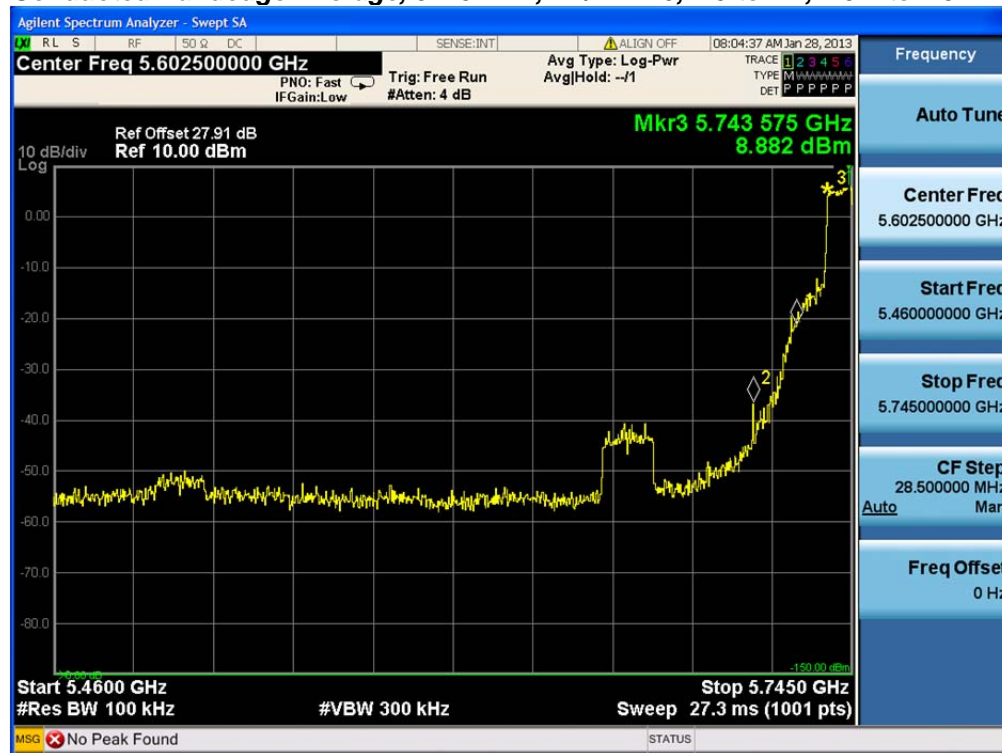


**Conducted Bandedge Average, 5745 MHz, Non HT/VHT20, 6 to 54 Mbps****Conducted Bandedge Average, 5745 MHz, Non HT/VHT20 Beam Forming, 6 to 54 Mbps**

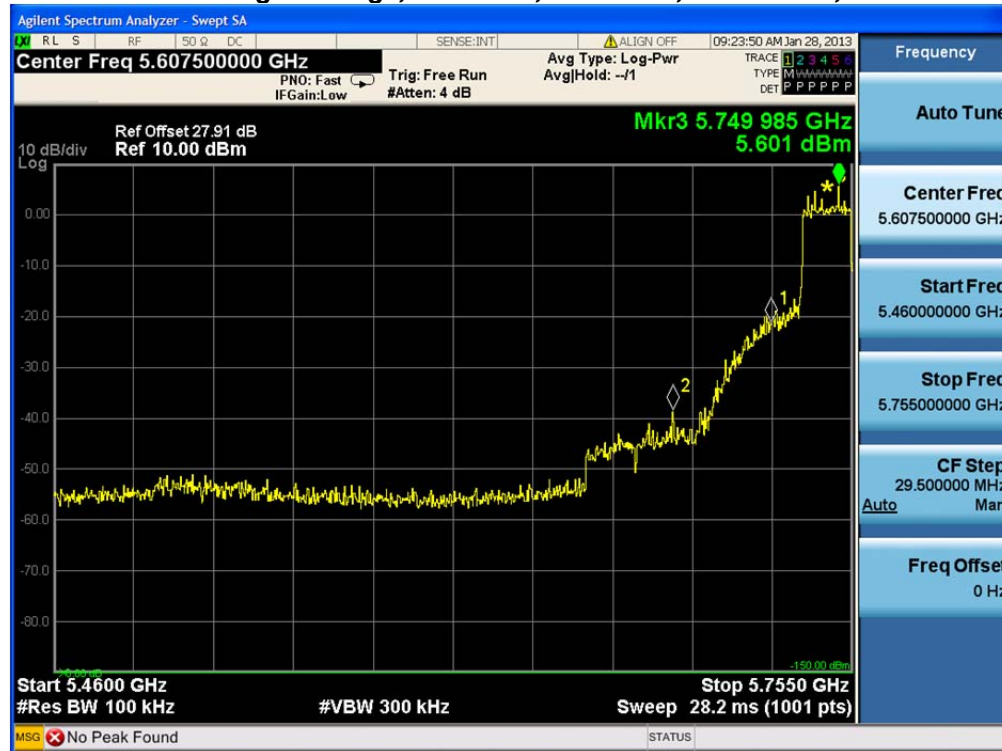
Conducted Bandedge Average, 5745 MHz, HT/VHT20, M0 to M7, M0.1 to M9.1**Conducted Bandedge Average, 5745 MHz, HT/VHT20, M8 to M15, M0.2 to M9.2**

**Conducted Bandedge Average, 5745 MHz, HT/VHT20, M16 to M23, M0.3 to M9.3****Conducted Bandedge Average, 5745 MHz, HT/VHT20 Beam Forming, M0 to M7, M0.1 to M9.1**

**Conducted Bandedge Average, 5745 MHz, HT/VHT20 Beam Forming, M8 to M15, M0.2 to M9.2****Conducted Bandedge Average, 5745 MHz, HT/VHT20 Beam Forming, M16 to M23, M0.3 to M9.3**

Conducted Bandedge Average, 5745 MHz, HT/VHT20 STBC, M0 to M7, M0.1 to M9.1**Conducted Bandedge Average, 5745 MHz, Non HT/VHT40, 6 to 54 Mbps**

Conducted Bandedge Average, 5745 MHz, HT/VHT40, M0 to M7, M0.1 to M9.1**Conducted Bandedge Average, 5745 MHz, HT/VHT40, M8 to M15, M0.2 to M9.2**

Conducted Bandedge Average, 5745 MHz, HT/VHT40, M16 to M23, M0.3 to M9.3**Conducted Bandedge Average, 5745 MHz, HT/VHT40 Beam Forming, M0 to M7, M0.1 to M9.1**

**Conducted Bandedge Average, 5745 MHz, HT/VHT40 Beam Forming, M8 to M15, M0.2 to M9.2****Conducted Bandedge Average, 5745 MHz, HT/VHT40 Beam Forming, M16 to M23, M0.3 to M9.3**

Conducted Bandedge Average, 5745 MHz, HT/VHT40 STBC, M0 to M7, M0.1 to M9.1**Conducted Bandedge Average, 5745 MHz, Non HT/VHT80, 6 to 54 Mbps**

Conducted Bandedge Average, 5745 MHz, HT/VHT80, M0 to M7, M0.1 to M9.1**Conducted Bandedge Average, 5745 MHz, HT/VHT80, M8 to M15, M0.2 to M9.2**

[illegible]

Agilent Spectrum Analyzer - Swept SA

☒ R.L. RF 150.0 DC SENSE:INT 11:18:52 AM Jan 29, 2013

Center Freq 5.617500000 GHz
 PNO: Fast ☐ Trig: Free Run Avg Type: Log-Pwr Avg/Hold: -/1

IF Gain: Low #Atten: 4 dB
 TRACE 1 2 3 4 5
TYPE M M M M M M M M
DET P P P P P P

Ref Offset 27.91 dB
 Ref 10.00 dBm

Mkr3 5.746 335 GHz
-0.110 dBm

10 dB/div
 Log

Start 5.4600 GHz Stop 5.7750 GHz
 #Res BW 100 kHz #VBW 300 kHz Sweep 30.1 ms (1001 pts)

