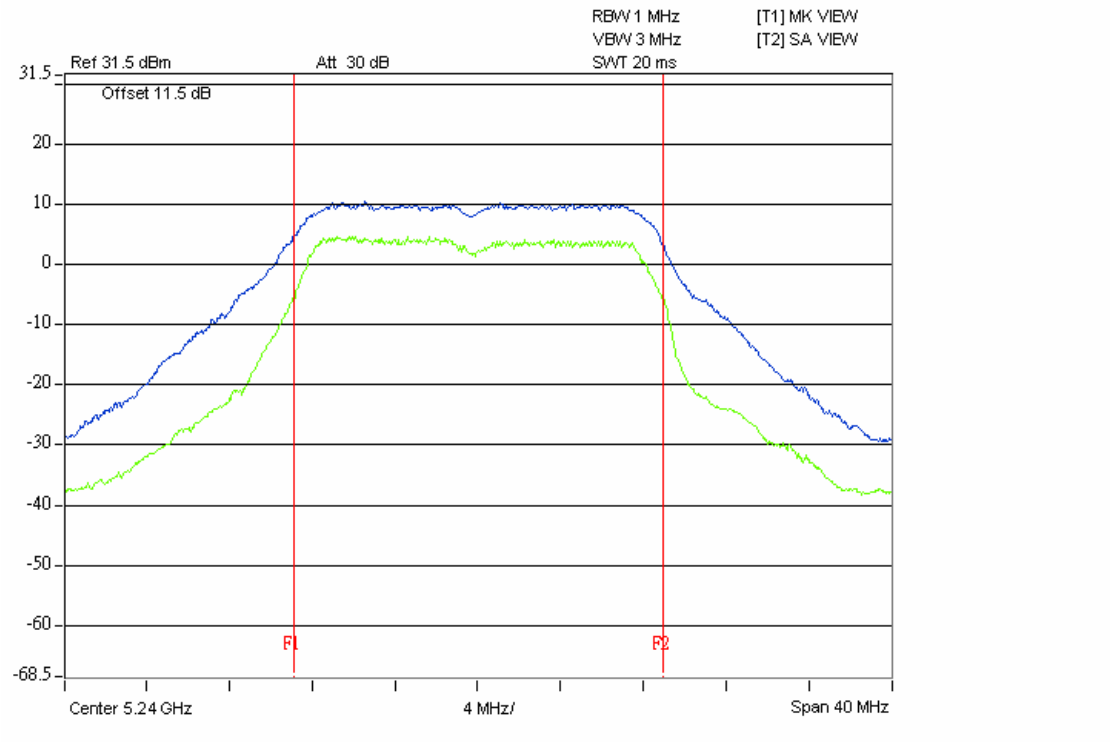


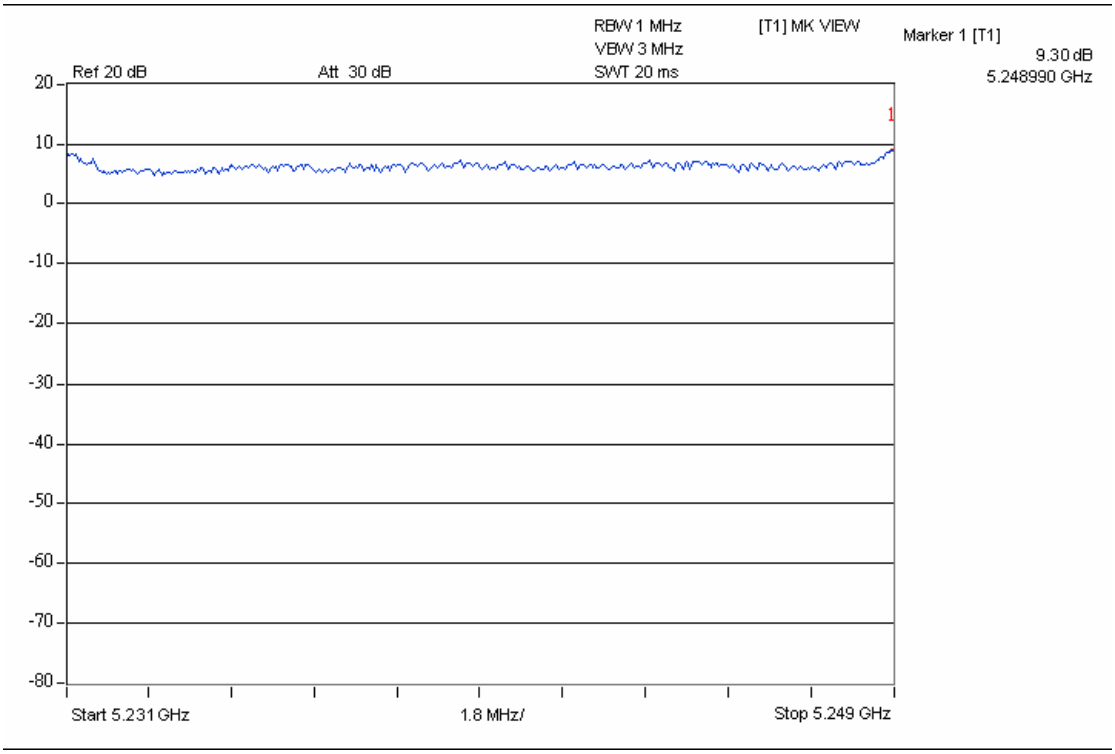
CH 27


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.20 GHz
4 MHz/
Span 40 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.36 dB
5.208932 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.191 GHz
1.8 MHz/
Stop 5.209 GHz

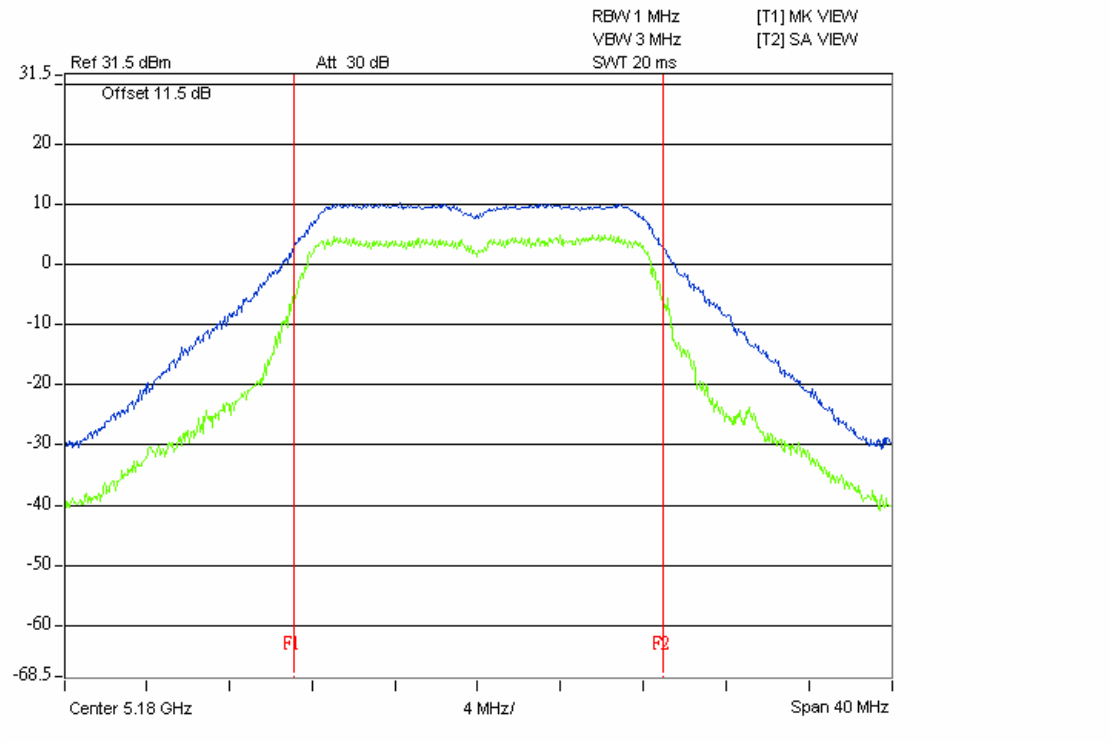
CH 30

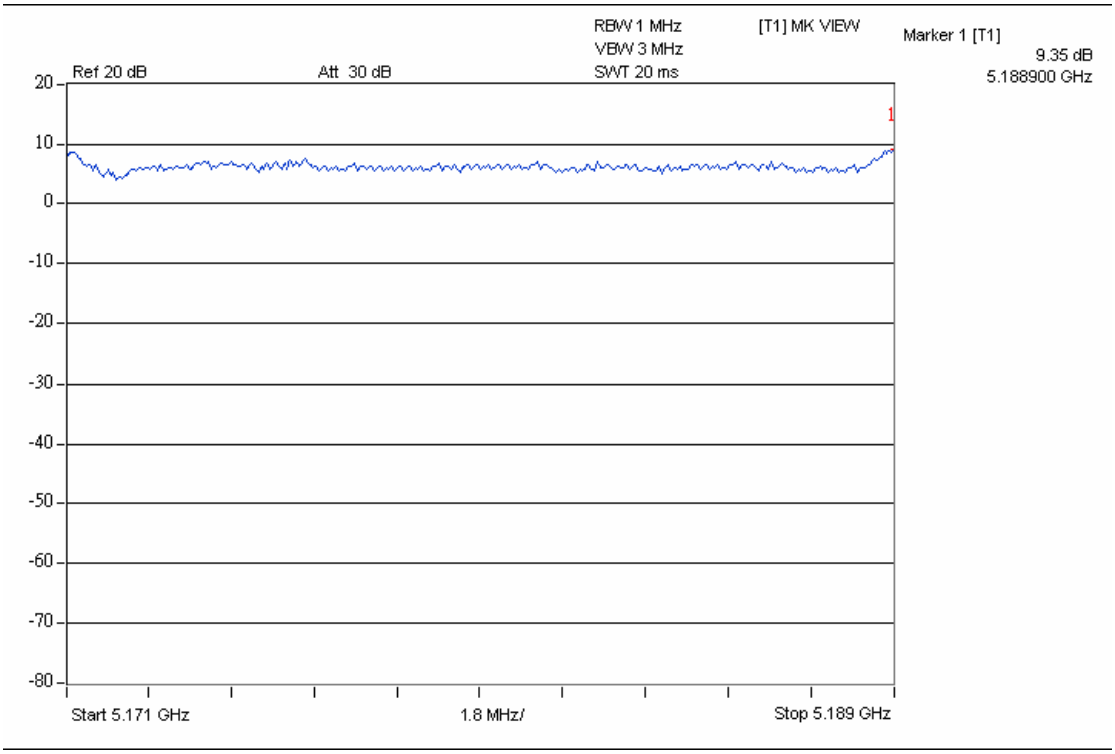

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.30 dB
5.248990 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.231 GHz
1.8 MHz/
Stop 5.249 GHz

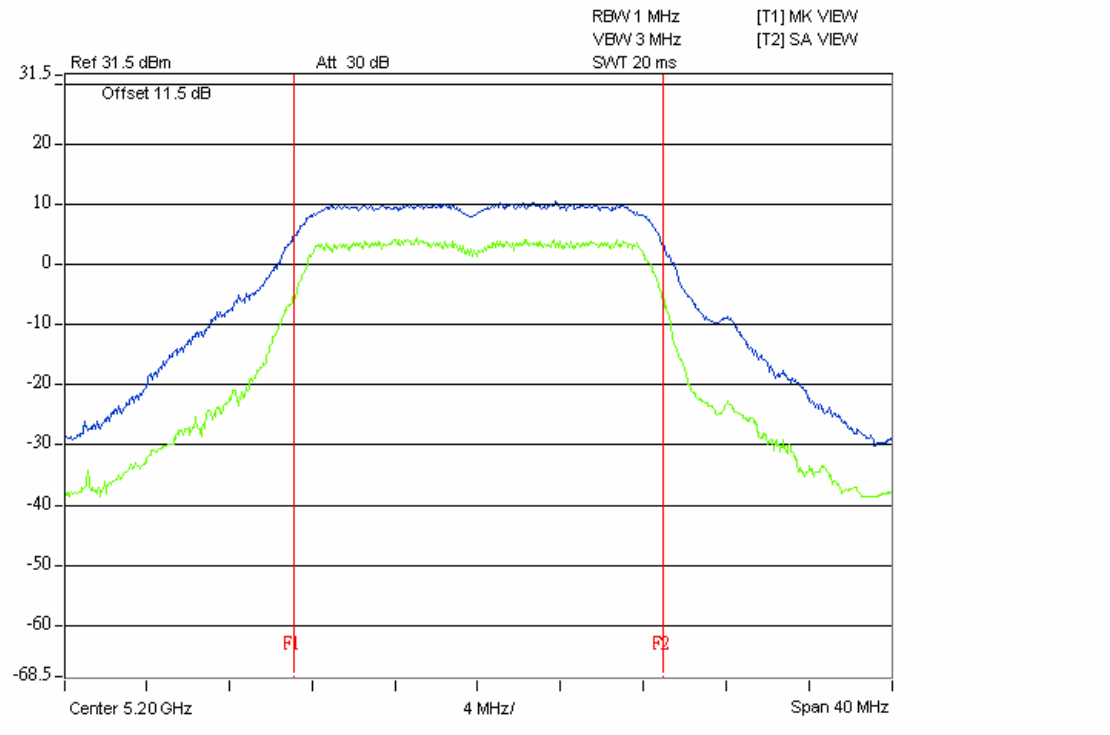
FOR CHAIN 1:

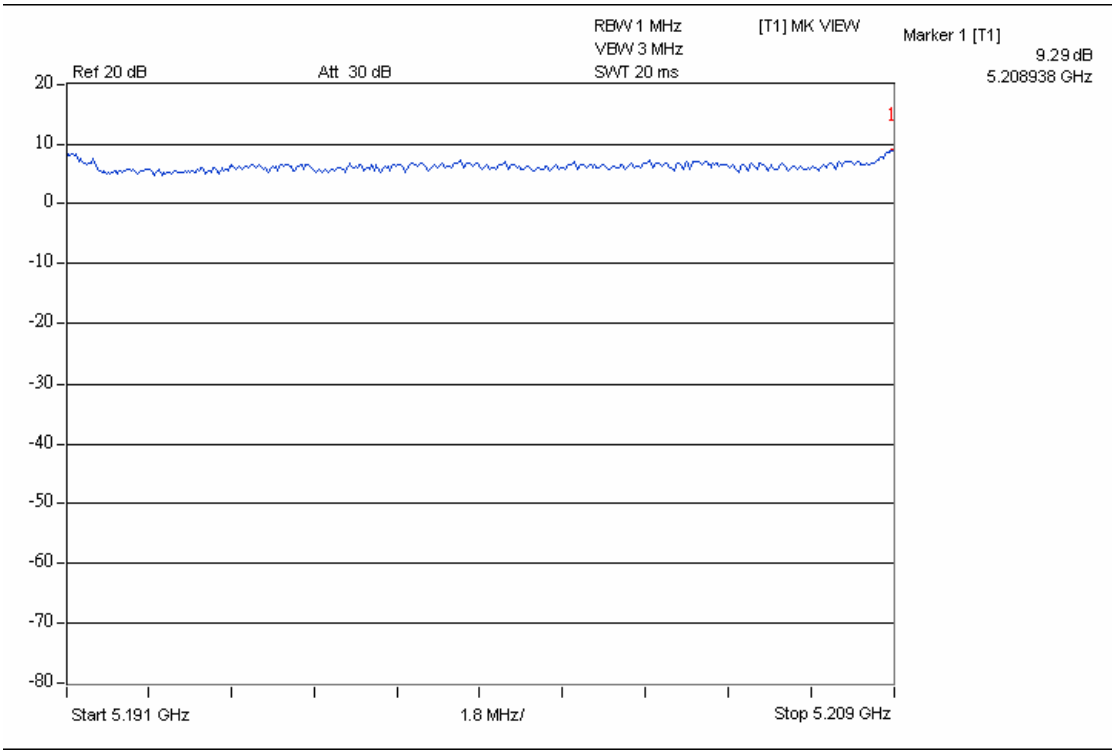
CH 25



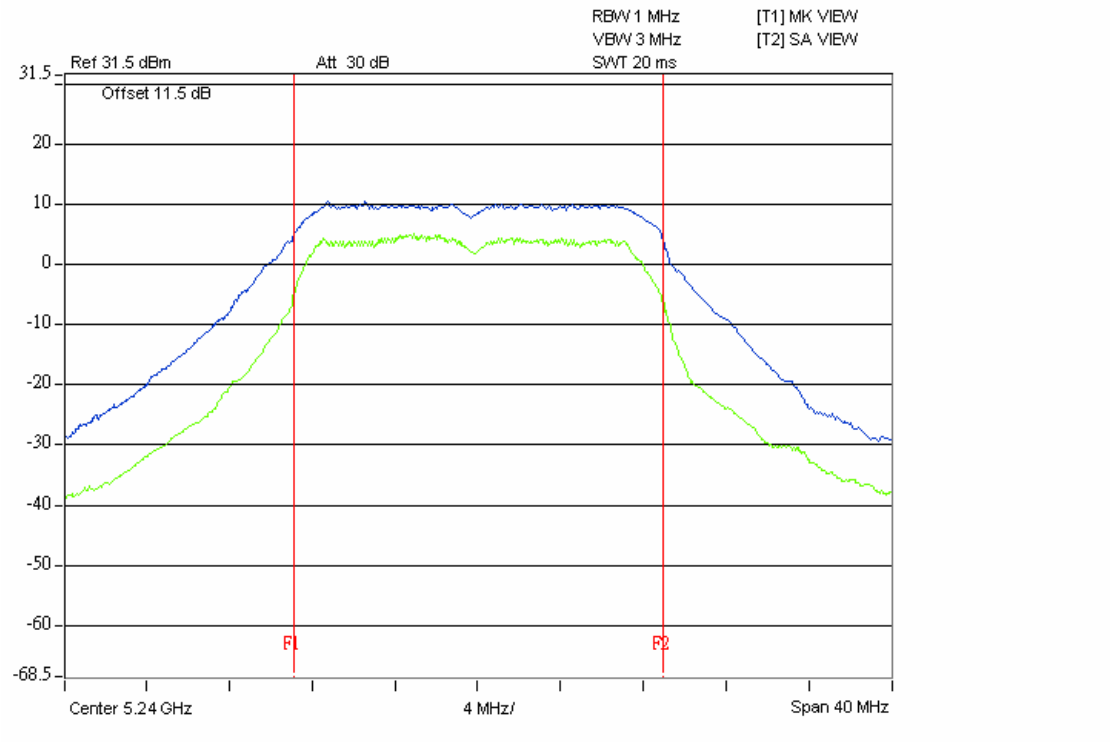


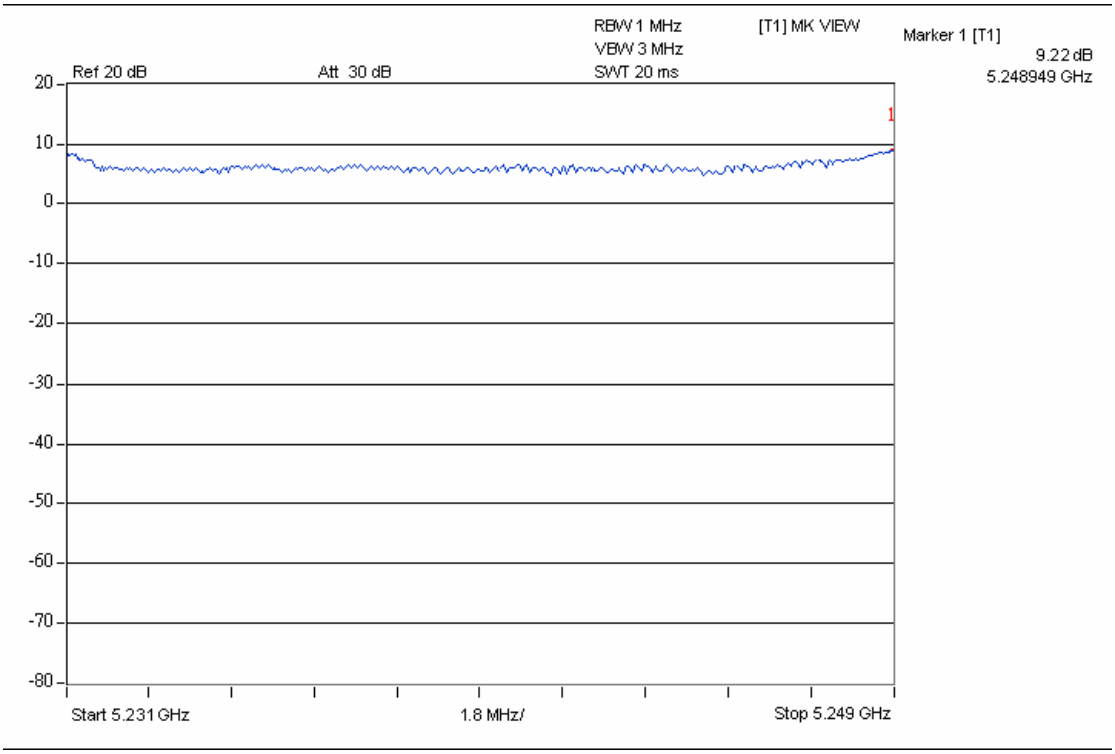
CH 27


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.20 GHz
4 MHz/
Span 40 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.29 dB
5.208938 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.191 GHz
1.8 MHz/
Stop 5.209 GHz

CH 30


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz

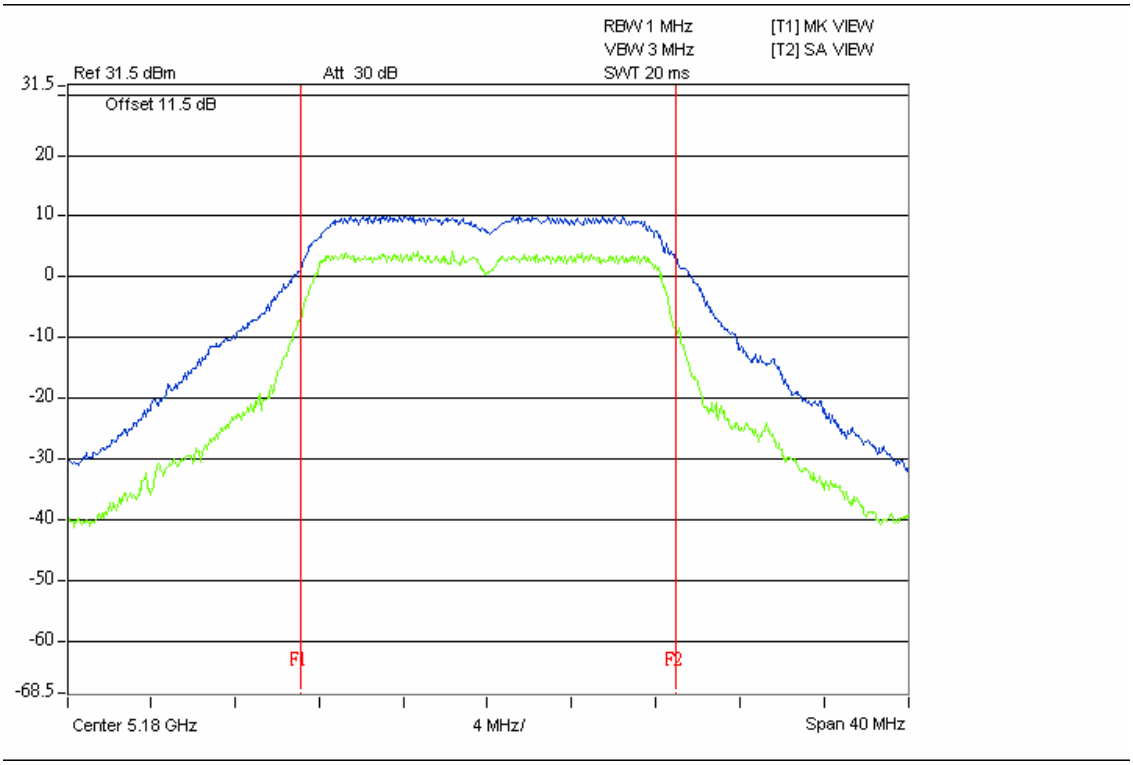

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.22 dB
5.248949 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.231 GHz
1.8 MHz/
Stop 5.249 GHz

