

	 MS ISO/IEC 17025 TESTING SAMM No. 0825																										
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn. Bhd. Innoplex Plot 2A Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia.	FCC / IC TEST REPORT Report Revision : Rev.B																										
<table><tr><td>Date/s Tested</td><td>: 21-May-2019 - 16-Jun-2019</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions Malaysia</td></tr><tr><td>Manufacturer Address</td><td>: Plot 2 Bayan Lepas Technoplex, 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>Requestor</td><td>: TANG, GARY</td></tr><tr><td>Product Type</td><td>: Mobile</td></tr><tr><td>Product Version (PMN)</td><td>: APX6500</td></tr><tr><td>Model Number (HVIN)</td><td>: M25URS9PW1BN</td></tr><tr><td>Frequency Band</td><td>: 5180-5825 MHz</td></tr><tr><td>Firmware Version (FVIN)</td><td>: D19.71.02</td></tr><tr><td>Applicant Name</td><td>: Motorola Solutions Inc</td></tr><tr><td>FCC Registrations</td><td>: 461337</td></tr><tr><td>ISED Registrations</td><td>: 109AK</td></tr></table>  The equipment was tested accordance to the requirement listed below: <table><tr><td>(5GHz Wi-Fi) FCC 47 CFR Part 15 Subpart E IC RSS 247 Issue 2 February 2017</td><td>PASS</td></tr></table>		Date/s Tested	: 21-May-2019 - 16-Jun-2019	Manufacturer/Location	: Motorola Solutions Malaysia	Manufacturer Address	: Plot 2 Bayan Lepas Technoplex, 11900 Bayan Lepas, Penang, Malaysia	Requestor	: TANG, GARY	Product Type	: Mobile	Product Version (PMN)	: APX6500	Model Number (HVIN)	: M25URS9PW1BN	Frequency Band	: 5180-5825 MHz	Firmware Version (FVIN)	: D19.71.02	Applicant Name	: Motorola Solutions Inc	FCC Registrations	: 461337	ISED Registrations	: 109AK	(5GHz Wi-Fi) FCC 47 CFR Part 15 Subpart E IC RSS 247 Issue 2 February 2017	PASS
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Prepared By: Gan Boon Teong Technician	Approved Signatory: Vincent Foong Chuen Kit Deputy Technical Manager																										

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REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	16-Jun-2019	Gan Boon Teong
Rev. B	Update Restricted Band Edge Data, amended duty cycle factor typo	02-Oct-2019	Gan Boon Teong

1.0. Summary of Test Results

FCC Clause	IC Clause	Test Item	Result	Remarks	Serial Number tested
15.407 (a)(1/2/3)	RSS 247 6.2	Maximum Conducted Output Power (Average)	Pass	NA	471TVF3449
15.407(a) (1/2/3)	RSS 247 6.2	Maximum Power Spectral Density	Pass	NA	471TVF3449
15.407 (e)	RSS 247 6.2.4	6dB Bandwidth	Pass	NA	471TVF3449
15.407 (g)	RSS Gen 6.11	Frequency Stability	Pass	NA	471TVF3449
15.407 (b) (1/2/3/4/6)	RSS 247 6.2	Band Edge Radiated Spurious Emission Measurement	Pass	NA	471TVF3482
15.407 (b) (1/2/3/4/6)	RSS 247 6.2	Radiated Spurious Emission Measurement	Pass	NA	471TVF3482
15.207 15.407 (b)(6)	RSS Gen 8.8	AC Powerline Conducted Emission	NA	Testing is not required, radio shall turn off during charging mode	NA
15.203	-	Antenna requirement	NA	Internal antenna is not accessible to the end-user	NA

2.0. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.43
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.01
	200MHz ~ 1000MHz	5.01
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.01
	18GHz ~ 25GHz	5.01

3.0. Equipment List

Bluetooth ATE # 1 (SW Version: Ate Main_3.1.10_R2)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
POWER SUPPLY (0-20V / 0-25A)	6652A	MY40001437	17-Aug-17	17-Aug-19
SPECTRUM ANALYZER	FSEK30	838495/014	11-Jul-18	11-Jul-19
STEP ATTENUATOR	RSC	102218	Not Required	Not Required
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	154549	8-May-18	8-May-20
SPECTRUM ANALYZER	E4443A	MY46181974	9-Aug-18	9-Aug-20
CHAMBER	SH-641	92003821	30-Oct-18	30-Oct-19

Radiated Emission Station (SW Version: EMC FCC RE v1.5.2)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DRG HORN FREQ.	SAS-571	719	18-Jul-17	18-Jul-19
DRG HORN FREQ.	SAS-571	1143	14-Feb-19	14-Feb-21
POWER SUPPLY	6032A	2615A-01178	13-Jun-18	13-Jun-19
SIGNAL GENERATOR	SMB 100A	181117	8-Nov-18	8-Nov-21
EMI TEST RECEIVER	ESW44	101750	25-Jun-18	25-Jun-19
5m Semi-anechoic Chamber	S800-HX	J2308	Not Required	Not Required
BILOG ANTENNA	CBL6112D	30991	23-Apr-18	23-Jul-19
BILOG ANTENNA	CBL6112B	2964	16-Feb-18	16-Feb-20
DATA LOGGER	SDL500	A.016800	19-Mar-19	18-Mar-20
SYSTEM CONTROLLER	SC104V	050806-1	Not Required	Not Required
TURNTABLE FLUSH MOUNT 2M	FM2011	NA	Not Required	Not Required
ANTENNA POSITIONING TOWER	TLT2	NA	Not Required	Not Required
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170255	21-Dec-18	21-Dec-19
18 - 40GHz PREAMPLIFIER	eq Hi Gain Succ	1	Not Required	Not Required
PREAMPLIFIER	PAM-0118P	361	Not Required	Not Required
LOOP ANTENNA	6502	208416	17-Aug-18	17-Aug-19

4.0. General Information

General Description of EUT:

Product	Mobile
Brand	Motorola Solutions
Test Model	APX6500
Power Supply Rating	13.6V
Mode of operation	WLAN 5GHz
Modulation Type	QPSK, BPSK, 16QAM, 64QAM, 256QAM
Modulation Technology	OFDM
Transfer Rate	802.11a: 6.0/9.0/12.0/18.0/24.0/36.0/48.0/54.0 Mbps 802.11n: up to MCS7 802.11ac: up to MCS9
Operating Frequency	5.180 ~ 5.240 GHz, 5.260 ~ 5.320 GHz, 5.50 ~ 5.720 GHz, 5.745 ~ 5.825 GHz
Max Output Power (26 EBW or 99% OBW)	15.84 mW for 5.180 ~ 5.240 GHz 15.84 mW for 5.260 ~ 5.320 GHz 15.84 mW for 5.50 ~ 5.720 GHz 15.84 mW for 5.745 ~ 5.825 GHz
Antenna Type	Trunk(AN000163A01)
SW Version	D19.71.02

Note:

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
ASSY,CBL,PWR	MOTOROLA	HKN4191B-2
CABLE, DATA, USB, 1-1/2M, XTL5000	MOTOROLA	HKN6163C-2
15 Watt Speaker (Water Resistant)	MOTOROLA	HSN4040A
Keypad Microphone	MOTOROLA	HMN4079G-4
ANTENNA, STUBBY, WIFI/GNSS LOW LOSS LMR240 (2.4/5 GHZ WI-FI/BT AND GNSS BT/WiFi/GPS Antenna)	MOTOROLA	AN000163A01
ANTENNA, WHIP,3DB MCYCLE 764-870 MHZ 762-870 MHZ	MOTOROLA	AN000197A10
O7 Control Head (English)	MOTOROLA	PMHN4194C
O2 Control Head (Grey)	MOTOROLA	PMHN4193F

Description of Test Modes:

For 5180 to 5240 MHz:

Channels for 802.11a, 802.11n, 802.11ac (HT20, VHT20)

Channel	Frequency (MHz)
36	5180
40	5200
44	5220
48	5240

For 5260 to 5320 MHz:

Channels for 802.11a, 802.11n, 802.11ac (HT20, VHT20)

Channel	Frequency (MHz)
52	5260
56	5280
60	5300
64	5320

For 5500 to 5720 MHz:

Channels for 802.11a, 802.11n, 802.11ac (HT20, VHT20)

Channel	Frequency (MHz)
100	5500
104	5520
108	5540
112	5560
116	5580
120	5600
124	5620
128	5640
132	5660
136	5680
140	5700
144	5720

For 5745 to 5825 MHz:

Channels for 802.11a, 802.11n, 802.11ac (HT20, VHT40)

Channel	Frequency(MHz)
149	5745
153	5765
157	5785
161	5805
165	5825

General Description of Applied Standards

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

FCC Part15, Subpart E (15.407)

789033 D02 General UNII Test Procedures New Rules v01r04

644545 D03 Guidance for IEEE 802 11ac New Rules v01

ANSI C63.10-2013

RSS 247 Issue 2, RSS Gen

All test have been performed and recorded as per above standards.

No modifications were done to the UUT to facilitate the tests in this report.

Deviation from standard

Not applicable as no deviation from standard test method

5.0. Test Mode Applicability and Test Channel Detail

EUT Configure Mode	Applicable to				Description
	RE$\geq$1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	x	√	x	x	Power from carcharger (12Vdc)
C	x	√	x	x	Power from carcharger (24Vdc)

Where:

RE $\geq$ 1G: Radiated Emission above 1GHz & Band edge Measurement

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Note: The EUT had been pre-scanned on the position of each 3 axis planes. The worst case was found when positioned on **Y-plane**.

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 and antenna ports (if EUT with antenna diversity architecture).

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

EUT Configure Mode	Frequency Band	MODE	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36-48	36,44,48	OFDM	BPSK	6.0
-	5180-5240	802.11n/ac (HT20, VHT20)	36-48	36,44,48	OFDM	BPSK	6.5
-	5260-5320	802.11a	52-64	52,60,64	OFDM	BPSK	6.0
-	5260-5320	802.11n/ac (HT20, VHT20)	52-46	52,60,64	OFDM	BPSK	6.5
-	5500-5700	802.11a	100-140	100,116,140	OFDM	BPSK	6.0
-	5500-5720	802.11n/ac (HT20, VHT20)	100-144	100,116,144	OFDM	BPSK	6.5
-	5745-5825	802.11a	149-165	149,157,165	OFDM	BPSK	6.0
-	5745-5825	802.11n/ac (HT20, VHT20)	149-165	149,157,165	OFDM	BPSK	6.5

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 and antenna ports (if EUT with antenna diversity architecture).

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

EUT Configure Mode	MODE	Frequency band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
-	802.11a	5260-5320	52 to 64		OFDM	BPSK	6.0
-	802.11a	5500-5700	100 to 140		OFDM	BPSK	6.0
-	802.11a	5745-5825	149 to 165		OFDM	BPSK	6.0

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.

EUT Configure Mode	MODE	Frequency band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
-	802.11a	5260-5320	52 to 64		OFDM	BPSK	6.0
-	802.11a	5500-5700	100 to 140		OFDM	BPSK	6.0
-	802.11a	5745-5825	149 to 165		OFDM	BPSK	6.0

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.

EUT Configure Mode	Frequency Band	MODE	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36-48	36,44,48	OFDM	BPSK	6.0
-	5180-5240	802.11n/ac (HT20, VHT20)	36-48	36,44,48	OFDM	BPSK	6.5
-	5260-5320	802.11a	52-64	52,60,64	OFDM	BPSK	6.0
-	5260-5320	802.11n/ac (HT20, VHT20)	52-64	52,60,64	OFDM	BPSK	6.5
-	5500-5700	802.11a	100-140	100,116,140	OFDM	BPSK	6.0
-	5500-5720	802.11n/ac (HT20, VHT20)	100-144	100,116,144	OFDM	BPSK	6.5
-	5745-5825	802.11a	149-165	149,157,165	OFDM	BPSK	6.0
-	5745-5825	802.11n/ac (HT20, VHT20)	149-165	149,157,165	OFDM	BPSK	6.5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23.5°C, 69.8% RH	13.6V DC	Nazrin/Qawiman
RE<1G	23.5°C, 69.8% RH	13.6V DC	Nazrin/Qawiman
PLC	NA	NA	NA
APCM	25°C, 50% RH	13.6V DC	Gan Boon Teong

Duty Cycle of Test Signal

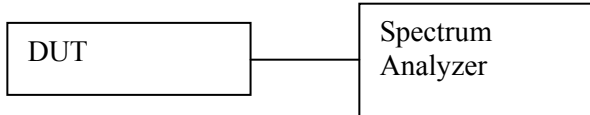
802.11a, 802.11n (HT20 and HT40) : Duty cycle of test signal is >99%

802.11ac(VHT80) : Duty cycle of test signal is <98%

If Duty cycle of test signal is <98%, duty cycle factor shall be considered. (Refer to section 6.0 for duty cycle measurement)

6.0. Duty Cycle of Test Signal

6.0.1. Test Setup



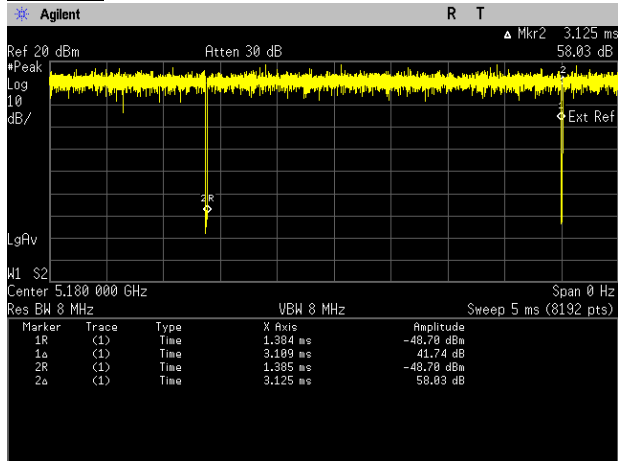
- 1) Set DUT to desire transmit frequency and transmit with maximum power.
- 2) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 3) Setting of Spectrum analyzer :
 - a. Set the RBW = 10 MHz or the highest RBW available on spectrum analyzer.
 - b. Set the VBW $\geq$ RBW.
 - c. Set to Zero Span.
 - d. Detector = Peak.
 - e. Sweep time = 10ms or others that allow to measure accurate duty cycle.
 - f. Trace mode = Max hold.
- 4) Record the duty cycle as X and save the plot.

6.0.2. Test Data

*Duty cycle = On time/ On +off time

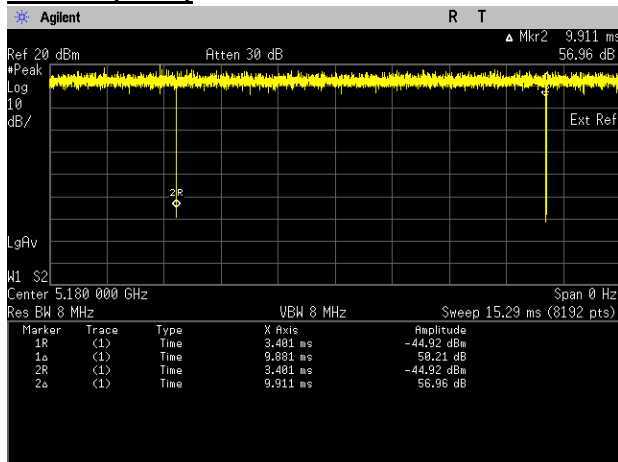
*Duty Cycle factor = $10 \cdot \log(1/\text{Duty Cycle})$

802.11a



On time	3.109	μs
On + off time	3.125	μs
Duty Cycle	0.9949	
Duty Cycle Factor	0.022	

802.11n (HT20)

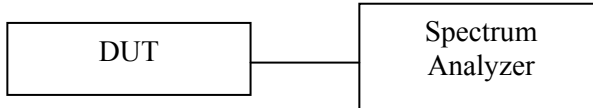


On time	9.881	μs
On + off time	9.911	μs
Duty Cycle	0.9970	
Duty Cycle Factor	0.013	

7.0. Transmitter Test Parameters

7.1. Bandwidth measurements

7.1.1. Test Setup



- a) Test Setup as per illustrated above.
- b) Set DUT to transmit at desire transmit frequency.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer for 26dB EBW:
 - RBW = approximate 1% of emission bandwidth
 - VBW > RBW
 - Detector = Peak
 - Trace =Max hold
 - Measure the maximum width of the emission that is 26 dB down from the maximum of the emission.
 - Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
- e) Setting of Spectrum analyzer for 99% Occupied bandwidth:
 - Span = 1.5 times to 5.0 times the OBW
 - RBW = 1% to 5 % of the OBW
 - VBW $\geq 3 \cdot$ RBW
 - Detector = Peak
 - Trace = Max Hold
 - Use the 99% power bandwidth function of the instrument
- f) The measurement method follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 under clause C.1) & D).

7.1.2. Test Limits

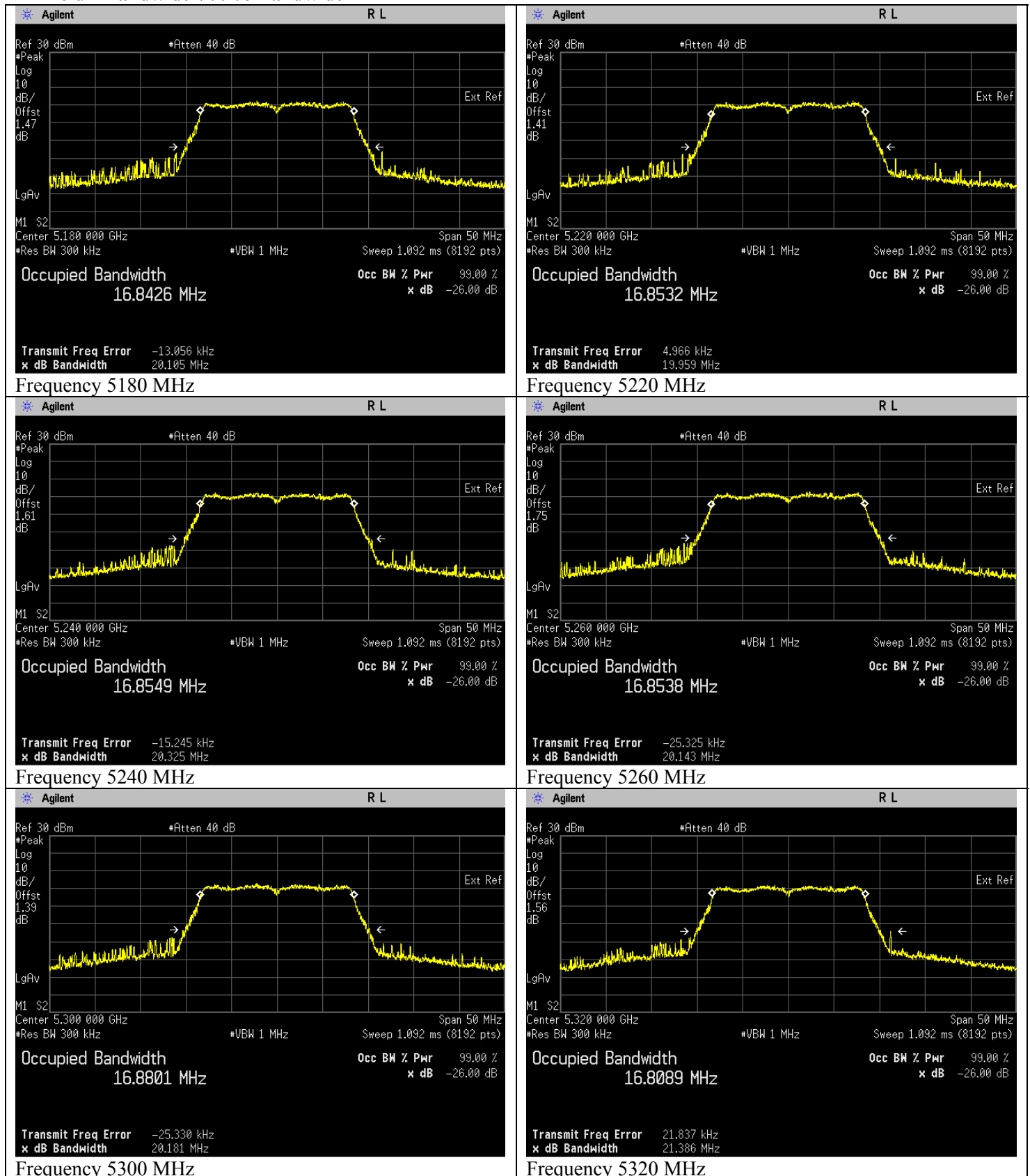
Not applicable.

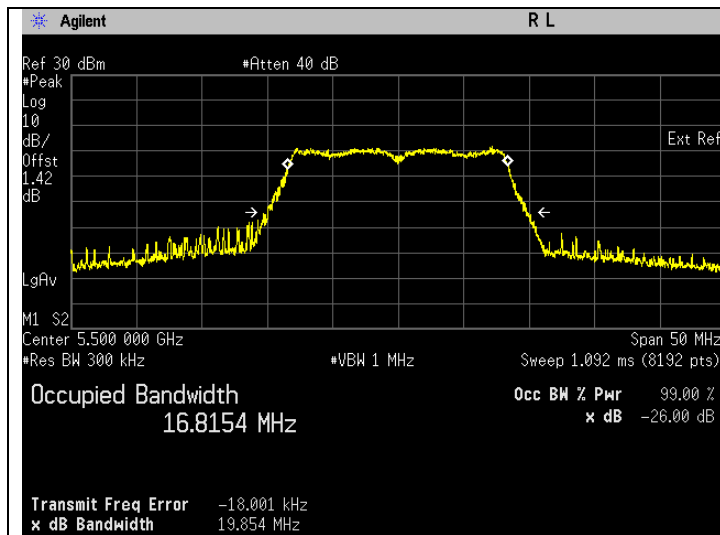
7.1.3. Test Data

802.11a

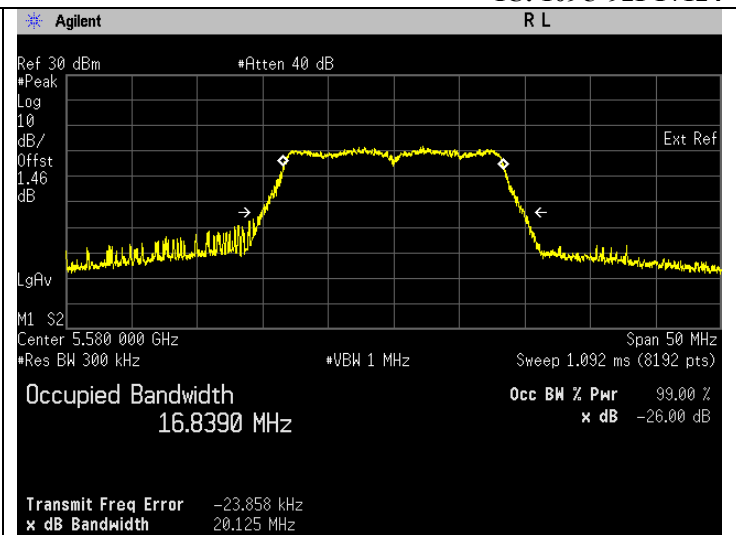
Frequency (MHz)	Test Configuration	Results			
		26 dB Bandwidth(MHz)	Status	99% Bandwidth(MHz)	Status
5180	Mod Type: BPSK, Data Rate: 6	20.105	Pass	16.831	Pass
5220	Mod Type: BPSK, Data Rate: 6	19.959	Pass	16.853	Pass
5240	Mod Type: BPSK, Data Rate: 6	20.325	Pass	16.855	Pass
5260	Mod Type: BPSK, Data Rate: 6	20.143	Pass	16.855	Pass
5300	Mod Type: BPSK, Data Rate: 6	20.181	Pass	16.880	Pass
5320	Mod Type: BPSK, Data Rate: 6	21.386	Pass	16.810	Pass
5500	Mod Type: BPSK, Data Rate: 6	19.854	Pass	16.815	Pass
5580	Mod Type: BPSK, Data Rate: 6	20.125	Pass	16.839	Pass
5700	Mod Type: BPSK, Data Rate: 6	20.046	Pass	16.847	Pass
5745	Mod Type: BPSK, Data Rate: 6	20.237	Pass	16.841	Pass
5785	Mod Type: BPSK, Data Rate: 6	19.954	Pass	16.843	Pass
5825	Mod Type: BPSK, Data Rate: 6	19.911	Pass	16.849	Pass

26 dB Bandwidth/ 99% Bandwidth

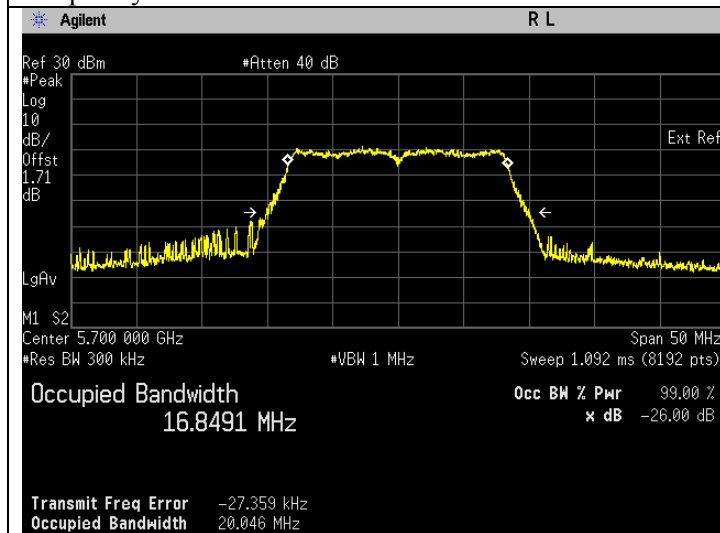




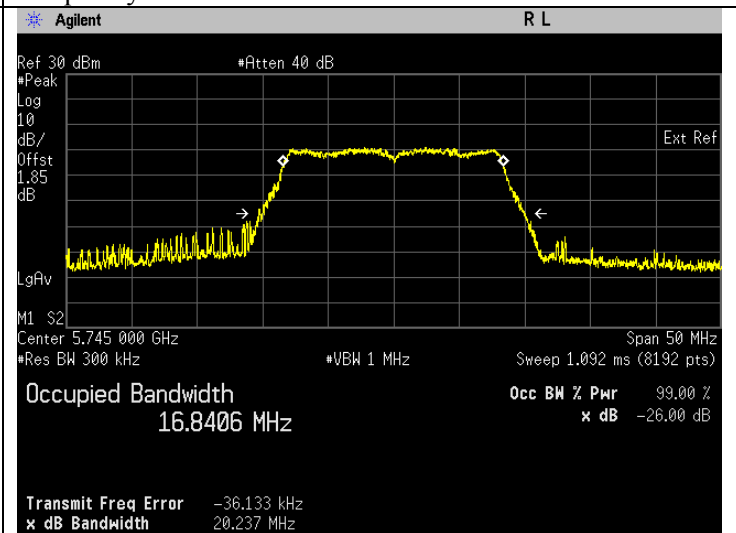
Frequency 5500 MHz



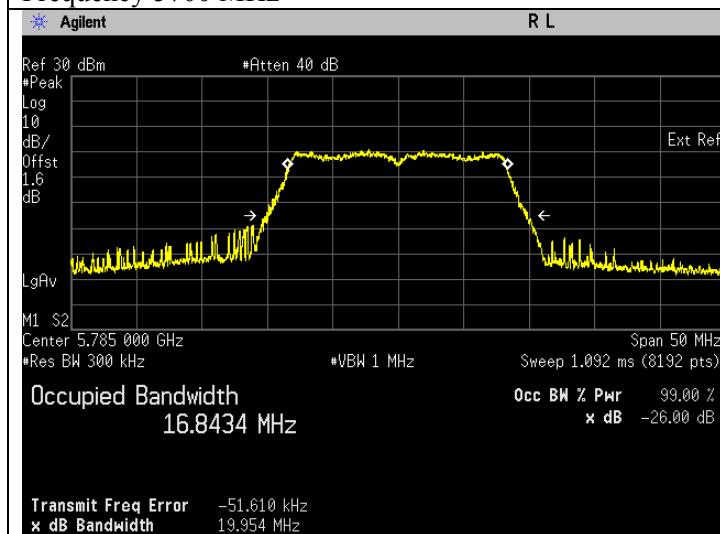
Frequency 5580 MHz



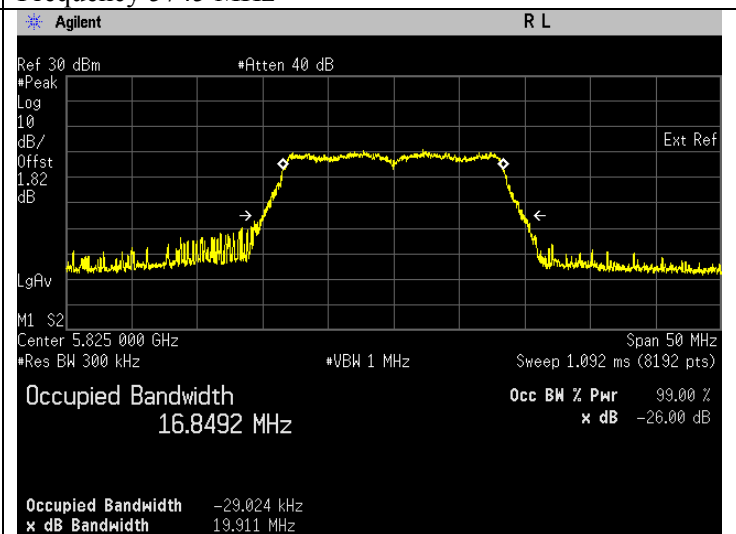
Frequency 5700 MHz



Frequency 5745 MHz



Frequency 5785 MHz

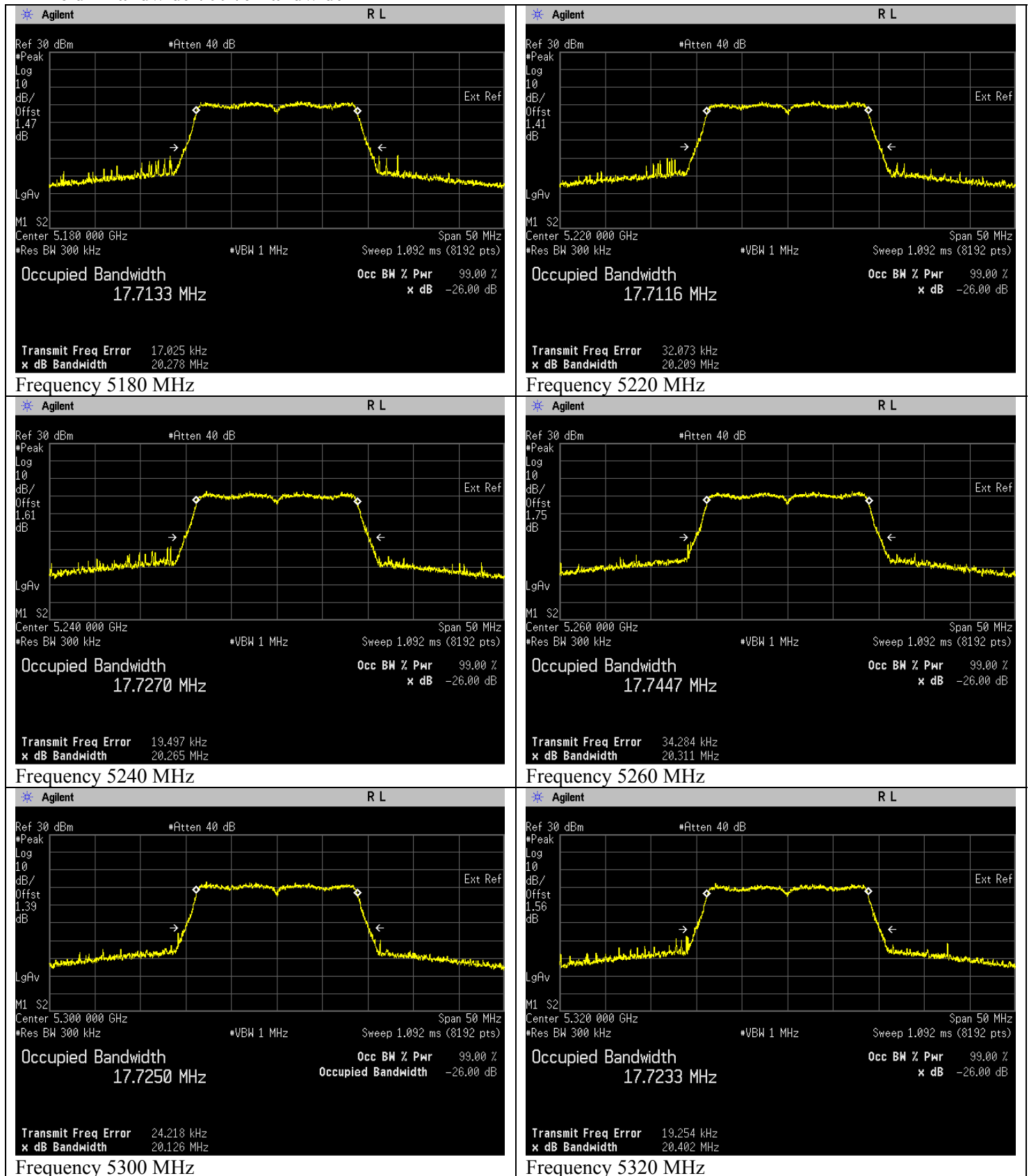


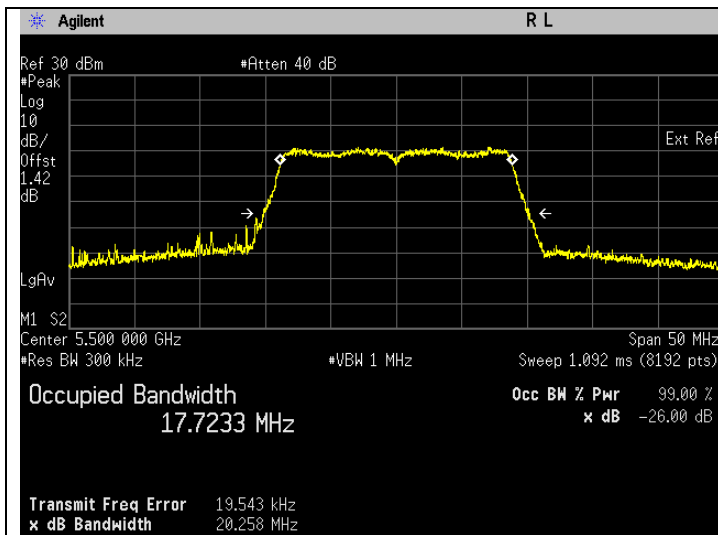
Frequency 5825 MHz

802.11n (HT20)

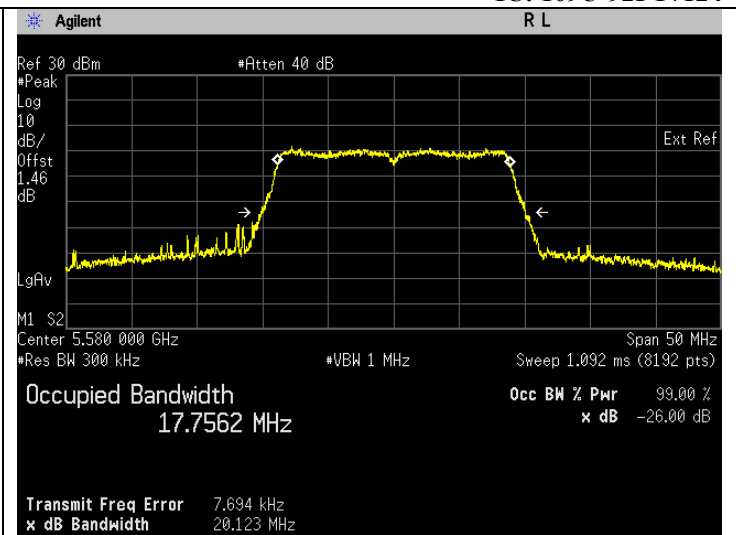
Frequency (MHz)	Test Configuration	Results			
		26 dB Bandwidth(MHz)	Status	99% Bandwidth(MHz)	Status
5180	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.278	Pass	17.714	Pass
5220	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.209	Pass	17.708	Pass
5240	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.265	Pass	17.727	Pass
5260	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.311	Pass	17.745	Pass
5300	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.126	Pass	17.725	Pass
5320	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.402	Pass	17.723	Pass
5500	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.258	Pass	17.724	Pass
5580	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.123	Pass	17.747	Pass
5700	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.272	Pass	17.716	Pass
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5), UNII-2C	15.124	Pass	13.865	Pass
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5), UNII-3	5.124	Pass	3.865	Pass
5745	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.233	Pass	17.717	Pass
5785	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.411	Pass	17.720	Pass
5825	Mod Type: BPSK, Data Rate: MCS0 (6.5)	20.077	Pass	17.741	Pass

26 dB Bandwidth/ 99% Bandwidth

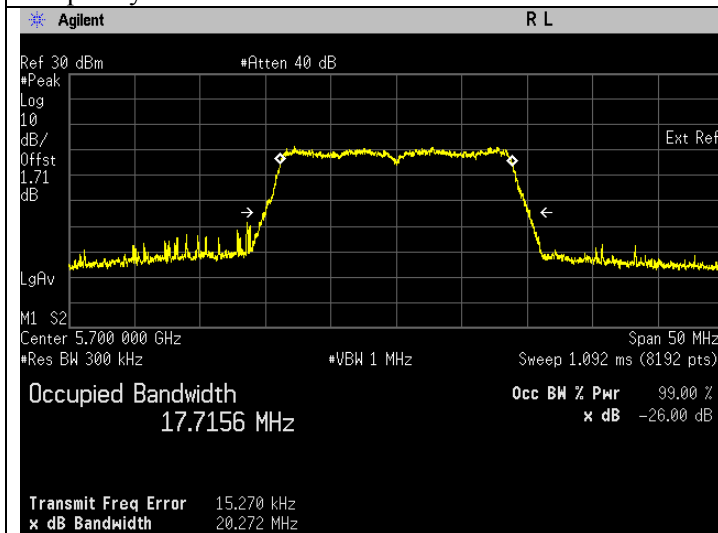




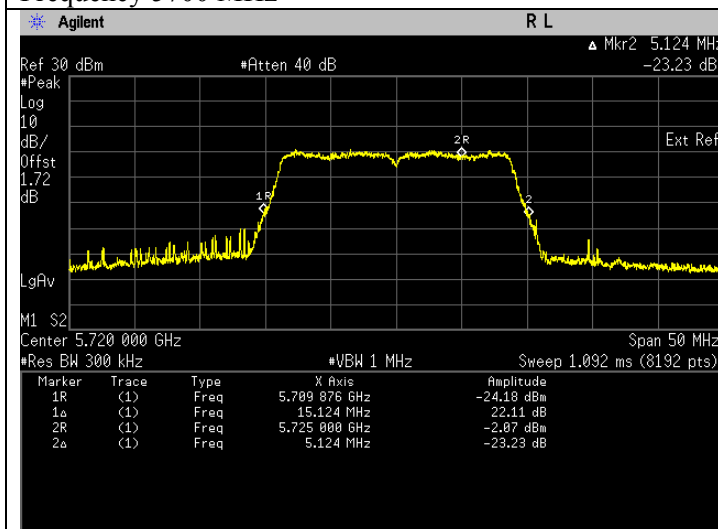
Frequency 5500 MHz



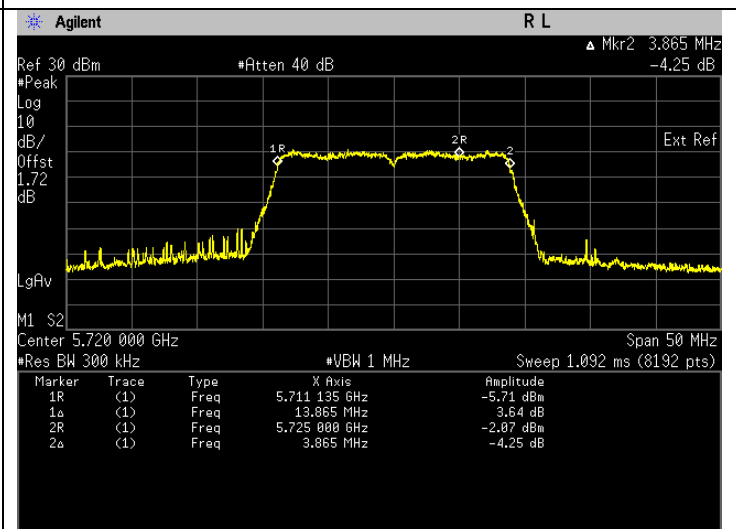
Frequency 5580 MHz



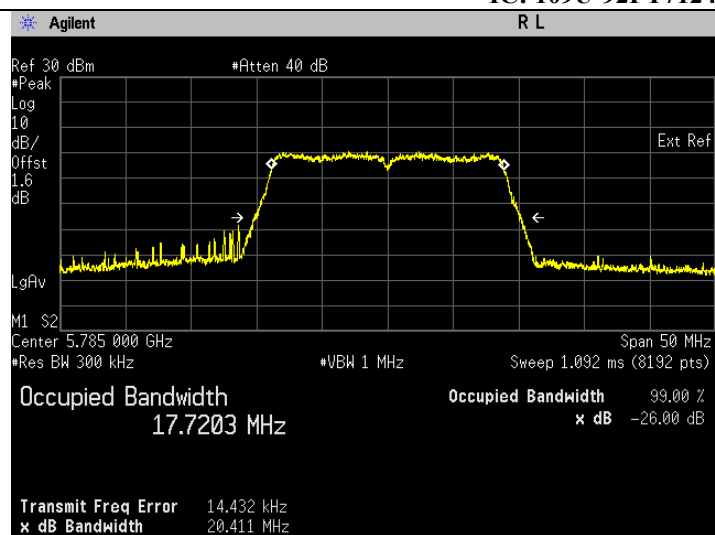
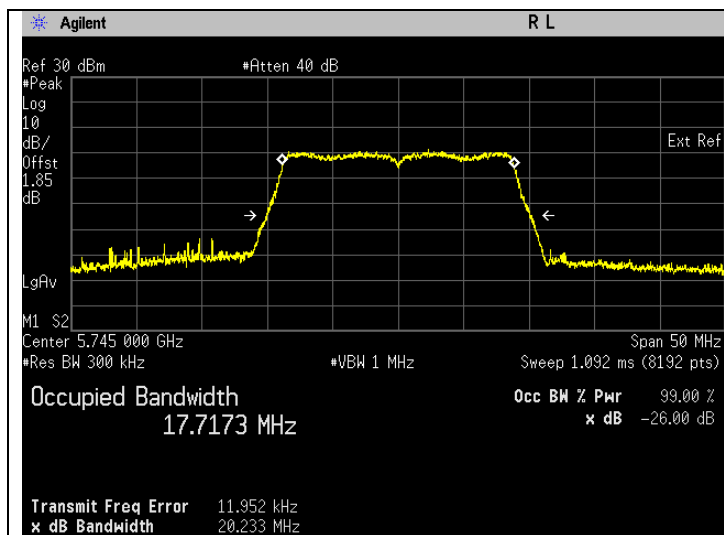
Frequency 5700 MHz



Frequency 5720 MHz, UNII-2C & UNII-3(FCC)

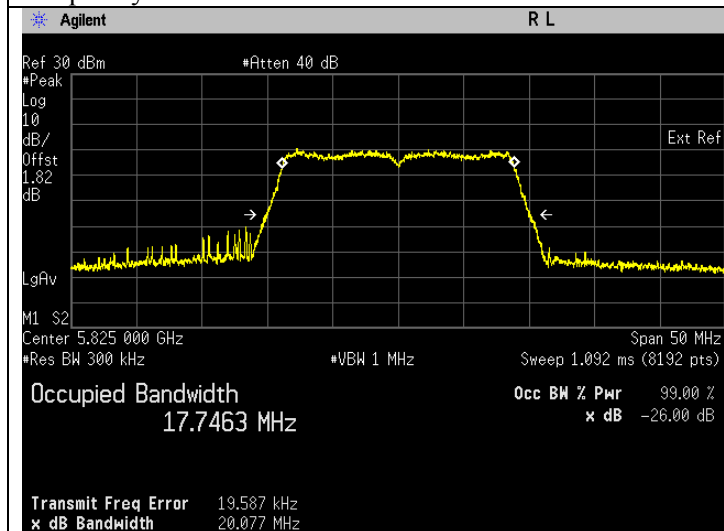


Frequency 5720 MHz, UNII-2C & UNII-3 (ISED)



Frequency 5745 MHz

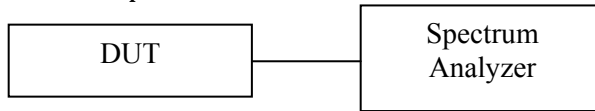
Frequency 5785 MHz



Frequency 5825 MHz

Maximum Conducted Output Power

7.1.4. Test Setup



- Test setup as per illustrated above.
- Set DUT to transmit at desire transmit frequency.
- Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- Setting of Spectrum analyzer :
 - Span to encompass the entire 26dB EBW or 99% Occupied Bandwidth.
 - RBW = 1 MHz
 - VBW $\geq$ 3 MHz
 - Detector = power averaging (RMS)
 - Trace = Max hold
 - Number of points in sweep $\geq 2 \times \text{span} / \text{RBW}$
 - Sweep time = auto
 - Trace average at least 100 traces in power averaging (rms) mode
 - Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power to compute the average power during the actual transmission times
- The measurement method follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 under clause E.2.d) Method SA-2.
- The Maximum output power results include a duty cycle correction factor.

7.1.5. Test Limits

FCC 15.407(a)

Range(GHz)	Condition	Output Power Limit
5.15-5.25 (UNII-1)	Outdoor AP	$\leq 1\text{W}$
	Indoor AP	$\leq 1\text{W}$
	Fixed Point to Point AP	$\leq 1\text{W}$
	√ Mobile and Portable client devices	$\leq 250\text{mW}$

5.25-5.35 (UNII-2A)	√	$\leq 250\text{mW}$ or $11\text{dBm} + 10\log_{10} B^*$ *B is 26dB emission bandwidth in MHz
5.47-5.525 (UNII-2C)	√	

5.725-5.85 (UNII-3)	√	$\leq 1\text{W}$
------------------------	---	------------------

RSS-247 6.2

Range(GHz)	Condition	Output Power Limit
5.15-5.25	indoor only (e.i.r.p.)	$\leq 200\text{mW}$ or $10+10\log_{10}B^*$ *B is 99% emission bandwidth in 1MHz
5.25-5.35	(Conducted & e.i.r.p.)	Conducted: $\leq 250\text{mW}$ or $11+10\log_{10}B^*$ EIRP: $< 1.0\text{W}$ or $17+10\log_{10}B^*$ *B is 99% emission bandwidth in 1MHz
5.47-5.6 5.65-5.725	(Conducted & e.i.r.p.)	Conducted: $\leq 250\text{mW}$ or $11+10\log_{10}B^*$ EIRP: $< 1.0\text{W}$ or $17+10\log_{10}B^*$ *B is 99% emission bandwidth in 1MHz
5.725-5.85	(Conducted)	$\leq 1\text{W}$

7.1.6. Additional Info

802.11a

Antenna	Gain (dBi)
Antenna 1	5.15
Duty Cycle Correction Factor	
Antenna 1	0.022

802.11n20

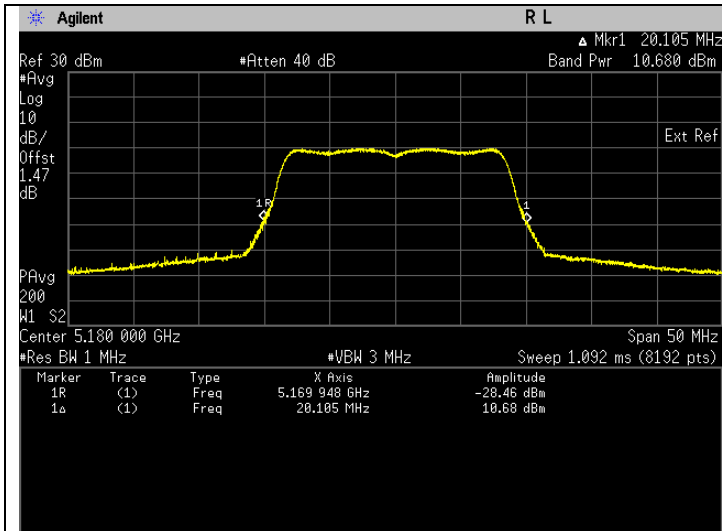
Antenna	Gain (dBi)
Antenna 1	5.15
Duty Cycle Correction Factor	
Antenna 1	0.013

7.1.7. Test Data

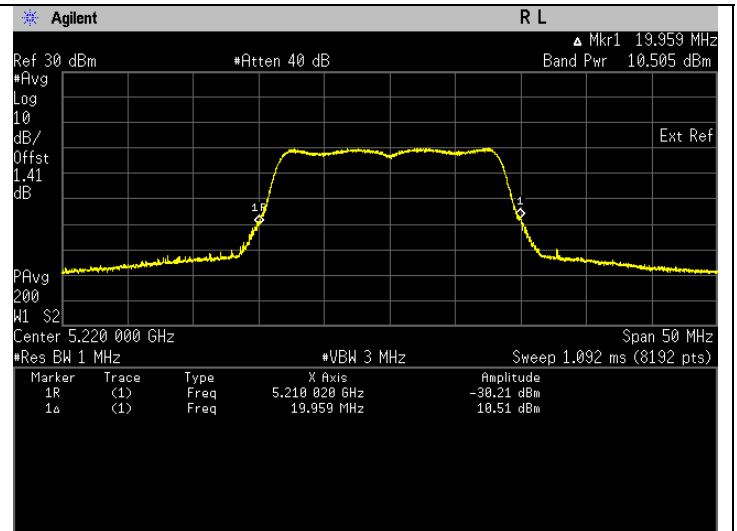
802.11a (26dB EBW)

Freq. (MHz)	Test Conditions	Results		
		Power (mW)	Power (dBm)	Status
5180	Mod Type: BPSK, Data Rate: 6	11.755	10.702	Pass
5220	Mod Type: BPSK, Data Rate: 6	11.291	10.527	Pass
5240	Mod Type: BPSK, Data Rate: 6	12.677	11.030	Pass
5260	Mod Type: BPSK, Data Rate: 6	13.189	11.202	Pass
5300	Mod Type: BPSK, Data Rate: 6	13.500	11.303	Pass
5320	Mod Type: BPSK, Data Rate: 6	11.424	10.578	Pass
5500	Mod Type: BPSK, Data Rate: 6	10.191	10.082	Pass

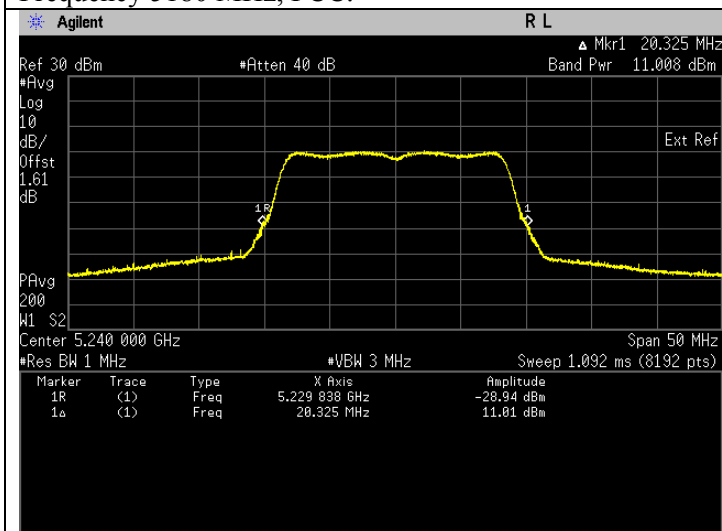
5580	Mod Type: BPSK, Data Rate: 6	9.793	9.909	Pass
5700	Mod Type: BPSK, Data Rate: 6	9.108	9.594	Pass
5745	Mod Type: BPSK, Data Rate: 6	9.493	9.774	Pass
5785	Mod Type: BPSK, Data Rate: 6	8.293	9.187	Pass
5825	Mod Type: BPSK, Data Rate: 6	7.639	8.830	Pass



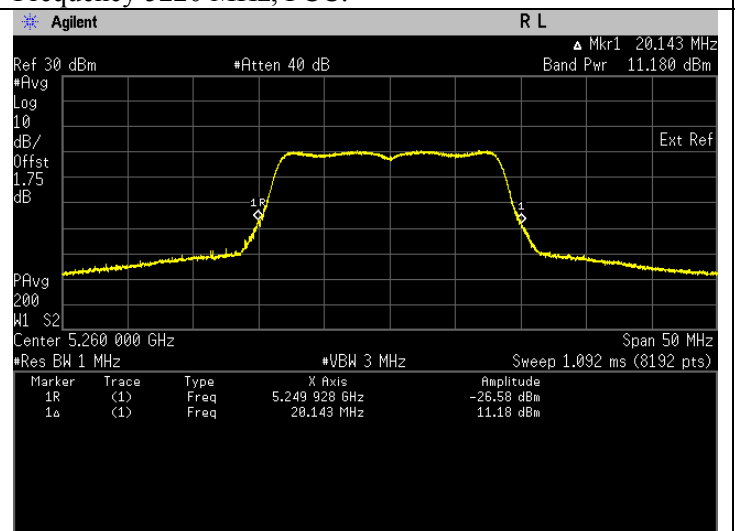
Frequency 5180 MHz, FCC.



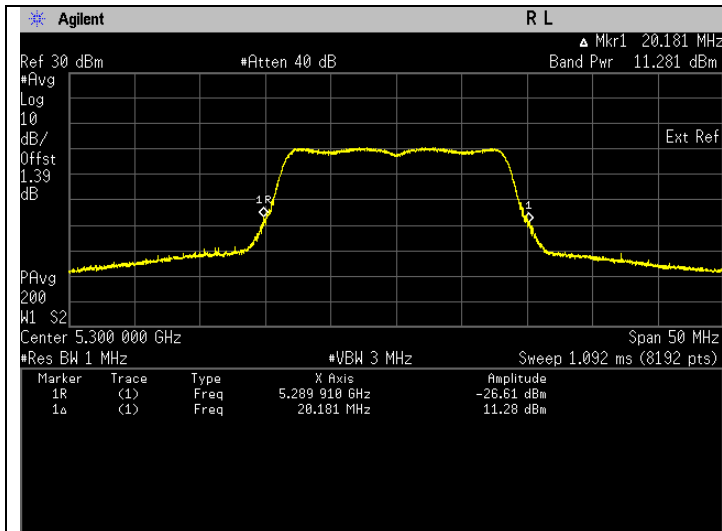
Frequency 5220 MHz, FCC.



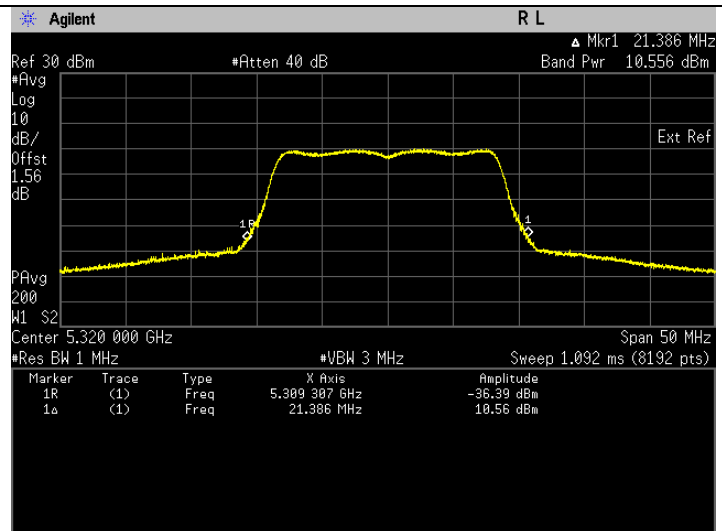
Frequency 5240 MHz, FCC.



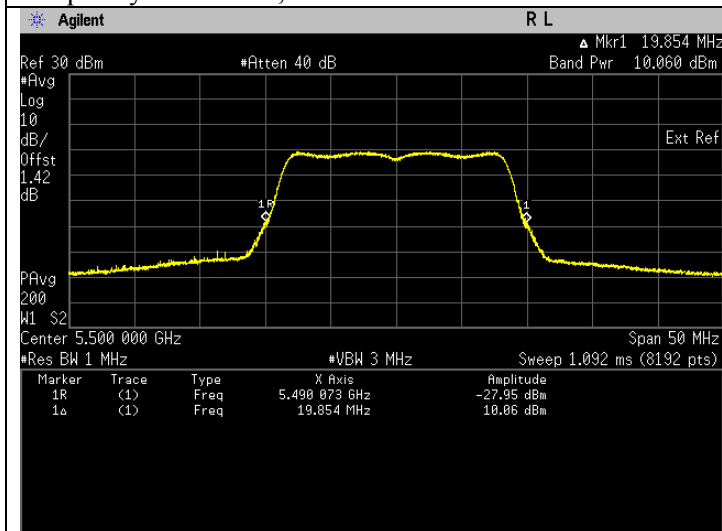
Frequency 5260 MHz, FCC.



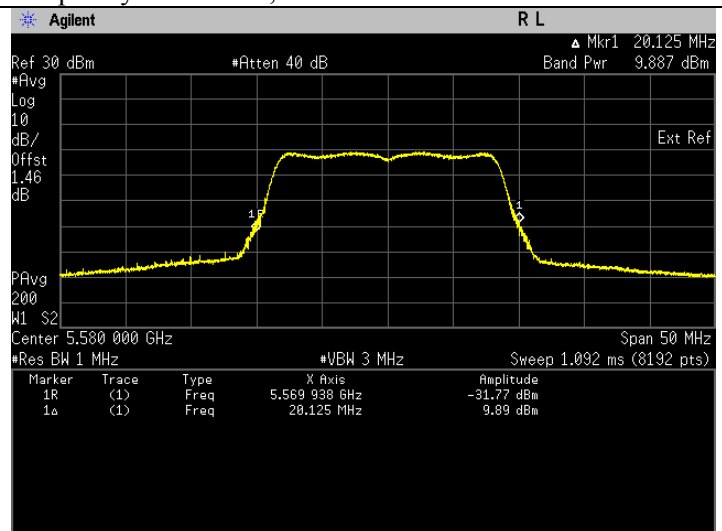
Frequency 5300 MHz, FCC.



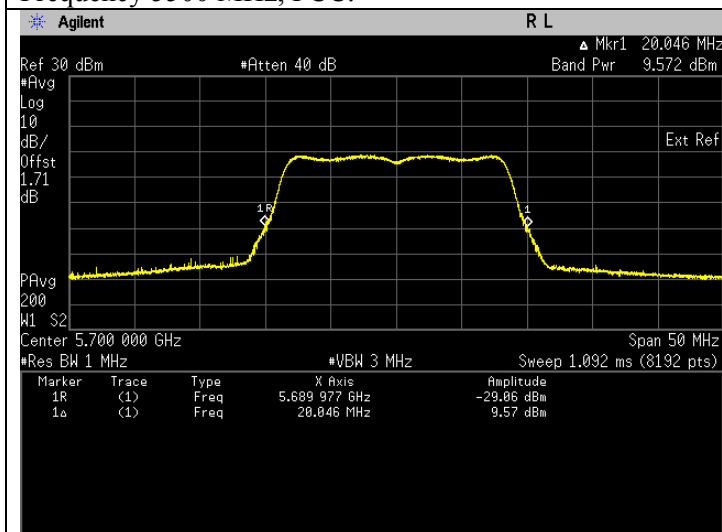
Frequency 5320 MHz, FCC.



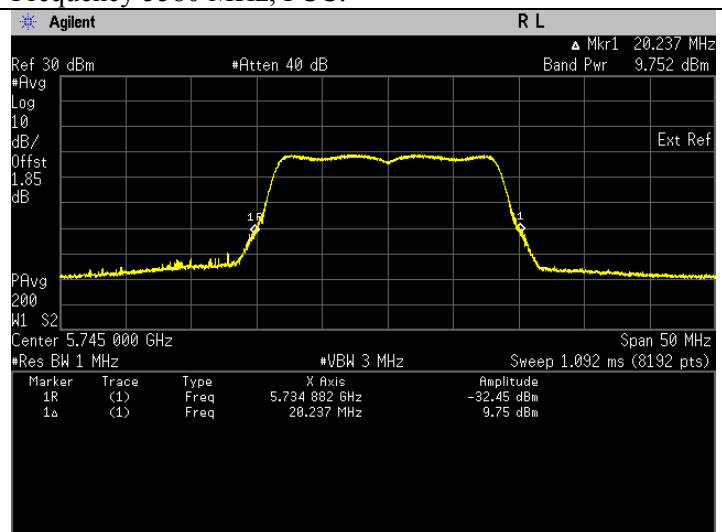
Frequency 5500 MHz, FCC.



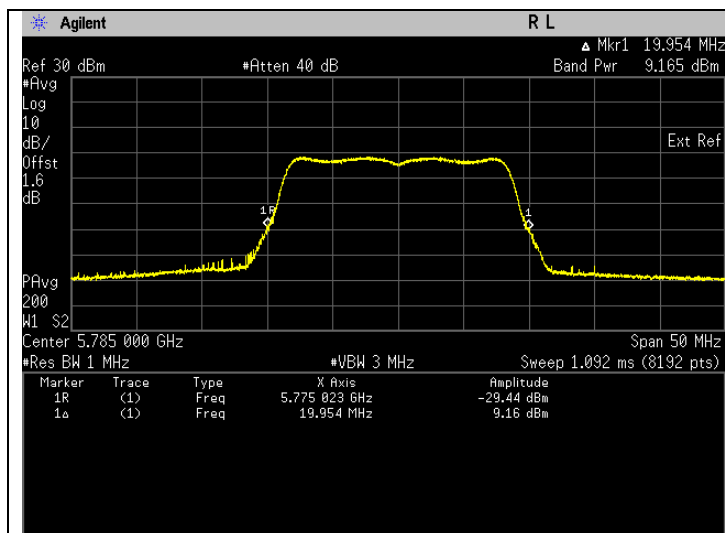
Frequency 5580 MHz, FCC.



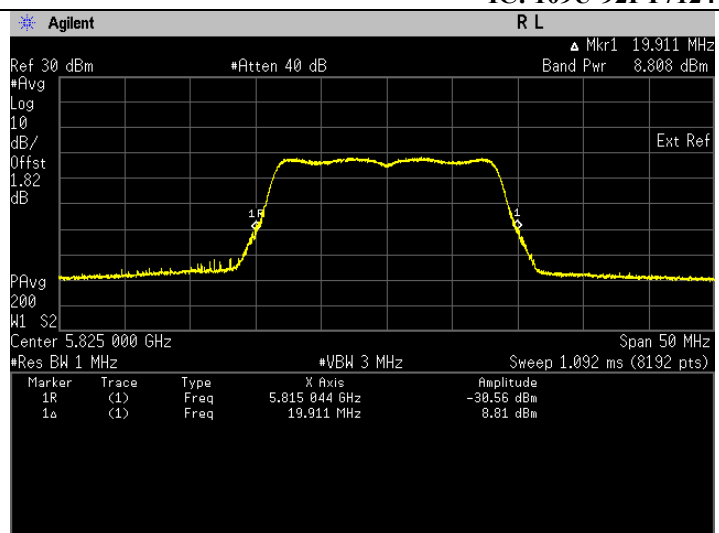
Frequency 5700 MHz, FCC.



Frequency 5745 MHz, FCC.



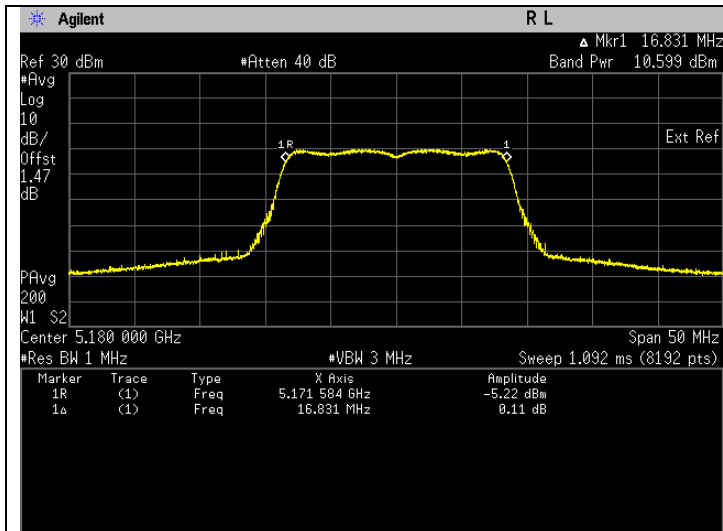
Frequency 5785 MHz, FCC.



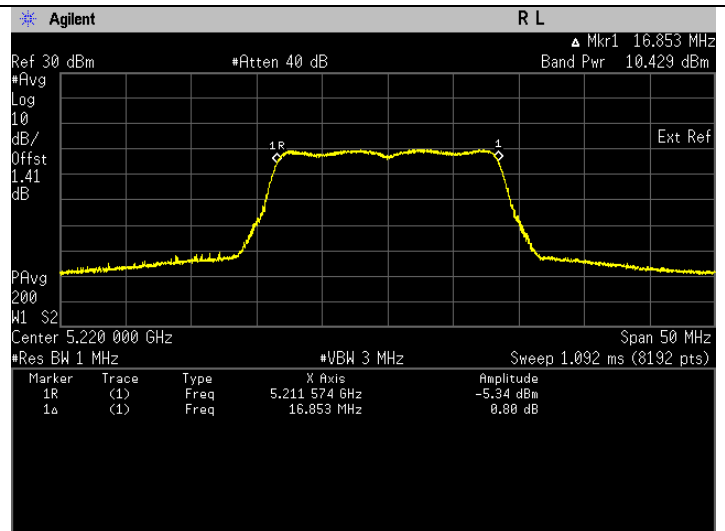
Frequency 5825 MHz, FCC.

802.11a (99% EBW)

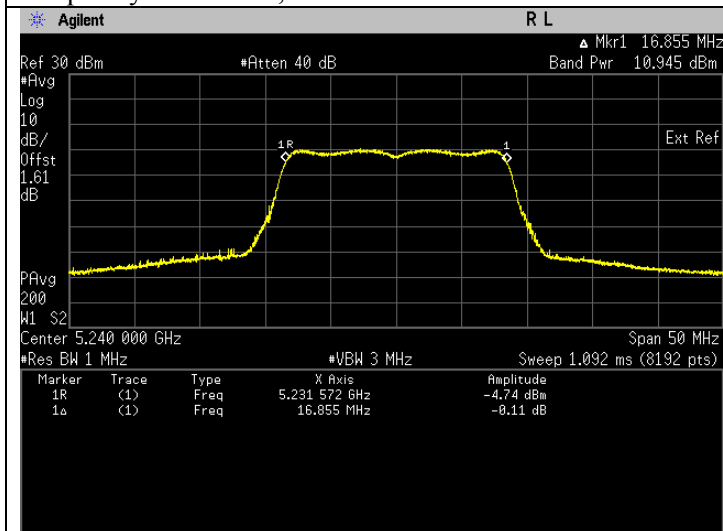
Freq. (MHz)	Test Conditions	Results				
		Power (mW)	Power (dBm)	Status	EIRP (dBm)	Status
5180	Mod Type: BPSK, Data Rate: 6	11.538	10.621	Pass	15.771	Pass
5220	Mod Type: BPSK, Data Rate: 6	11.095	10.451	Pass	15.601	Pass
5240	Mod Type: BPSK, Data Rate: 6	12.495	10.967	Pass	16.117	Pass
5260	Mod Type: BPSK, Data Rate: 6	12.984	11.134	Pass	16.284	Pass
5300	Mod Type: BPSK, Data Rate: 6	13.229	11.215	Pass	16.365	Pass
5320	Mod Type: BPSK, Data Rate: 6	11.228	10.503	Pass	15.653	Pass
5500	Mod Type: BPSK, Data Rate: 6	10.040	10.017	Pass	15.167	Pass
5580	Mod Type: BPSK, Data Rate: 6	9.668	9.853	Pass	15.003	Pass
5700	Mod Type: BPSK, Data Rate: 6	8.942	9.514	Pass	14.664	Pass
5745	Mod Type: BPSK, Data Rate: 6	9.314	9.691	Pass	14.841	Pass
5785	Mod Type: BPSK, Data Rate: 6	8.153	9.113	Pass	14.263	Pass
5825	Mod Type: BPSK, Data Rate: 6	7.517	8.760	Pass	13.91	Pass



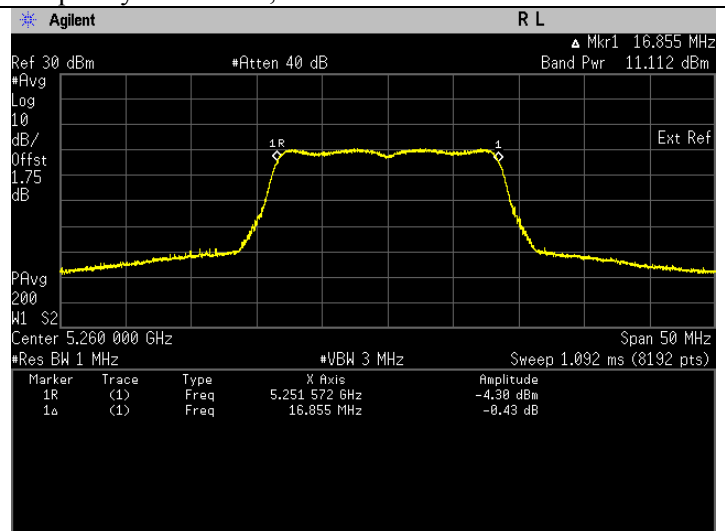
Frequency 5180 MHz, ISED



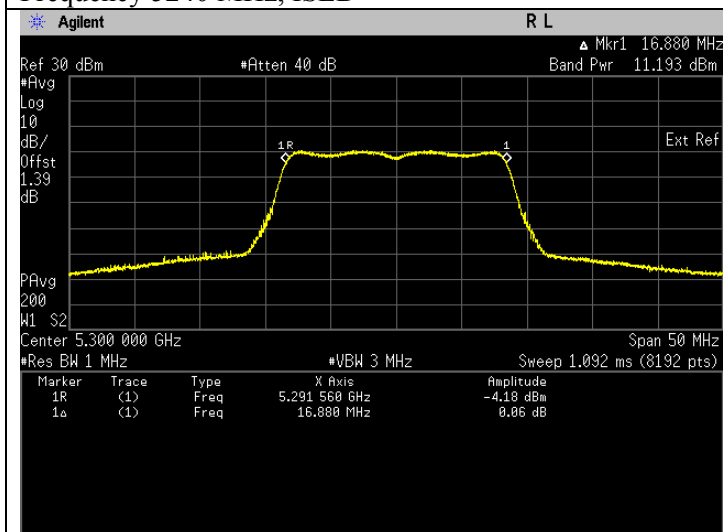
Frequency 5220 MHz, ISED



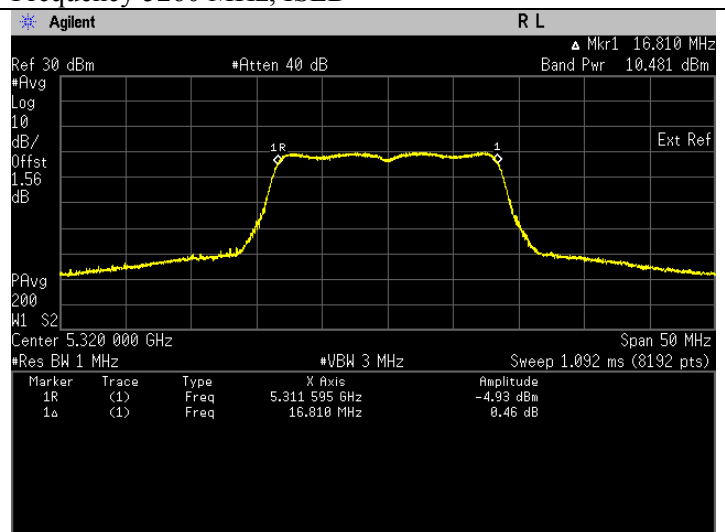
Frequency 5240 MHz, ISED



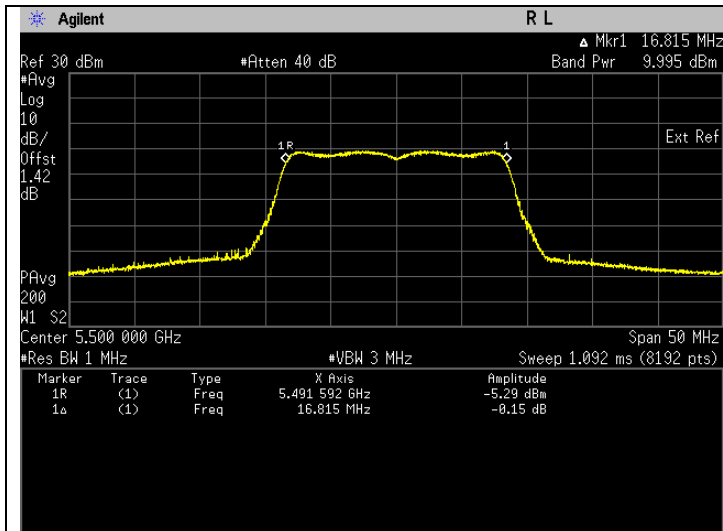
Frequency 5260 MHz, ISED



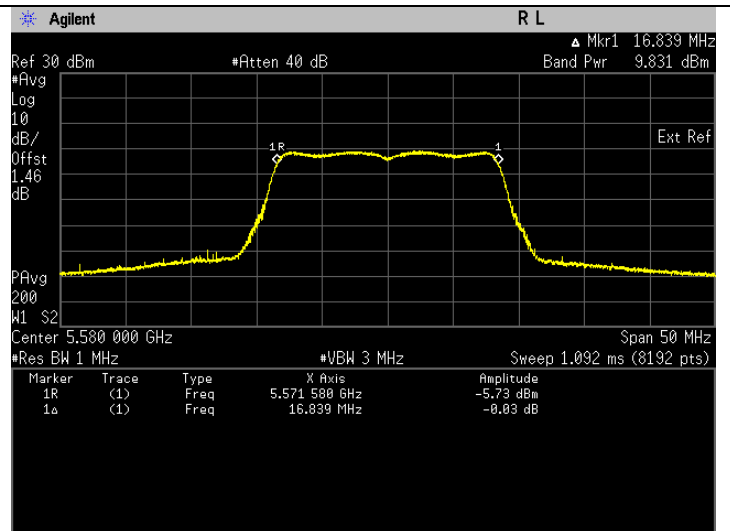
Frequency 5300 MHz, ISED



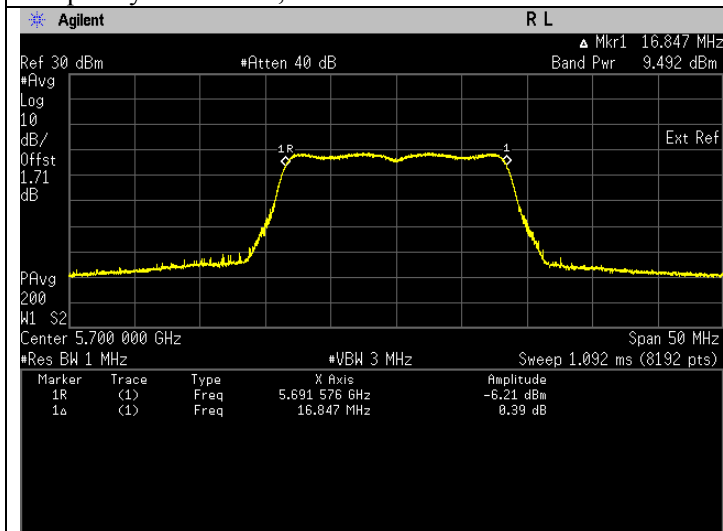
Frequency 5320 MHz, ISED



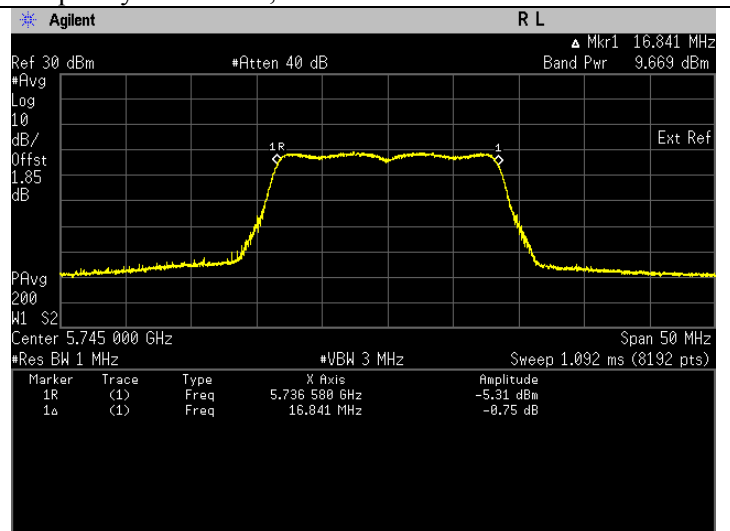
Frequency 5500 MHz, ISED



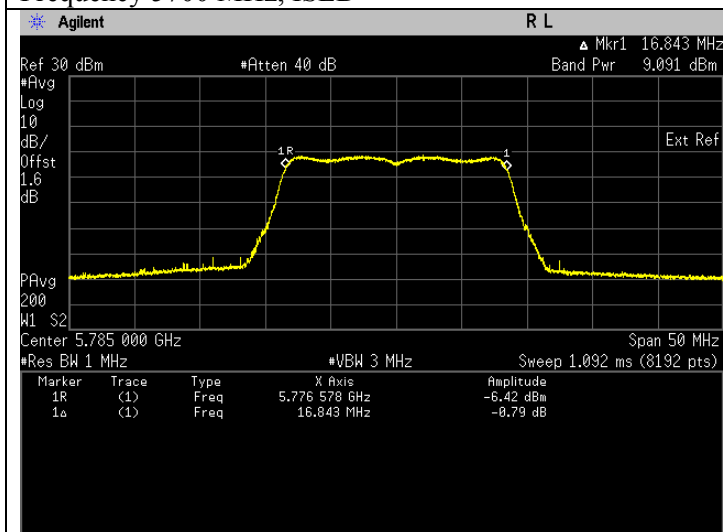
Frequency 5580 MHz, ISED



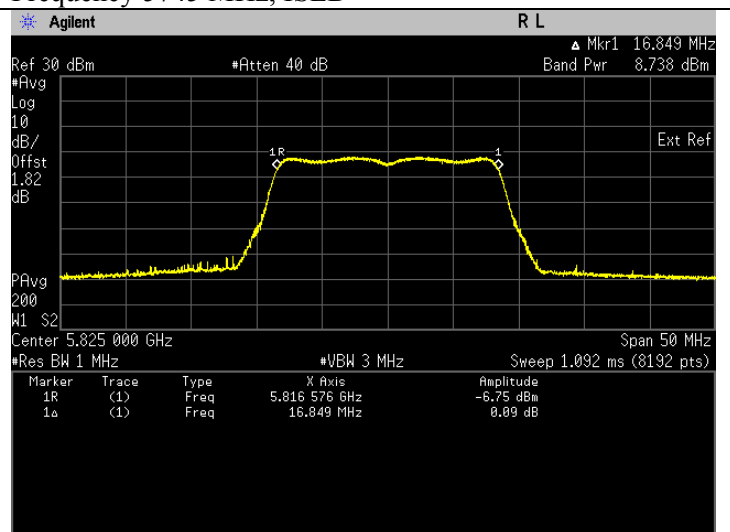
Frequency 5700 MHz, ISED



Frequency 5745 MHz, ISED



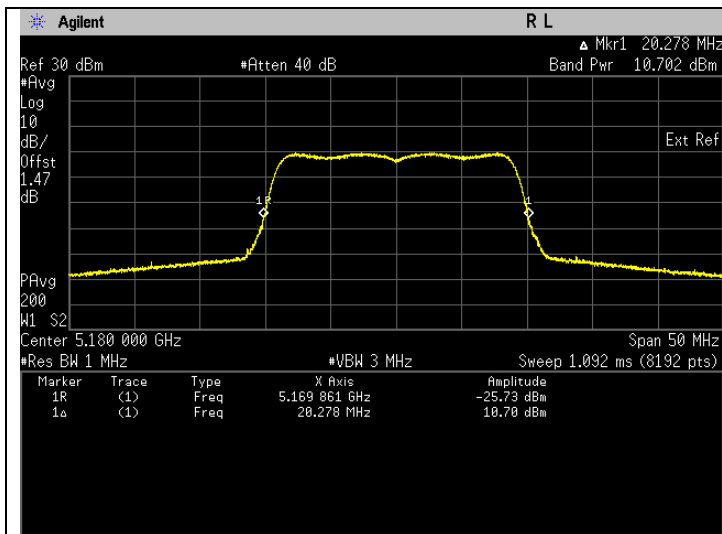
Frequency 5785 MHz, ISED



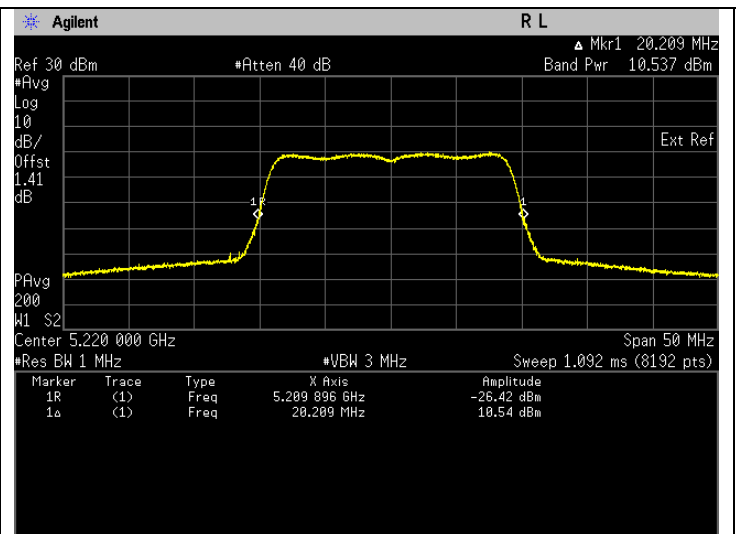
Frequency 5825 MHz, ISED

802.11n (HT20)(26dB EBW)

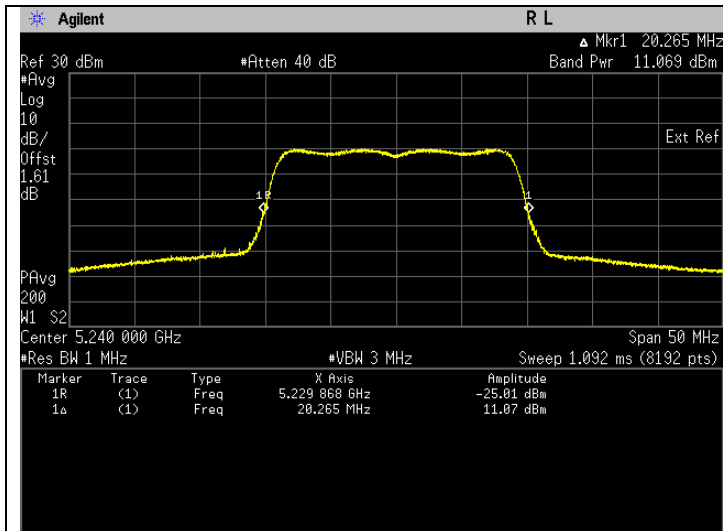
Freq. (MHz)	Test Conditions	Results		
		Power (mW)	Power (dBm)	Status
5180	Mod Type: BPSK, Data Rate: MCS0 (6.5)	11.790	10.715	Pass
5220	Mod Type: BPSK, Data Rate: MCS0 (6.5)	11.350	10.550	Pass
5240	Mod Type: BPSK, Data Rate: MCS0 (6.5)	12.829	11.082	Pass
5260	Mod Type: BPSK, Data Rate: MCS0 (6.5)	13.446	11.286	Pass
5300	Mod Type: BPSK, Data Rate: MCS0 (6.5)	13.744	11.381	Pass
5320	Mod Type: BPSK, Data Rate: MCS0 (6.5)	11.671	10.671	Pass
5500	Mod Type: BPSK, Data Rate: MCS0 (6.5)	10.366	10.156	Pass
5580	Mod Type: BPSK, Data Rate: MCS0 (6.5)	9.929	9.969	Pass
5700	Mod Type: BPSK, Data Rate: MCS0 (6.5)	9.298	9.684	Pass
5745	Mod Type: BPSK, Data Rate: MCS0 (6.5)	9.723	9.878	Pass
5785	Mod Type: BPSK, Data Rate: MCS0 (6.5)	8.441	9.264	Pass
5825	Mod Type: BPSK, Data Rate: MCS0 (6.5)	7.688	8.858	Pass



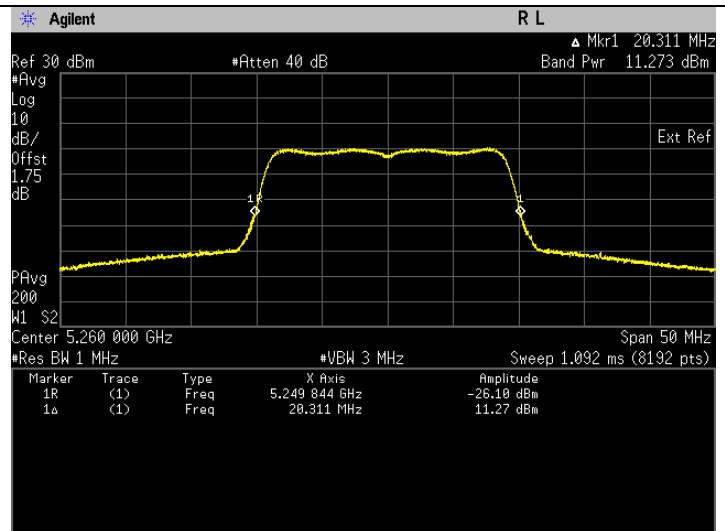
Frequency 5180 MHz, FCC.