MSG STATUS

Frequency

Auto Tune

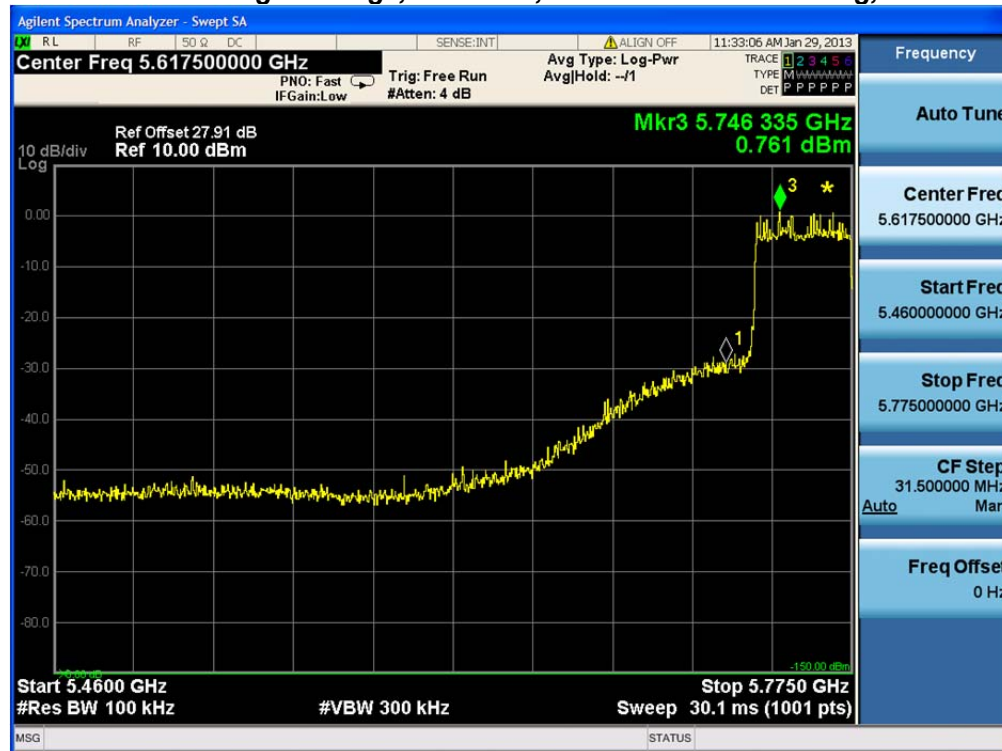
Center Freq
5.617500000 GHz

Start Freq
5.460000000 GHz

Stop Freq
5.775000000 GHz

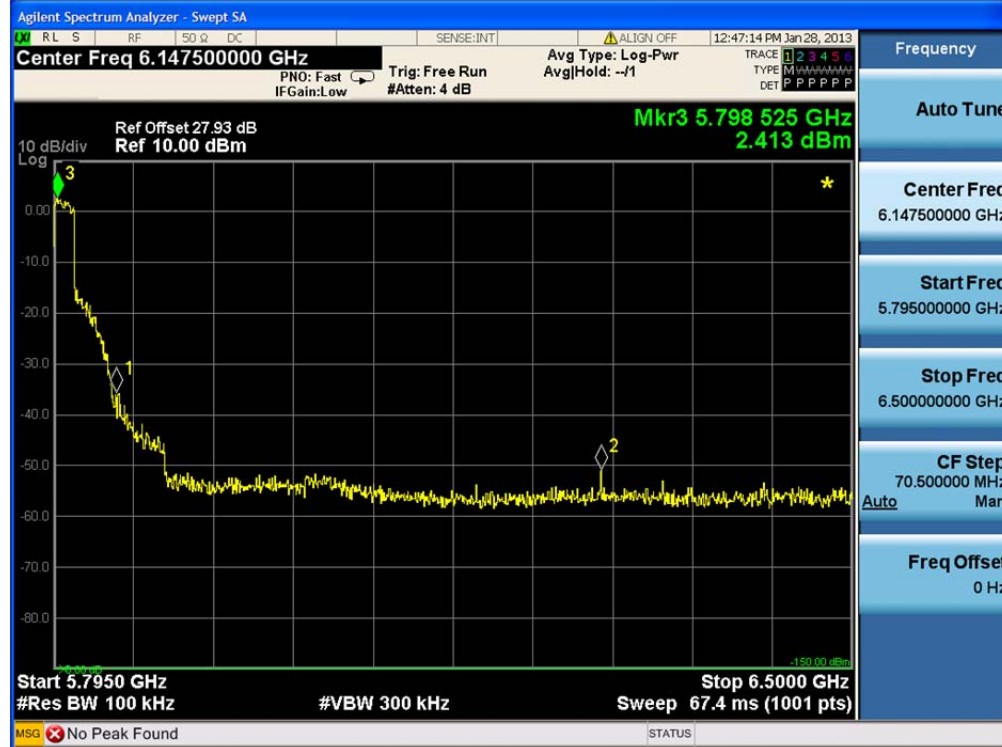
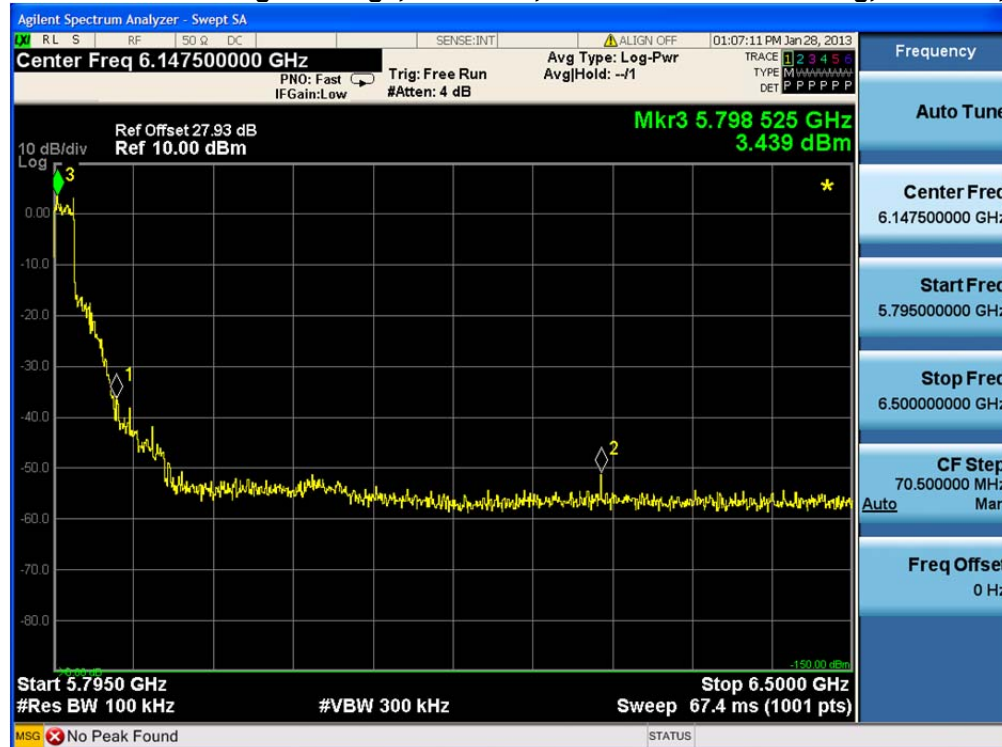
CF Step
31.500000 MHz
[Auto](#) Man

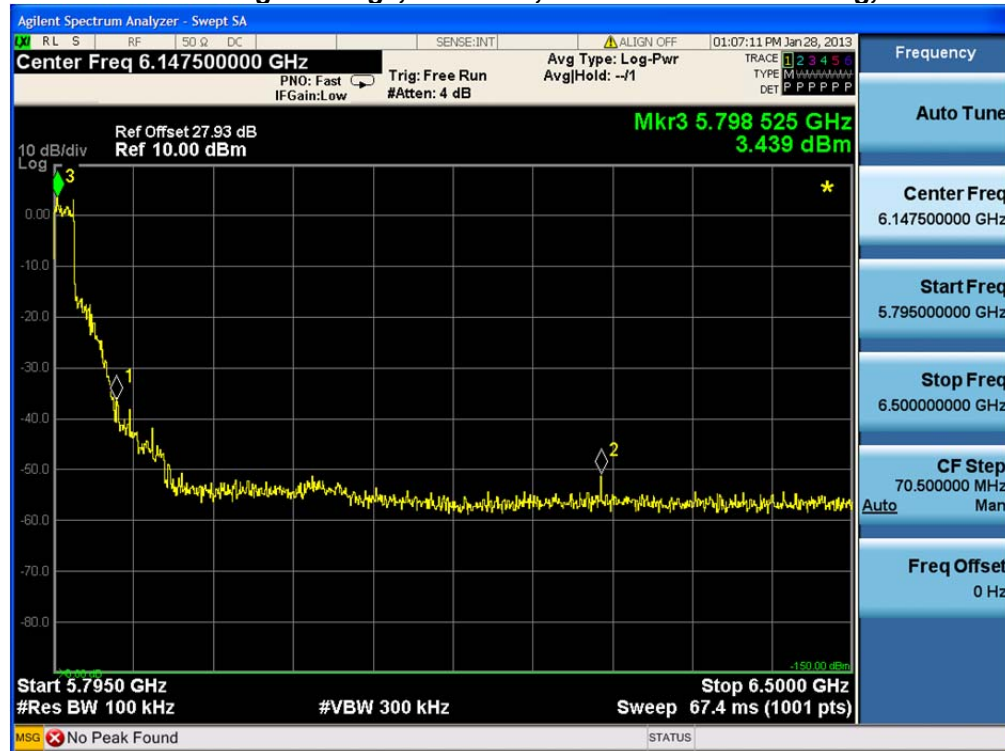
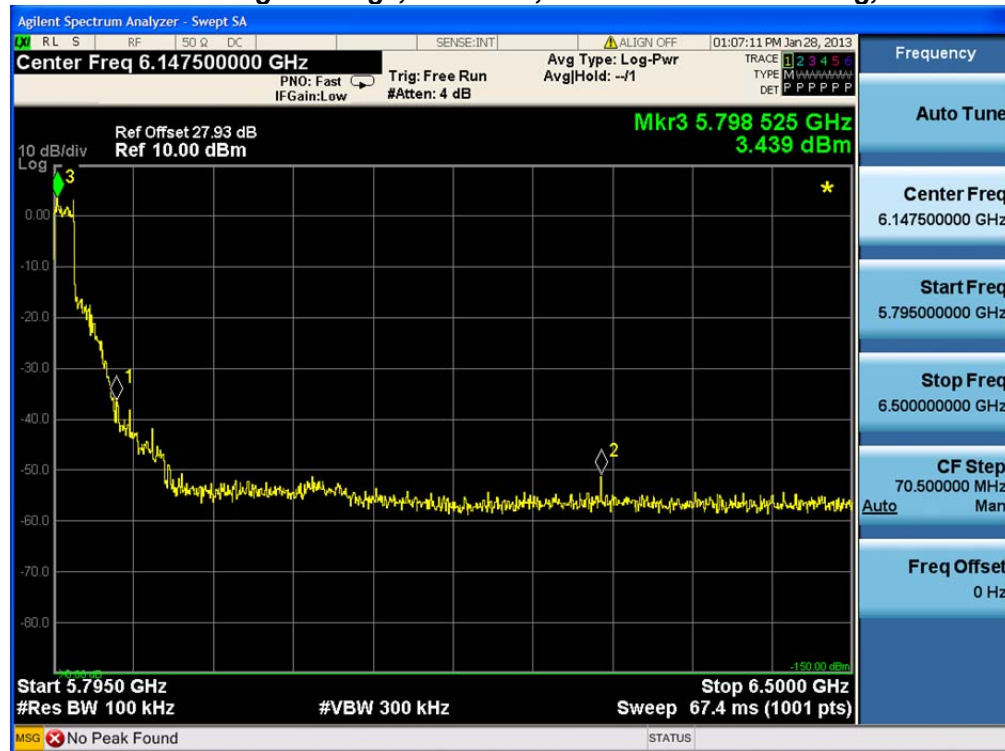
Freq Offset
0 Hz

