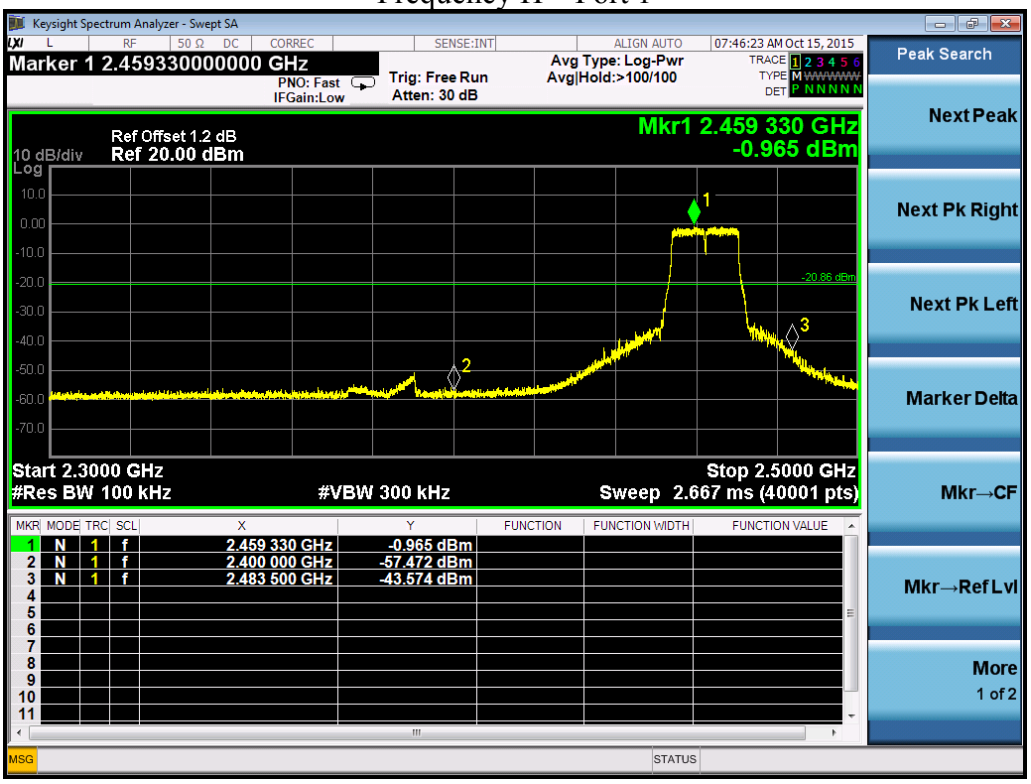
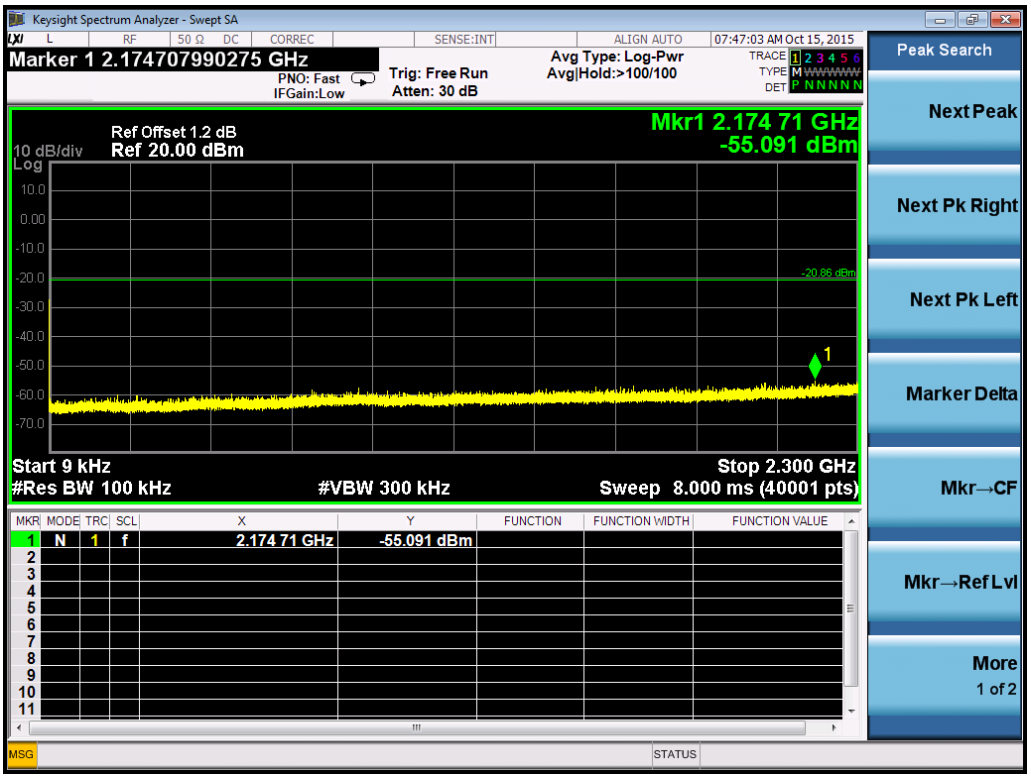