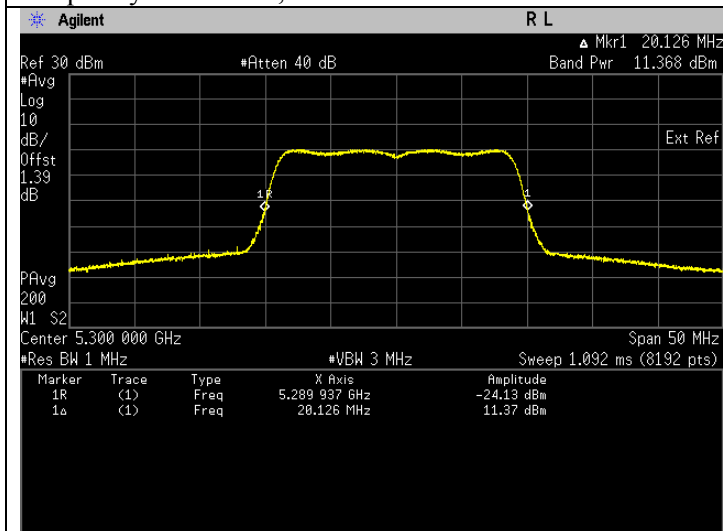
Frequency 5220 MHz, FCC.



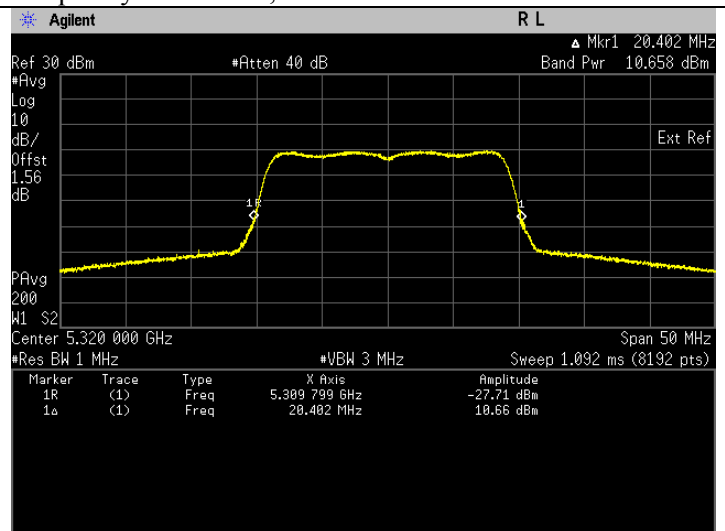
Frequency 5240 MHz, FCC.



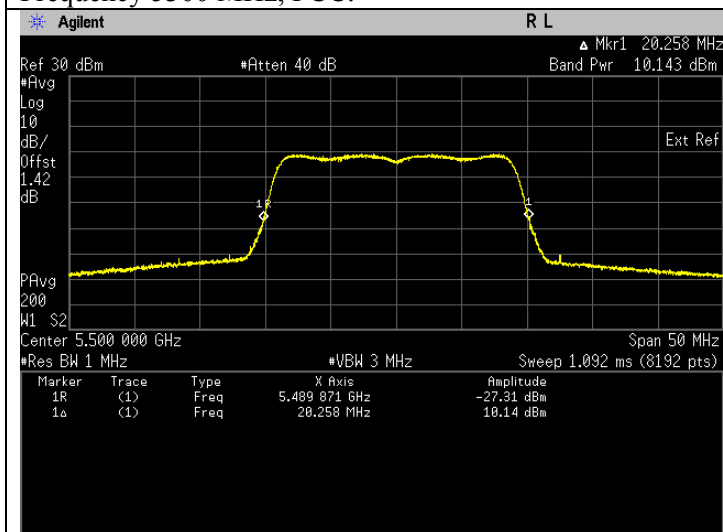
Frequency 5260 MHz, FCC.



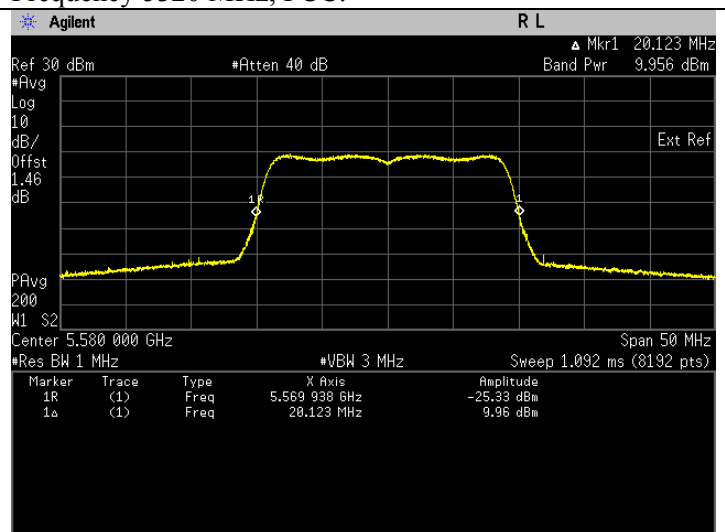
Frequency 5300 MHz, FCC.



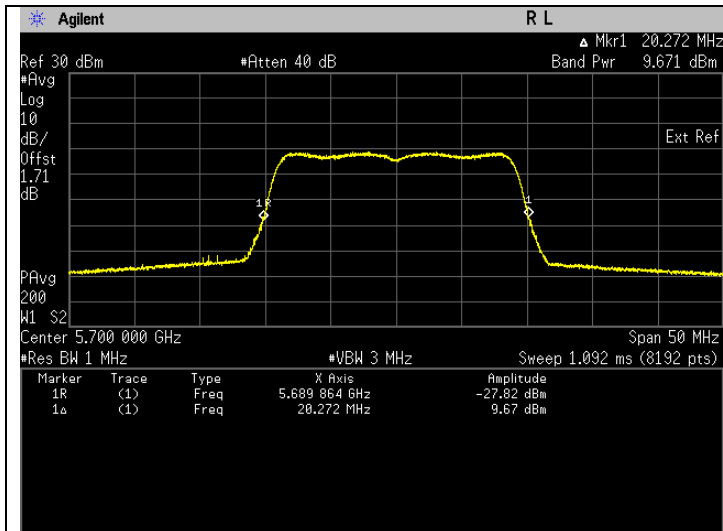
Frequency 5320 MHz, FCC.



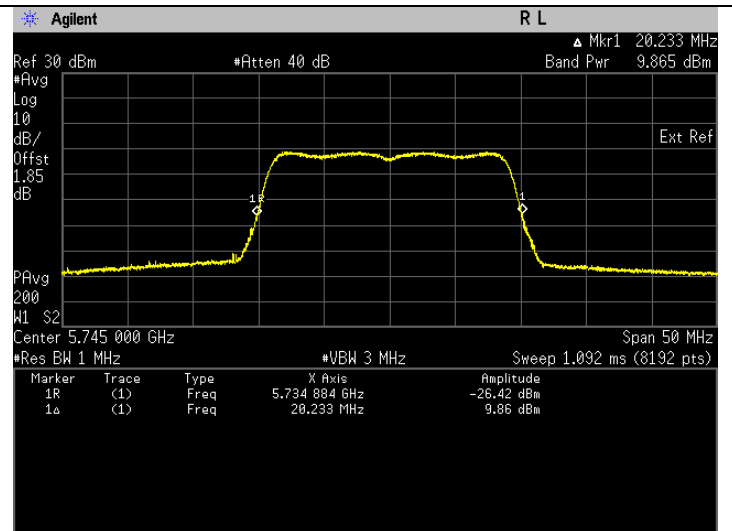
Frequency 5500 MHz, FCC.



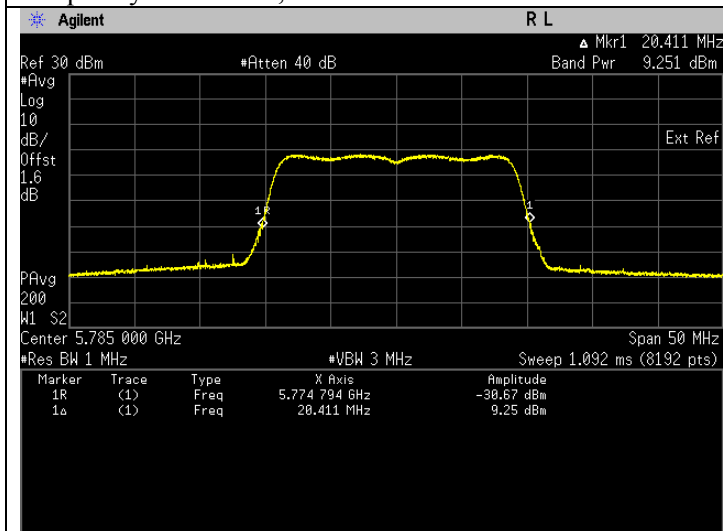
Frequency 5580 MHz, FCC.



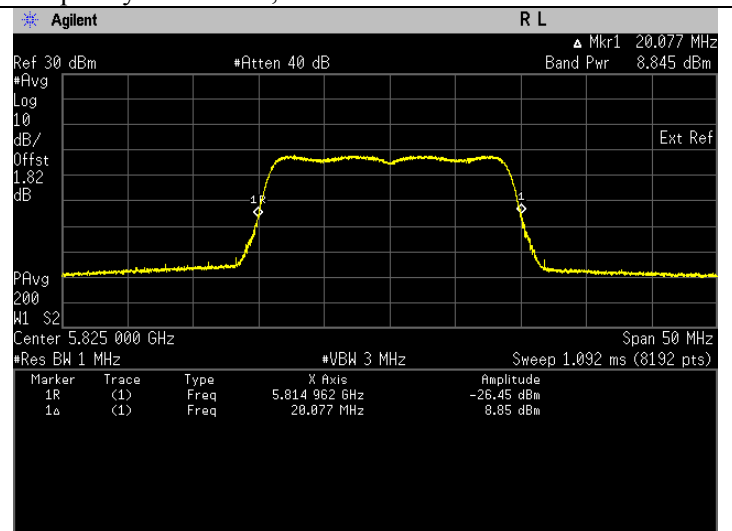
Frequency 5700 MHz, FCC.



Frequency 5745 MHz, FCC.



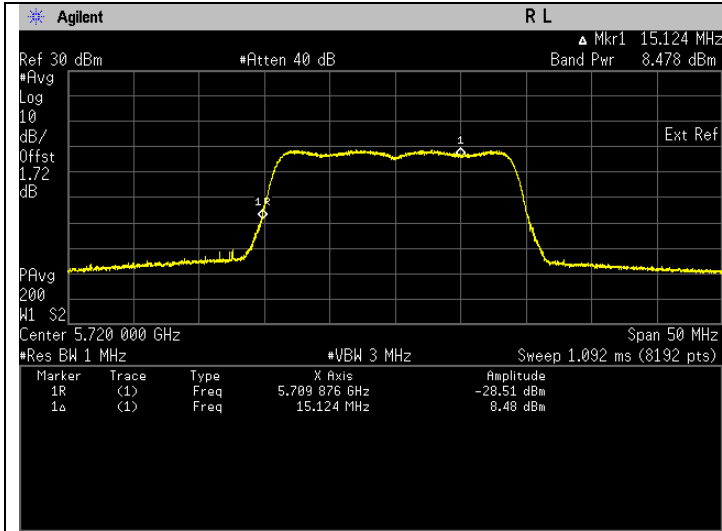
Frequency 5785 MHz, FCC.



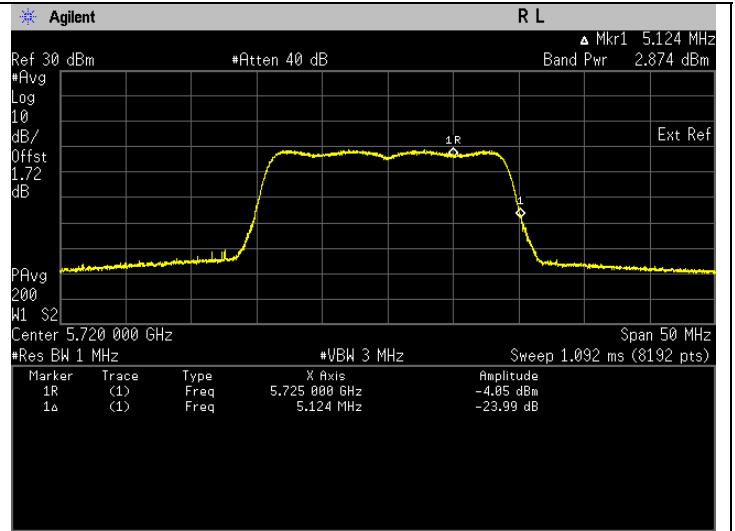
Frequency 5825 MHz, FCC.

Straddle Frequency

Freq. (MHz)	Test Conditions	Results		
		U-NII- 2C		
		Power (mW)	Power (dBm)	Status
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	7.065	8.491	Pass
		U-NII-3		
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	1.944	2.887	Pass



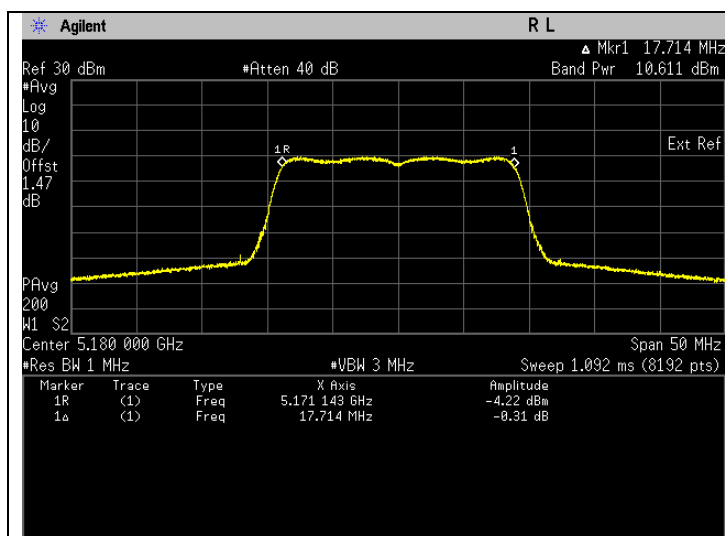
Frequency 5720 MHz, FCC, U-NII-2C. *Note: The band power is captured before the 5725 MHz.



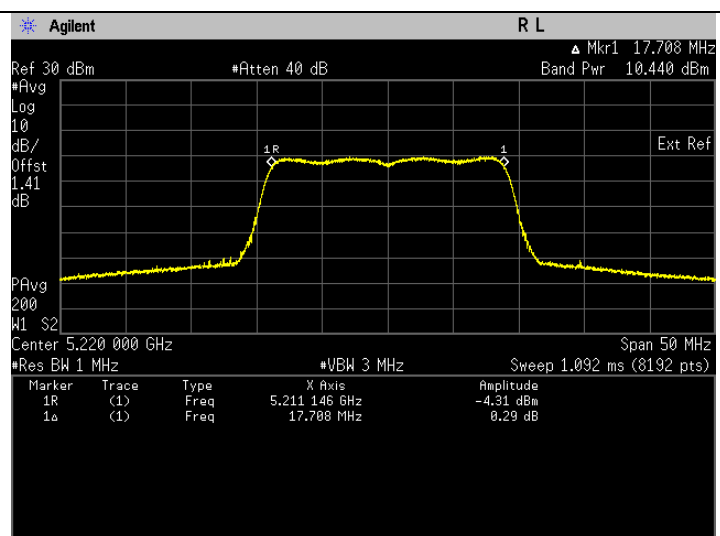
Frequency 5720 MHz, FCC, U-NII-3. *Note: The band power is captured after the 5725 MHz.

802.11n (HT20)(99% EBW)

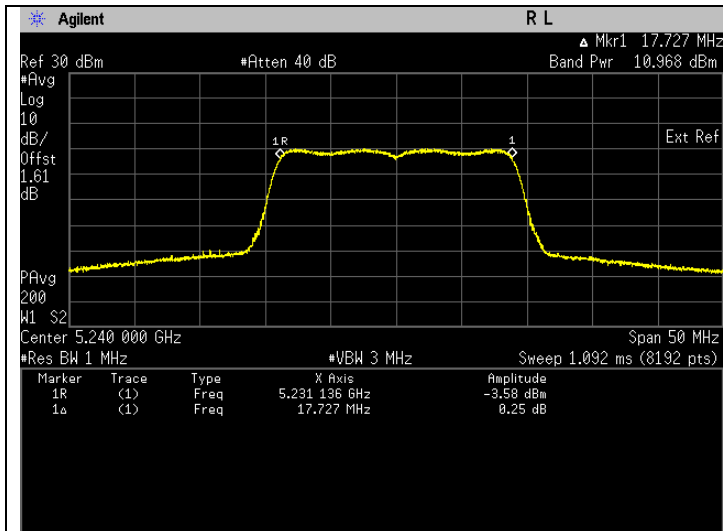
Freq. (MHz)	Test Conditions	Results				
		Power (mW)	Power (dBm)	Status	EIRP (dBm)	Status
5180	Mod Type: BPSK, Data Rate: MCS0 (6.5)	11.545	10.624	Pass	15.774	Pass
5220	Mod Type: BPSK, Data Rate: MCS0 (6.5)	11.100	10.453	Pass	15.603	Pass
5240	Mod Type: BPSK, Data Rate: MCS0 (6.5)	12.534	10.981	Pass	16.131	Pass
5260	Mod Type: BPSK, Data Rate: MCS0 (6.5)	13.180	11.199	Pass	16.349	Pass
5300	Mod Type: BPSK, Data Rate: MCS0 (6.5)	13.446	11.286	Pass	16.436	Pass
5320	Mod Type: BPSK, Data Rate: MCS0 (6.5)	11.418	10.576	Pass	15.726	Pass
5500	Mod Type: BPSK, Data Rate: MCS0 (6.5)	10.132	10.057	Pass	15.207	Pass
5580	Mod Type: BPSK, Data Rate: MCS0 (6.5)	9.741	9.886	Pass	15.036	Pass
5700	Mod Type: BPSK, Data Rate: MCS0 (6.5)	9.101	9.591	Pass	14.741	Pass
5745	Mod Type: BPSK, Data Rate: MCS0 (6.5)	9.491	9.773	Pass	14.923	Pass
5785	Mod Type: BPSK, Data Rate: MCS0 (6.5)	8.276	9.178	Pass	14.328	Pass
5825	Mod Type: BPSK, Data Rate: MCS0 (6.5)	7.532	8.769	Pass	13.919	Pass



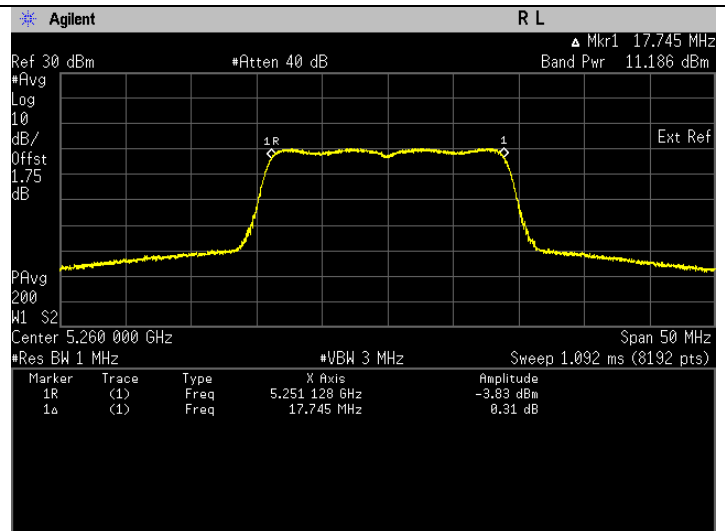
Frequency 5180 MHz, ISED



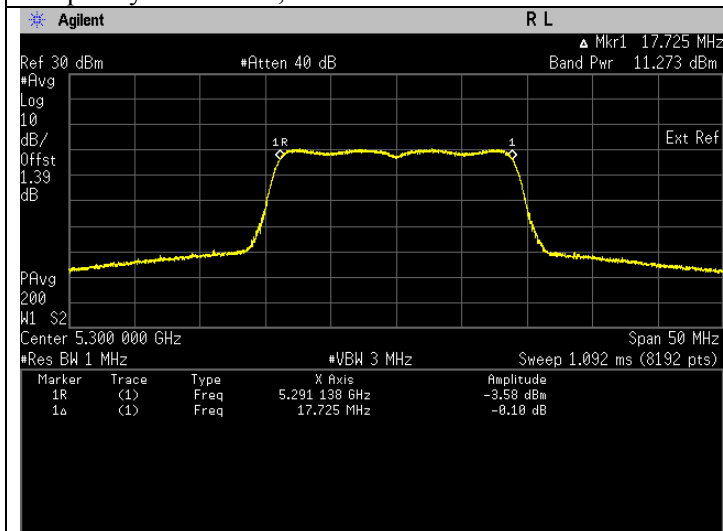
Frequency 5220 MHz, ISED



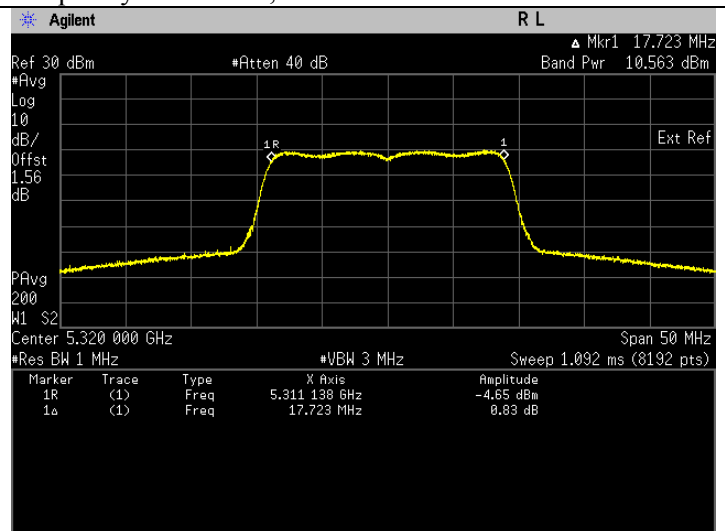
Frequency 5240 MHz, ISED



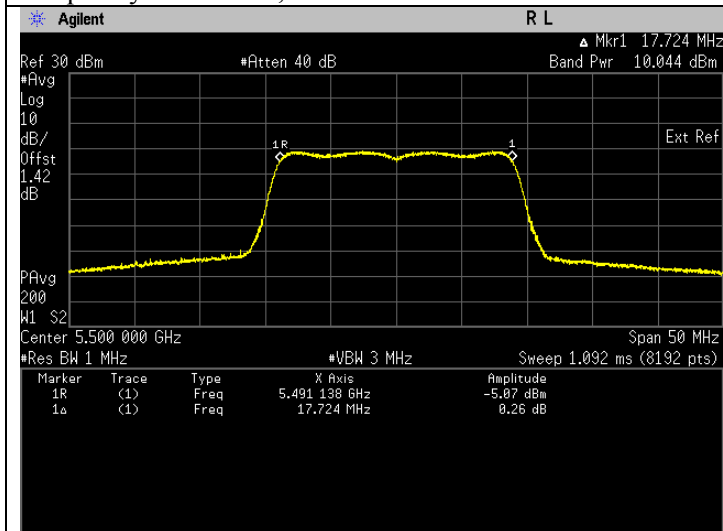
Frequency 5260 MHz, ISED



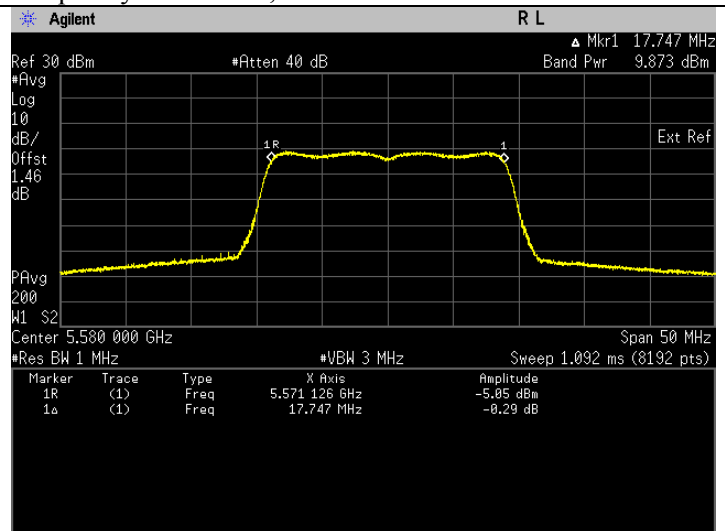
Frequency 5300 MHz, ISED



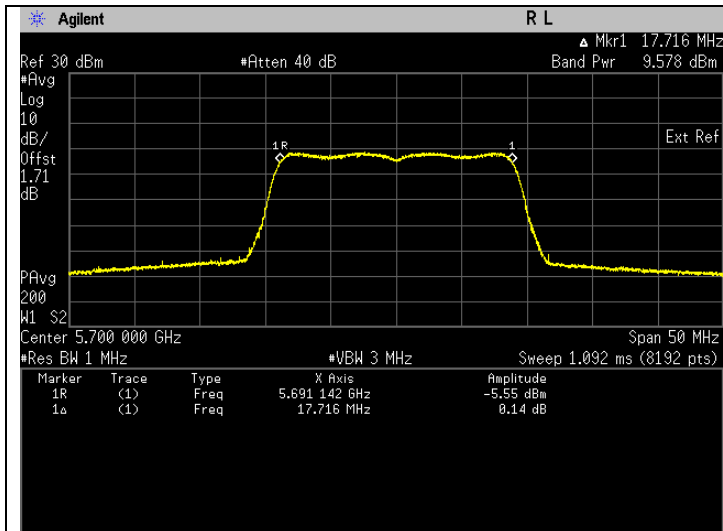
Frequency 5320 MHz, ISED



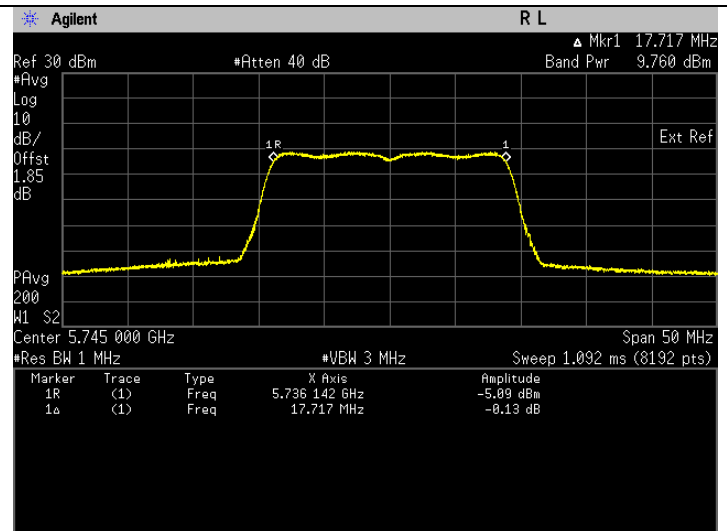
Frequency 5500 MHz, ISED



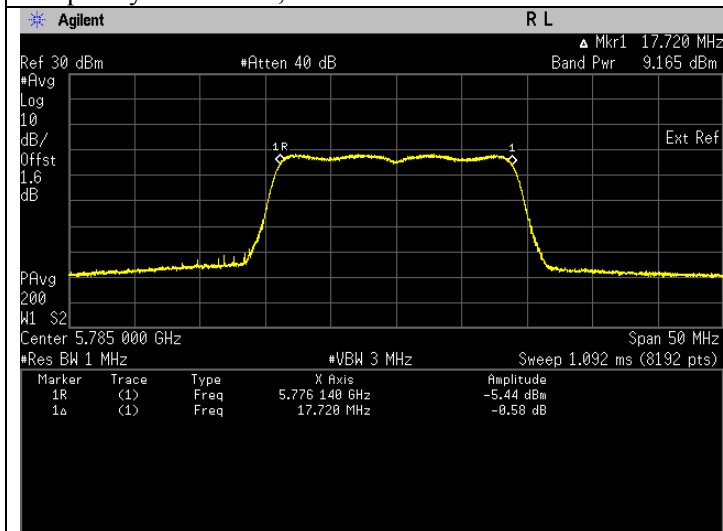
Frequency 5580 MHz, ISED



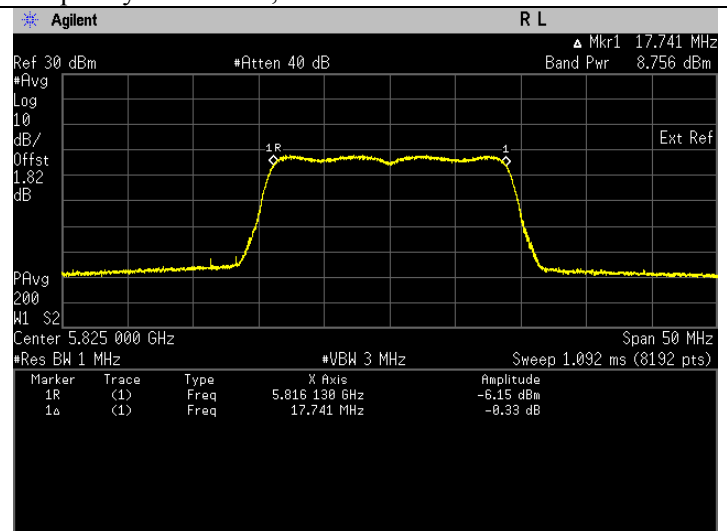
Frequency 5700 MHz, ISED



Frequency 5745 MHz, ISED



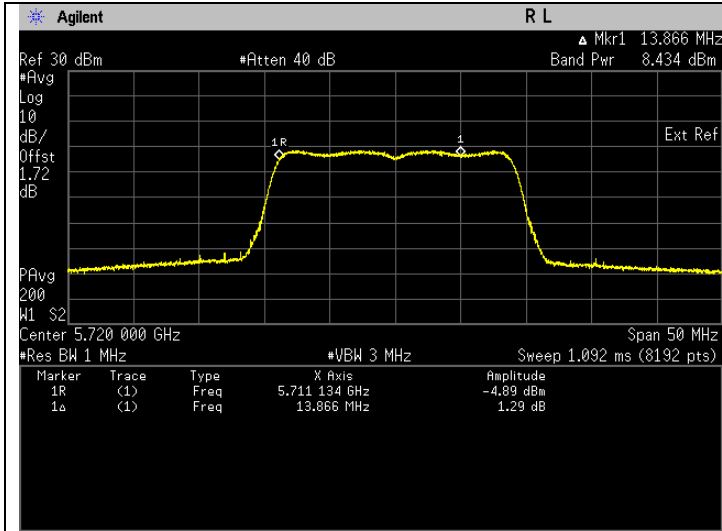
Frequency 5785 MHz, ISED



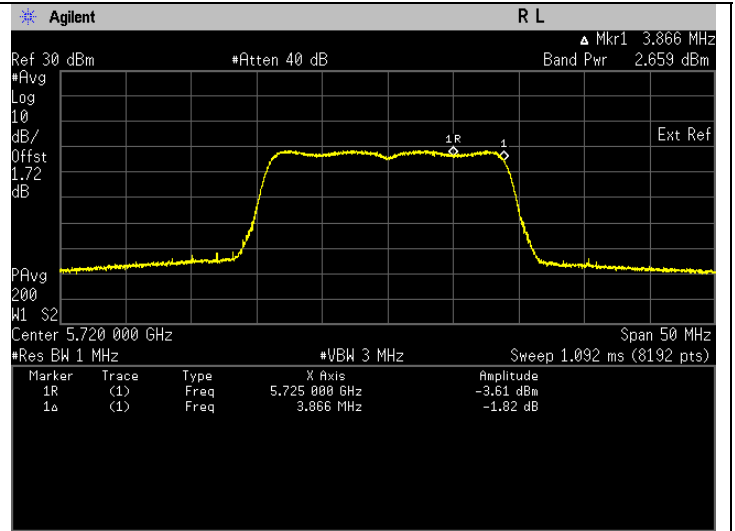
Frequency 5825 MHz, ISED

Straddle Frequency

Freq. (MHz)	Test Conditions	Results				
		U-NII- 2C				
		Power (mW)	Power (dBm)	Status	EIRP (dBm)	Status
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	6.994	8.447	Pass	13.597	Pass
		U-NII-3				
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	1.850	2.672	Pass	7.822	Pass



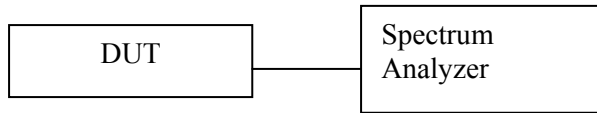
Frequency 5720 MHz, ISED, U-NII-2C. *Note: The band power is captured before the 5725 MHz.



Frequency 5720 MHz, ISED, U-NII-3. *Note: The band power is captured after the 5725 MHz.

Maximum Power Spectral Density

7.1.8. Test Setup



- Test setup as per illustrated above.
- Set DUT to transmit at desire transmit frequency.
- Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- Setting of Spectrum analyzer :
 - Span to encompass the entire 26dB EBW or 99% occupied bandwidth.
 - RBW = 1 MHz (5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz) / 500 kHz (5.725-5.85 GHz)
 - VBW $\geq 3 \cdot$ RBW
 - Detector = power averaging (RMS)
 - Trace = Max hold
 - Number of points in sweep $\geq 2 \times$ span / RBW
 - Sweep time = auto
 - Trace average at least 100 traces in power averaging (rms) mode
- Use the peak search function on the instrument to find the peak of the spectrum and record its value.
- Add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.
- The measurement method follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 under clause F) Method SA-2.
- The Maximum power spectral density results are included duty cycle correction factor.

7.1.9. Test Limits

FCC 15.407(a)

Range (GHz)	Condition	Limit
5.15-5.25	Outdoor AP	17dBm/ 1MHz
	Indoor AP	17dBm/ 1MHz
	Fixed Point to Point AP	17dBm/ 1MHz
	√ Mobile and Portable Client Devices	11dBm/ 1MHz
5.25-5.35	√	11dBm/ 1MHz
5.47-5.525	√	11dBm/ 1MHz
5.725-5.85	√	30dBm/ 500kHz

RSS-247 6.2

Range(GHz)	Condition	Limit
5.15-5.25	Indoor Operation Only	EIRP: 10dBm/ 1MHz
5.25-5.35		11dBm/ 1MHz
5.47-5.6		11dBm/ 1MHz
5.6-5.525		11dBm/ 1MHz
5.725-5.85		30dBm/ 500kHz

7.1.10. Additional Info

802.11a

Antenna	Gain (dBi)
Antenna 1	5.15
Duty Cycle Correction Factor	
Antenna 1	0.022

802.11n20

Antenna	Gain (dBi)
Antenna 1	5.15
Duty Cycle Correction Factor	
Antenna 1	0.013

7.1.11. Test Data

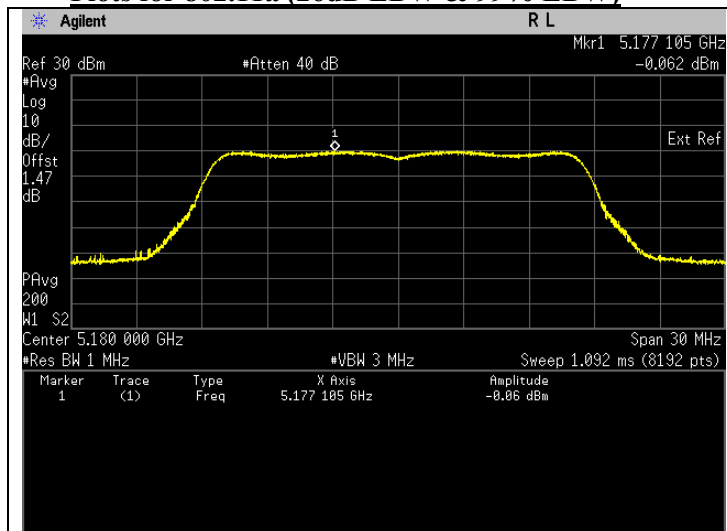
802.11a (26dB EBW)

Freq. (MHz)	Test Conditions	Results	
		Power/Frequency (dBm/MHz)	Status
5180	Mod Type: BPSK, Data Rate: 6	-0.040	Pass
5220	Mod Type: BPSK, Data Rate: 6	0.090	Pass
5240	Mod Type: BPSK, Data Rate: 6	0.187	Pass
5260	Mod Type: BPSK, Data Rate: 6	0.461	Pass
5300	Mod Type: BPSK, Data Rate: 6	0.699	Pass
5320	Mod Type: BPSK, Data Rate: 6	0.196	Pass
5500	Mod Type: BPSK, Data Rate: 6	-0.608	Pass
5580	Mod Type: BPSK, Data Rate: 6	-0.702	Pass
5700	Mod Type: BPSK, Data Rate: 6	-0.977	Pass
Freq. (MHz)	Test Conditions	Power/Frequency (dBm/500kHz)	Status
5745	Mod Type: BPSK, Data Rate: 6	-3.809	Pass
5785	Mod Type: BPSK, Data Rate: 6	-4.203	Pass
5825	Mod Type: BPSK, Data Rate: 6	-4.629	Pass

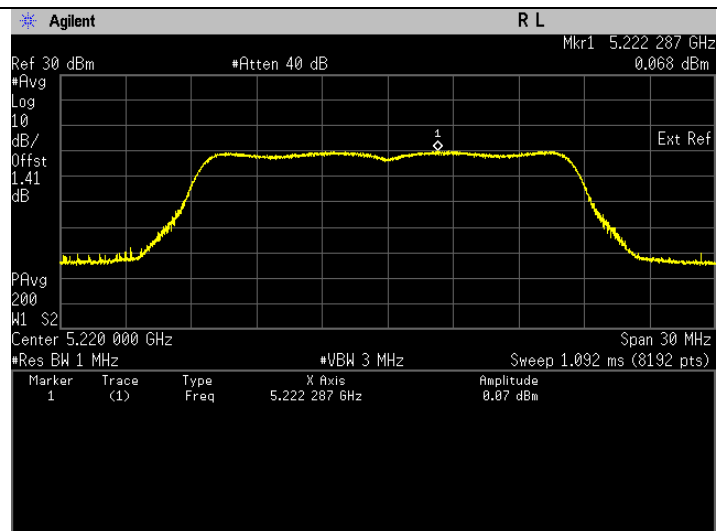
802.11a (99% EBW)

Freq. (MHz)	Test Conditions	Results			
		Power/Frequency (dBm/MHz)	Status	EIRP (dBm/MHz)	Status
5180	Mod Type: BPSK, Data Rate: 6	-0.040	Pass	5.11	Pass
5220	Mod Type: BPSK, Data Rate: 6	0.090	Pass	5.24	Pass
5240	Mod Type: BPSK, Data Rate: 6	0.187	Pass	5.337	Pass
5260	Mod Type: BPSK, Data Rate: 6	0.461	Pass	5.611	Pass
5300	Mod Type: BPSK, Data Rate: 6	0.699	Pass	5.849	Pass
5320	Mod Type: BPSK, Data Rate: 6	0.196	Pass	5.346	Pass
5500	Mod Type: BPSK, Data Rate: 6	-0.608	Pass	4.542	Pass
5580	Mod Type: BPSK, Data Rate: 6	-0.702	Pass	4.448	Pass
5700	Mod Type: BPSK, Data Rate: 6	-0.977	Pass	4.173	Pass
Freq. (MHz)	Test Conditions	Power/Frequency (dBm/500kHz)	Status		
5745	Mod Type: BPSK, Data Rate: 6	-3.809	Pass	1.341	Pass
5785	Mod Type: BPSK, Data Rate: 6	-4.203	Pass	0.947	Pass
5825	Mod Type: BPSK, Data Rate: 6	-4.629	Pass	0.521	Pass

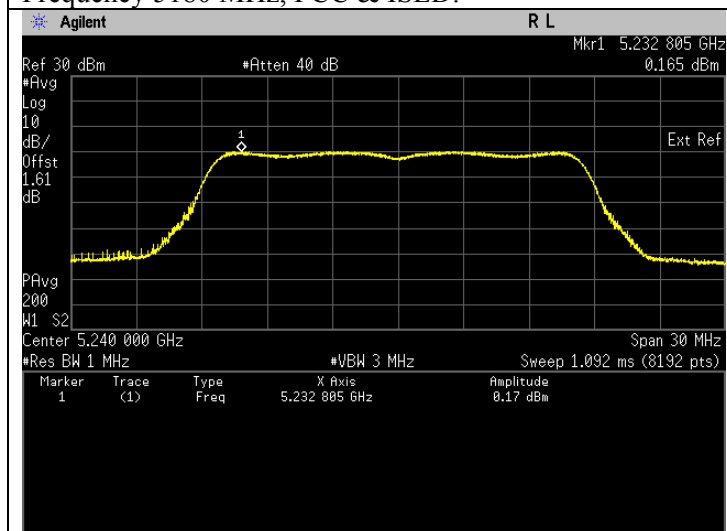
Plots for 802.11a (26dB EBW & 99% EBW)



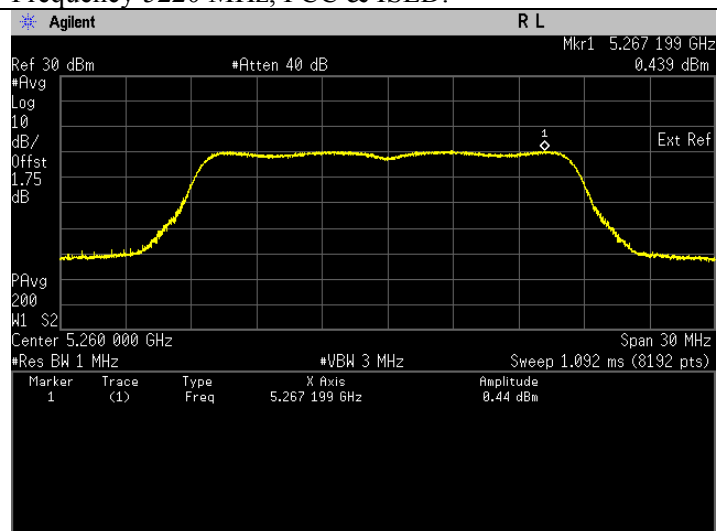
Frequency 5180 MHz, FCC & ISSED.



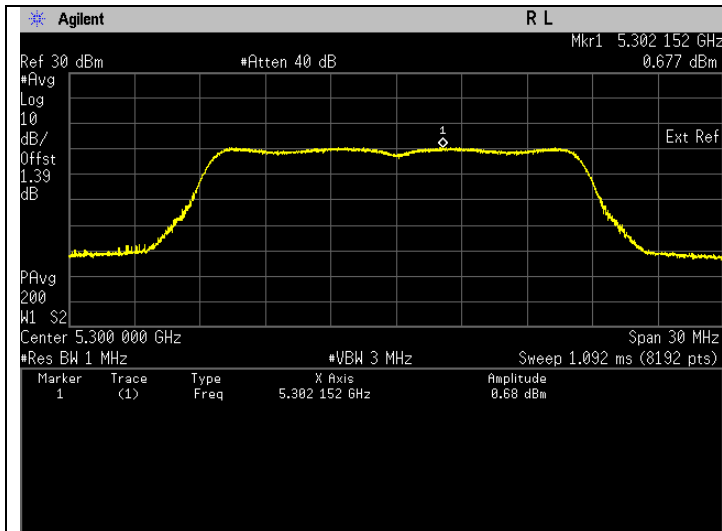
Frequency 5220 MHz, FCC & ISSED.



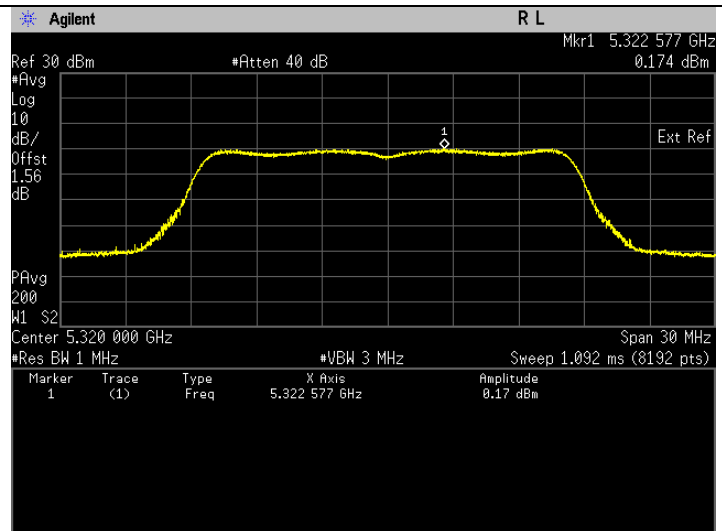
Frequency 5240 MHz, FCC & ISSED.



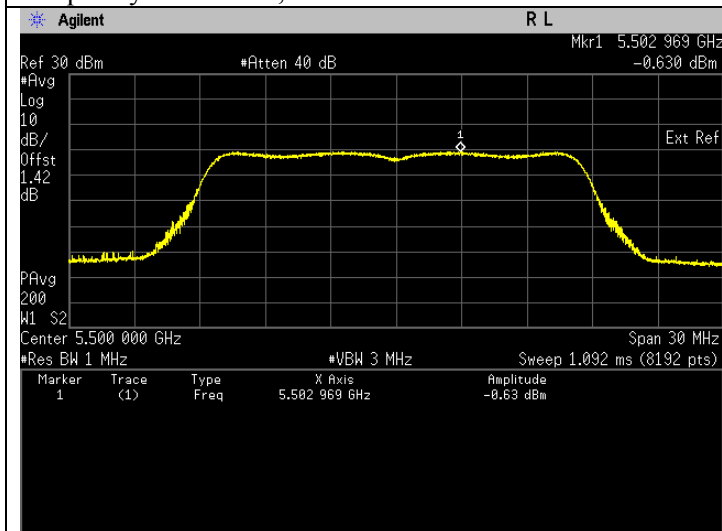
Frequency 5260 MHz, FCC & ISSED.



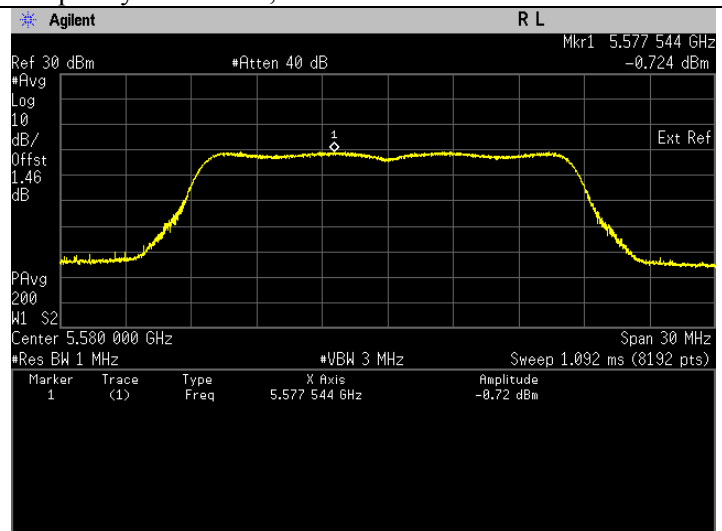
Frequency 5300 MHz, FCC & ISSED.



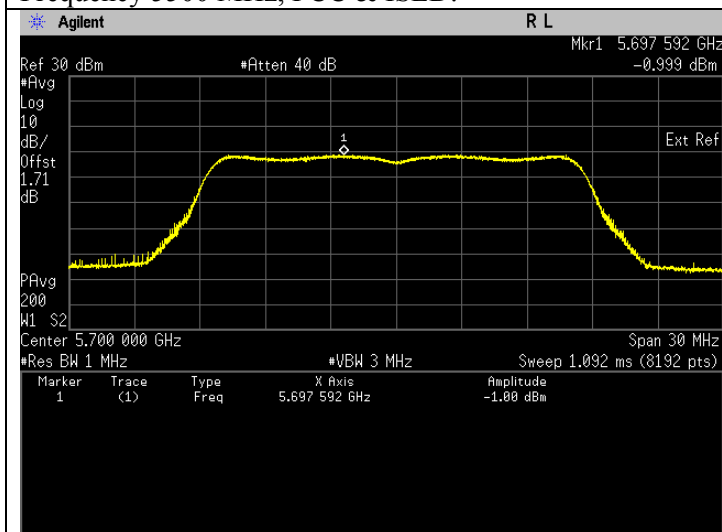
Frequency 5320 MHz, FCC & ISSED.



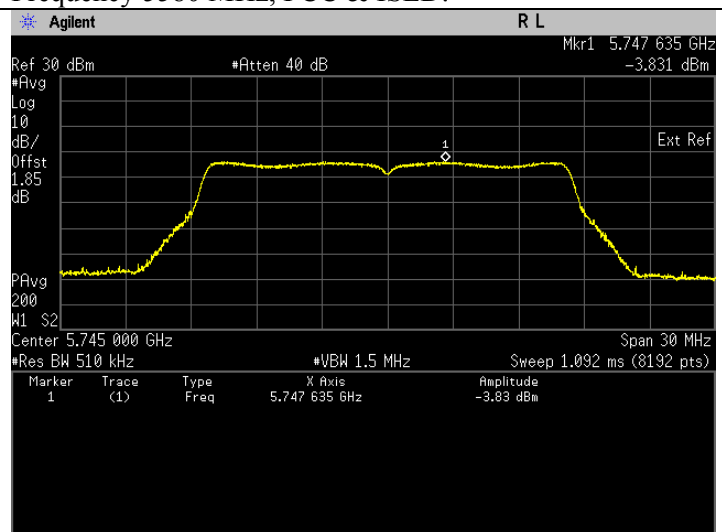
Frequency 5500 MHz, FCC & ISSED.



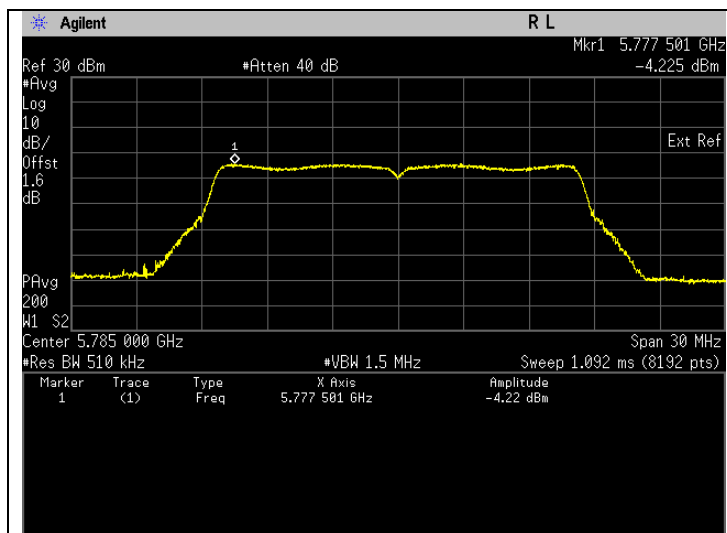
Frequency 5580 MHz, FCC & ISSED.



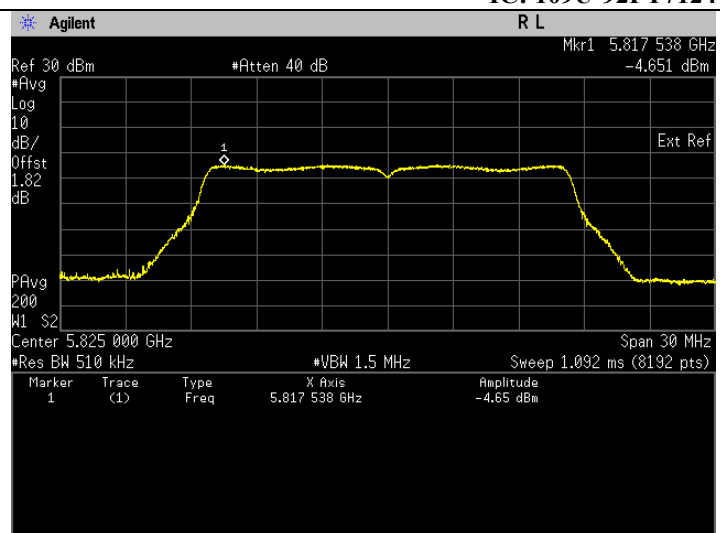
Frequency 5700 MHz, FCC & ISSED.



Frequency 5745 MHz, FCC & ISSED.



Frequency 5785 MHz, FCC & ISED.



Frequency 5825 MHz, FCC & ISED.

802.11n (HT20)(26dB EBW)

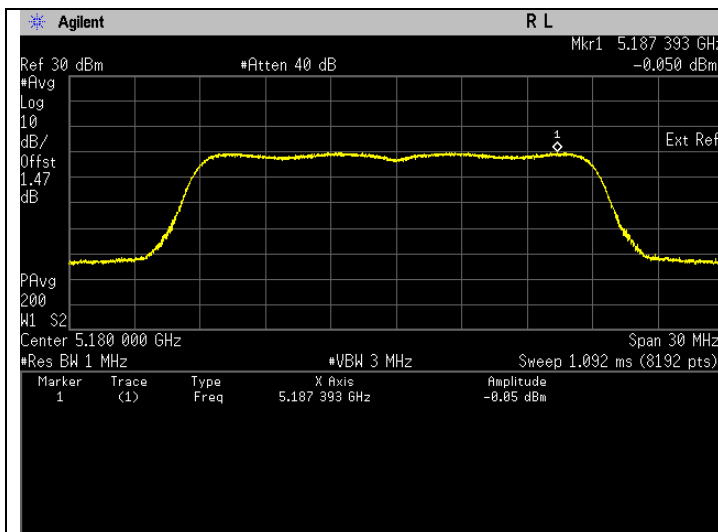
Freq. (MHz)	Test Conditions	Results	
		Power/Frequency (dBm/MHz)	Status
5180	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-0.037	Pass
5220	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.010	Pass
5240	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.453	Pass
5260	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.534	Pass
5300	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.449	Pass
5320	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-0.005	Pass
5500	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-0.830	Pass
5580	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.055	Pass
5700	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.050	Pass
Freq. (MHz)	Test Conditions	Power/Frequency (dBm/500kHz)	Status
5745	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-3.806	Pass
5785	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-4.136	Pass
5825	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-4.743	Pass

802.11n (HT20)(99% EBW)

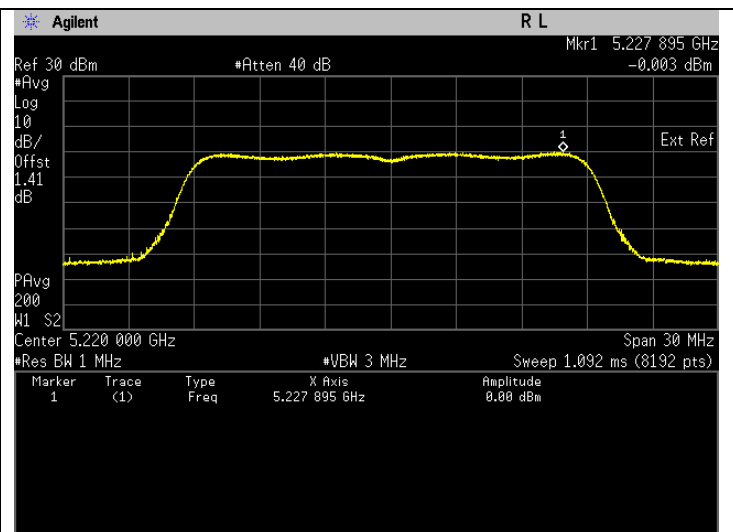
Freq. (MHz)	Test Conditions	Results			
		Power/Frequency (dBm/MHz)	Status	EIRP (dBm/MHz)	Status
5180	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-0.037	Pass	5.113	Pass
5220	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.010	Pass	5.16	Pass
5240	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.453	Pass	5.603	Pass
5260	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.534	Pass	5.684	Pass
5300	Mod Type: BPSK, Data Rate: MCS0 (6.5)	0.449	Pass	5.599	Pass
5320	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-0.005	Pass	5.145	Pass
5500	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-0.830	Pass	4.32	Pass

5580	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.055	Pass	4.095	Pass
5700	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.050	Pass	4.1	Pass
Freq. (MHz)	Test Conditions	Power/Frequency (dBm/500kHz)	Status		
5745	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-3.806	Pass	1.344	Pass
5785	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-4.136	Pass	1.014	Pass
5825	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-4.743	Pass	0.407	Pass

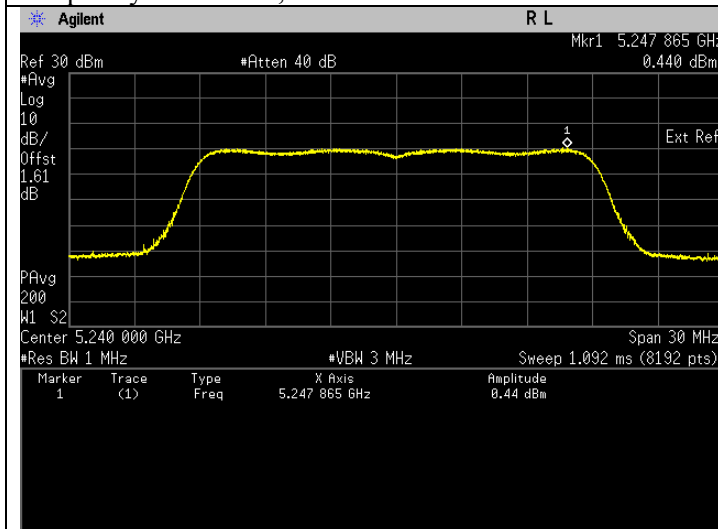
Plots for 802.11n (HT20) (26dB EBW & 99% EBW)



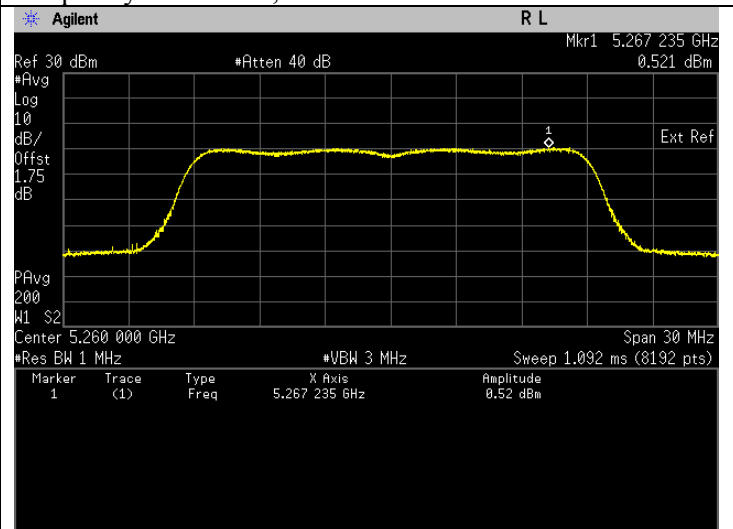
Frequency 5180 MHz, FCC & ISSED.



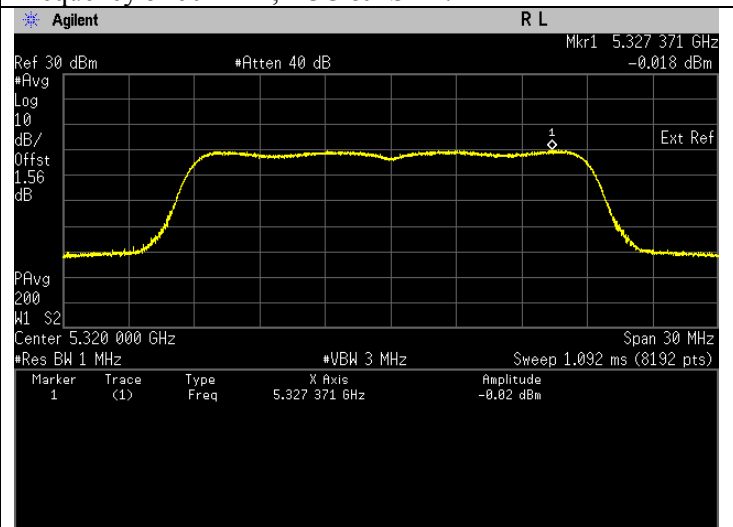
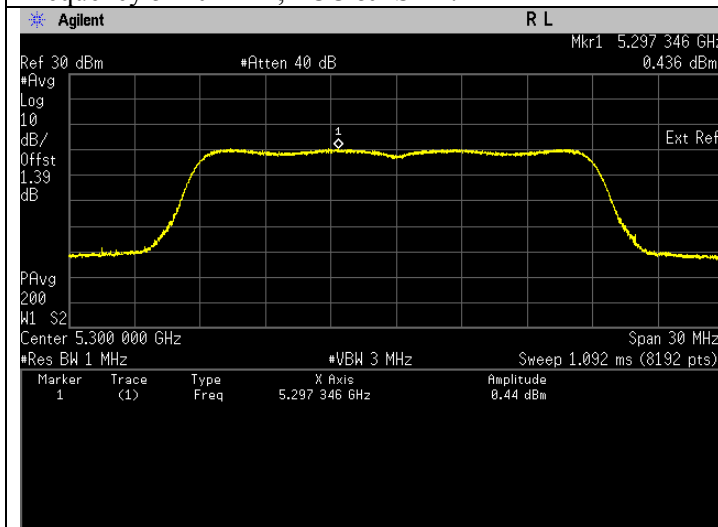
Frequency 5220 MHz, FCC & ISSED.



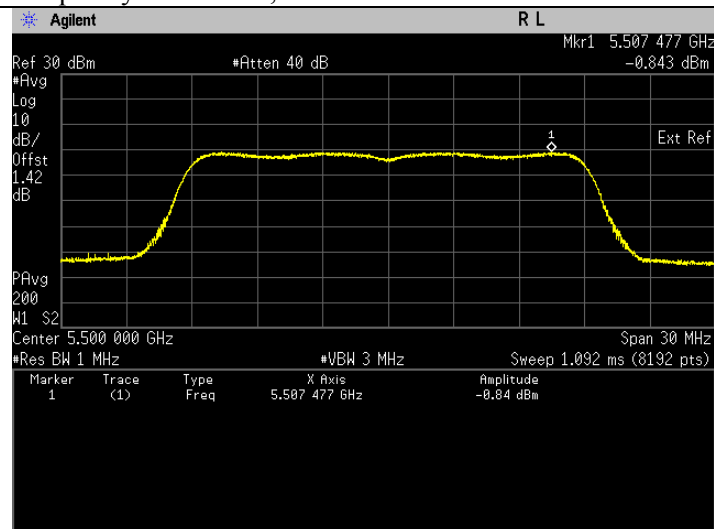
Frequency 5240 MHz, FCC & ISSED.



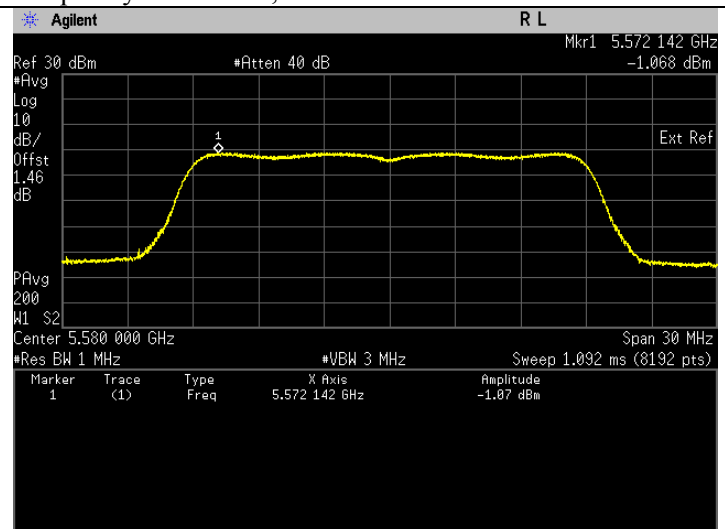
Frequency 5260 MHz, FCC & ISSED.



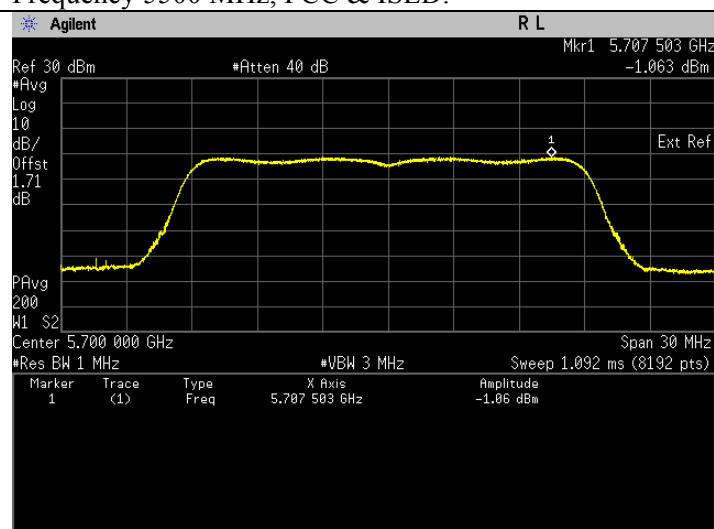
Frequency 5300 MHz, FCC & ISSED.



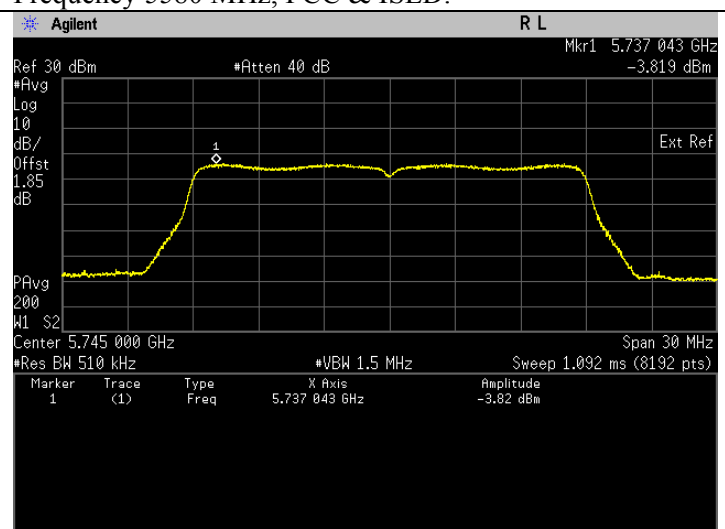
Frequency 5320 MHz, FCC & ISSED.



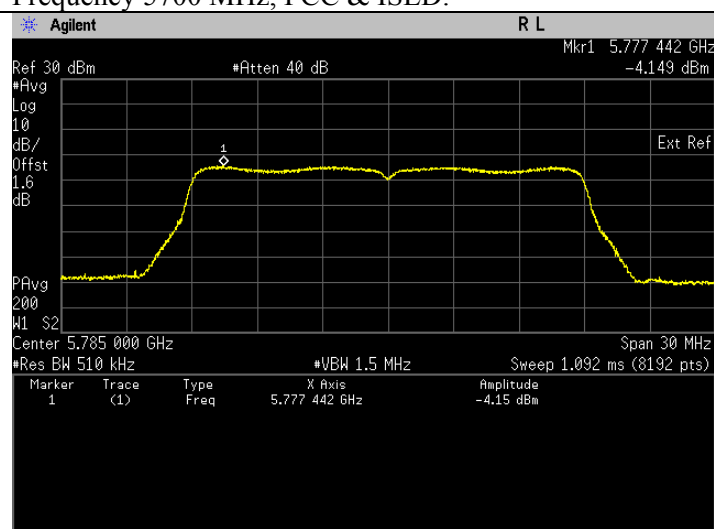
Frequency 5500 MHz, FCC & ISSED.



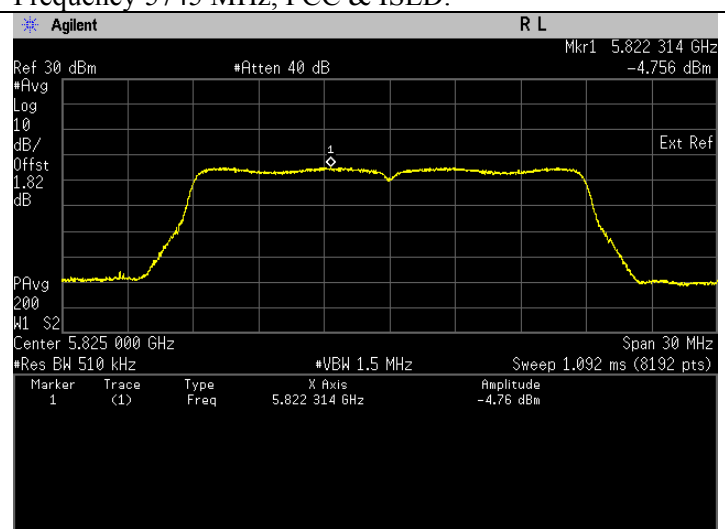
Frequency 5580 MHz, FCC & ISSED.