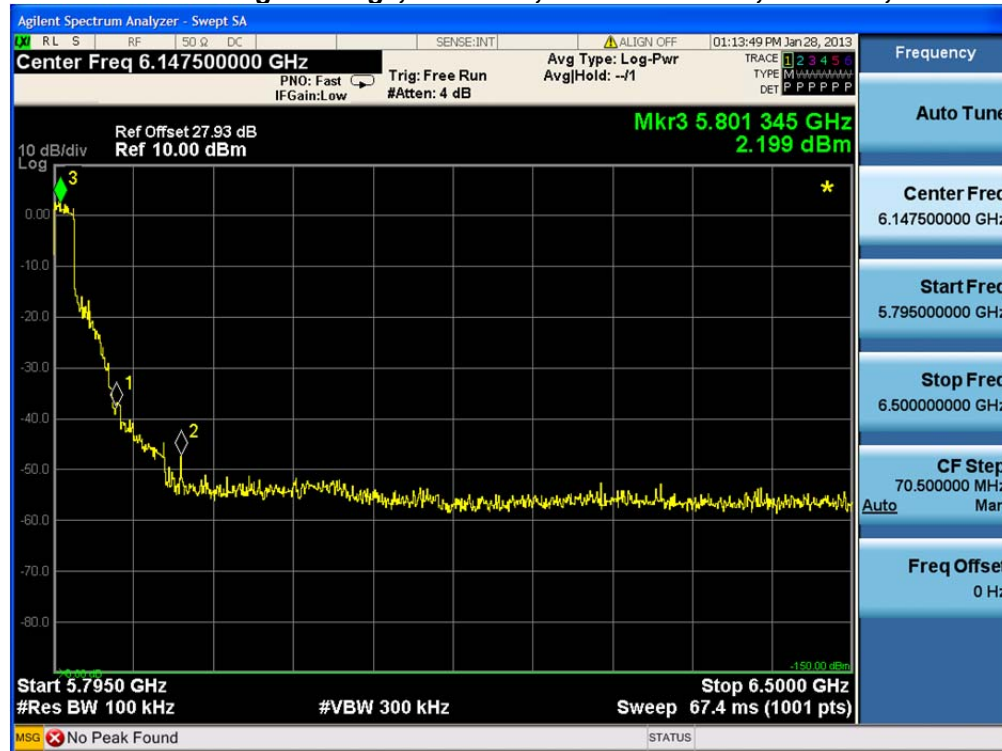
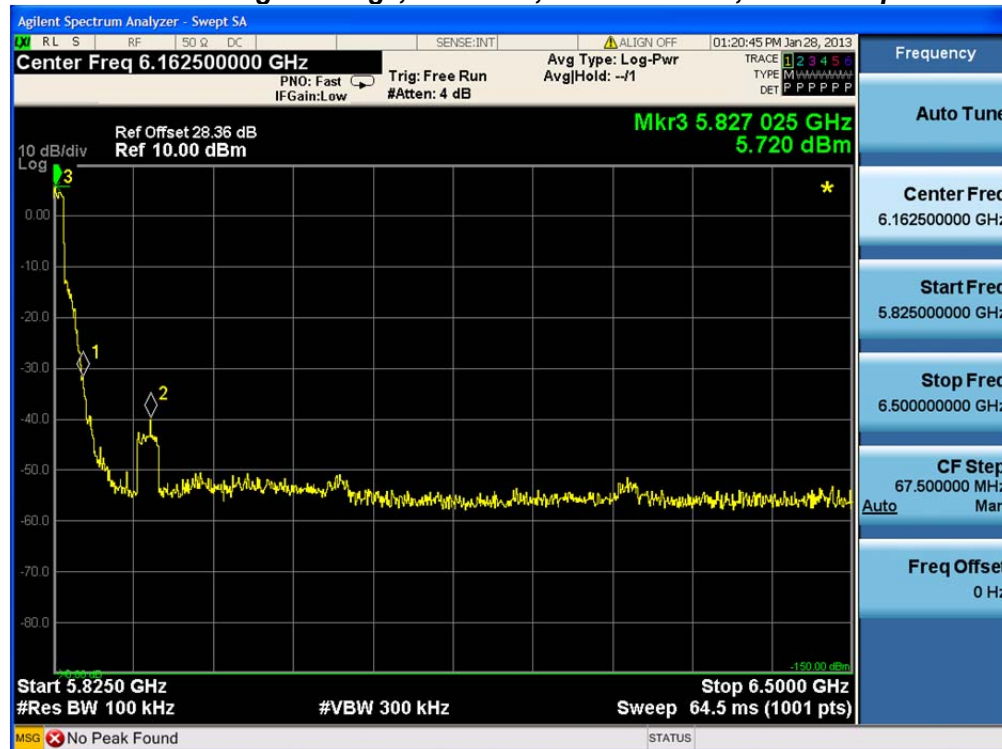
**Conducted Bandedge Average, 5745 MHz, HT/VHT80 Beam Forming, M8 to M15, M0.2 to M9.2****Conducted Bandedge Average, 5745 MHz, HT/VHT80 Beam Forming, M16 to M23, M0.3 to M9.3**