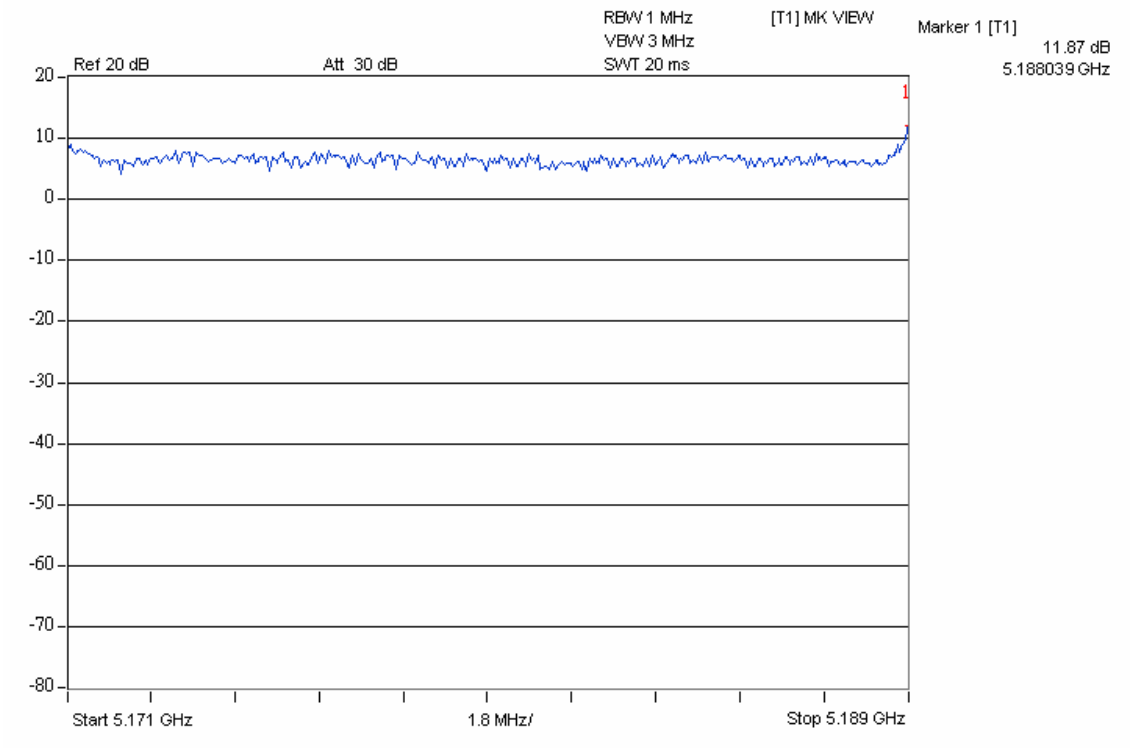
802.11n (20MHz)

Channel	Frequency (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	Result
		Chain 0	Chain 1		
25	5180	11.87	11.97	13.00	PASS
27	5200	11.53	11.55	13.00	PASS
30	5240	11.23	11.34	13.00	PASS

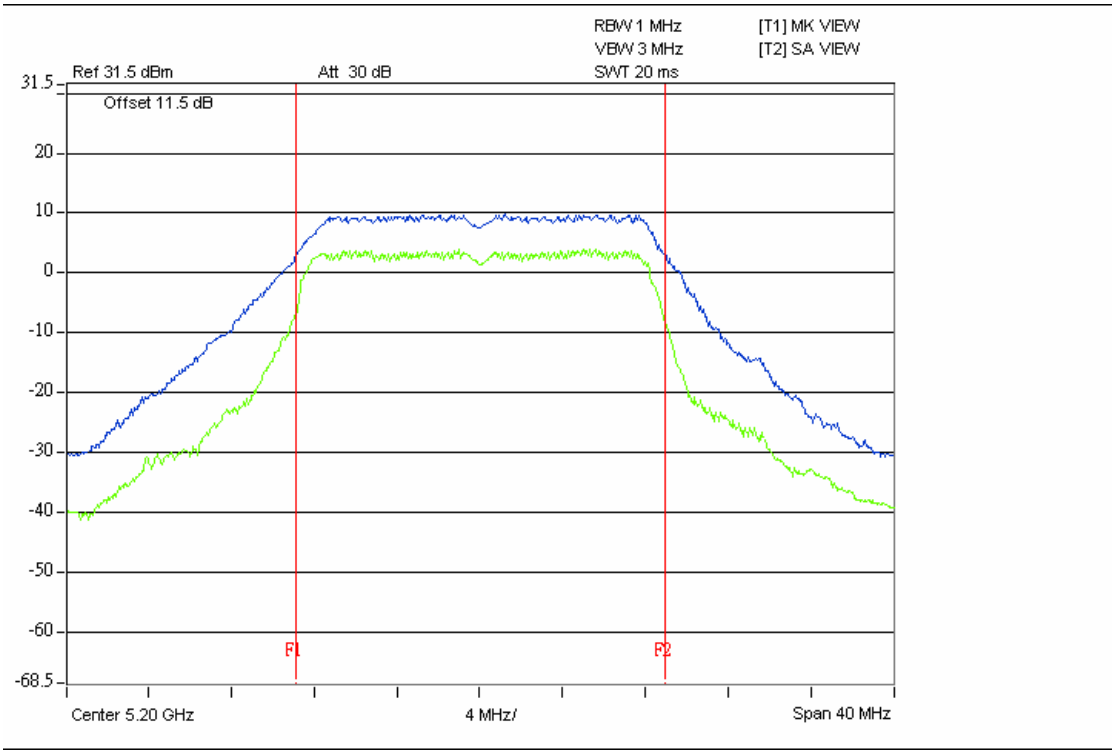
FOR CHAIN 0:

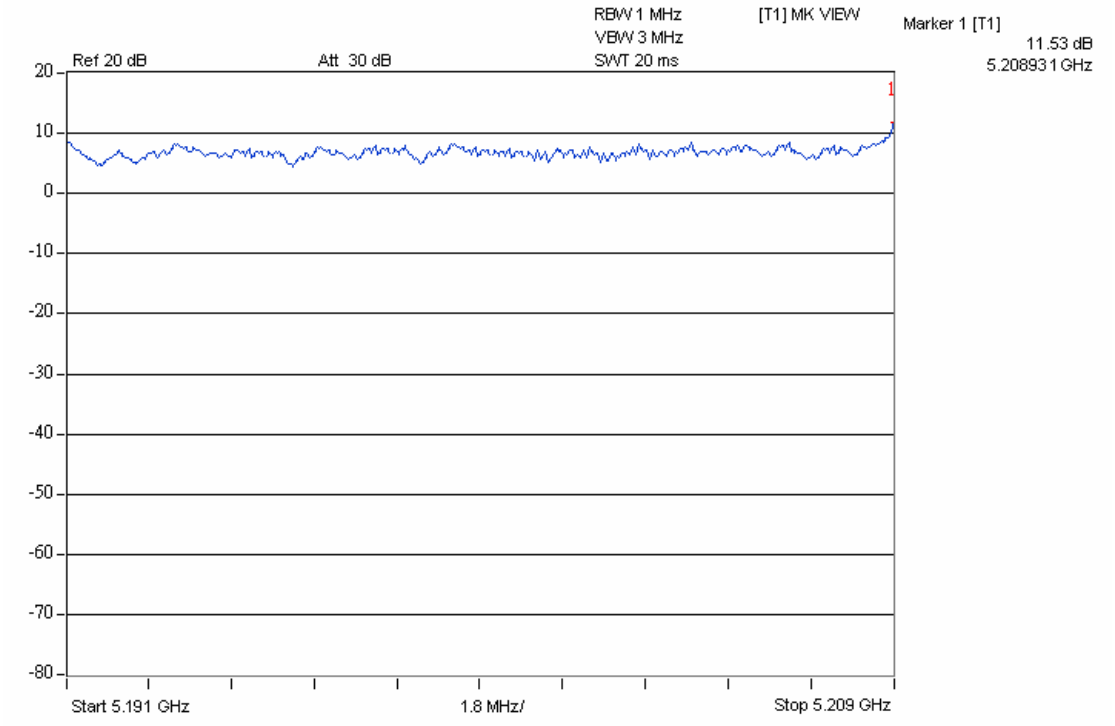
CH 25



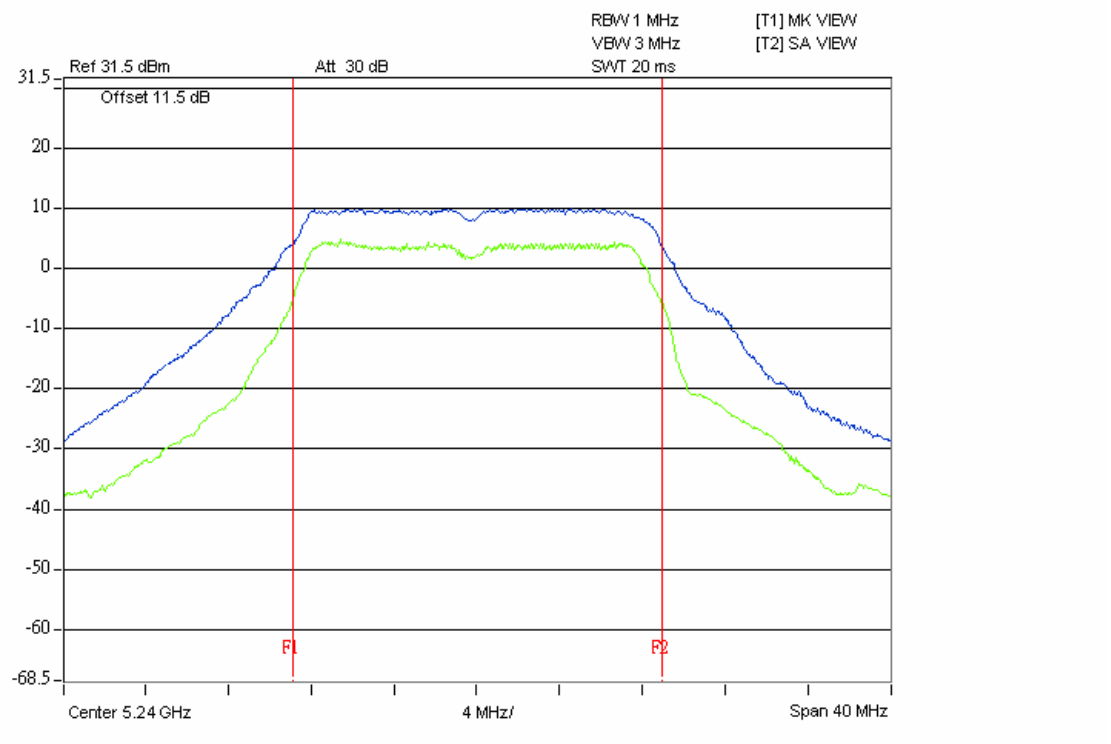


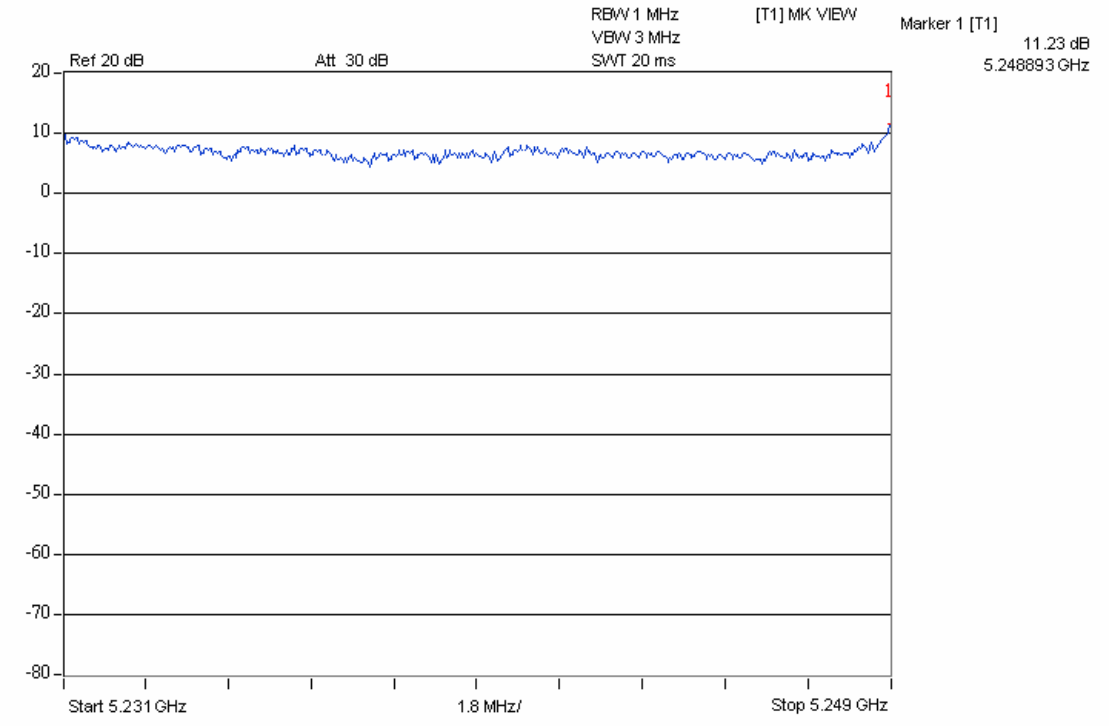
CH 27


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Offset 11.5 dB
Att 30 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.20 GHz
4 MHz/
Span 40 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
11.53 dB
5.208931 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.191 GHz
1.8 MHz/
Stop 5.209 GHz

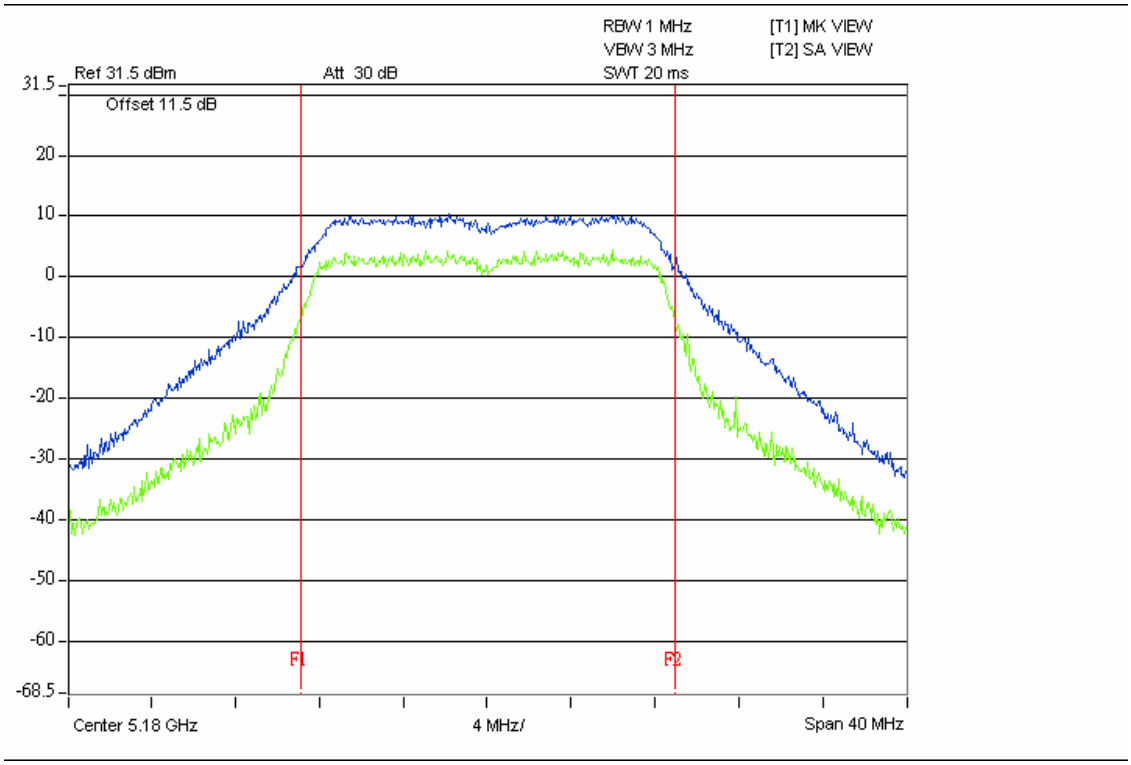
CH 30

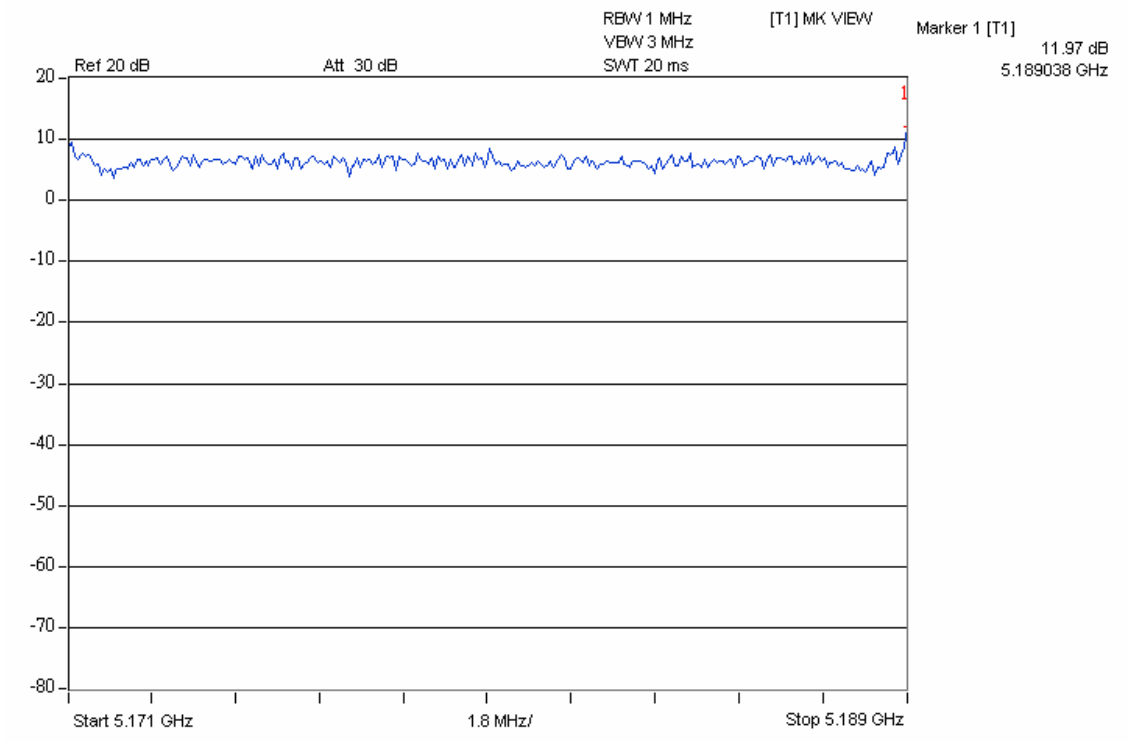

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
11.23 dB
5.248893 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.231 GHz
1.8 MHz/
Stop 5.249 GHz

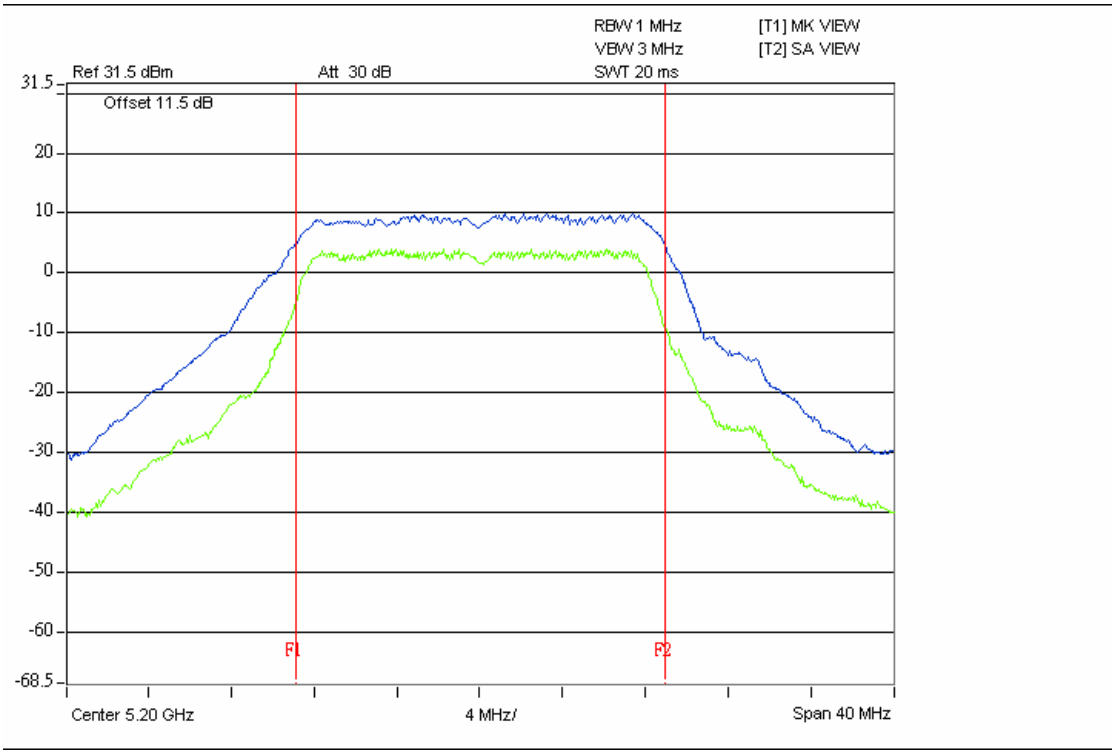
FOR CHAIN 1:

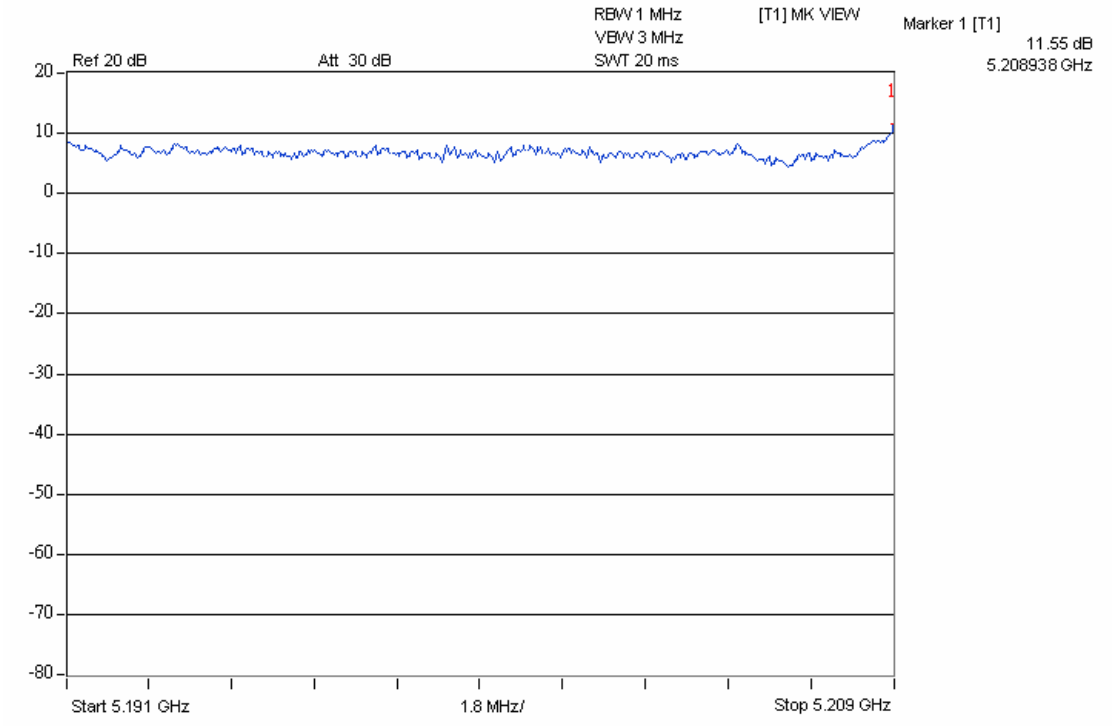
CH 25



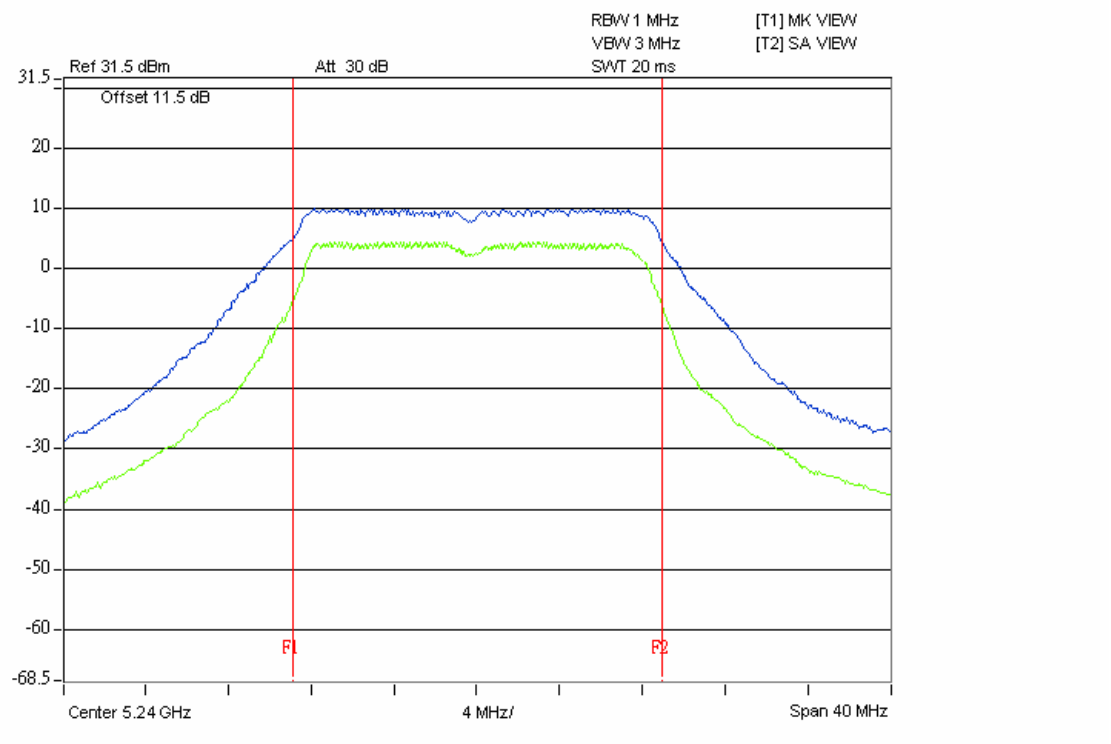


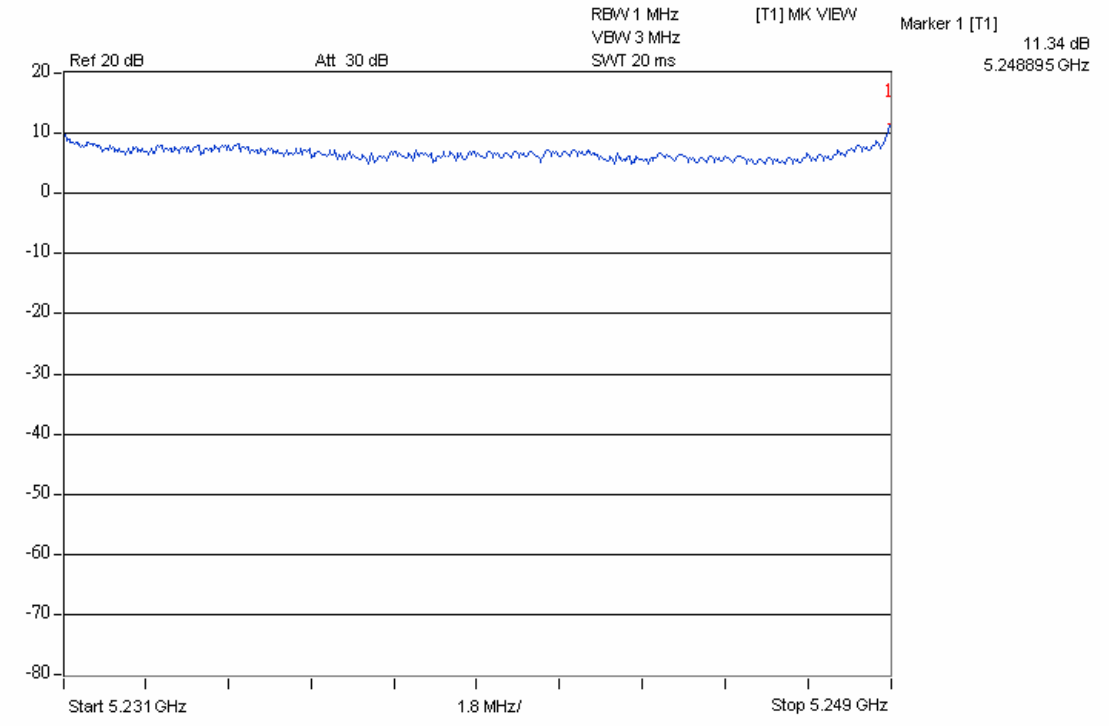
CH 27


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.20 GHz
4 MHz/
Span 40 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
11.55 dB
5.208938 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Start 5.191 GHz
1.8 MHz/
Stop 5.209 GHz

CH 30


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.24 GHz
4 MHz/
Span 40 MHz

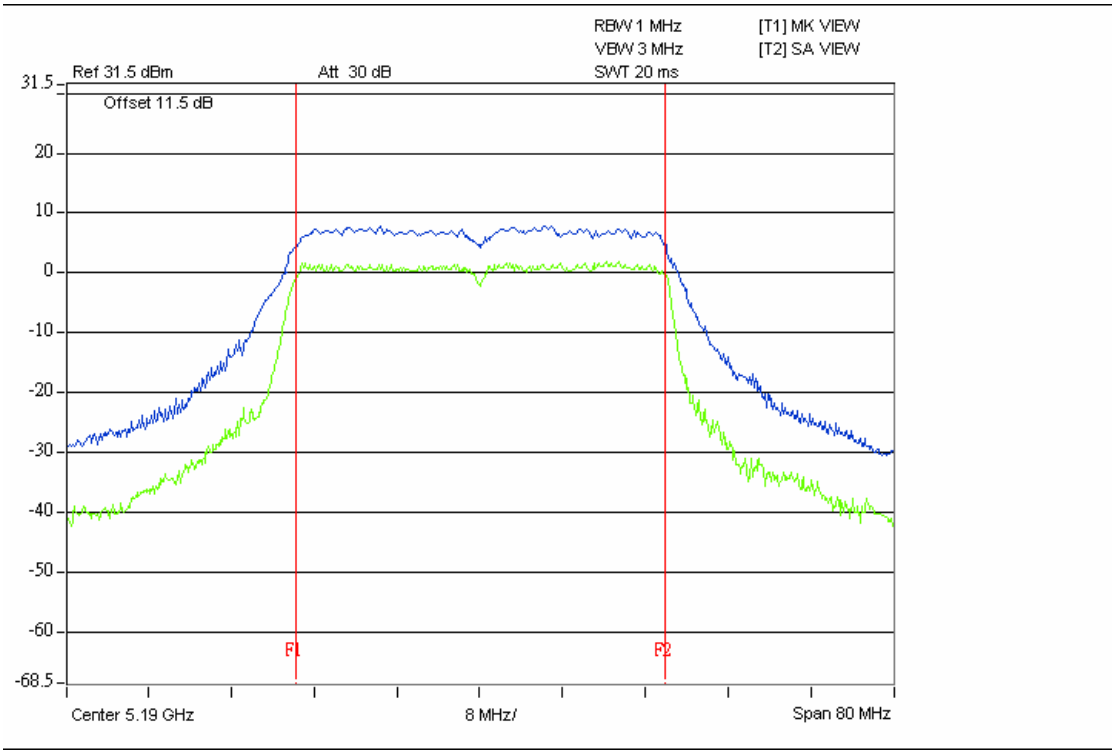

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
11.34 dB
5.248895 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.231 GHz
1.8 MHz/
Stop 5.249 GHz

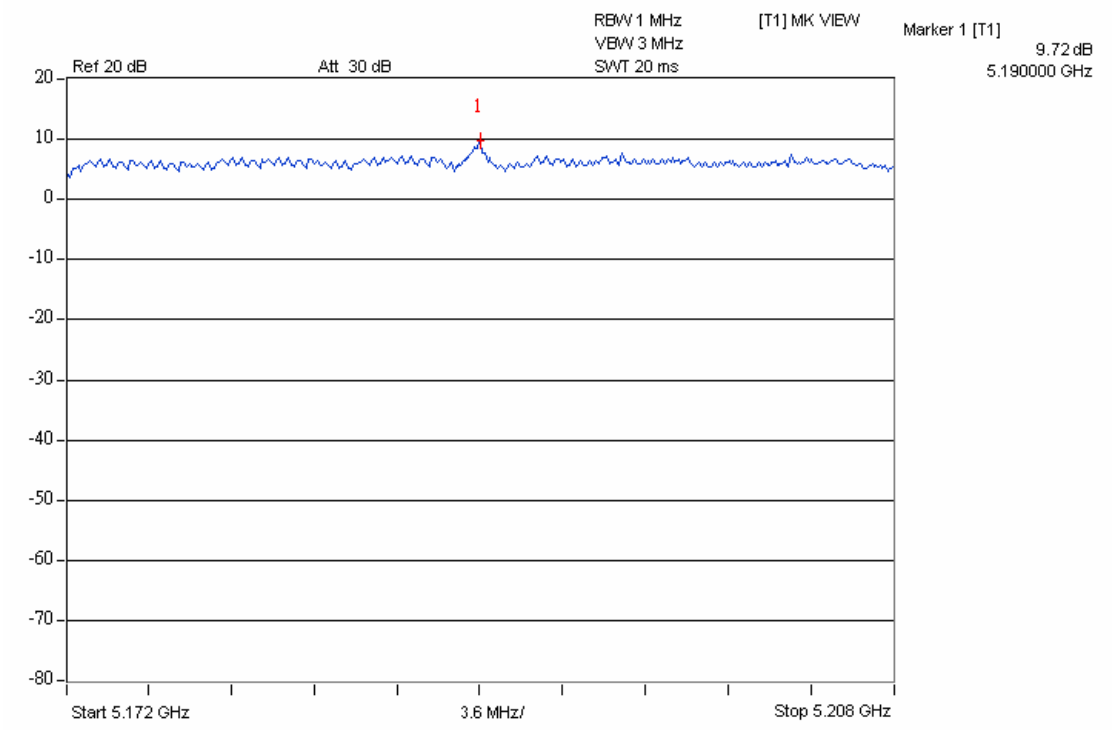
802.11n (40MHz)

Channel	Frequency (MHz)	PEAK POWER EXCURSION (dB)		PEAK to AVERAGE EXCURSION LIMIT (dB)	Result
		Chain 0	Chain 1		
26	5190	9.72	9.63	13.00	PASS
29	5230	9.90	9.84	13.00	PASS

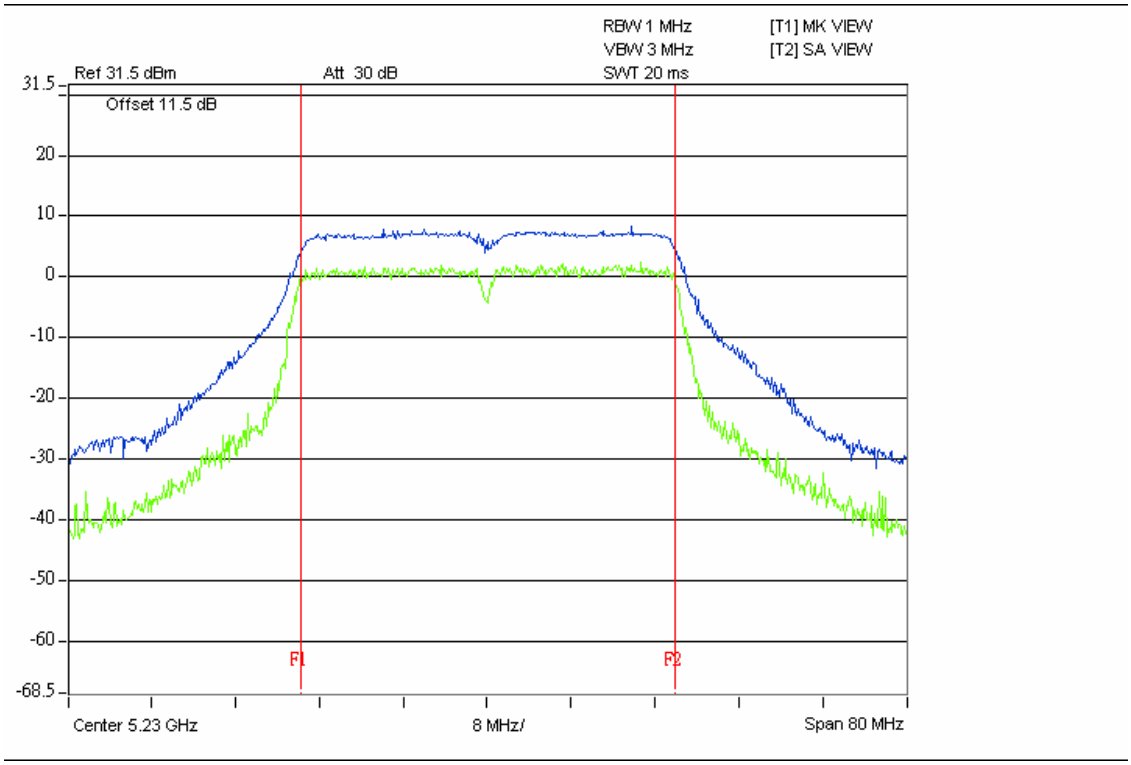
FOR CHAIN 0:

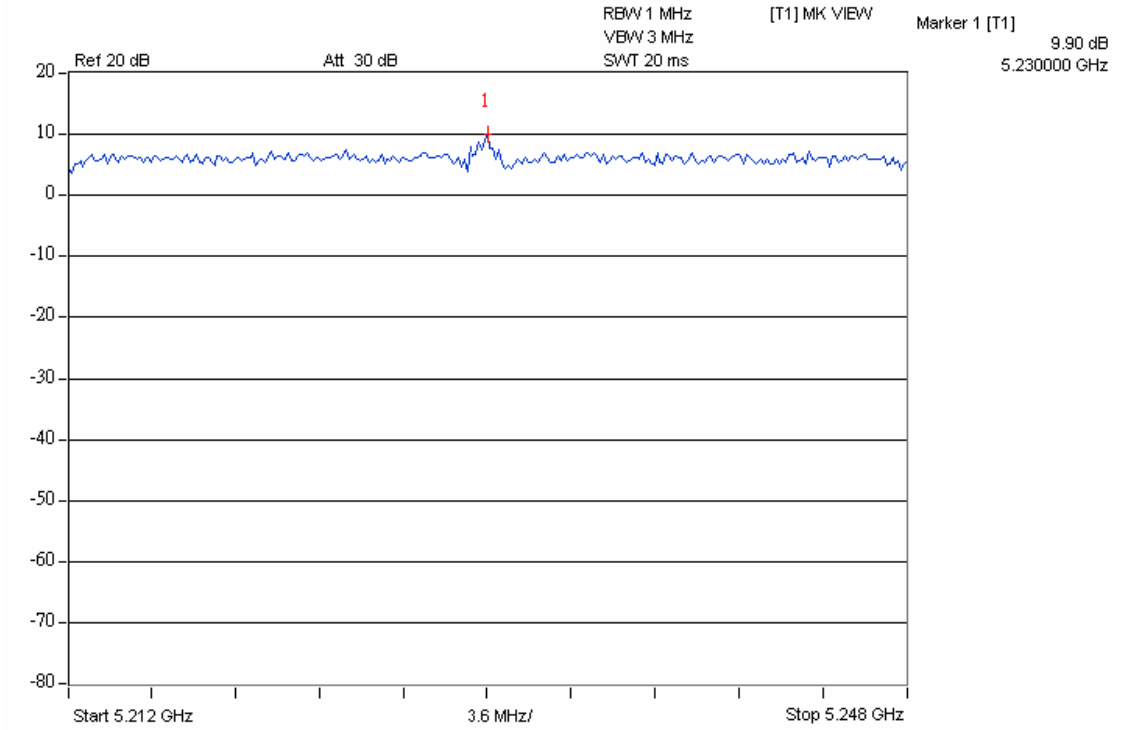
CH 26





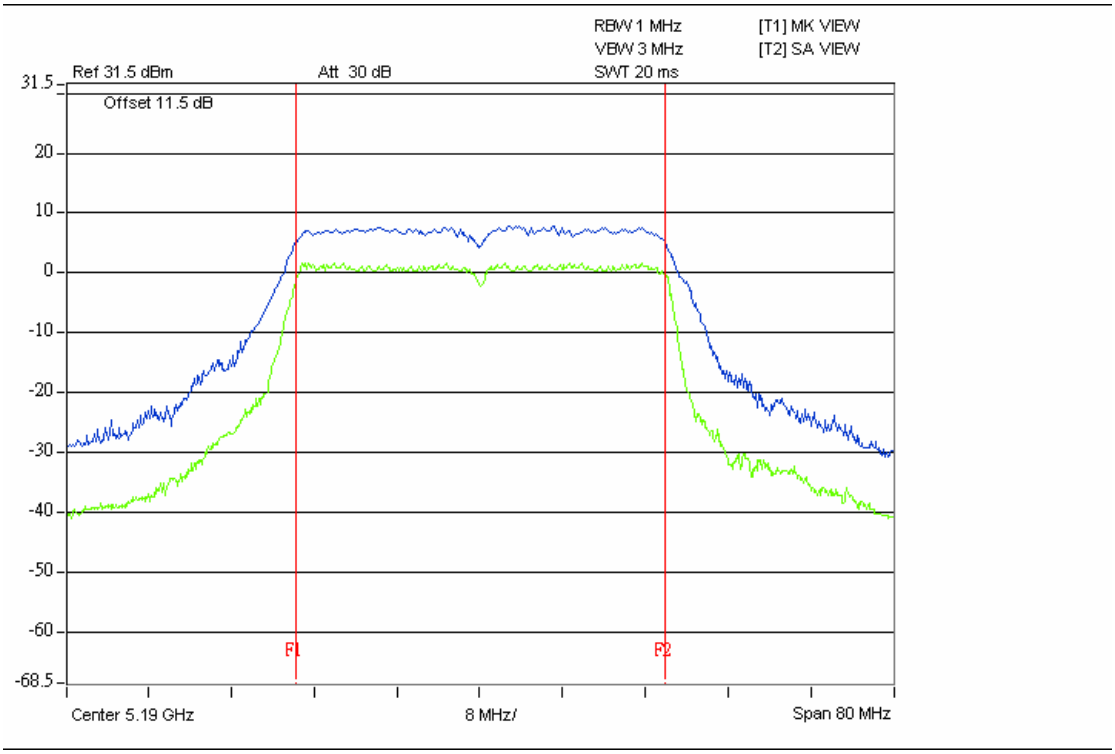
CH 29

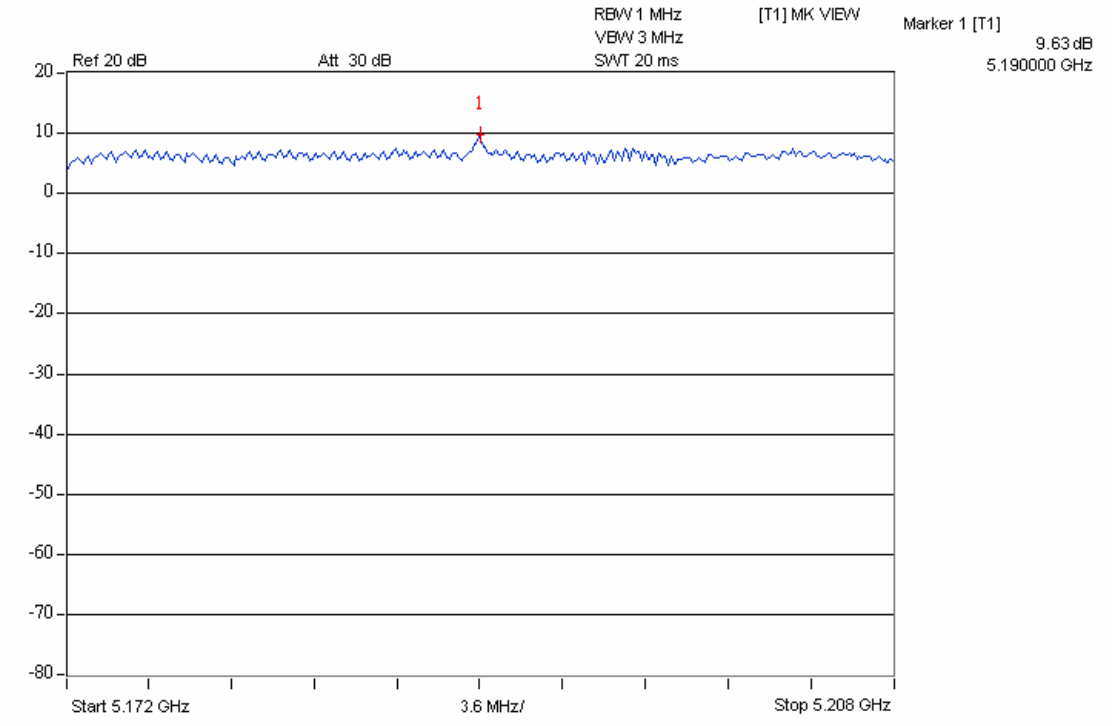

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.23 GHz
8 MHz/
Span 80 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.90 dB
5.230000 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.212 GHz
3.6 MHz/
Stop 5.248 GHz