Frequency 5700 MHz, FCC & ISSED.



Frequency 5745 MHz, FCC & ISSED.



Frequency 5785 MHz, FCC & ISSED.

Frequency 5825 MHz, FCC & ISSED.

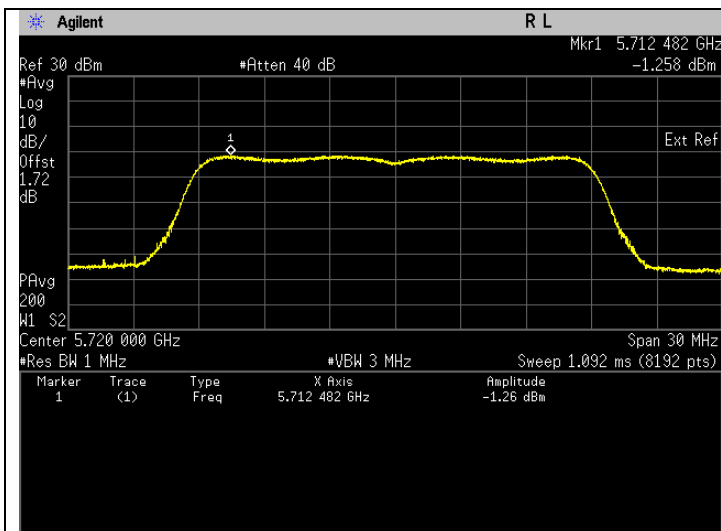
Straddle Frequency for 802.11n (HT20) (26dB EBW)

Freq. (MHz)	Test Conditions	Results	
		Power/Frequency (dBm/MHz)	Status
		U-NII- 2C	
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.245	Pass
Freq. (MHz)	Test Conditions	U-NII-3	
		Power/Frequency (dBm/500kHz)	Status
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.632	Pass

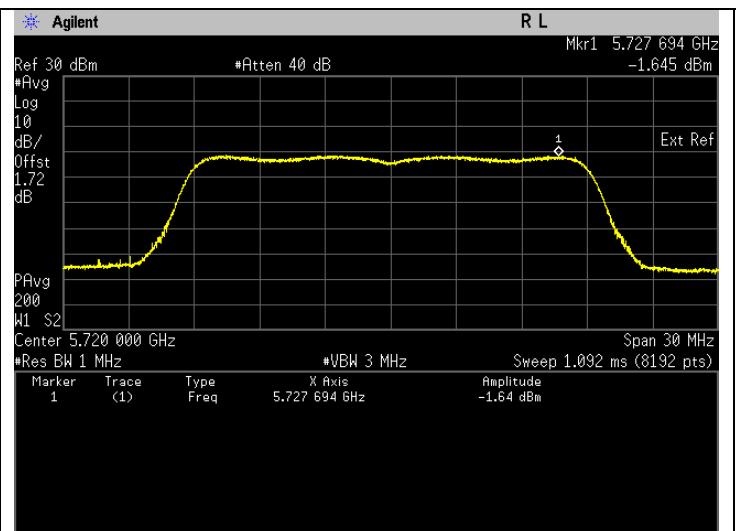
Straddle Frequency for 802.11n (HT20) (99% EBW)

Freq. (MHz)	Test Conditions	Results			
		Power/Frequency (dBm/MHz)	Status	EIRP (dBm/MHz)	Status
		U-NII- 2C			
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.245	Pass	3.905	Pass
Freq. (MHz)	Test Conditions	U-NII-3			
		Power/Frequency (dBm/500kHz)	Status		
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	-1.632	Pass	3.518	Pass

Plots for 802.11n (HT20) Straddle Frequency (26dB EBW & 99% EBW)



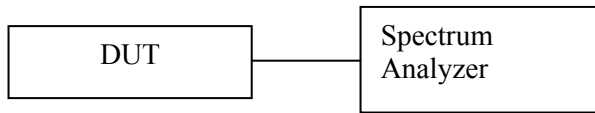
Frequency 5720 MHz, FCC & ISSED,U-NII-2C. *Note: The highest spectral density is captured before the 5725 MHz.



Frequency 5720 MHz, FCC & ISSED, U-NII-3. *Note: The highest spectral density is captured after the 5725 MHz.

7.2. 6dB Bandwidth

7.2.1. Test Setup



- a) Test setup as per illustrated above.
- b) Set DUT to transmit at desire transmit frequency.
- c) 6dB bandwidth is applicable for the band 5.725-5.85GHz only.
- d) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- e) Setting of Spectrum analyzer :
 - RBW = 100 kHz
 - VBW $\geq 3 \cdot$ RBW
 - Detector = Peak
 - Trace = Max Hold
 - Sweep = Auto couple
- f) Allow trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.
- h) The measurement method follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 under clause C.2).

7.2.2. Test Limits

FCC 15.407(e)

Within the 5.725-5.85GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

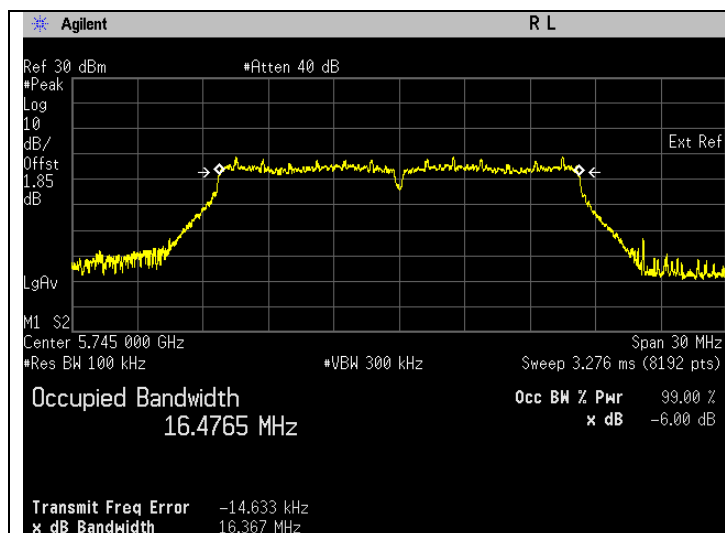
RSS 247 6.2.4

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz.

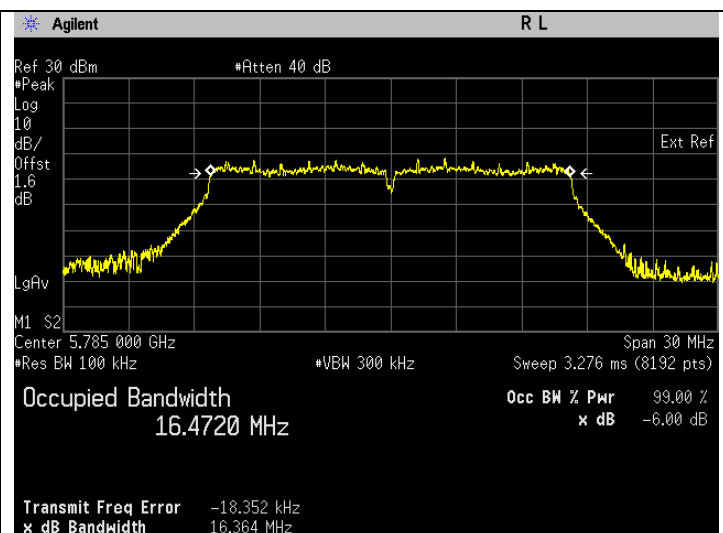
7.2.3. Test Data

802.11a

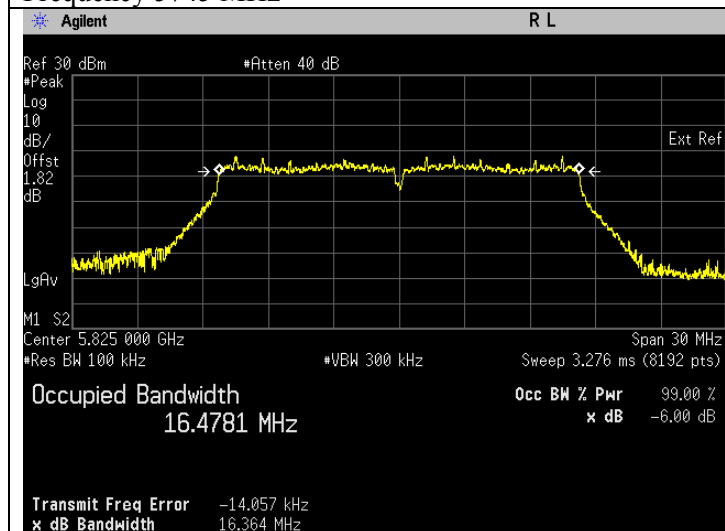
Freq. (MHz)	Test Configuration	Results	
		Bandwidth(MHz)	Status
5745	Mod Type: BPSK, Data Rate: 6	16.367	Pass
5785	Mod Type: BPSK, Data Rate: 6	16.364	Pass
5825	Mod Type: BPSK, Data Rate: 6	16.364	Pass



Frequency 5745 MHz



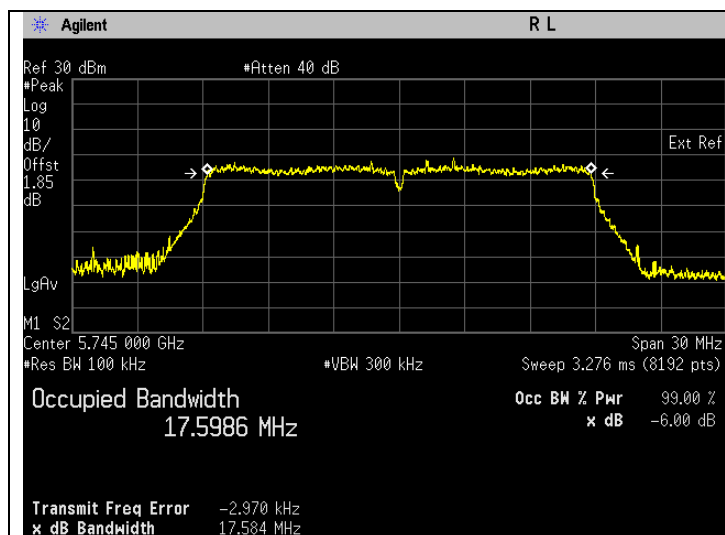
Frequency 5785 MHz



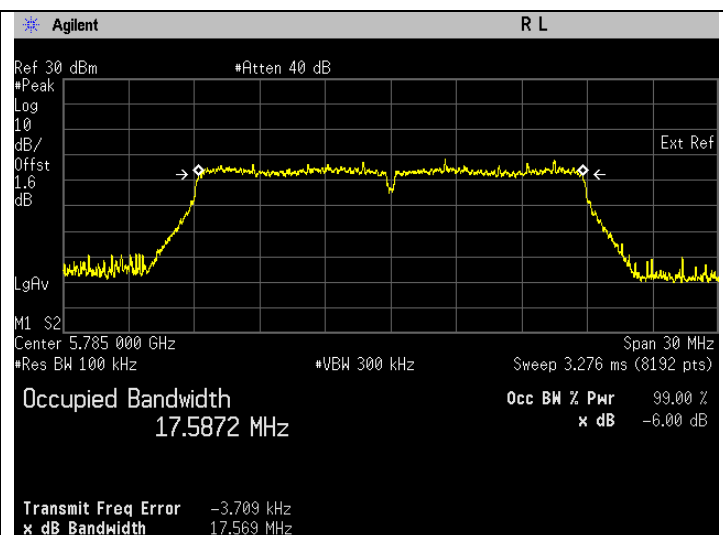
Frequency 5825 MHz

802.11n (HT20)

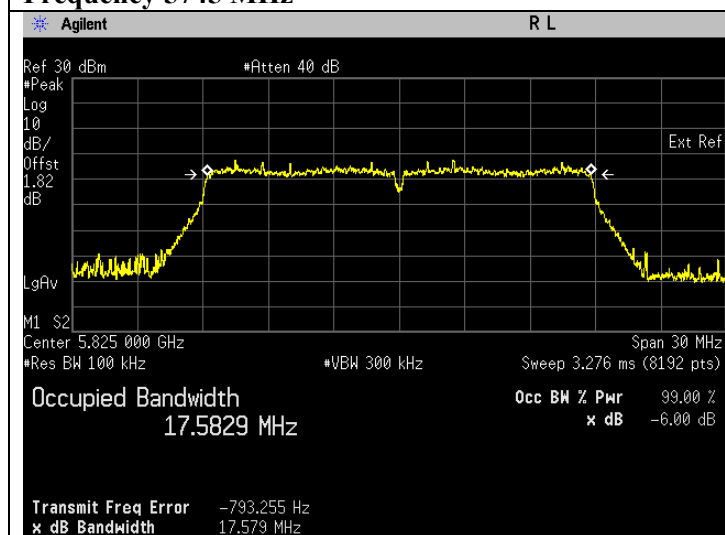
Freq. (MHz)	Test Configuration	Results	
		Bandwidth(MHz)	Status
5745	Mod Type: BPSK, Data Rate: MCS0 (6.5)	17.584	Pass
5785	Mod Type: BPSK, Data Rate: MCS0 (6.5)	17.569	Pass
5825	Mod Type: BPSK, Data Rate: MCS0 (6.5)	17.579	Pass



Frequency 5745 MHz



Frequency 5785 MHz

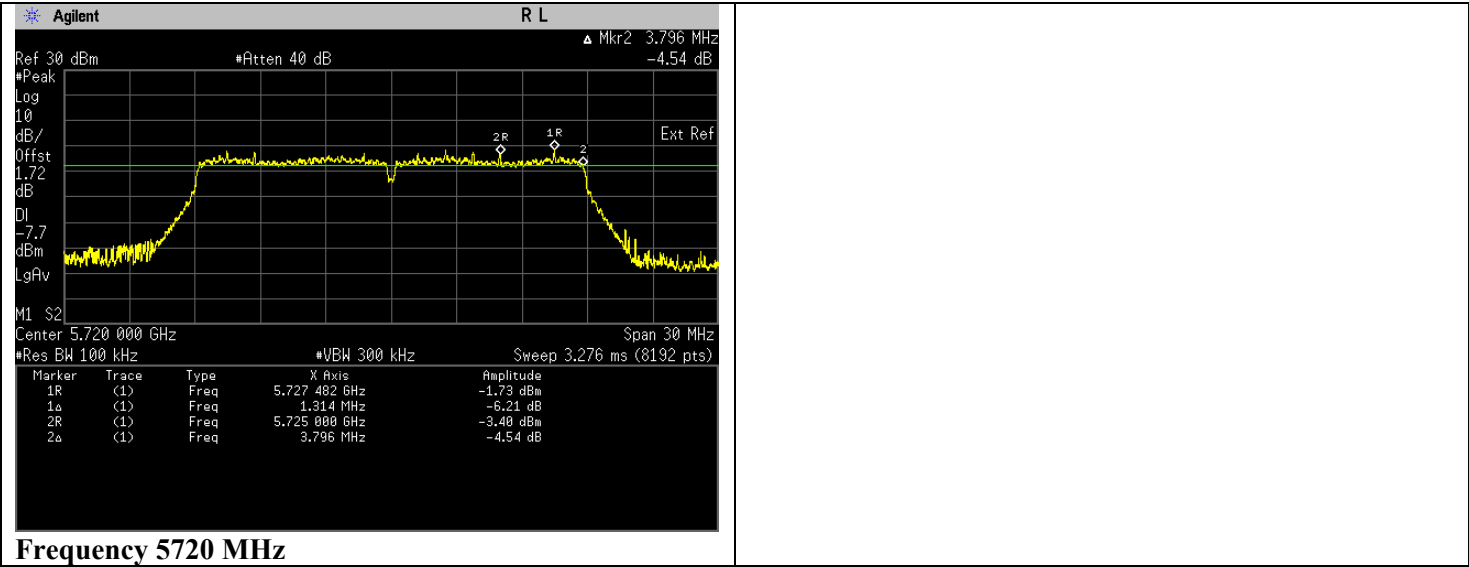


Frequency 5825 MHz

Straddle Frequency for 802.11n (HT20)

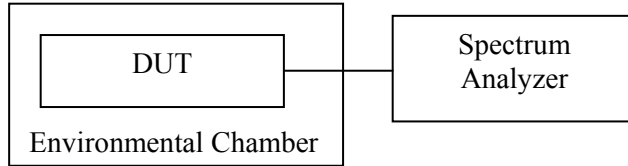
Freq. (MHz)	Test Conditions	Results	
		Power/Freq. (dBm/MHz)	Status
		U-NII- 3	
5720	Mod Type: BPSK, Data Rate: MCS0 (6.5)	3.796	Pass

Plots for 802.11n (HT20) Straddle Frequency



7.3. Frequency Stability

7.3.1. Test Setup



- a) Test setup as per illustrated above.
- b) Set DUT to transmit un-modulated signal at desire transmit frequency.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) The DUT was operated at the maximum output power, and spectrum which is set to maximum hold function and peak detector.
- e) The peak value of the power envelope was measured and noted.
- f) Test was conducted from temperature range from -30⁰C to 50⁰C with step size of 10⁰C on manufacturer's rated supply voltage.
- g) At temperature of 20⁰C, +/-15% of manufacturer's rated voltage are to be applied.
- h) The frequency stability is measured and recorded of frequency deviation due to temperature and supply voltage variations as mentioned at condition f) & g) above.

7.3.2. Test Limits

FCC 15.407(g)

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

RSS-GEN 6.11

7.3.3. Test Data

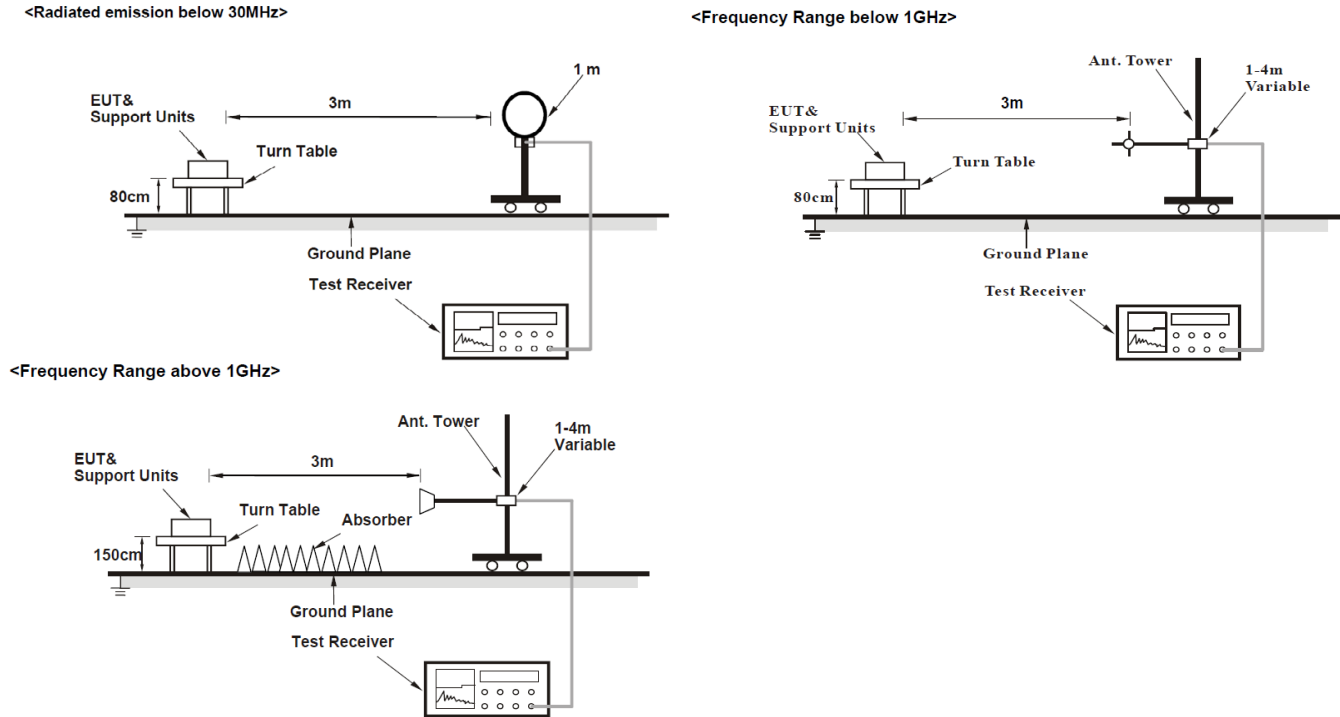
802.11a

Test Configuration	Test Frequency
	Tx (MHz)
Mod Type: BPSK, Data Rate: 6	5180

Temperature(°C)	Voltage	Results			
		Measured Frequency(MHz)	Frequency Error(kHz)	Frequency Error(%)	Status
20	+15%	5179.998602	1.398000	0.000027	Pass
	±0%	5179.998895	1.105000	0.000021	Pass
	-15%	5179.999644	0.356000	0.000007	Pass
-30		5179.999878	0.122000	0.000002	Pass
-20		5179.999483	0.517000	0.000010	Pass
-10		5179.998666	1.334000	0.000026	Pass
0		5179.998055	1.945000	0.000038	Pass
10		5179.998051	1.949000	0.000038	Pass
30		5179.998429	1.571000	0.000030	Pass
40		5179.998442	1.558000	0.000030	Pass
50		5179.998461	1.539000	0.000030	Pass

7.4. Band Edge Radiated Spurious Emission Measurement

7.4.1. Test Setup



1. The EUT is placed on the top of a rotating table 0.8m/1.5m above the ground at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
2. The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
3. The antenna is Bilog/Horn antenna depend on which frequency range uses, 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.
4. For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, 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. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection using reduced video bandwidth (Duty cycle $\geq 98\%$) at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $1/\tau$ Hz, where τ is minimum transmitter on time (Duty cycle $< 98\%$) for Average detection using reduced video bandwidth at frequency above 1GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

7.4.2. Test Limits

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency (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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, 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.

For Radiated emissions which fall out of the restricted bands must comply with the radiated emission limits specified as below table.

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v01r03		Field Strength at 3 m	
		PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
5150–5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
5250–5350 MHz	15.407(b)(2)		
5470–5725 MHz	15.407(b)(3)		
5725–5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2 (dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8 (dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			
^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.			
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			
^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			

NOTE:

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

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

7.4.3. Test Result

802.11a

Test: WIFI SAC Restricted Band Edge

Model Number: M25URS9PW1BN S/N: 471TVF3482 EMC SR ID#: 14913-EMC-00024

Battery: NA Accessory: AN000163A01, AN000197A10, 3466-HMN4079G-4, HSN4040A-C4, HKN4191B-2, 3466-HKN6163C-2, PMHN4194C-CF3

Test Channel: Low Test Frequency: 5180.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Y-Plane (802.11a 20MHz)

Restricted Band Edge (Low Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBμV/m)	Spur level PK (dBμV/m)	Spur level AV (dBμV/m)	Limit QPK (dBμV/m)	Limit PK (dBμV/m)	Limit AV (dBμV/m)	Margin QPK (dBμV/m)	Margin PK (dBμV/m)	Margin AV (dBμV/m)	Carrier PK Power (dBμV/m)
5005.8500	-	-	42.6711	-	-	54.0000	-	-	-11.3289	-
5065.2500	-	-	43.4829	-	-	54.0000	-	-	-10.5171	-
5067.6500	-	-	42.6922	-	-	54.0000	-	-	-11.3078	-
5089.5500	-	-	42.8062	-	-	54.0000	-	-	-11.1938	-
5104.8500	-	-	42.6926	-	-	54.0000	-	-	-11.3074	-
5107.2500	-	-	42.8030	-	-	54.0000	-	-	-11.1970	-
5108.7500	-	-	42.8751	-	-	54.0000	-	-	-11.1249	-
5124.0500	-	-	42.6098	-	-	54.0000	-	-	-11.3902	-
5127.6500	-	-	42.4499	-	-	54.0000	-	-	-11.5501	-
5139.6500	-	-	44.8607	-	-	54.0000	-	-	-9.1393	-
5150.0000	-	61.6442	44.4788	-	74.0000	54.0000	-	-12.3558	-9.5212	-
Horizontal Radiated Emission Result										
5001.3500	-	-	42.1037	-	-	54.0000	-	-	-11.8963	-
5104.8500	-	-	42.0452	-	-	54.0000	-	-	-11.9548	-
5135.7500	-	-	42.0145	-	-	54.0000	-	-	-11.9855	-
5150.0000	-	51.6575	41.2210	-	74.0000	54.0000	-	-22.3425	-12.7790	-

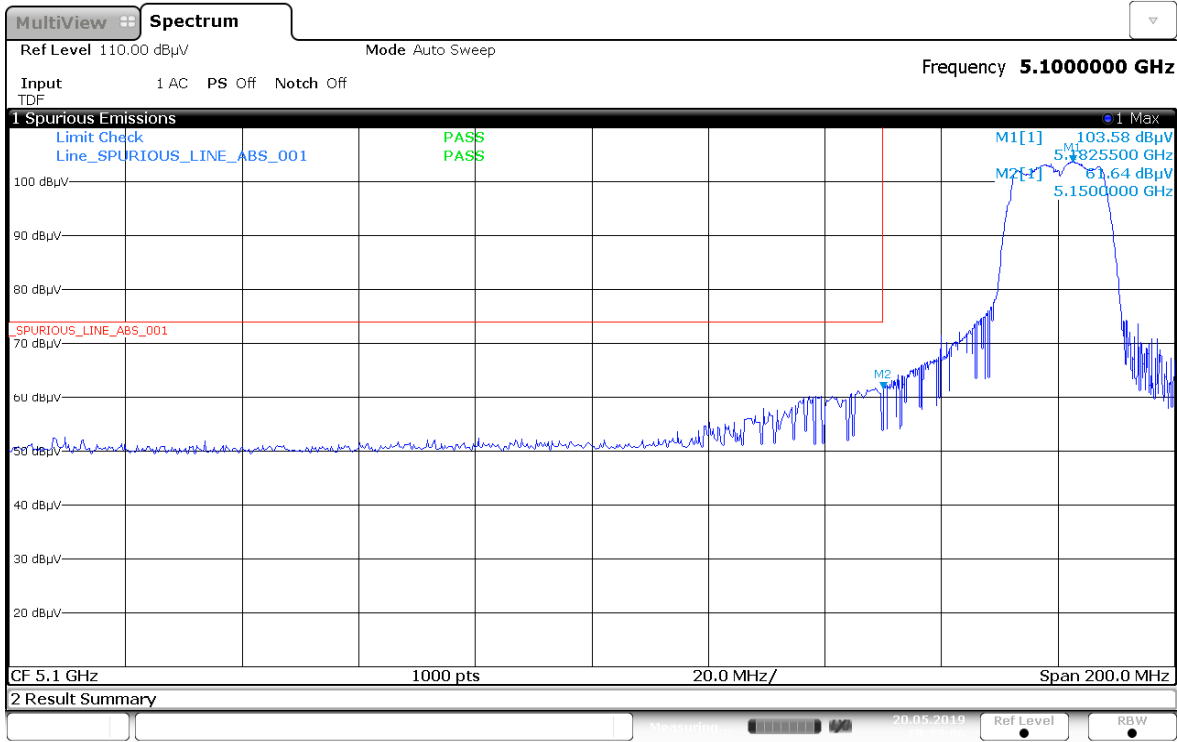
Remarks: Pass Result	Marginal Result	Fail Result
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Temperature (degC):23.6
Test Performed by: Qawiman&Nazrin
5.01dB

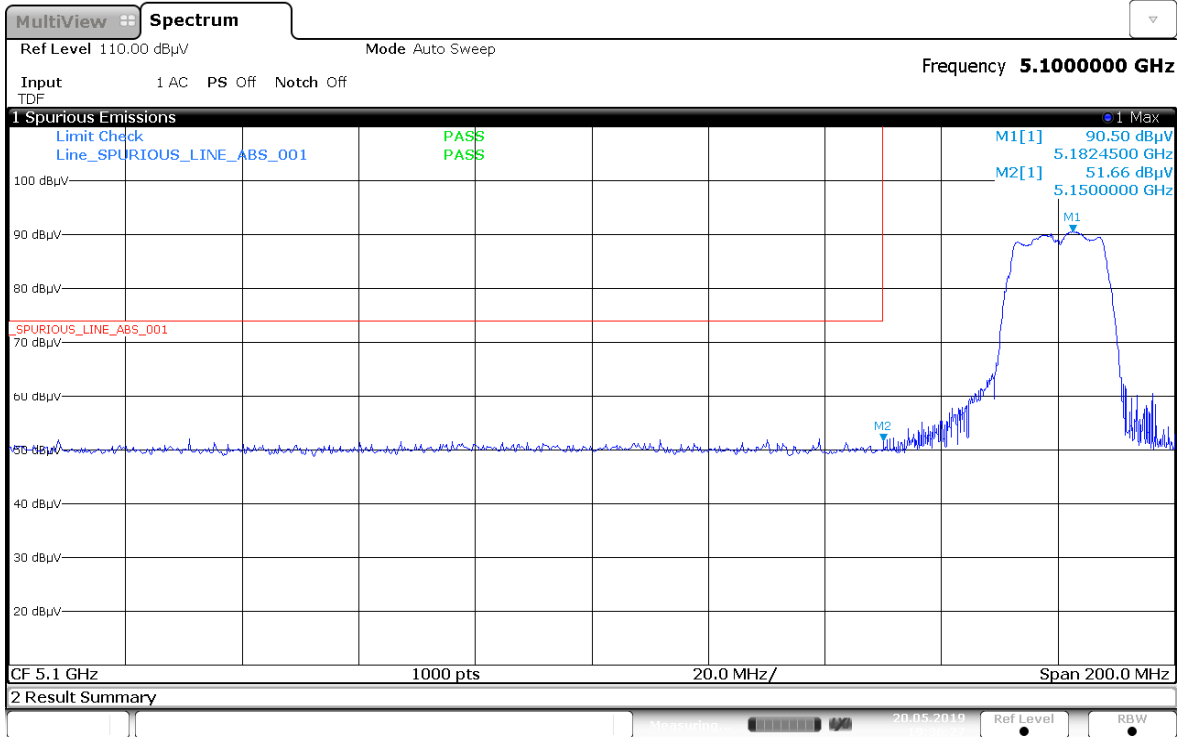
Humidity (%): 69.3
Test Date: Tue, May 21, 2019

System MU:

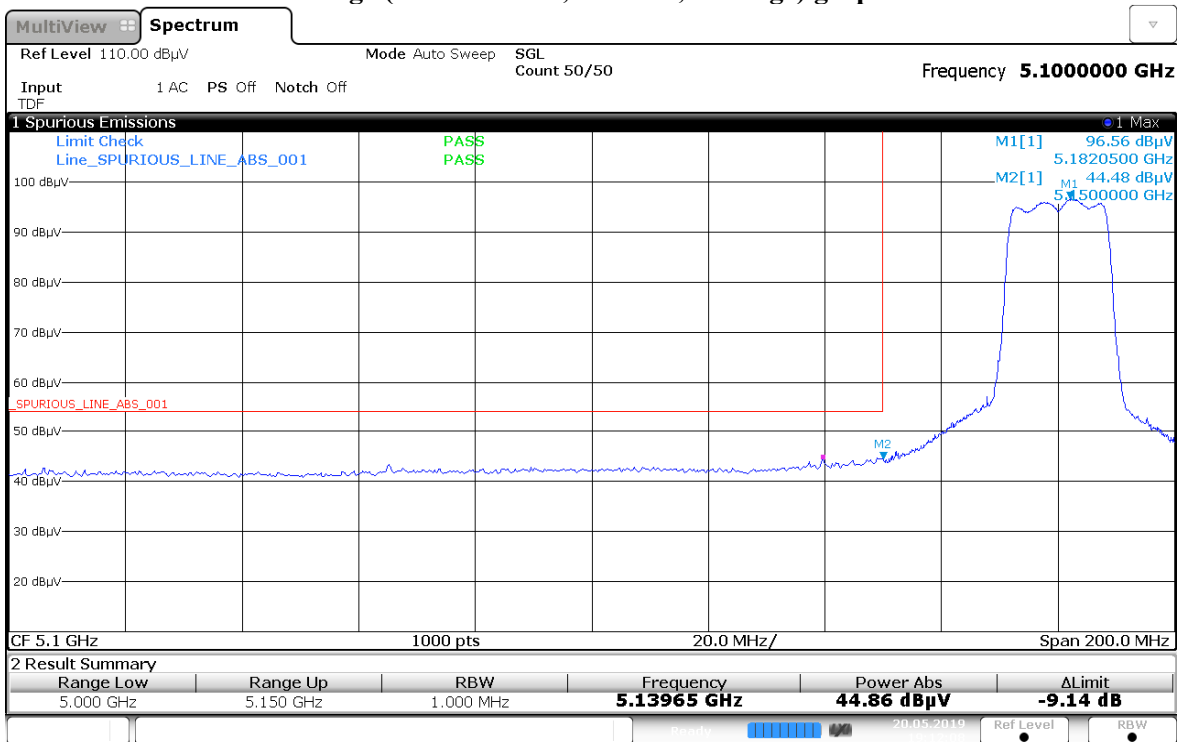
Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



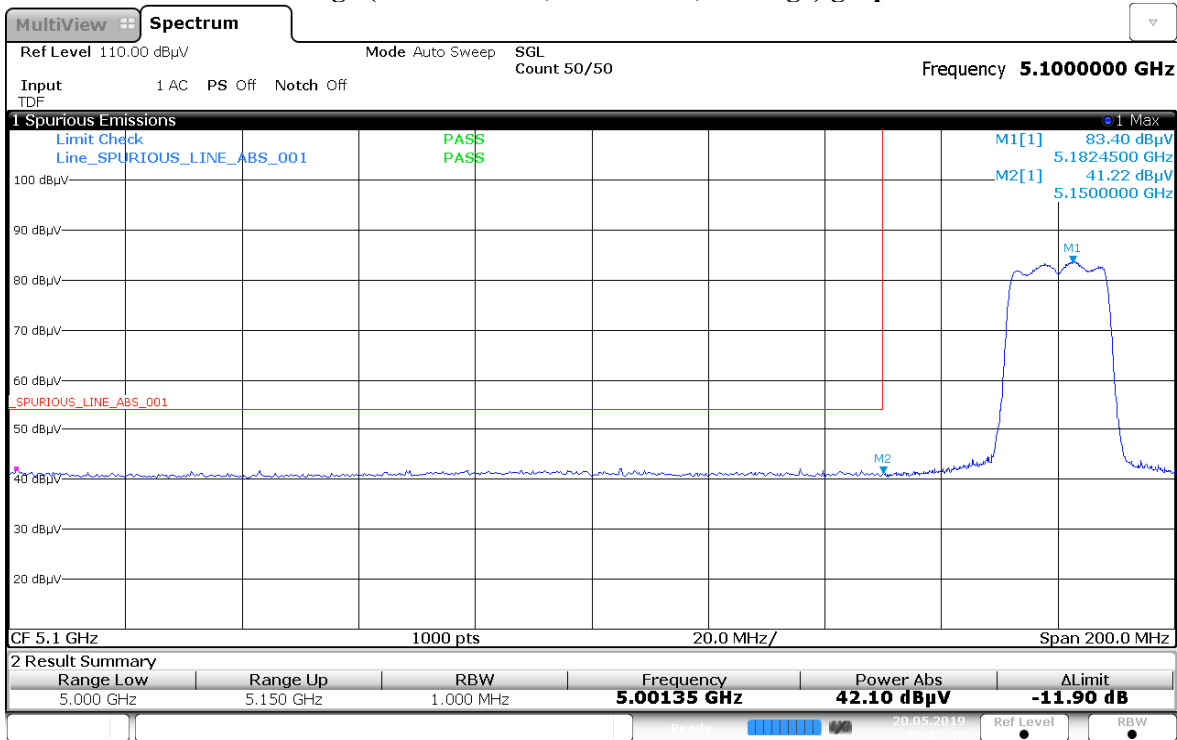
Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot

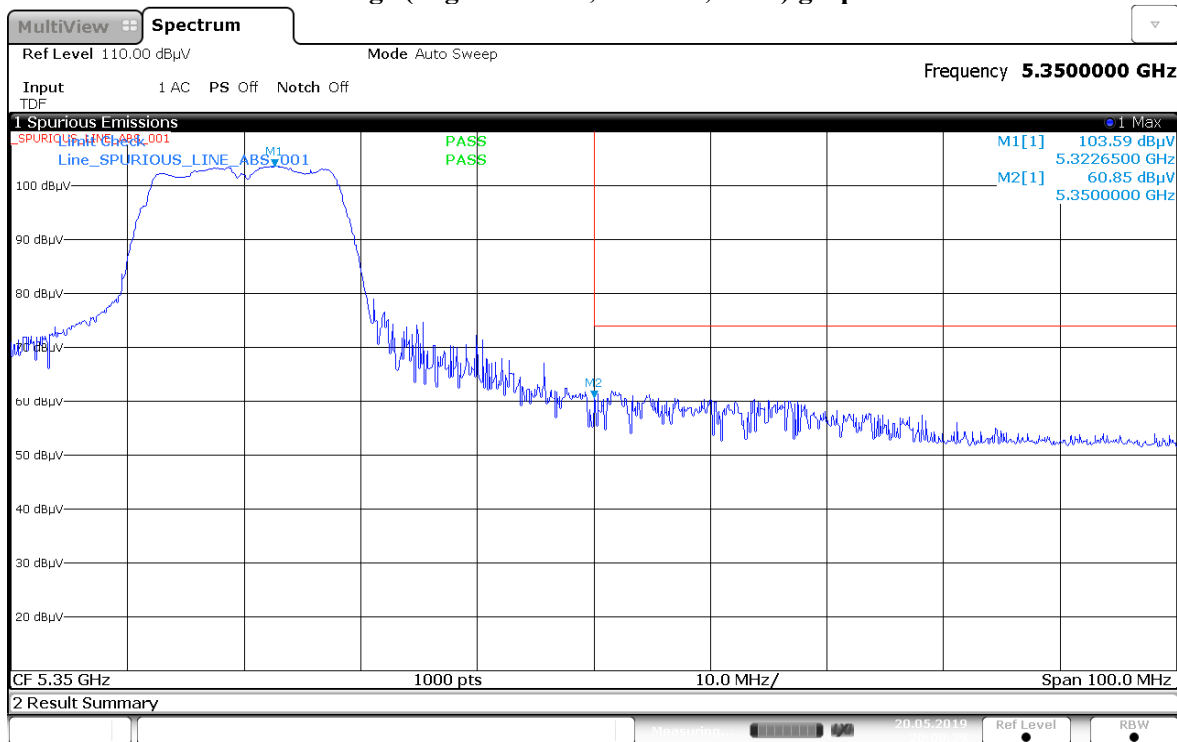


Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot

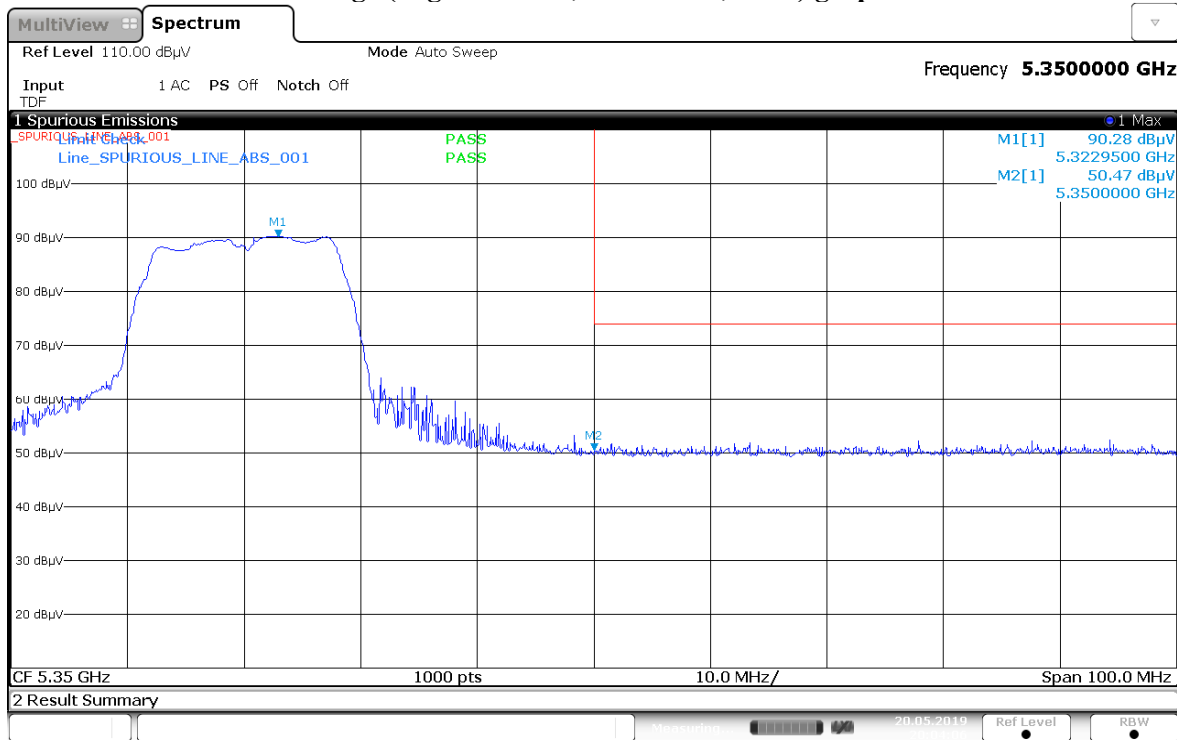


Test Channel: High Test Frequency: 5320.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Y-Plane (802.11a 20MHz)

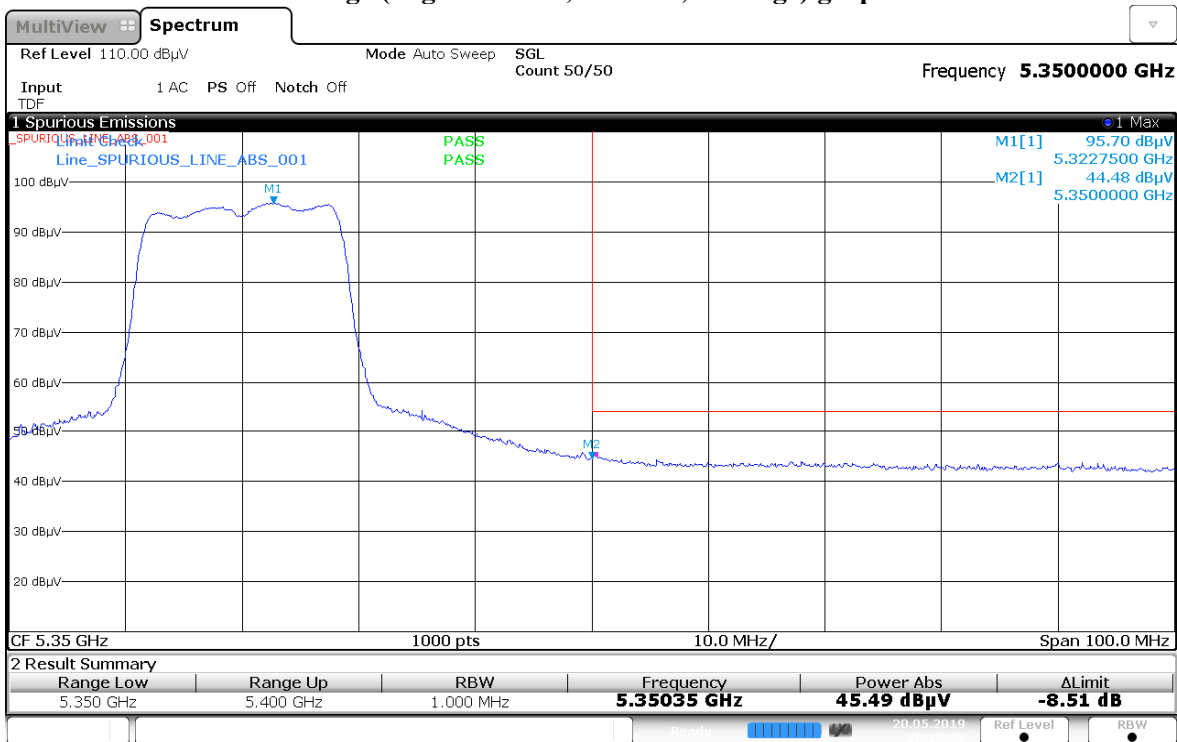
Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



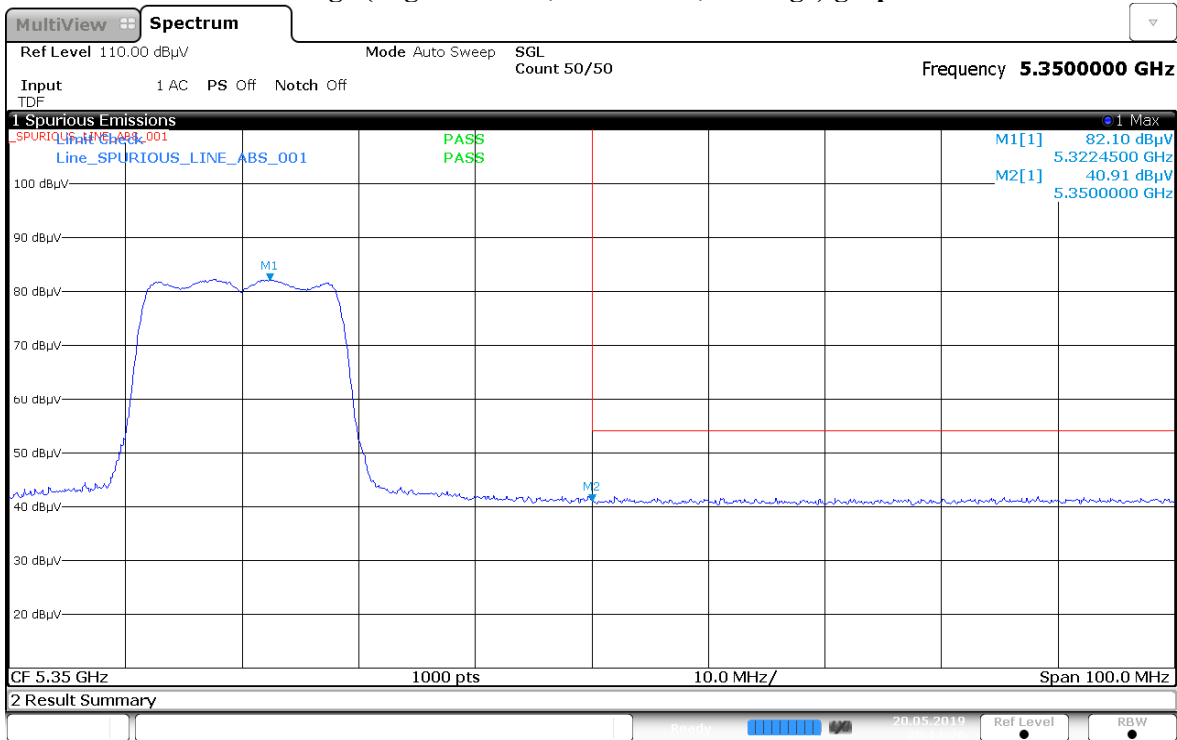
Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



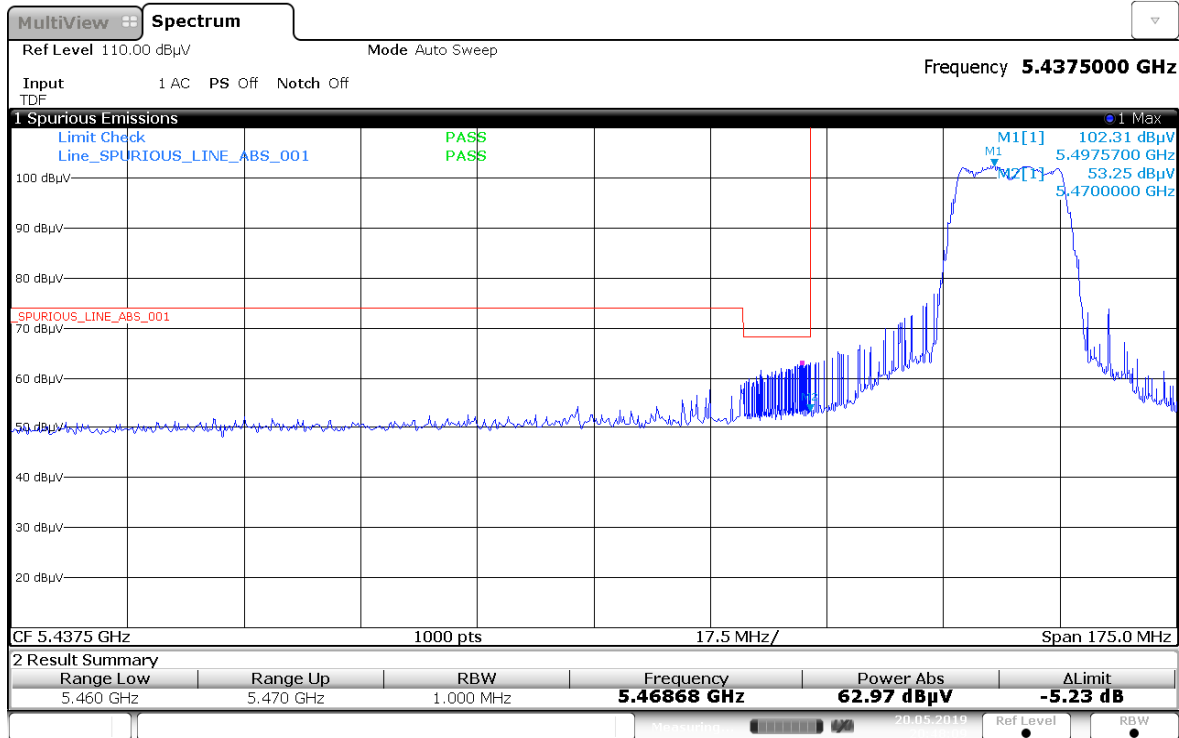
Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



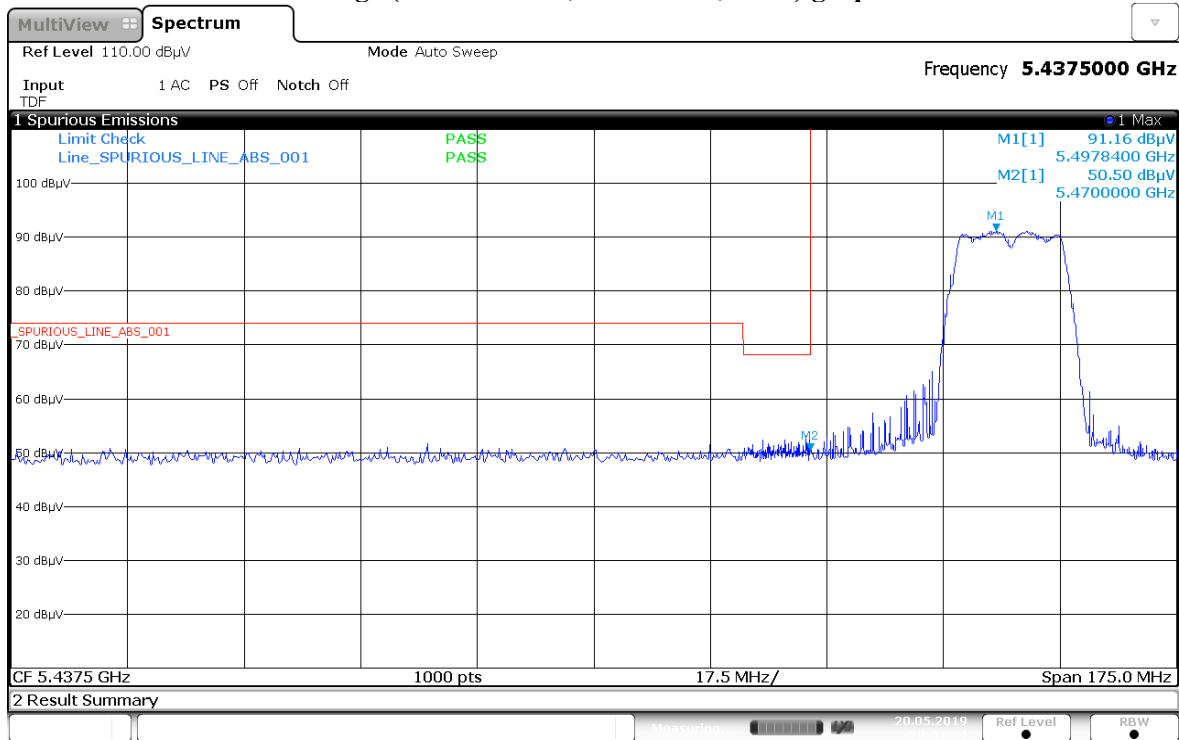
Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



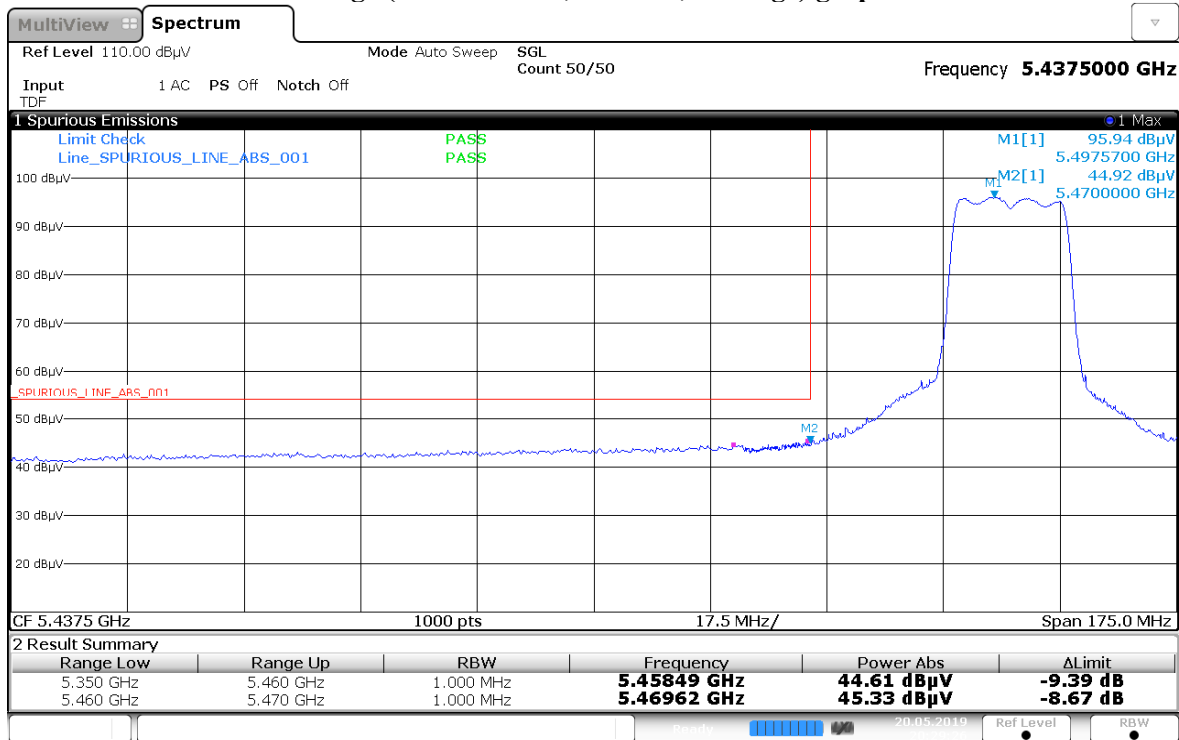
Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



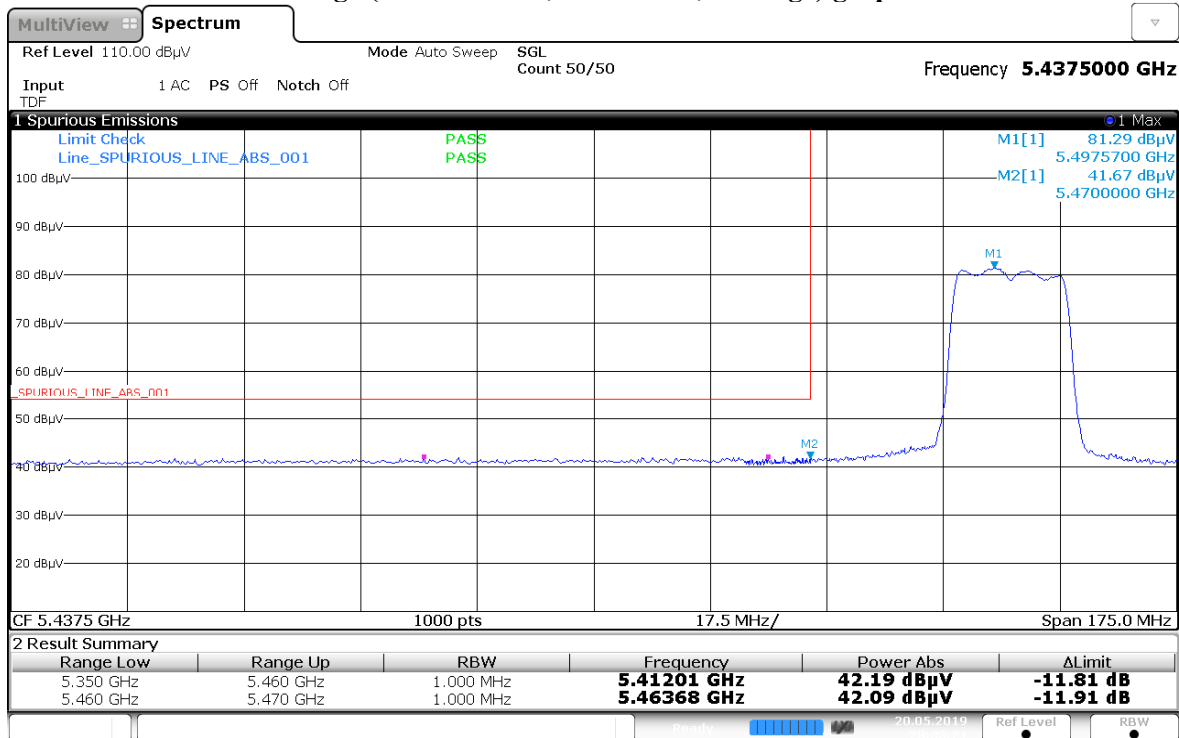
Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



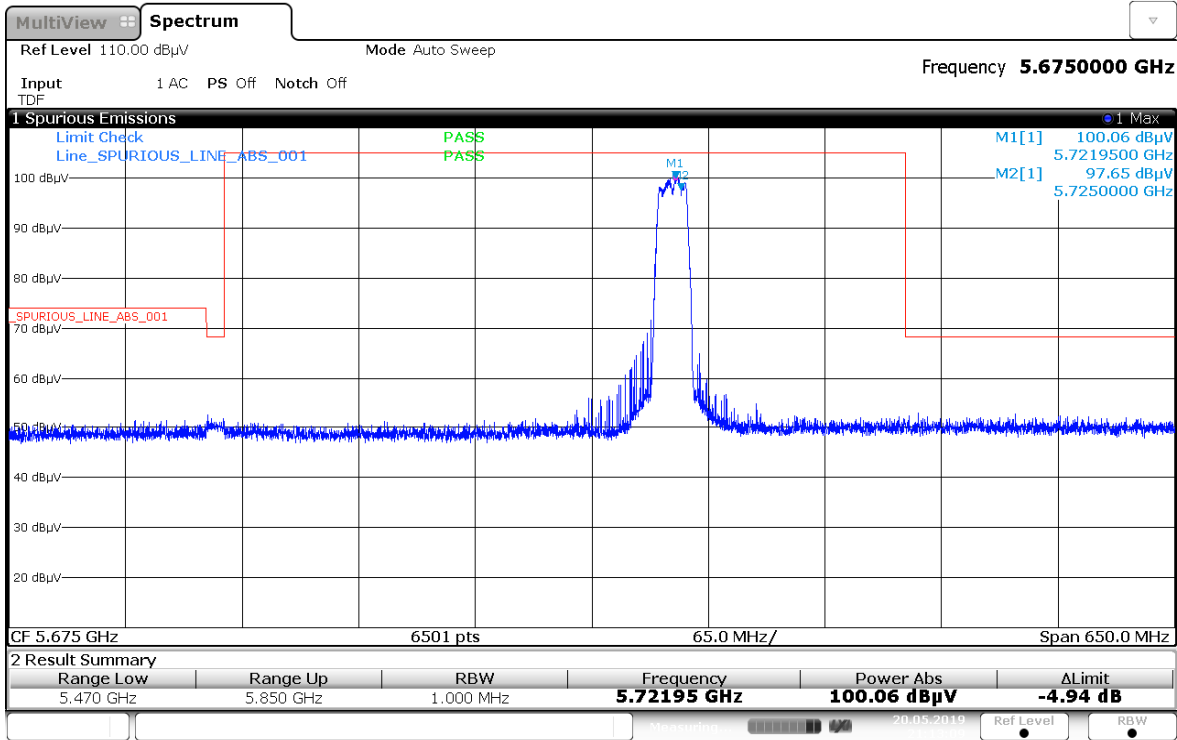
Test Channel: Straddle Test Frequency: 5720.0000 MHz Test Standard: ANSI C63.10-2013
Worst Case Plane: Y-Plane (802.11a 20MHz)

[illegible]

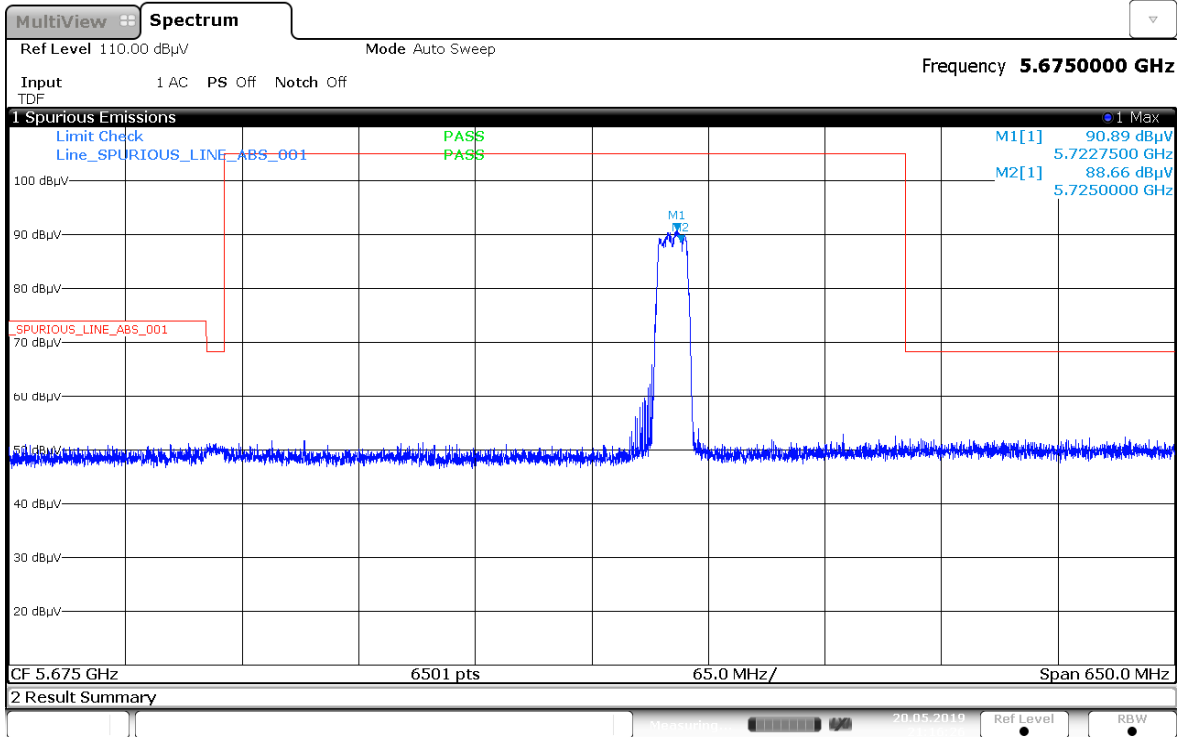
Remarks: Pass Result	Marginal Result	Fail Result
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Humidity (%): 69.3
Test Date: Tue, May 21, 2019

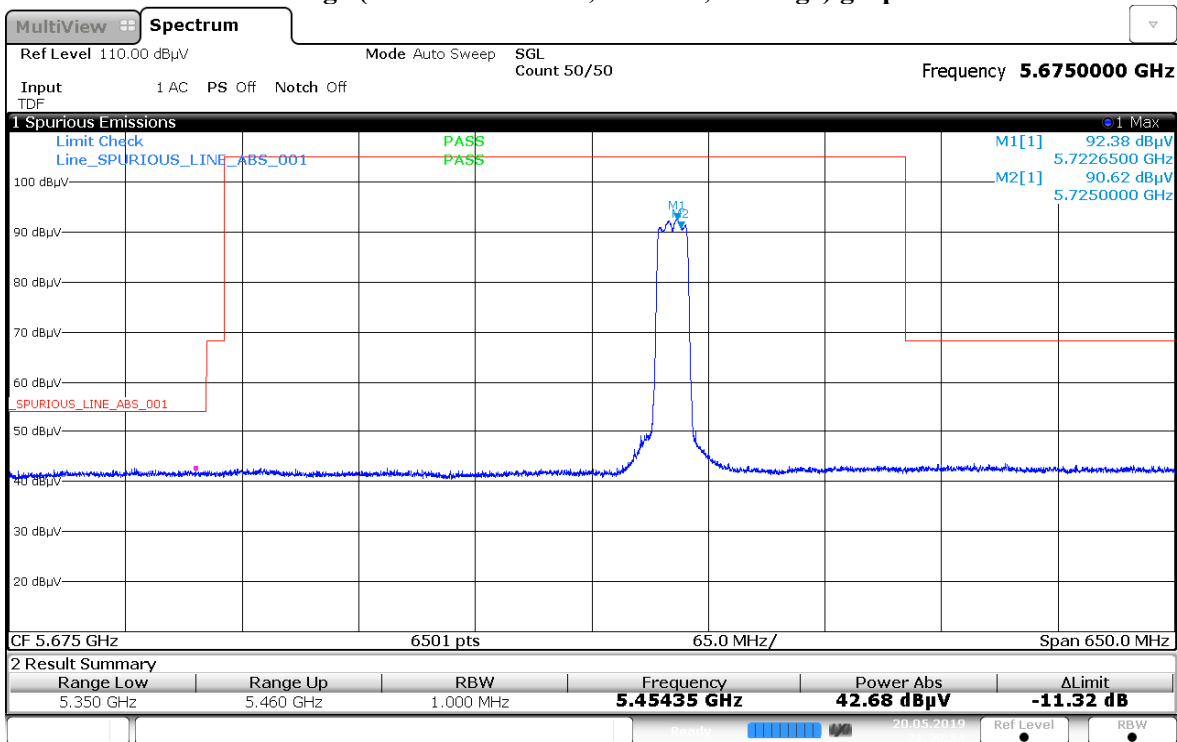
Restricted Band Edge (Straddle Channel, Vertical, Peak) graphical screen shot



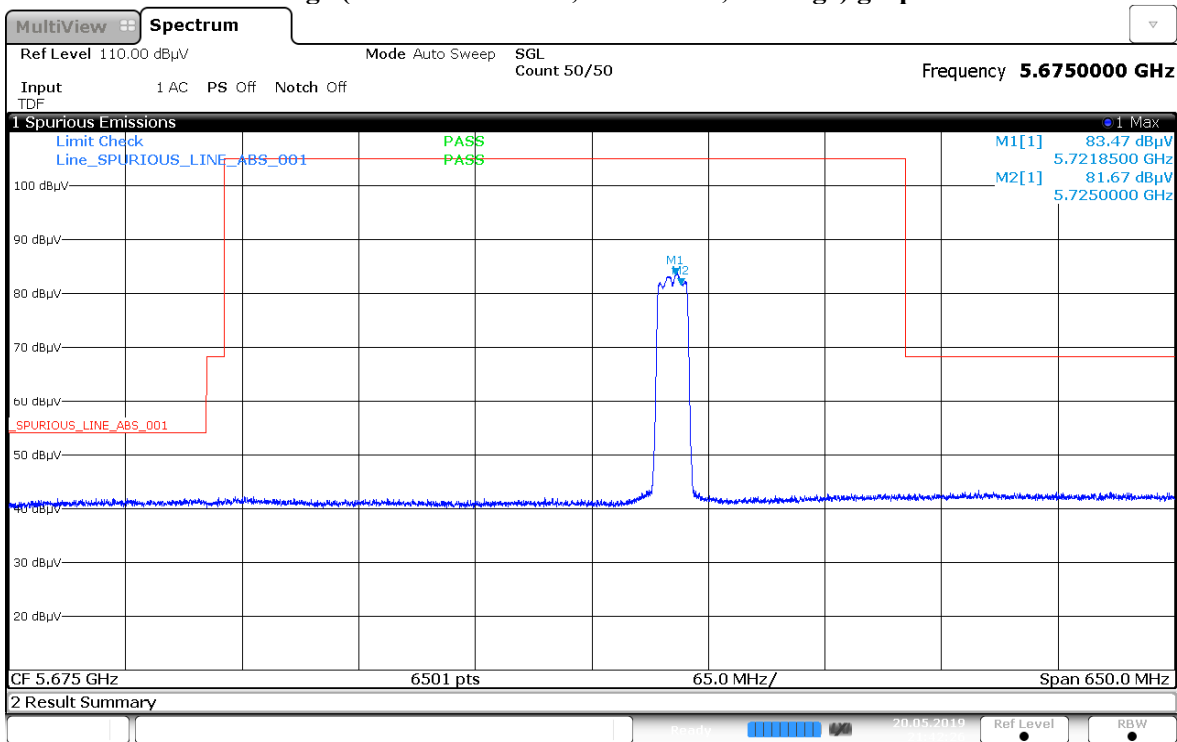
Restricted Band Edge (Straddle Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Straddle Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (Straddle Channel, Horizontal, Average) graphical screen shot



Test: WIFI SAC Restricted Band Edge

Model Number: M25URS9PW1BN S/N: 471TVF3482 EMC SR ID#: 14913-EMC-00024

Battery: NA Accessory: AN000163A01, AN000197A10, 3466-HMN4079G-4, HSN4040A-C4, HKN4191B-2, 3466-HKN6163C-2, PMHN4194C-CF3

**Test Channel: Low Test Frequency: 5745.0000 MHz Test Standard: ANSI C63.10-2013
 Worst Case Plane: Y-Plane (802.11a 20MHz)**

Restricted Band Edge (Low Channel) tabular data

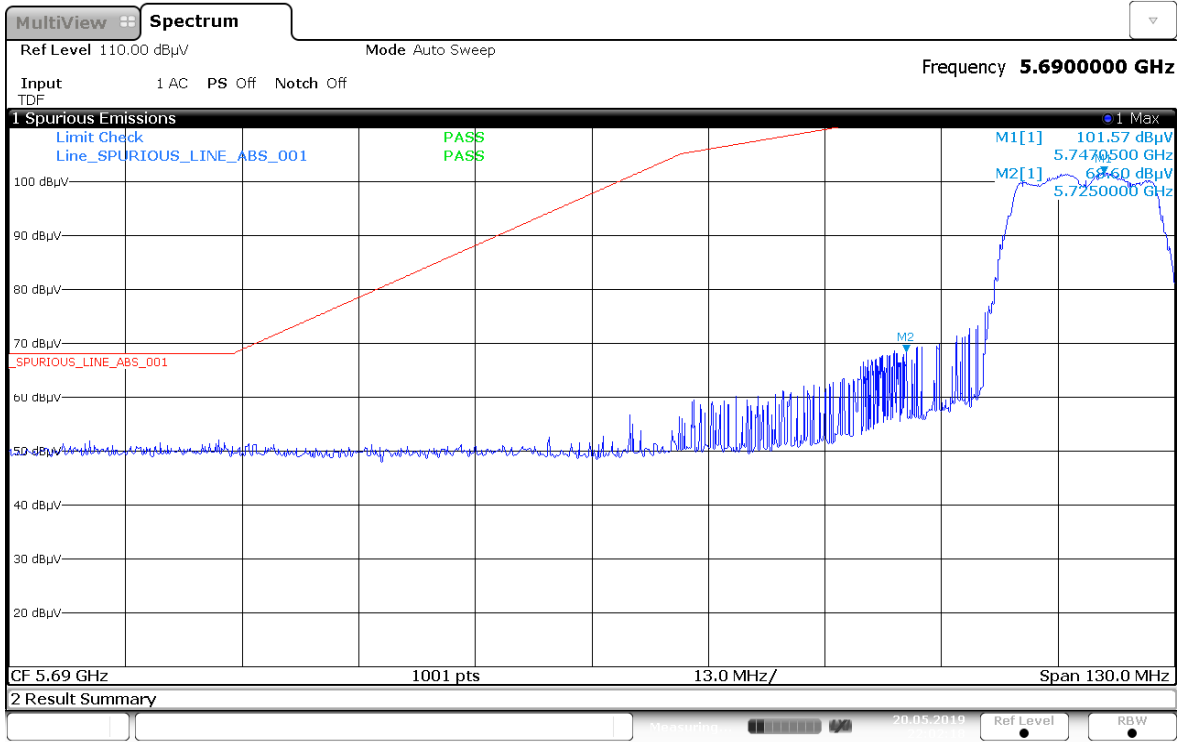
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBμV/m)	Spur level PK (dBμV/m)	Spur level AV (dBμV/m)	Limit QPK (dBμV/m)	Limit PK (dBμV/m)	Limit AV (dBμV/m)	Margin QPK (dBμV/m)	Margin PK (dBμV/m)	Margin AV (dBμV/m)	Carrier PK Power (dBμV/m)
5650.0833	-	-	42.3389	-	-	54.0000	-	-	-11.6611	-
5659.9167	-	-	42.4428	-	-	54.0000	-	-	-11.5572	-
5663.9167	-	-	42.3294	-	-	54.0000	-	-	-11.6706	-
5666.4167	-	-	42.6189	-	-	54.0000	-	-	-11.3811	-
5676.4167	-	-	42.6914	-	-	54.0000	-	-	-11.3086	-
5695.9167	-	-	42.3624	-	-	54.0000	-	-	-11.6376	-
5697.7500	-	-	42.9757	-	-	54.0000	-	-	-11.0243	-
5699.4167	-	-	42.8575	-	-	54.0000	-	-	-11.1425	-
5700.7333	-	-	42.7758	-	-	54.0000	-	-	-11.2242	-
5705.2667	-	-	42.9330	-	-	54.0000	-	-	-11.0670	-
5709.4000	-	-	42.9983	-	-	54.0000	-	-	-11.0017	-
5718.6000	-	-	45.3437	-	-	54.0000	-	-	-8.6563	-
5724.3812	-	-	47.0018	-	-	54.0000	-	-	-6.9982	-
5725.0000	-	68.5963	46.7630	-	74.0000	54.0000	-	-5.4037	-7.2370	-
Horizontal Radiated Emission Result										
5698.7500	-	-	42.1971	-	-	54.0000	-	-	-11.8029	-
5722.2525	-	-	42.3846	-	-	54.0000	-	-	-11.6154	-
5722.5990	-	-	42.0589	-	-	54.0000	-	-	-11.9411	-
5724.4802	-	-	42.6752	-	-	54.0000	-	-	-11.3248	-
5725.0000	-	50.2561	41.5585	-	74.0000	54.0000	-	-23.7439	-12.4415	-

Remarks: Pass Result	Marginal Result	Fail Result
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Temperature (degC):23.6
 Test Performed by: Qawiman&Nazrin
 System MU: 5.01dB