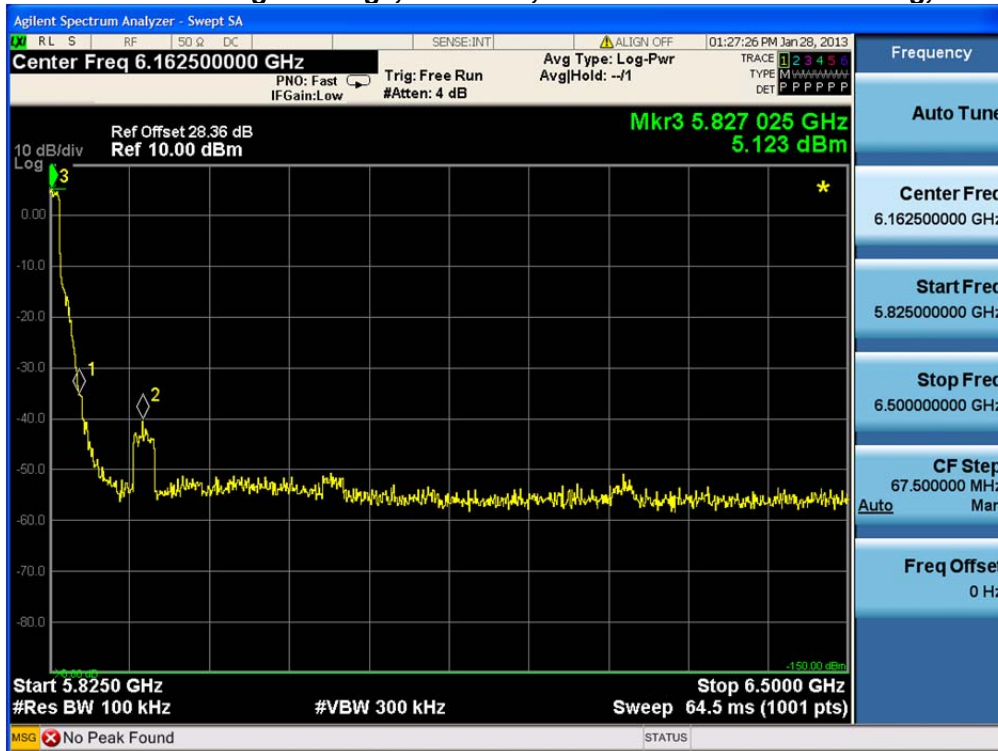
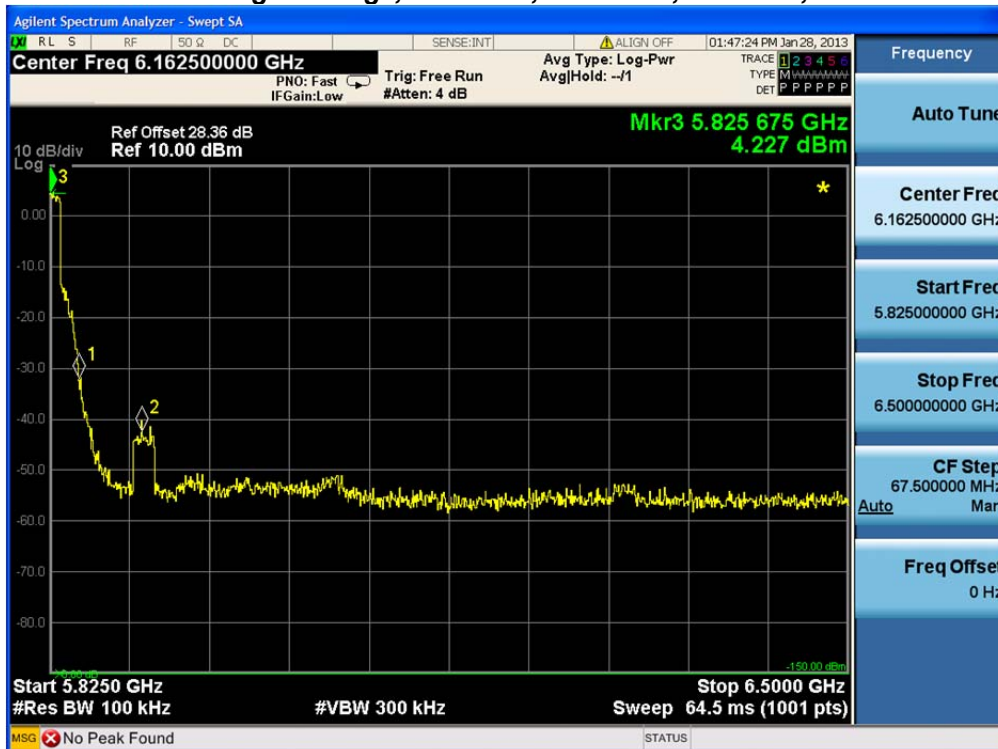
**Conducted Bandedge Average, 5745 MHz, HT/VHT80 STBC, M0 to M7, M0.1 to M9.1****Conducted Bandedge Average, 5785 MHz, Non HT/VHT40, 6 to 54 Mbps**

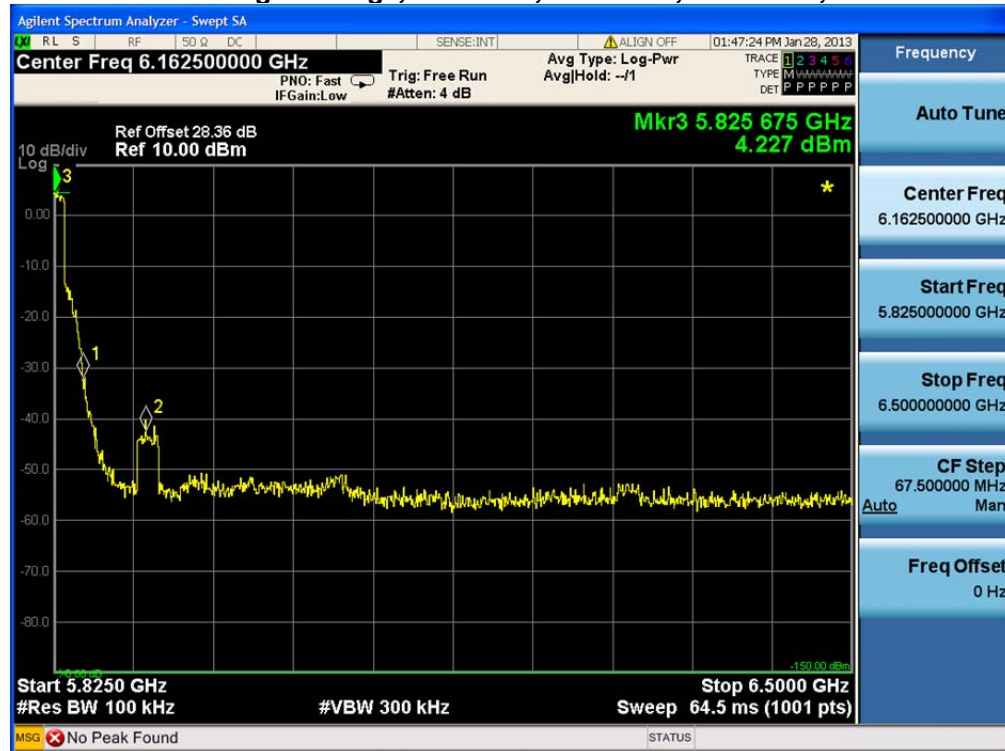
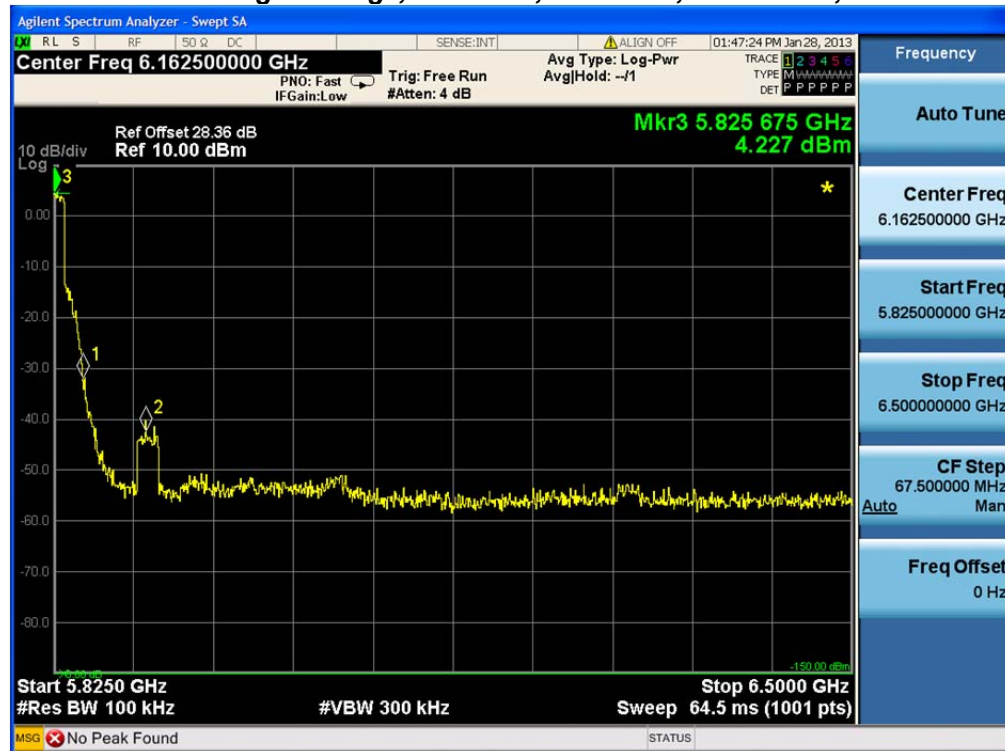
**Conducted Bandedge Average, 5785 MHz, HT/VHT40, M0 to M7, M0.1 to M9.1****Conducted Bandedge Average, 5785 MHz, HT/VHT40, M8 to M15, M0.2 to M9.2**