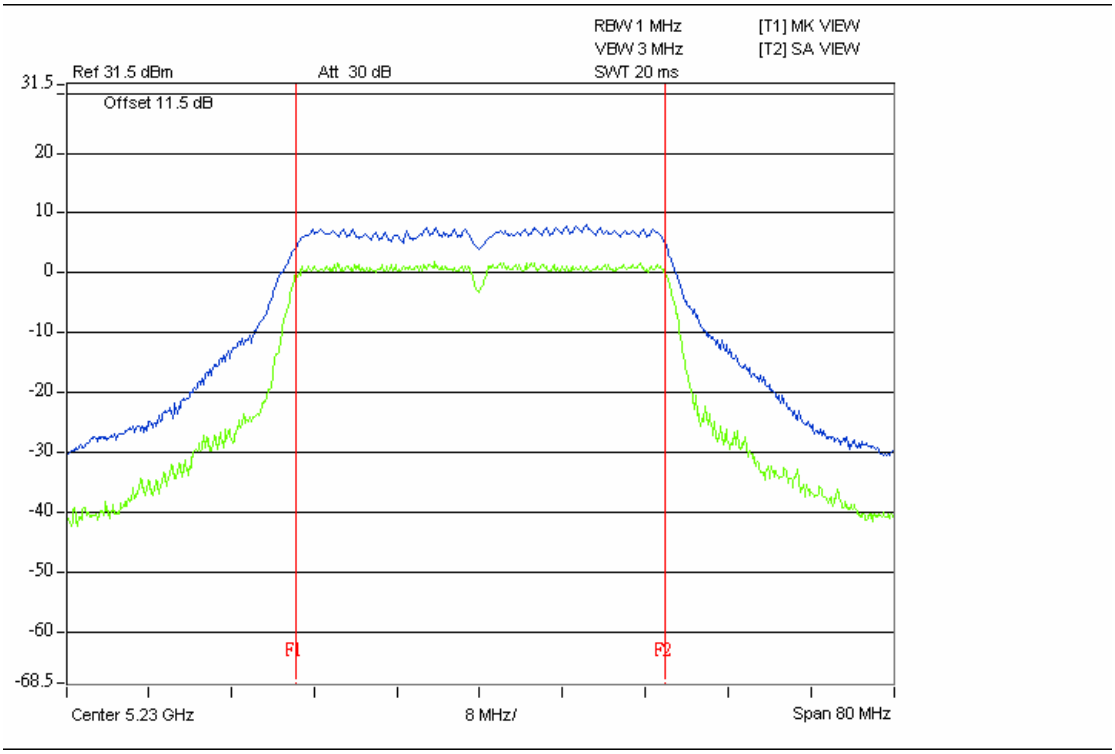
FOR CHAIN 1:

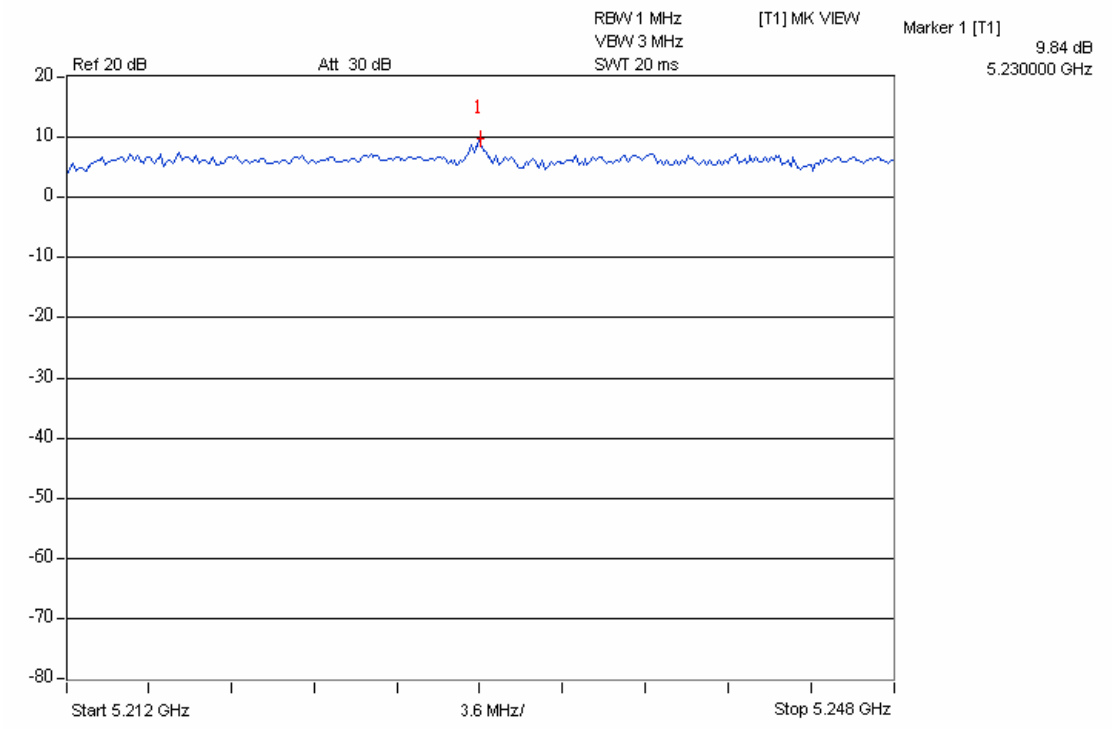
CH 26





CH 29


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
[T2] SA VIEW
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
F1
F2
Center 5.23 GHz
8 MHz/
Span 80 MHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Marker 1 [T1]
9.84 dB
5.230000 GHz
Ref 20 dB
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Start 5.212 GHz
3.6 MHz/
Stop 5.248 GHz

7.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

7.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.15 ~ 5.25GHz	4dBm

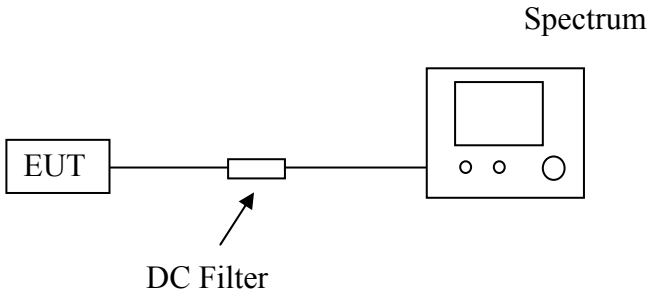
7.5.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum Analyzer	Agilent	E4407B	MY41440292	Mar 30, 2010	1 Year
RF Cable	Hubersuhne	Sucoflex104	FP2RX2	Mar 30, 2010	1 Year
DC Filter	MPE	23872C	N/A	Mar 30, 2010	1 Year

7.5.3 TEST PROCEDURES

a) Place the EUT on the table and set it in transmitting mode.Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
b) Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 300kHz, Sweep=100s
c) Record the max. reading.
d) Repeat the above procedure until the measurements for all frequencies are completed.

7.5.4 TEST SETUP



7.5.5 TEST RESULTS

PASS

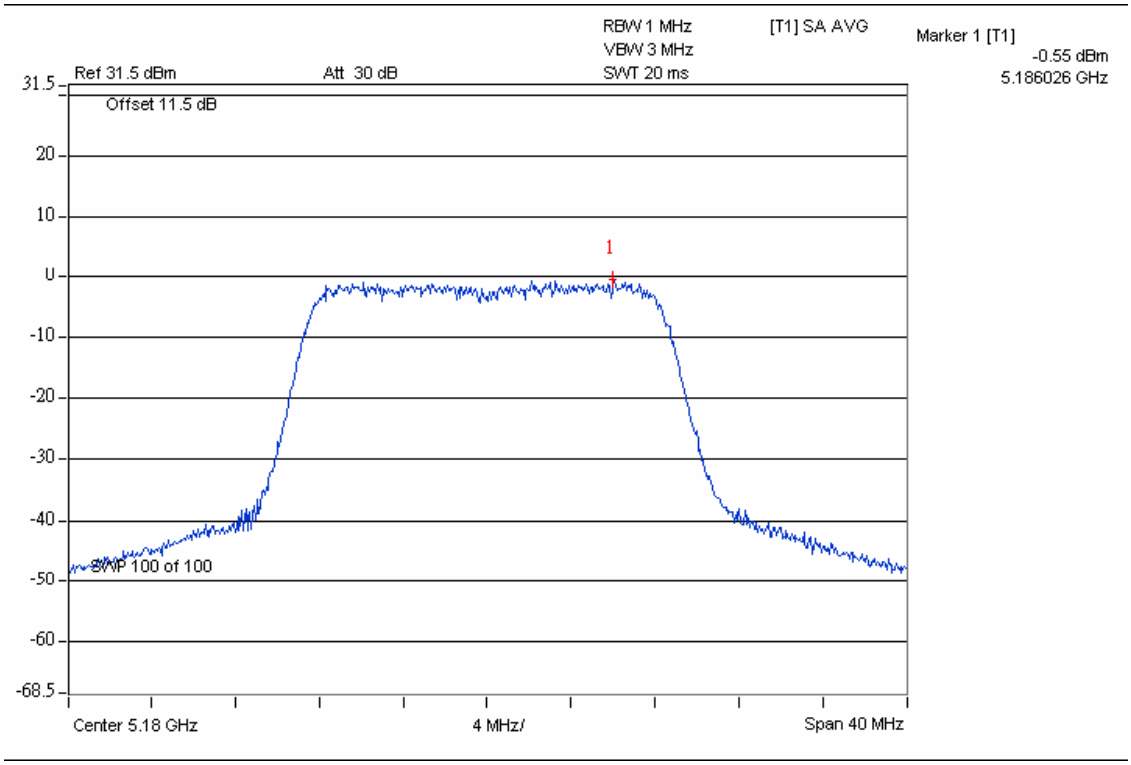
The test result please refer to the following pages.

IEEE 802.11a

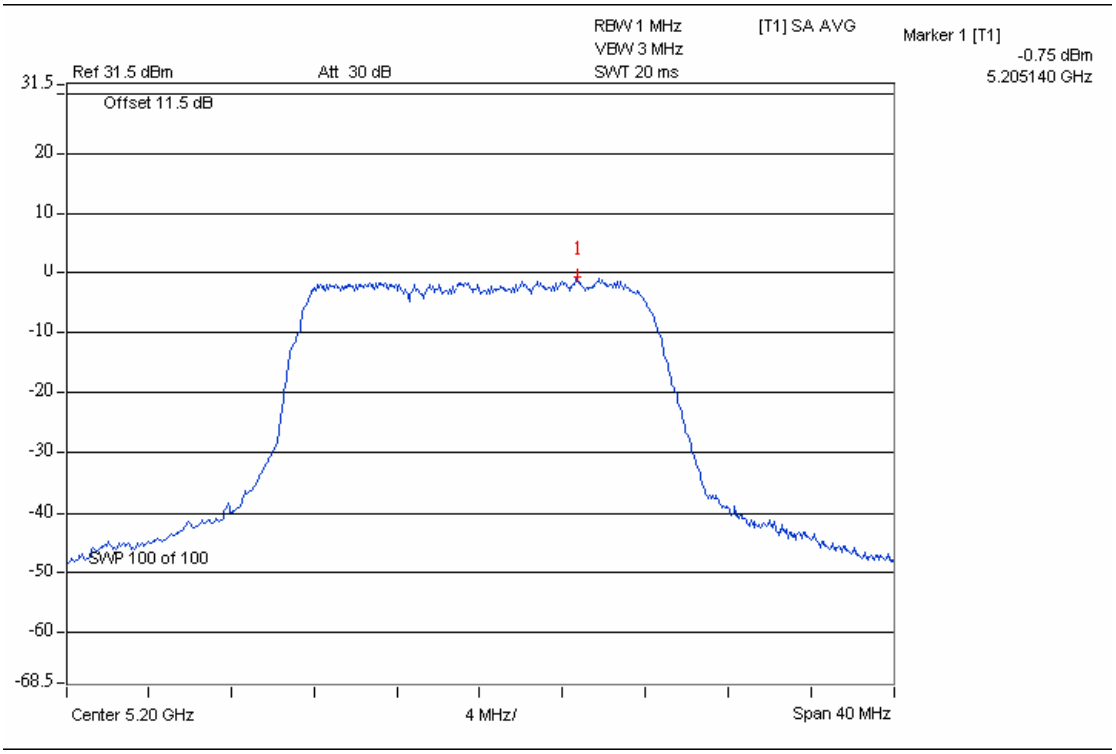
Channel	Frequency (MHz)	PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1			
25	5180	-0.55	-0.62	2.43	4	PASS
27	5200	-0.75	-0.87	2.20		PASS
30	5240	-0.78	-0.84	2.20		PASS

FOR CHAIN 0:

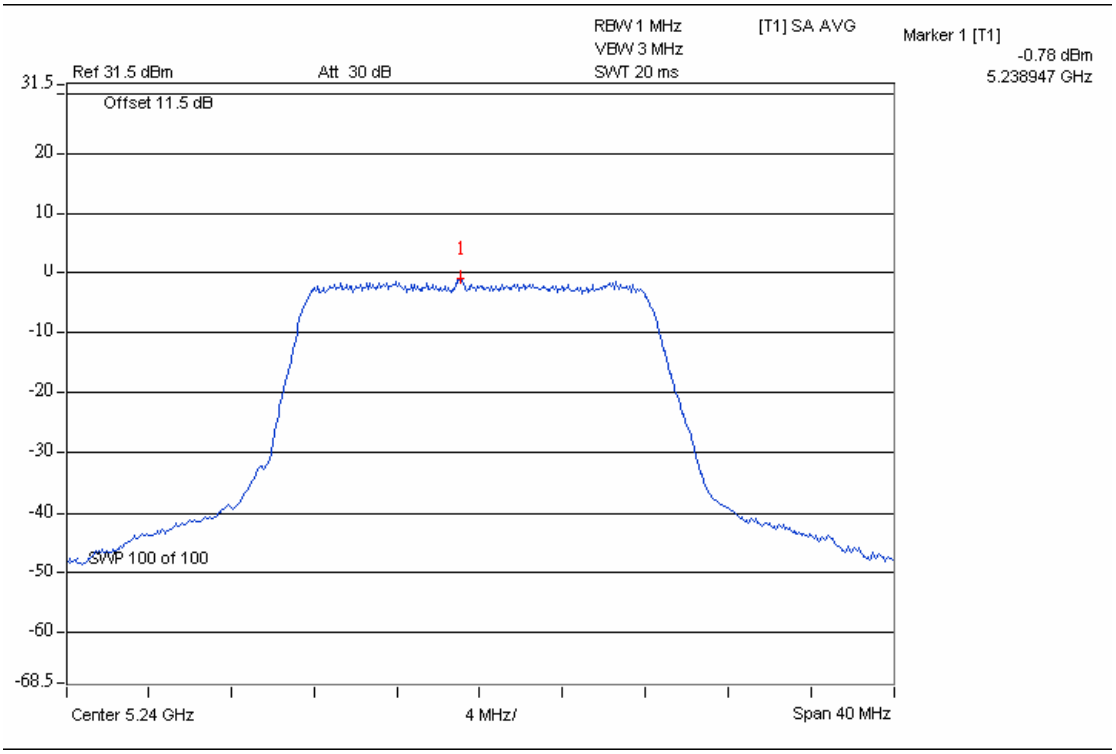
CH 25



CH 27

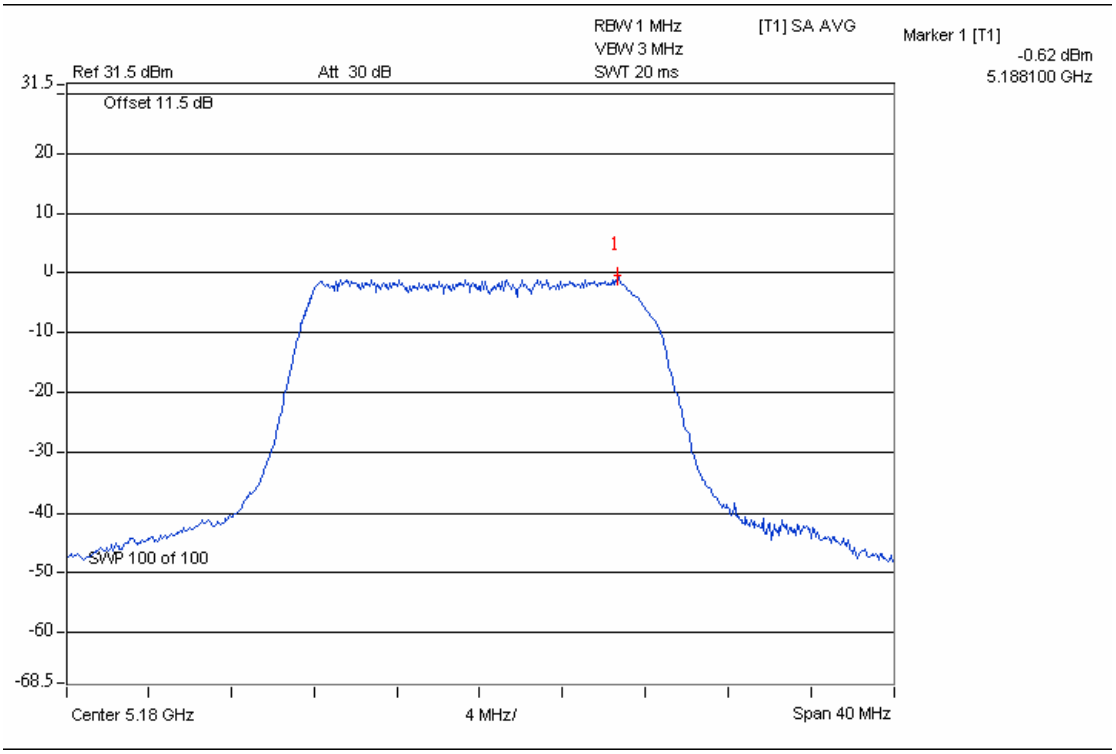


CH 30

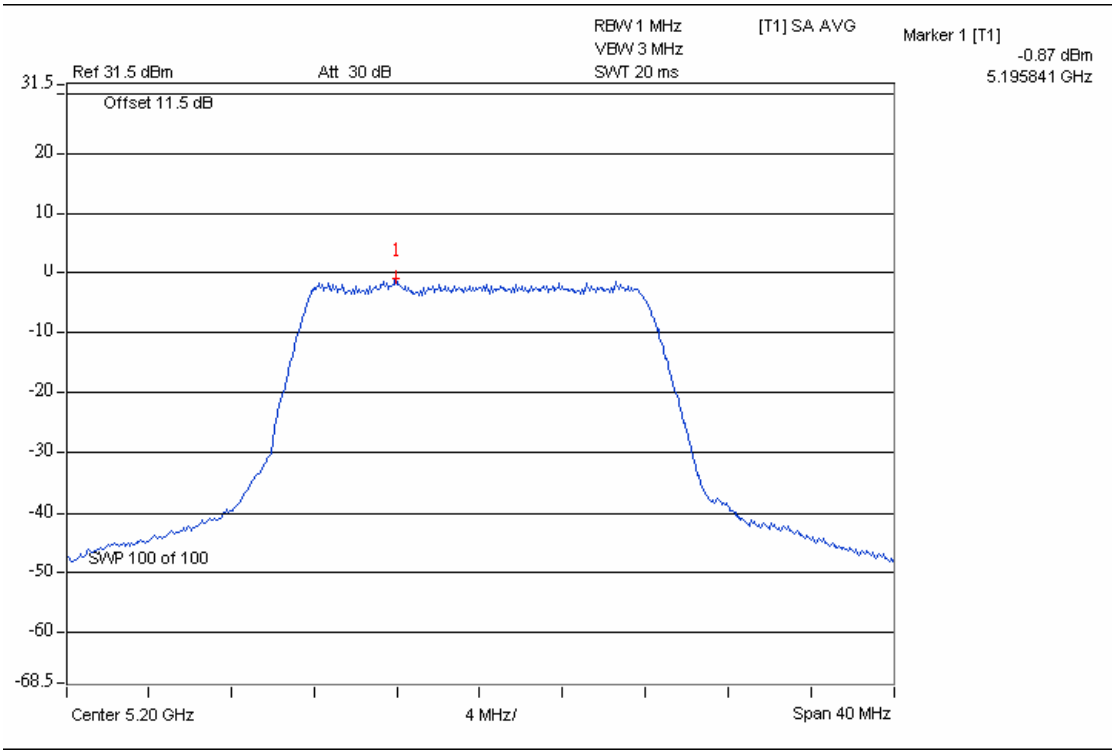


FOR CHAIN 1:

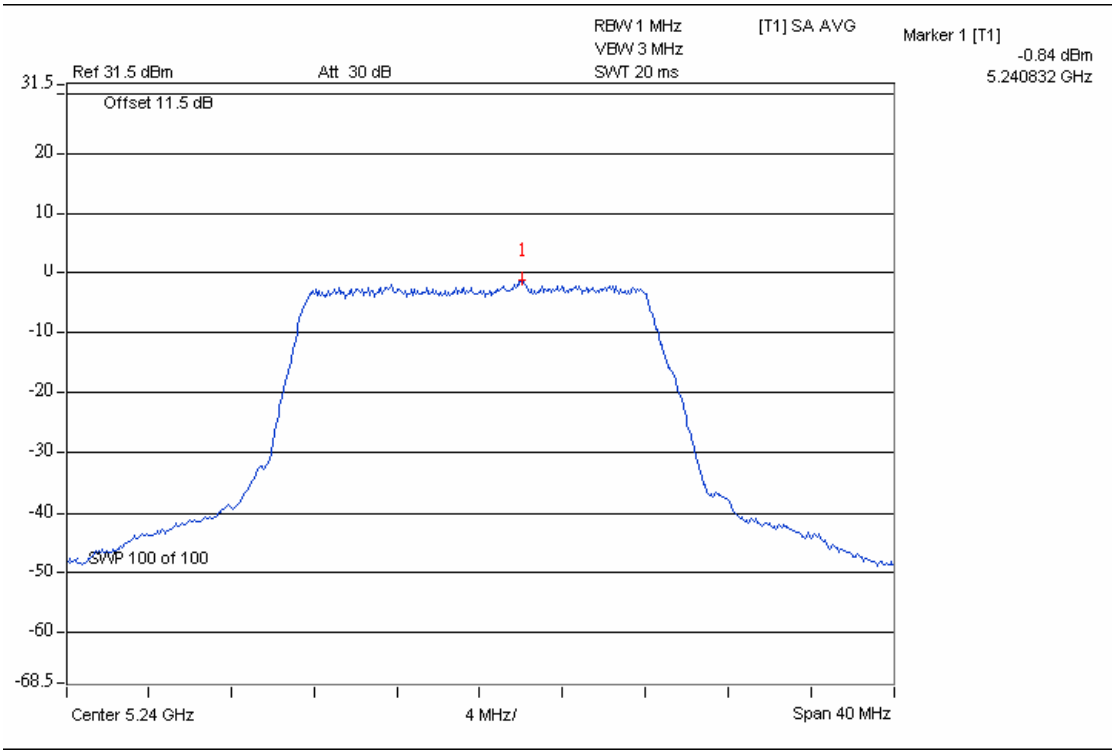
CH 25



CH 27


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-0.87 dBm
5.195841 GHz
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
SWP 100 of 100
Center 5.20 GHz
4 MHz/
Span 40 MHz

CH 30

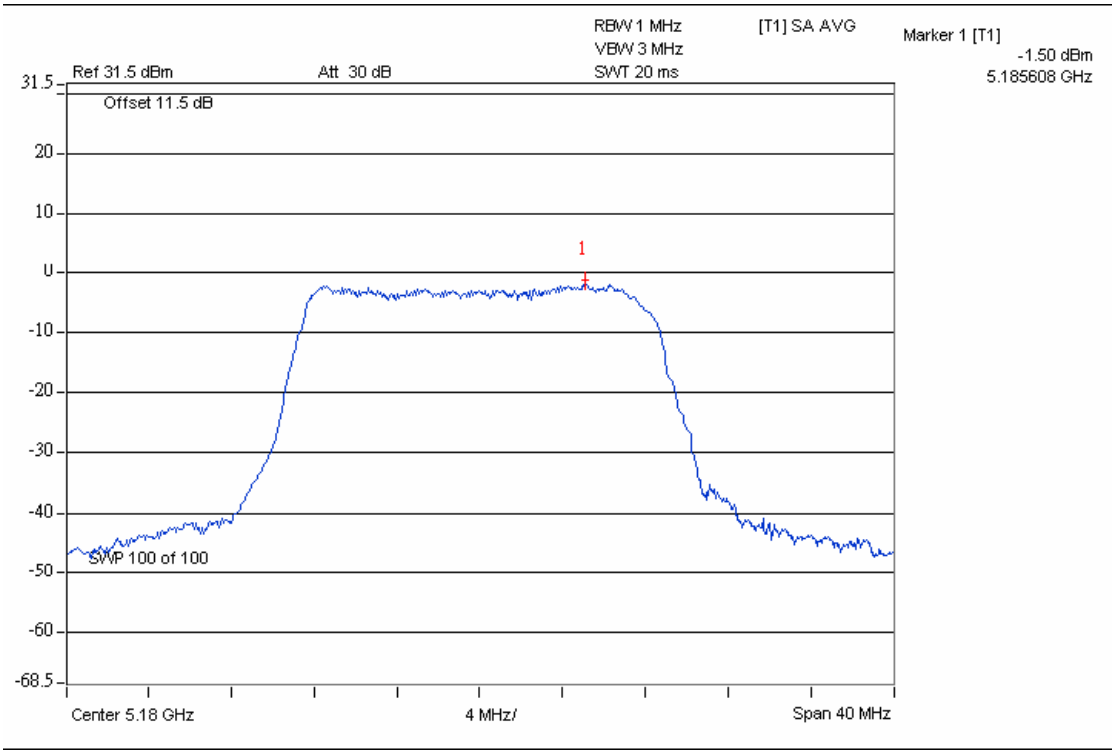

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-0.84 dBm
5.240832 GHz
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
SWP 100 of 100
Center 5.24 GHz
4 MHz/
Span 40 MHz

IEEE 802.11n 20MHz

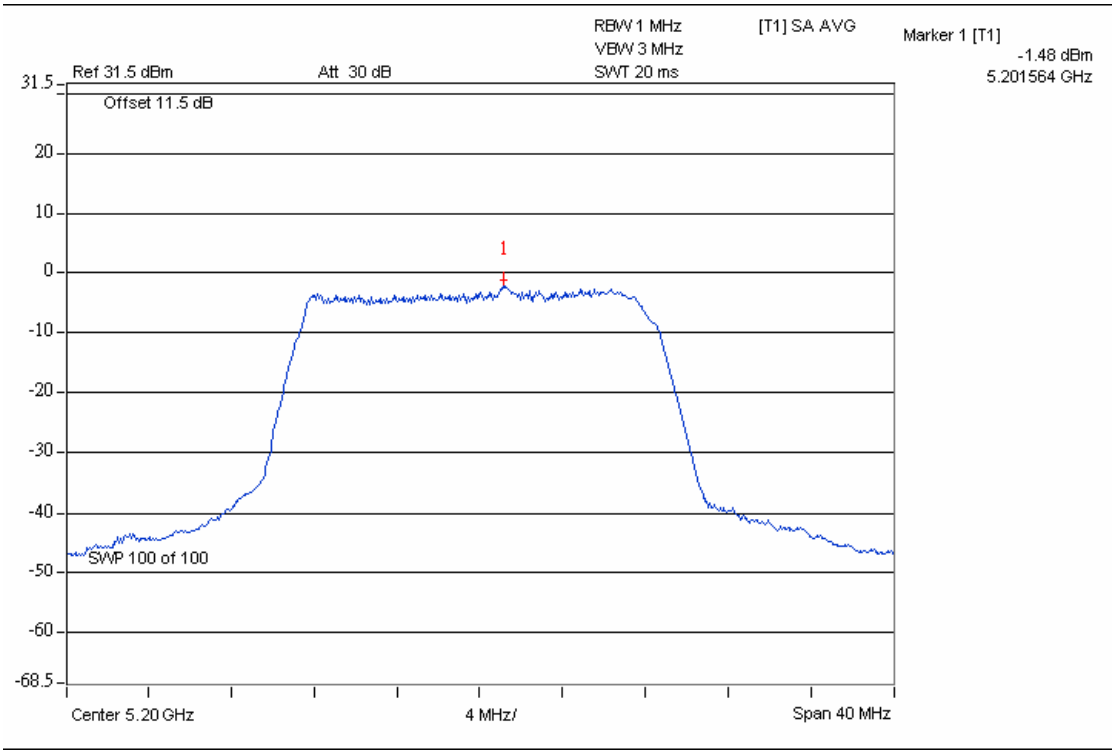
Channel	Frequency (MHz)	PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1			
25	5180	-1.50	-1.46	1.53	4	PASS
27	5200	-1.48	-1.41	1.57		PASS
30	5240	-1.42	-1.37	1.62		PASS

FOR CHAIN 0:

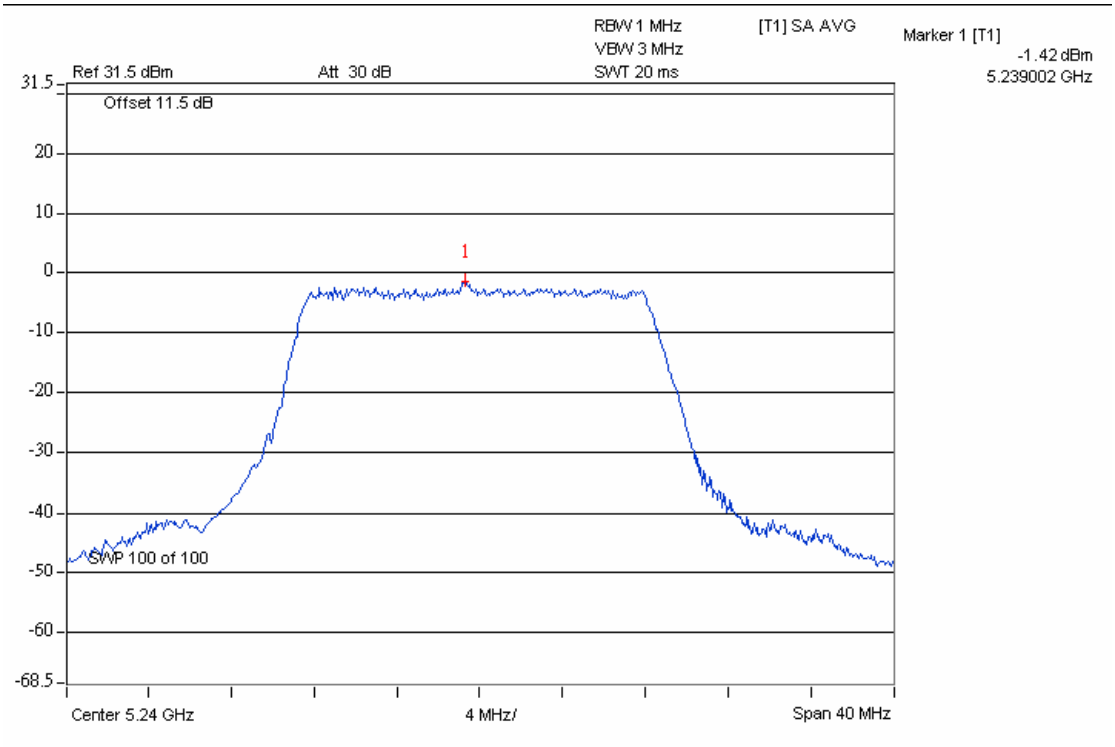
CH 25



CH 27

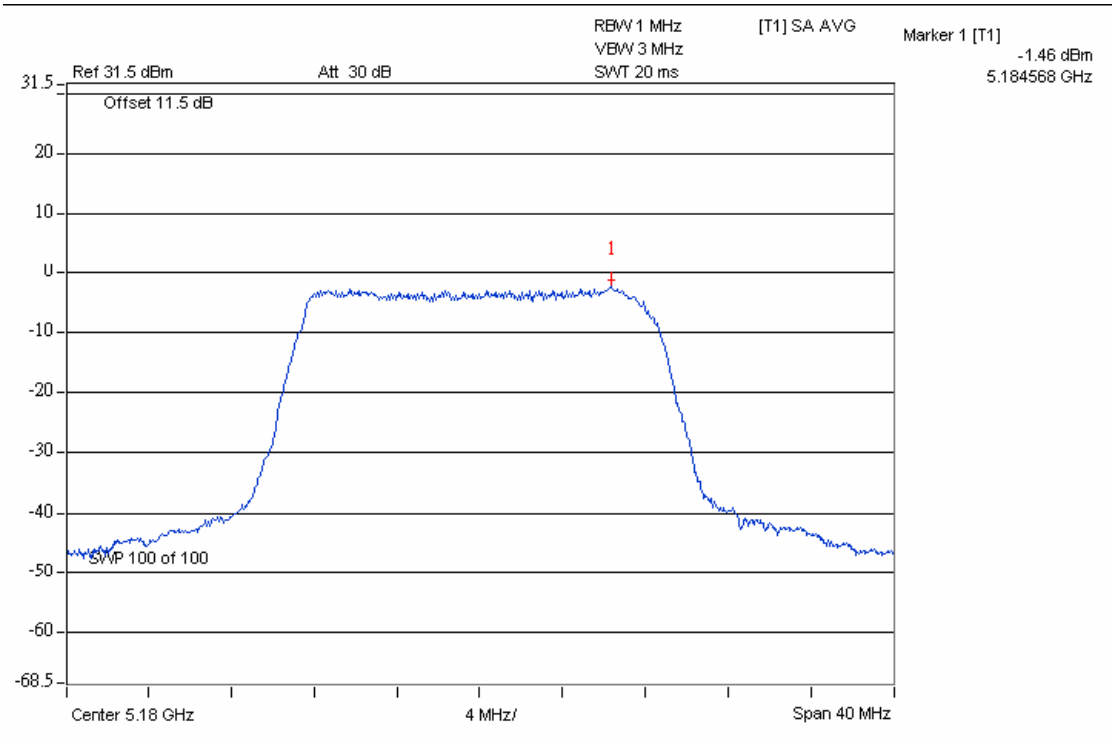


CH 30

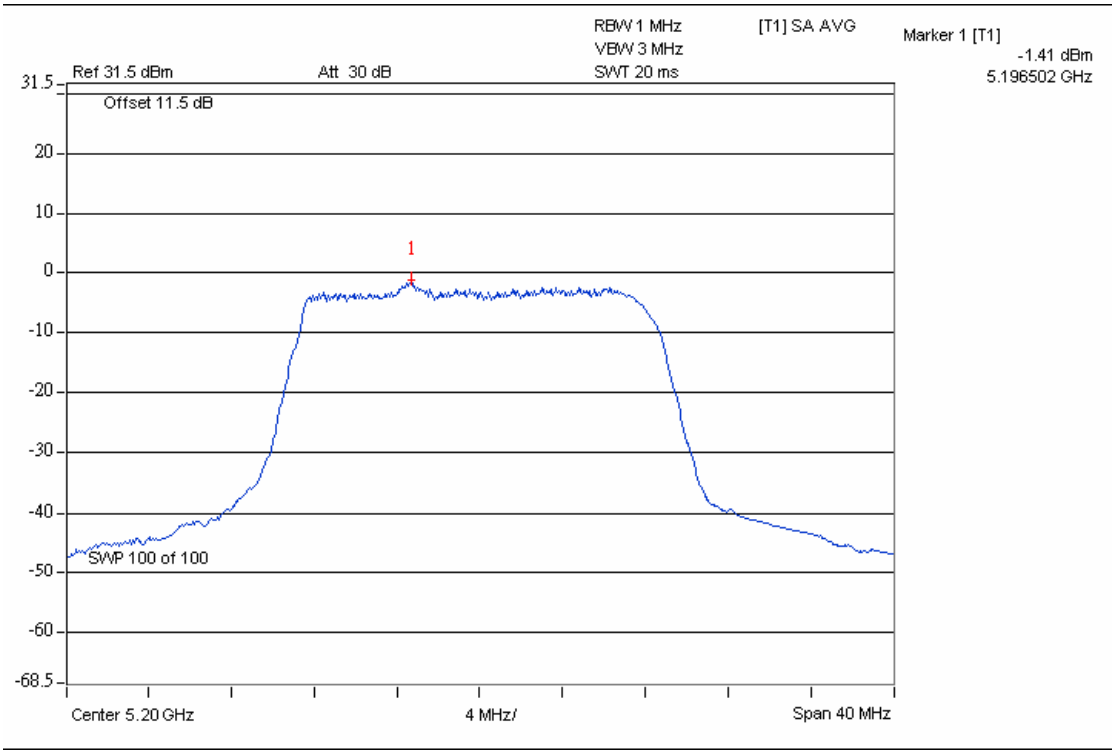


FOR CHAIN 1:

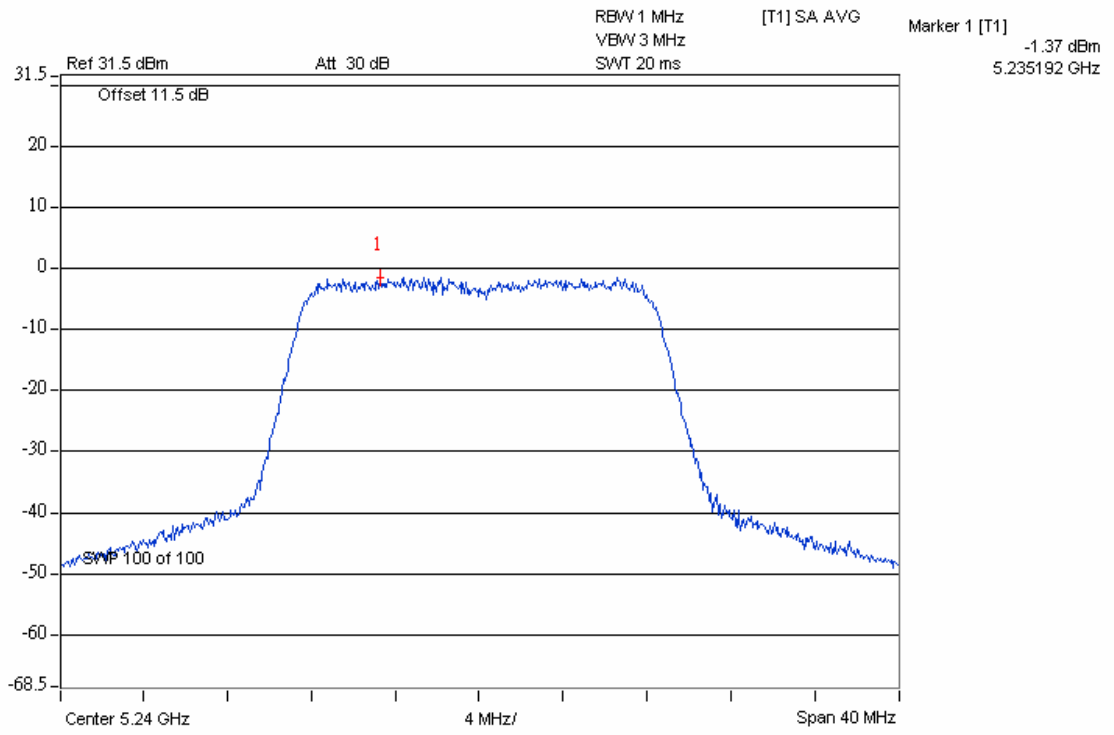
CH 25



CH 27


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-1.41 dBm
5.196502 GHz
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
1
SWP 100 of 100
Center 5.20 GHz
4 MHz/
Span 40 MHz

CH 30

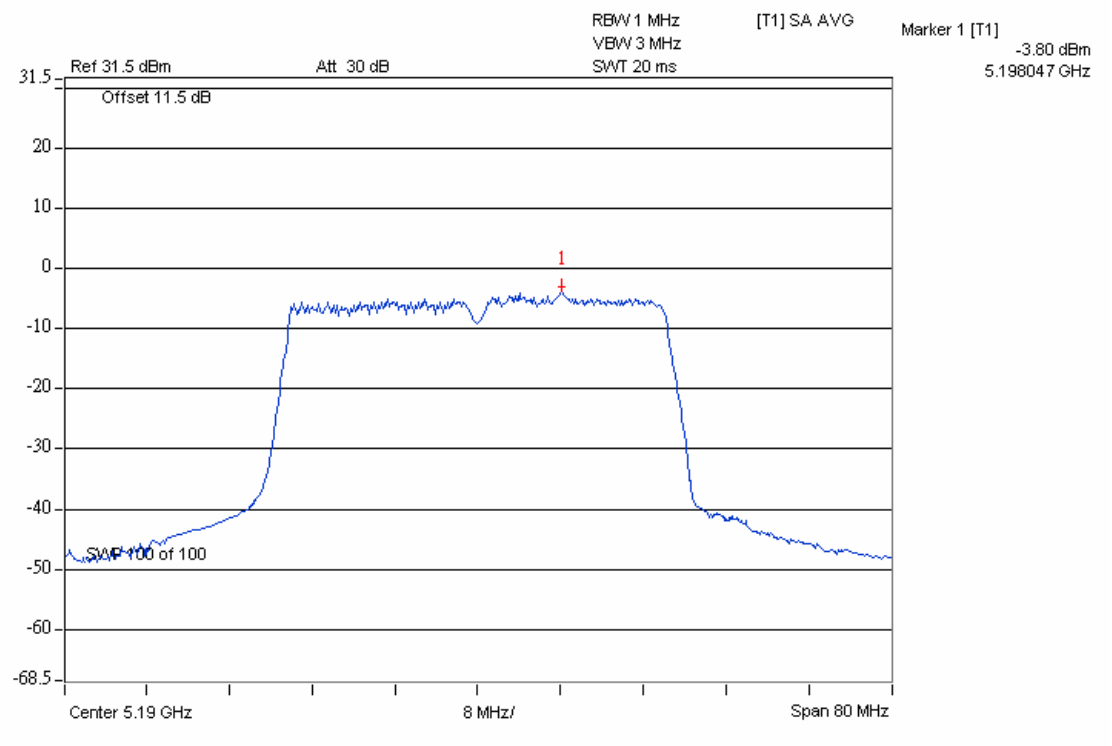

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] SA AVG
Marker 1 [T1]
-1.37 dBm
5.235192 GHz
Ref 31.5 dBm
Att 30 dB
Offset 11.5 dB
31.5
20
10
0
-10
-20
-30
-40
-50
-60
-68.5
1
SWP 100 of 100
Center 5.24 GHz
4 MHz/
Span 40 MHz

IEEE 802.11n 40MHz

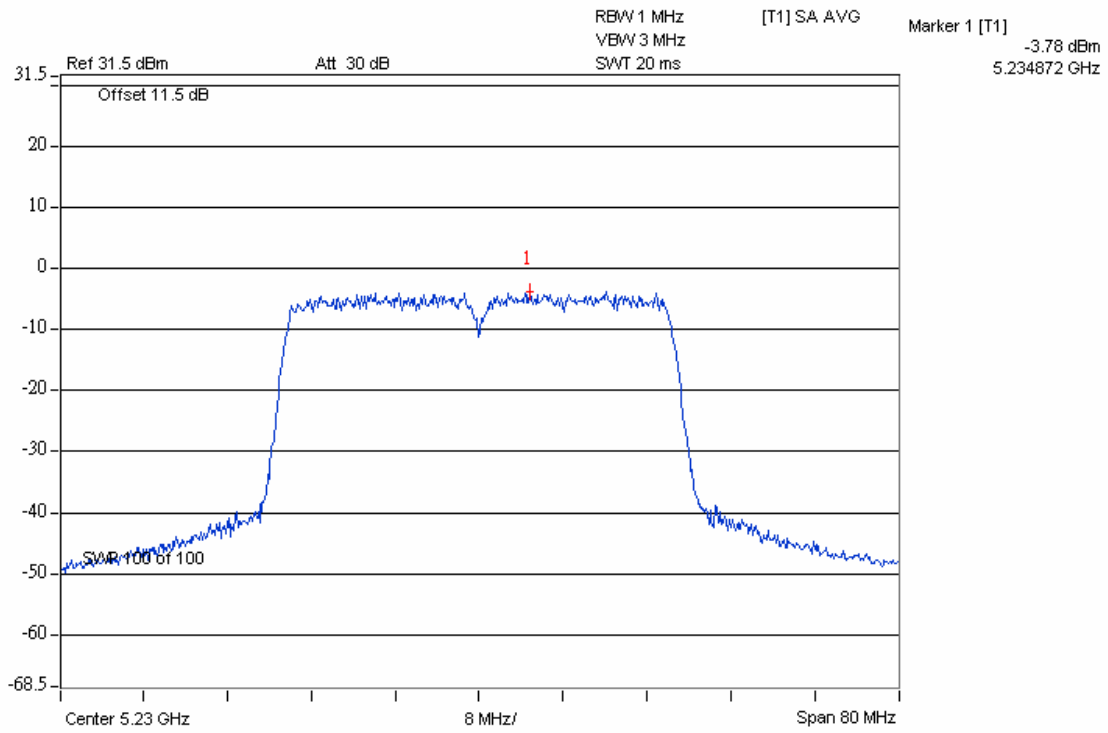
Channel	Frequency (MHz)	PPSD (dBm)		Total PPSD (dBm)	Limit (dBm)	Result
		Chain 0	Chain 1			
26	5190	-3.80	-4.07	-0.92	4	PASS
29	5230	-3.78	-3.85	-0.80		PASS