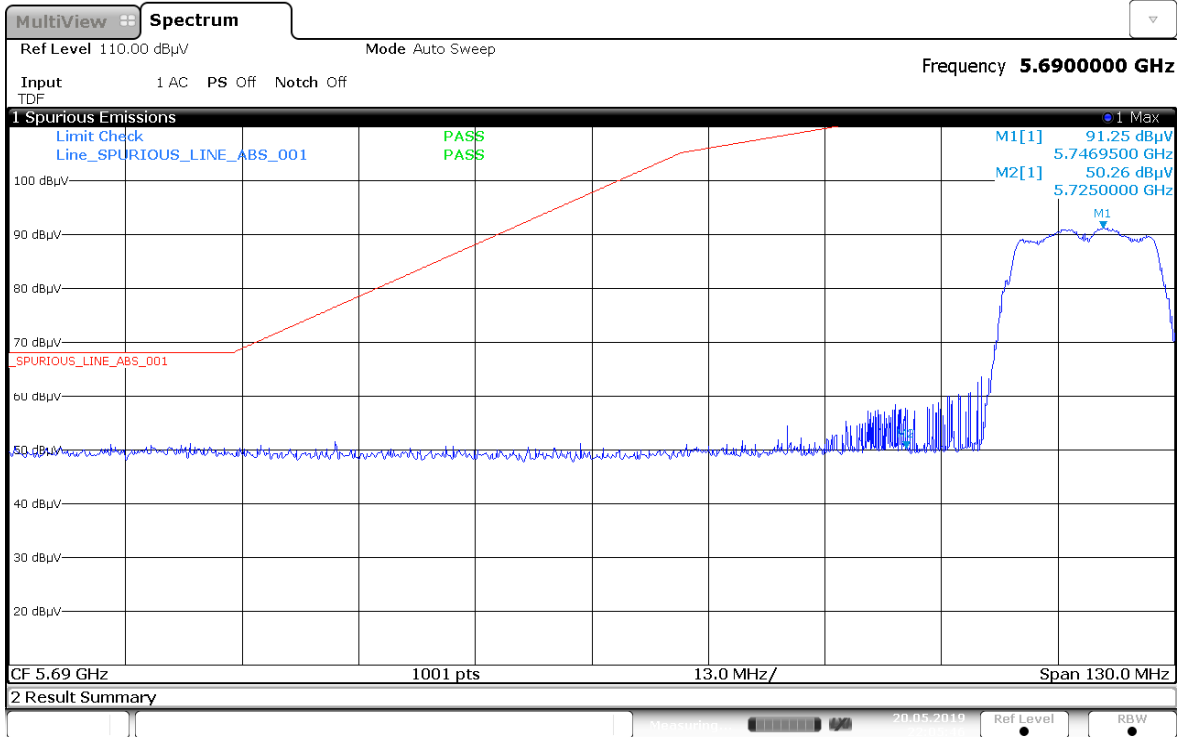
Humidity (%): 69.3
 Test Date: Tue, May 21, 2019

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



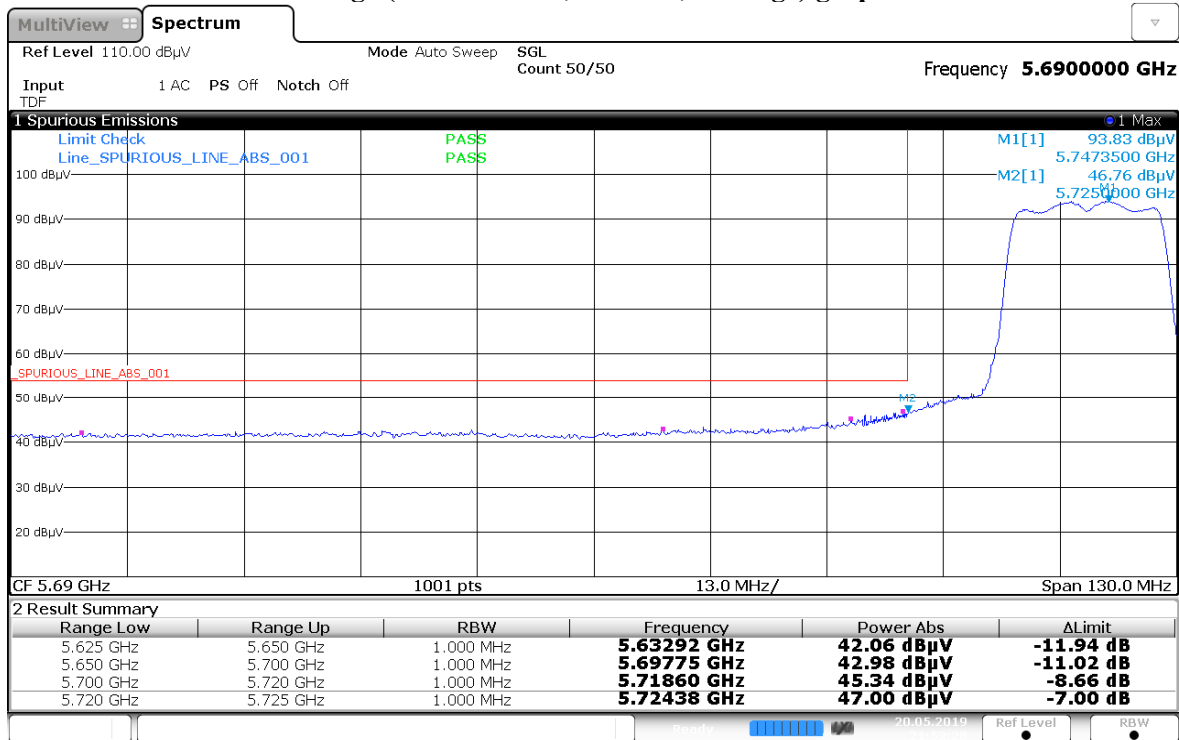
22:02:19 20.05.2019

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



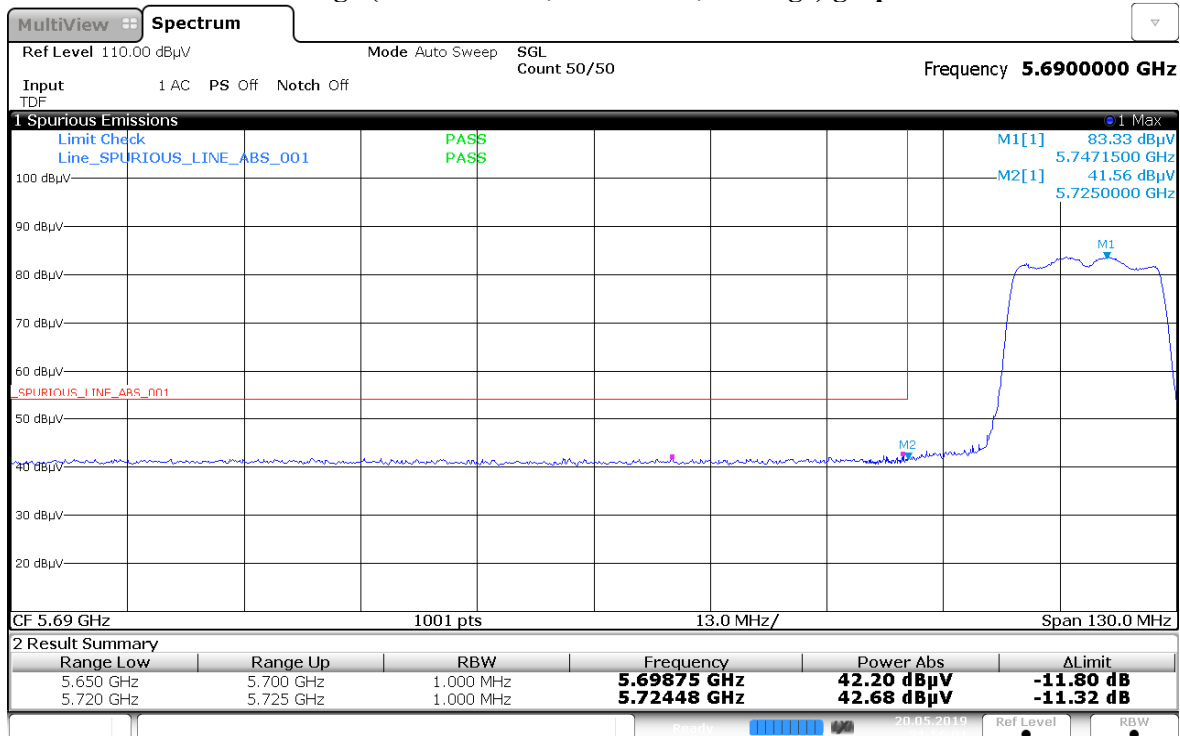
22:05:47 20.05.2019

Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



21:52:29 20.05.2019

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



21:56:02 20.05.2019

Test: WIFI SAC Restricted Band Edge

Model Number: M25URS9PW1BN **S/N:** 471TVF3482 **EMC SR ID#:** 14913-EMC-00024

Battery: NA **Accessory:** AN000163A01, AN000197A10, 3466-HMN4079G-4, HSN4040A-C4, HKN4191B-2, 3466-HKN6163C-2, PMHN4194C-CF3

Test Channel: High **Test Frequency:** 5825.0000 MHz **Test Standard:** ANSI C63.10-2013
Worst Case Plane: Y-Plane (802.11a 20MHz)

Restricted Band Edge (High Channel) tabular data

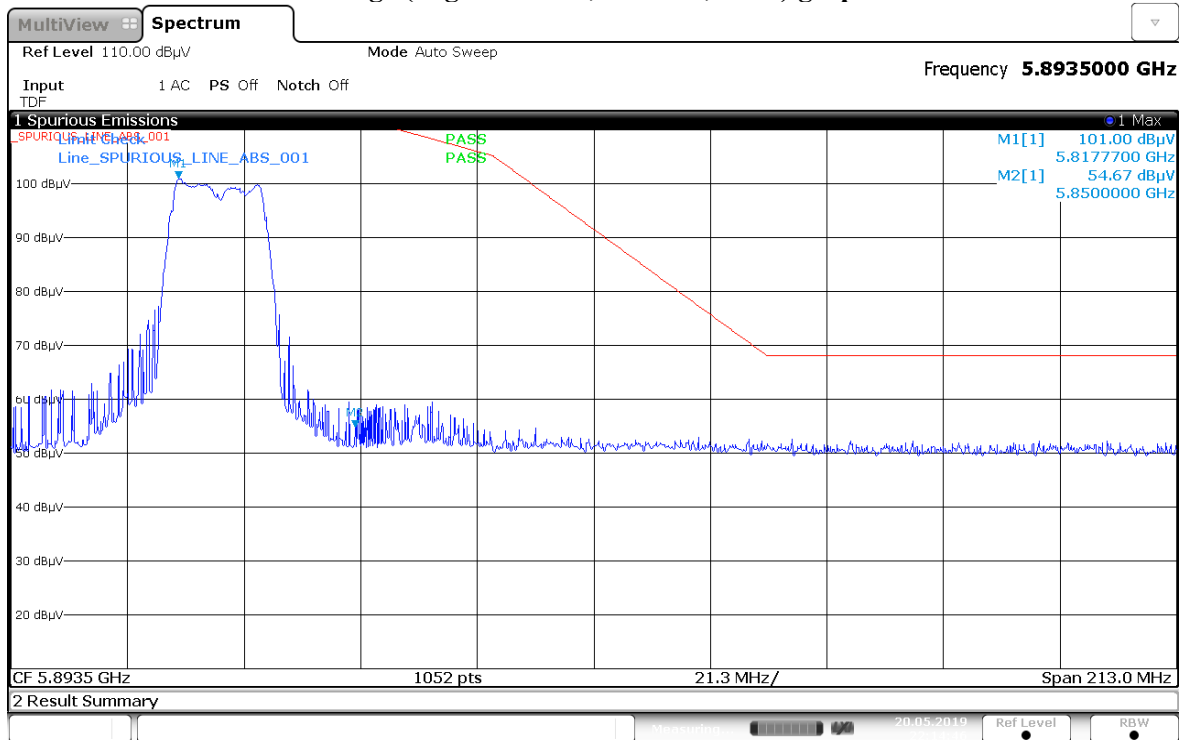
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBμV/m)	Spur level PK (dBμV/m)	Spur level AV (dBμV/m)	Limit QPK (dBμV/m)	Limit PK (dBμV/m)	Limit AV (dBμV/m)	Margin QPK (dBμV/m)	Margin PK (dBμV/m)	Margin AV (dBμV/m)	Carrier PK Power (dBμV/m)
5850.0000	-	54.6715	42.8369	-	74.0000	54.0000	-	-19.3285	-11.1631	-
5851.2129	-	-	43.3220	-	-	54.0000	-	-	-10.6780	-
5859.8515	-	-	44.1569	-	-	54.0000	-	-	-9.8431	-
5883.3750	-	-	43.8775	-	-	54.0000	-	-	-10.1225	-
5928.1071	-	-	43.2242	-	-	54.0000	-	-	-10.7758	-
5956.8214	-	-	43.1318	-	-	54.0000	-	-	-10.8682	-
5972.6786	-	-	43.3536	-	-	54.0000	-	-	-10.6464	-
5989.3929	-	-	43.6340	-	-	54.0000	-	-	-10.3660	-
Horizontal Radiated Emission Result										
5854.5792	-	-	42.3290	-	-	54.0000	-	-	-11.6710	-
5856.2871	-	-	42.9413	-	-	54.0000	-	-	-11.0587	-
5867.1782	-	-	42.8386	-	-	54.0000	-	-	-11.1614	-
5870.3465	-	-	42.7544	-	-	54.0000	-	-	-11.2456	-
5874.3069	-	-	42.8553	-	-	54.0000	-	-	-11.1447	-
5880.3750	-	-	43.2663	-	-	54.0000	-	-	-10.7337	-
5918.8750	-	-	42.8851	-	-	54.0000	-	-	-11.1149	-
5936.2500	-	-	42.9962	-	-	54.0000	-	-	-11.0038	-
5938.6071	-	-	43.0295	-	-	54.0000	-	-	-10.9705	-
5941.6071	-	-	42.9210	-	-	54.0000	-	-	-11.0790	-
5948.2500	-	-	42.8391	-	-	54.0000	-	-	-11.1609	-
5950.6071	-	-	42.7816	-	-	54.0000	-	-	-11.2184	-
5959.3929	-	-	42.8037	-	-	54.0000	-	-	-11.1963	-
5987.0357	-	-	42.8860	-	-	54.0000	-	-	-11.1140	-

Remarks: Pass Result	Marginal Result	Fail Result
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Temperature (degC):23.6
Test Performed by: Qawiman&Nazrin
System MU: 5.01dB

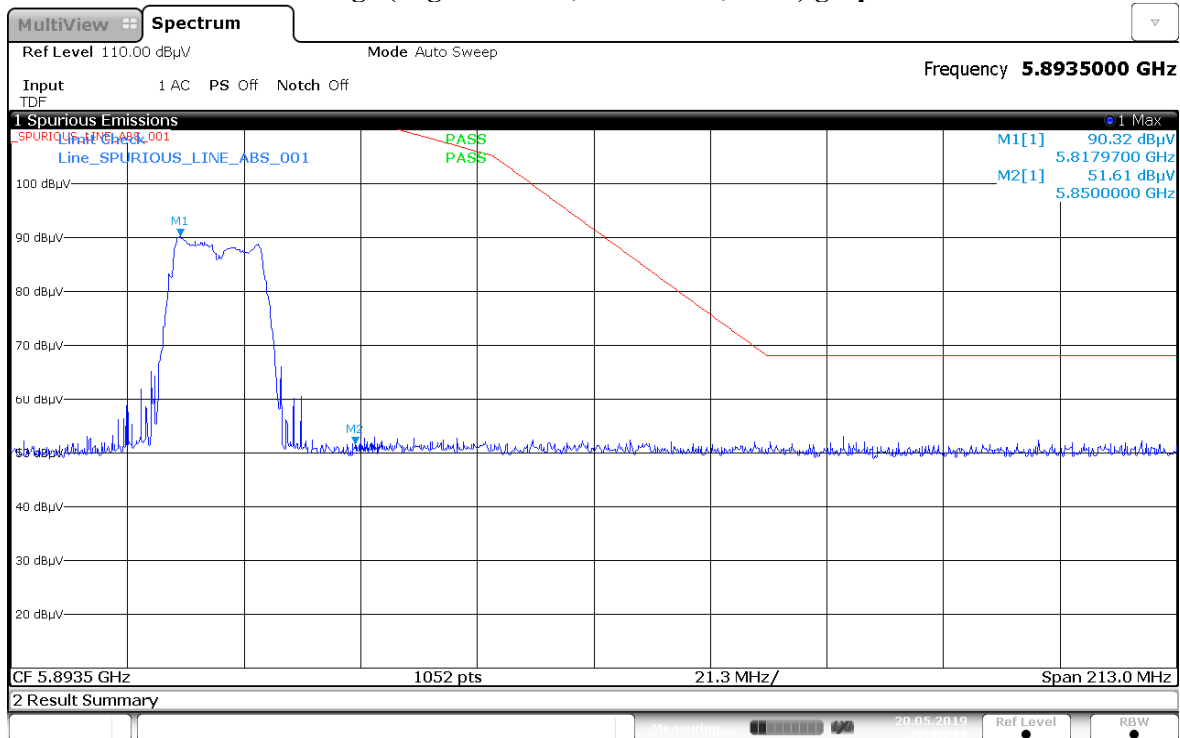
Humidity (%): 69.3
Test Date: Tue, May 21, 2019

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



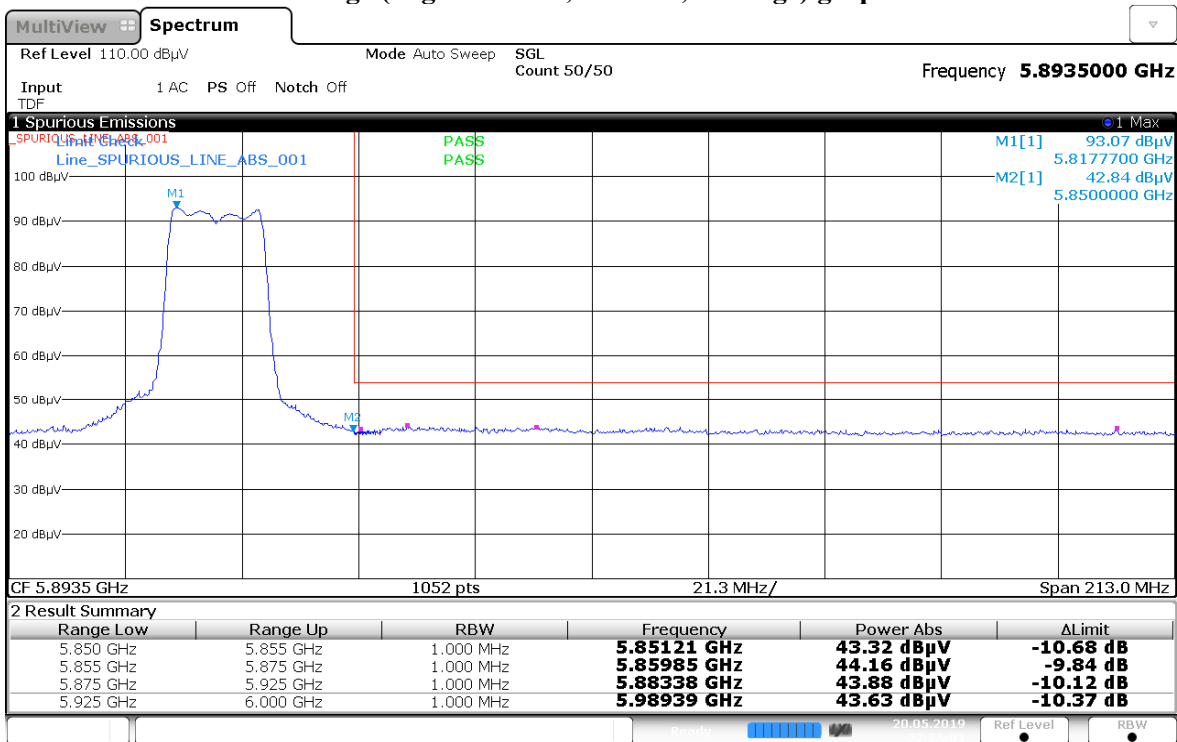
22:14:47 20.05.2019

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot

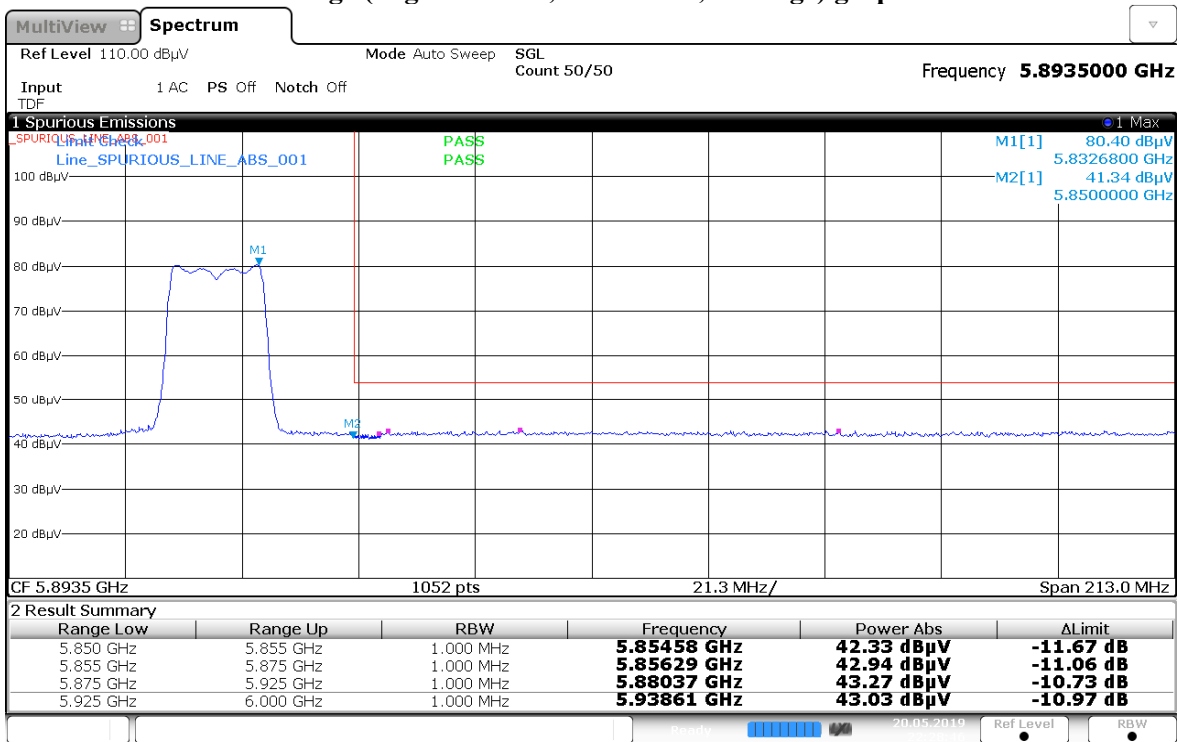


22:18:14 20.05.2019

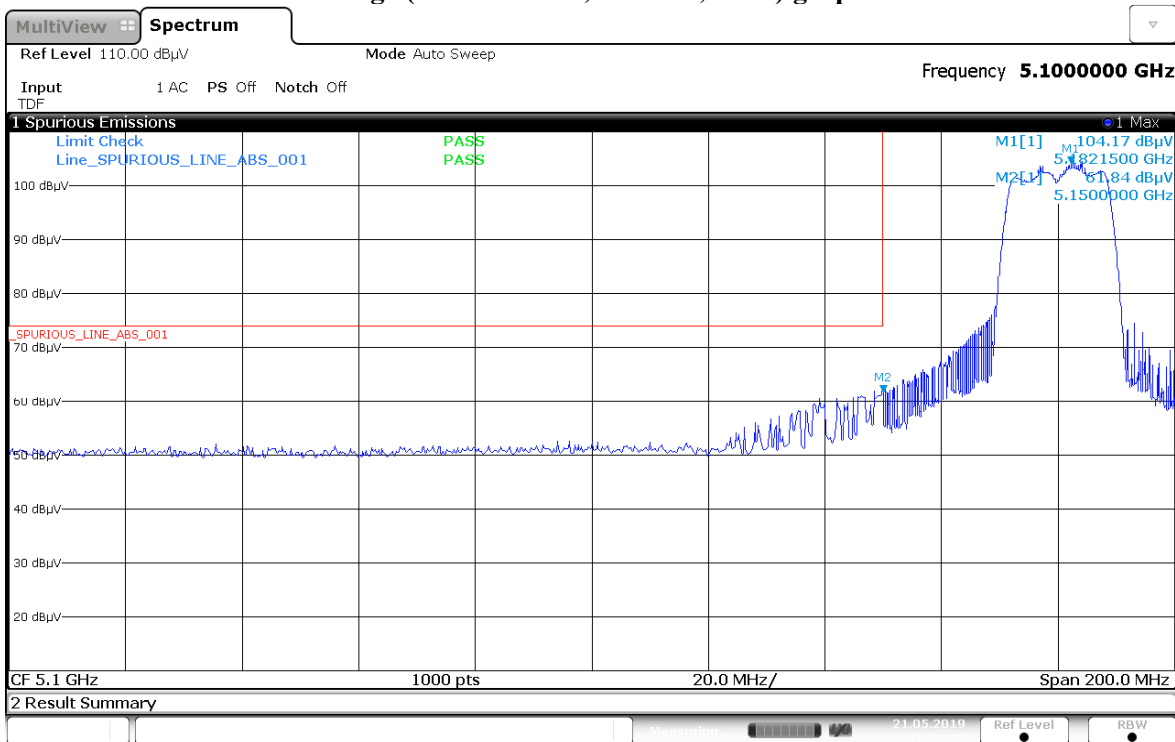
Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot

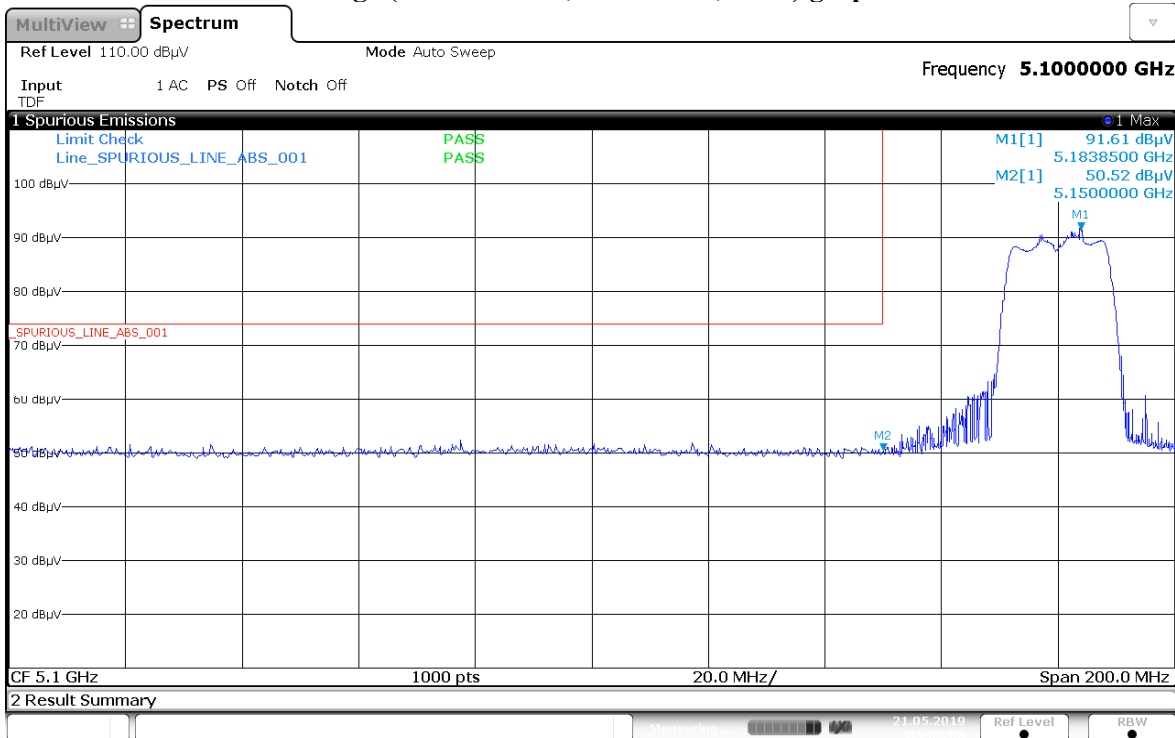


Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



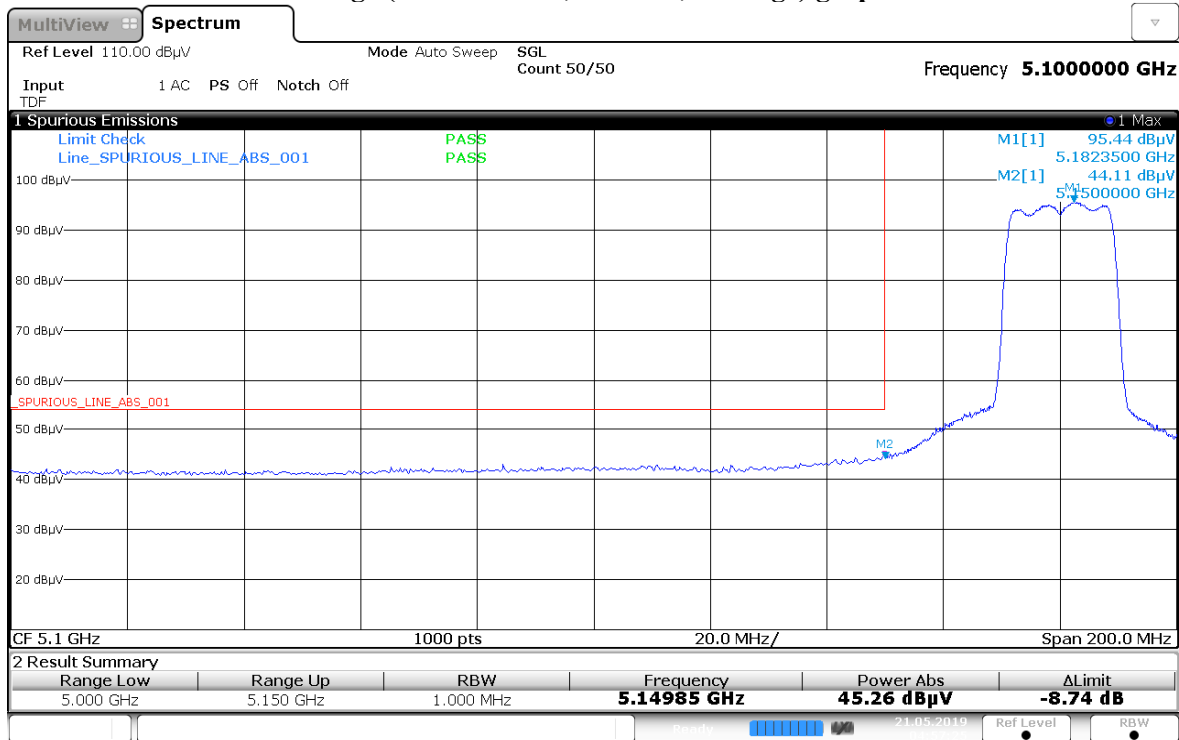
05:04:49 21.05.2019

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot

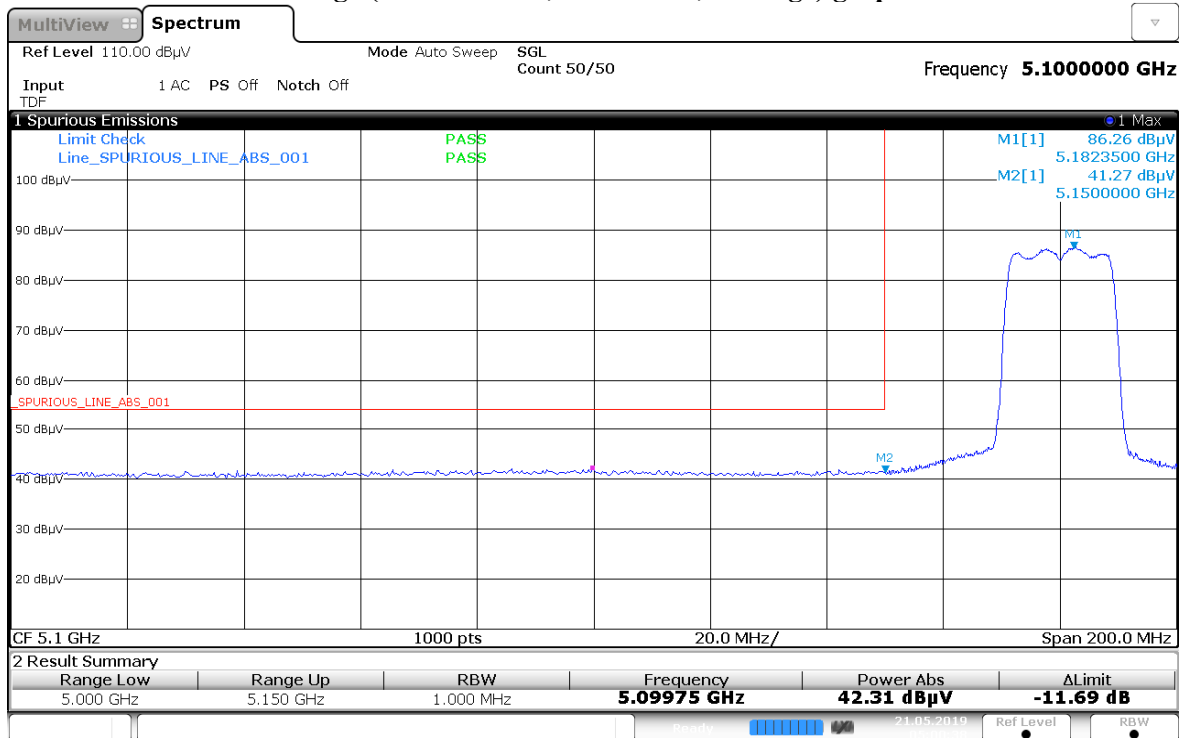


05:08:06 21.05.2019

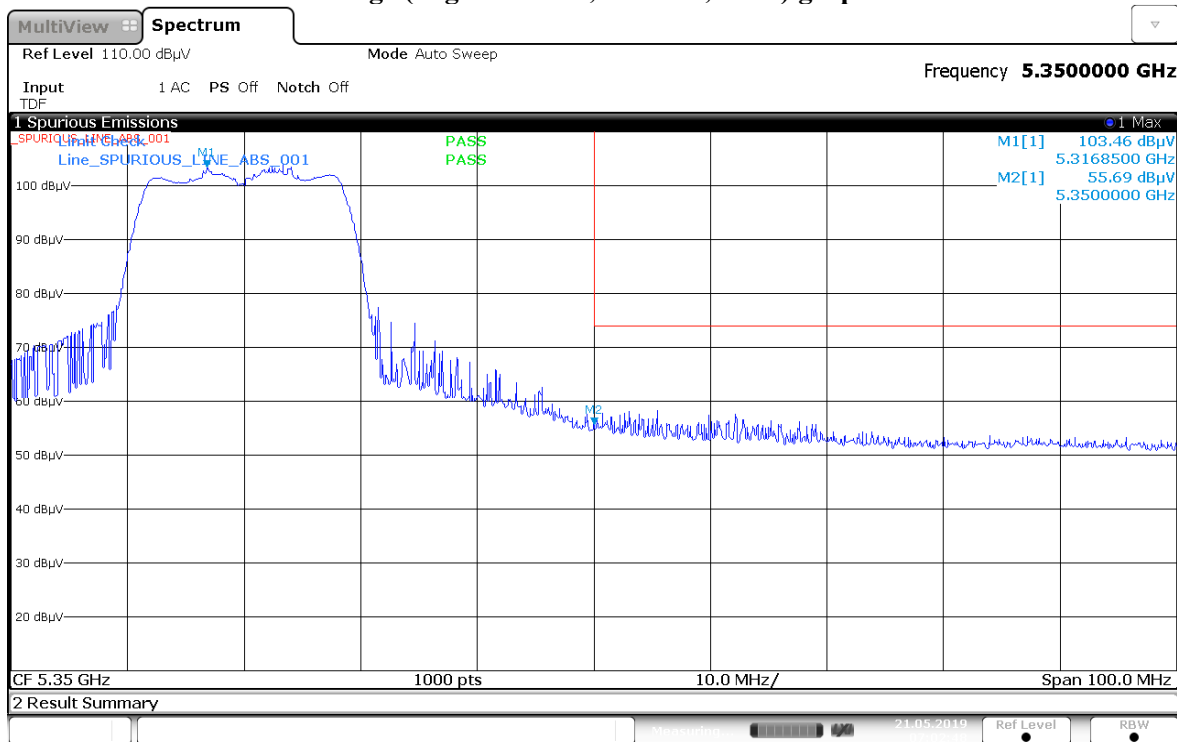
Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



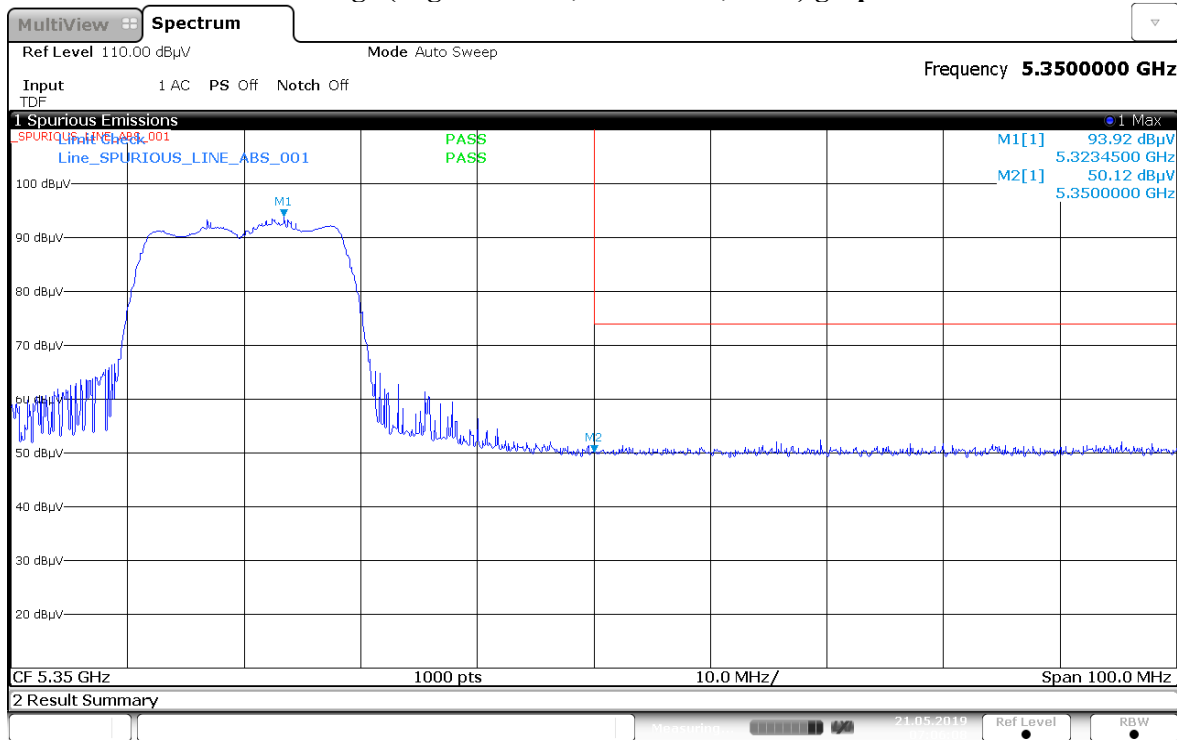
Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



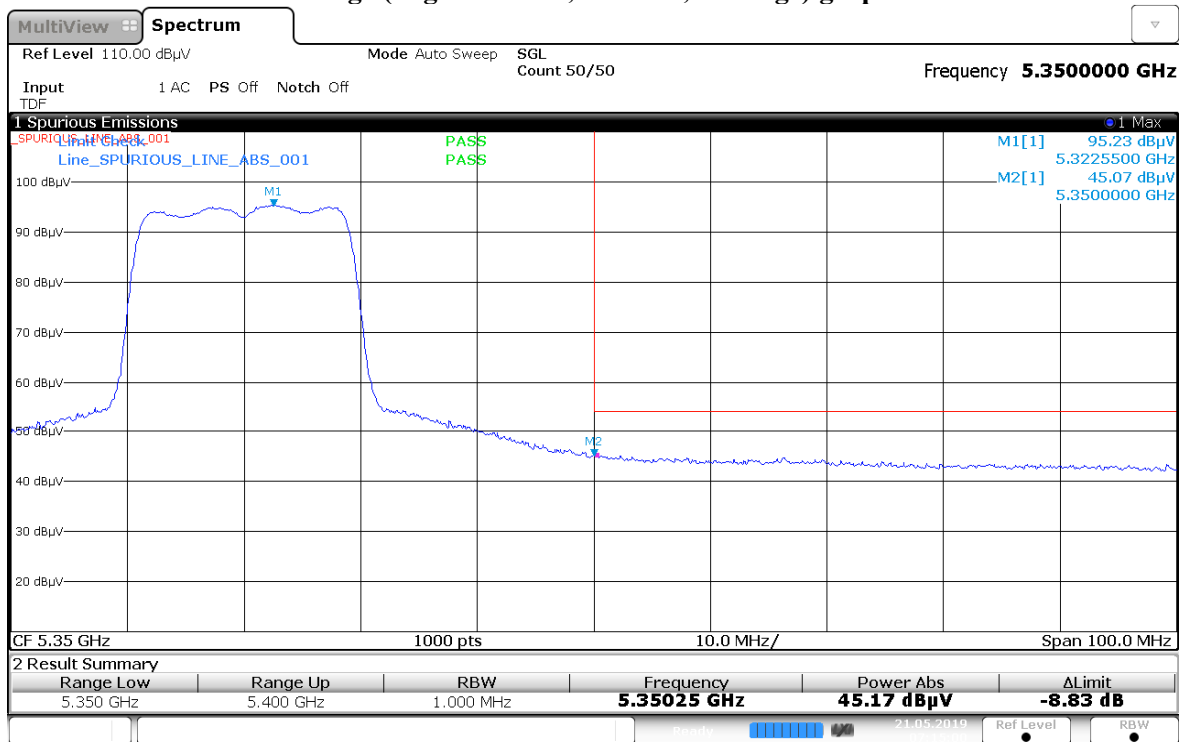
Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



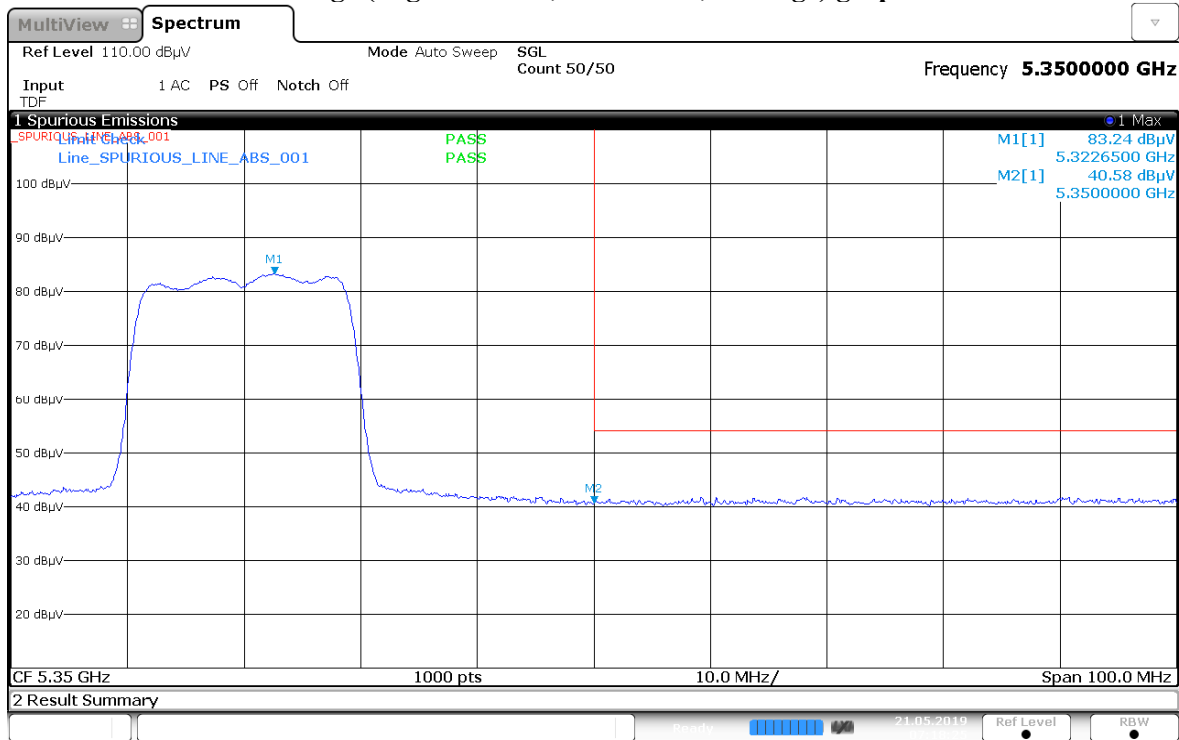
Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



Test: WIFI SAC Restricted Band Edge

Model Number: M25URS9PW1BN **S/N:** 471TVF3482 **EMC SR ID#:** 14913-EMC-00024
Battery: NA **Accessory:** AN000163A01, AN000197A10, 3466-HMN4079G-4, HSN4040A-C4, HKN4191B-2, 3466-HKN6163C-2, PMHN4194C-CF3
Test Channel: Low **Test Frequency:** 5500.0000 MHz **Test Standard:** ANSI C63.10-2013
Y-Plane (802.11n 20MHz)

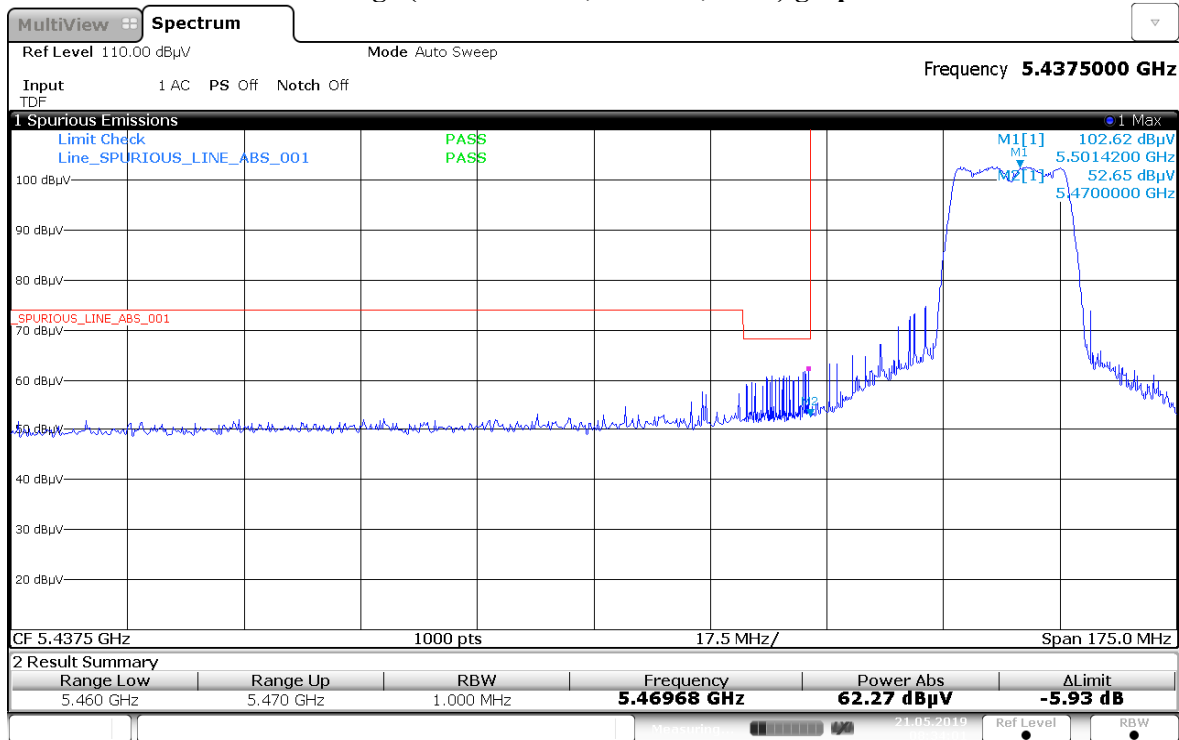
Restricted Band Edge (Low Channel) tabular data

Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBμV/m)	Spur level PK (dBμV/m)	Spur level AV (dBμV/m)	Limit QPK (dBμV/m)	Limit PK (dBμV/m)	Limit AV (dBμV/m)	Margin QPK (dBμV/m)	Margin PK (dBμV/m)	Margin AV (dBμV/m)	Carrier PK Power (dBμV/m)
5386.7125	-	-	43.3225	-	-	54.0000	-	-	-10.6775	-
5459.3125	-	-	44.8369	-	-	54.0000	-	-	-9.1631	-
5463.4250	-	60.6129	-	-	68.2000	-	-	-7.5871	-	-
5464.1750	-	60.8424	-	-	68.2000	-	-	-7.3576	-	-
5464.2750	-	60.6629	-	-	68.2000	-	-	-7.5371	-	-
5466.0250	-	60.8903	-	-	68.2000	-	-	-7.3097	-	-
5466.7750	-	60.7487	-	-	68.2000	-	-	-7.4513	-	-
5467.5750	-	59.9010	-	-	68.2000	-	-	-8.2990	-	-
5468.1750	-	60.6547	-	-	68.2000	-	-	-7.5453	-	-
5468.8750	-	61.6031	-	-	68.2000	-	-	-6.5969	-	-
5469.1750	-	61.8107	-	-	68.2000	-	-	-6.3893	-	-
5469.6750	-	62.2703	-	-	68.2000	-	-	-5.9297	-	-
5469.8750	-	-	46.3455	-	-	54.0000	-	-	-7.6545	-
5470.0000	-	52.6522	45.5601	-	74.0000	54.0000	-	-21.3478	-8.4399	-
Horizontal Radiated Emission Result										
5414.4875	-	-	42.2577	-	-	54.0000	-	-	-11.7423	-
5456.5625	-	-	42.0422	-	-	54.0000	-	-	-11.9578	-
5457.6625	-	-	42.2976	-	-	54.0000	-	-	-11.7024	-
5470.0000	-	50.1267	41.5764	-	74.0000	54.0000	-	-23.8733	-12.4236	-

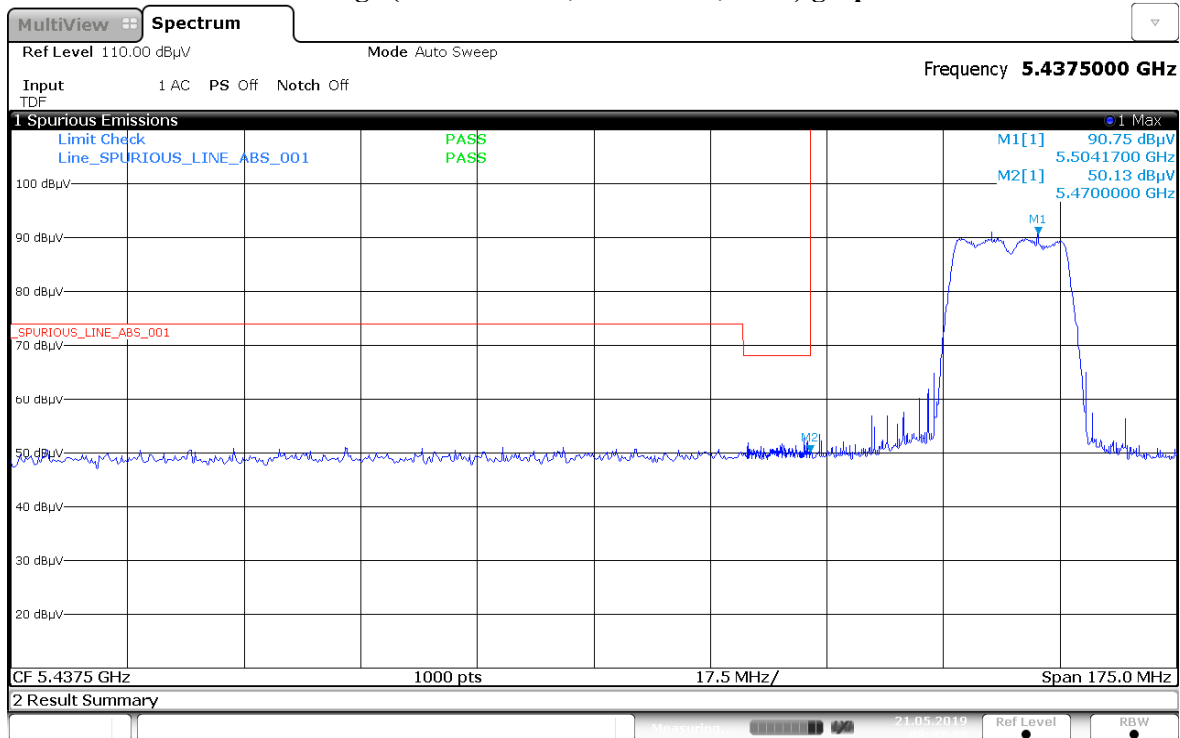
Remarks: Pass Result	Marginal Result	Fail Result
-------------------------	-----------------	-------------

Temperature (degC):23.6 **Humidity (%):** 69.3 **System MU:**
Test Performed by: Qawiman&Nazrin **Test Date:** Tue, May 21, 2019
5.01dB

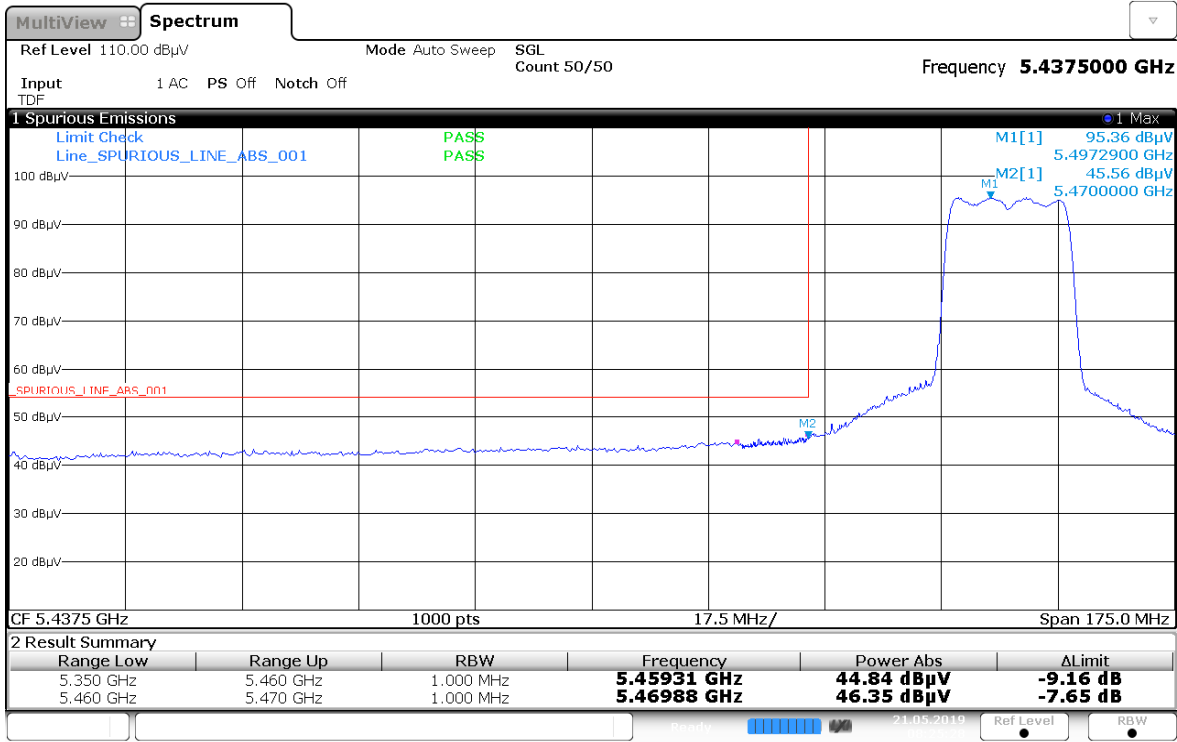
Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



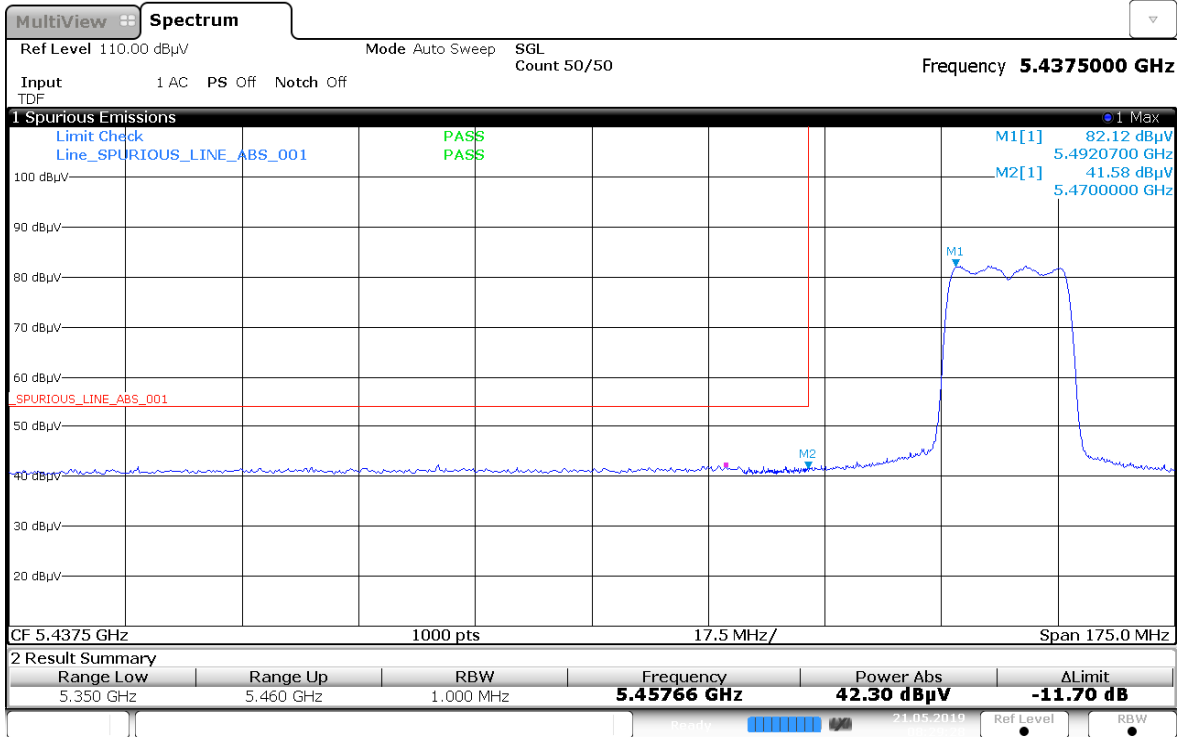
Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



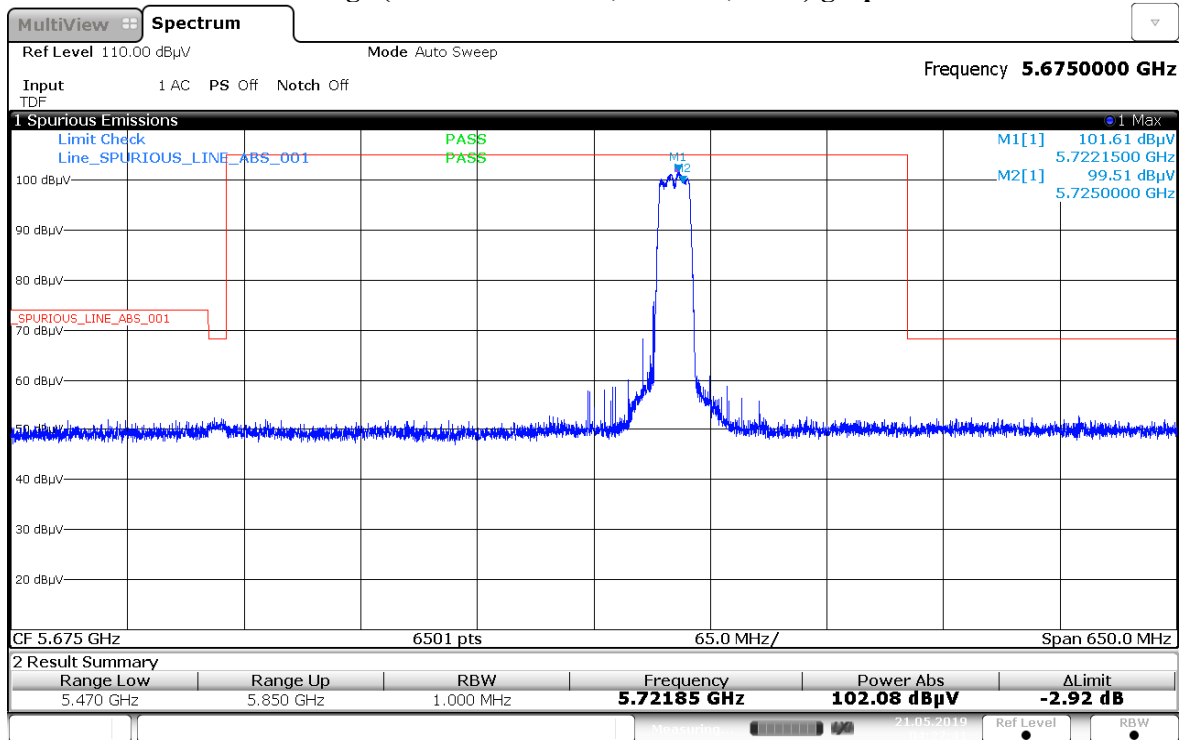
Test Channel: Straddle Test Frequency: 5720.0000 MHz Test Standard: ANSI C63.10-2013
Y-Plane (802.11n 20MHz)

[illegible]

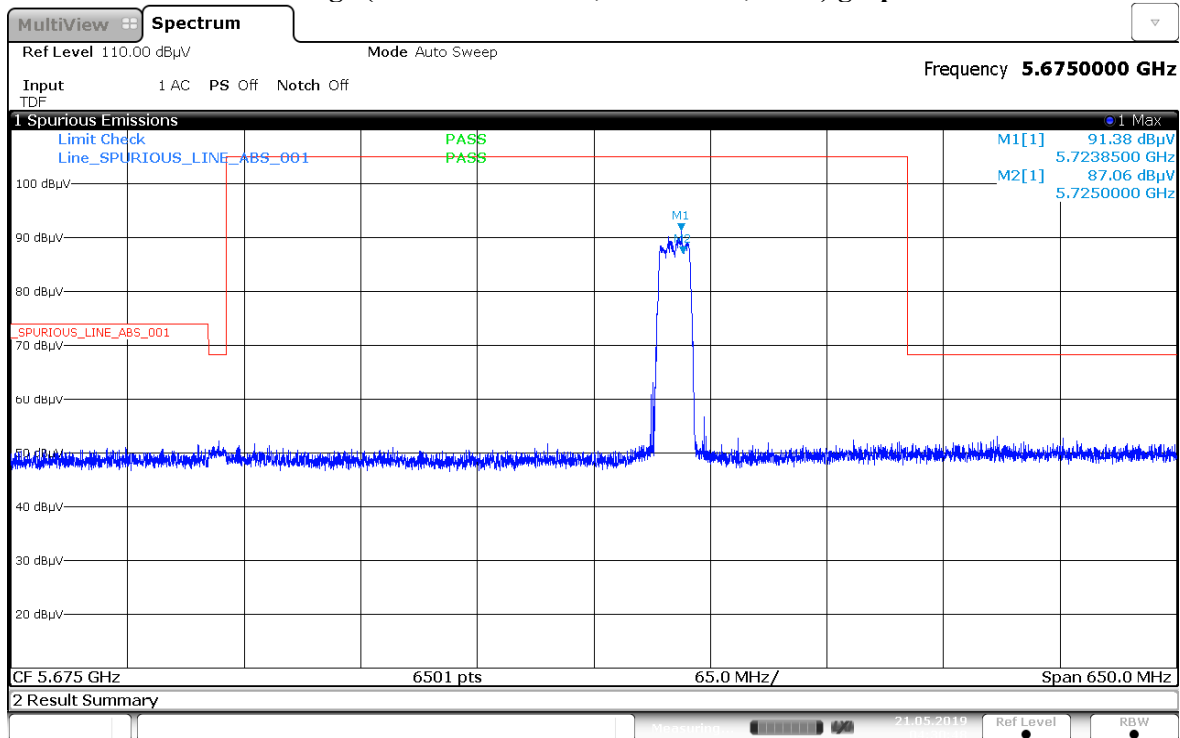
Remarks: Pass Result	Marginal Result	Fail Result
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Humidity (%): 69.3
Test Date: Tue, May 21, 2019

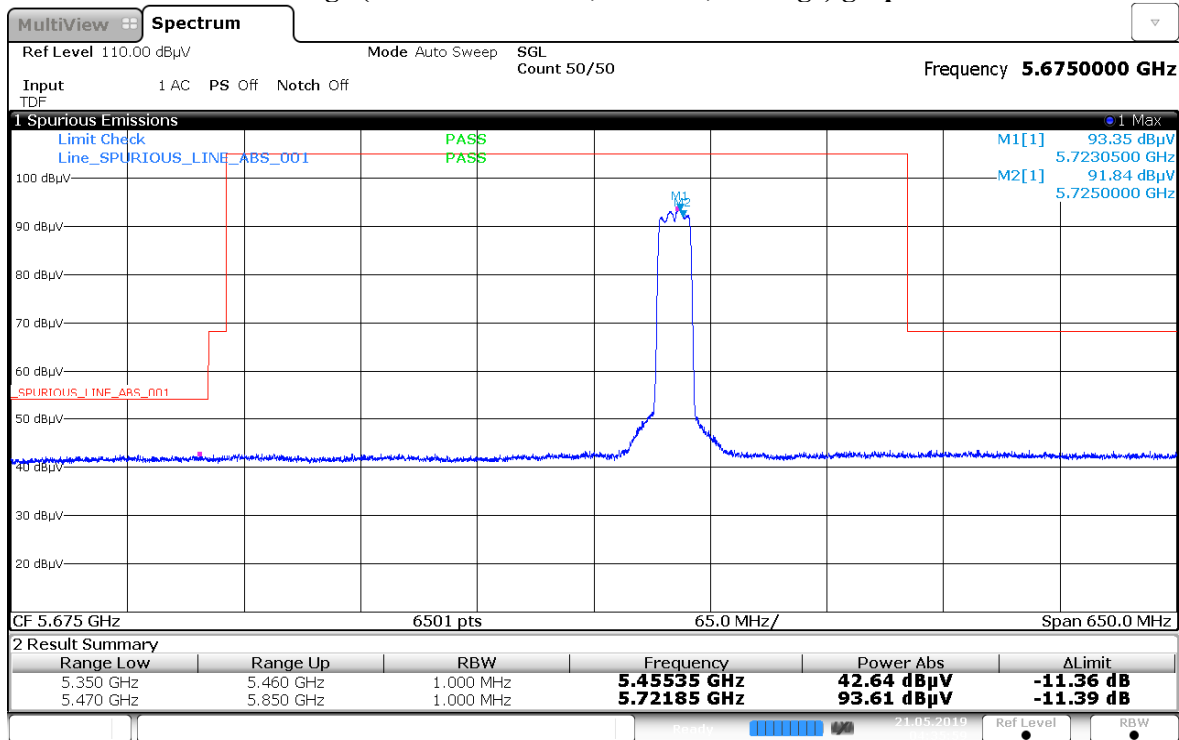
Restricted Band Edge (Straddle Channel, Vertical, Peak) graphical screen shot



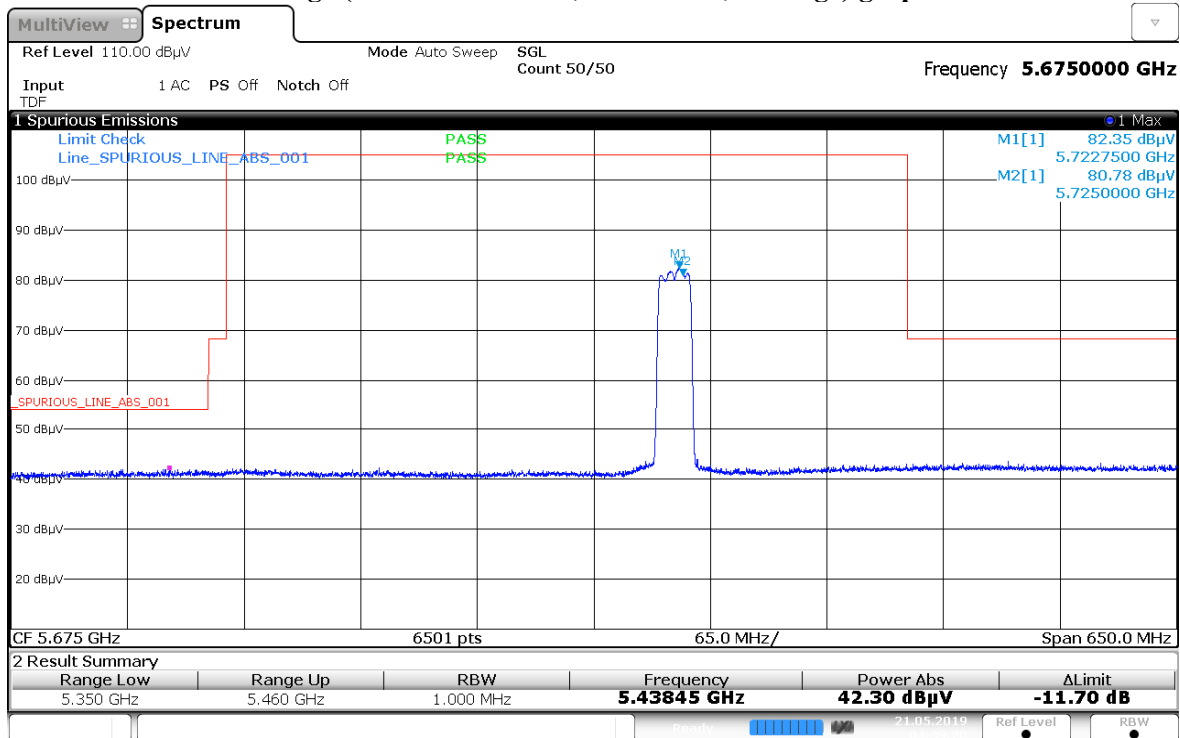
Restricted Band Edge (Straddle Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Straddle Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (Straddle Channel, Horizontal, Average) graphical screen shot



Test: WIFI SAC Restricted Band Edge

Model Number: M25URS9PW1BN **S/N:** 471TVF3482 **EMC SR ID#:** 14913-EMC-00024
Battery: NA **Accessory:** AN000163A01, AN000197A10, 3466-HMN4079G-4, HSN4040A-C4, HKN4191B-2, 3466-HKN6163C-2, PMHN4194C-CF3
Test Channel: Low **Test Frequency:** 5745.0000 MHz **Test Standard:** ANSI C63.10-2013
Y-Plane (802.11n 20MHz)

Restricted Band Edge (Low Channel) tabular data

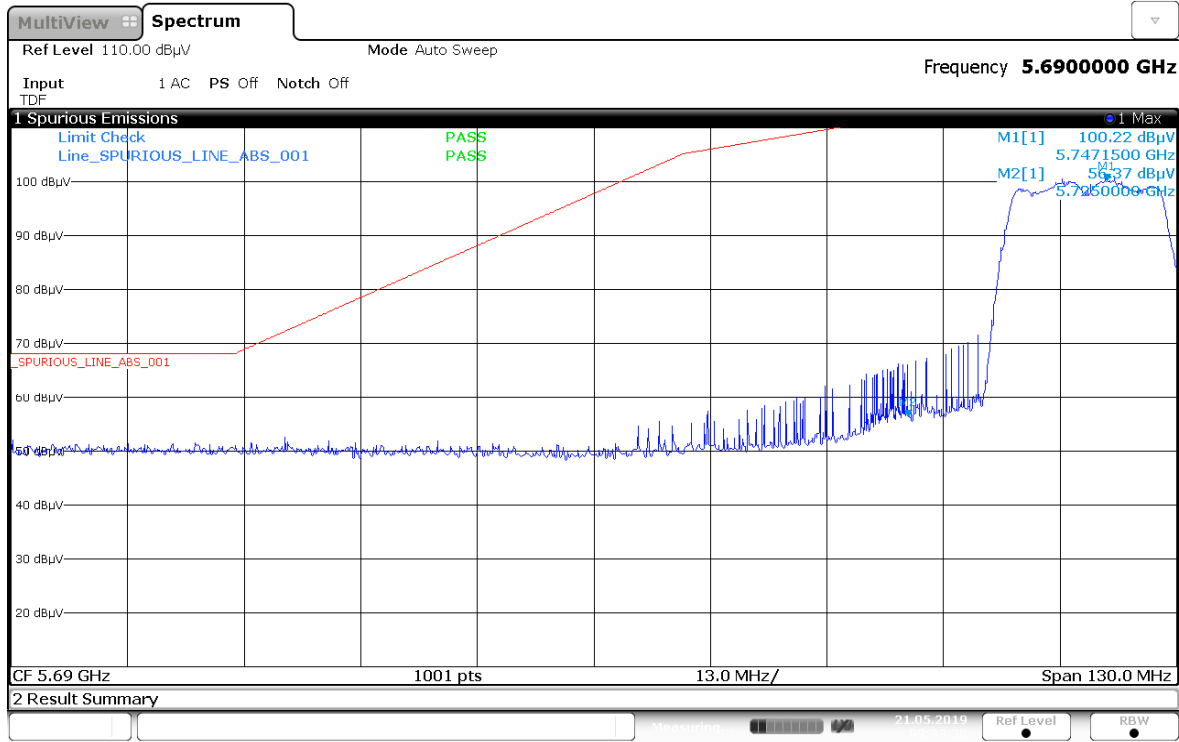
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBμV/m)	Spur level PK (dBμV/m)	Spur level AV (dBμV/m)	Limit QPK (dBμV/m)	Limit PK (dBμV/m)	Limit AV (dBμV/m)	Margin QPK (dBμV/m)	Margin PK (dBμV/m)	Margin AV (dBμV/m)	Carrier PK Power (dBμV/m)
5629.7500	-	-	42.4372	-	-	54.0000	-	-	-11.5628	-
5632.2500	-	-	42.6991	-	-	54.0000	-	-	-11.3009	-
5665.5833	-	-	42.5233	-	-	54.0000	-	-	-11.4767	-
5671.5833	-	-	42.5641	-	-	54.0000	-	-	-11.4359	-
5677.7500	-	-	42.8366	-	-	54.0000	-	-	-11.1634	-
5679.5833	-	-	42.4930	-	-	54.0000	-	-	-11.5070	-
5697.0833	-	-	42.5611	-	-	54.0000	-	-	-11.4389	-
5700.3333	-	-	42.9539	-	-	54.0000	-	-	-11.0461	-
5703.5333	-	-	42.4649	-	-	54.0000	-	-	-11.5351	-
5705.1333	-	-	42.7055	-	-	54.0000	-	-	-11.2945	-
5705.6667	-	-	42.6621	-	-	54.0000	-	-	-11.3379	-
5706.4667	-	-	42.4792	-	-	54.0000	-	-	-11.5208	-
5719.8000	-	-	44.6382	-	-	54.0000	-	-	-9.3618	-
5724.4802	-	-	48.0281	-	-	54.0000	-	-	-5.9719	-
5725.0000	-	-	47.3882	-	-	54.0000	-	-	-6.6118	-
Horizontal Radiated Emission Result										
5717.9333	-	-	42.1535	-	-	54.0000	-	-	-11.8465	-
5721.5099	-	-	42.0105	-	-	54.0000	-	-	-11.9895	-
5725.0000	-	50.1373	42.3691	-	74.0000	54.0000	-	-23.8627	-11.6309	-

Remarks: Pass Result	Marginal Result	Fail Result
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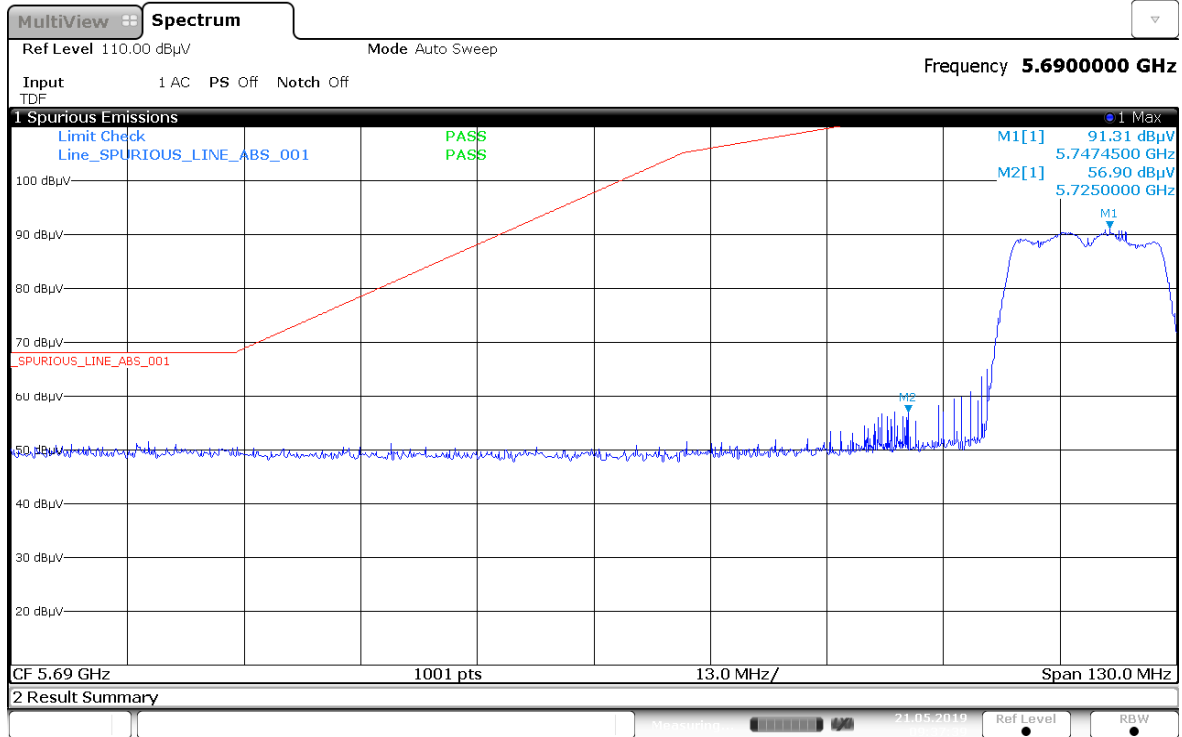
Temperature (degC):23.6
Test Performed by: Qawiman&Nazrin
System MU: 5.01dB