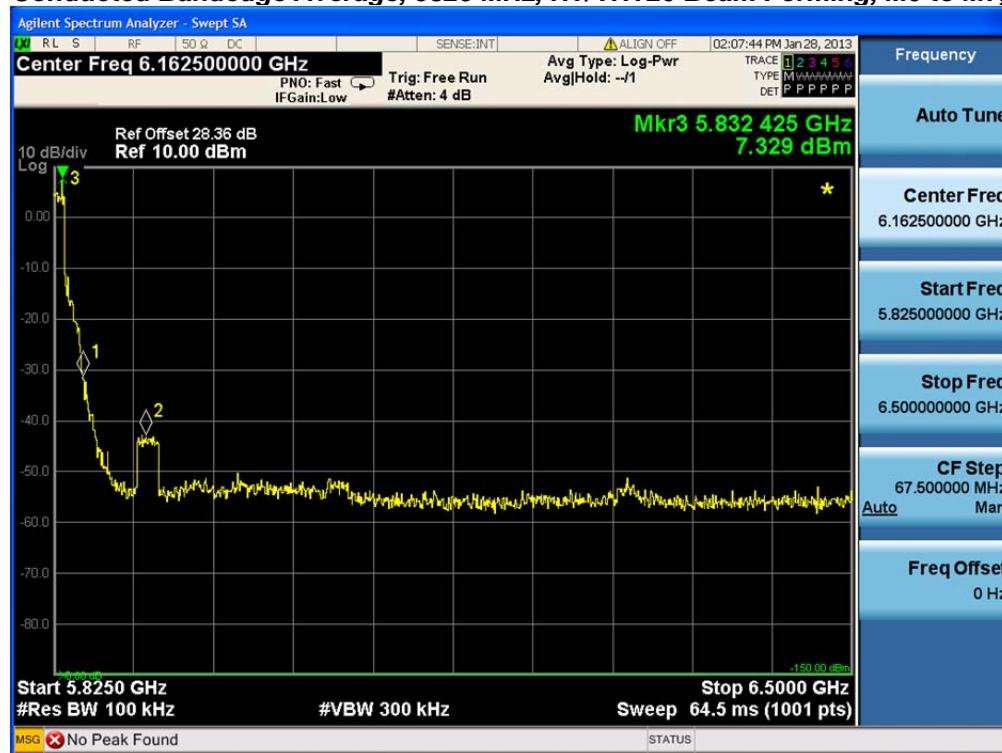
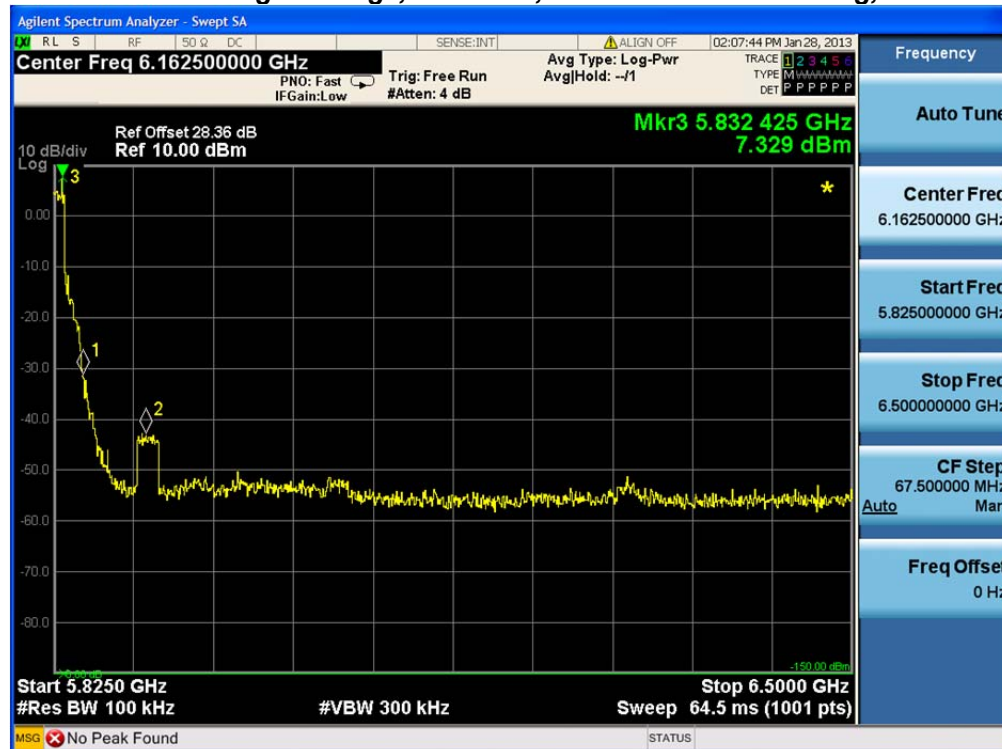
**Conducted Bandedge Average, 5785 MHz, HT/VHT40, M16 to M23, M0.3 to M9.3****Conducted Bandedge Average, 5785 MHz, HT/VHT40 Beam Forming, M0 to M7, M0.1 to M9.1**

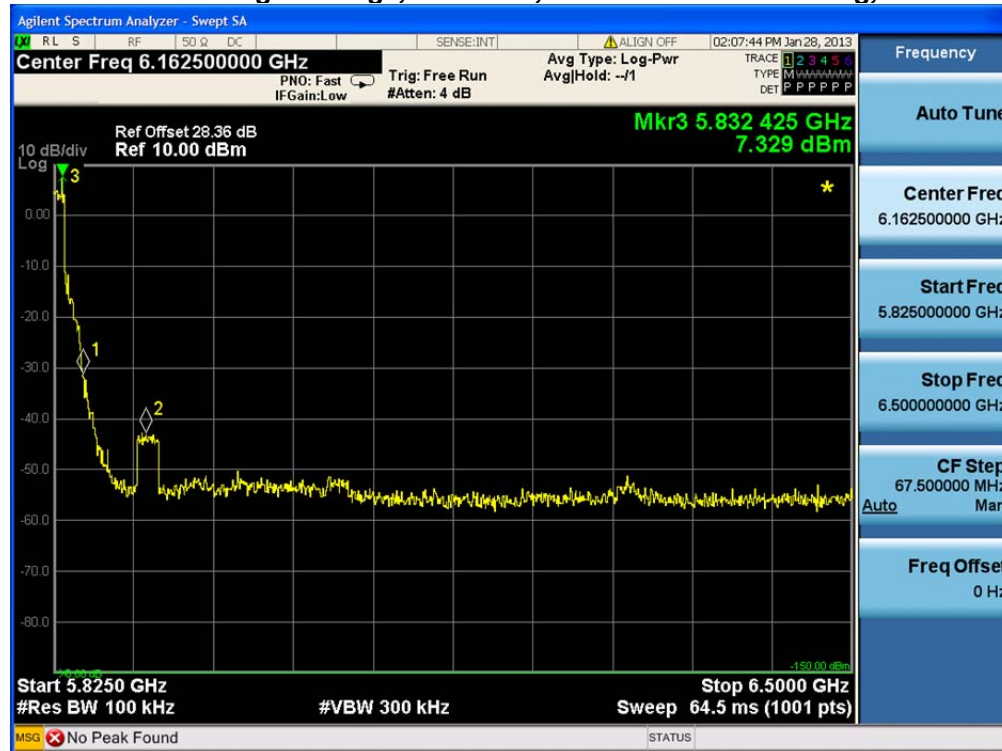
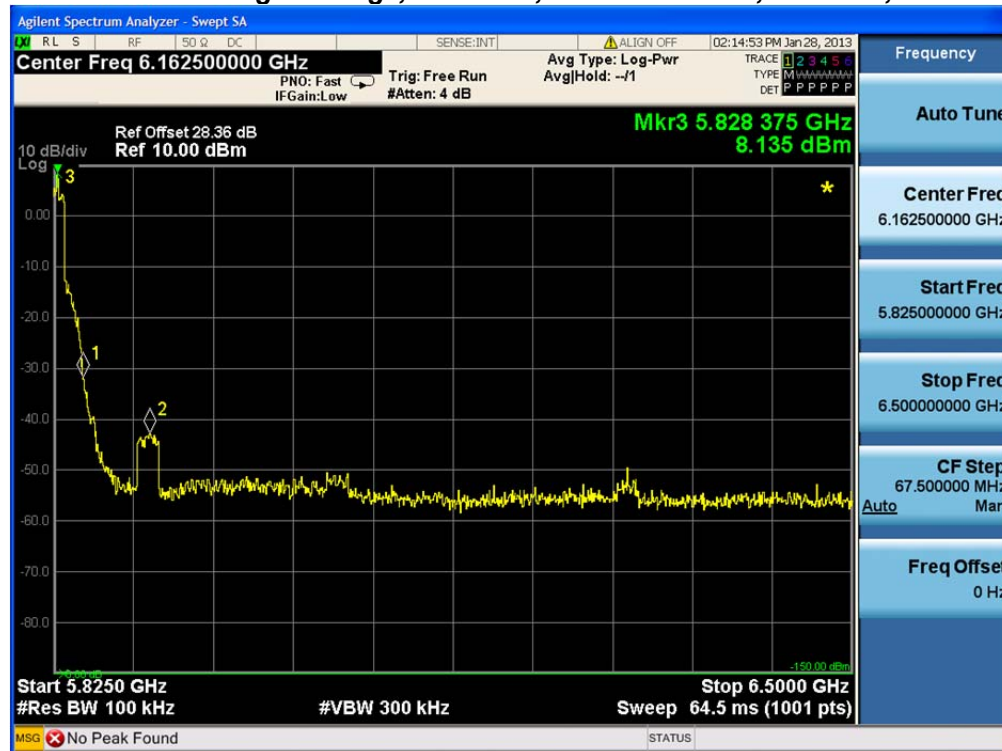
**Conducted Bandedge Average, 5785 MHz, HT/VHT40 Beam Forming, M8 to M15, M0.2 to M9.2****Conducted Bandedge Average, 5785 MHz, HT/VHT40 Beam Forming, M16 to M23, M0.3 to M9.3**