FOR CHAIN 0:

CH 26

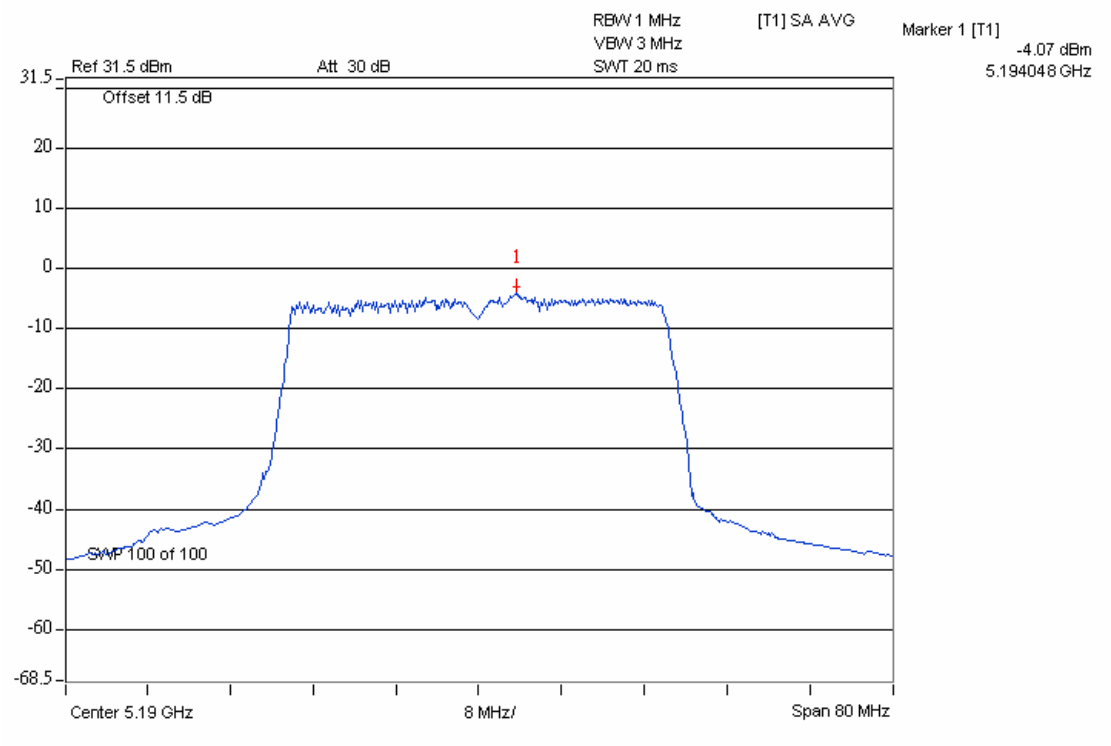


CH 29

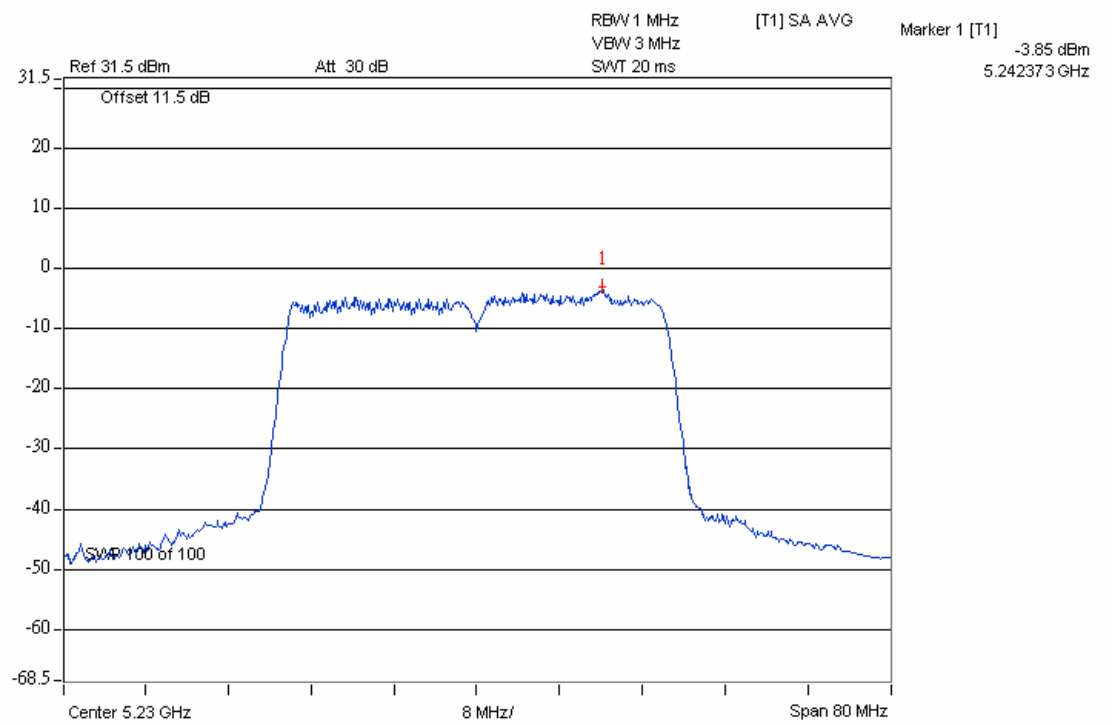


FOR CHAIN 1:

CH 26



CH 29



7.6 FREQUENCY STABILITY

7.6.1 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.

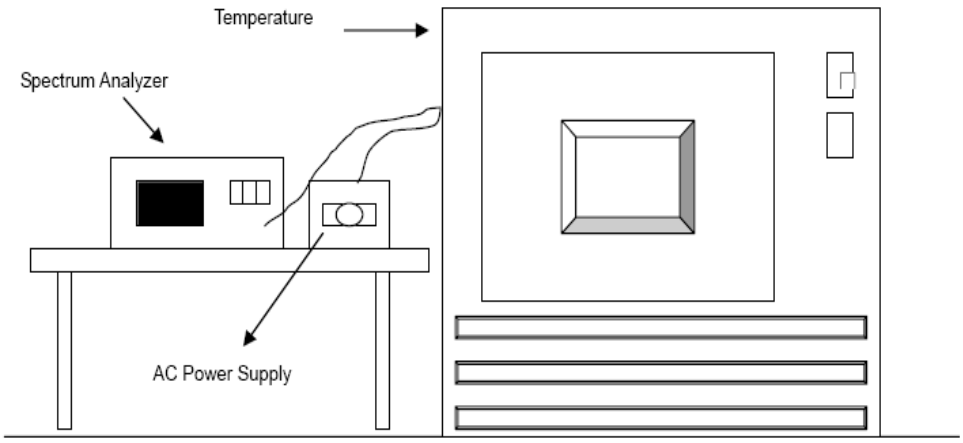
7.6.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum Analyzer	Agilent	E4407B	MY41440292	Mar 30, 2010	1 Year
RF Cable	Hubersuhne	Sucoflex104	FP2RX2	Mar 30, 2010	1 Year
DC Filter	MPE	23872C	N/A	Mar 30, 2010	1 Year
Wit Standard Temperature And Humidity Chamber	YUXIN	TH-4S-C	W981030	Mar 30, 2010	1 Year

7.6.3 TEST PROCEDURE

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. 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.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. 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.

7.6.4 TEST SETUP



7.6.5 TEST RESULT

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5200MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10minute	
		Measured Frequency	Freq Drift	Measured Frequency	Freq Drift	Measured Frequency	Freq Drift	Measured Frequency	Freq Drift
		(MHz)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
50	120	5199.988252	-2.259	5199.987842	-2.338	5199.988065	-2.295	5199.987784	-2.349
40	120	5199.988518	-2.208	5199.988316	-2.247	5199.988597	-2.193	5199.988604	-2.192
30	120	5199.989594	-2.001	5199.989811	-1.959	5199.990045	-1.914	5199.990269	-1.871
20	120	9199.991477	-1.639	5199.991059	-1.719	5199.990776	-1.774	5199.991039	-1.723
10	120	5199.992381	-1.465	5199.992262	-1.488	5199.992555	-1.432	5199.992699	-1.404
0	120	5199.990846	-1.760	5199.991428	-1.648	5199.990627	-1.802	5199.991323	-1.669
-10	120	5199.989973	-1.928	5199.989736	-1.974	5199.989908	-1.941	5199.989437	-2.031
-20	120	5199.988813	-2.151	5199.989195	-2.078	5199.989019	-2.112	5199.989323	-2.053
-30	120	5199.987914	-2.324	5199.987695	-2.366	5199.987623	-2.380	5199.988207	-2.268

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5200MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 minute	
		Measured Frequency	Freq Drift	Measured Frequency	Freq Drift	Measured Frequency	Freq Drift	Measured Frequency	Freq Drift
		(MHz)	ppm	(MHz)	ppm	(MHz)	ppm	(MHz)	ppm
20	102	5199.990251	-1.875	5199.990331	-1.859	5199.990378	-1.850	5199.987784	-1.835
	120	5199.991477	-1.639	5199.991059	-1.719	5199.990776	-1.774	5199.988604	-1.732
	138	5199.992794	-1.386	5199.992400	-1.462	5199.992554	-1.432	5199.990269	-1.464

7.6 BAND EDGES MEASUREMENT

7.6.1.TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Spectrum Analyzer	ANRITSU	MS2661C	6200140915	Mar 30, 2010	1 Year
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	Mar 30, 2010	1 Year
Antenna	Schwarzbeck	VULB9163	142	Mar 30, 2010	1 Year
Horn-antenna	Schwarzbeck	BBHA9120D	9120D-209	Mar 30, 2010	1 Year
Power Line Filter	DUOJI EME	FNF 201 B16	N/A	Mar 30, 2010	1 Year
Power Line Filter	JIANLI	DL-40C	N/A	Mar 30, 2010	1 Year

7.6.2. 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. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz 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

7.6.4.TEST RESULTS

PASS

For signals in the restricted bands above and below the 5.15 to 5.25GHz 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.

802.11a

RESTRICT BAND (4500 ~ 5150 MHz)

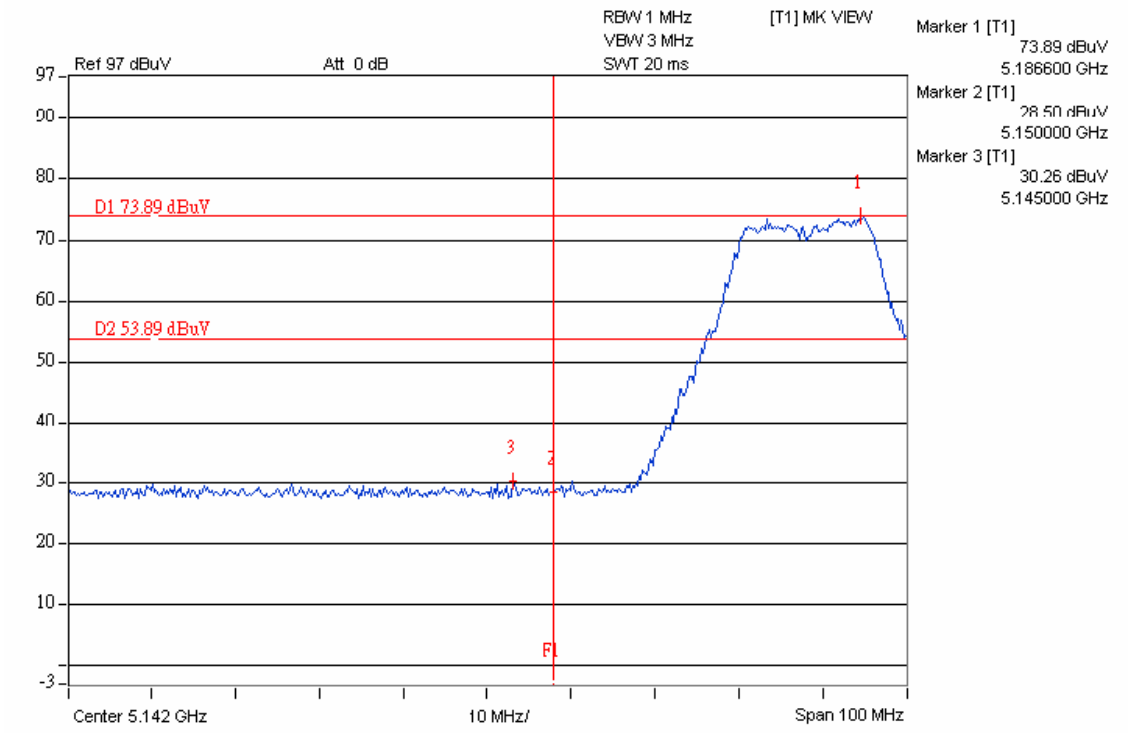
Frequency (MHz)	Fundamental Emission (dBuV/m)	Delta (dB)	Maximum Field Strength In Restrict Band (dBuV/m)	Limit (dBuV/m)
5180.00 (PK)	105.1	43.63	61.47	74.00
5180.00 (AV)	94.4	45.70	48.70	54.00

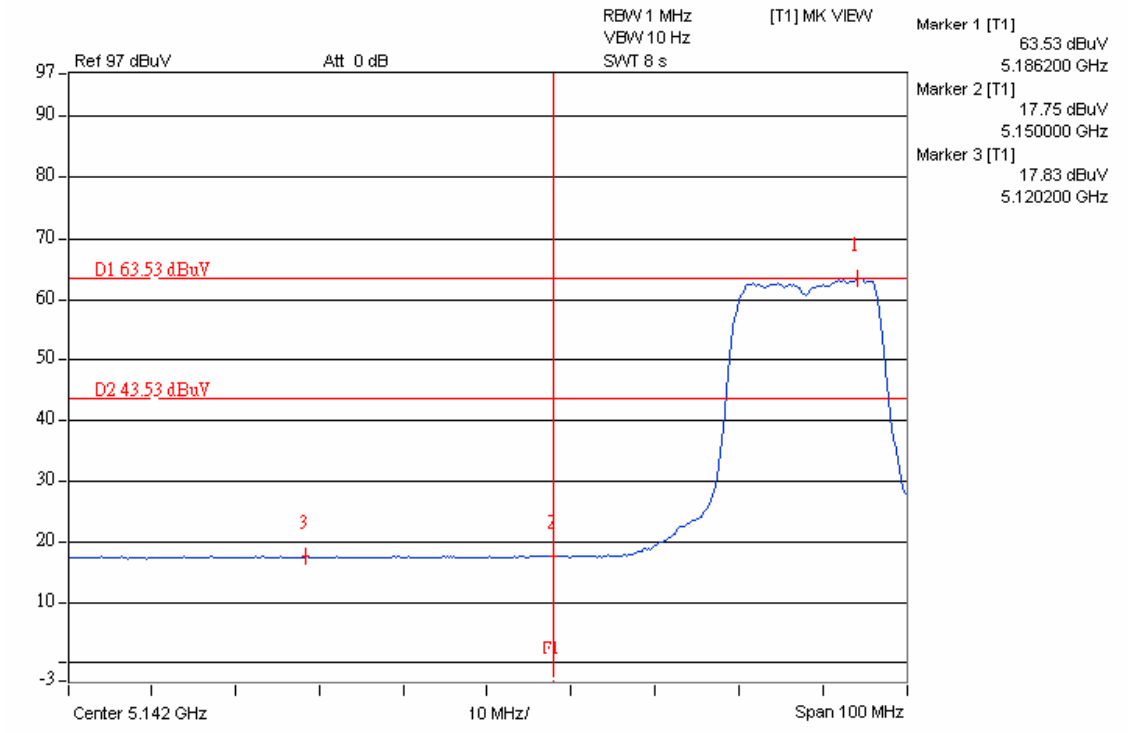
RESTRICT BAND (5350 ~ 5460 MHz)

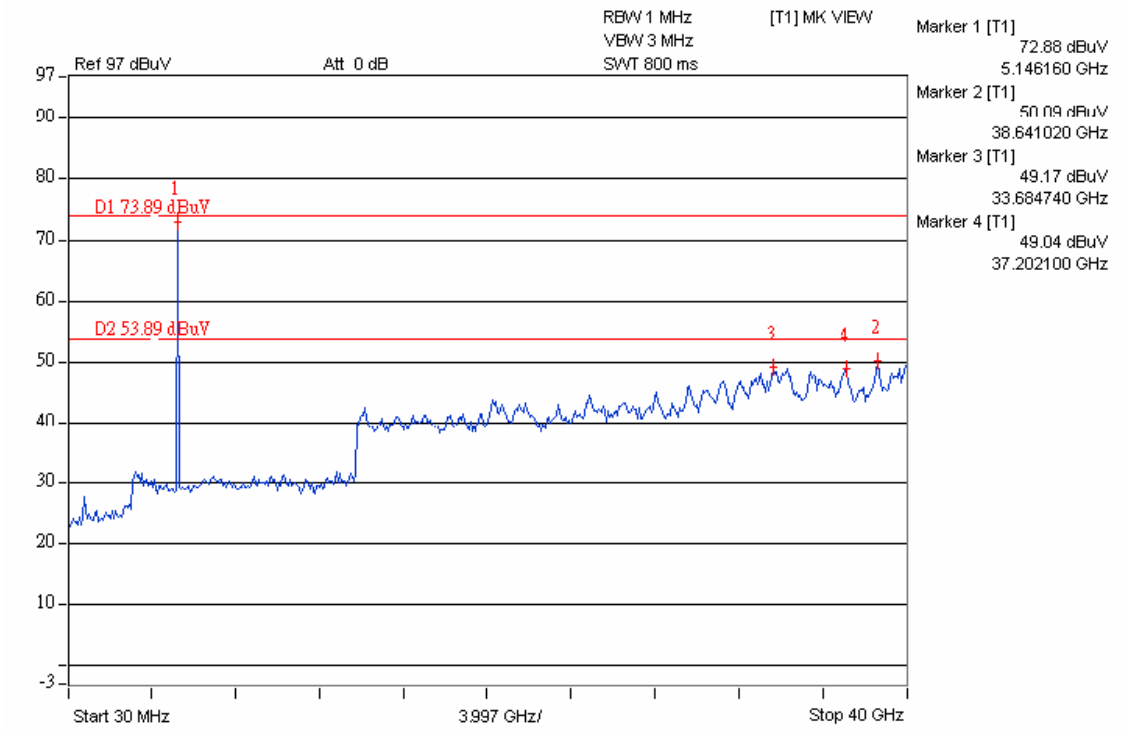
Frequency (MHz)	Fundamental Emission (dBuV/m)	Delta (dB)	Maximum Field Strength In Restrict Band (dBuV/m)	Limit (dBuV/m)
5240.00 (PK)	104.4	41.75	62.65	74.00
5240.00 (AV)	93.1	43.47	49.63	54.00

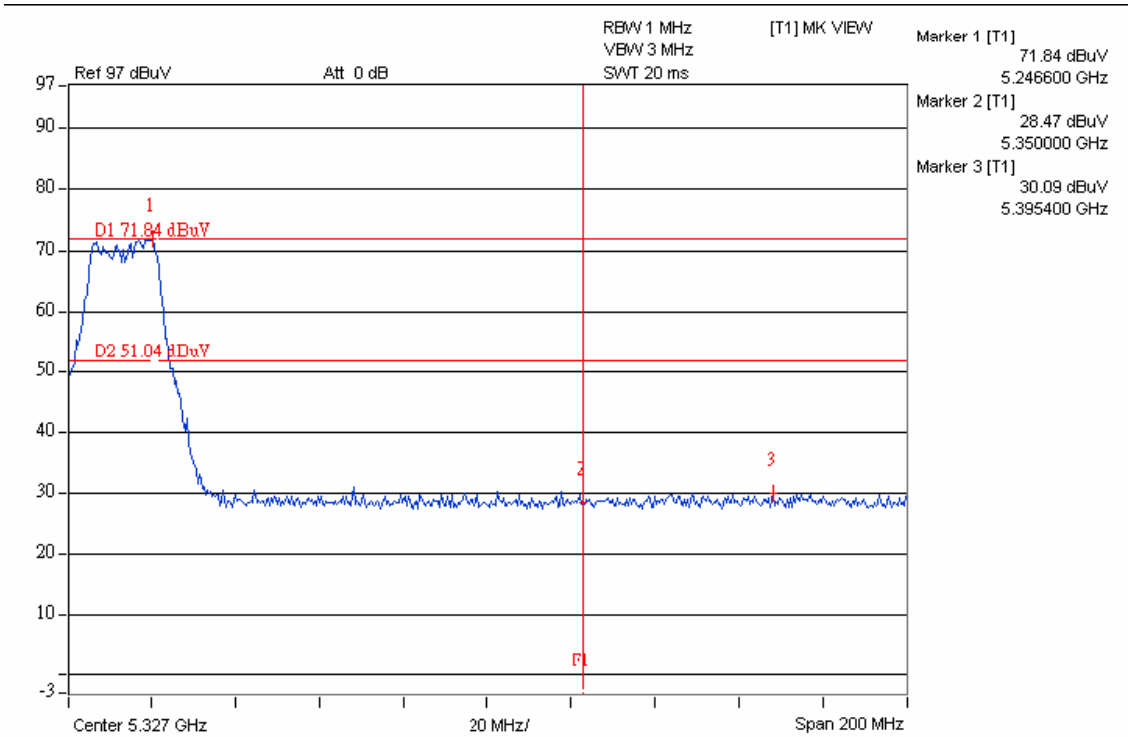
NOTE:

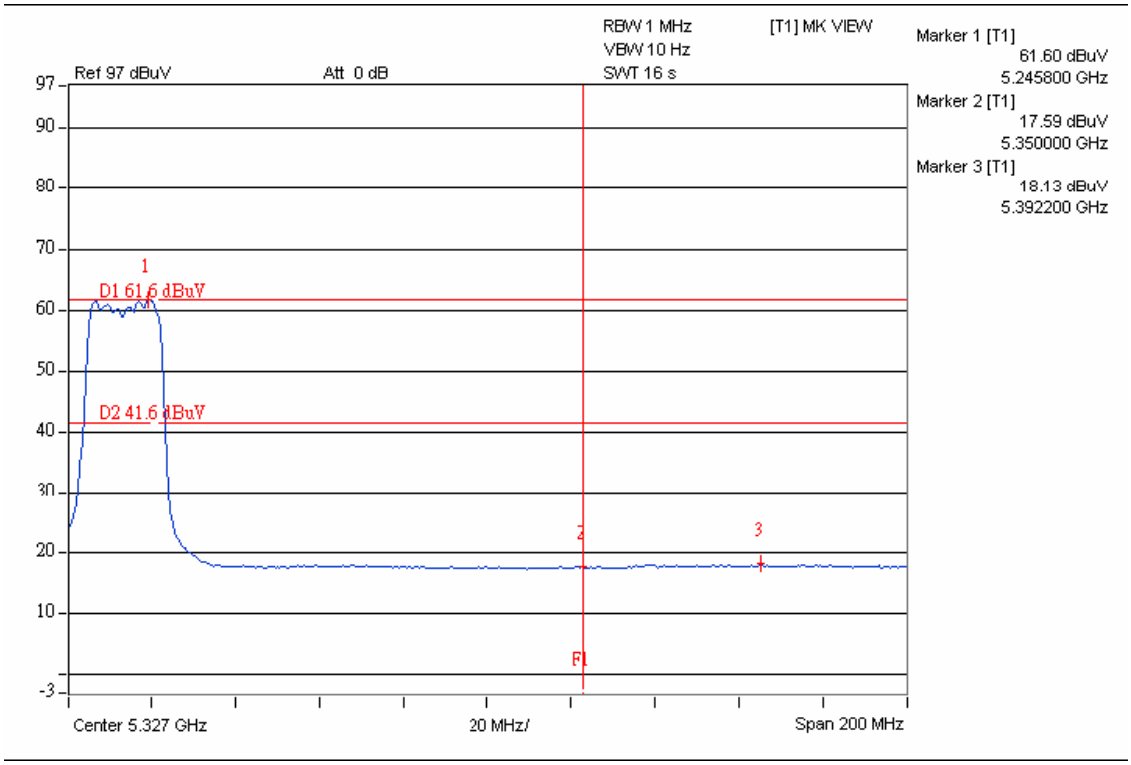
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission.
   Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

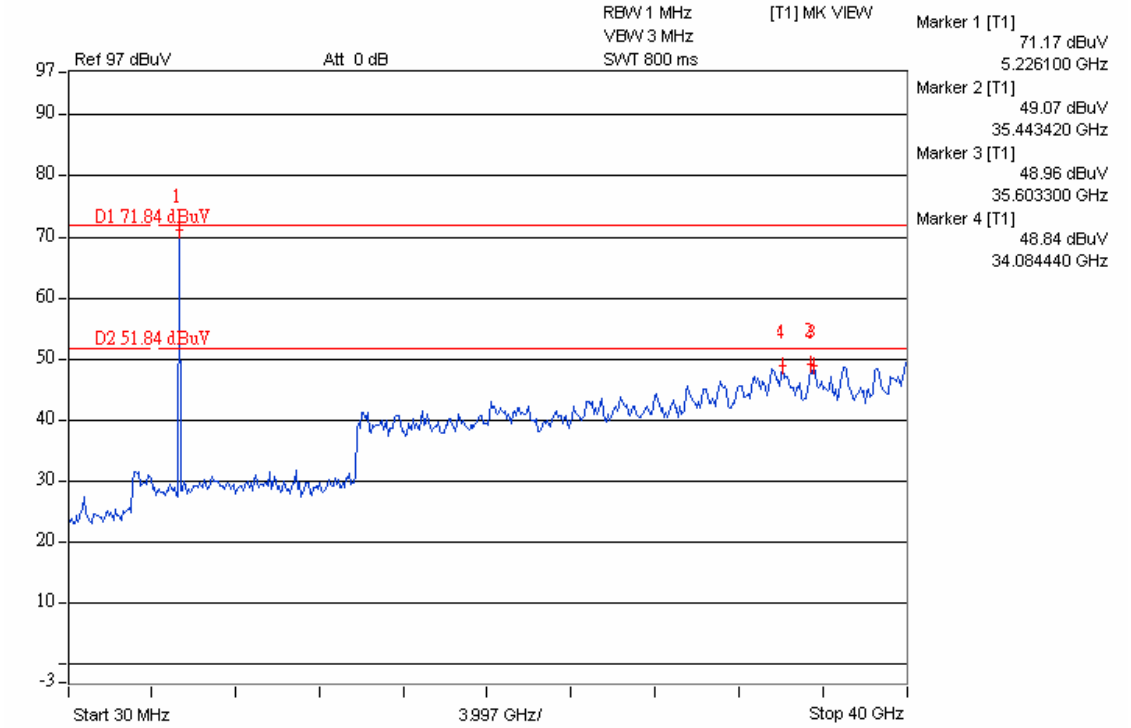

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
73.89 dBuV
5.186600 GHz
Marker 2 [T1]
28.50 dBuV
5.150000 GHz
Marker 3 [T1]
30.26 dBuV
5.145000 GHz
D1 73.89 dBuV
D2 53.89 dBuV
97
90
80
70
60
50
40
30
20
10
-3
Center 5.142 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
63.53 dBuV
5.186200 GHz
Marker 2 [T1]
17.75 dBuV
5.150000 GHz
Marker 3 [T1]
17.83 dBuV
5.120200 GHz
D1 63.53 dBuV
D2 43.53 dBuV
97
90
80
70
60
50
40
30
20
10
-3
Center 5.142 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
72.88 dBuV
5.146160 GHz
Marker 2 [T1]
38.641020 GHz
Marker 3 [T1]
49.17 dBuV
33.684740 GHz
Marker 4 [T1]
49.04 dBuV
37.202100 GHz
D1 73.89 dBuV
D2 53.89 dBuV
Start 30 MHz
3.997 GHz/
Stop 40 GHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
71.84 dBuV
5.246600 GHz
Marker 2 [T1]
28.47 dBuV
5.350000 GHz
Marker 3 [T1]
30.09 dBuV
5.395400 GHz
D1 71.84 dBuV
D2 51.04 dBuV
Center 5.327 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
61.60 dBuV
5.245800 GHz
Marker 2 [T1]
17.59 dBuV
5.350000 GHz
Marker 3 [T1]
18.13 dBuV
5.392200 GHz
D1 61.6 dBuV
D2 41.6 dBuV
Center 5.327 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
71.17 dBuV
5.226100 GHz
Marker 2 [T1]
49.07 dBuV
35.443420 GHz
Marker 3 [T1]
48.96 dBuV
35.603300 GHz
Marker 4 [T1]
48.84 dBuV
34.084440 GHz
D1 71.84 dBuV
D2 51.84 dBuV
Start 30 MHz
3.997 GHz/
Stop 40 GHz

802.11n 20MHz

RESTRICT BAND (4500 ~ 5150 MHz)

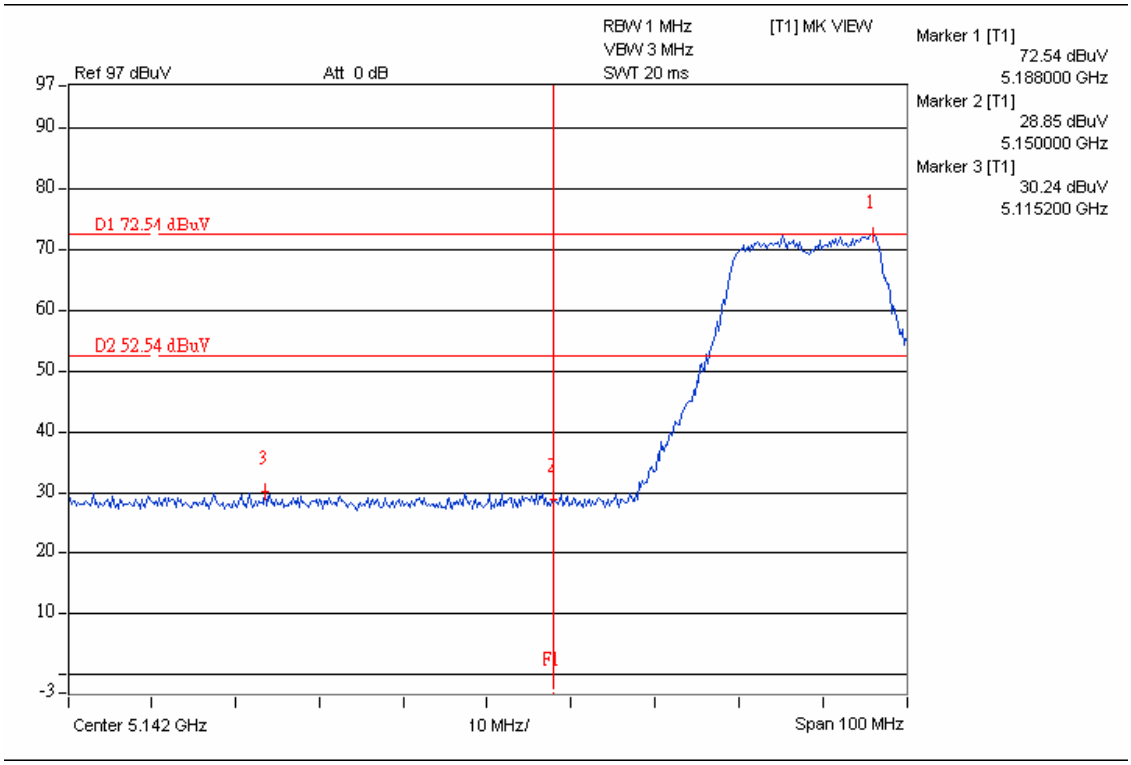
Frequency (MHz)	Fundamental Emission (dBuV/m)	Delta (dB)	Maximum Field Strength In Restrict Band (dBuV/m)	Limit (dBuV/m)
5180.00 (PK)	104.5	42.30	62.20	74.00
5180.00 (AV)	92.2	43.87	48.33	54.00

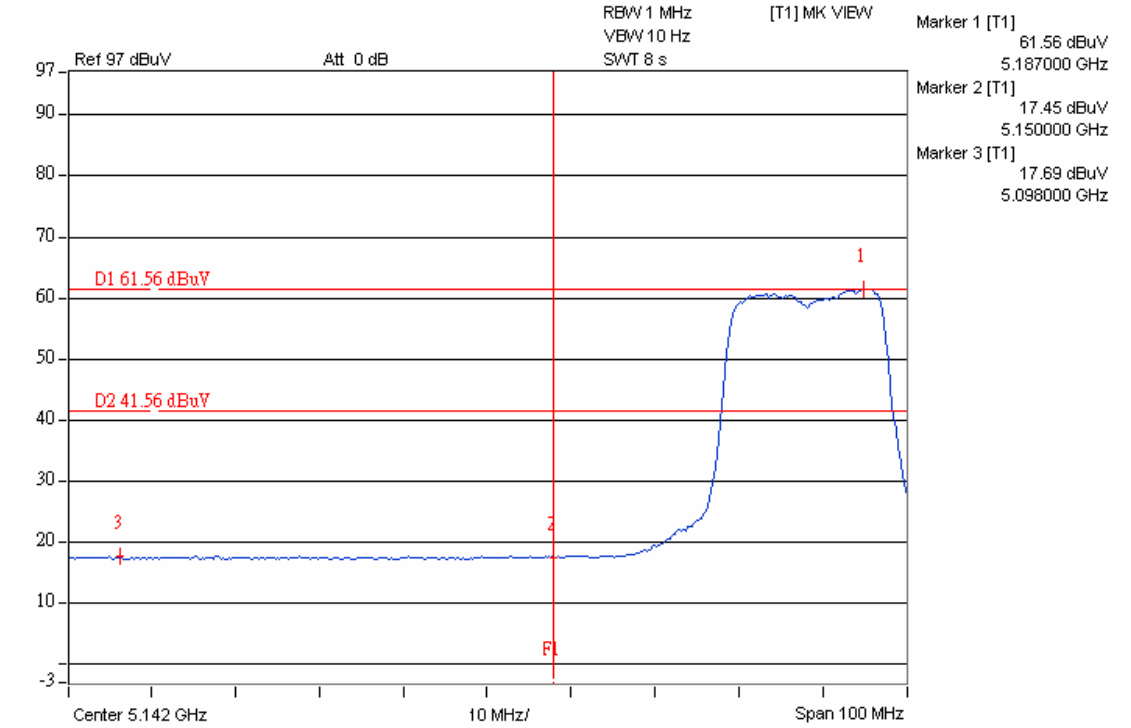
RESTRICT BAND (5350 ~ 5460 MHz)

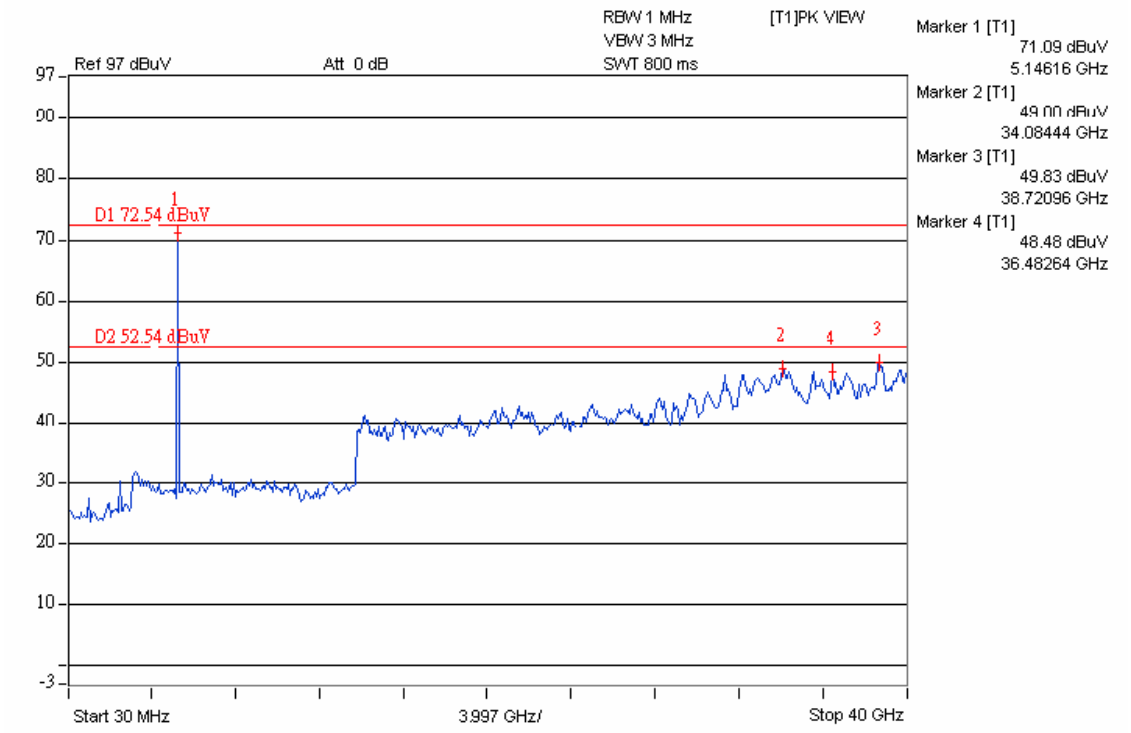
Frequency (MHz)	Fundamental Emission (dBuV/m)	Delta (dB)	Maximum Field Strength In Restrict Band (dBuV/m)	Limit (dBuV/m)
5240.00 (PK)	104.2	41.98	62.22	74.00
5240.00 (AV)	92.0	42.55	49.45	54.00

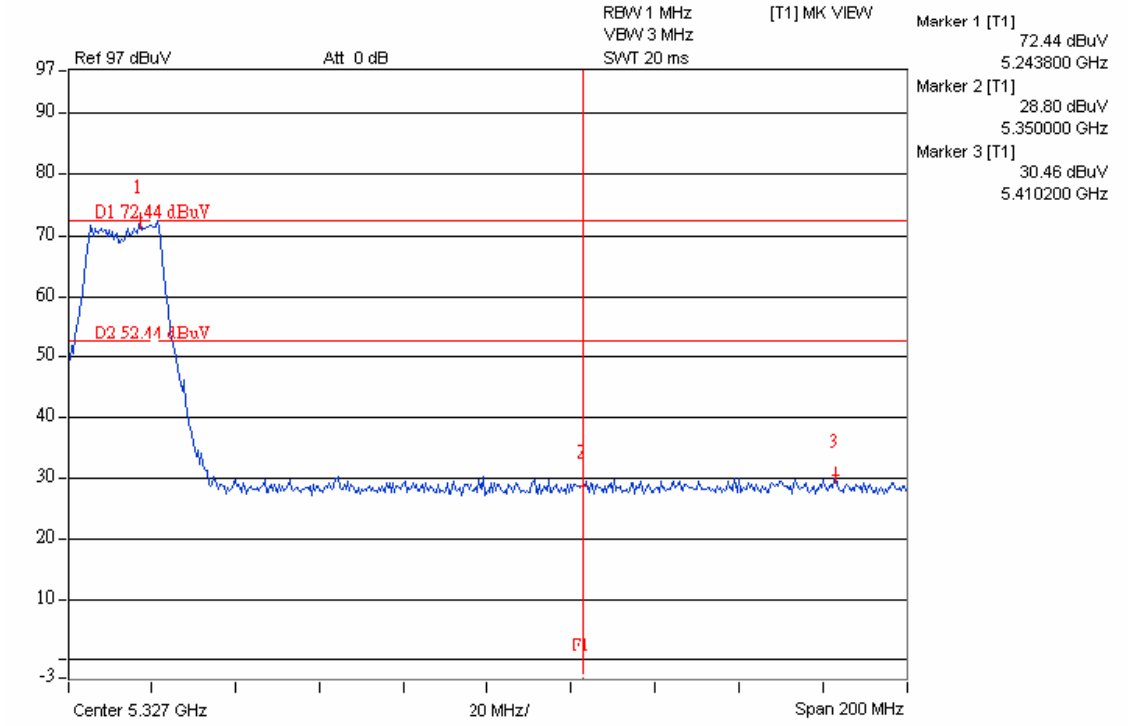
NOTE:

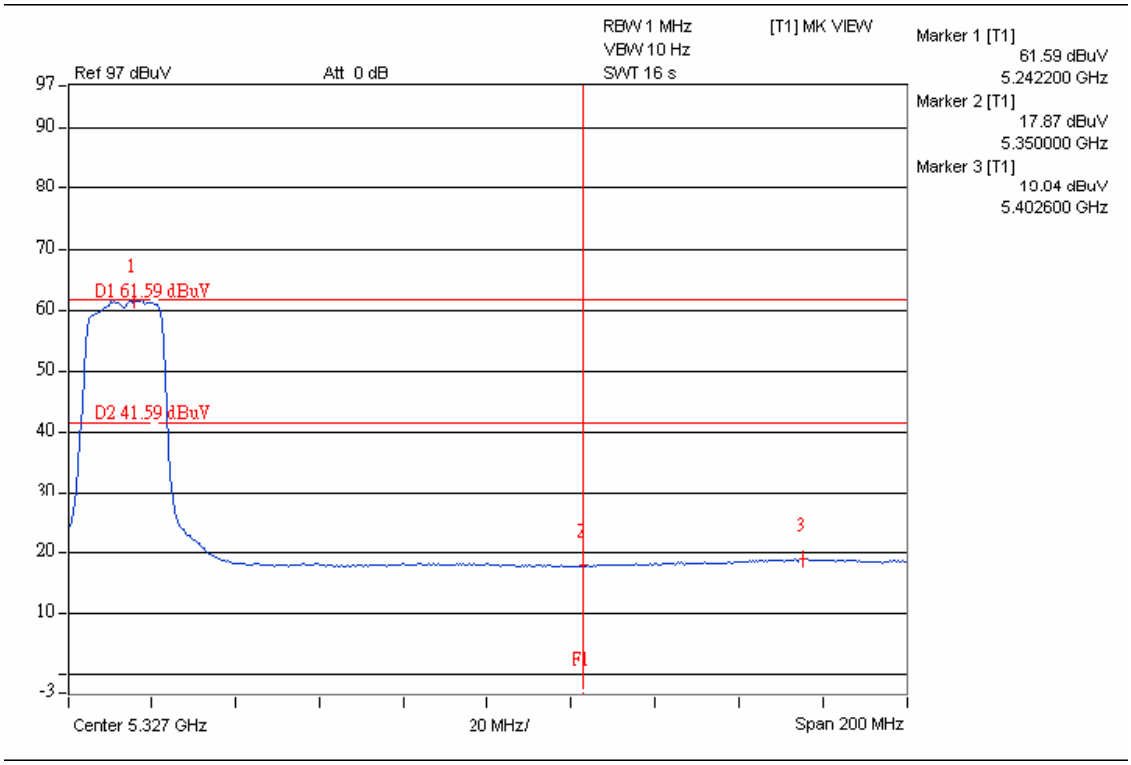
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission.
   Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