Humidity (%): 69.3
Test Date: Tue, May 21, 2019

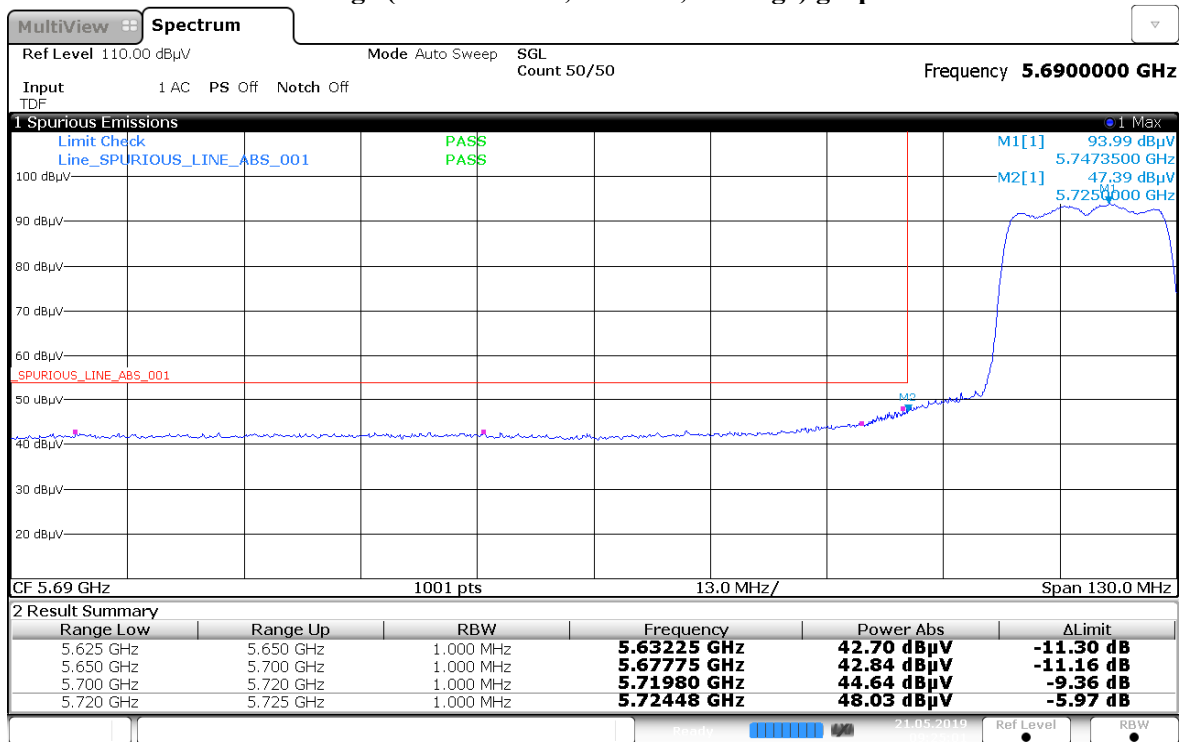
Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



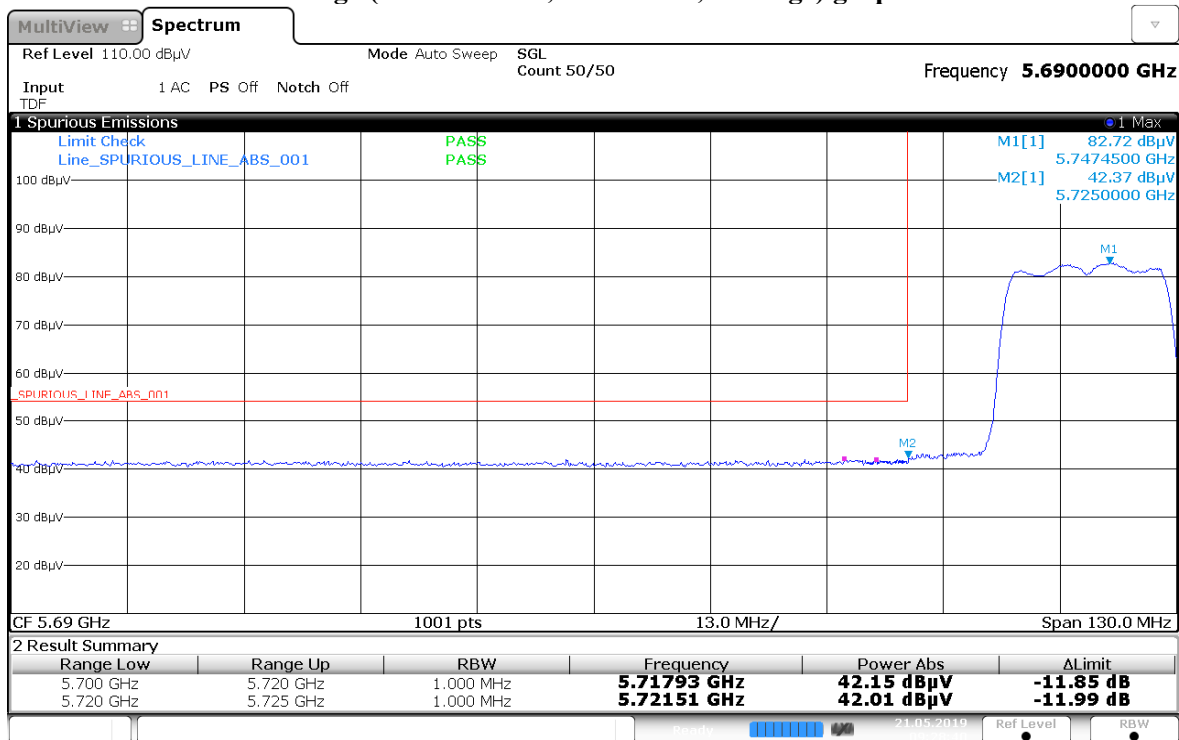
Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



Test: WIFI SAC Restricted Band Edge

Model Number: M25URS9PW1BN **S/N:** 471TVF3482 **EMC SR ID#:** 14913-EMC-00024

Battery: NA **Accessory:** AN000163A01, AN000197A10, 3466-HMN4079G-4, HSN4040A-C4, HKN4191B-2, 3466-HKN6163C-2, PMHN4194C-CF3

Test Channel: High **Test Frequency:** 5825.0000 MHz **Test Standard:** ANSI C63.10-2013
Y-Plane (802.11n 20MHz)

Restricted Band Edge (High Channel) tabular data

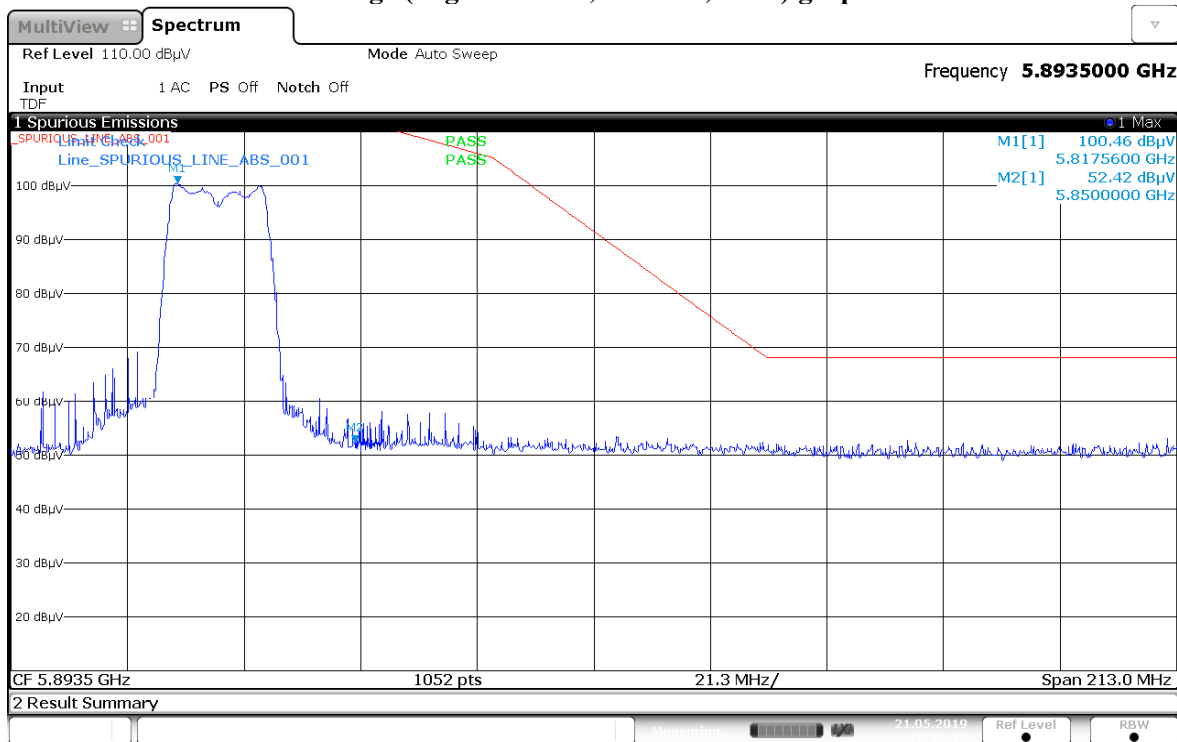
Vertical Radiated Emission Result										
Spur Freq (MHz)	Spur level QPK (dBμV/m)	Spur level PK (dBμV/m)	Spur level AV (dBμV/m)	Limit QPK (dBμV/m)	Limit PK (dBμV/m)	Limit AV (dBμV/m)	Margin QPK (dBμV/m)	Margin PK (dBμV/m)	Margin AV (dBμV/m)	Carrier PK Power (dBμV/m)
5850.0000	-	52.4204	42.9251	-	74.0000	54.0000	-	-21.5796	-11.0749	-
5850.6683	-	-	43.5653	-	-	54.0000	-	-	-10.4347	-
5859.0594	-	-	44.6669	-	-	54.0000	-	-	-9.3331	-
5883.6250	-	-	44.0873	-	-	54.0000	-	-	-9.9127	-
5932.1786	-	-	43.3805	-	-	54.0000	-	-	-10.6195	-
5964.1071	-	-	42.2113	-	-	54.0000	-	-	-11.7887	-
5976.1071	-	-	43.4757	-	-	54.0000	-	-	-10.5243	-
Horizontal Radiated Emission Result										
5870.3465	-	-	43.0408	-	-	54.0000	-	-	-10.9592	-
5879.3750	-	-	42.9423	-	-	54.0000	-	-	-11.0577	-
5885.8750	-	-	43.0699	-	-	54.0000	-	-	-10.9301	-
5890.6250	-	-	42.9659	-	-	54.0000	-	-	-11.0341	-
5905.3750	-	-	42.8810	-	-	54.0000	-	-	-11.1190	-
5914.1250	-	-	43.0404	-	-	54.0000	-	-	-10.9596	-
5923.6250	-	-	43.0619	-	-	54.0000	-	-	-10.9381	-
5932.6071	-	-	43.1537	-	-	54.0000	-	-	-10.8463	-
5944.3929	-	-	42.9524	-	-	54.0000	-	-	-11.0476	-
5952.3214	-	-	43.2784	-	-	54.0000	-	-	-10.7216	-
5978.4643	-	-	42.9401	-	-	54.0000	-	-	-11.0599	-
5980.8214	-	-	43.3821	-	-	54.0000	-	-	-10.6179	-
5983.3929	-	-	42.9783	-	-	54.0000	-	-	-11.0217	-
5998.3929	-	-	42.8856	-	-	54.0000	-	-	-11.1144	-

Remarks: Pass Result	Marginal Result	Fail Result
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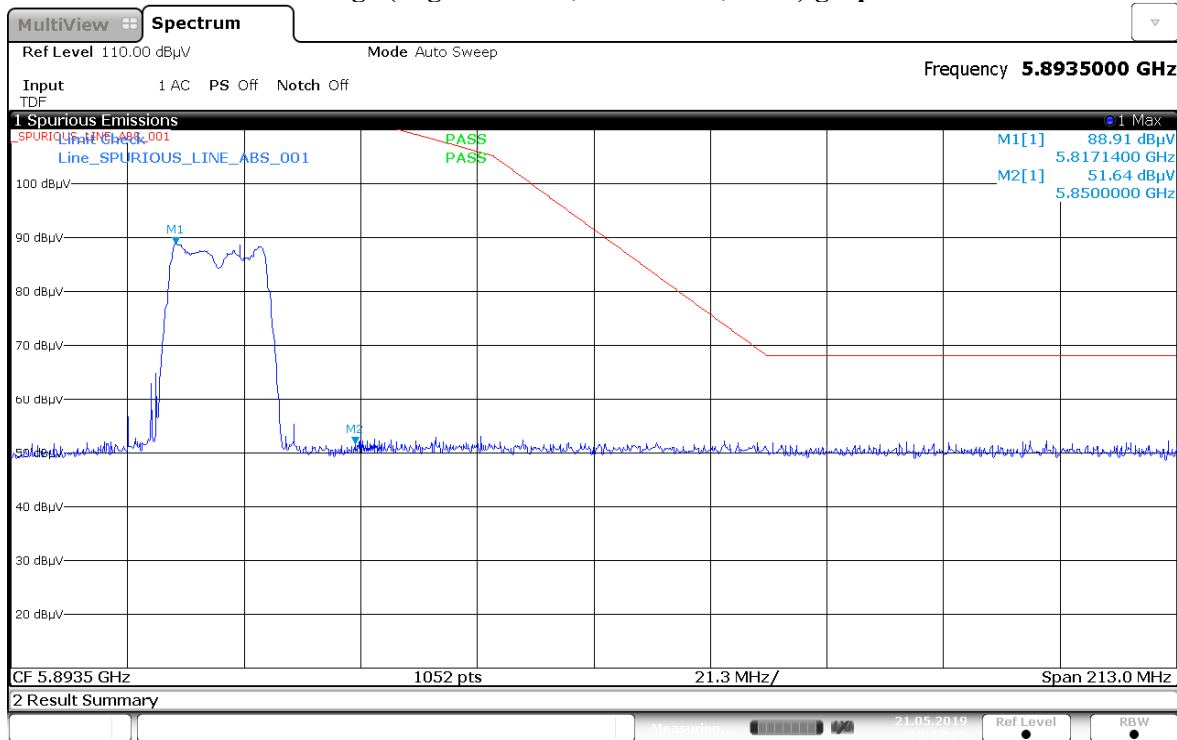
Temperature (degC):23.6
Test Performed by: Qawiman&Nazrin
System MU: 5.01dB

Humidity (%): 69.3
Test Date: Tue, May 21, 2019

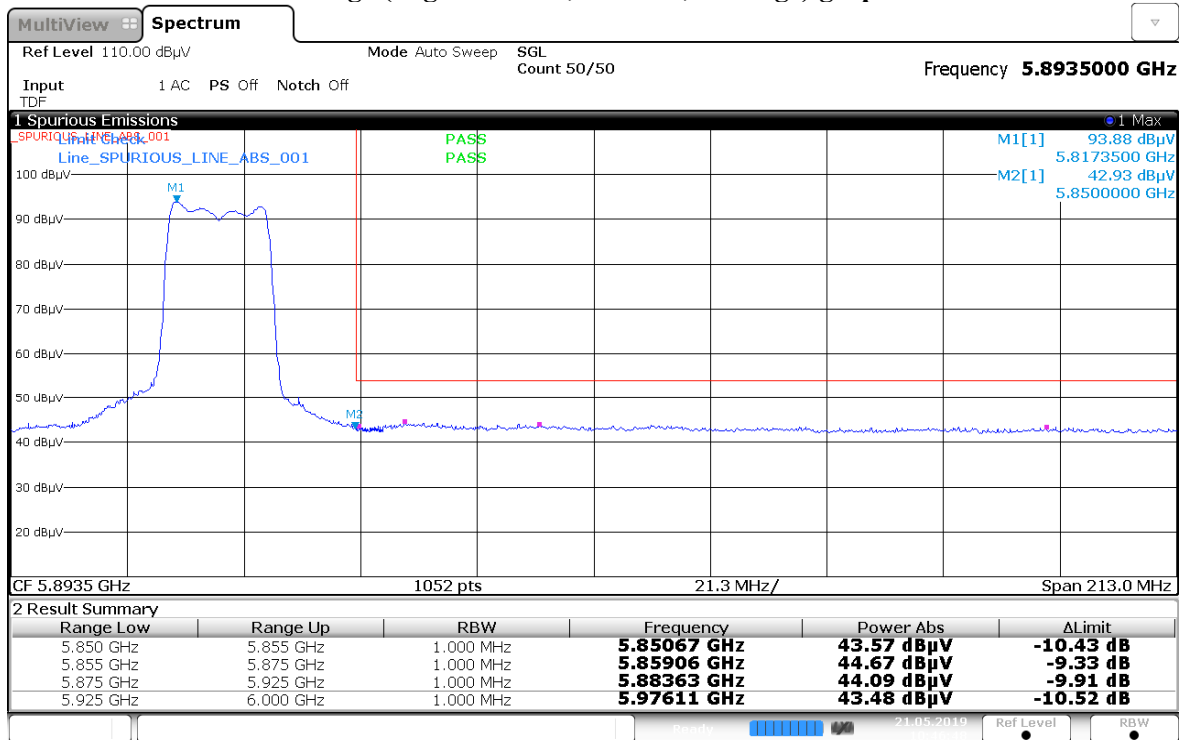
Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



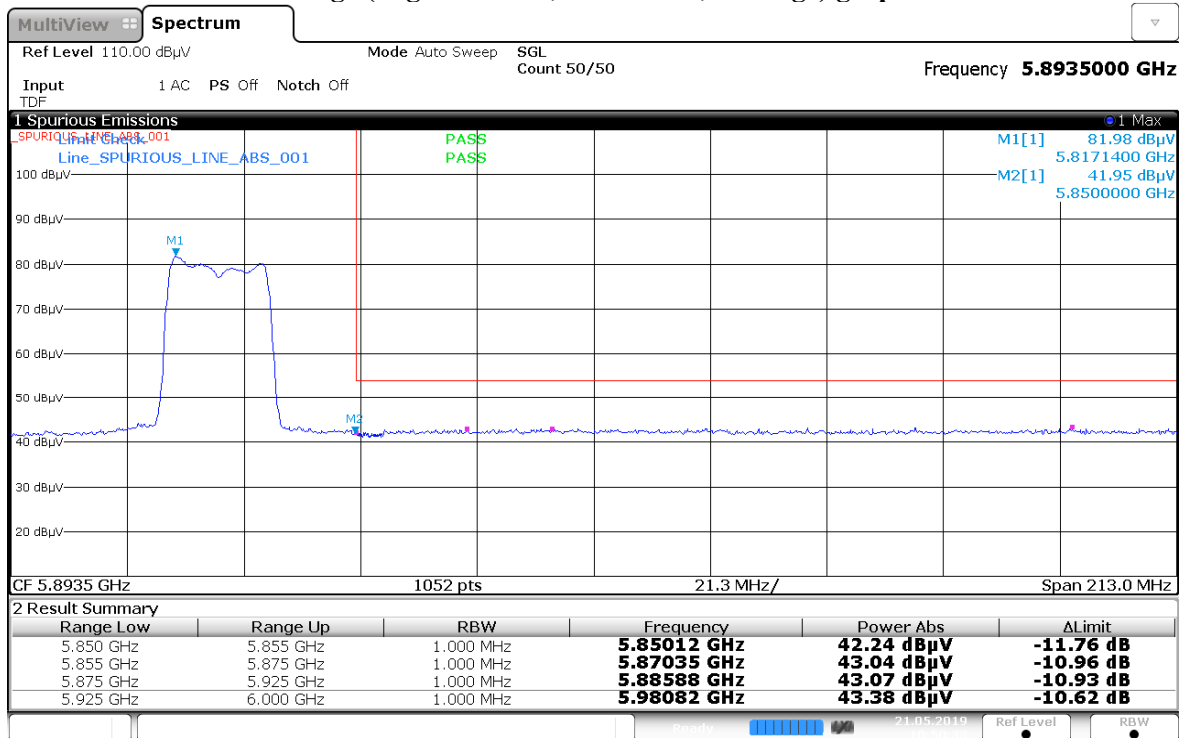
Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



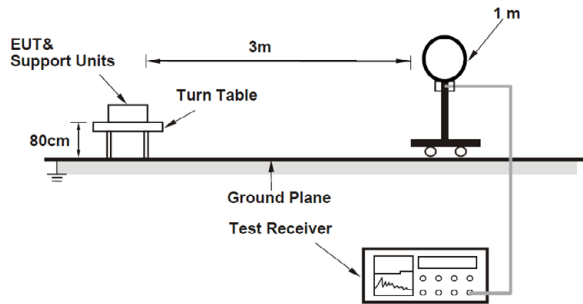
Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



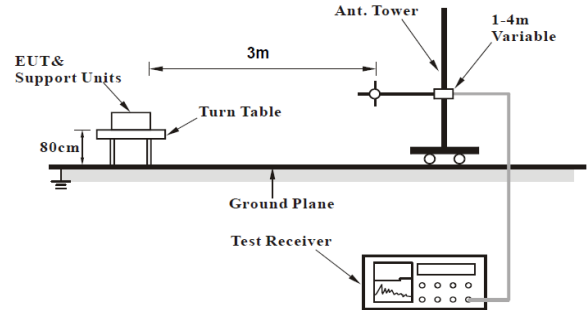
7.5. Radiated Spurious Emission Measurement

7.5.1. Test Setup

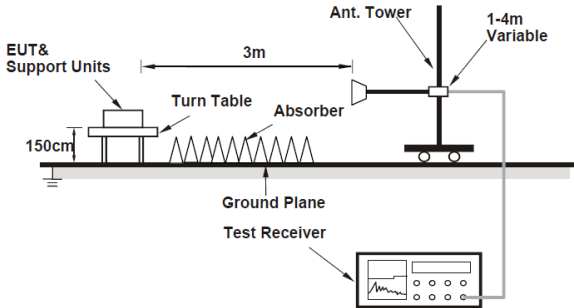
<Radiated emission below 30MHz>



<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



1. The EUT is placed on the top of a rotating table 0.8m/1.5m above the ground at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
2. The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
3. The antenna is Bilog/Horn antenna depend on which frequency range uses, 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.
4. For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, 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. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection using reduced video bandwidth (Duty cycle $\geq 98\%$) at frequency above 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $1/\tau$ Hz, where τ is minimum transmitter on time (Duty cycle $< 98\%$) for Average detection using reduced video bandwidth at frequency above 1GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

7.5.2. Test Limits

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency (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:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- For frequencies above 1000 MHz, 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.

For Radiated emissions which fall out of the restricted bands must comply with the radiated emission limits specified as below table.

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v01r03		Field Strength at 3 m	
		PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2 (dBµV/m) ^{*1} PK:105.2 (dBµV/m) ^{*2} PK: 110.8 (dBµV/m) ^{*3} PK:122.2 (dBµV/m) ^{*4}
	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			
^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.			
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			
^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge			

NOTE:

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

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

802.11a

Worst Case Plane: Y-Plane (802.11a 20MHz)

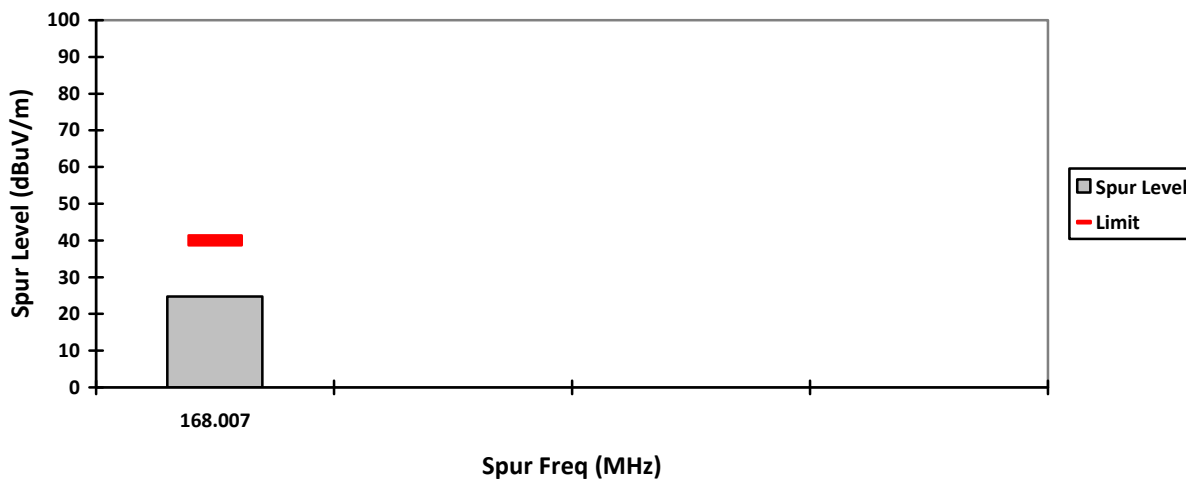
Vertical Radiated Emission Result

Horizontal Radiated Emission Result

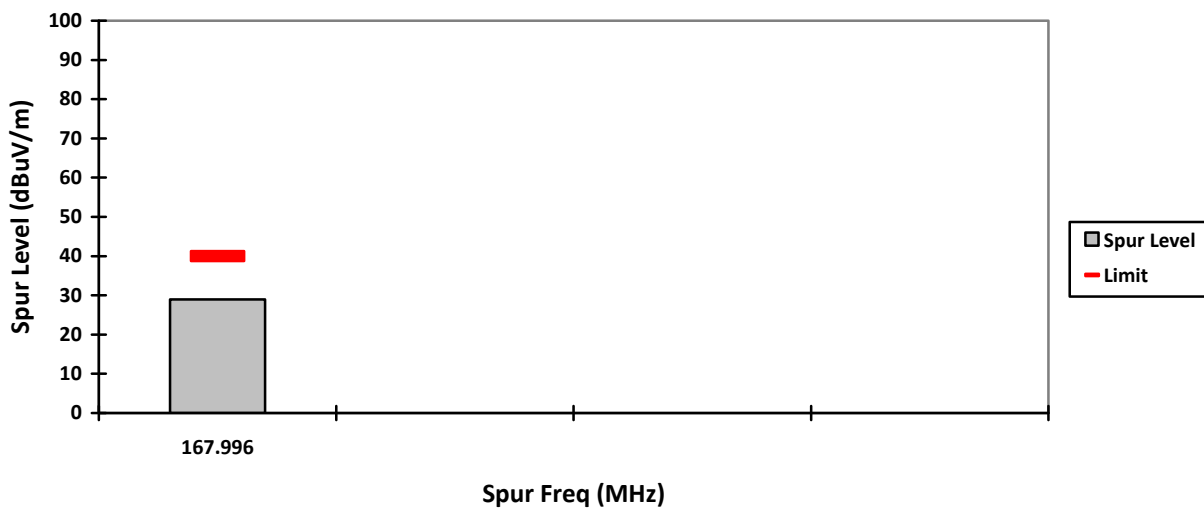
Humidity (%): 69.8
Test Date: Fri, May 24, 2019

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.

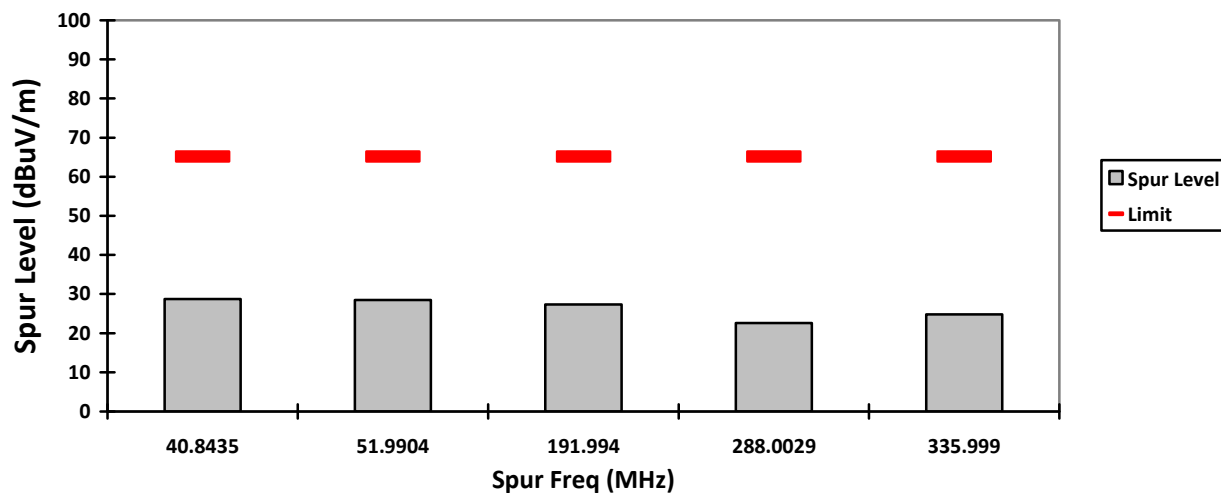
VERTICAL, QPK



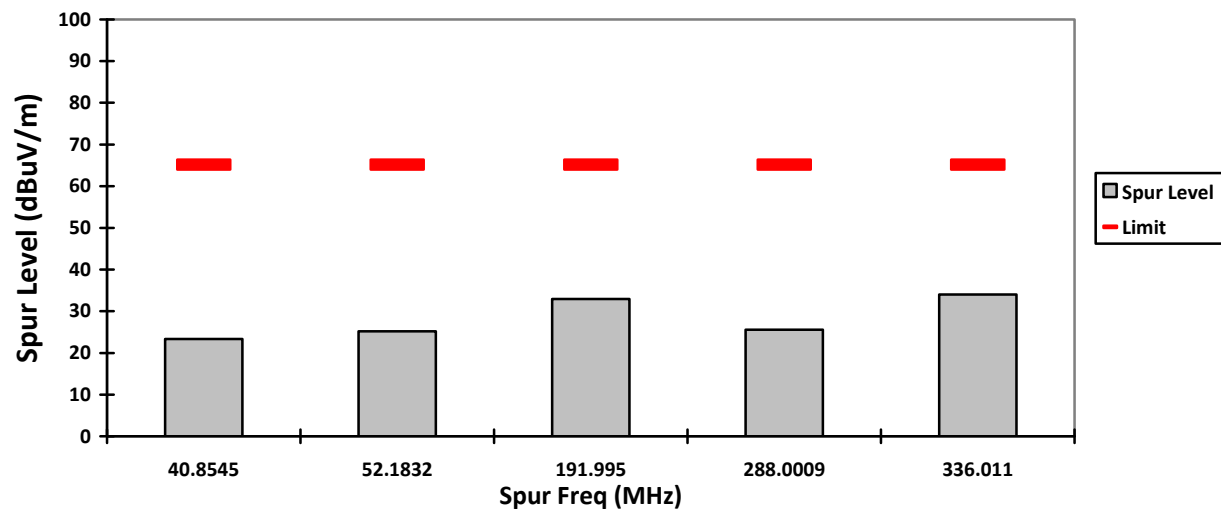
HORIZONTAL, QPK



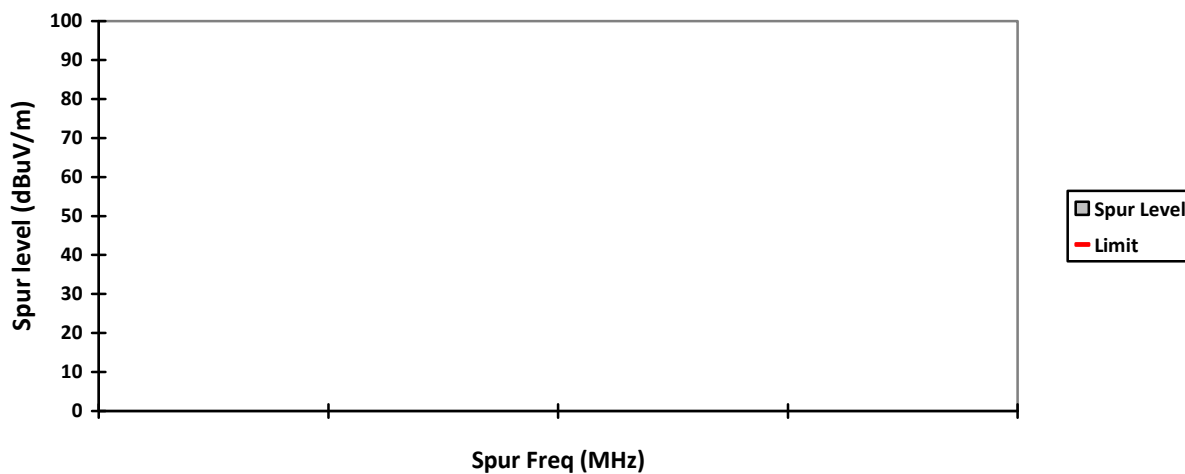
VERTICAL, PK



HORIZONTAL, PK



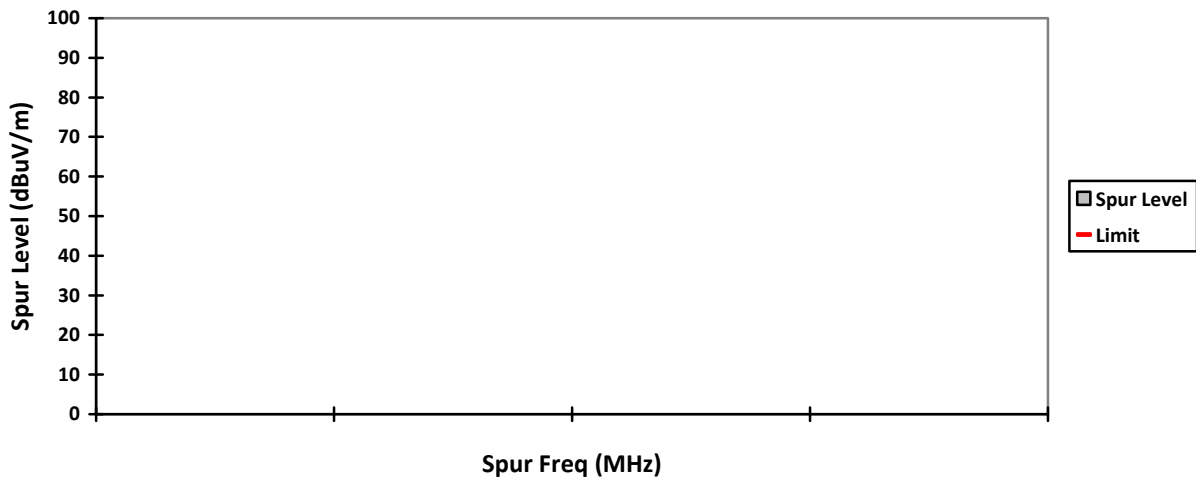
VERTICAL, AV



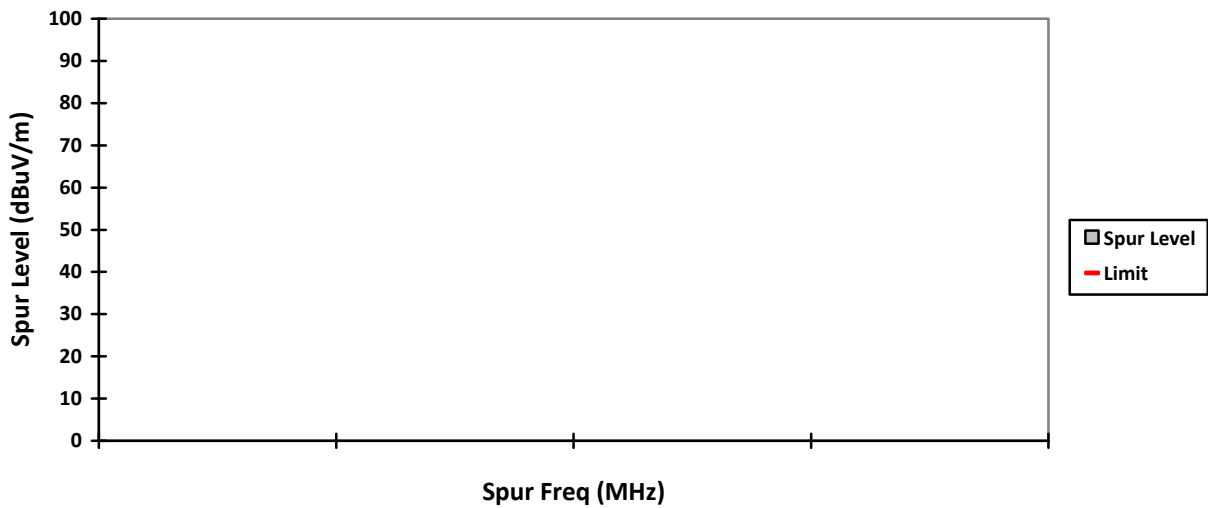
HORIZONTAL, AV



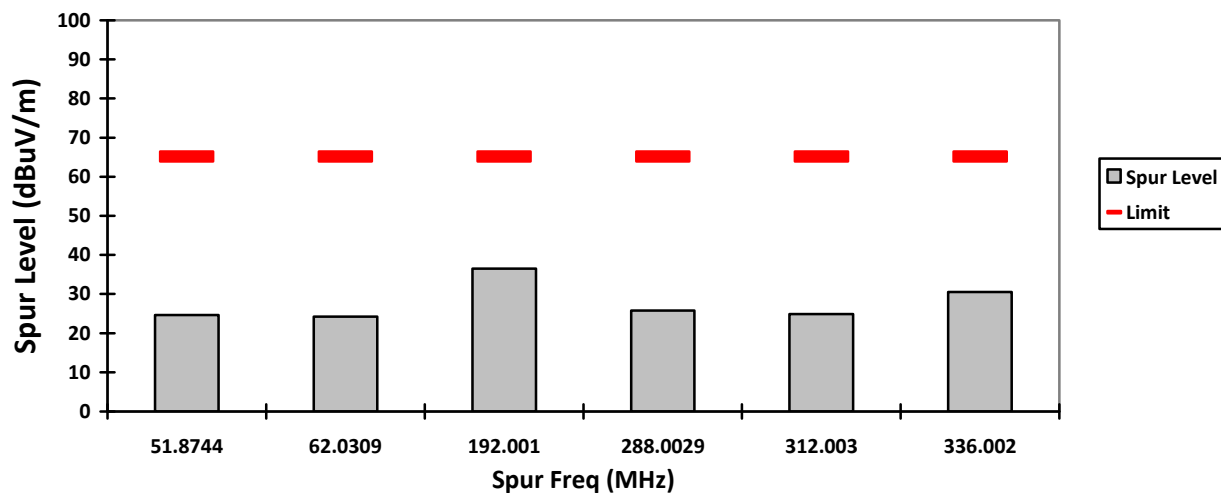
VERTICAL, QPK



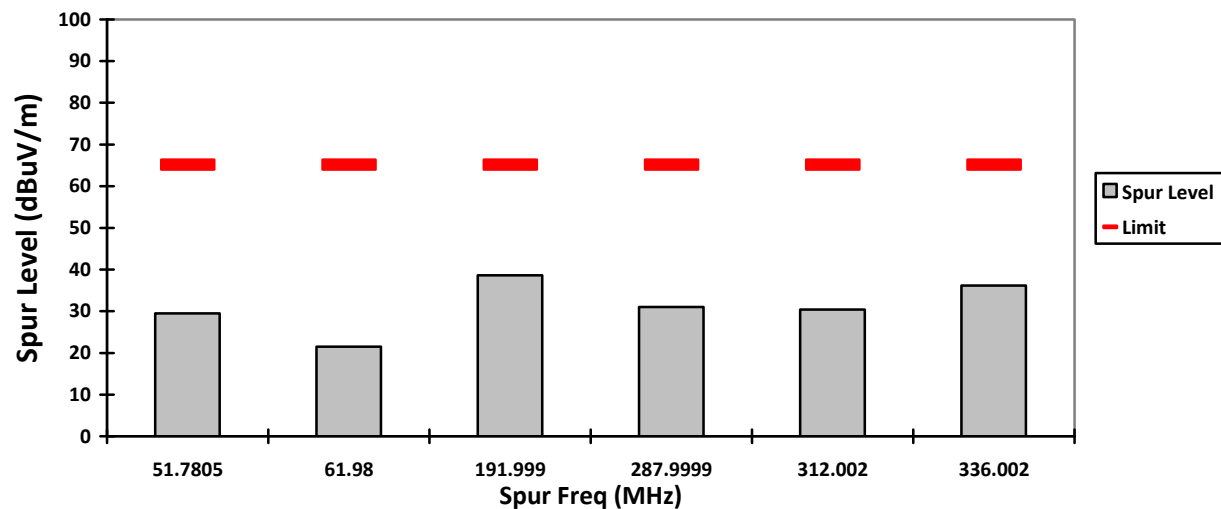
HORIZONTAL, QPK



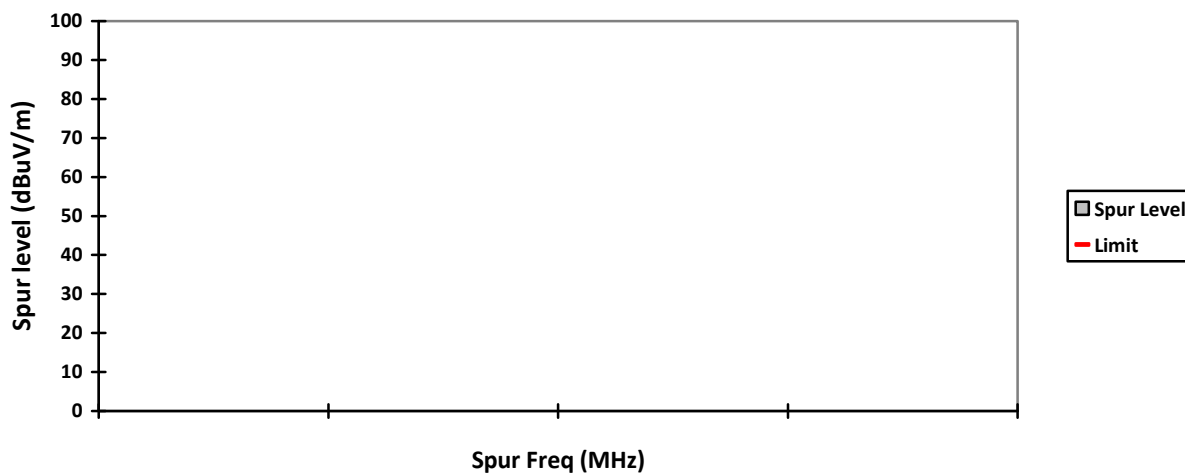
VERTICAL, PK



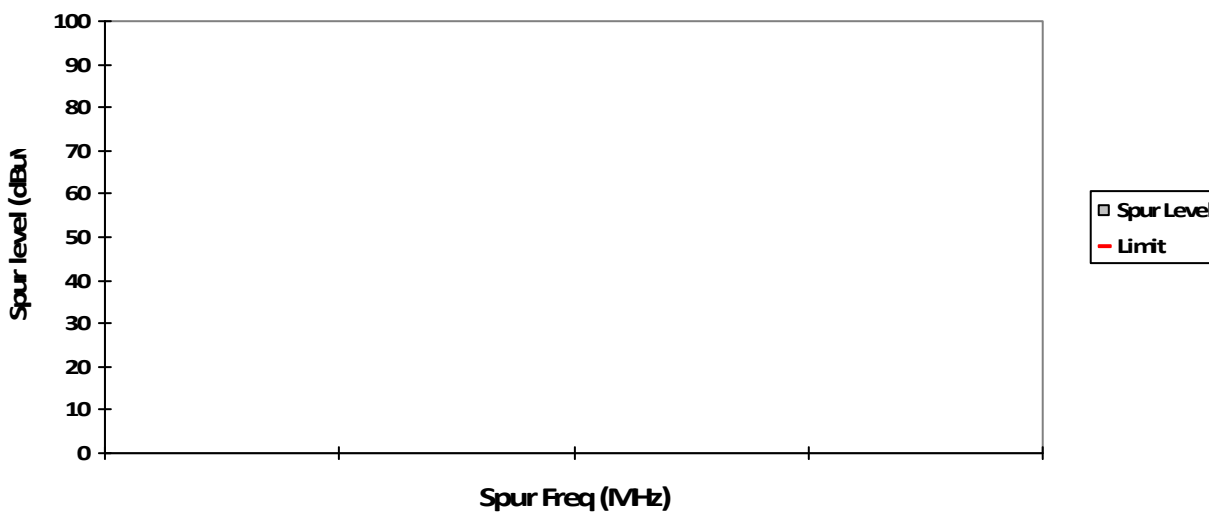
HORIZONTAL, PK



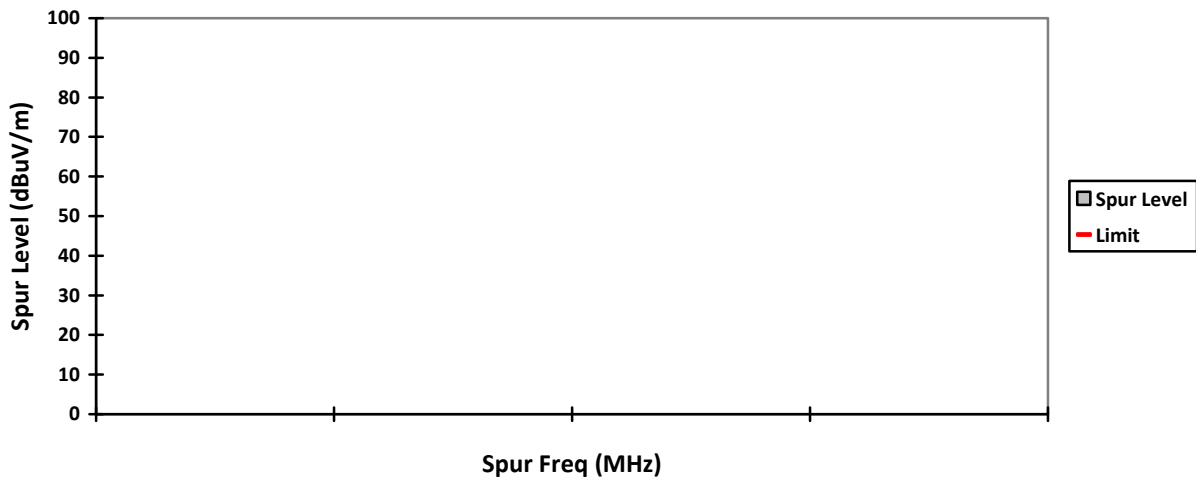
VERTICAL, AV



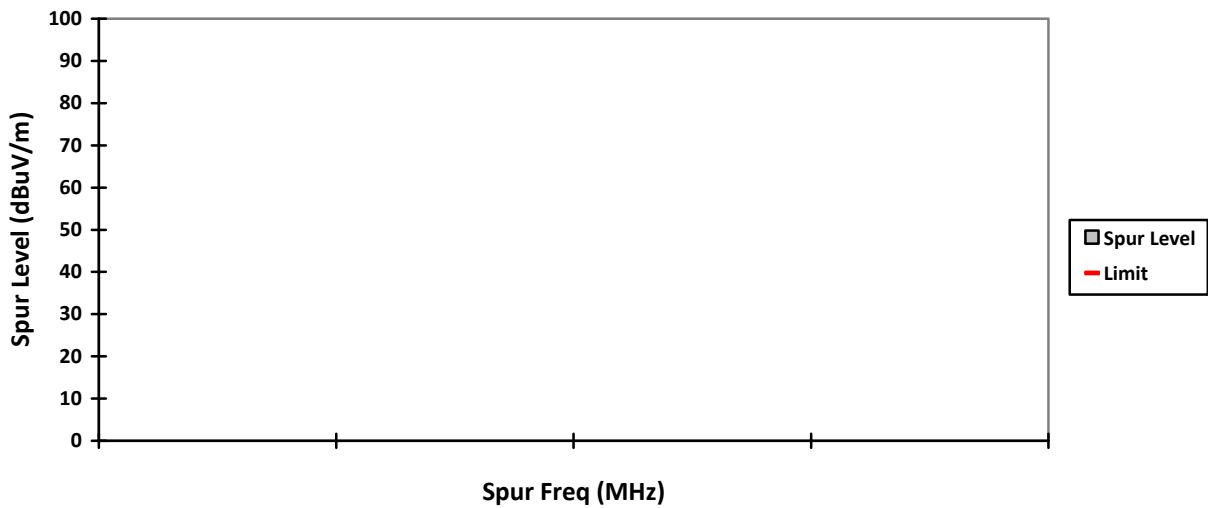
HORIZONTAL, AV



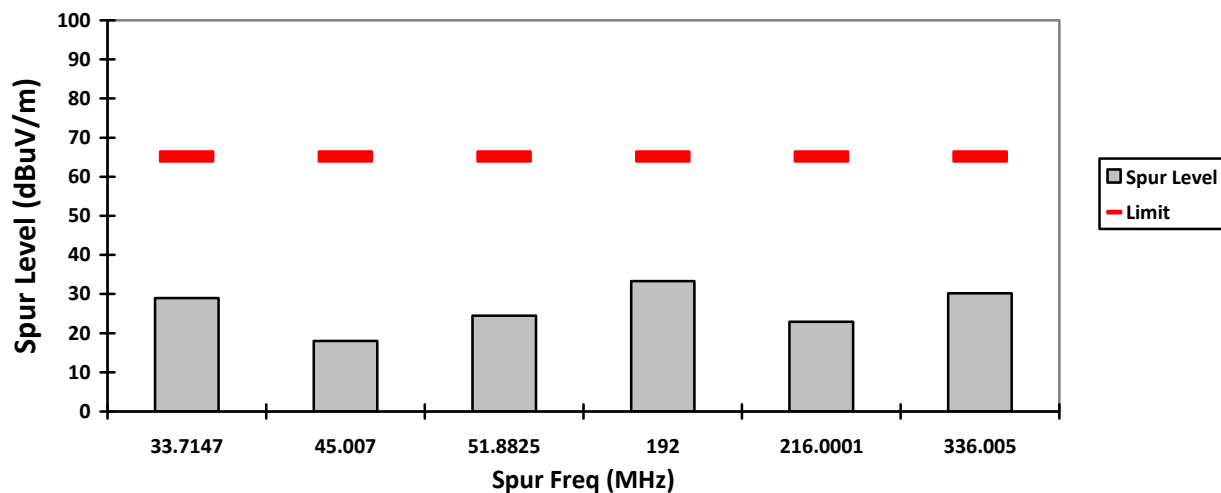
VERTICAL, QPK



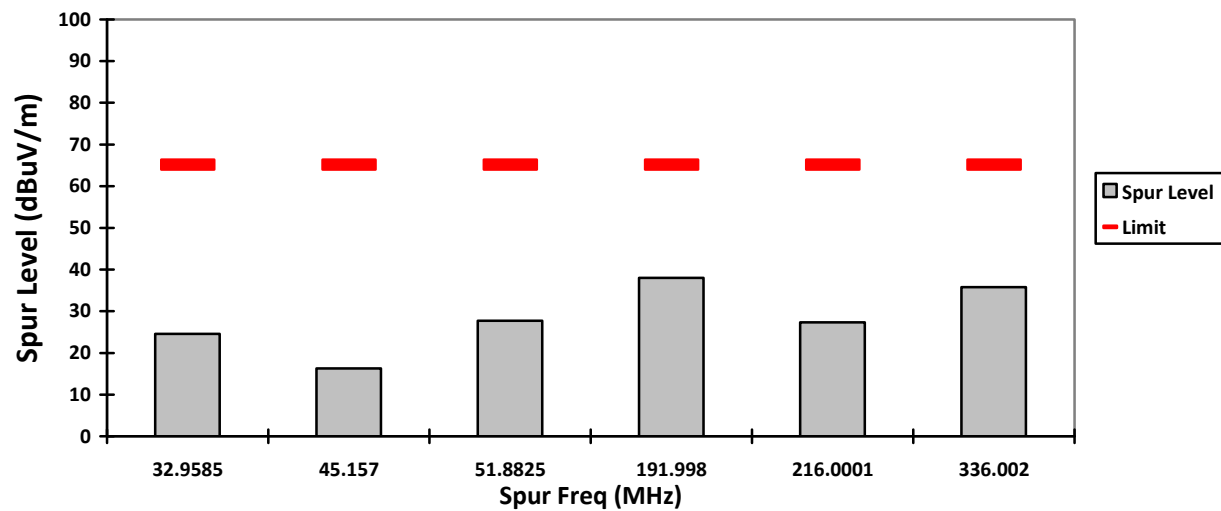
HORIZONTAL, QPK

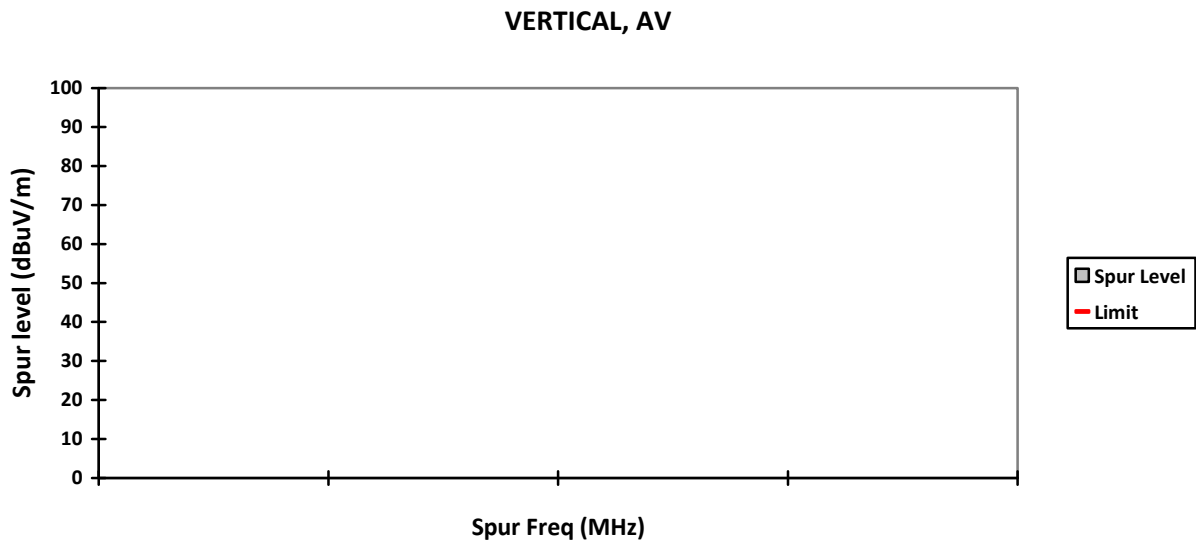


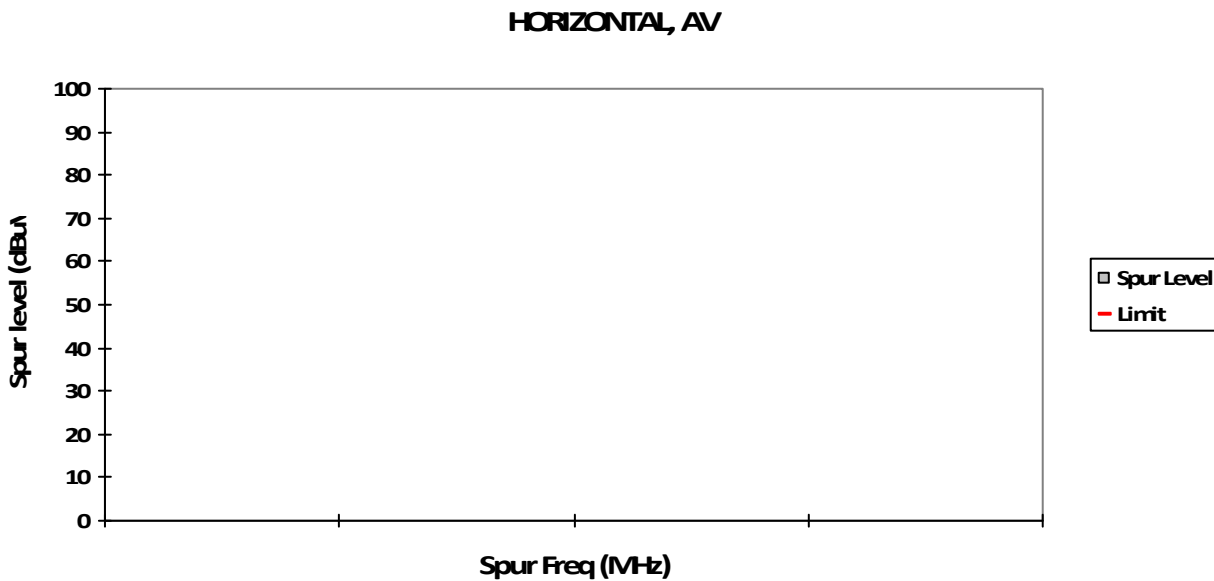
VERTICAL, PK



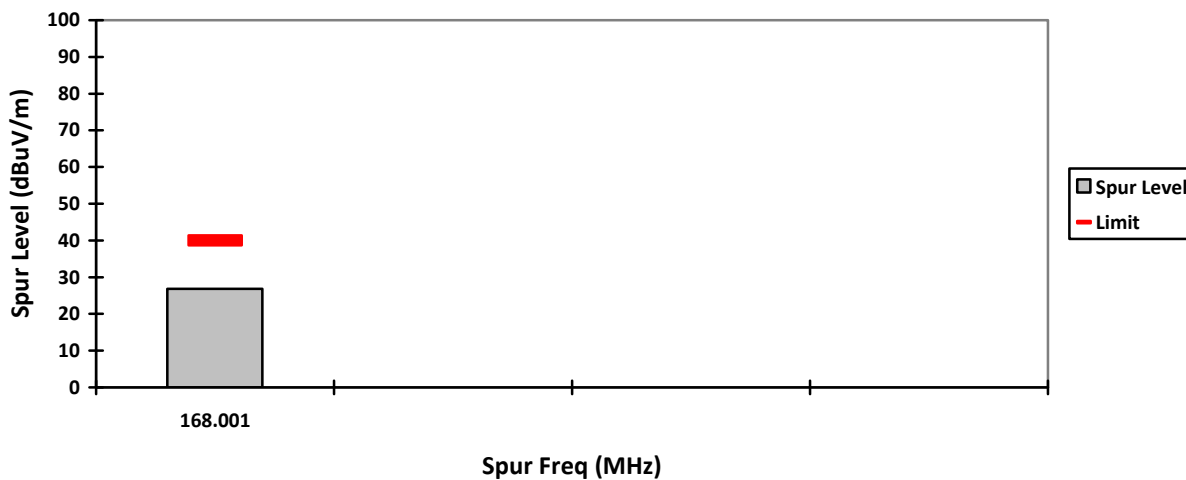
HORIZONTAL, PK



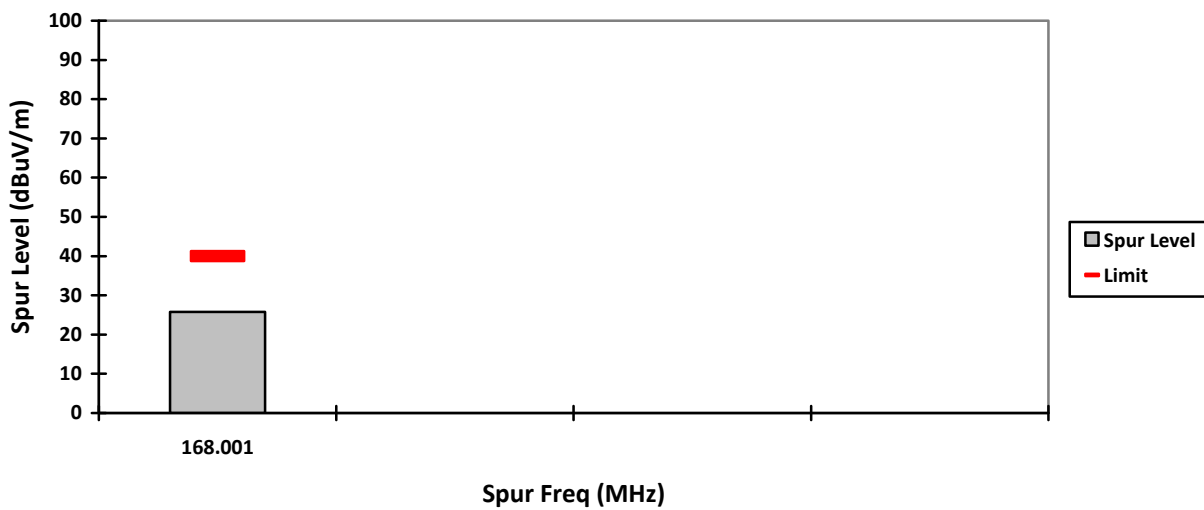




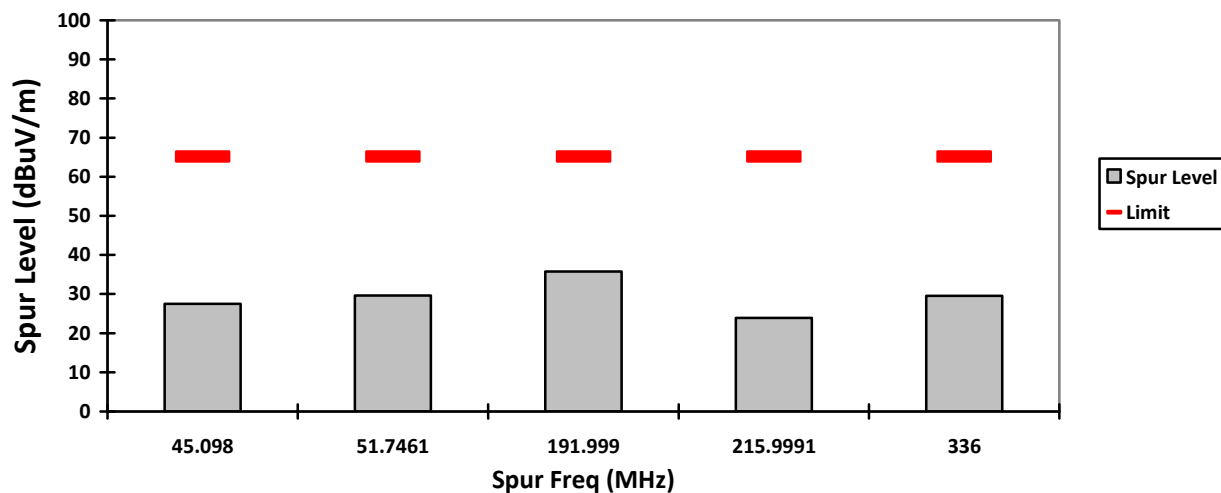
VERTICAL, QPK



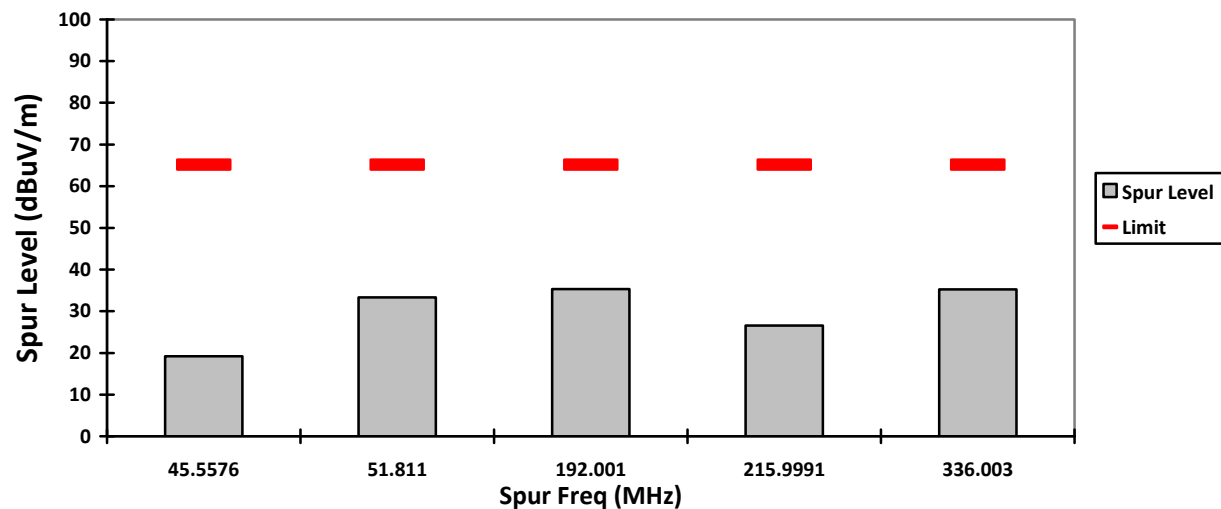
HORIZONTAL, QPK



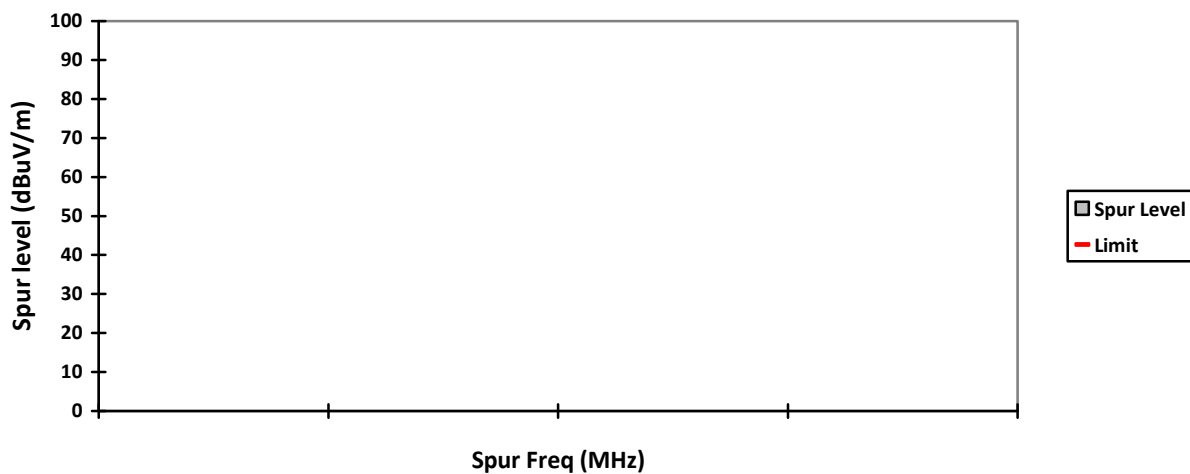
VERTICAL, PK



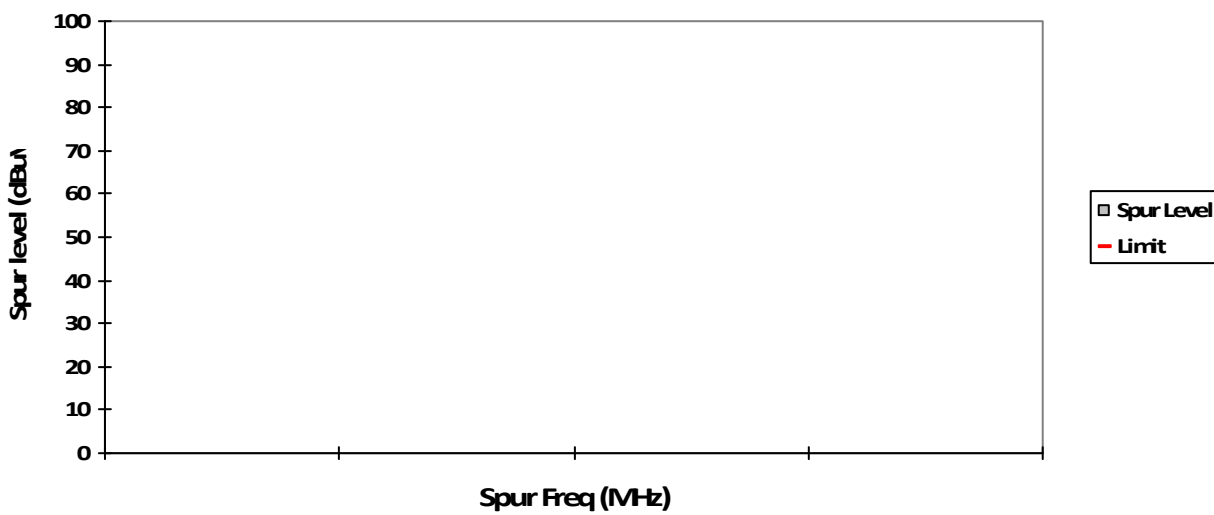
HORIZONTAL, PK



VERTICAL, AV

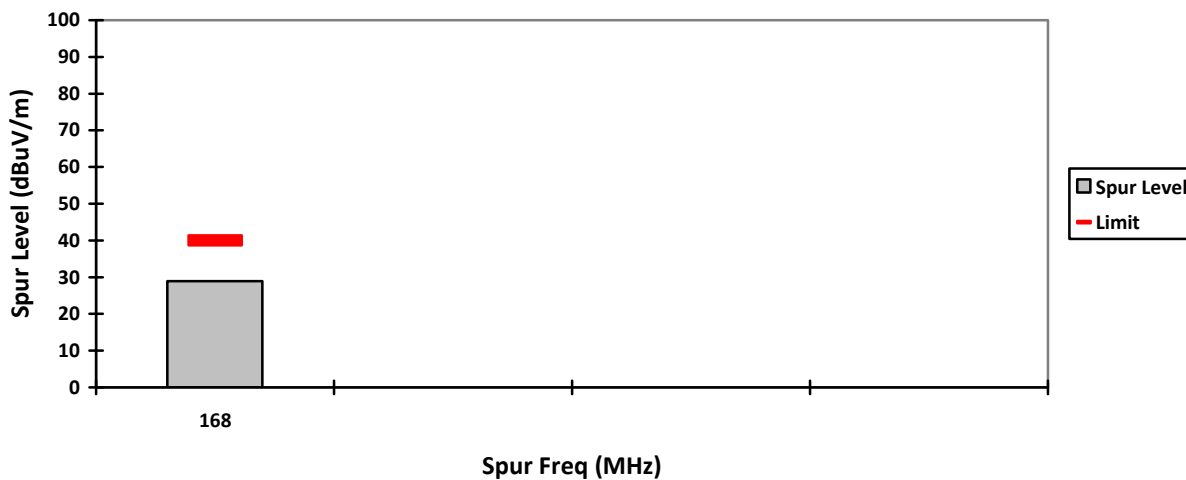


HORIZONTAL, AV

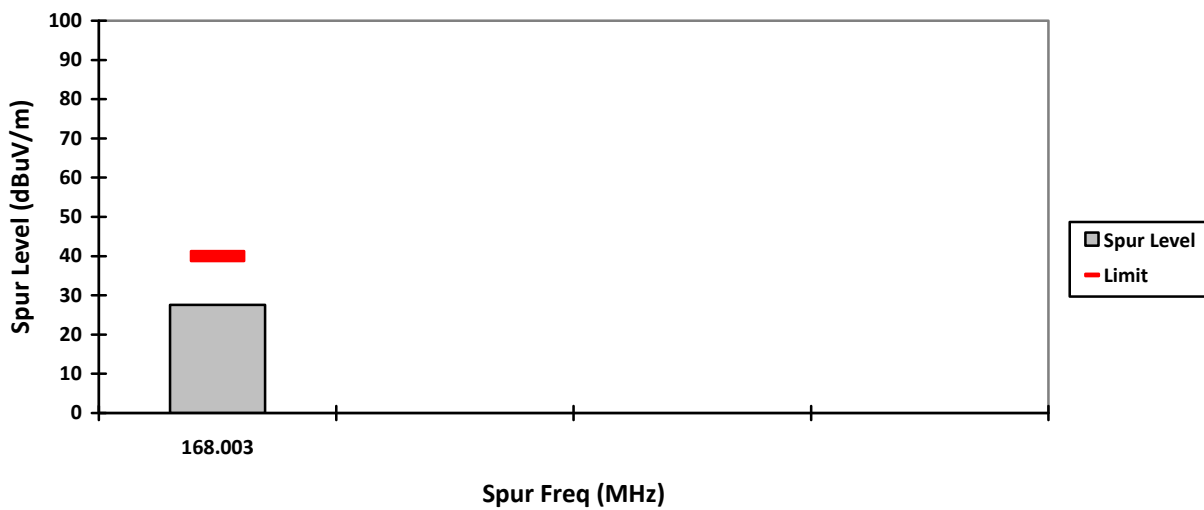


Worst Case Plane: Y-Plane (802.11a 20MHz)