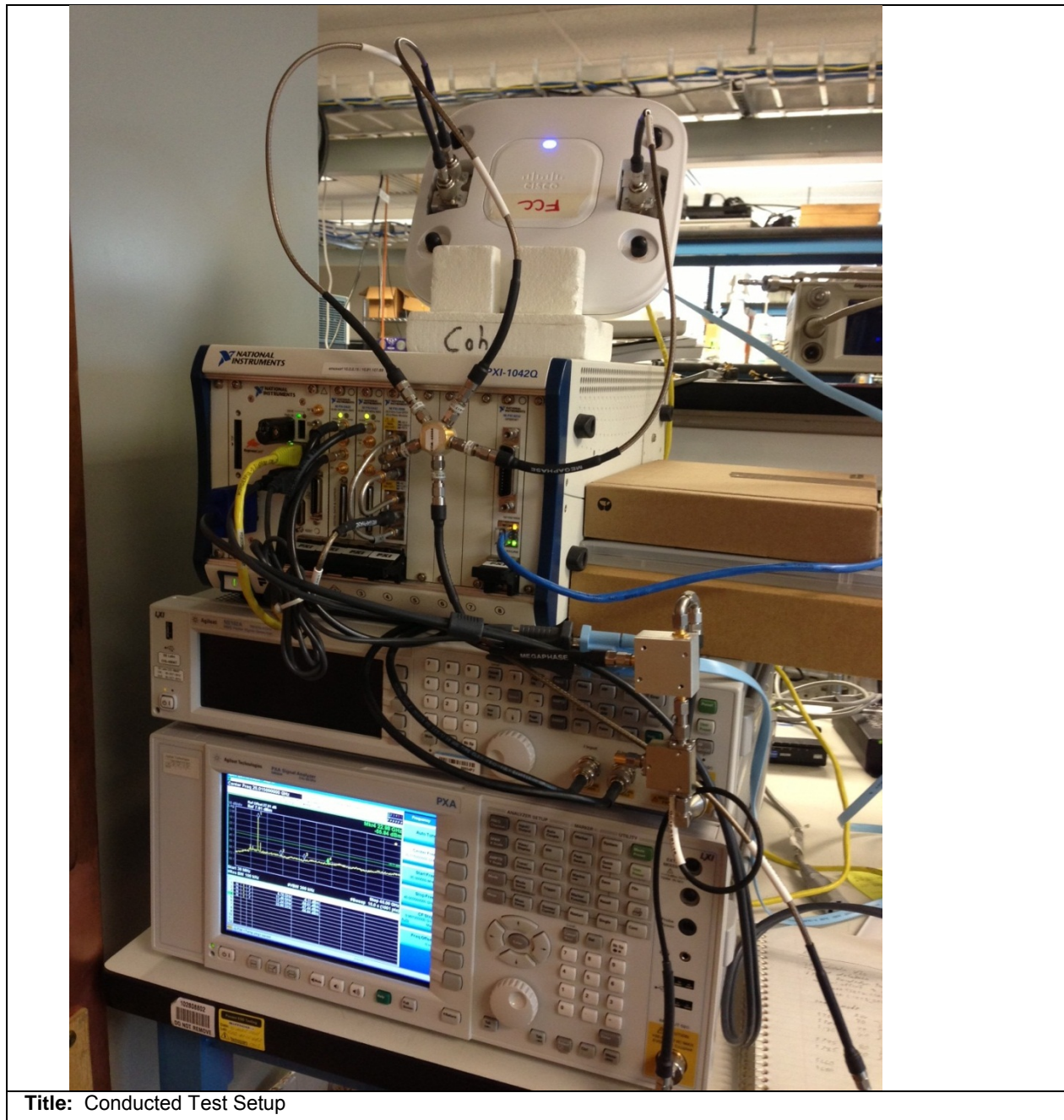
**Conducted Bandedge Average, 5785 MHz, HT/VHT40 STBC, M0 to M7, M0.1 to M9.1****Conducted Bandedge Average, 5825 MHz, Non HT/VHT20, 6 to 54 Mbps**

Conducted Bandedge Average, 5825 MHz, Non HT/VHT20 Beam Forming, 6 to 54 Mbps**Conducted Bandedge Average, 5825 MHz, HT/VHT20, M0 to M7, M0.1 to M9.1**

**Conducted Bandedge Average, 5825 MHz, HT/VHT20, M8 to M15, M0.2 to M9.2****Conducted Bandedge Average, 5825 MHz, HT/VHT20, M16 to M23, M0.3 to M9.3**

Conducted Bandedge Average, 5825 MHz, HT/VHT20 Beam Forming, M0 to M7, M0.1 to M9.1**Conducted Bandedge Average, 5825 MHz, HT/VHT20 Beam Forming, M8 to M15, M0.2 to M9.2**

**Conducted Bandedge Average, 5825 MHz, HT/VHT20 Beam Forming, M16 to M23, M0.3 to M9.3****Conducted Bandedge Average, 5825 MHz, HT/VHT20 STBC, M0 to M7, M0.1 to M9.1**

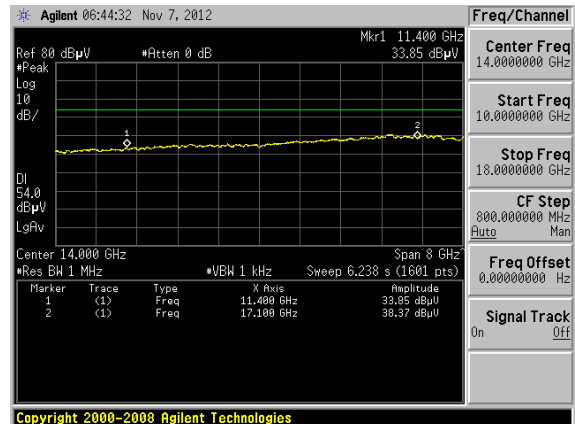
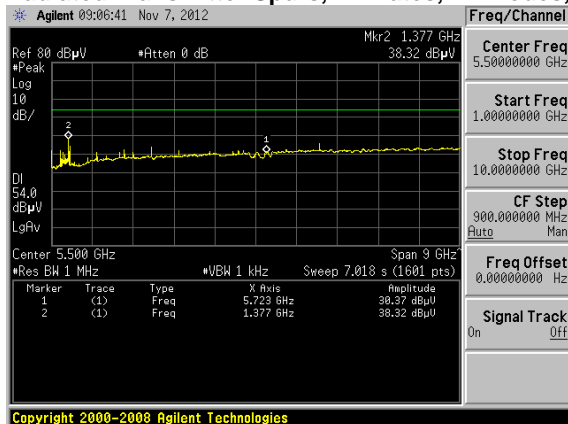


Title: Conducted Test Setup

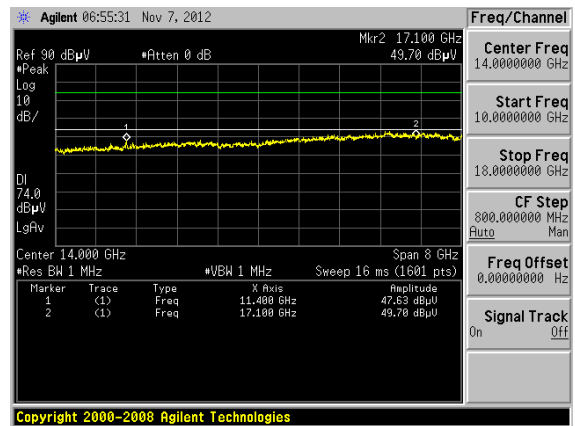
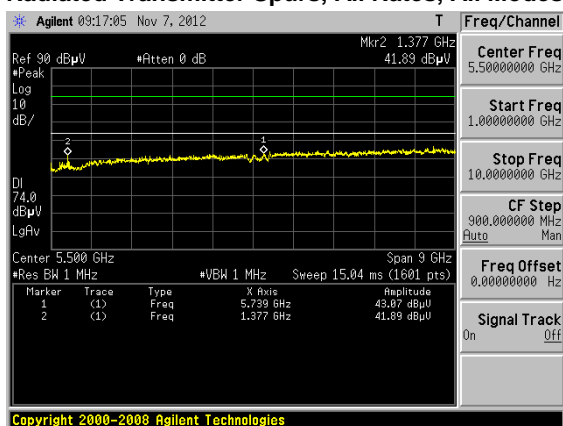