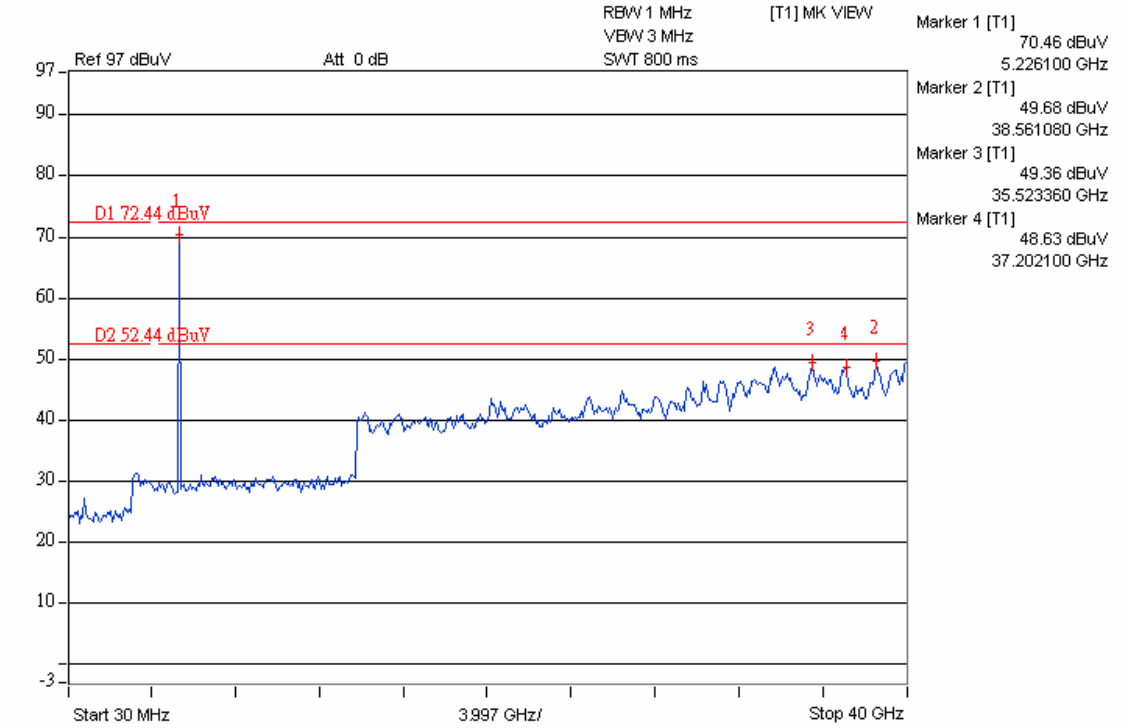

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
72.54 dBuV
5.188000 GHz
Marker 2 [T1]
28.85 dBuV
5.150000 GHz
Marker 3 [T1]
30.24 dBuV
5.115200 GHz
D1 72.54 dBuV
D2 52.54 dBuV
Center 5.142 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 8 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
61.56 dBuV
5.187000 GHz
Marker 2 [T1]
17.45 dBuV
5.150000 GHz
Marker 3 [T1]
17.69 dBuV
5.098000 GHz
D1 61.56 dBuV
D2 41.56 dBuV
Center 5.142 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1]PK VIEW
Ref 97 dBuV
Att 0 dB
D1 72.54 dBuV
D2 52.54 dBuV
Marker 1 [T1]
71.09 dBuV
5.14616 GHz
Marker 2 [T1]
49.00 dBuV
34.08444 GHz
Marker 3 [T1]
49.83 dBuV
38.72096 GHz
Marker 4 [T1]
48.48 dBuV
36.48264 GHz
Start 30 MHz
3.997 GHz/
Stop 40 GHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
D1 72.44 dBuV
D2 52.44 dBuV
Marker 1 [T1]
72.44 dBuV
5.243800 GHz
Marker 2 [T1]
28.80 dBuV
5.350000 GHz
Marker 3 [T1]
30.46 dBuV
5.410200 GHz
Center 5.327 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
61.59 dBuV
5.242200 GHz
Marker 2 [T1]
17.87 dBuV
5.350000 GHz
Marker 3 [T1]
19.04 dBuV
5.402600 GHz
D1 61.59 dBuV
D2 41.59 dBuV
Center 5.327 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
70.46 dBuV
5.226100 GHz
Marker 2 [T1]
49.68 dBuV
38.561080 GHz
Marker 3 [T1]
49.36 dBuV
35.523360 GHz
Marker 4 [T1]
48.63 dBuV
37.202100 GHz
D1 72.44 dBuV
D2 52.44 dBuV
Start 30 MHz
3.997 GHz/
Stop 40 GHz

802.11n (40MHz)

RESTRICT BAND (4500 ~ 5150 MHz)

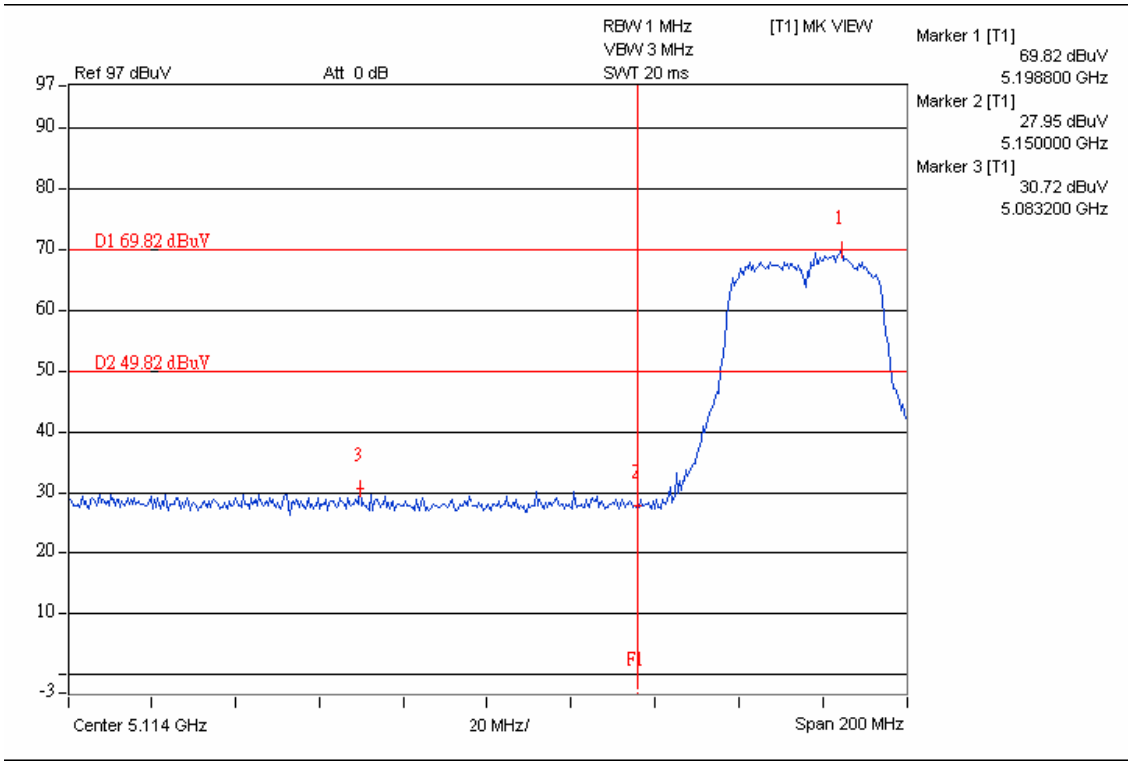
Frequency (MHz)	Fundamental Emission (dBuV/m)	Delta (dB)	Maximum Field Strength In Restrict Band (dBuV/m)	Limit (dBuV/m)
5190.00 (PK)	101.3	39.10	62.20	74.00
5190.00 (AV)	89.5	40.32	49.18	54.00

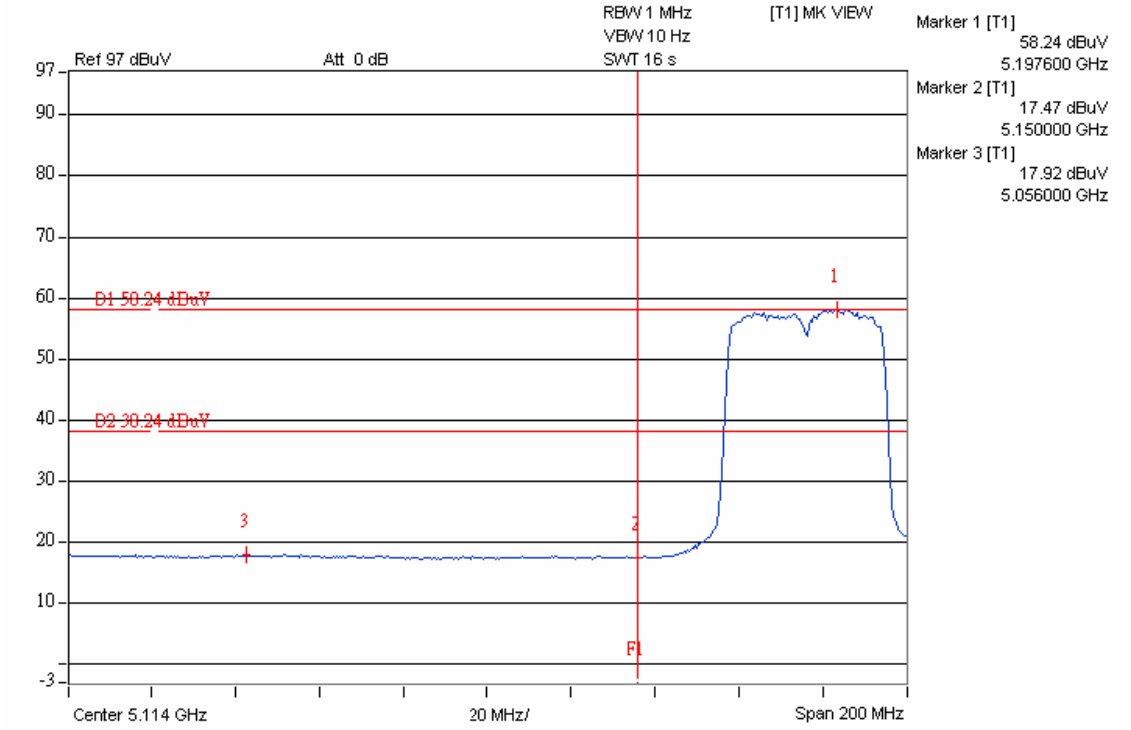
RESTRICT BAND (5350 ~ 5460 MHz)

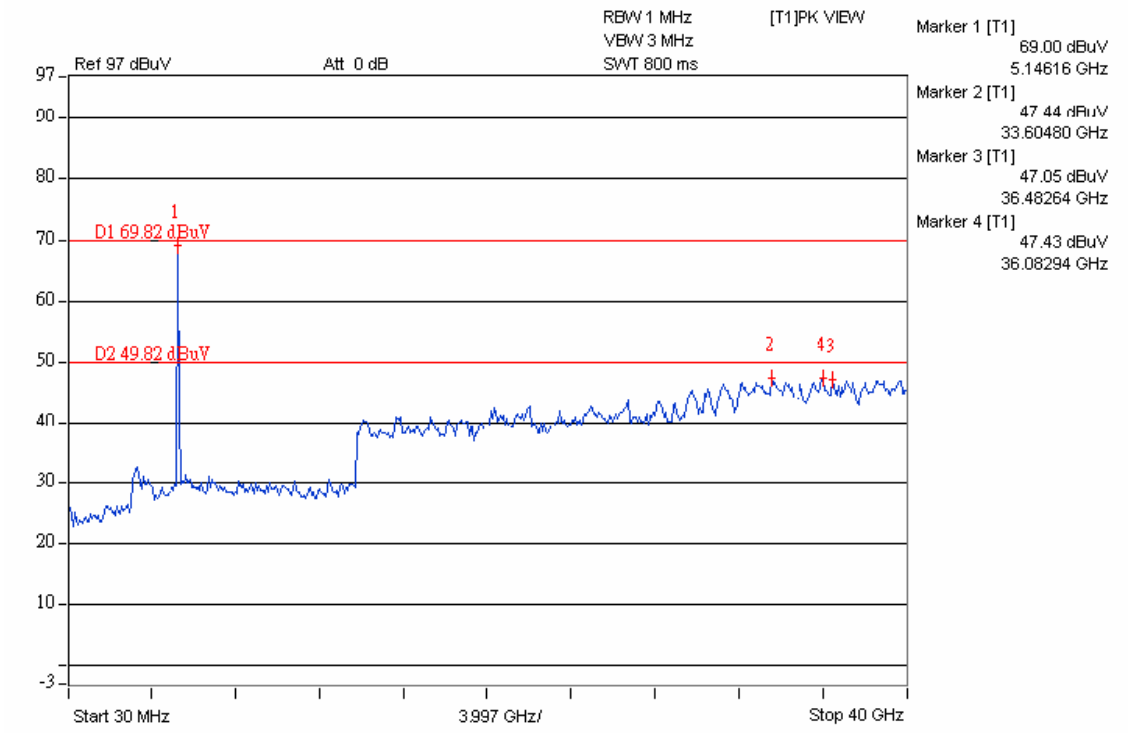
Frequency (MHz)	Fundamental Emission (dBuV/m)	Delta (dB)	Maximum Field Strength In Restrict Band (dBuV/m)	Limit (dBuV/m)
5230.00 (PK)	101.5	38.57	62.93	74.00
5230.00 (AV)	89.6	40.04	49.56	54.00

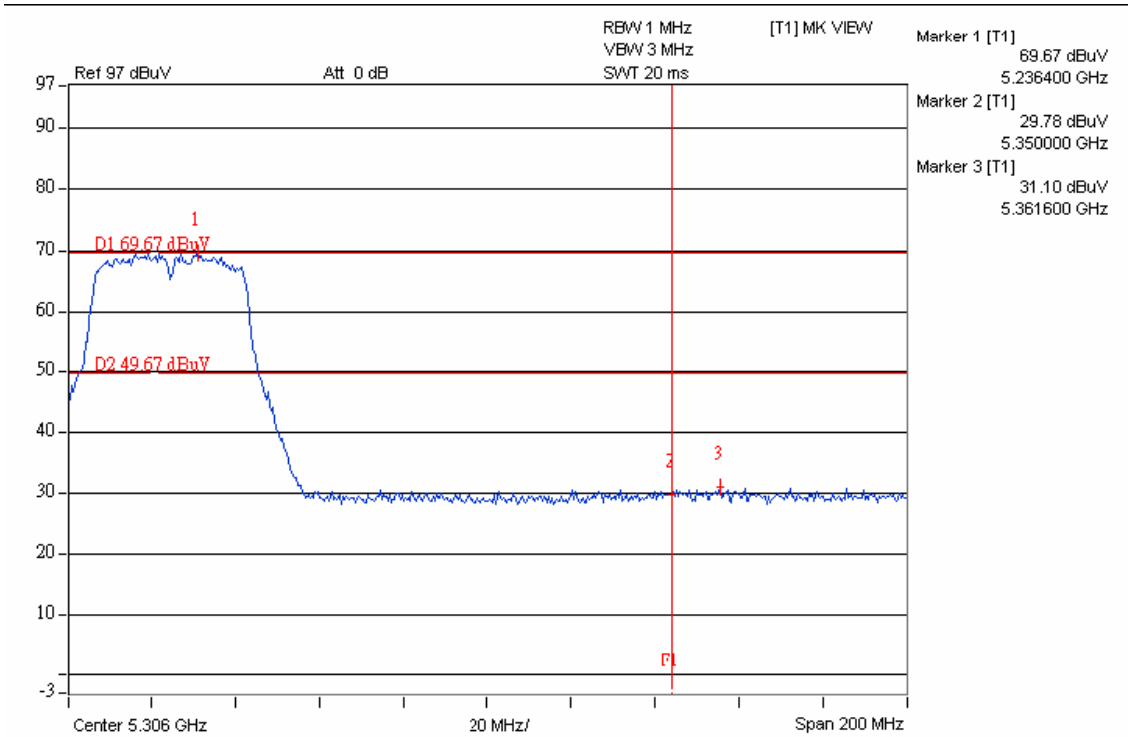
NOTE:

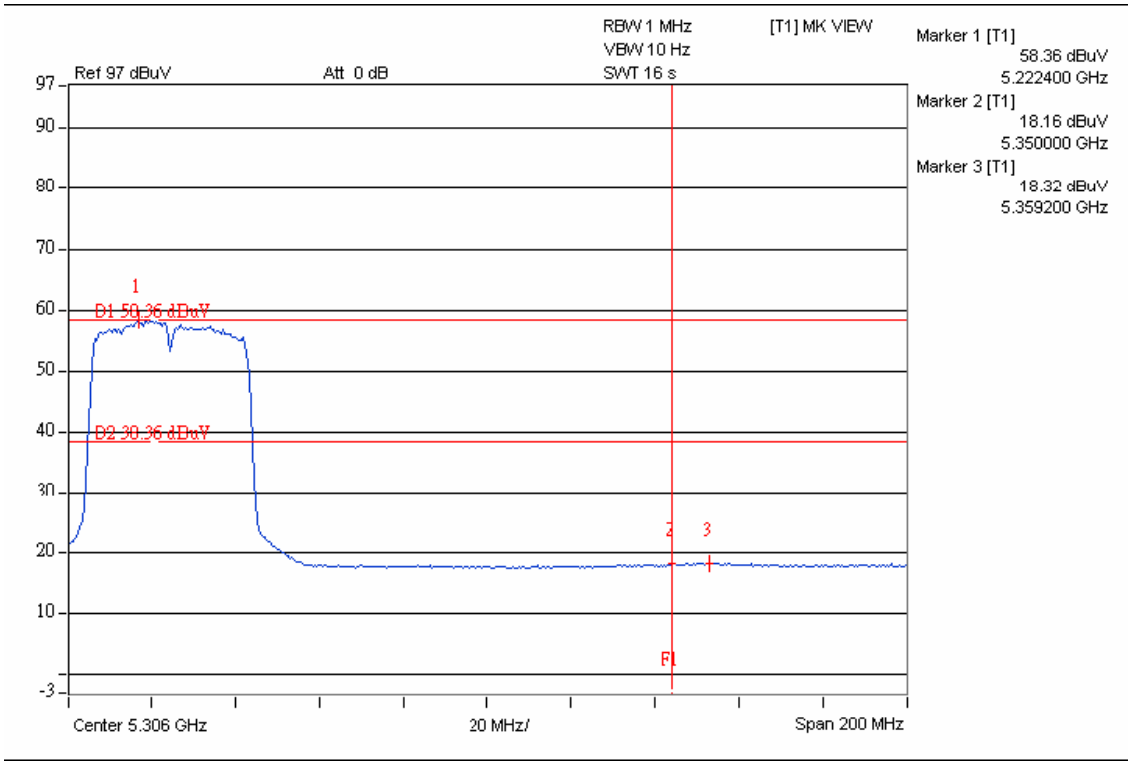
1. Delta = Amplitude between the peak of the fundamental and the peak of the band edge emission.
   Please check following 3 pages.
2. Maximum field strength in restrict band = Fundamental emission – Delta.

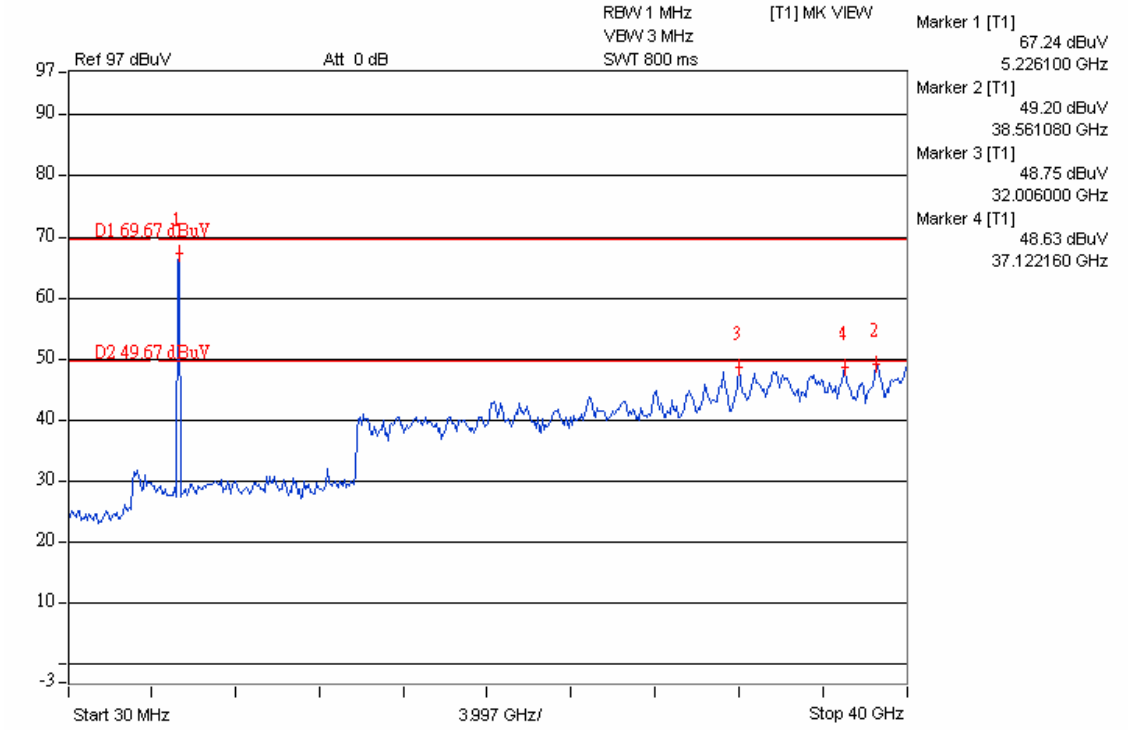

RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
69.82 dBuV
5.198800 GHz
Marker 2 [T1]
27.95 dBuV
5.150000 GHz
Marker 3 [T1]
30.72 dBuV
5.083200 GHz
D1 69.82 dBuV
D2 49.82 dBuV
97
90
80
70
60
50
40
30
20
10
-3
Center 5.114 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
58.24 dBuV
5.197600 GHz
Marker 2 [T1]
17.47 dBuV
5.150000 GHz
Marker 3 [T1]
17.92 dBuV
5.056000 GHz
D1 50.24 dBuV
D2 30.24 dBuV
97
90
80
70
60
50
40
30
20
10
-3
Center 5.114 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1]PK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
69.00 dBuV
5.14616 GHz
Marker 2 [T1]
47.44 dBuV
33.60480 GHz
Marker 3 [T1]
47.05 dBuV
36.48264 GHz
Marker 4 [T1]
47.43 dBuV
36.08294 GHz
D1 69.82 dBuV
D2 49.82 dBuV
Start 30 MHz
3.997 GHz/
Stop 40 GHz


RBW 1 MHz
VBW 3 MHz
SWT 20 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
69.67 dBuV
5.236400 GHz
Marker 2 [T1]
29.78 dBuV
5.350000 GHz
Marker 3 [T1]
31.10 dBuV
5.361600 GHz
D1 69.67 dBuV
D2 49.67 dBuV
Center 5.306 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 10 Hz
SWT 16 s
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
58.36 dBuV
5.222400 GHz
Marker 2 [T1]
18.16 dBuV
5.350000 GHz
Marker 3 [T1]
18.32 dBuV
5.359200 GHz
D1 50.36 dBuV
D2 30.36 dBuV
Center 5.306 GHz
20 MHz/
Span 200 MHz


RBW 1 MHz
VBW 3 MHz
SWT 800 ms
[T1] MK VIEW
Ref 97 dBuV
Att 0 dB
Marker 1 [T1]
67.24 dBuV
5.226100 GHz
Marker 2 [T1]
49.20 dBuV
38.561080 GHz
Marker 3 [T1]
48.75 dBuV
32.006000 GHz
Marker 4 [T1]
48.63 dBuV
37.122160 GHz
D1 69.67 dBuV
D2 49.67 dBuV
Start 30 MHz
3.997 GHz/
Stop 40 GHz

8. ANTENNA REQUIREMENT

8.1 STANDARD APPLICABLE

47 CFR §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.

Antenna requirement must meet at least one of the following:

a) Antenna must be permanently attached to the device.

b) Antenna must use a unique type of connector to attach to the device.

c) Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

8.2 ANTENNA CONNECTED CONSTRUCTION

Device must be professionally installed. Installer shall be responsible for ensuring that the correct antenna is employed with the device.

Antenna type for point to point link.

5180-5825MHz dipole antenna, model: ATQ1-58, 0dBi antenna Gain.

----------END REPORT----------