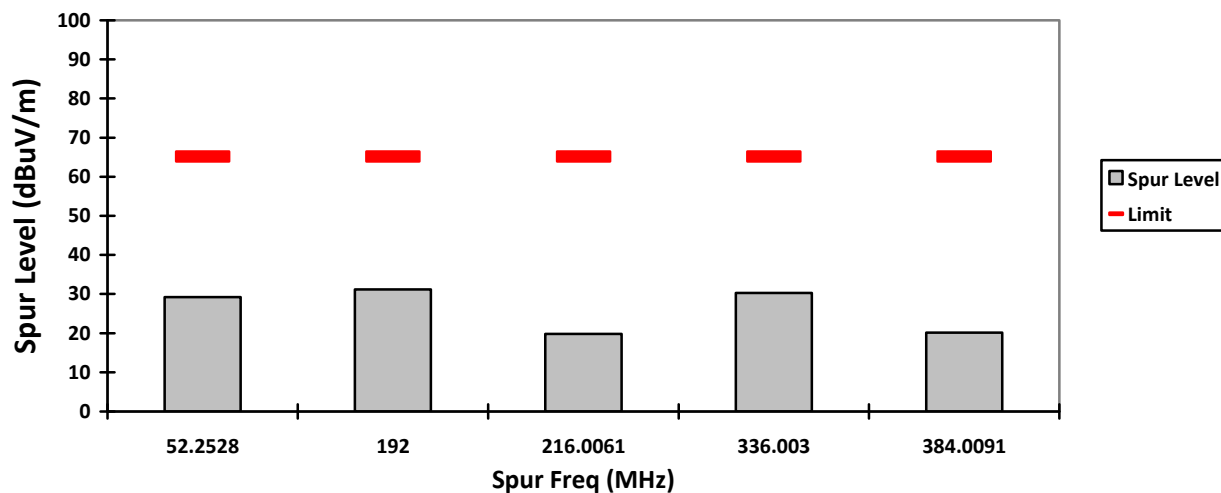
VERTICAL, QPK



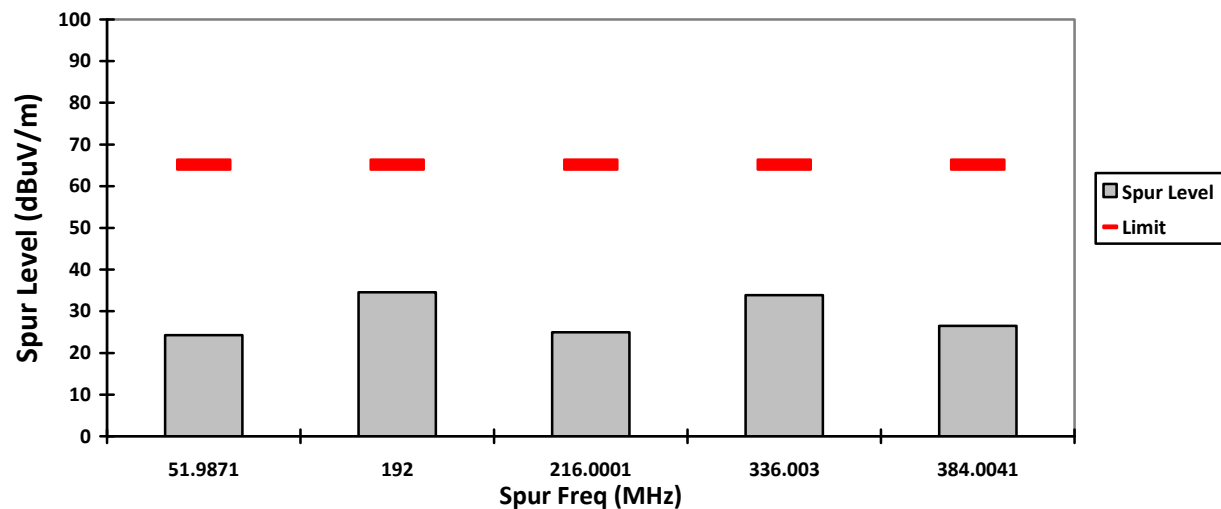
HORIZONTAL, QPK



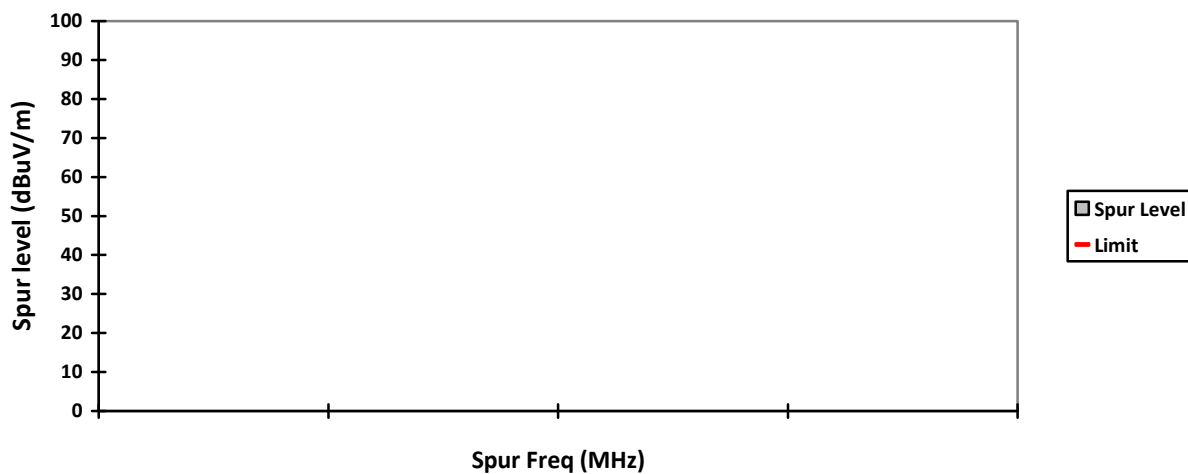
VERTICAL, PK



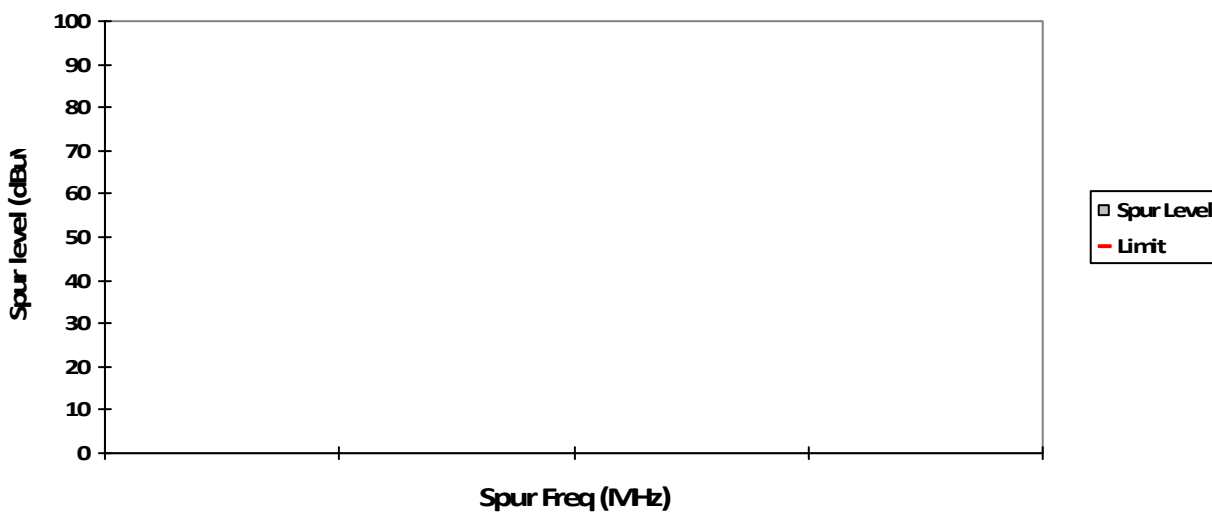
HORIZONTAL, PK



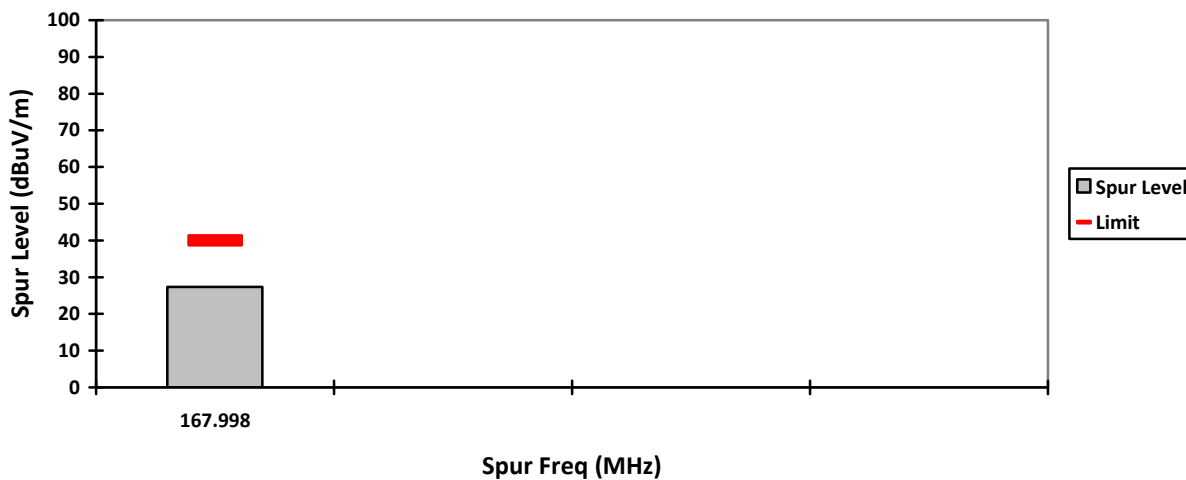
VERTICAL, AV



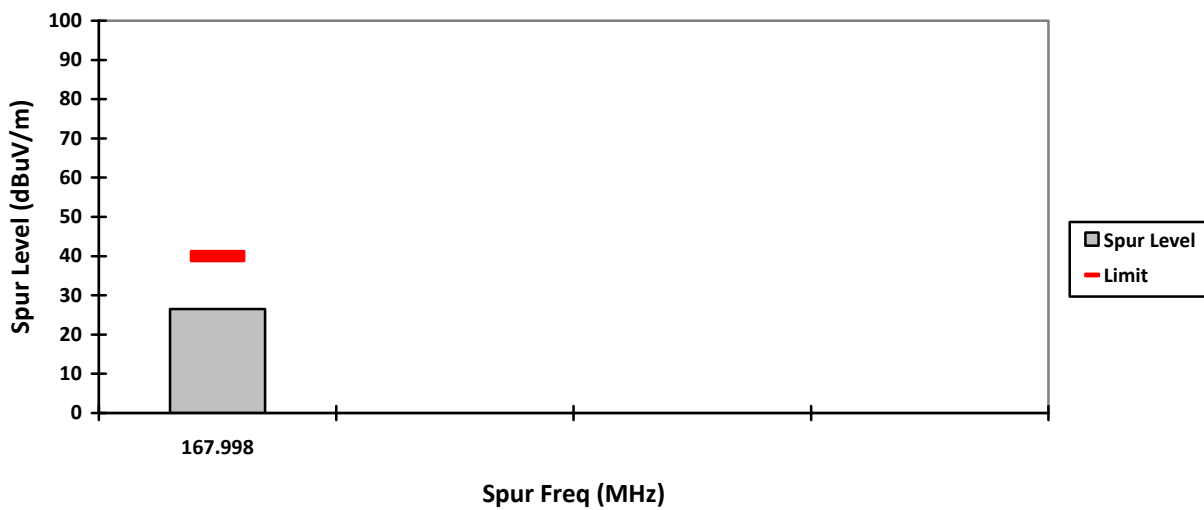
HORIZONTAL, AV



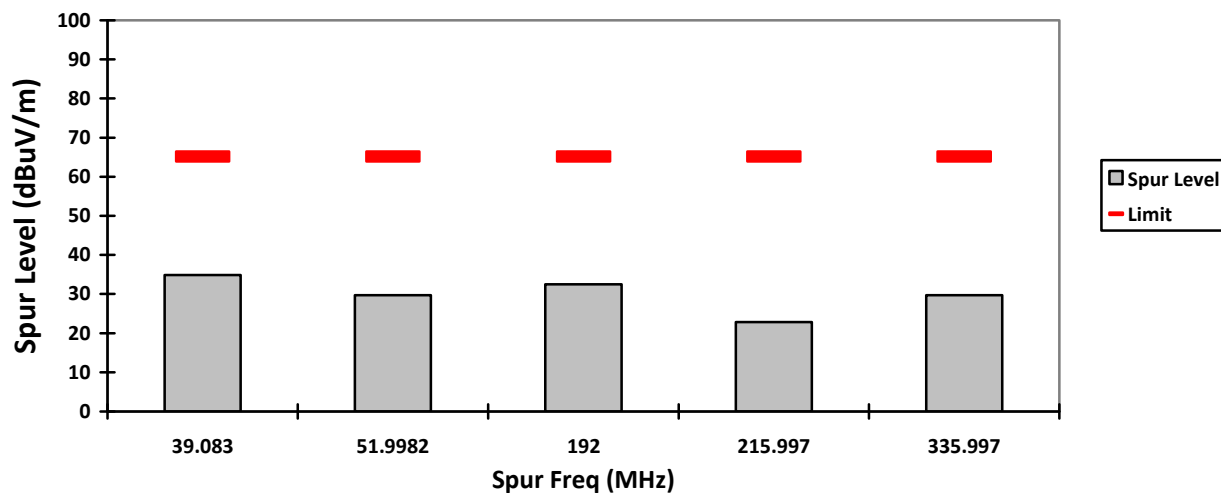
VERTICAL, QPK



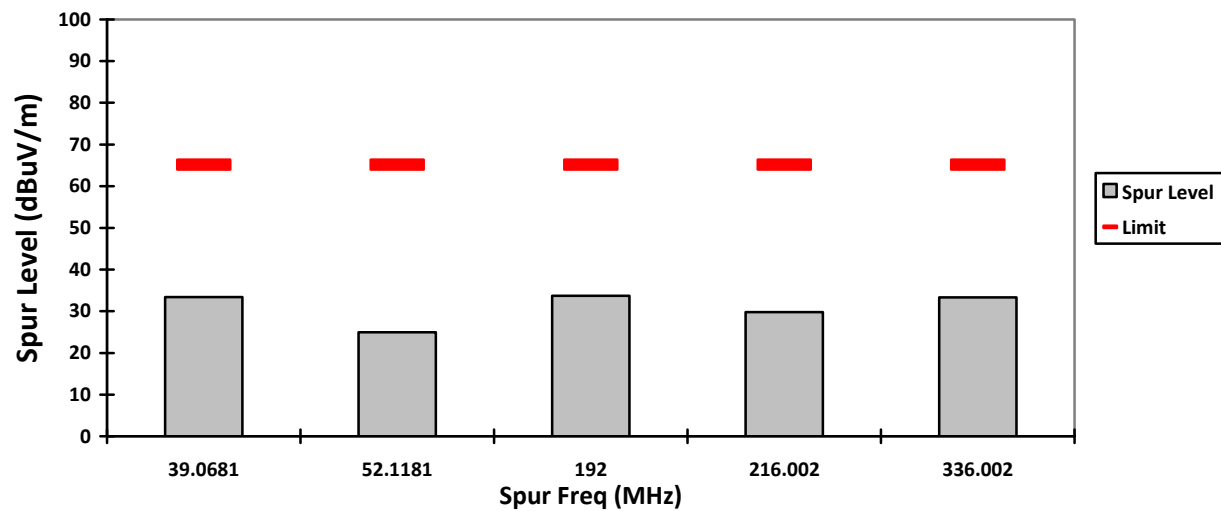
HORIZONTAL, QPK



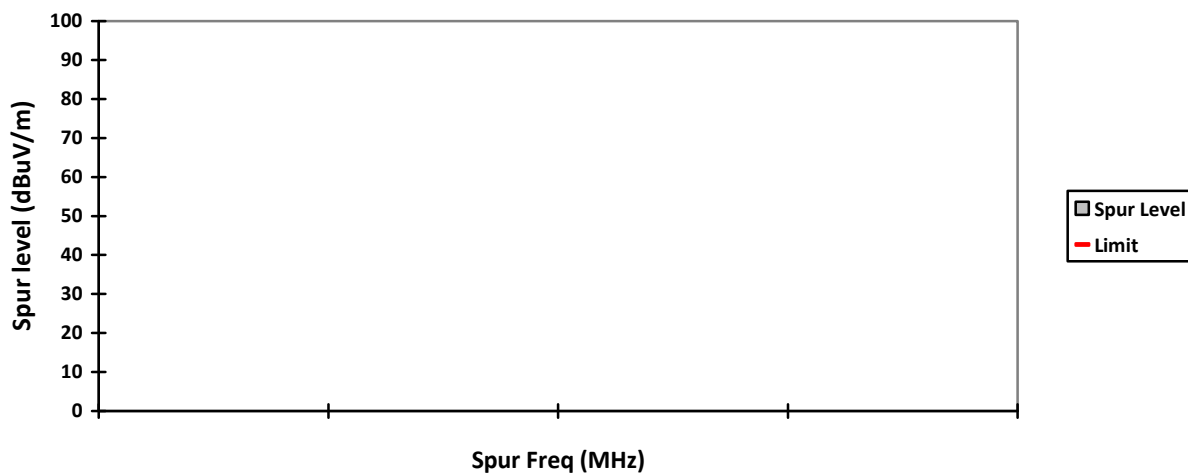
VERTICAL, PK



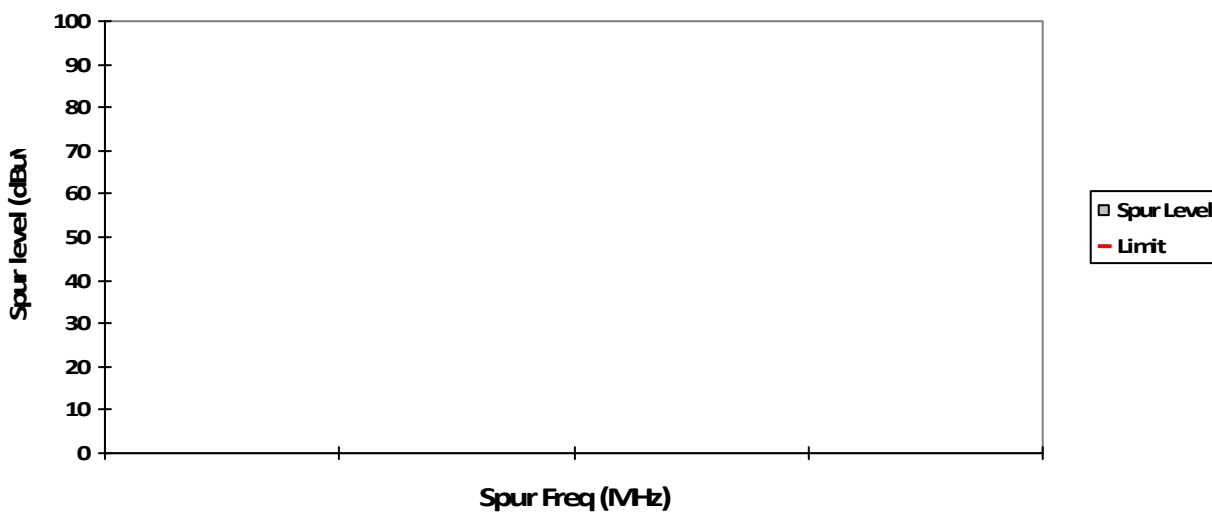
HORIZONTAL, PK



VERTICAL, AV

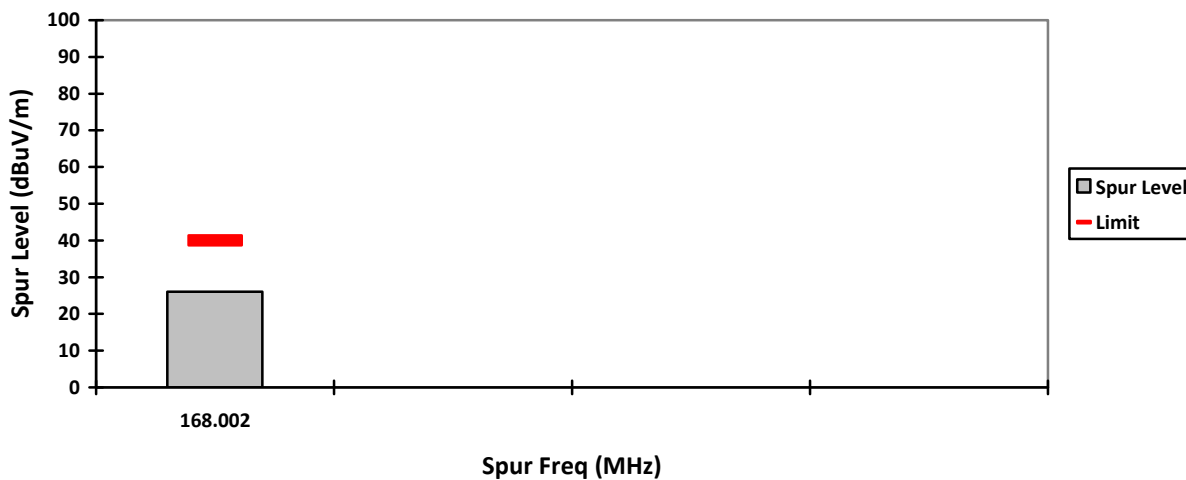


HORIZONTAL, AV

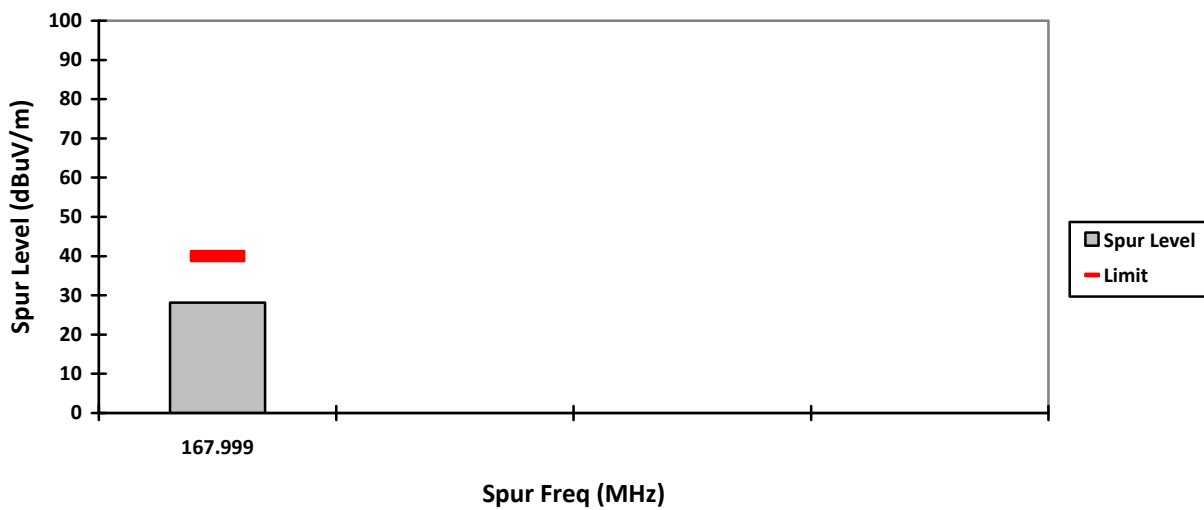


Worst Case Plane: Y-Plane (802.11a 20MHz)

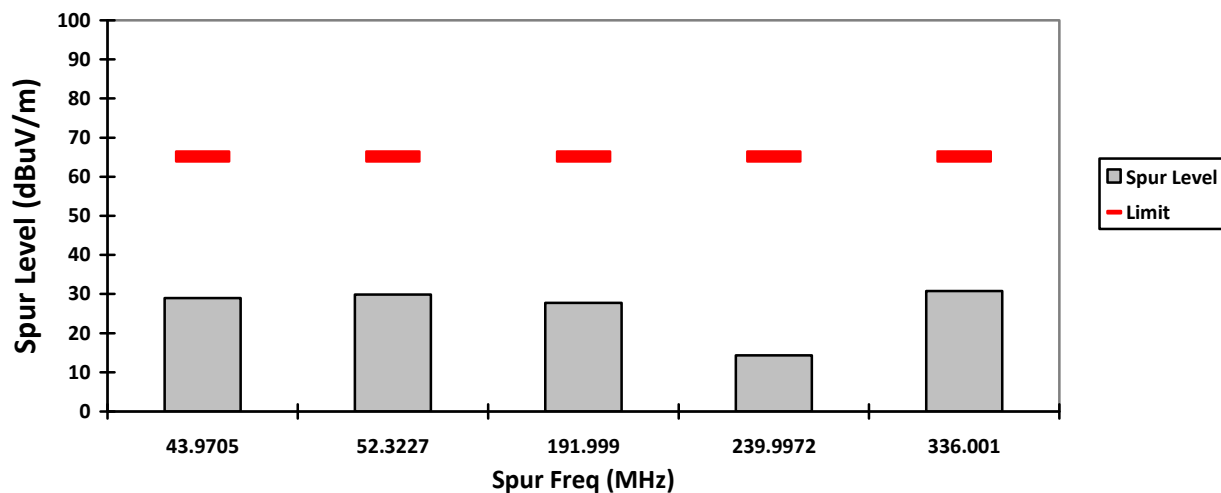
VERTICAL, QPK



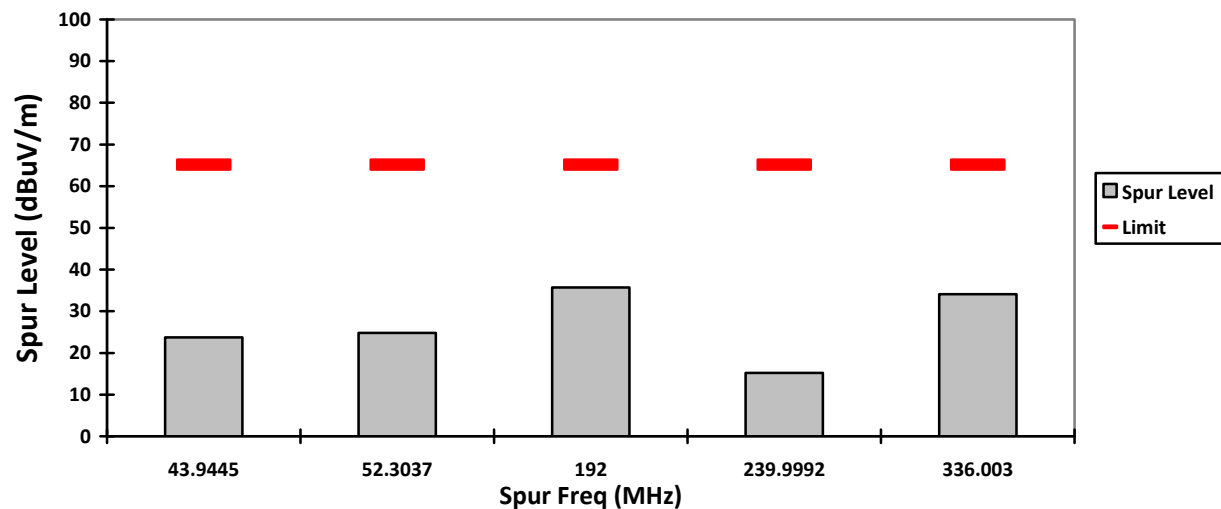
HORIZONTAL, QPK



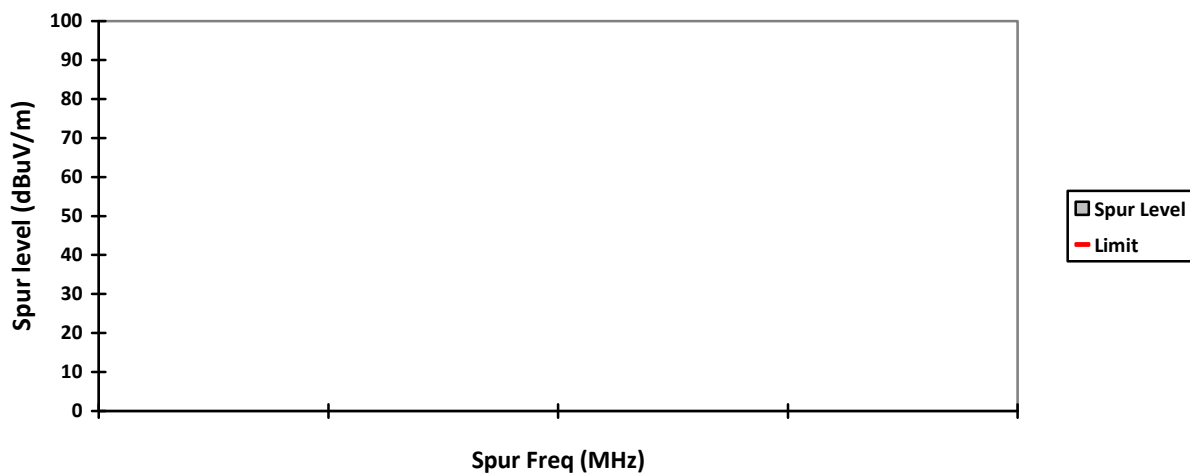
VERTICAL, PK



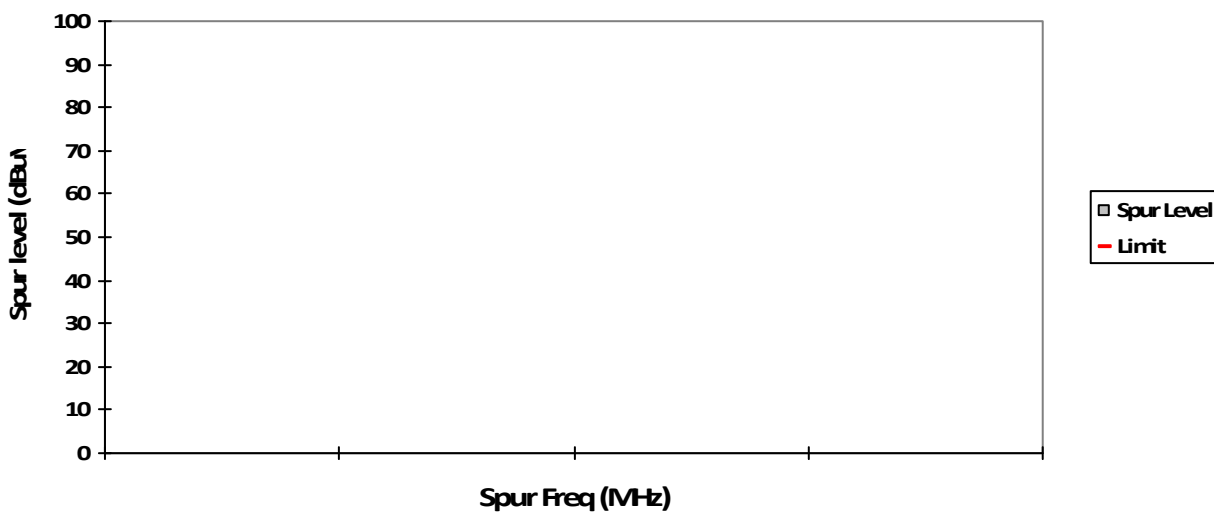
HORIZONTAL, PK



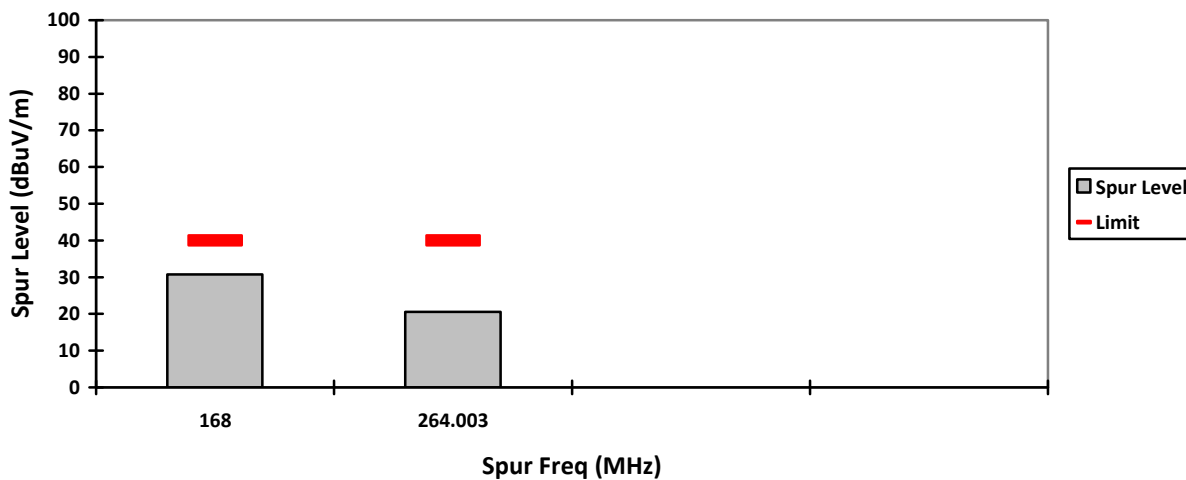
VERTICAL, AV



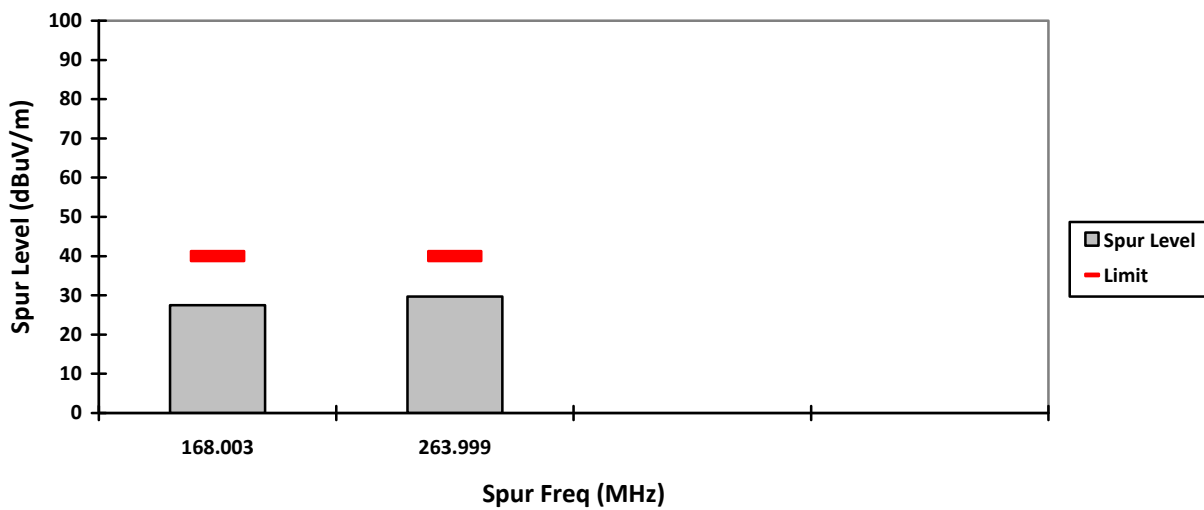
HORIZONTAL, AV



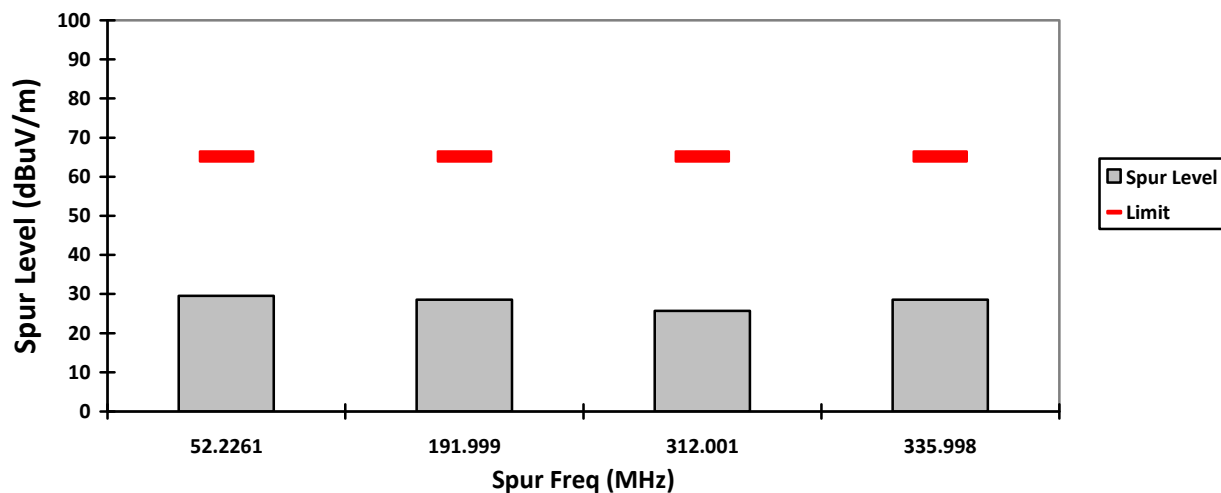
VERTICAL, QPK



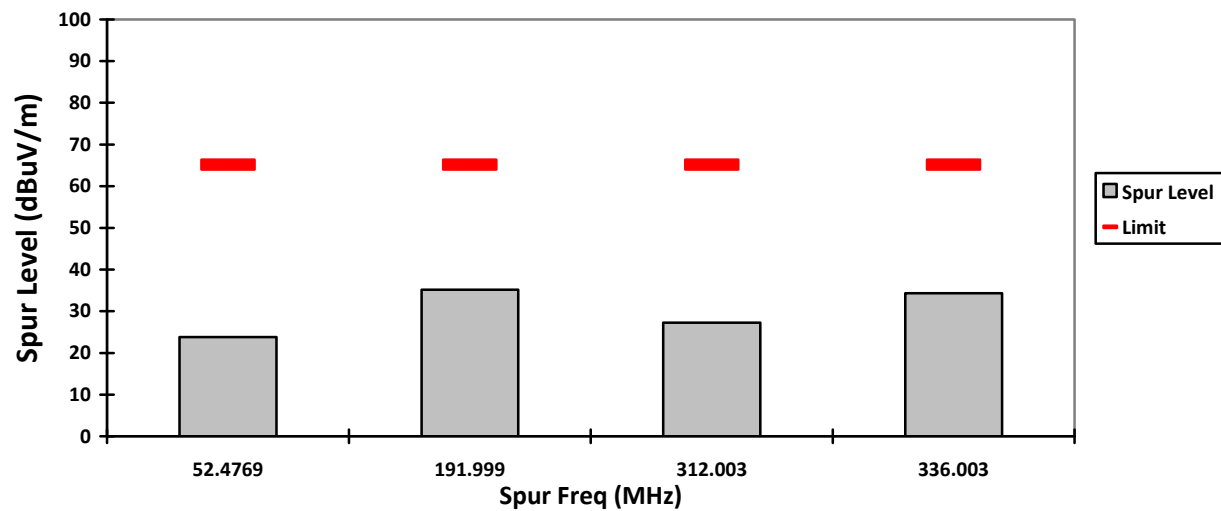
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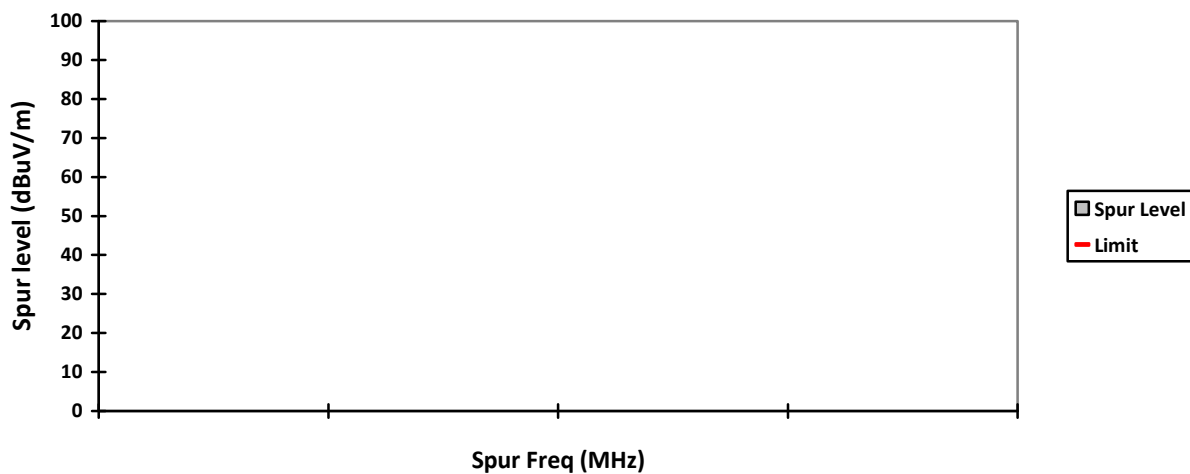
VERTICAL, PK



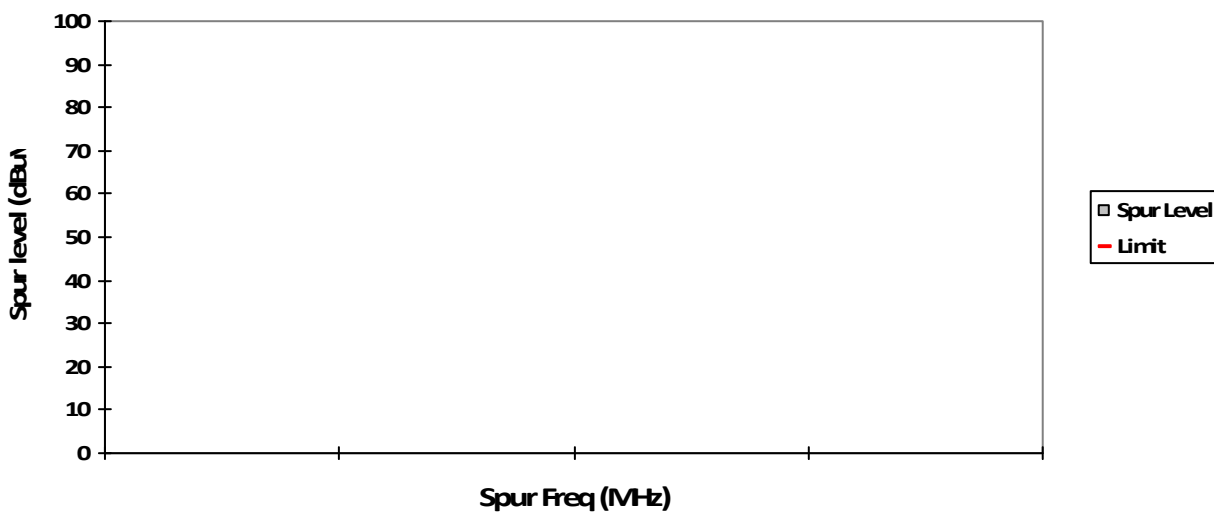
HORIZONTAL, PK



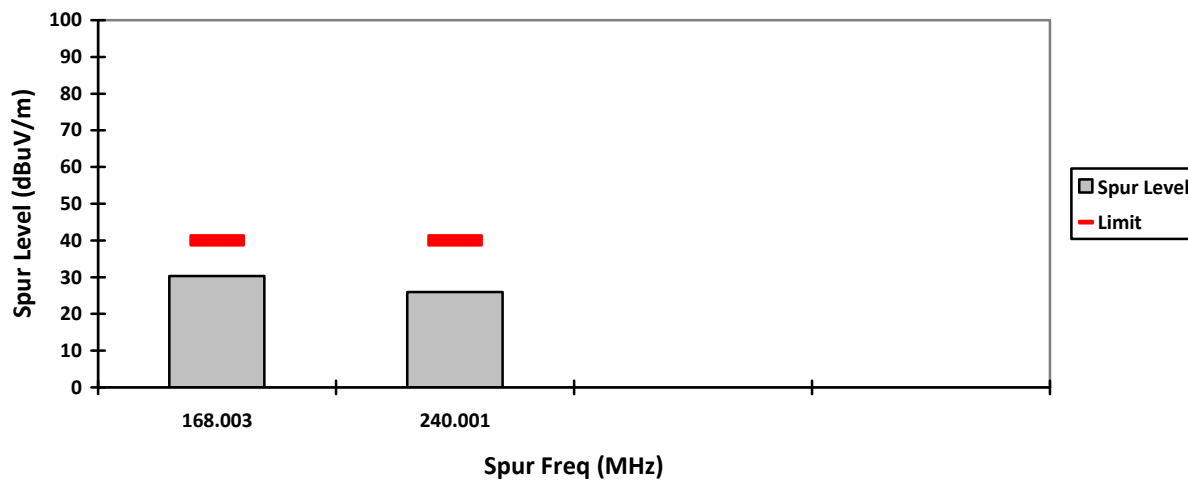
VERTICAL, AV



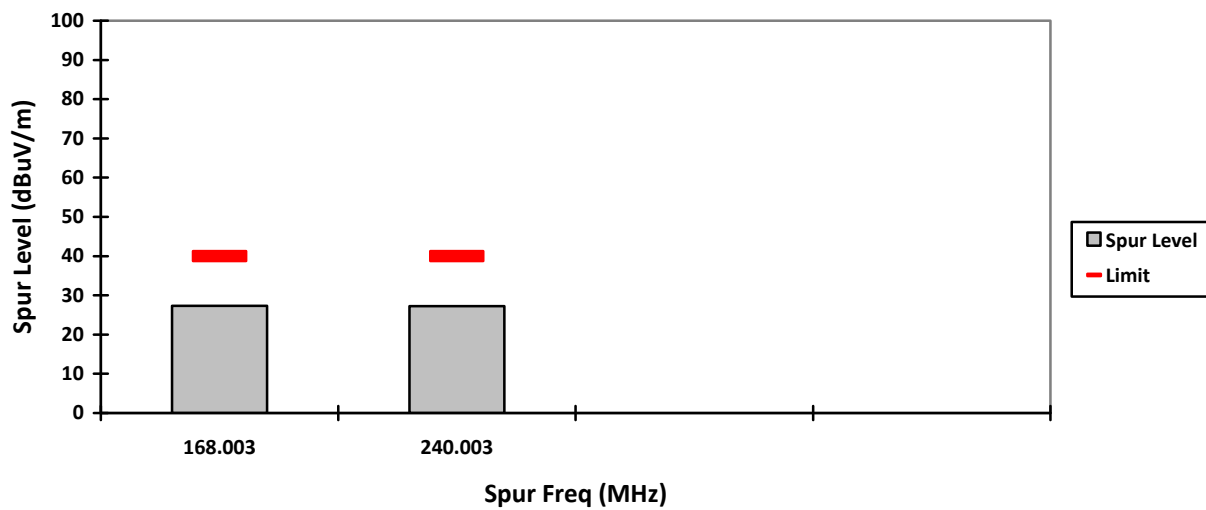
HORIZONTAL, AV



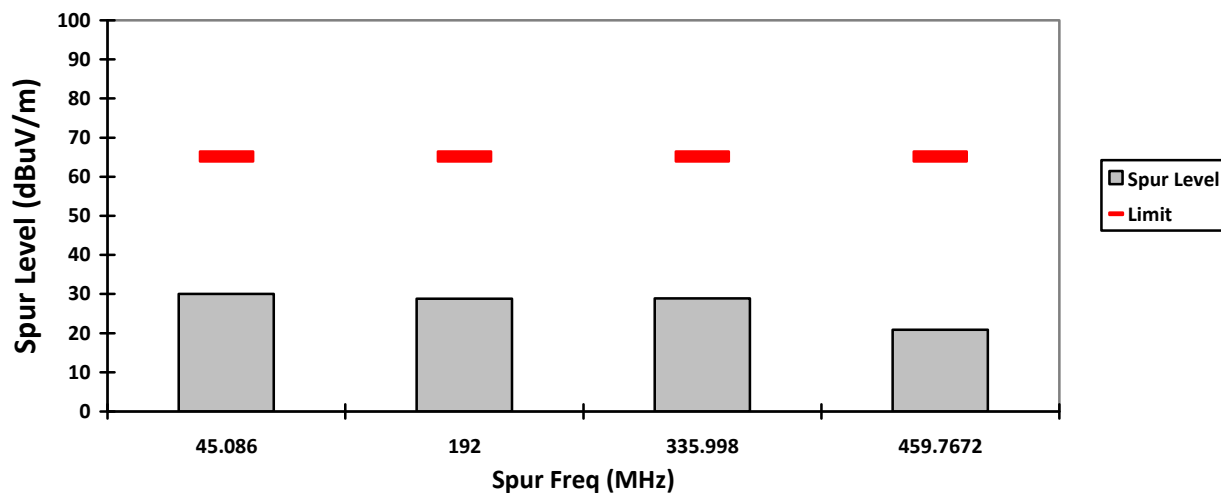
VERTICAL, QPK



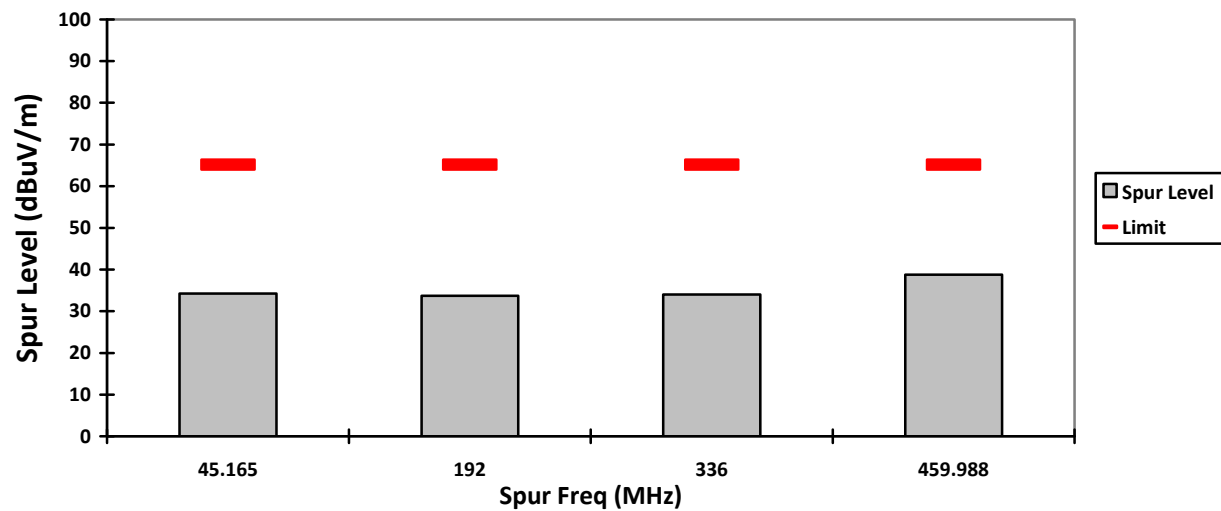
HORIZONTAL, QPK



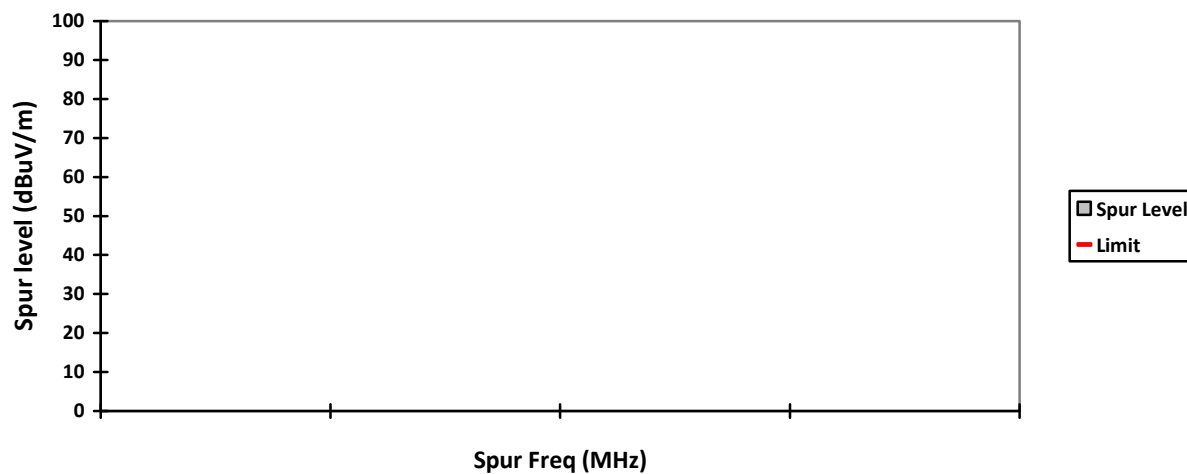
VERTICAL, PK



HORIZONTAL, PK



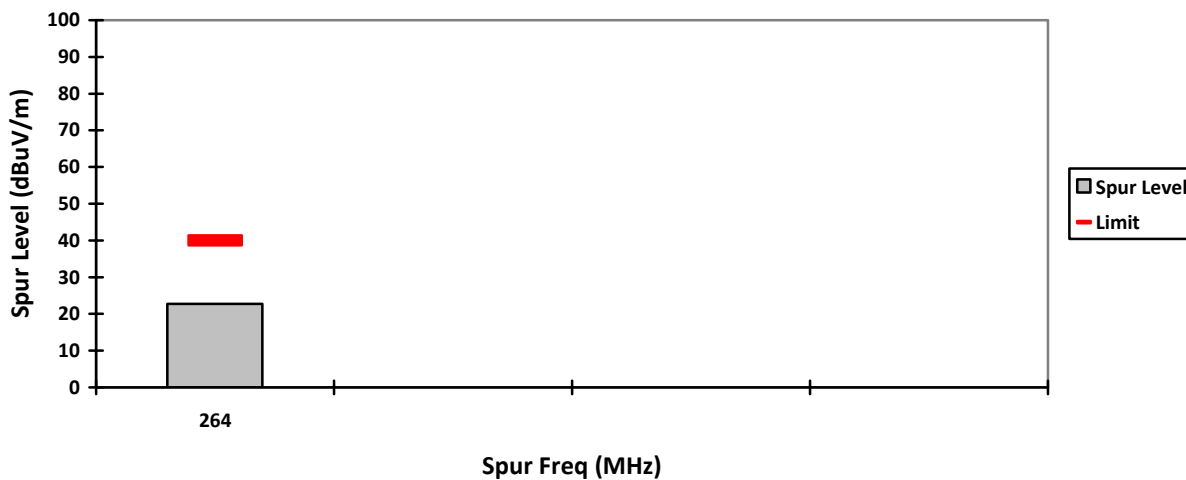
VERTICAL, AV



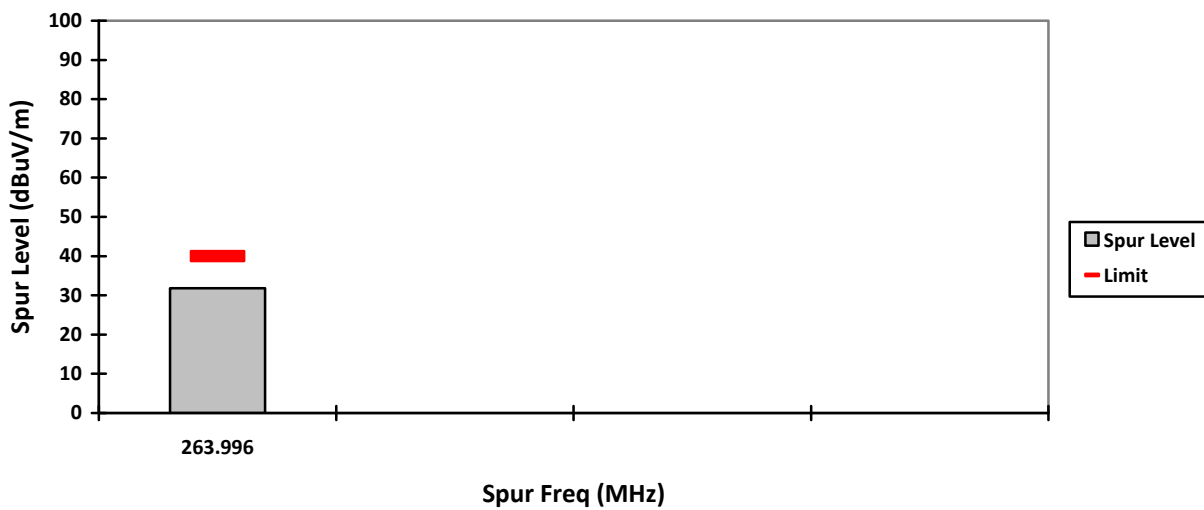
HORIZONTAL, AV



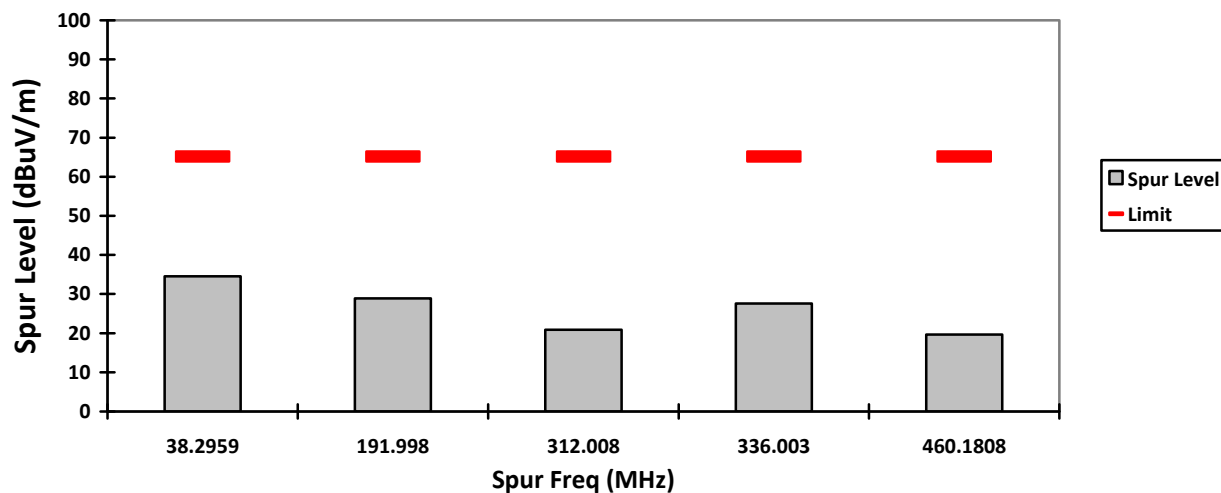
VERTICAL, QPK



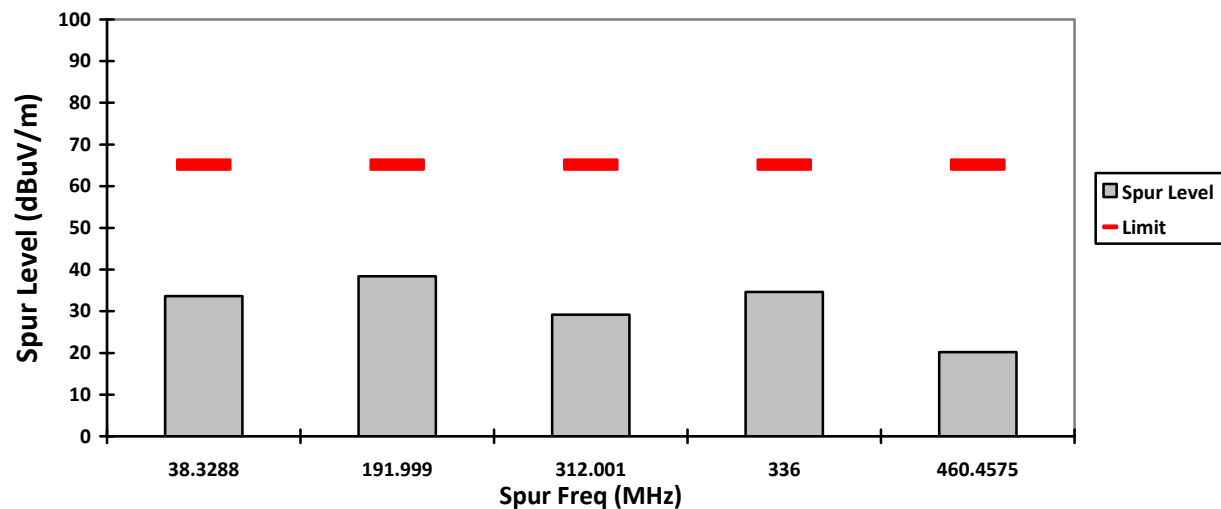
HORIZONTAL, QPK



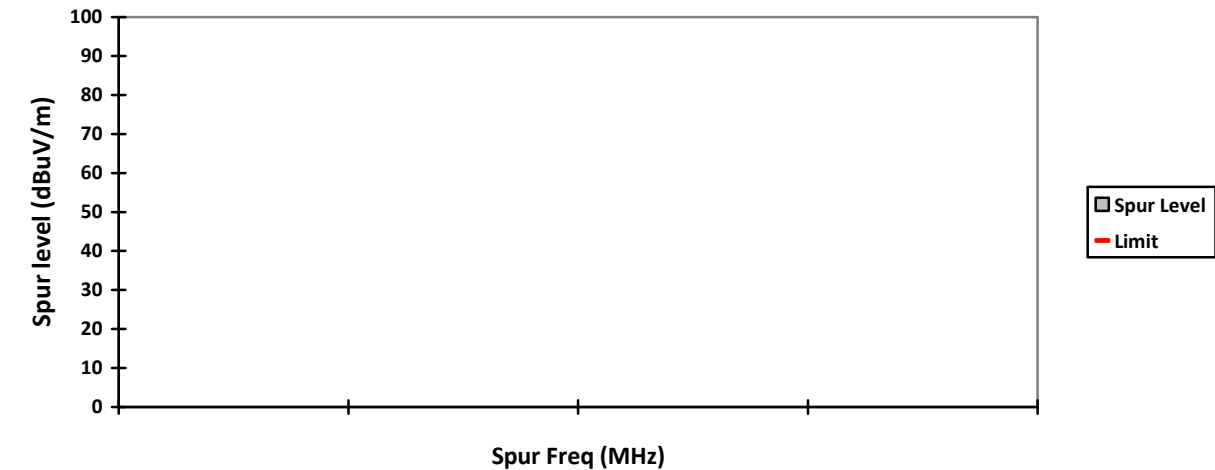
VERTICAL, PK



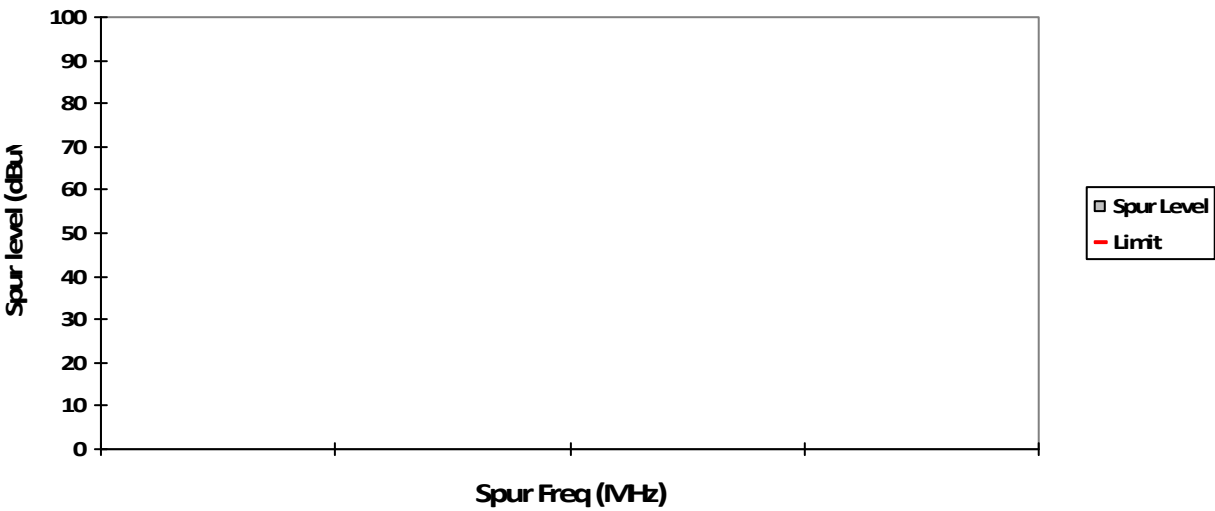
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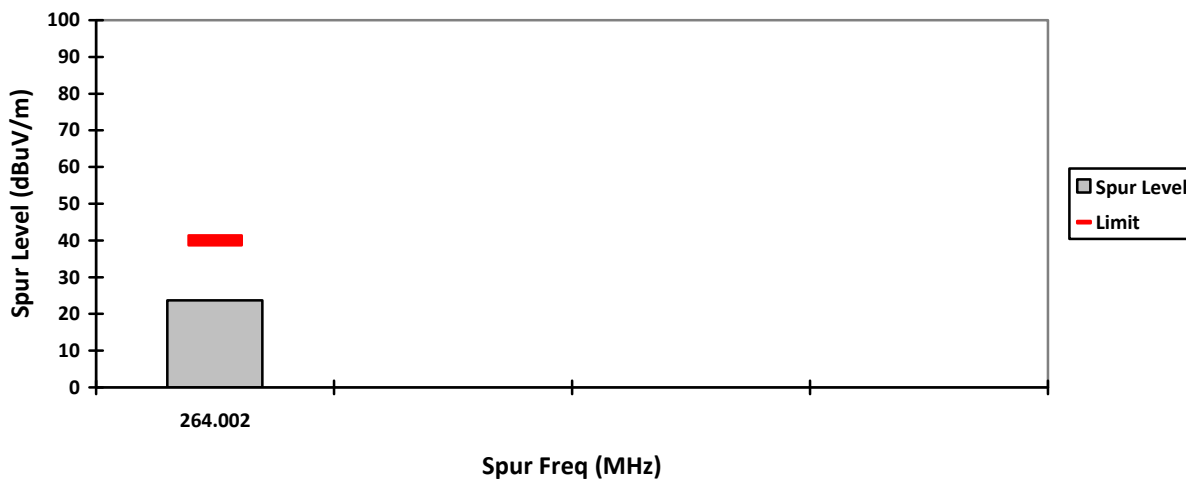
VERTICAL, AV



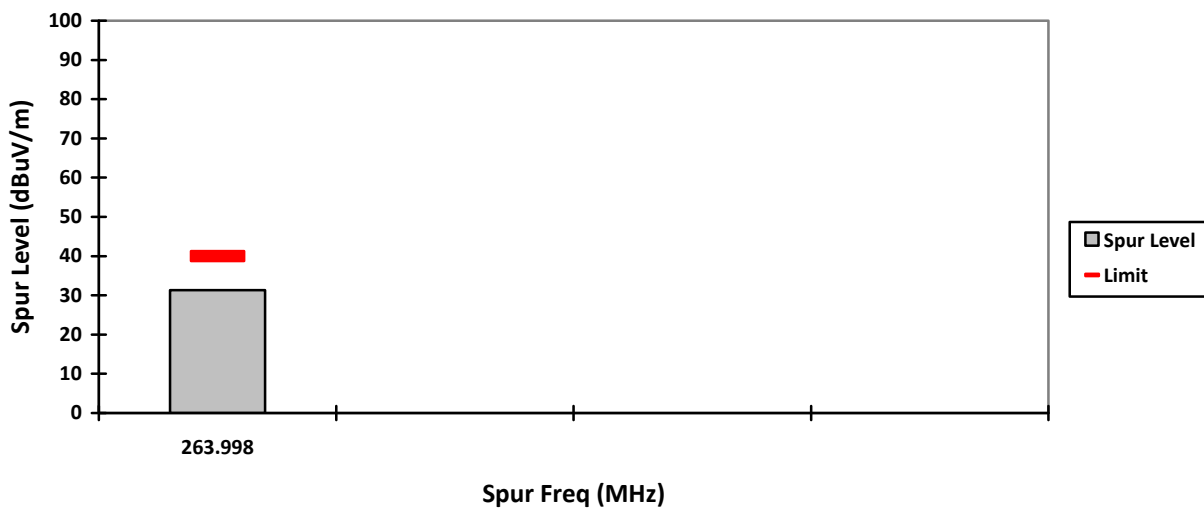
HORIZONTAL, AV



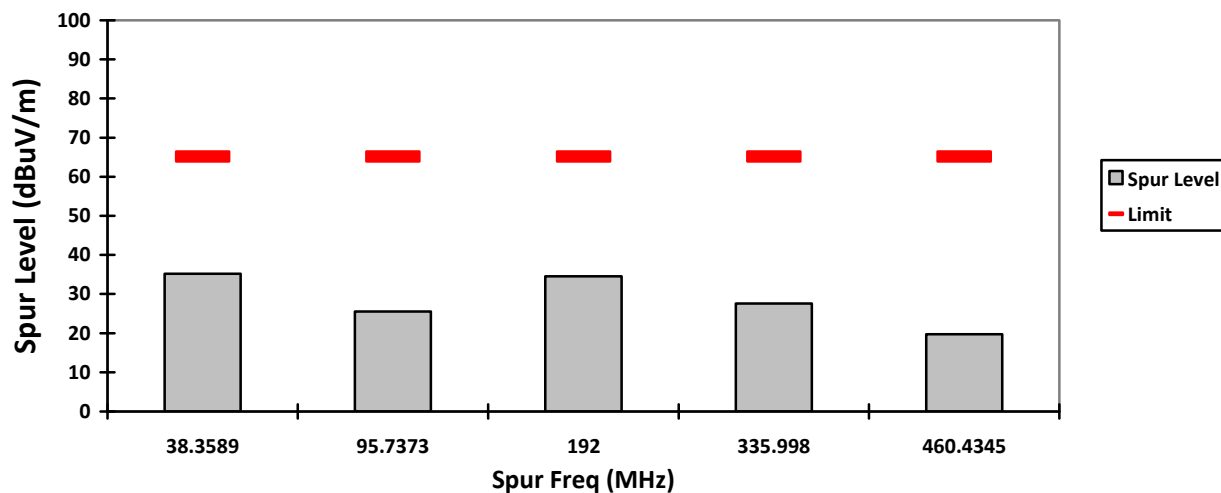
VERTICAL, QPK



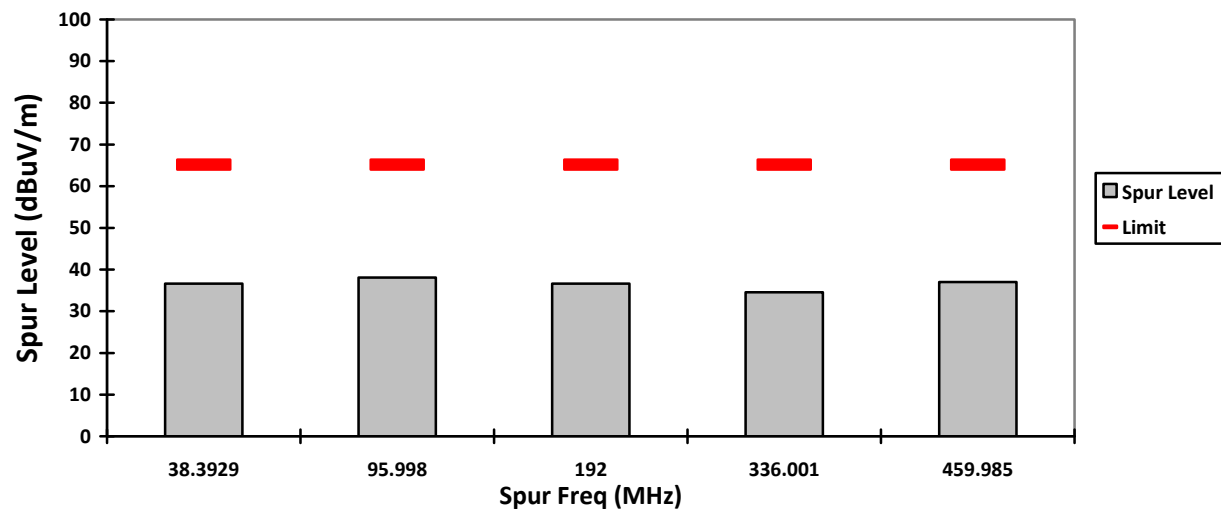
HORIZONTAL, QPK



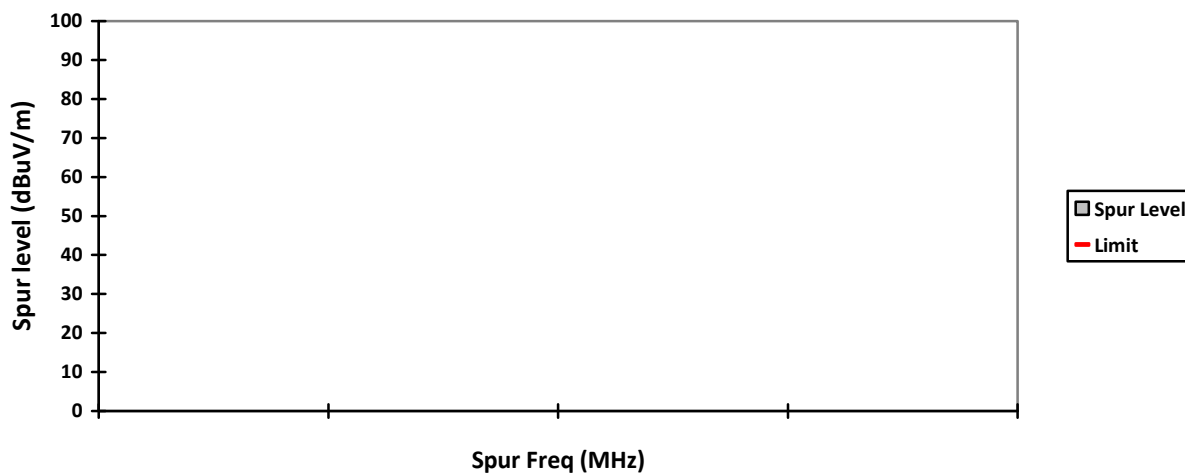
VERTICAL, PK



HORIZONTAL, PK



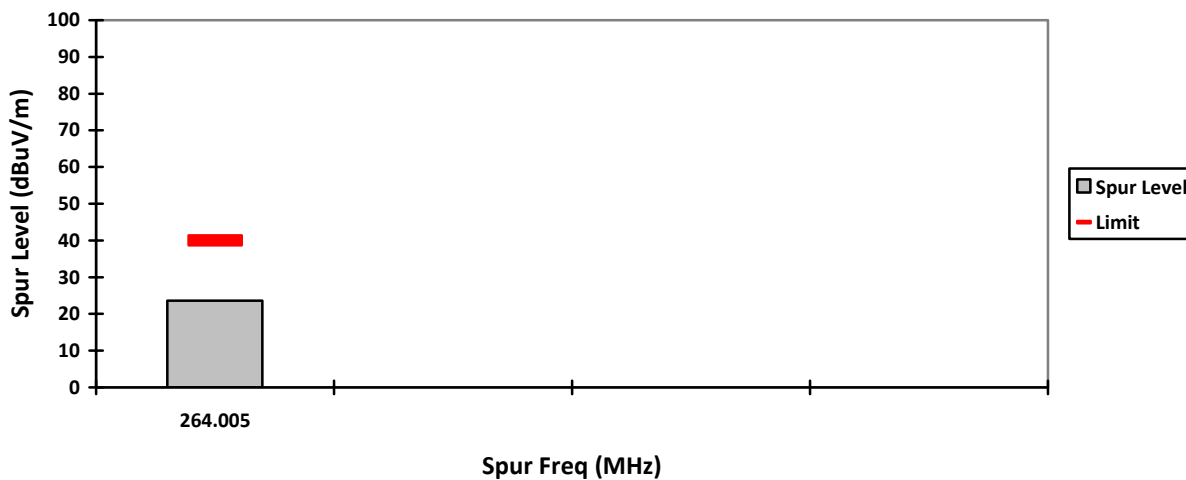
VERTICAL, AV



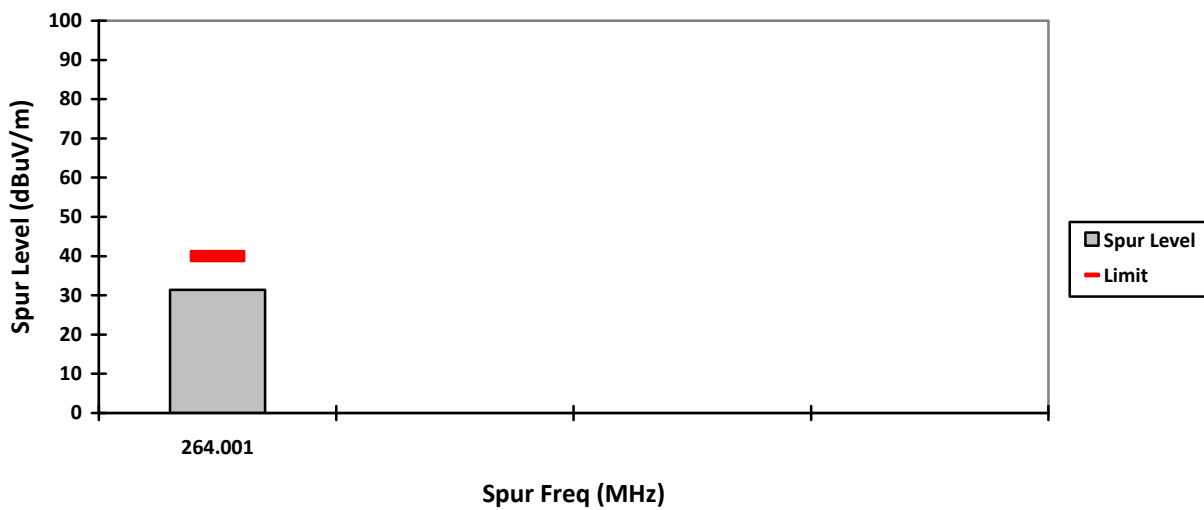
HORIZONTAL, AV



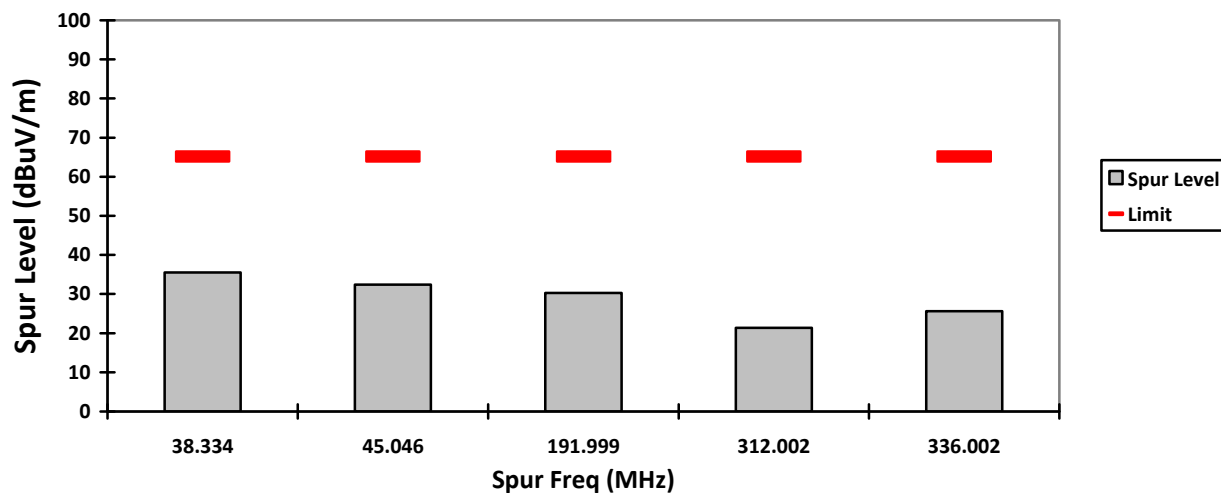
VERTICAL, QPK



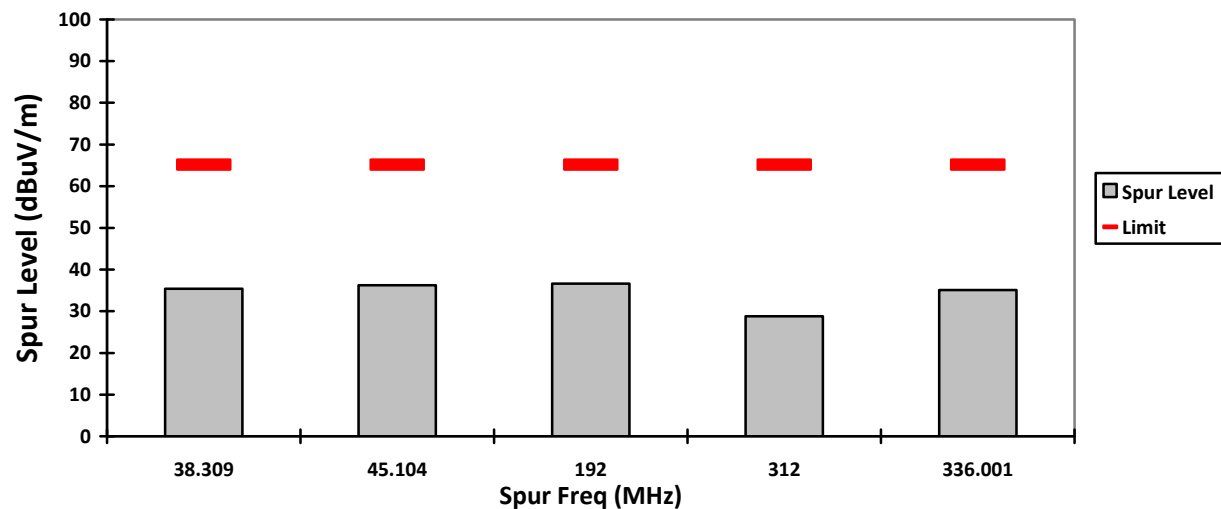
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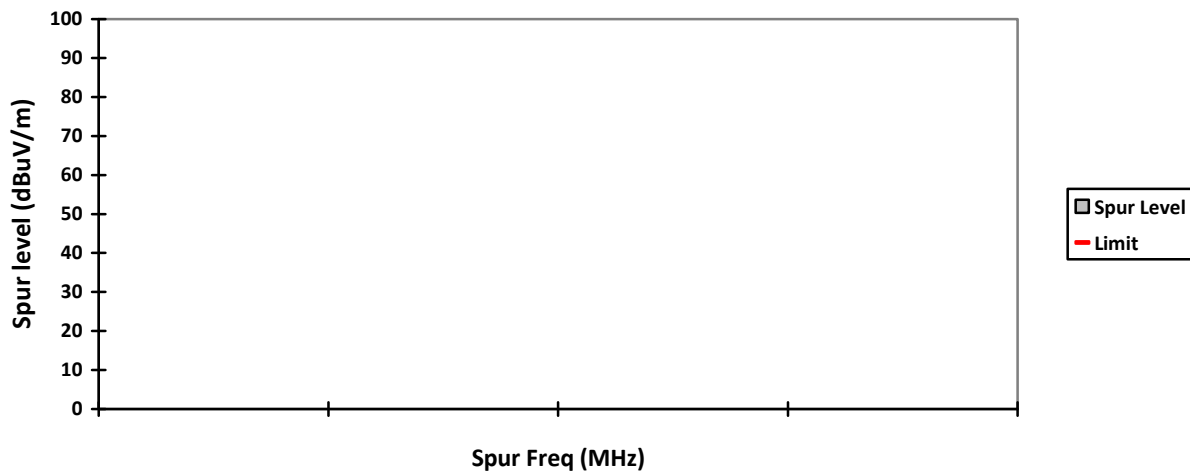
VERTICAL, PK