Transmitter Radiated Spurious Emissions

Radiated Transmitter Spurs, All Rates, All Modes, Average



Radiated Transmitter Spurs, All Rates, All Modes, Peak

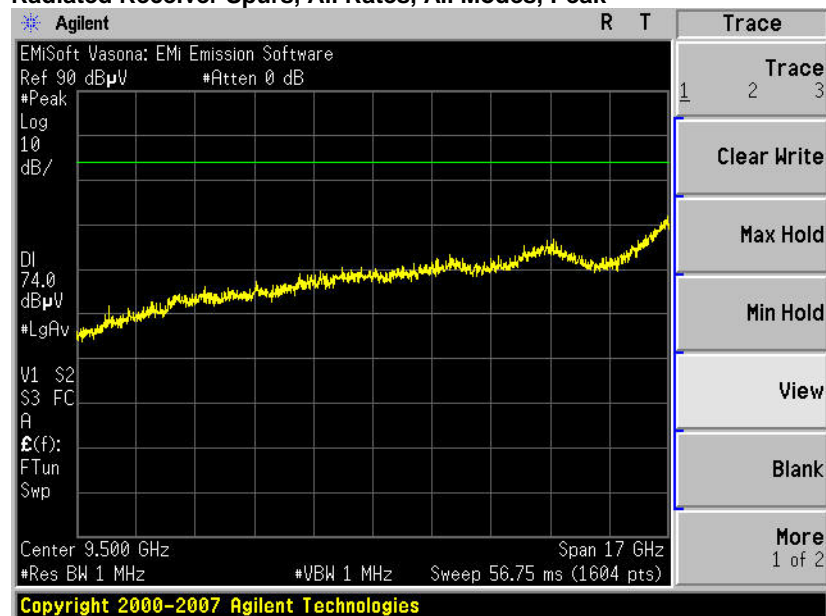


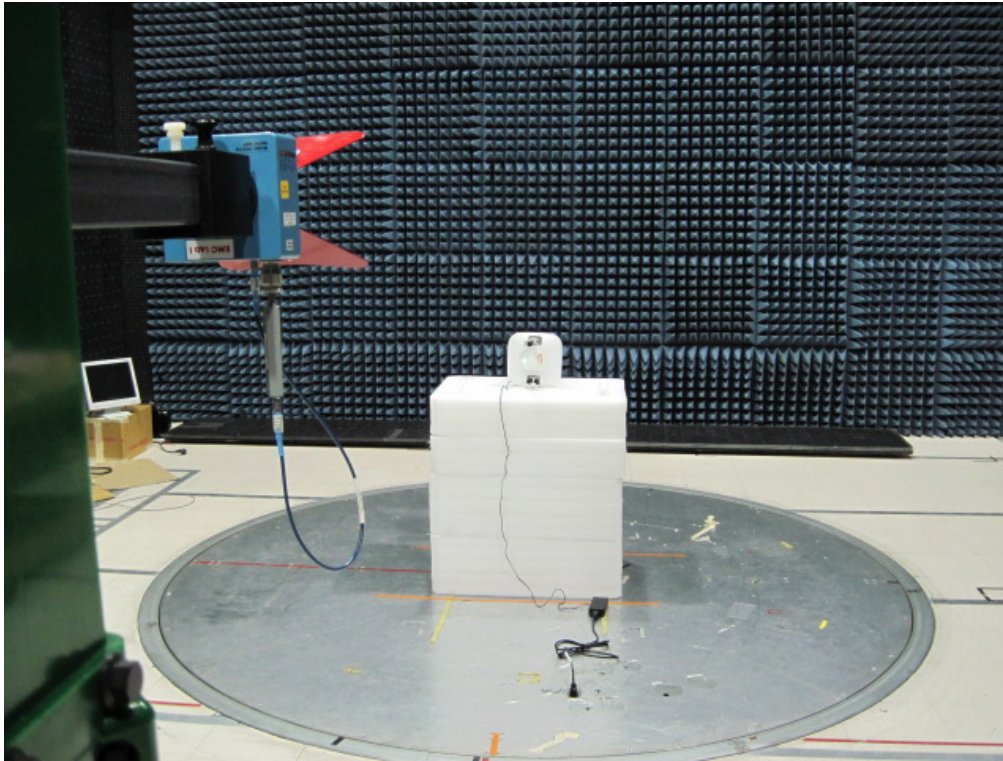
Receiver Radiated Spurious Emissions

Radiated Receiver Spurs, All Rates, All Modes, Average



Radiated Receiver Spurs, All Rates, All Modes, Peak

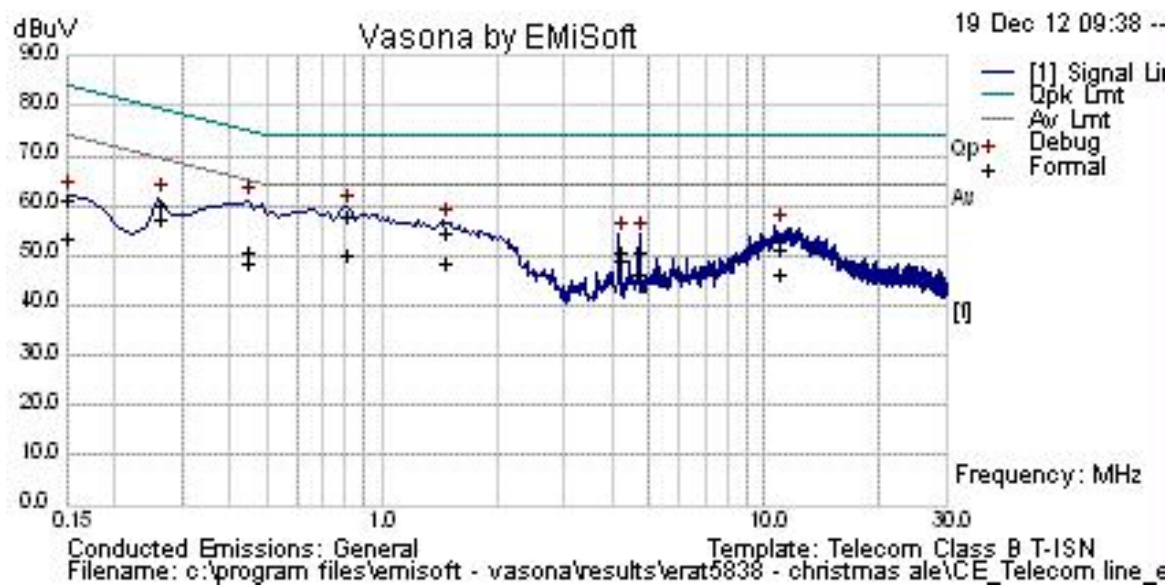




Radiated Test Setup



Conducted Emissions

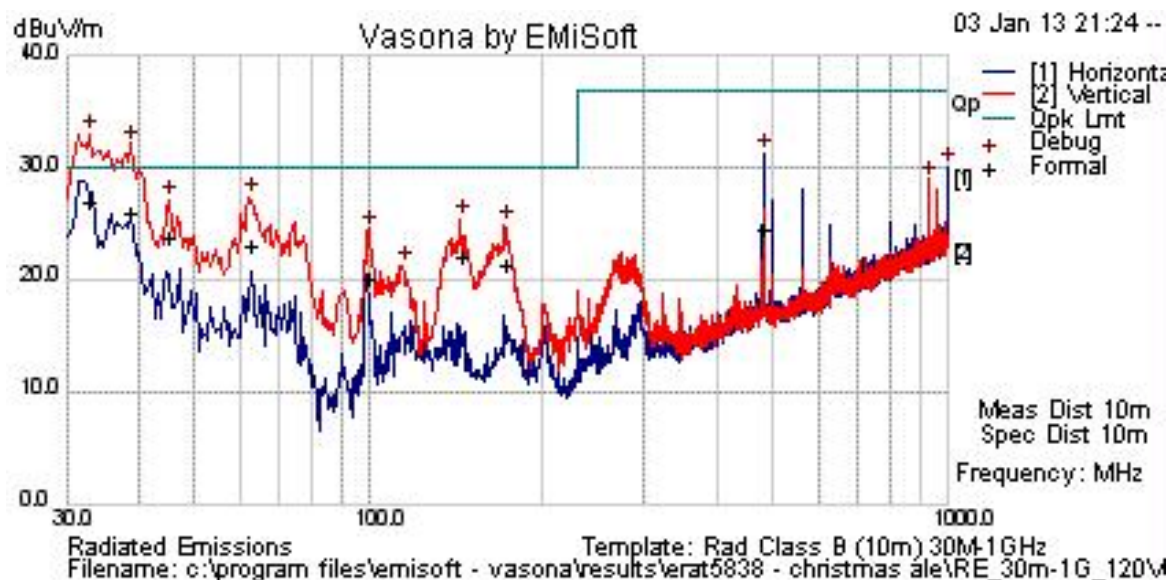


Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.444	38.7	0.2	9.7	48.6	Qp	SL	75	-26.4	Pass	
0.808	48.2	0.2	9.7	58	Qp	SL	74	-16	Pass	
1.46	44.8	0.2	9.7	54.7	Qp	SL	74	-19.3	Pass	
0.261	50.4	0.1	9.8	60.2	Qp	SL	79.4	-19.2	Pass	
10.86	40.7	0.4	10	51.1	Qp	SL	74	-22.9	Pass	
4.703	40.5	0.3	9.8	50.5	Qp	SL	74	-23.5	Pass	
4.181	40.8	0.3	9.8	50.8	Qp	SL	74	-23.2	Pass	
0.15	51.6	0.1	9.8	61.5	Qp	SL	84	-22.5	Pass	
0.444	41	0.2	9.7	50.9	Av	SL	65	-14.1	Pass	
0.808	40.3	0.2	9.7	50.1	Av	SL	64	-13.9	Pass	
1.46	38.6	0.2	9.7	48.4	Av	SL	64	-15.6	Pass	
0.261	47.4	0.1	9.8	57.3	Av	SL	69.4	-12.1	Pass	
10.86	36.1	0.4	10	46.5	Av	SL	64	-17.5	Pass	
4.703	36.5	0.3	9.8	46.5	Av	SL	64	-17.5	Pass	
4.181	39.2	0.3	9.8	49.2	Av	SL	64	-14.8	Pass	
0.15	43.6	0.1	9.8	53.5	Av	SL	74	-20.5	Pass	

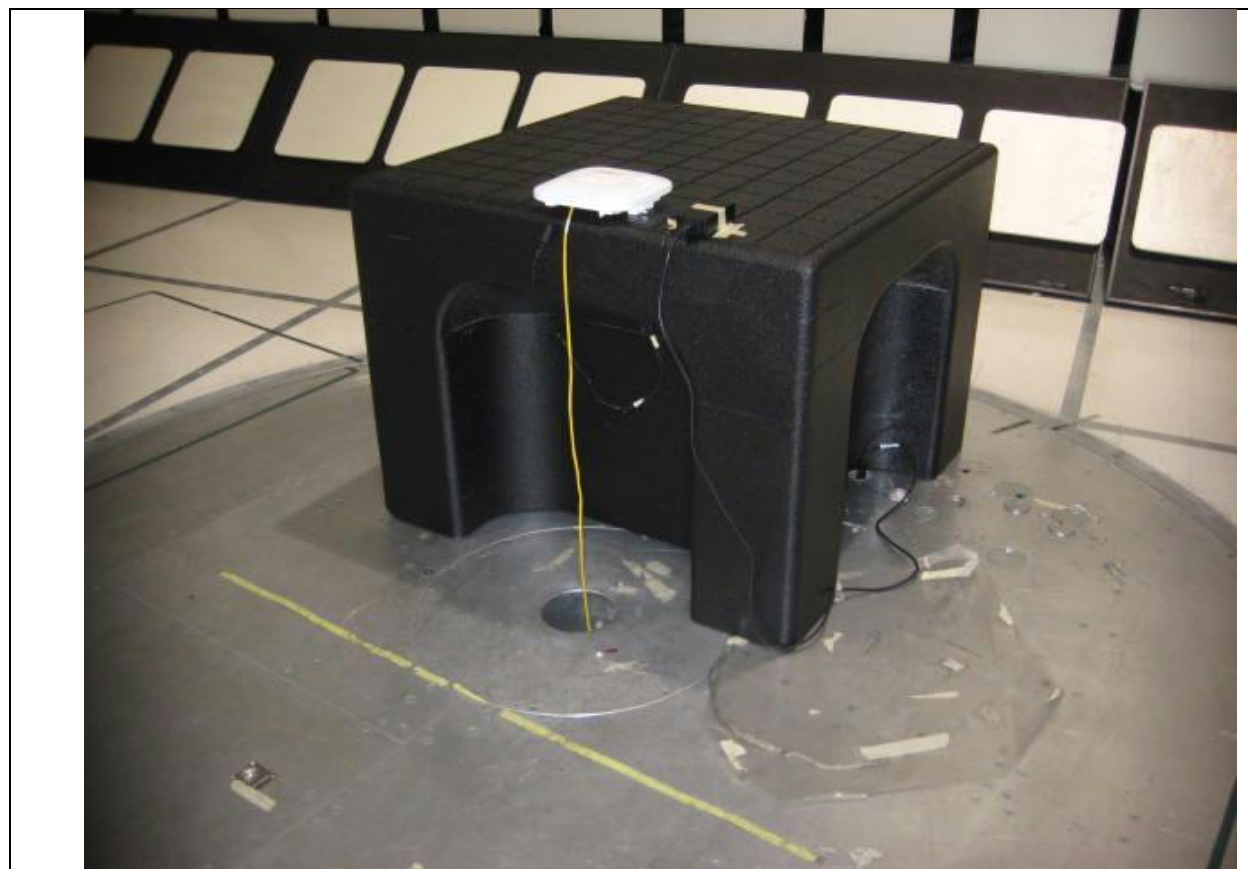




Radiated Emissions



Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
32.608	35	0.6	-8.8	26.9	Qp	V	215	292	30	-3.1	Pass	
38.719	38.6	0.7	-13.4	26	Qp	V	339	235	30	-4	Pass	
45.136	40.9	0.7	-17.9	23.7	Qp	V	361	22	30	-6.3	Pass	
62.01	42.3	0.9	-20.2	23	Qp	V	122	225	30	-7	Pass	
144.005	35.3	1.4	-14.6	22.1	Qp	V	182	20	30	-7.9	Pass	
171.795	35.7	1.5	-15.8	21.4	Qp	V	164	336	30	-8.6	Pass	
99.955	36.5	1.1	-17.5	20.2	Qp	V	129	116	30	-9.8	Pass	
480.013	32.5	2.6	-10.4	24.6	Qp	H	309	60	37	-12.4	Pass	



Title: Radiated Emissions Configuration Photograph

Maximum Permissible Exposure (MPE) Calculations

15.247: U-NII devices are subject to the radio frequency radiation exposure requirements specified in Sec. 1.1307(b), Sec. 2.1091 and Sec. 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

Given

$$E = \sqrt{(30 \cdot P \cdot G)/d} \quad \text{and} \quad S = E^2/3770$$

where

E=Field Strength in Volts/meter

P=Power in Watts

G=Numeric Antenna Gain

d=Distance in meters

S=Power Density in mW/cm²

Combine equations and rearrange the terms to express the distance as a function of the remaining variables:

$$d = \sqrt{((30 \cdot P \cdot G)/(3770 \cdot S))}$$

Changing to units of power in mW and distance in cm, using:

$$P(\text{mW}) = P(\text{W})/1000 \quad d(\text{cm}) = 100 \cdot d(\text{m})$$

yields

$$d = 100 \cdot \sqrt{((30 \cdot (P/1000) \cdot G)/(3770 \cdot S))}$$

$$d = 0.282 \cdot \sqrt{(P \cdot G/S)}$$

where

d=Distance in cm

P=Power in mW

G=Numeric Antenna Gain

S=Power Density in mW/cm²

Substituting the logarithmic form of power and gain using:

$$P(\text{mW}) = 10^{(P(\text{dBm})/10)} \quad G(\text{numeric}) = 10^{(G(\text{dBi})/10)}$$

yields

$$d = 0.282 \cdot 10^{((P+G)/20)} / \sqrt{S} \quad \text{Equation (1)}$$

and

$$S = ((0.282 \cdot 10^{((P+G)/20)})/d)^2 \quad \text{Equation (2)}$$

where

d=MPE distance in cm

P=Power in dBm

G=Antenna Gain in dBi

S=Power Density in mW/cm²

Equation (1) and the measured peak power are used to calculate the MPE distance. Note that for mobile or fixed location transmitters such as an access point, the minimum separation distance is 20 cm even if the calculations indicate that the MPE distance may be less.

$S=1\text{mW/cm}^2$ maximum. The highest supported antenna gain is 6 dBi (12dBi with beam forming). Using the peak power levels recorded in the test report along with Equation 1 above, the MPE distances are calculated as follows.

Frequency (MHz)	Bit Rate (Mbps)	Power Density (mW/cm ²)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	MPE Distance (cm)	Limit (cm)	Margin (cm)
5745	m0	1	23.0	10	12.60	20	7.40
5785	m0	1	23.0	10	12.60	20	7.40
5825	m0	1	23.0	10	12.60	20	7.40

MPE Calculations

To maintain compliance, installations will assure a separation distance of at least 20cm.

Using Equation 2, the MPE levels (s) at 20 cm are calculated as follows:

Frequency (MHz)	Bit Rate (Mbps)	MPE Distance (cm)	Peak Transmit Power (dBm)	Antenna Gain (dBi)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Margin (mW/cm ²)
5745	11	20	23.0	10	0.40	1	0.60
5785	11	20	23.0	10	0.40	1	0.60
5825	11	20	23.0	10	0.40	1	0.60

**Appendix C: Test Equipment/Software Used to perform the test**

Equip #	Manufacturer	Model	Description	Last Cal	Next Due
CIS004882	EMC Test Systems	3115	Double Ridged Guide Horn Antenna	26-May-12	26-May-13
CIS005691	Miteq	NSP1800-25-S1	Broadband Preamplifier	31-Jan-12	31-Jan-13
COM000210	TTE	H785-150K-50-21378	Hi Pass Filter - 150KHz cutoff	17-Aug-12	17-Aug-13
COM000213	Fischer	FCC-LISN-50-50-2M	Turntable LISN (150KHz-30MHz)	5-Mar-12	5-Mar-13
CIS021117	Micro-Coax	UFB311A-0-2484-520520	RF Coaxial Cable, to 18GHz, 248.4 in	24-Aug-12	24-Aug-13
CIS030564	Micro-Coax	UFB311A-1-0950-504504	RF Coaxial Cable, to 18GHz, 95 in	24-Aug-12	24-Aug-13
COM000233	Sunol Sciences	JB1	Combination Antenna, 30MHz-2GHz	13-Jul-12	13-Jul-13
COM000239	Rohde & Schwarz	ESI40	EMI Test Receiver	21-Jun-12	21-Jun-13
COM000443	Sonoma Instrument	310N	Amplifier 9kHz-1GHz	8-Apr-12	8-Apr-13
CIS034972	Midwest Microwave	ATT-0640-20-29M-02	Attenuator, 20dB	17-May-12	16-May-13
CIS043116	Huber + Suhner	Sucoflex 104PE	N & SMA RF cable	14-Dec-12	14-Dec-13
CIS040603	Agilent	E4440A	Spectrum Analyzer	5-Aug-12	5-Aug-13
CIS040053	Agilent	E4448A	Spectrum Analyzer	29-Apr-12	28-Apr-13