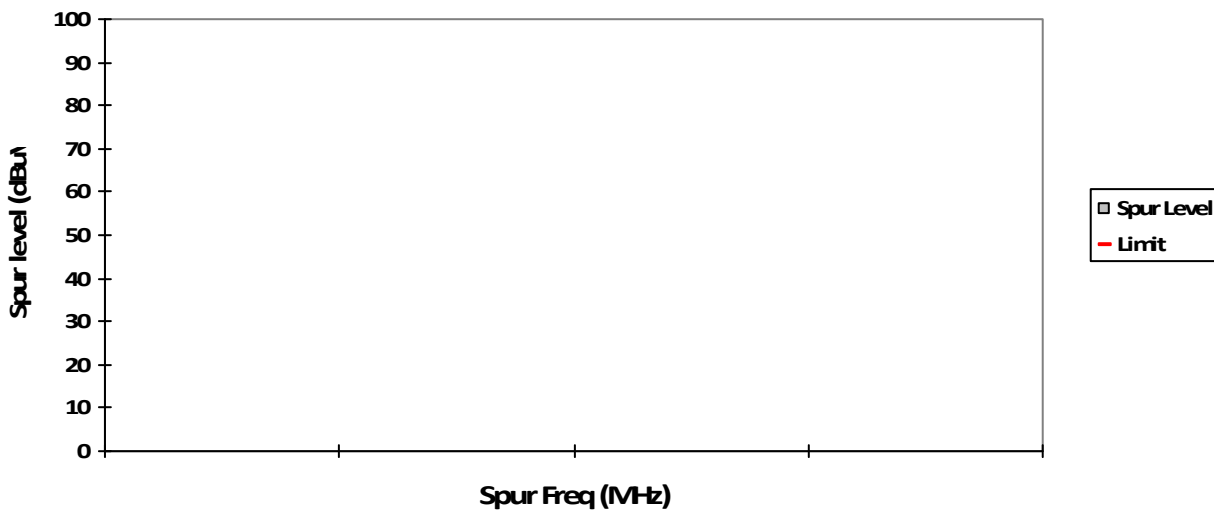
HORIZONTAL, PK



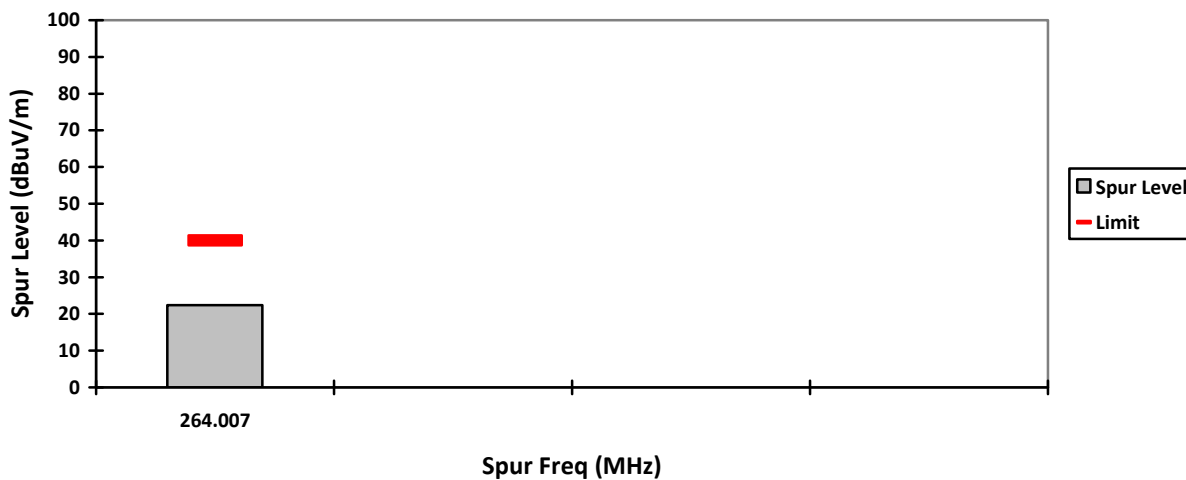
VERTICAL, AV



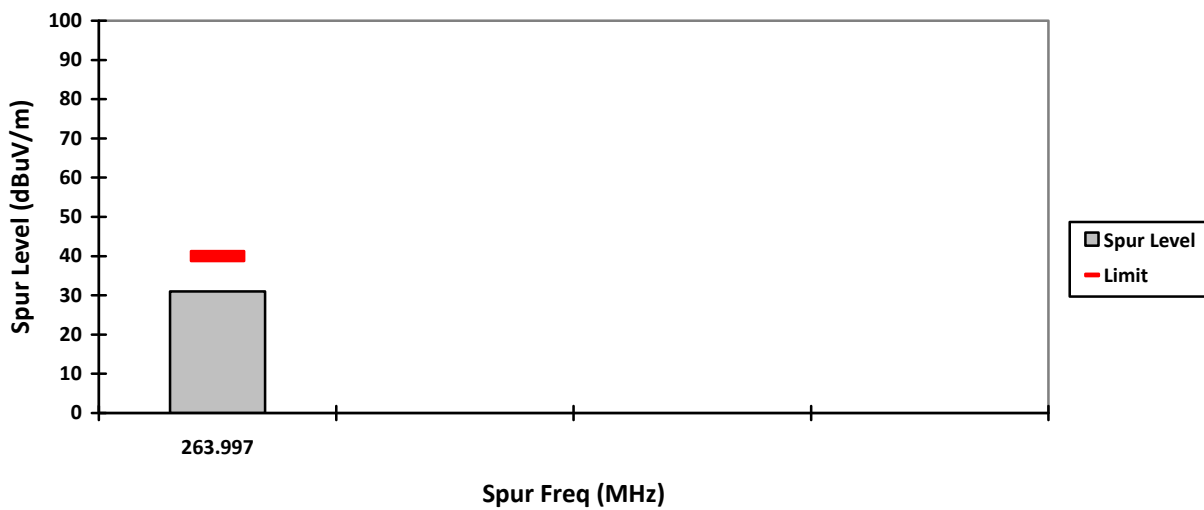
HORIZONTAL, AV



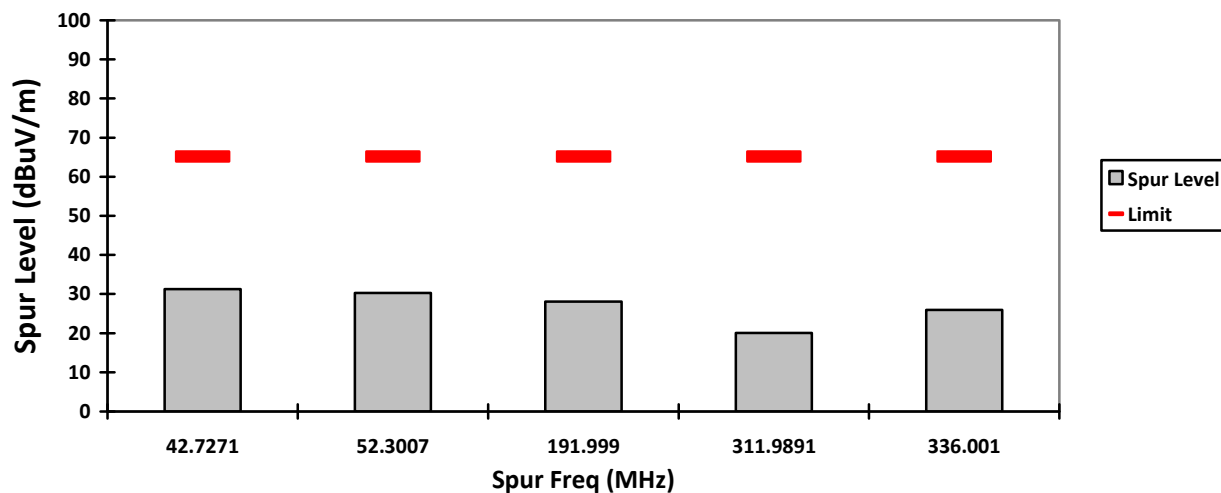
VERTICAL, QPK



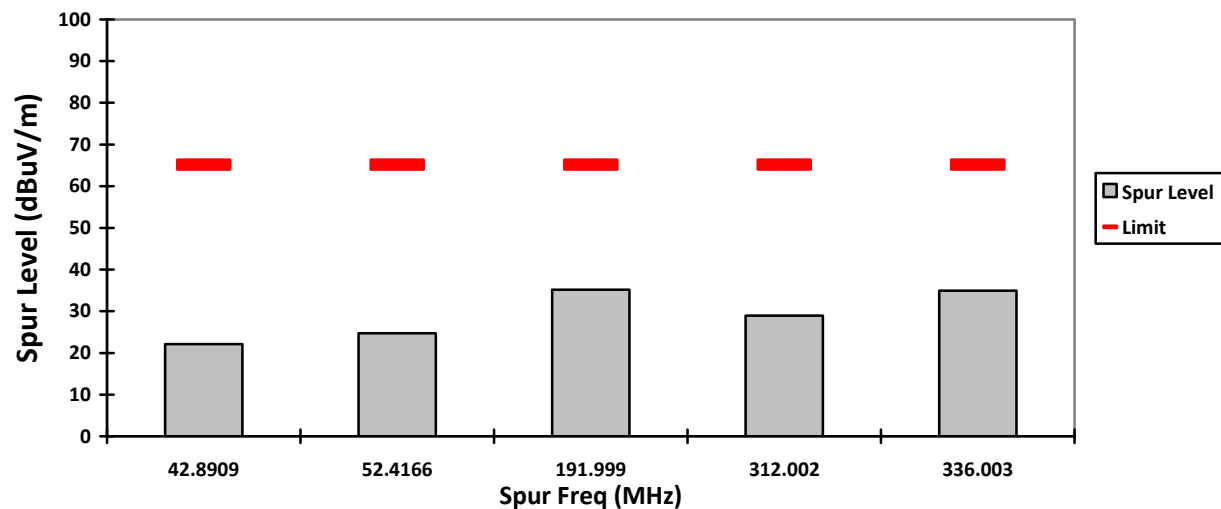
HORIZONTAL, QPK



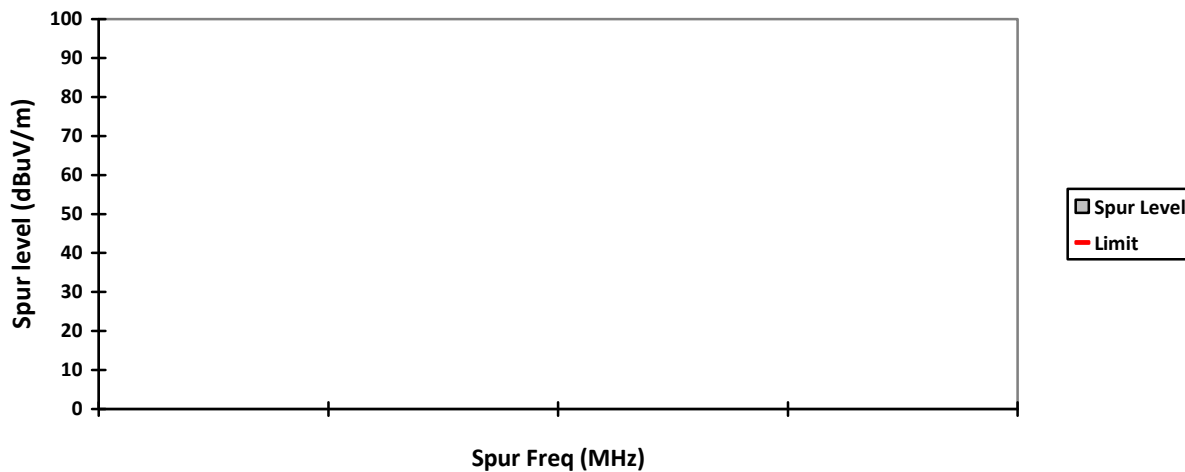
VERTICAL, PK



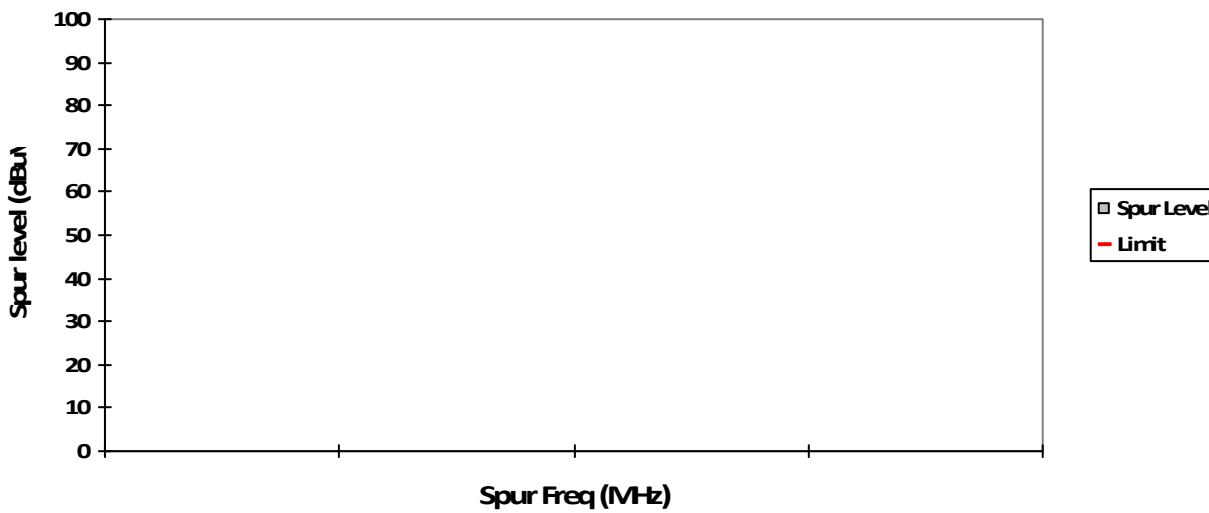
HORIZONTAL, PK



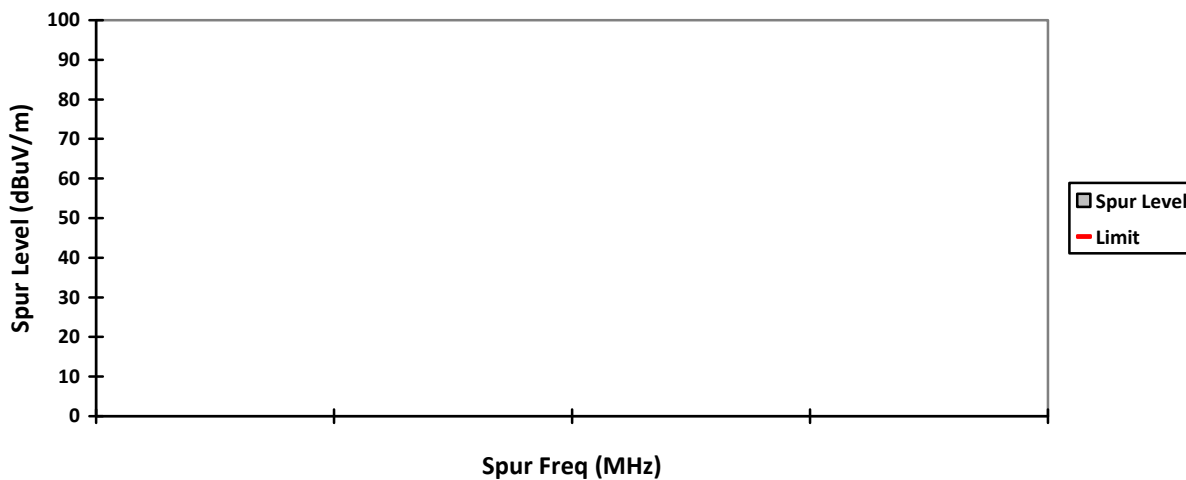
VERTICAL, AV



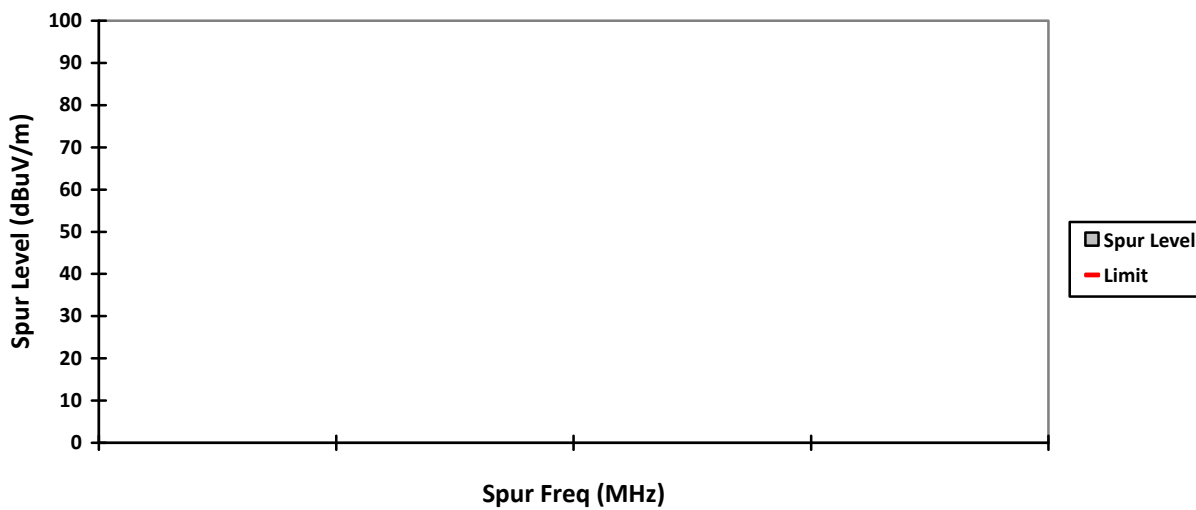
HORIZONTAL, AV



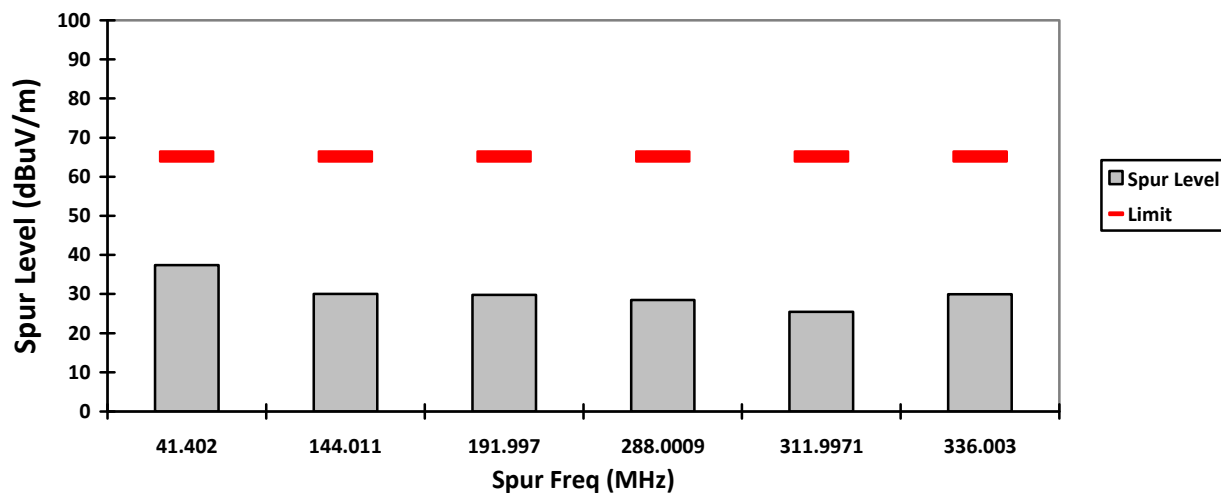
VERTICAL, QPK



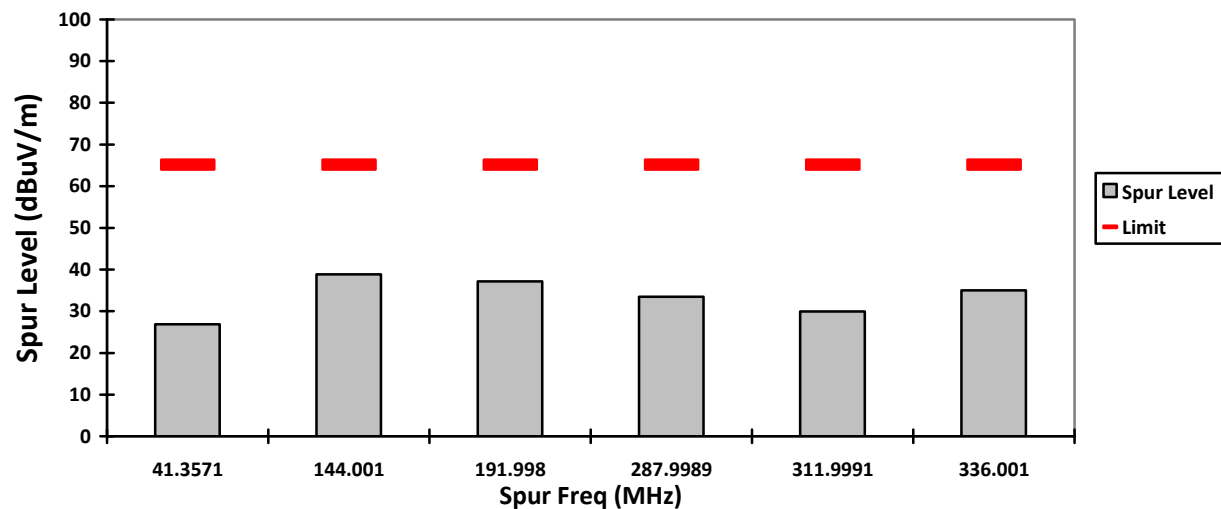
HORIZONTAL, QPK



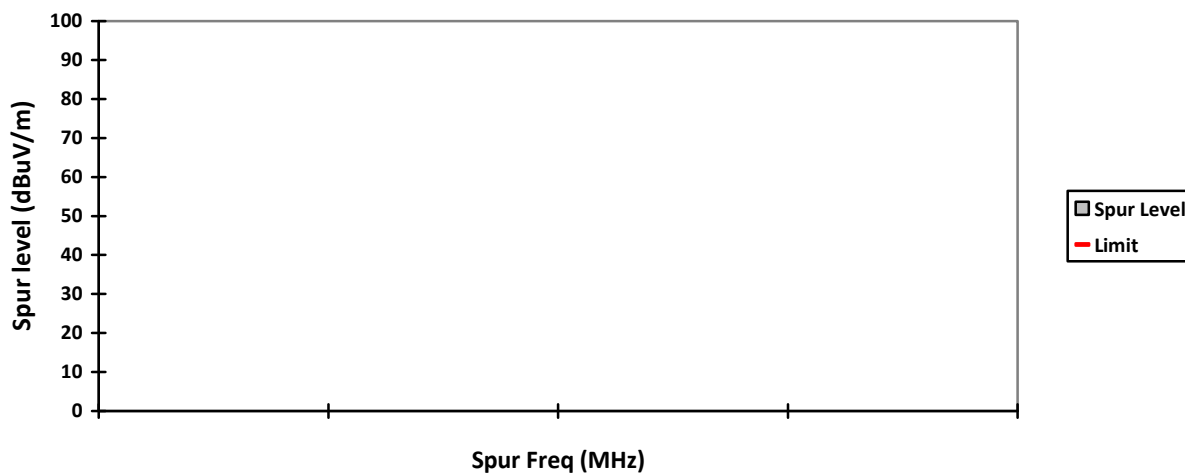
VERTICAL, PK



HORIZONTAL, PK



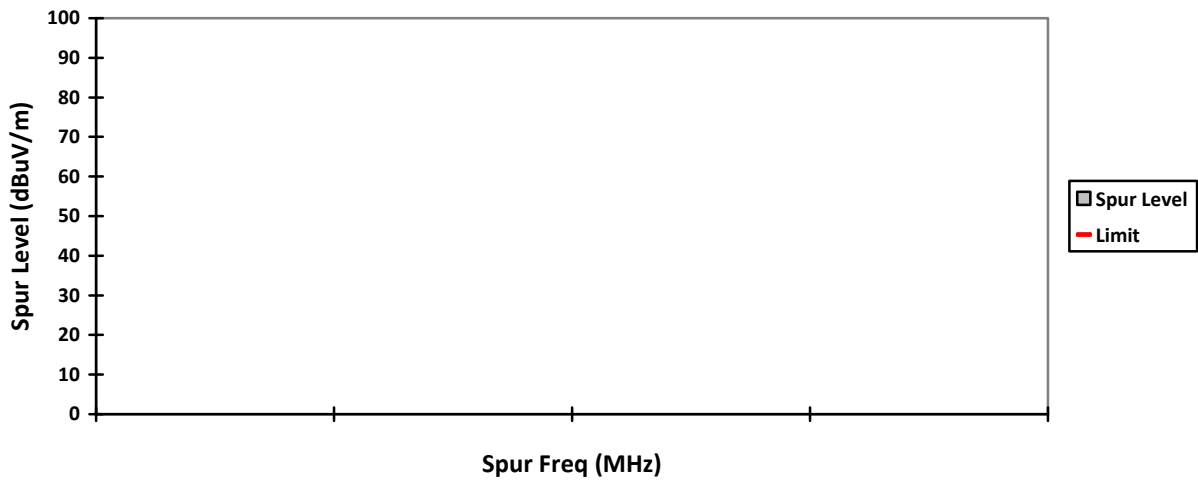
VERTICAL, AV



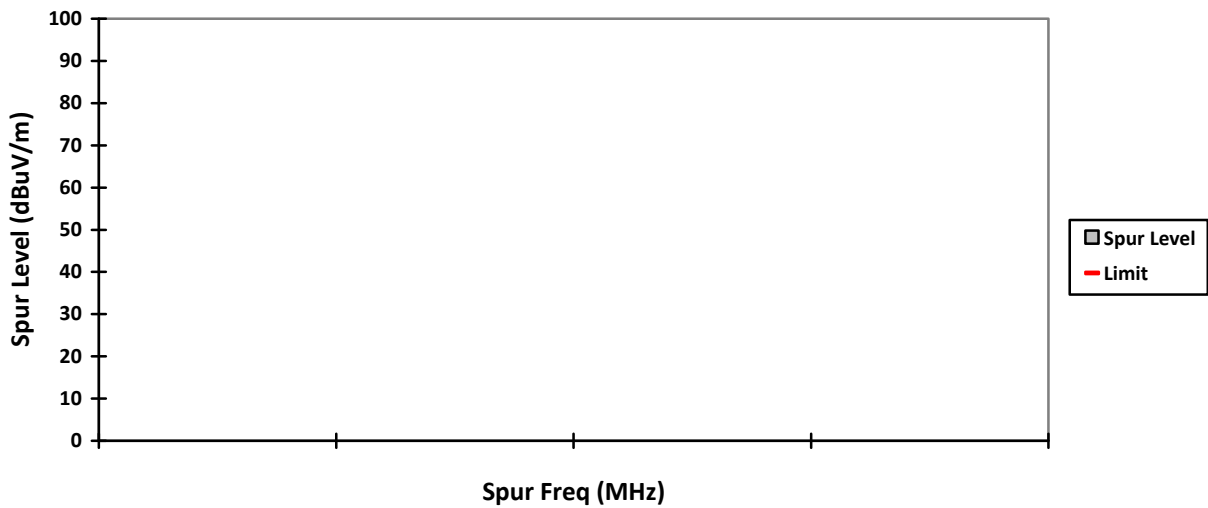
HORIZONTAL, AV



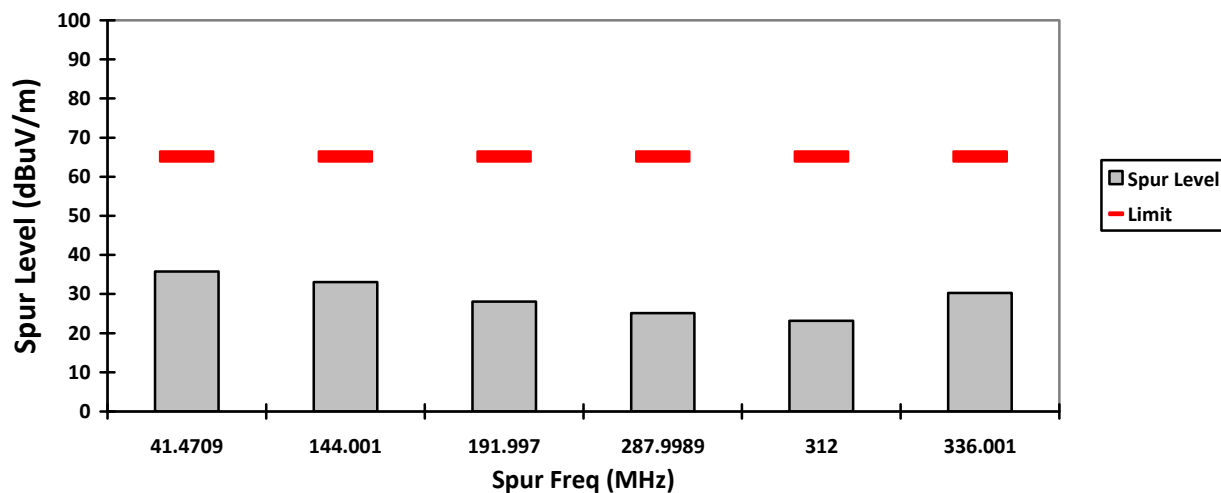
VERTICAL, QPK



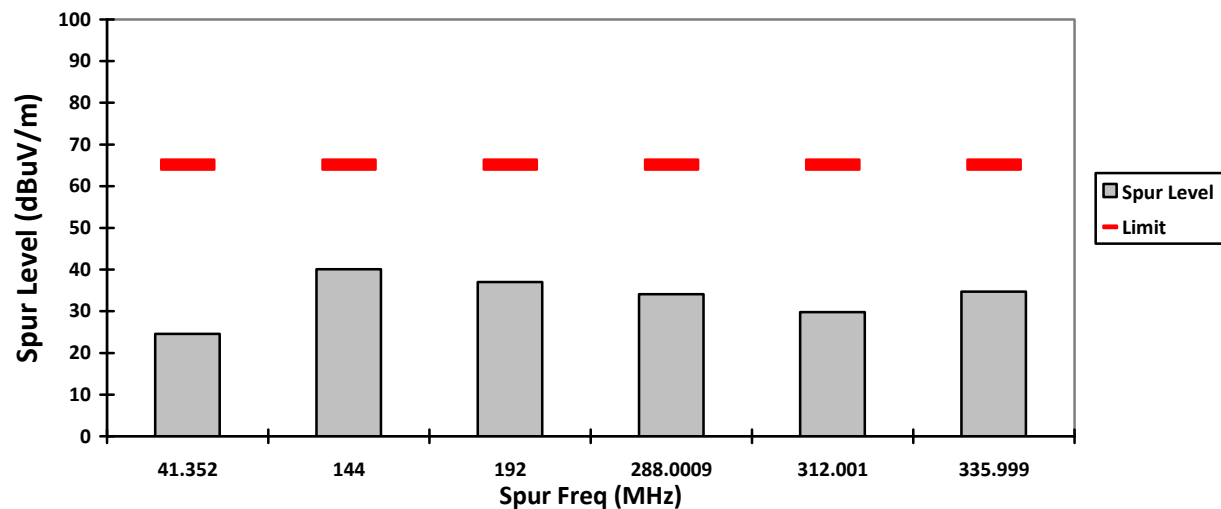
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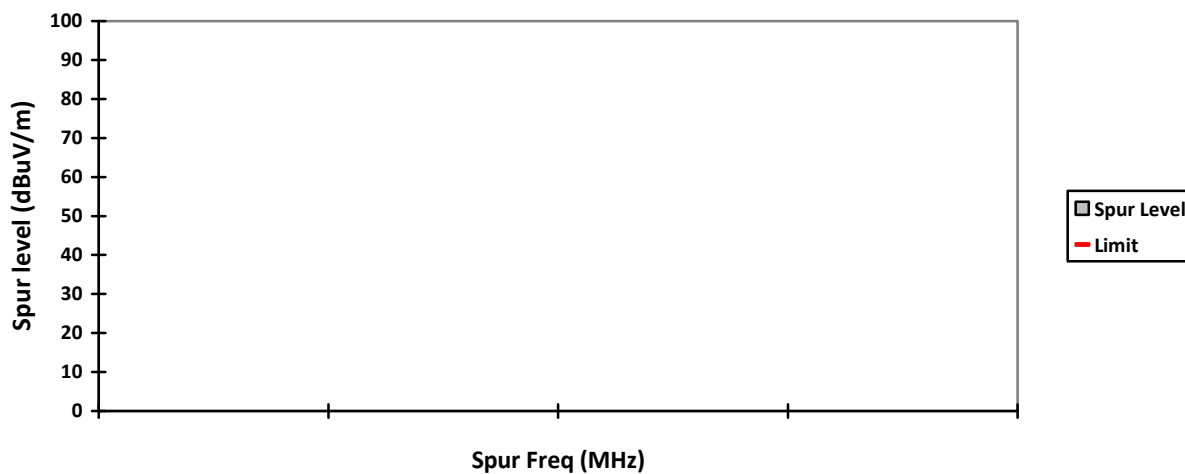
VERTICAL, PK



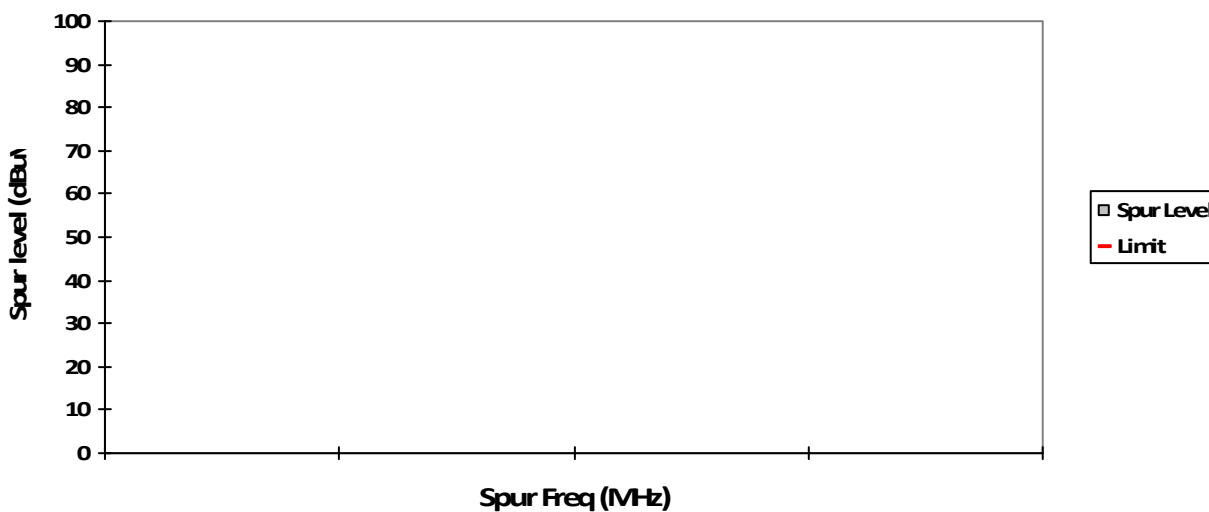
HORIZONTAL, PK



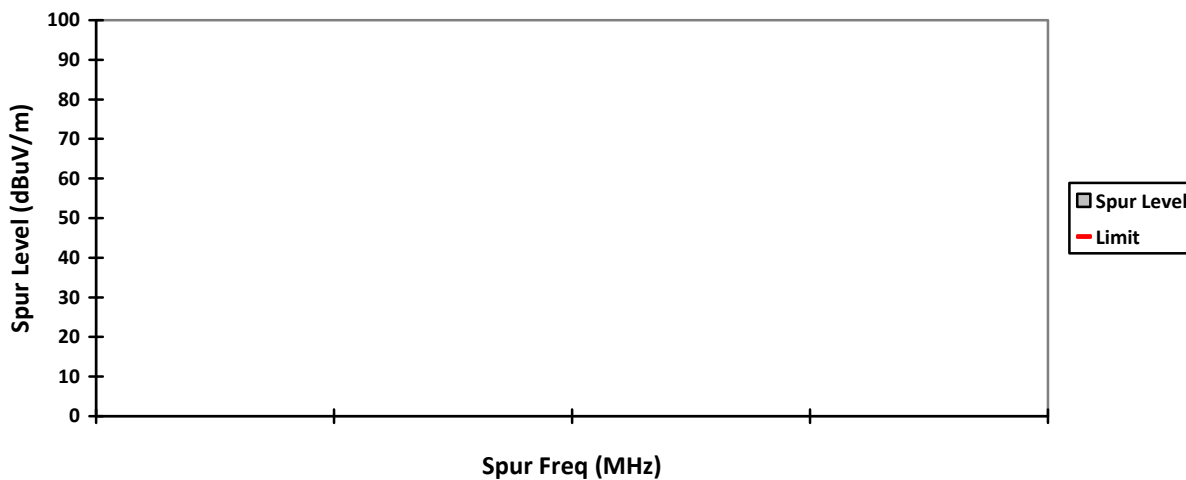
VERTICAL, AV



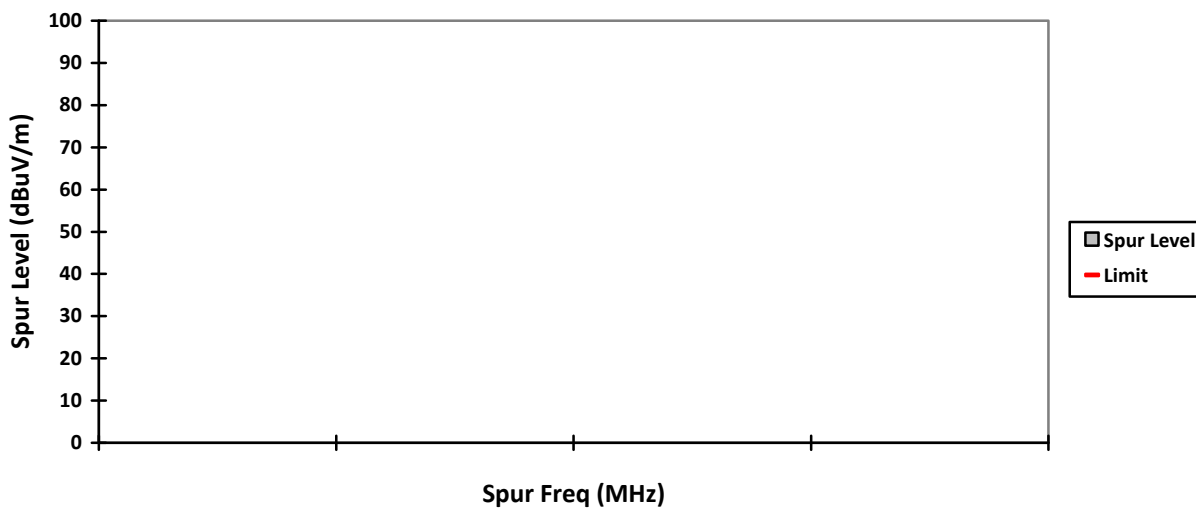
HORIZONTAL, AV



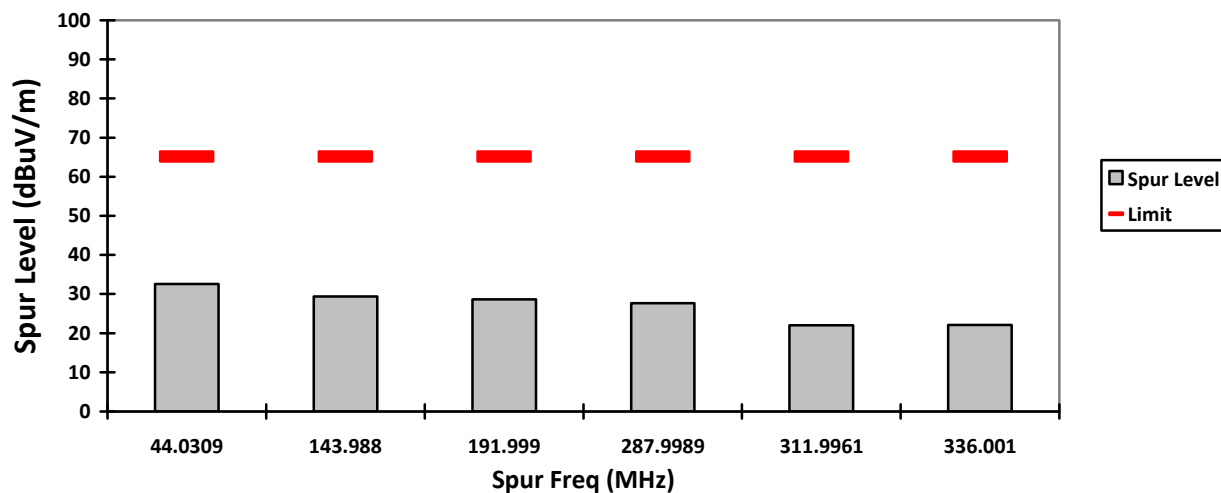
VERTICAL, QPK



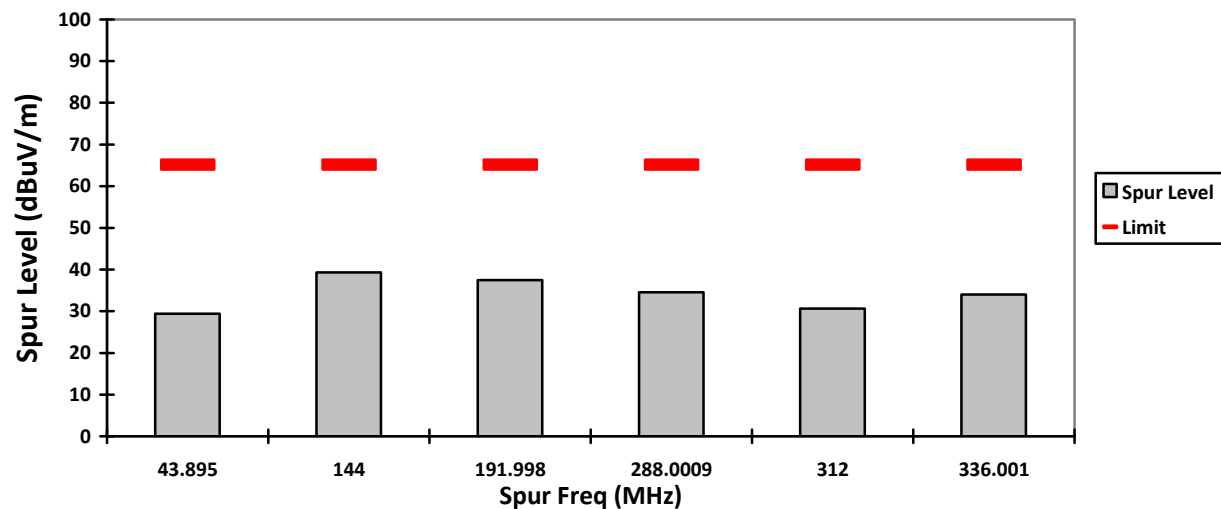
HORIZONTAL, QPK



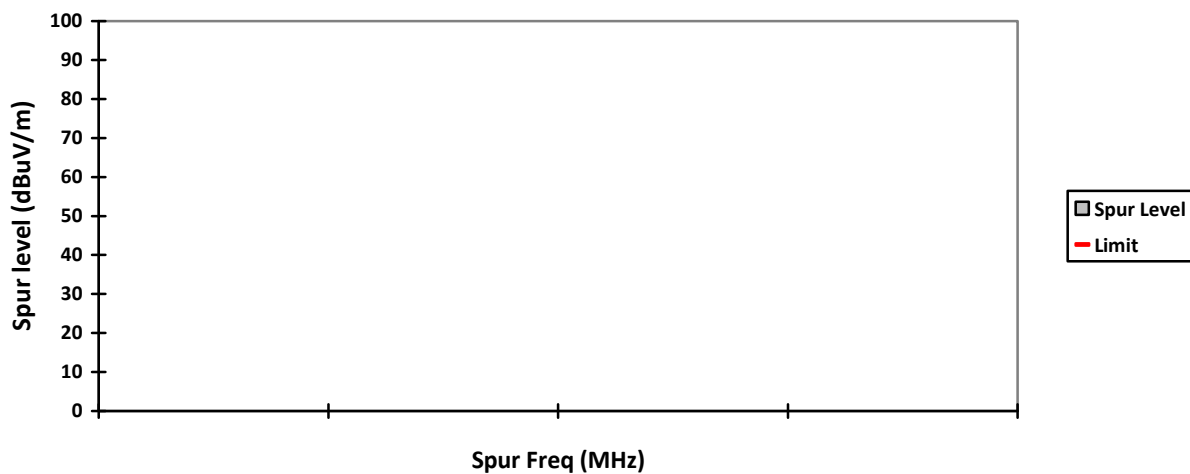
VERTICAL, PK



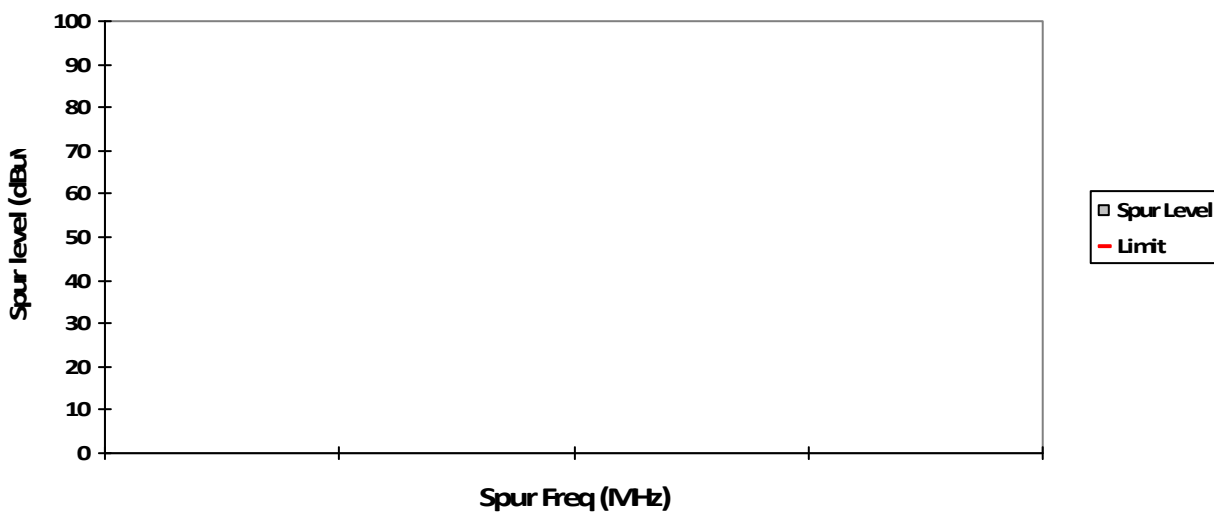
HORIZONTAL, PK



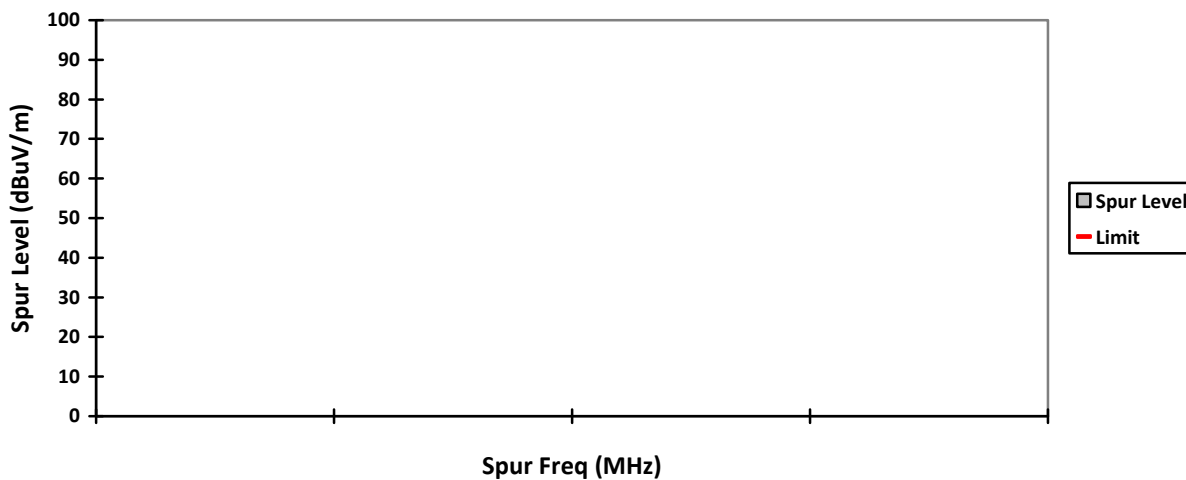
VERTICAL, AV



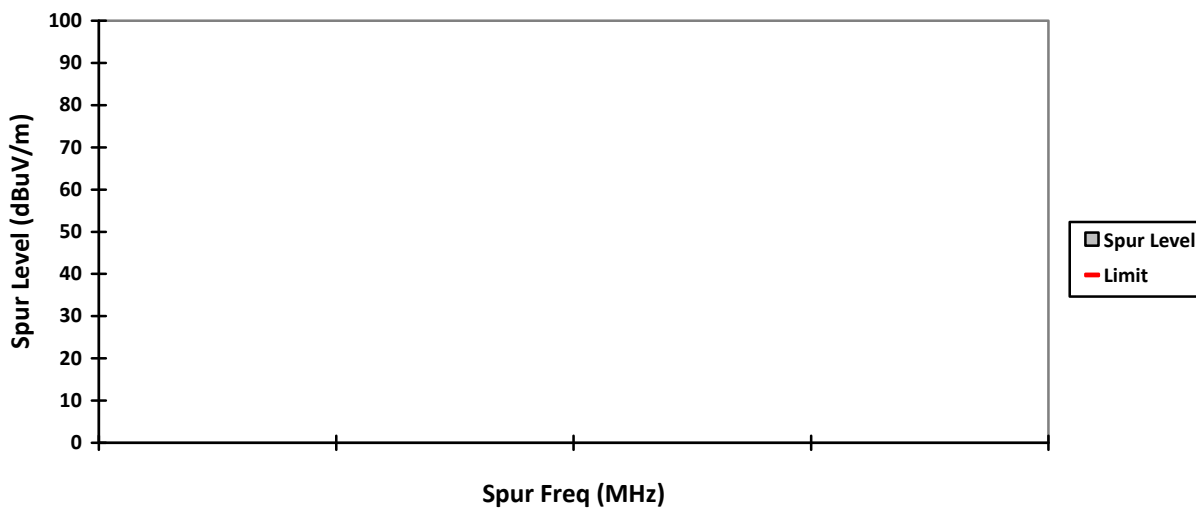
HORIZONTAL, AV



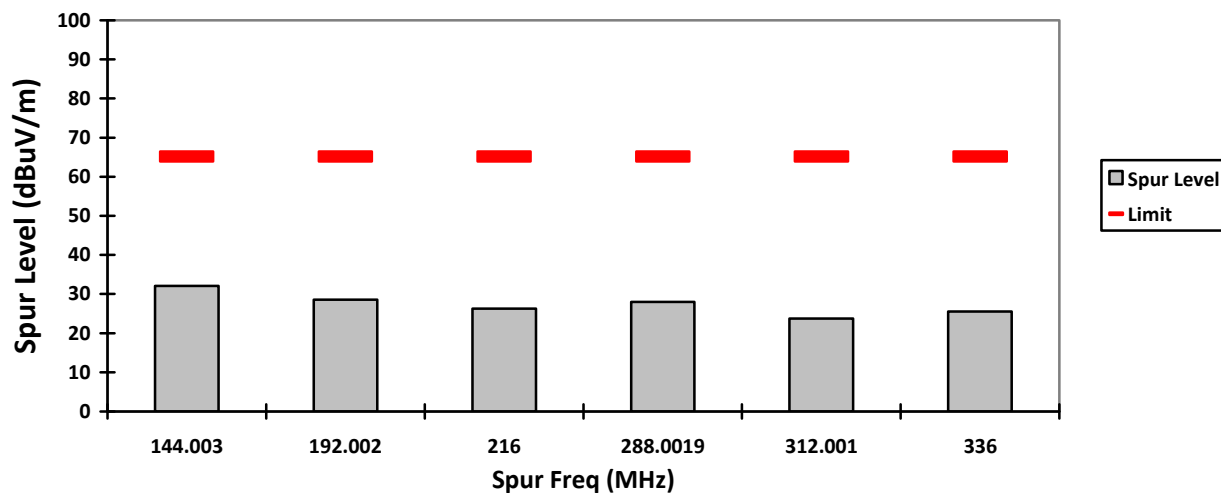
VERTICAL, QPK



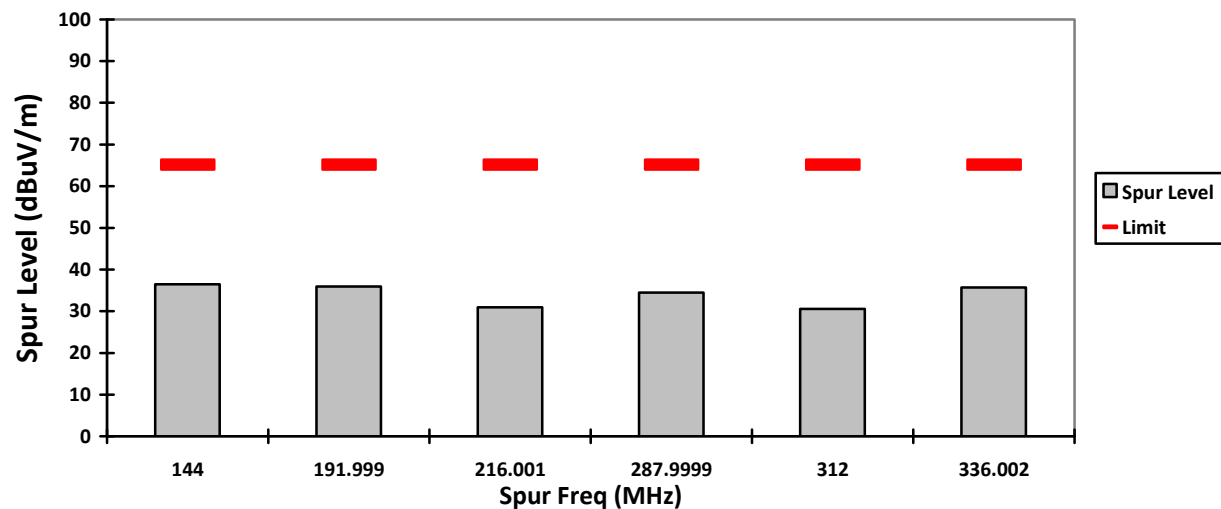
HORIZONTAL, QPK



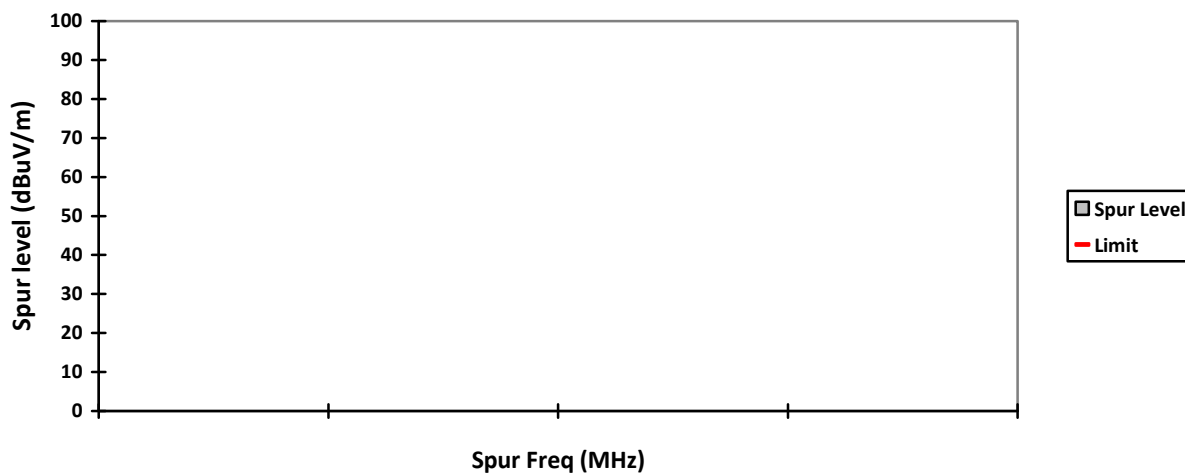
VERTICAL, PK



HORIZONTAL, PK



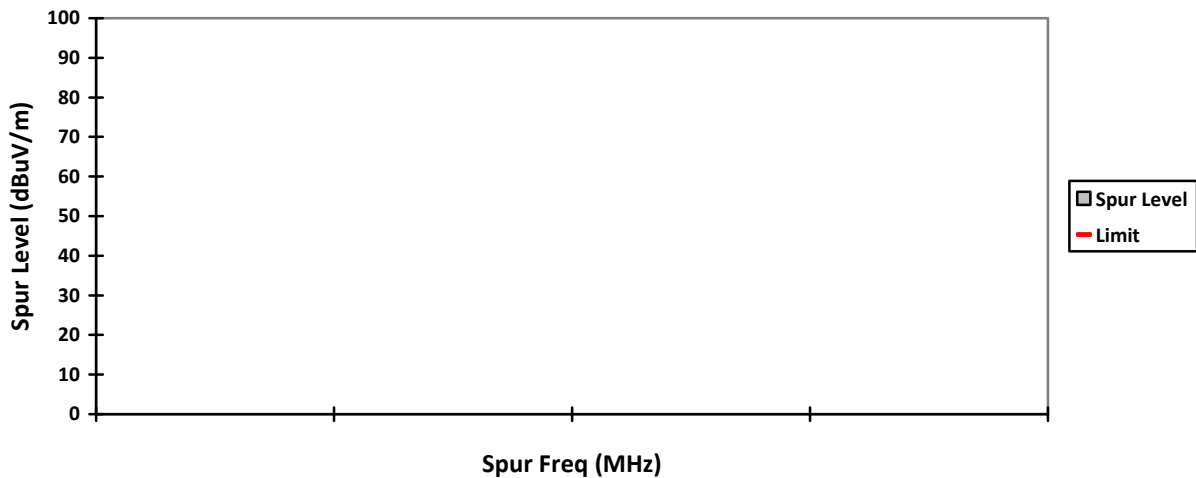
VERTICAL, AV



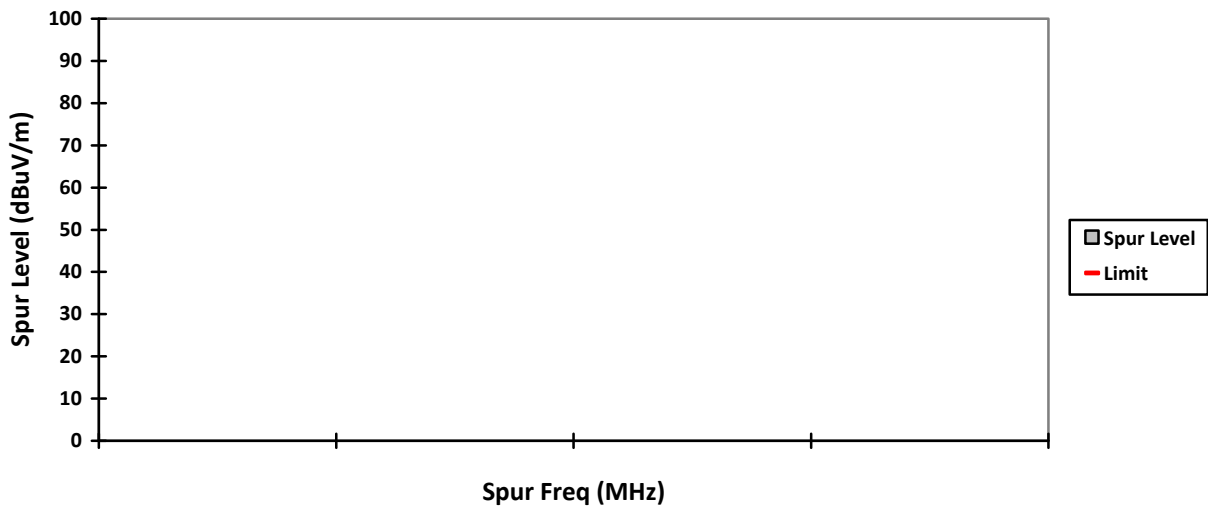
HORIZONTAL, AV



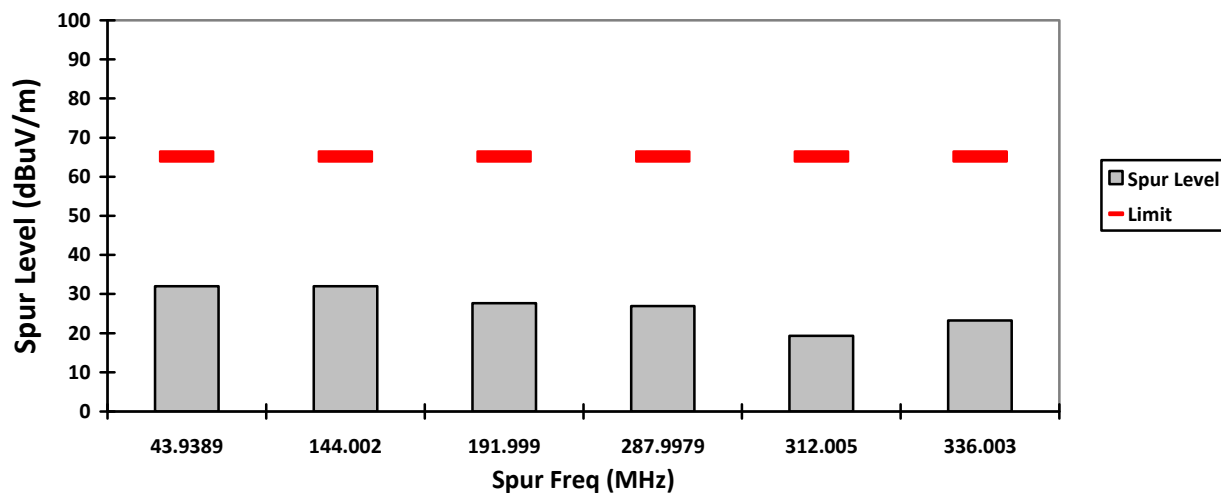
VERTICAL, QPK



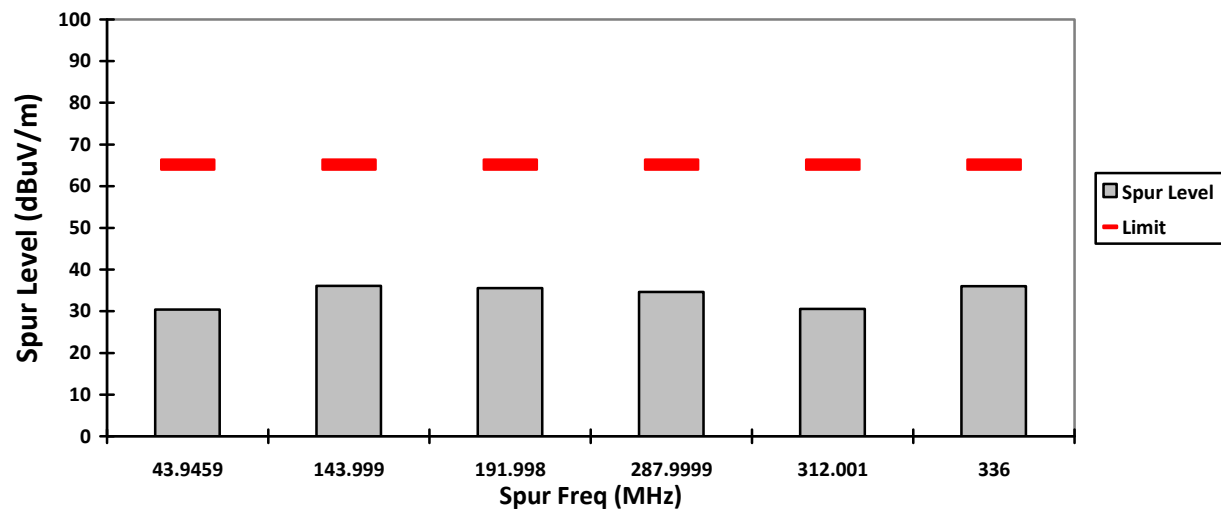
HORIZONTAL, QPK



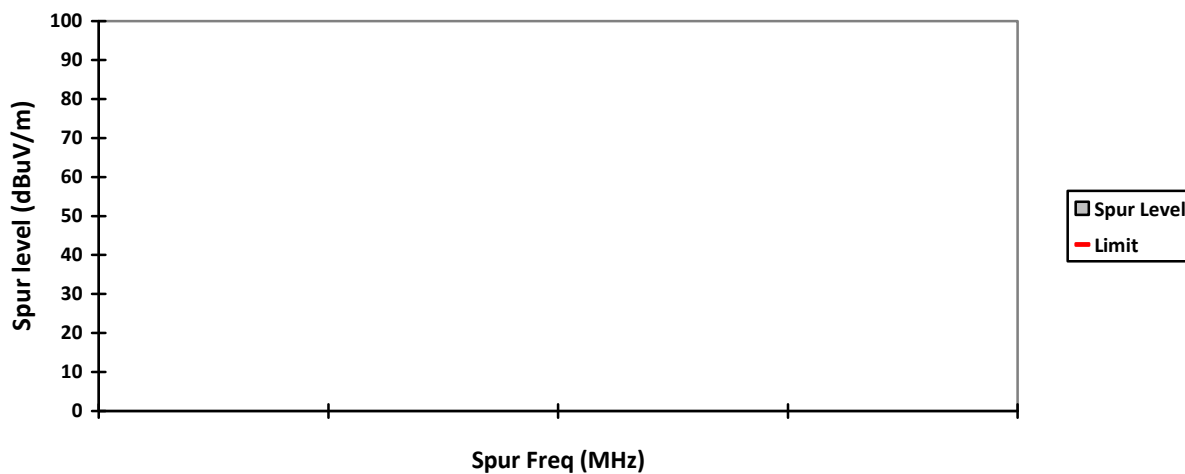
VERTICAL, PK



HORIZONTAL, PK



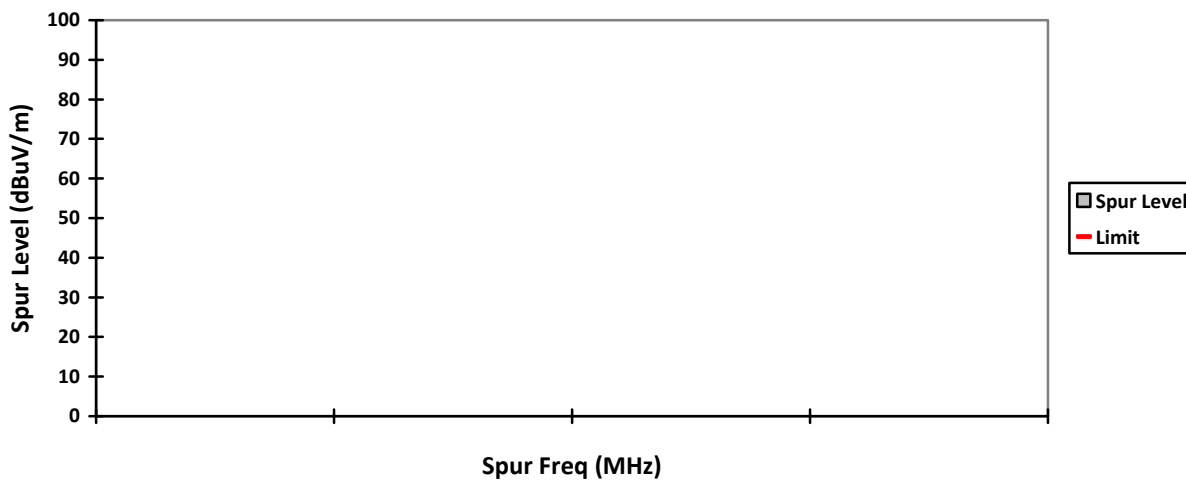
VERTICAL, AV



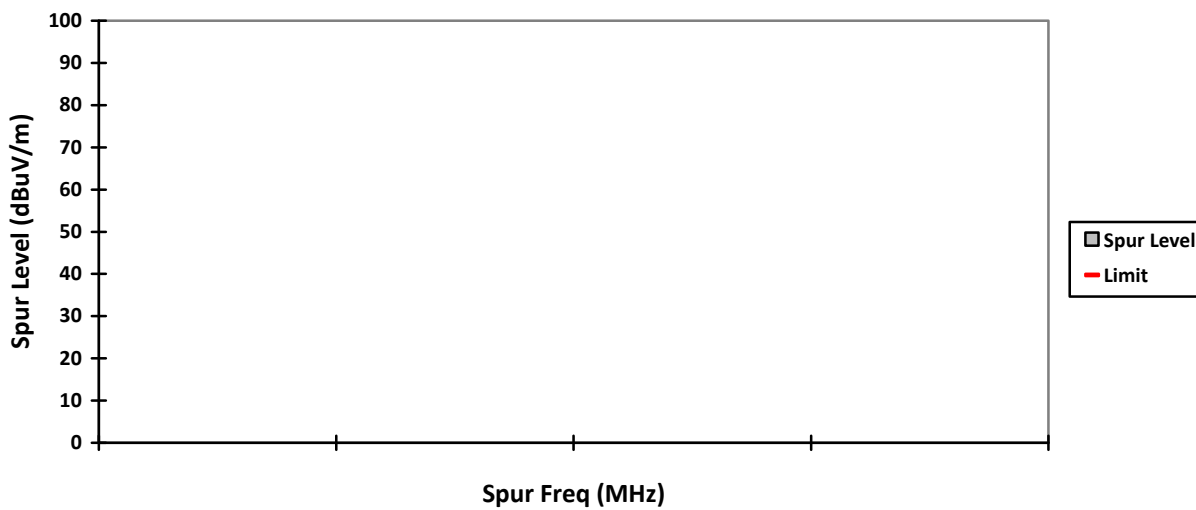
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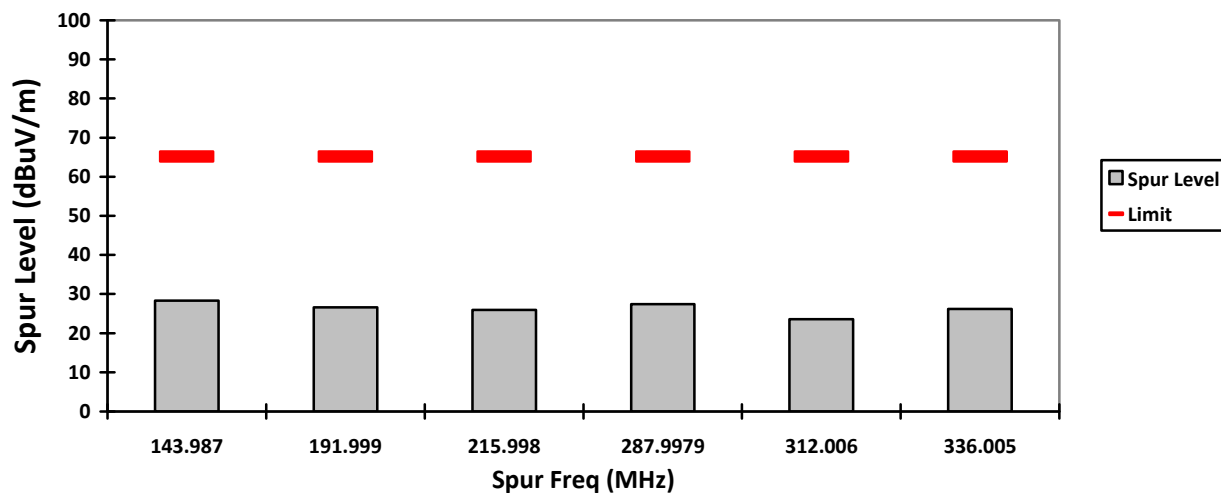
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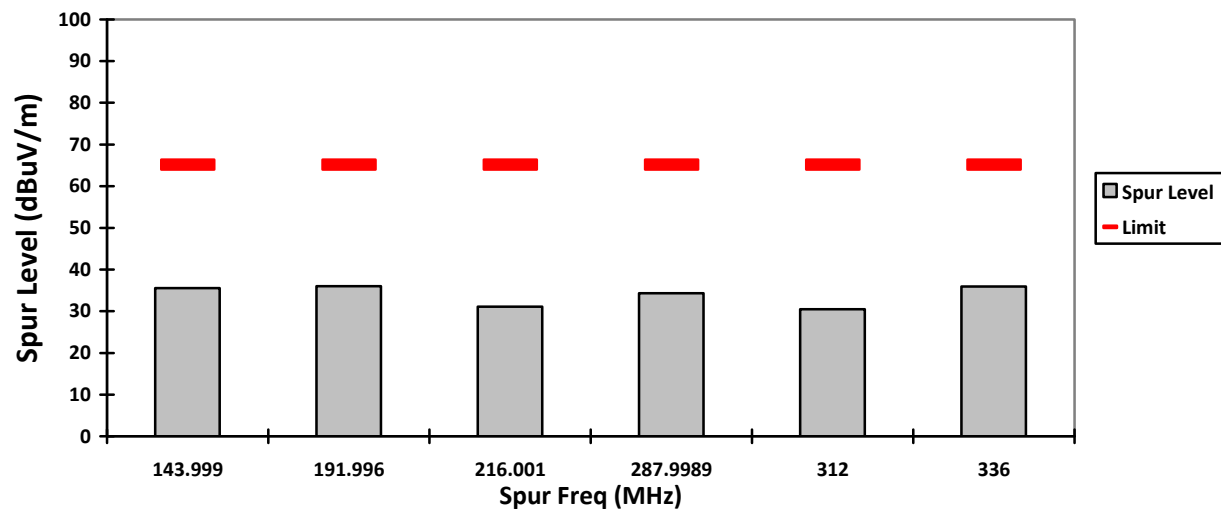
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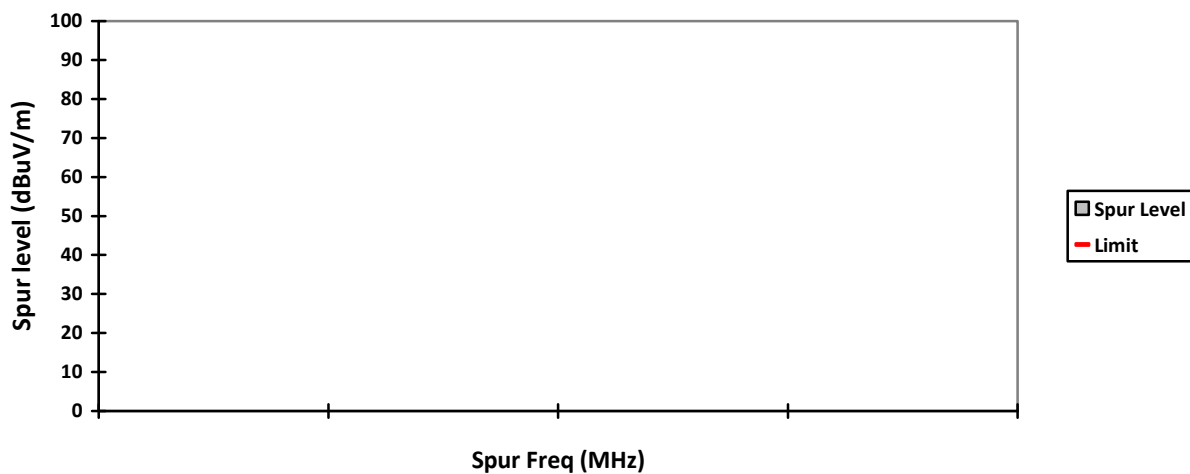
VERTICAL, PK



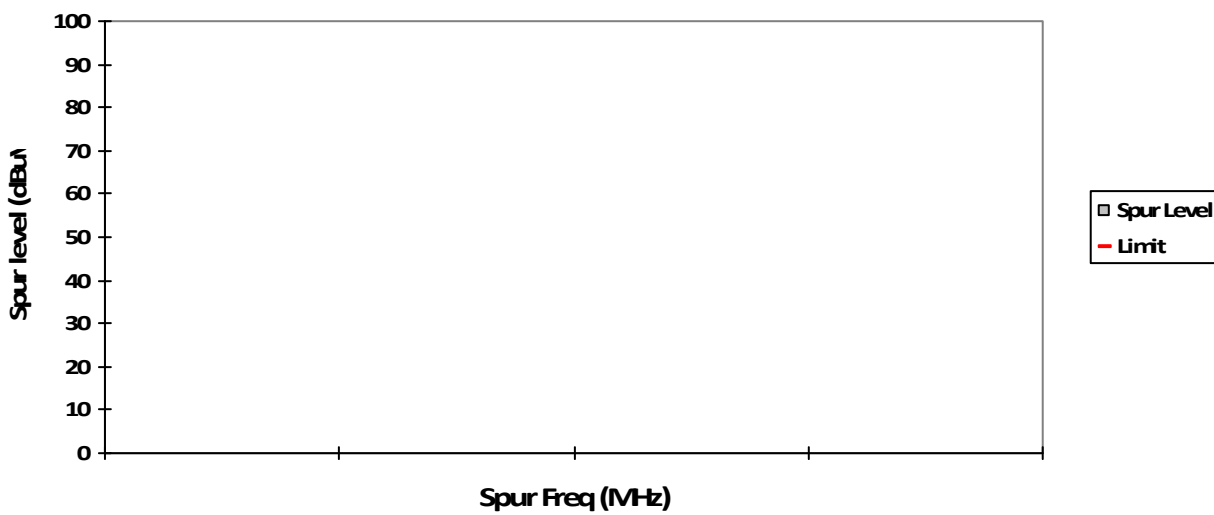
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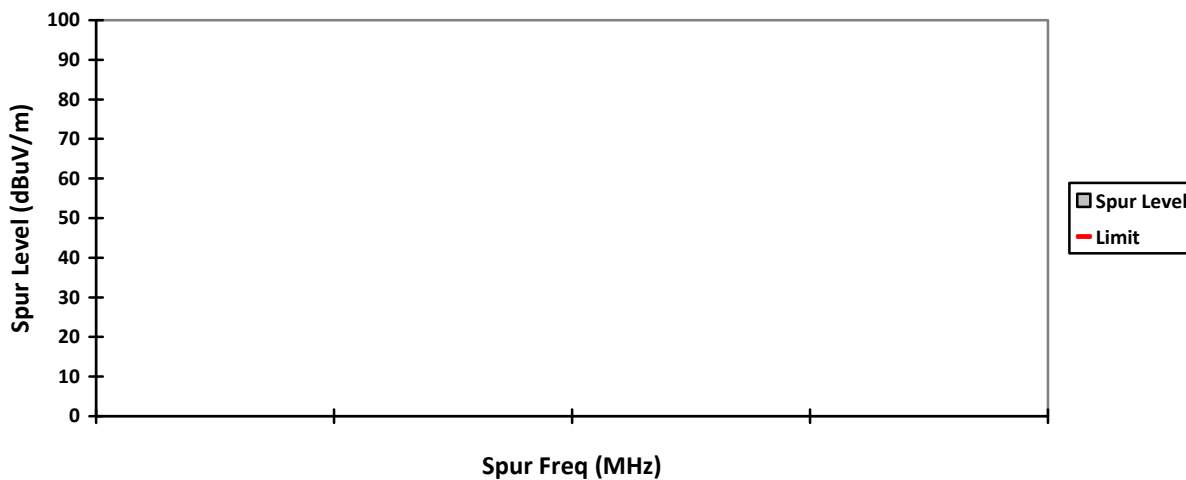
VERTICAL, AV



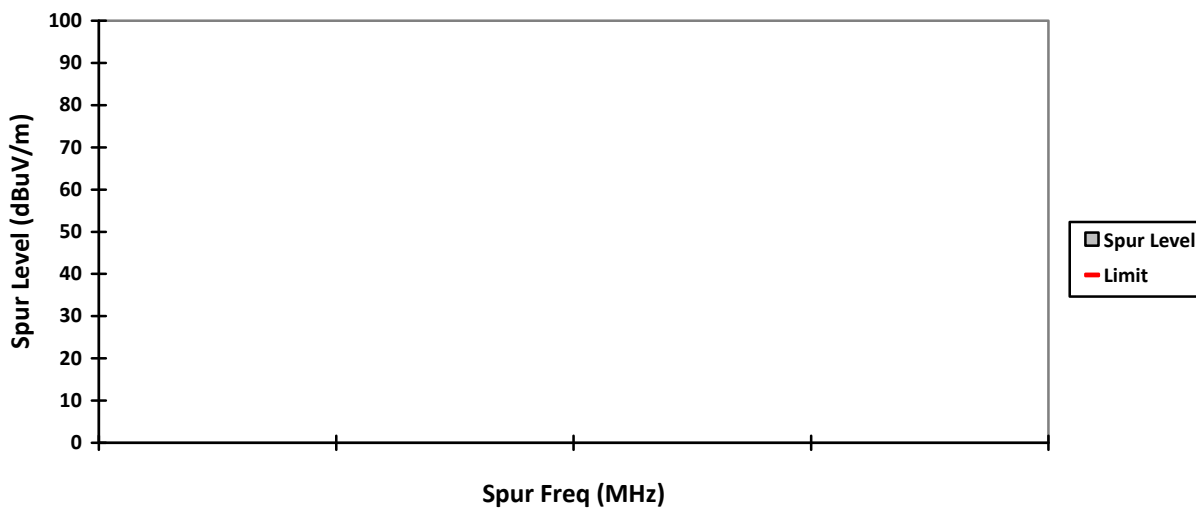
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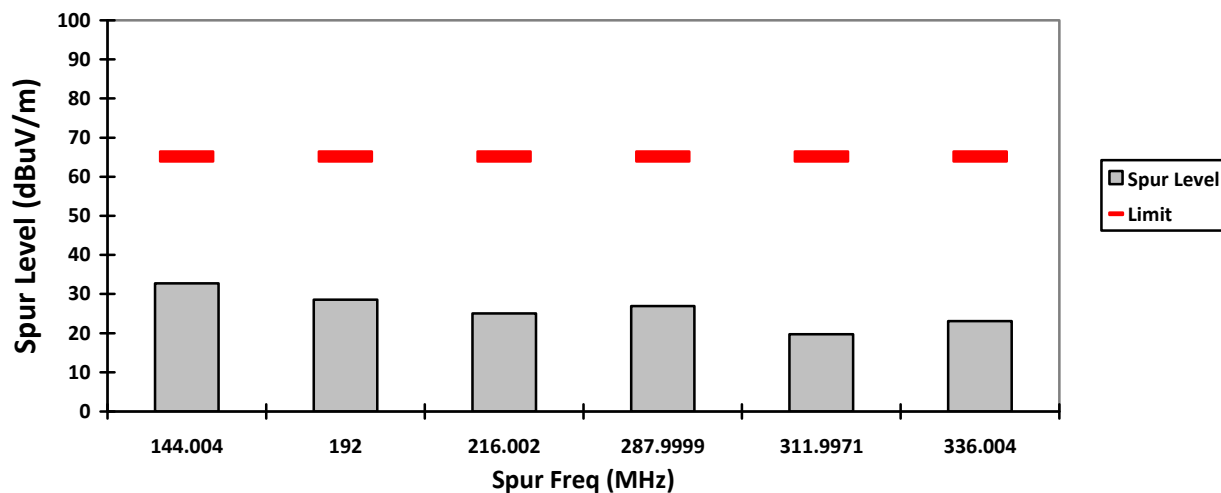
VERTICAL, QPK



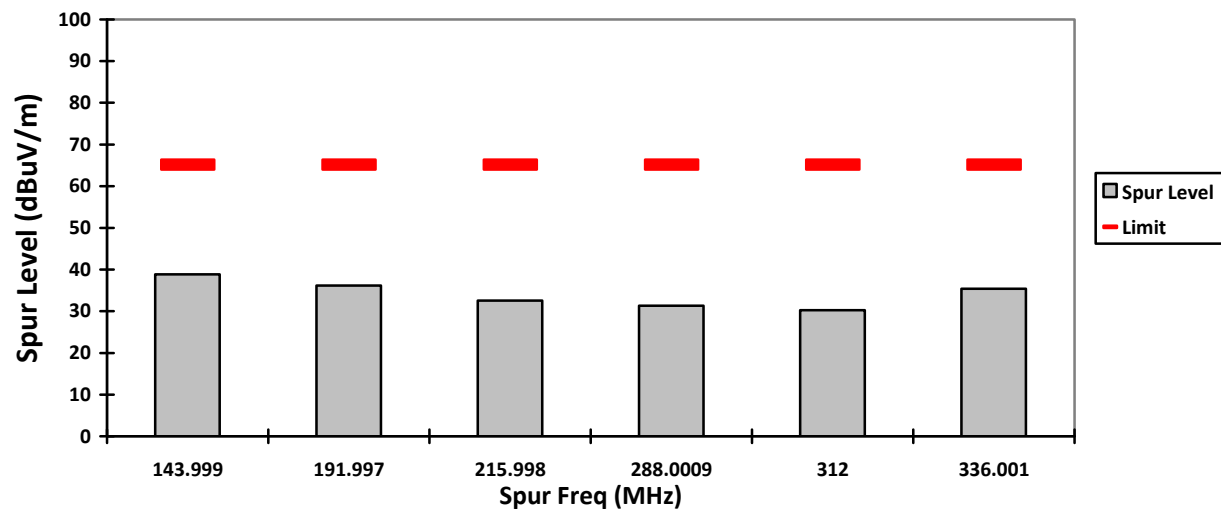
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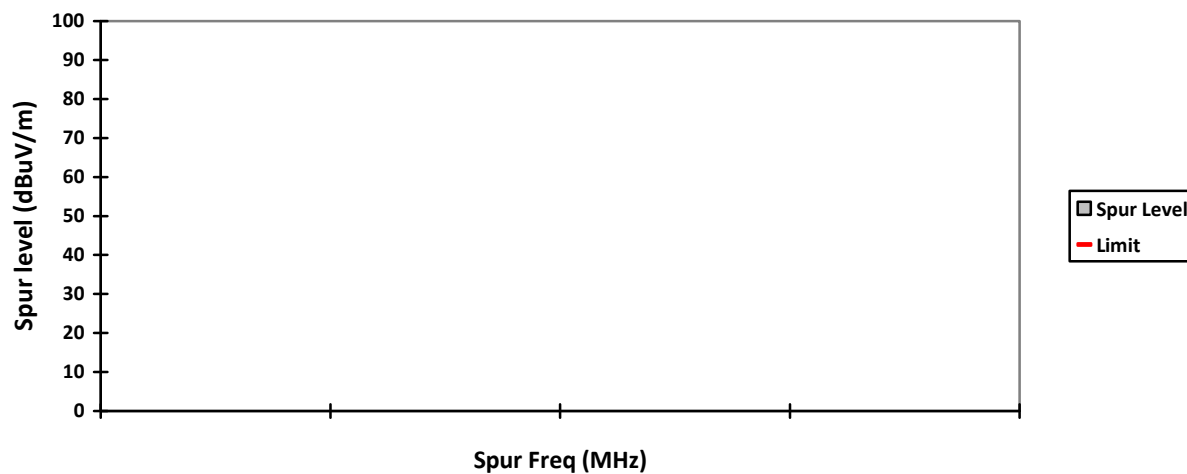
VERTICAL, PK



HORIZONTAL, PK



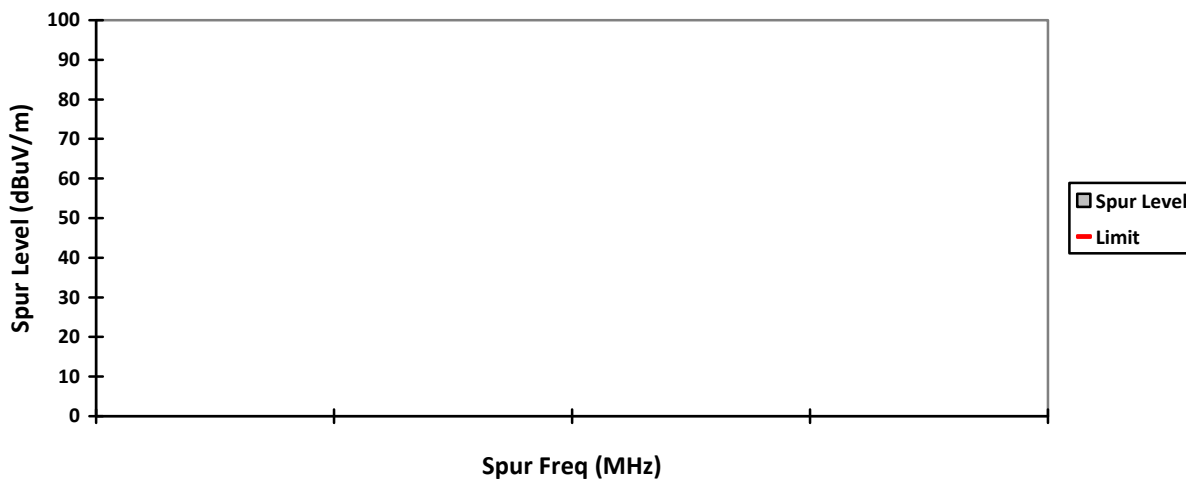
VERTICAL, AV



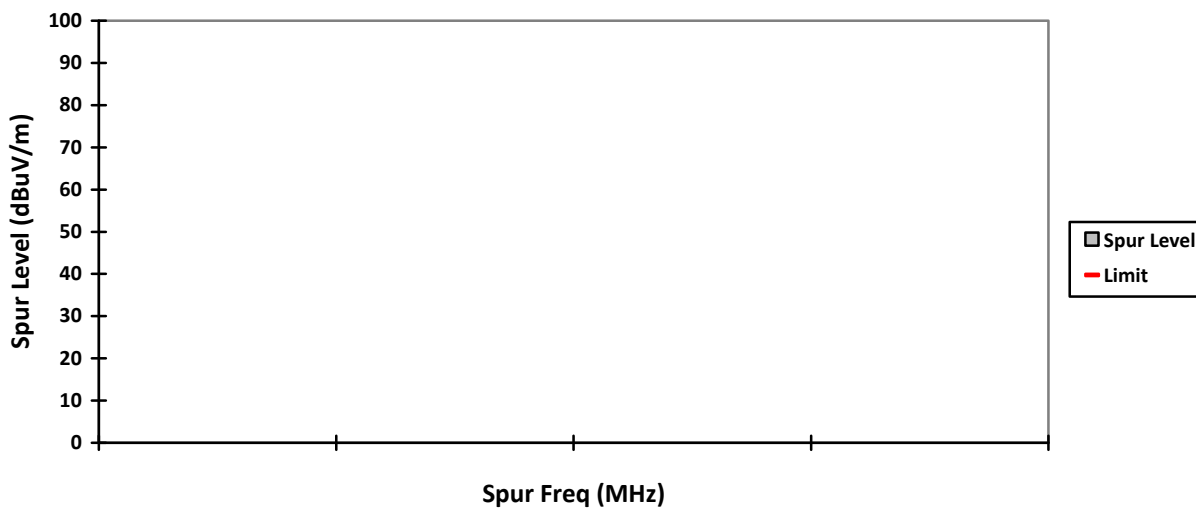
HORIZONTAL, AV



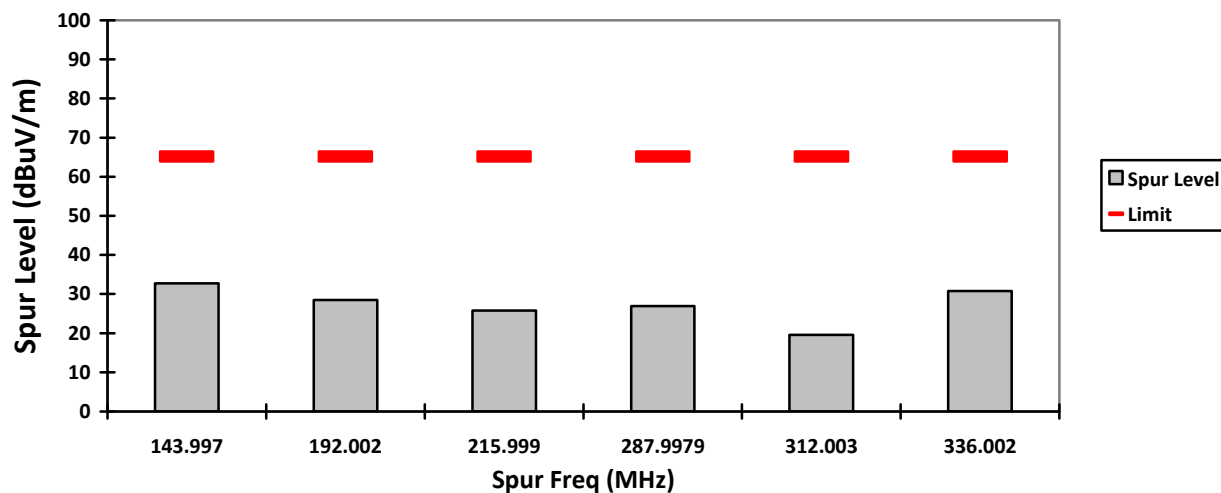
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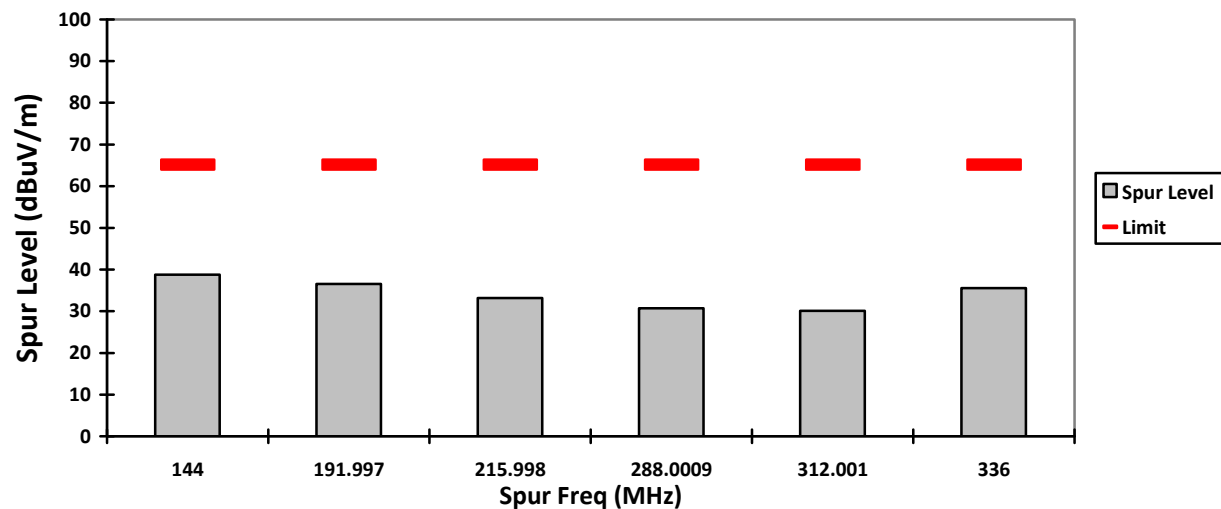
HORIZONTAL, QPK



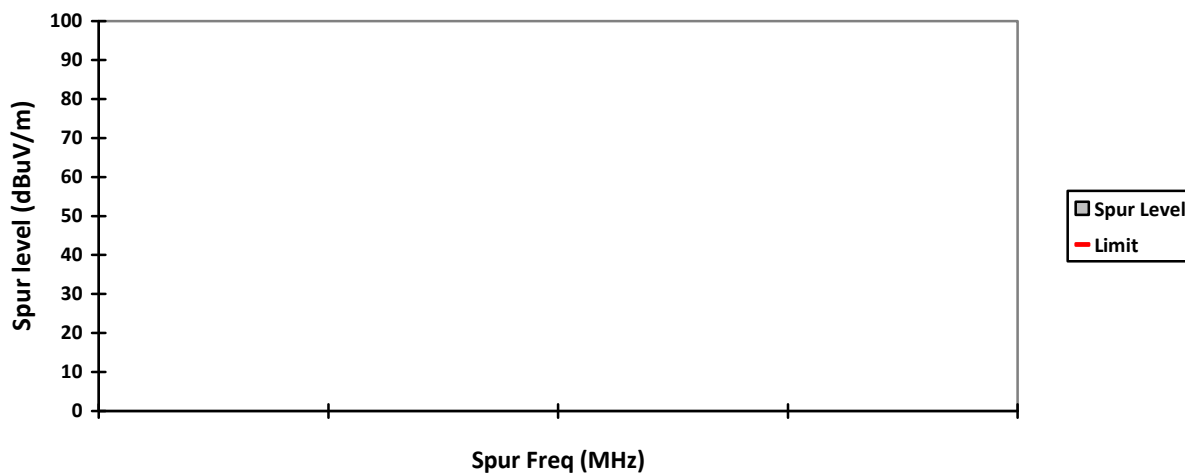
VERTICAL, PK



HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Worst Case Plane: Y-Plane (802.11n 20MHz)

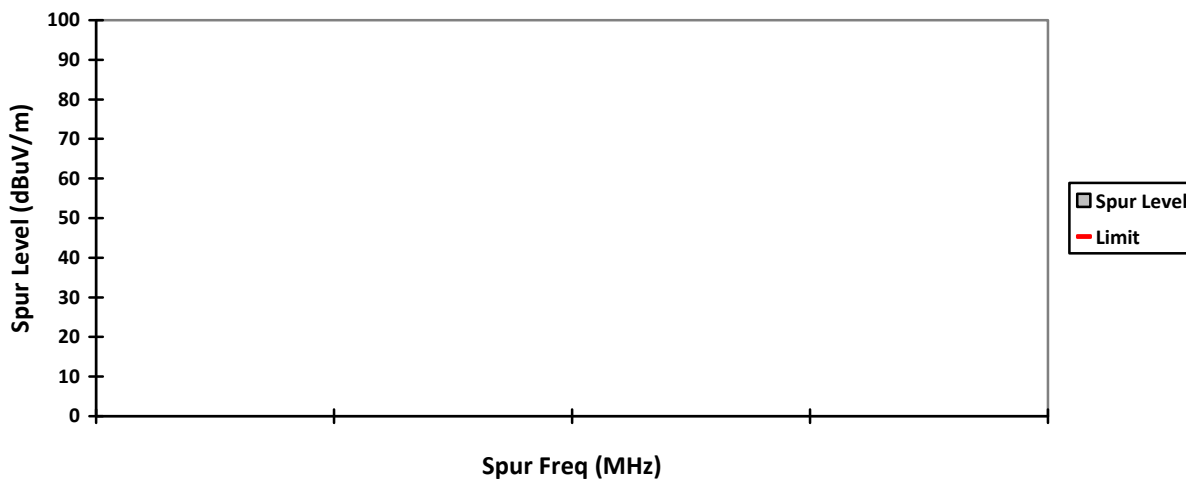
[illegible]

Remarks: Pass Result	Marginal Result	Fail Result
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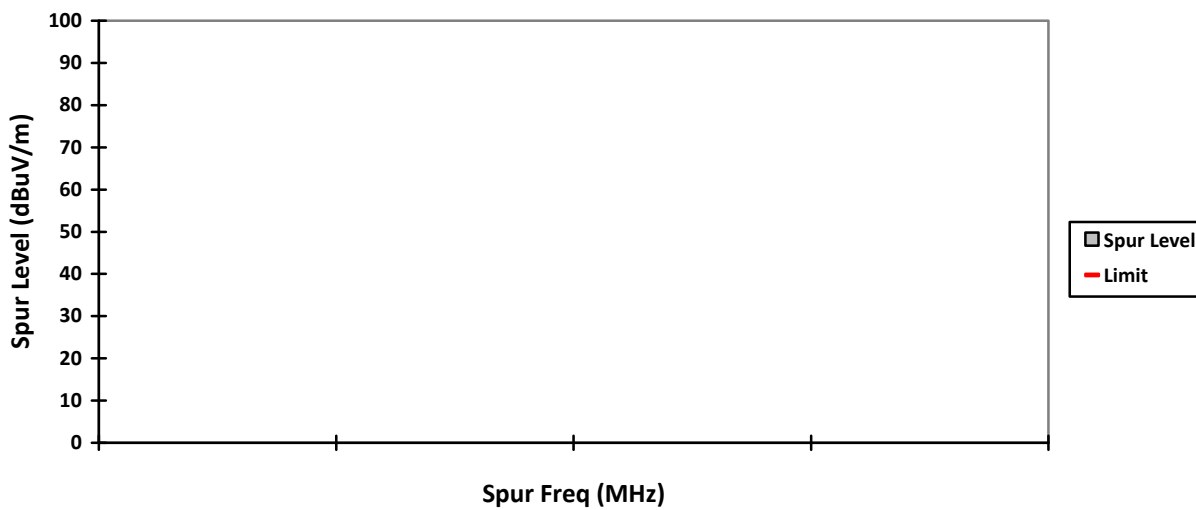
Humidity (%): 69.8
Test Date: Mon, May 27, 2019

*Pursuant to CFR 47 Part 2.1057 (c), emissions attenuated more than 20 dB below the permissible limit are not reported.

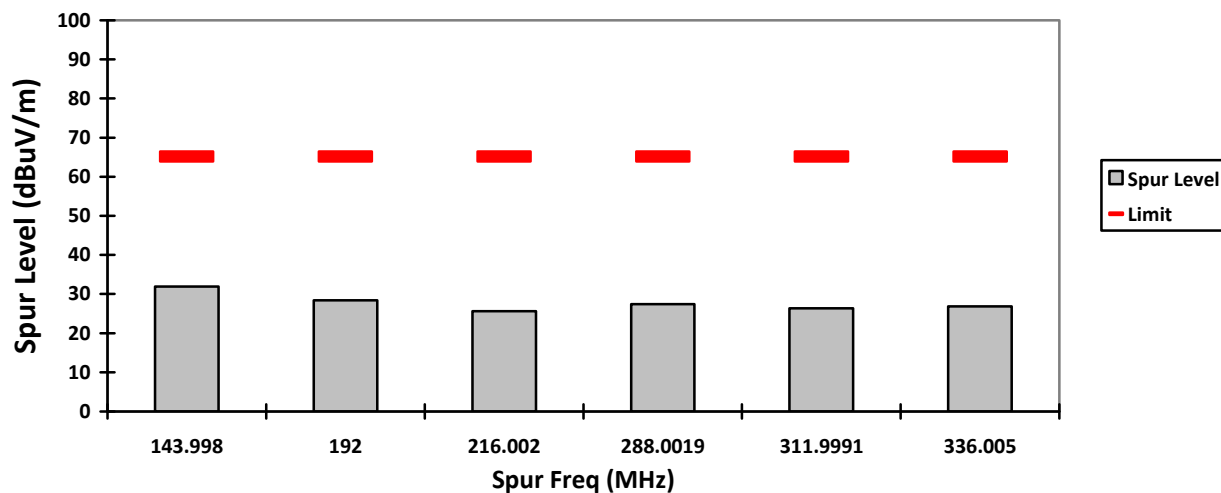
VERTICAL, QPK



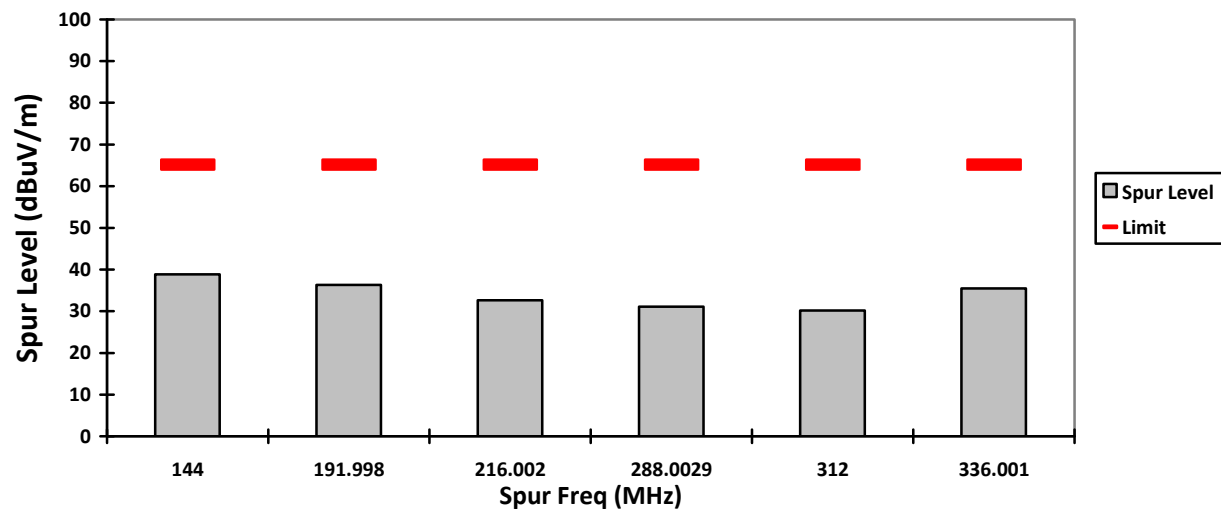
HORIZONTAL, QPK



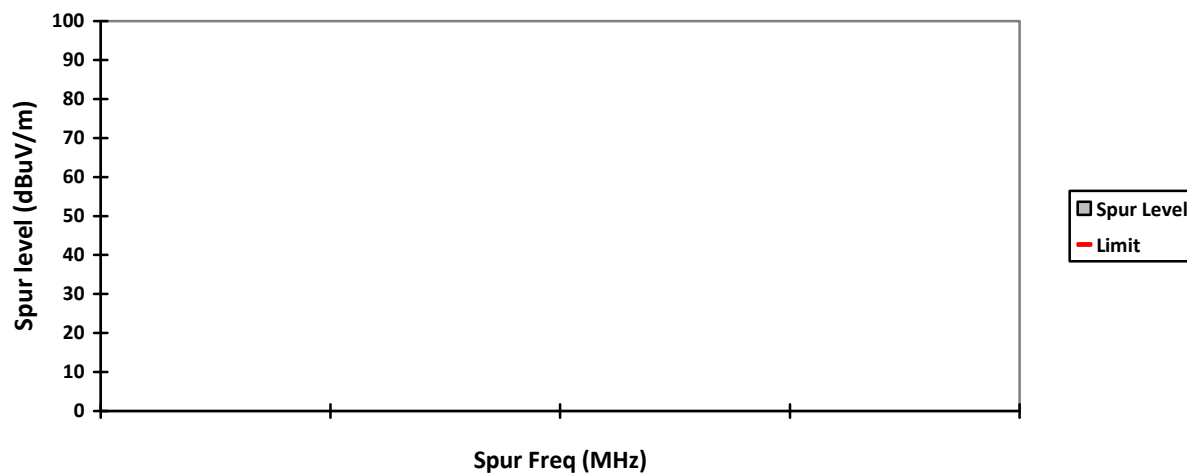
VERTICAL, PK



HORIZONTAL, PK



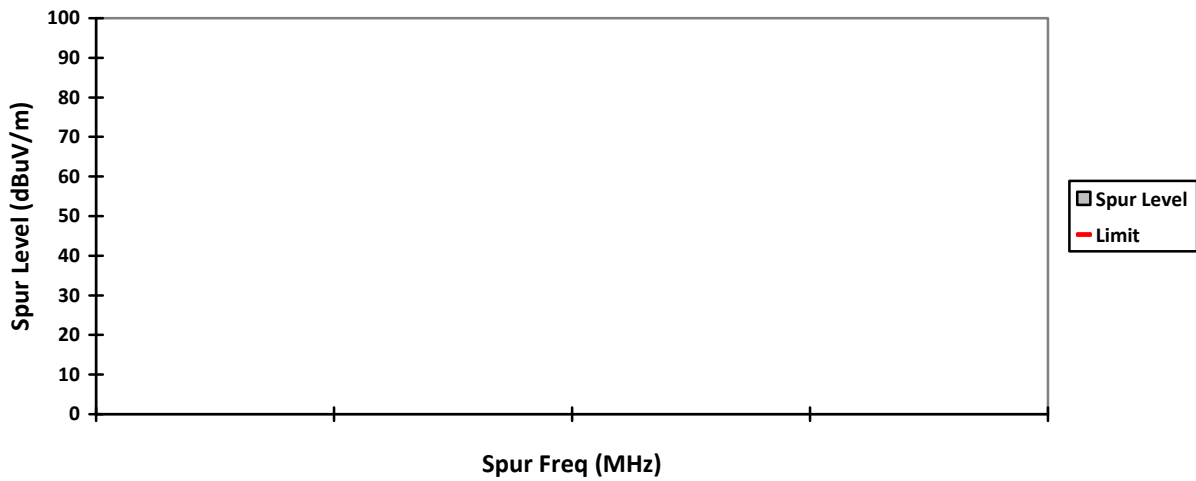
VERTICAL, AV



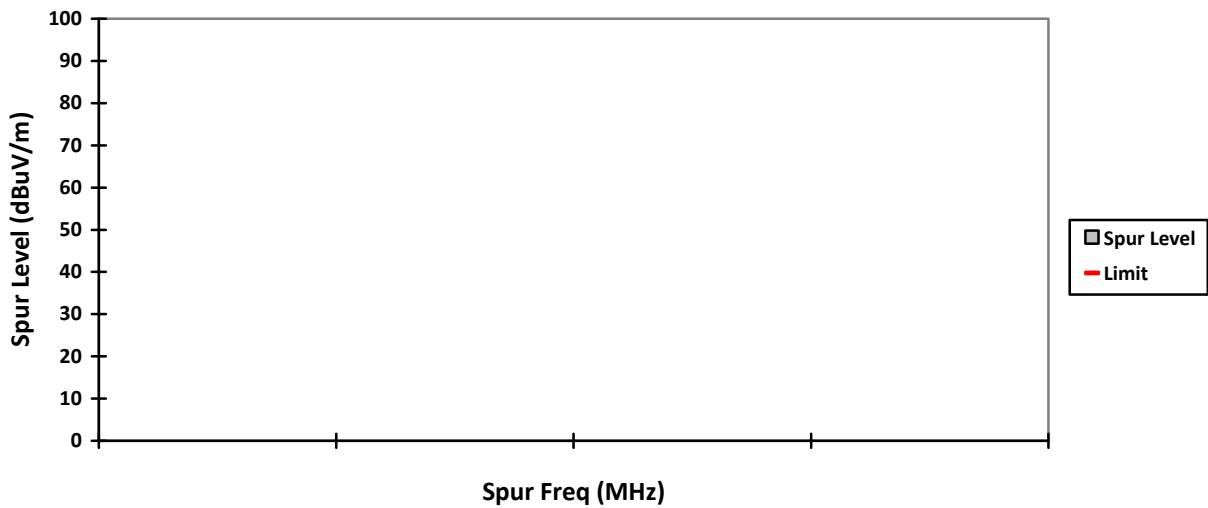
HORIZONTAL, AV



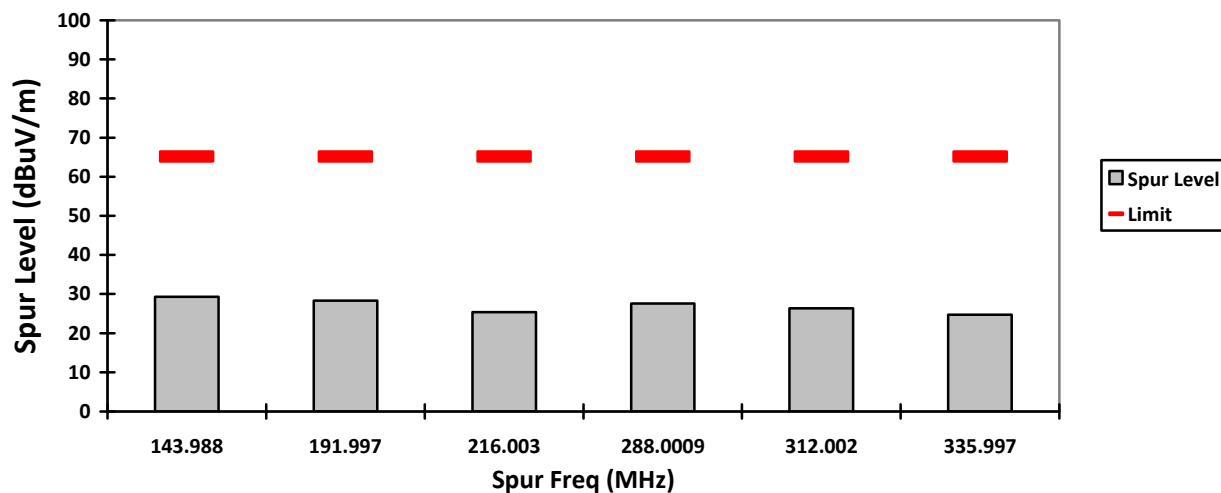
VERTICAL, QPK



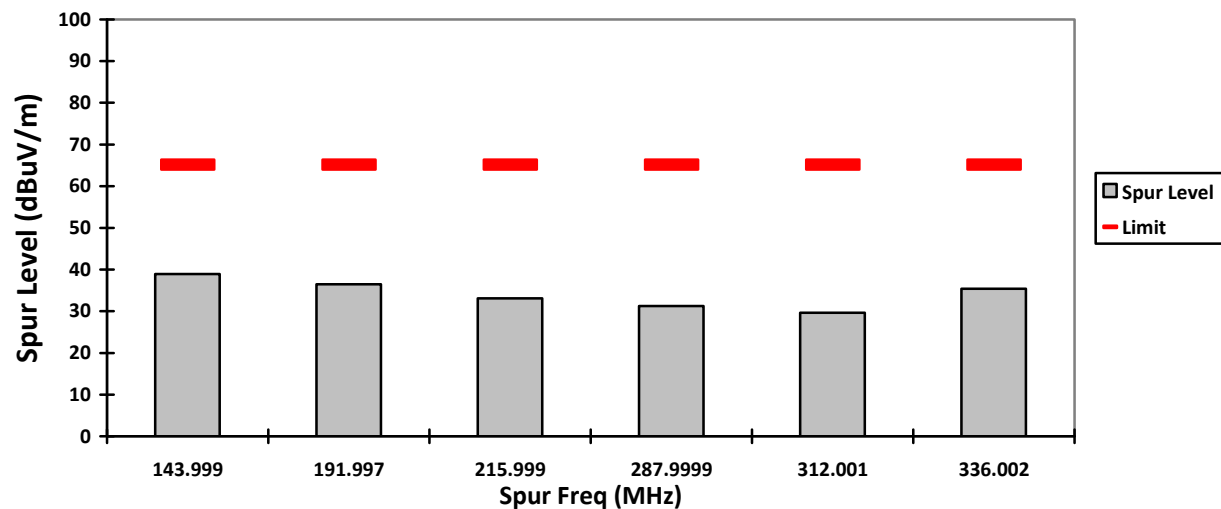
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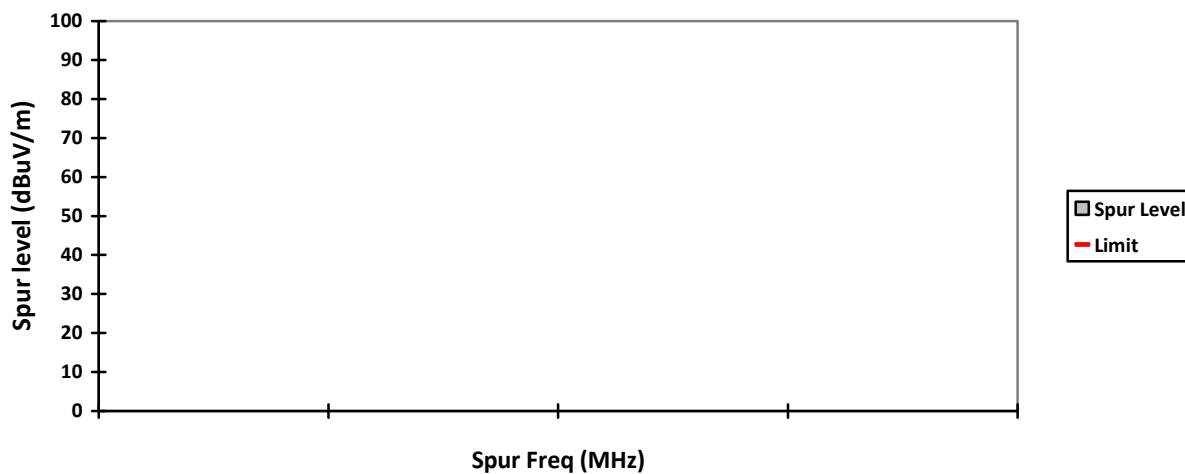
VERTICAL, PK



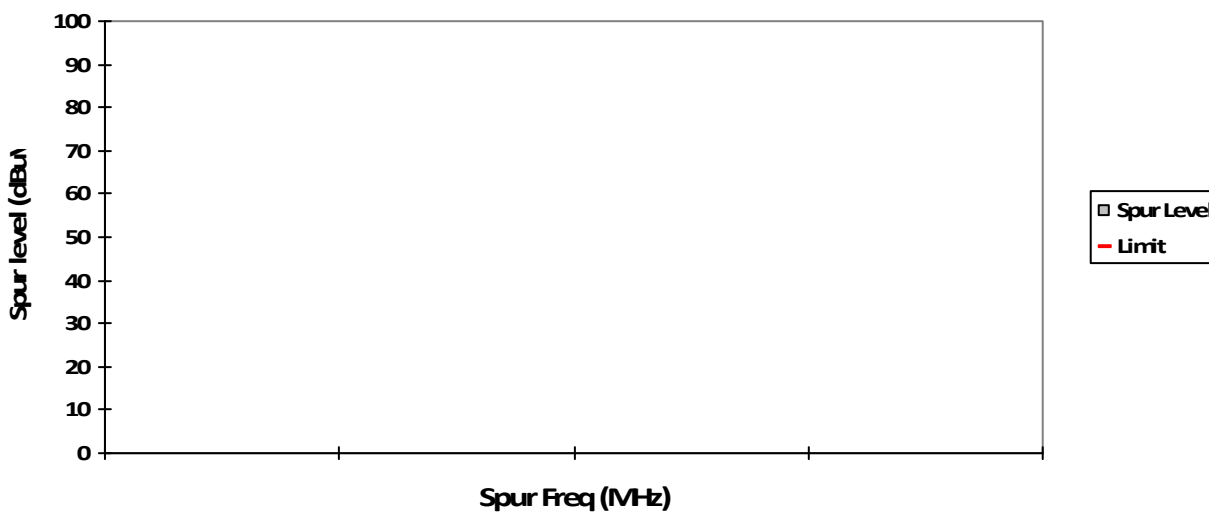
HORIZONTAL, PK



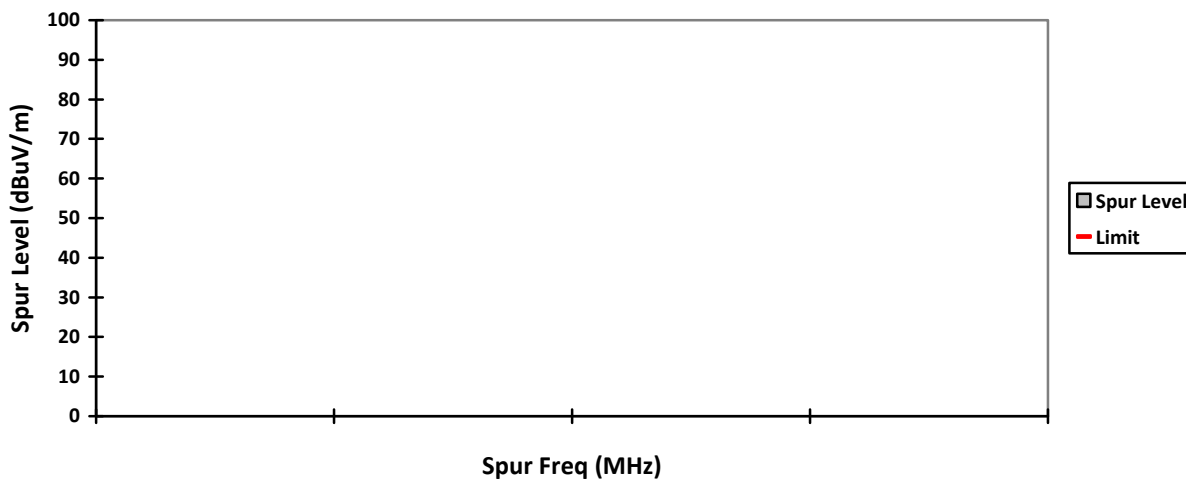
VERTICAL, AV



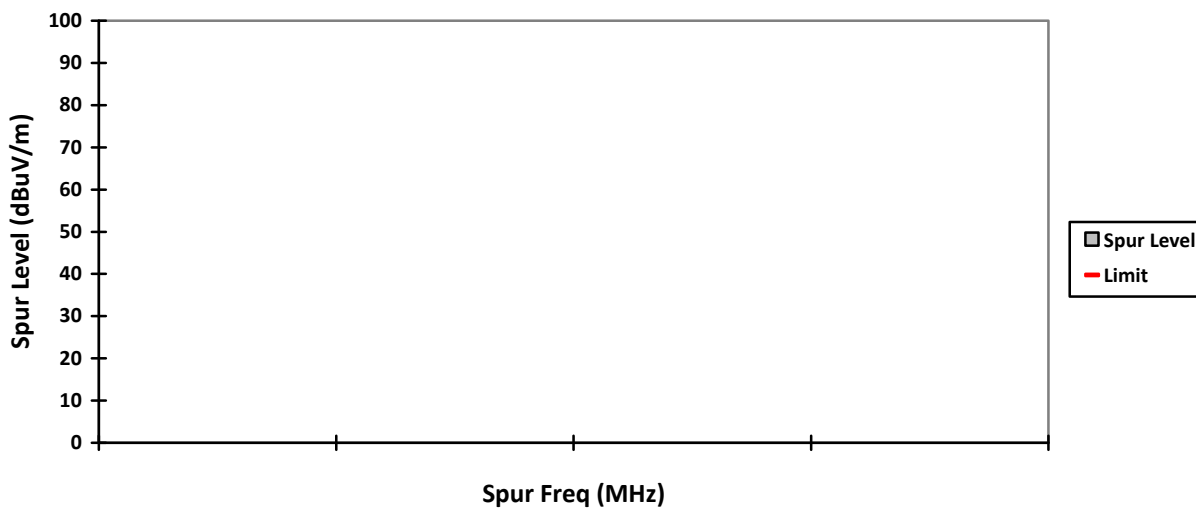
HORIZONTAL, AV



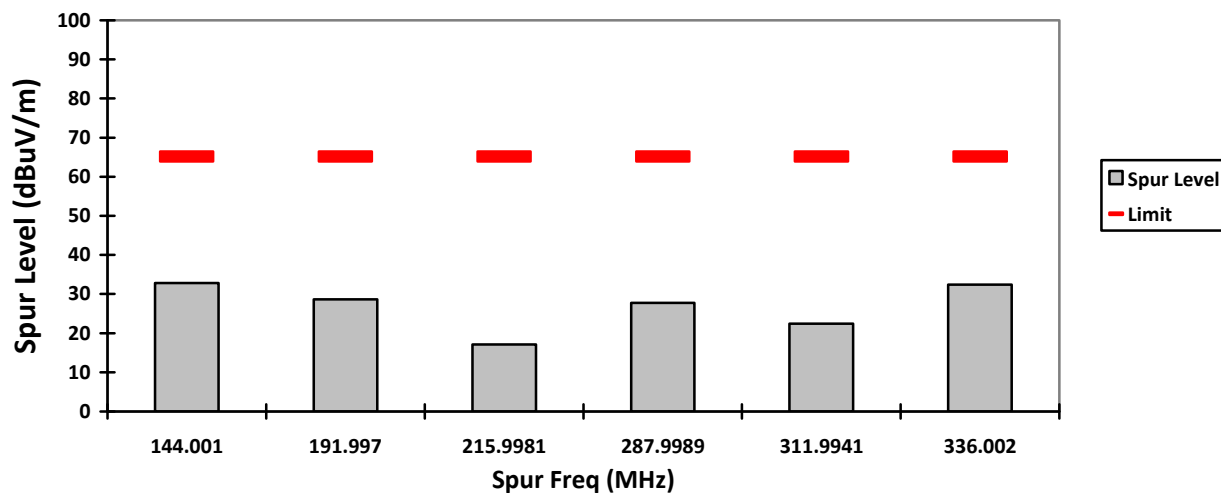
VERTICAL, QPK



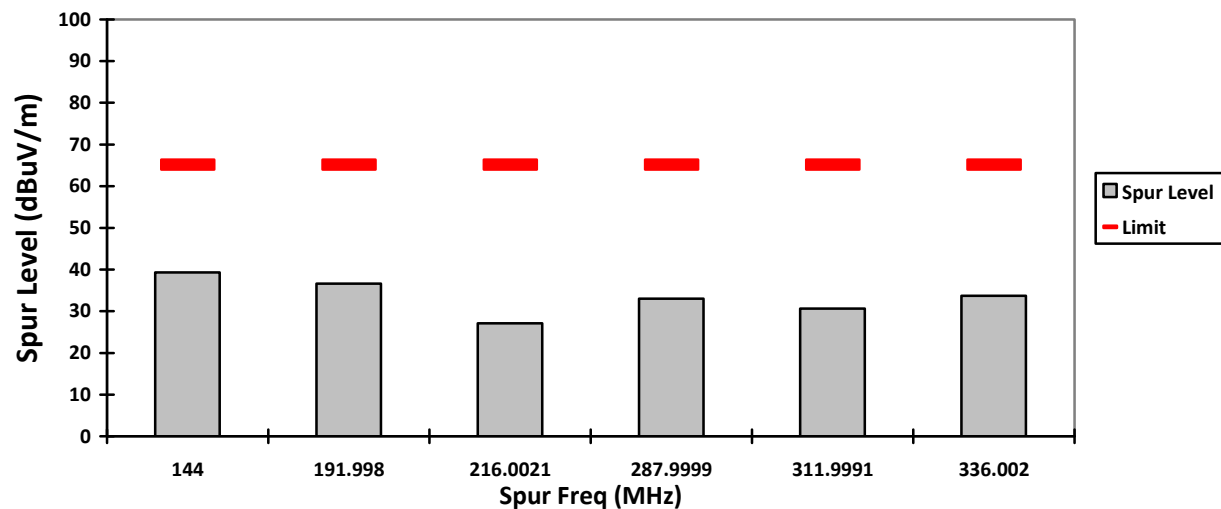
HORIZONTAL, QPK



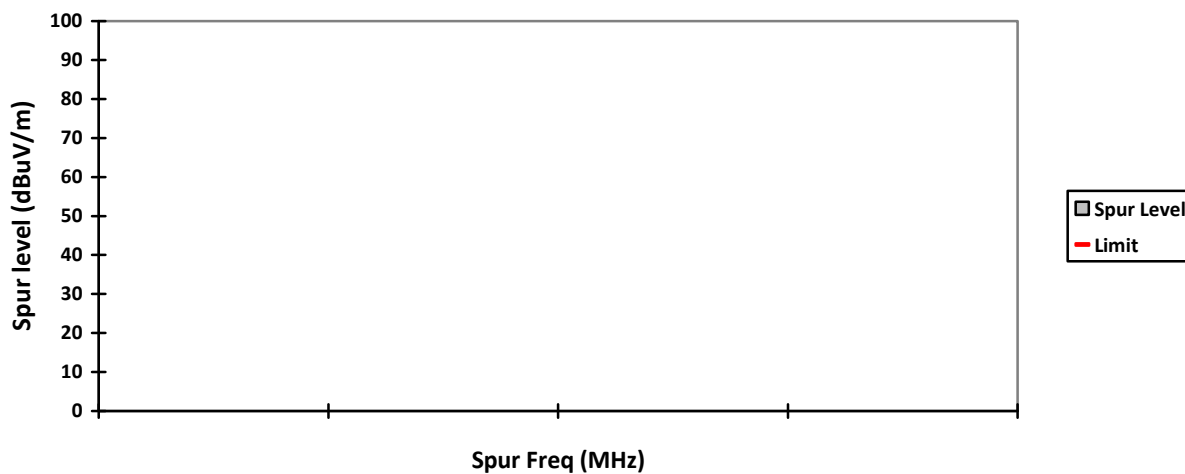
VERTICAL, PK



HORIZONTAL, PK



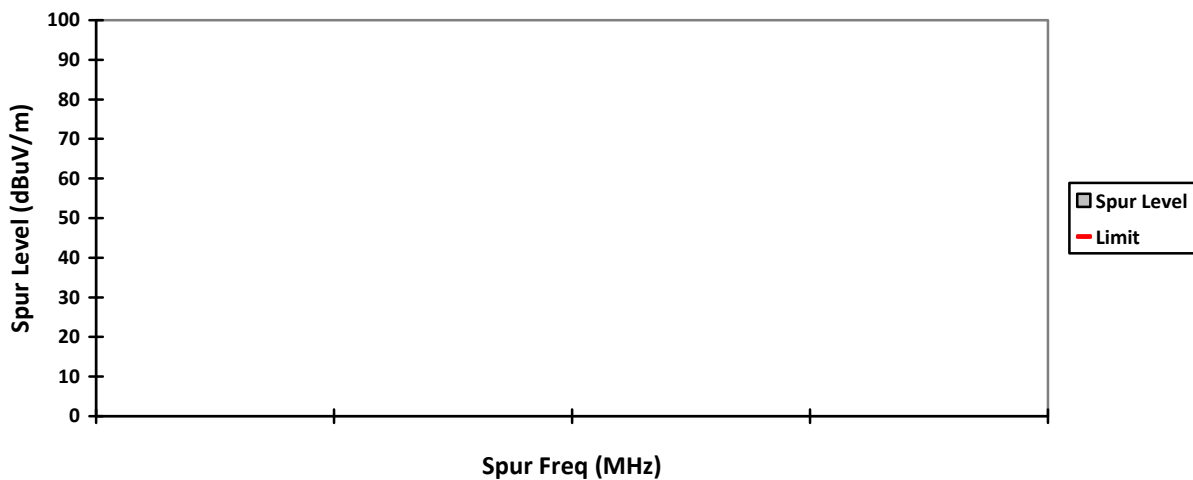
VERTICAL, AV



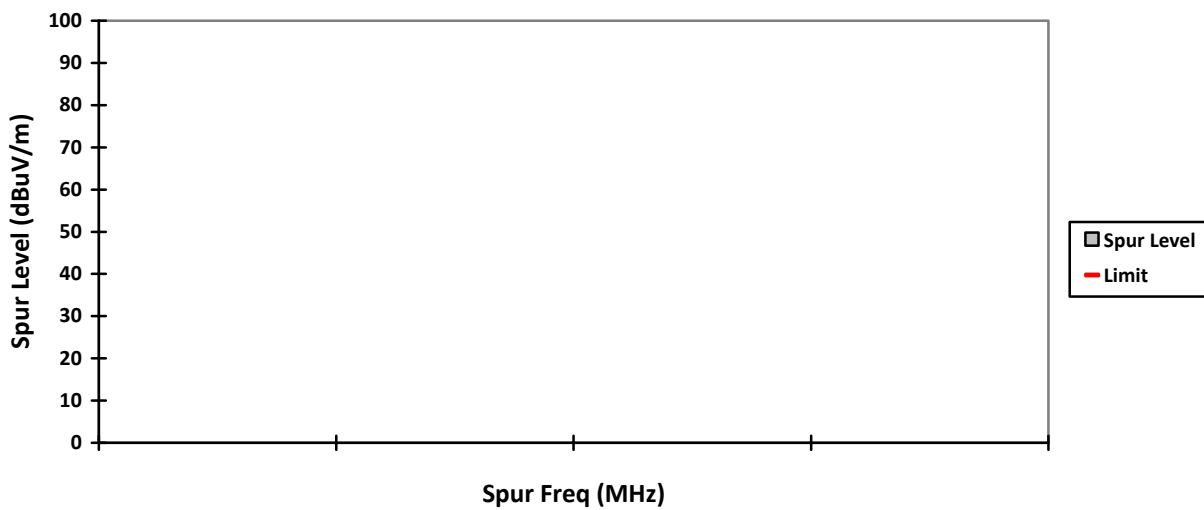
HORIZONTAL, AV



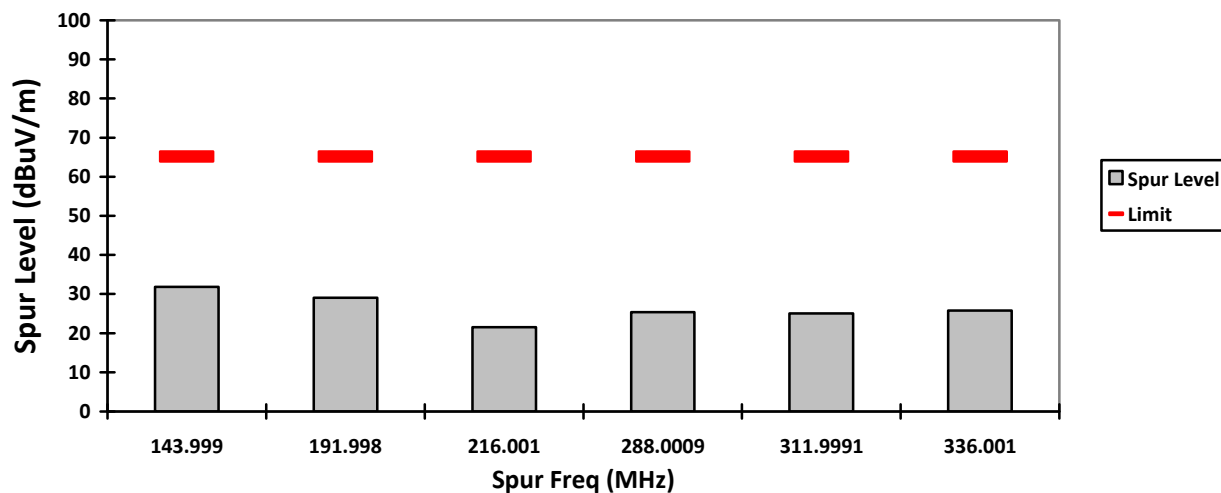
VERTICAL, QPK



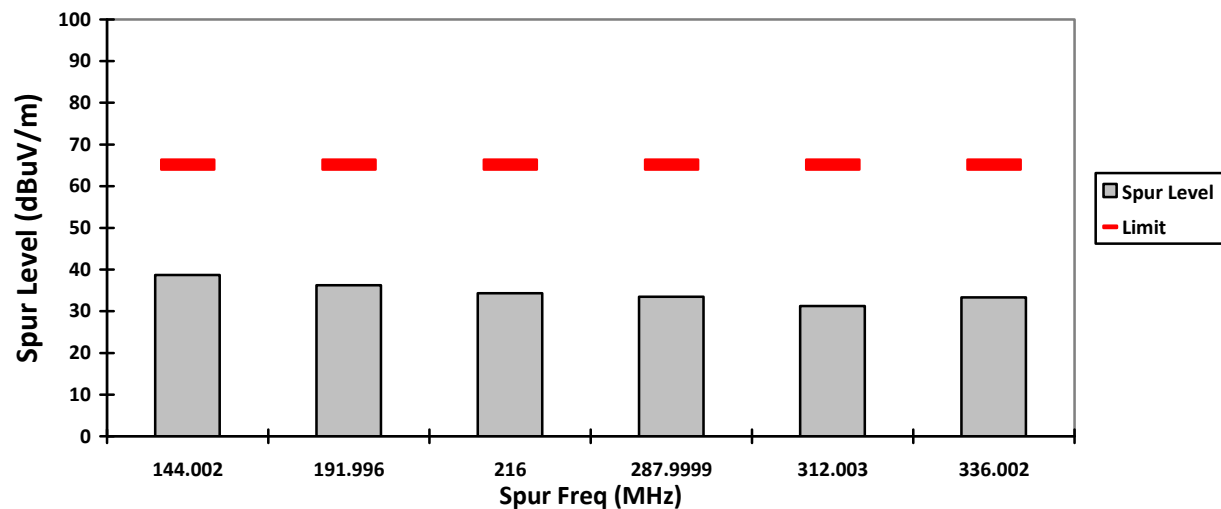
HORIZONTAL, QPK



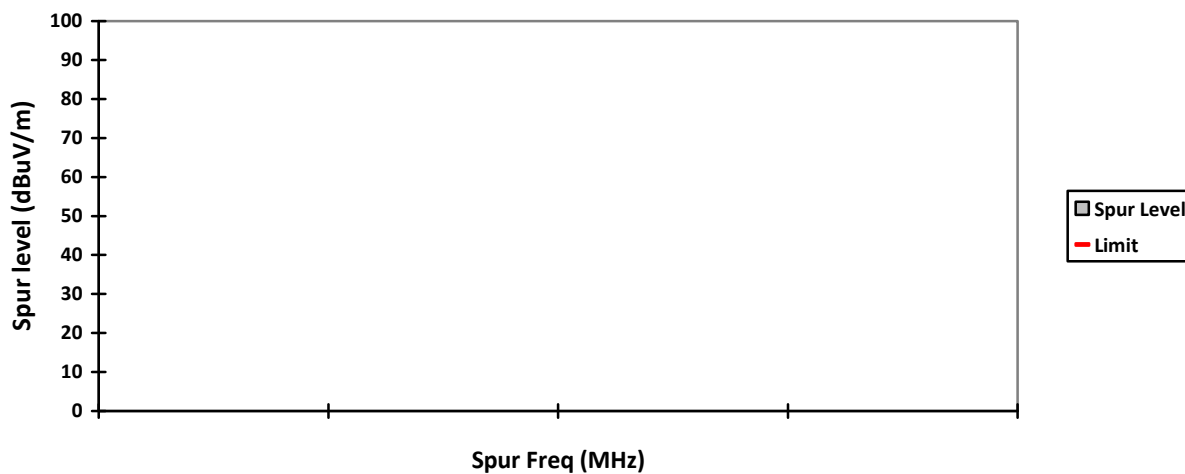
VERTICAL, PK



HORIZONTAL, PK



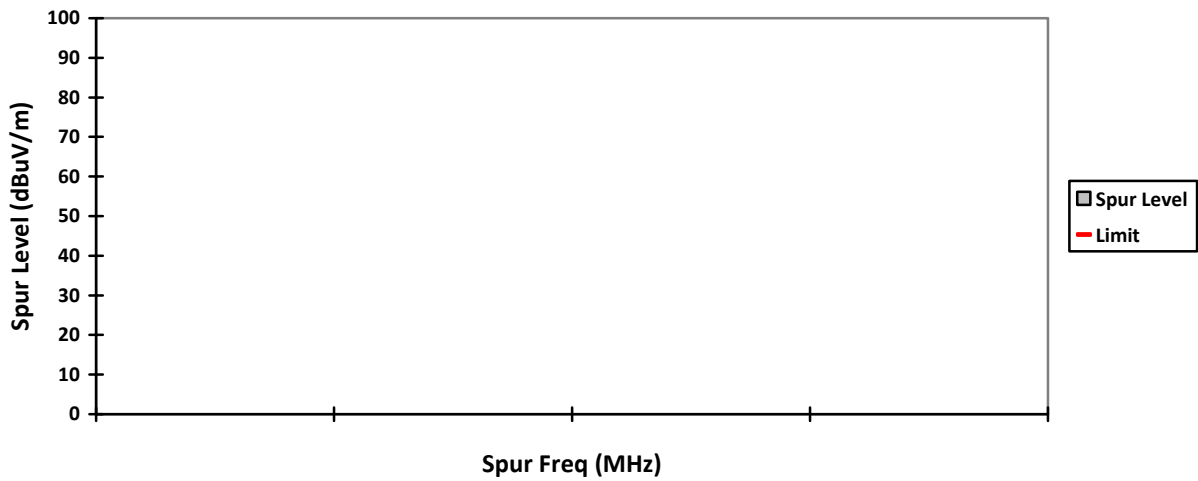
VERTICAL, AV



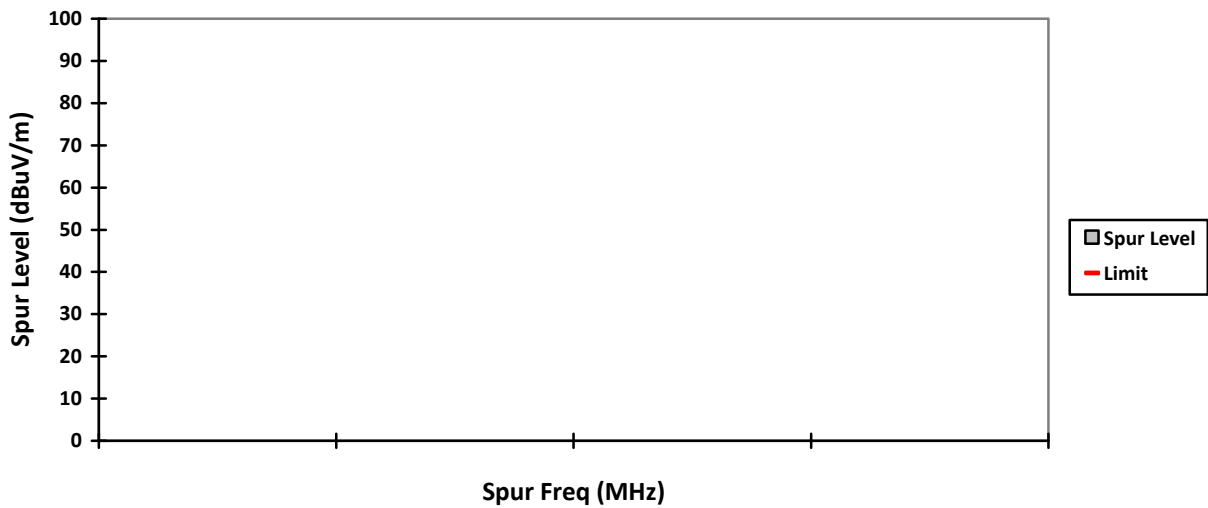
HORIZONTAL, AV



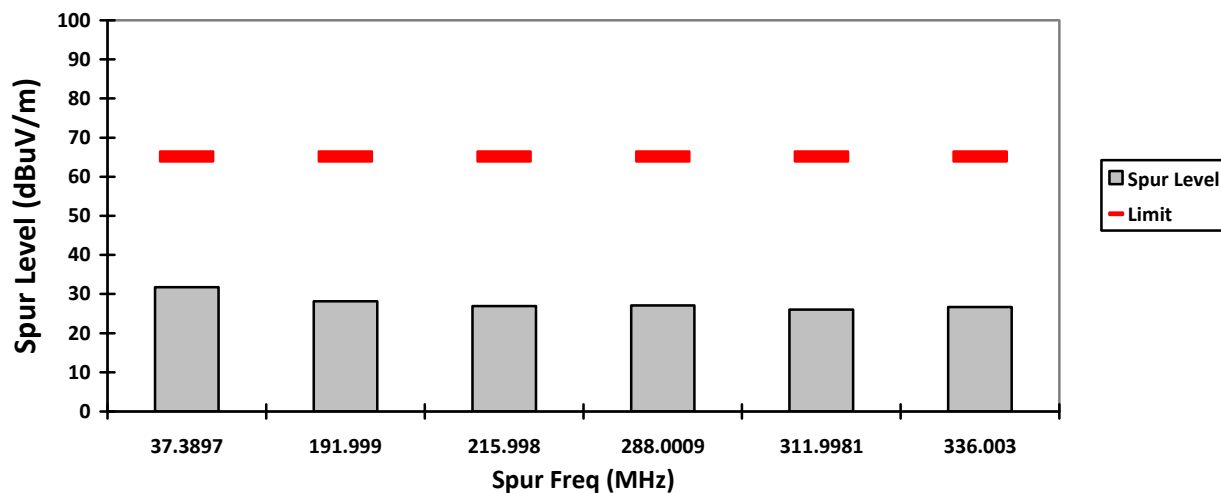
VERTICAL, QPK



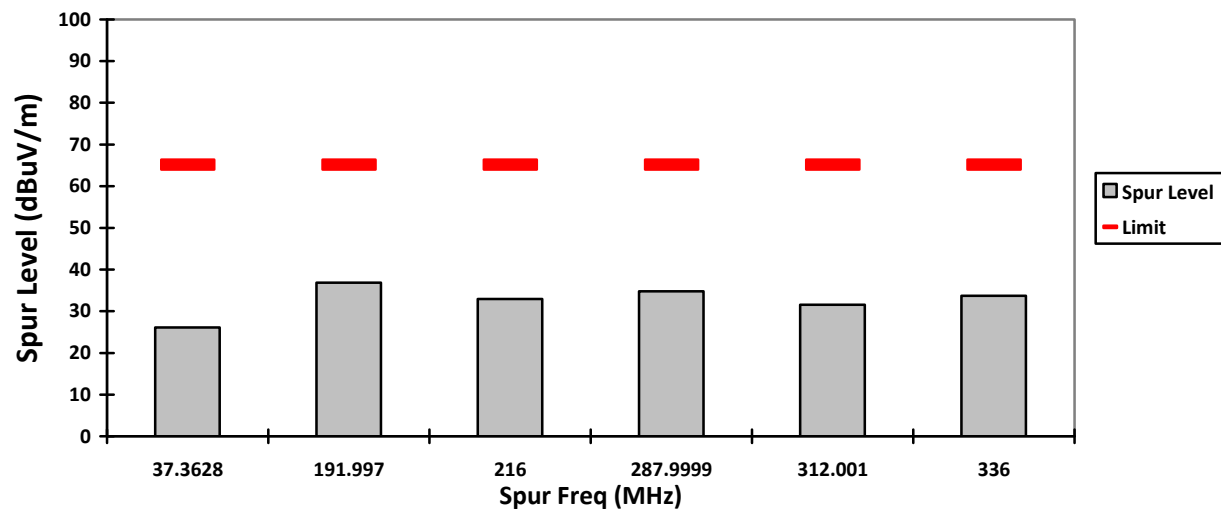
HORIZONTAL, QPK



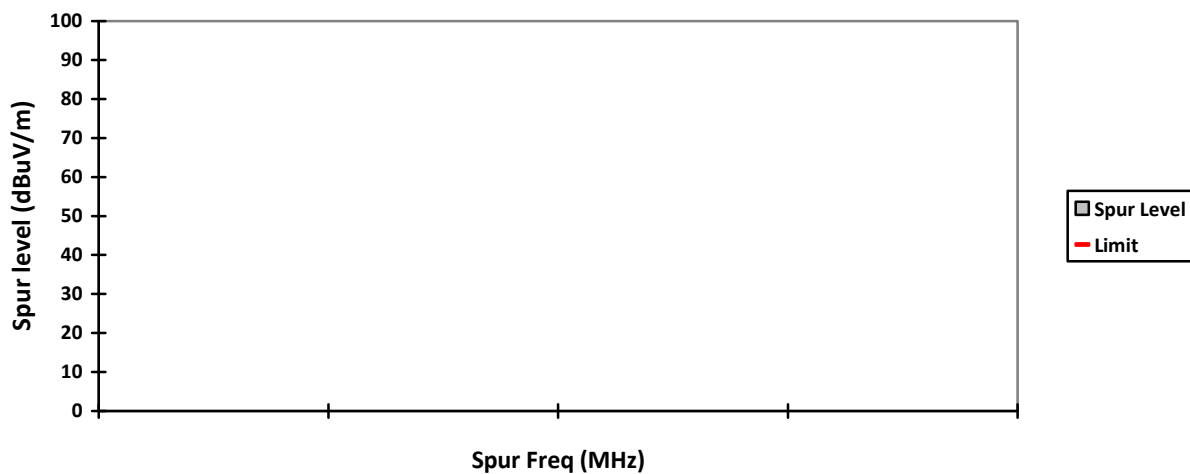
VERTICAL, PK



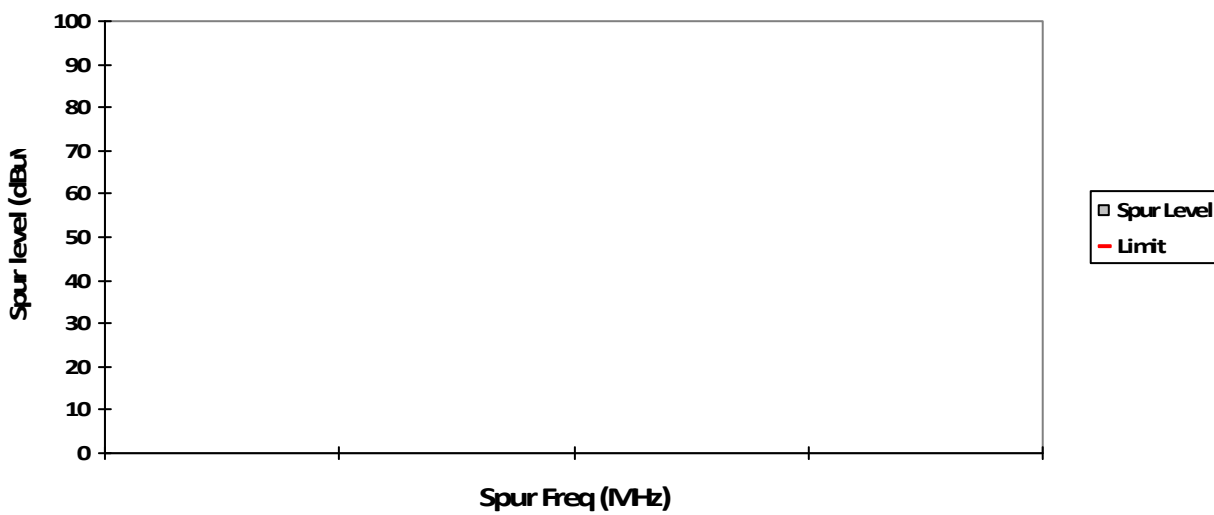
HORIZONTAL, PK



VERTICAL, AV

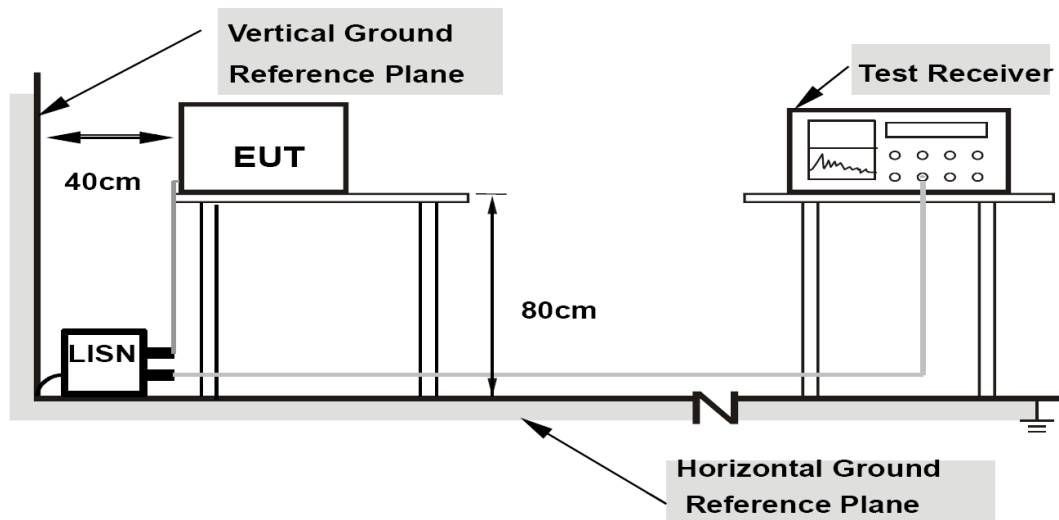


HORIZONTAL, AV



7.6. AC Powerline Conducted Emission

7.6.1. Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) 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.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

7.6.2. Test Limits

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

**Limits for conducted disturbance at the mains ports
of class A ITE**

Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

**Limits for conducted disturbance at the mains ports
of class B ITE**

Frequency range MHz	Limits dB(μ V)	
	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.		
NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

7.6.3. Test Data

Not Applicable. Testing is not required, radio shall turn off during charging mode.

END OF TEST REPORT