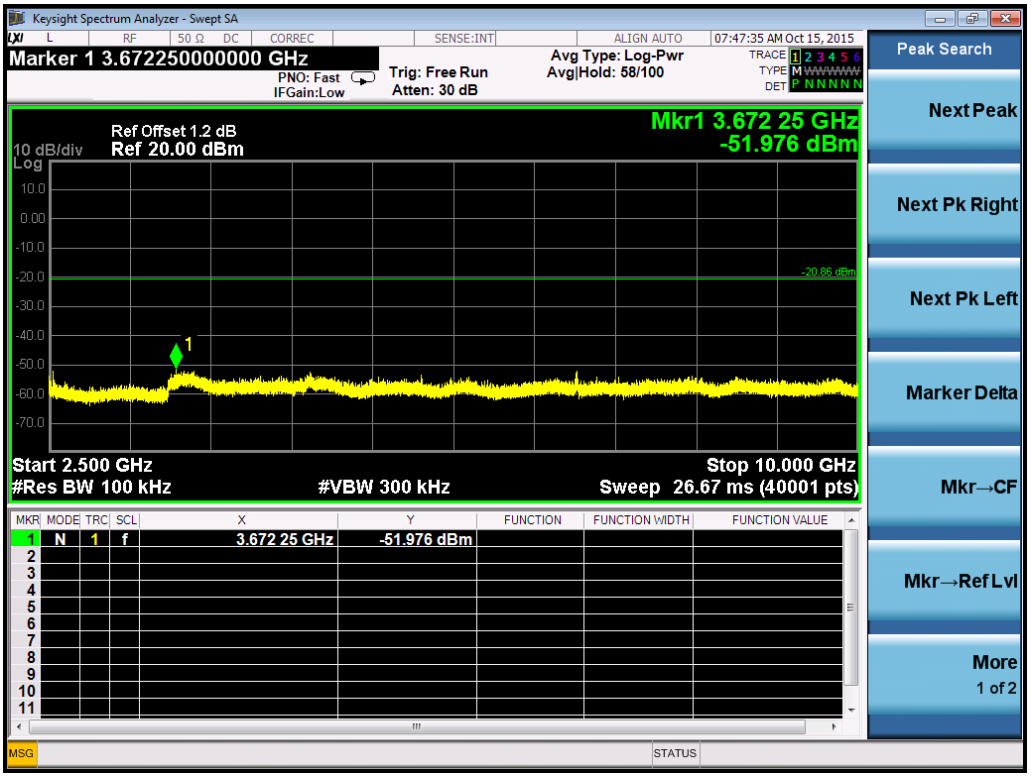
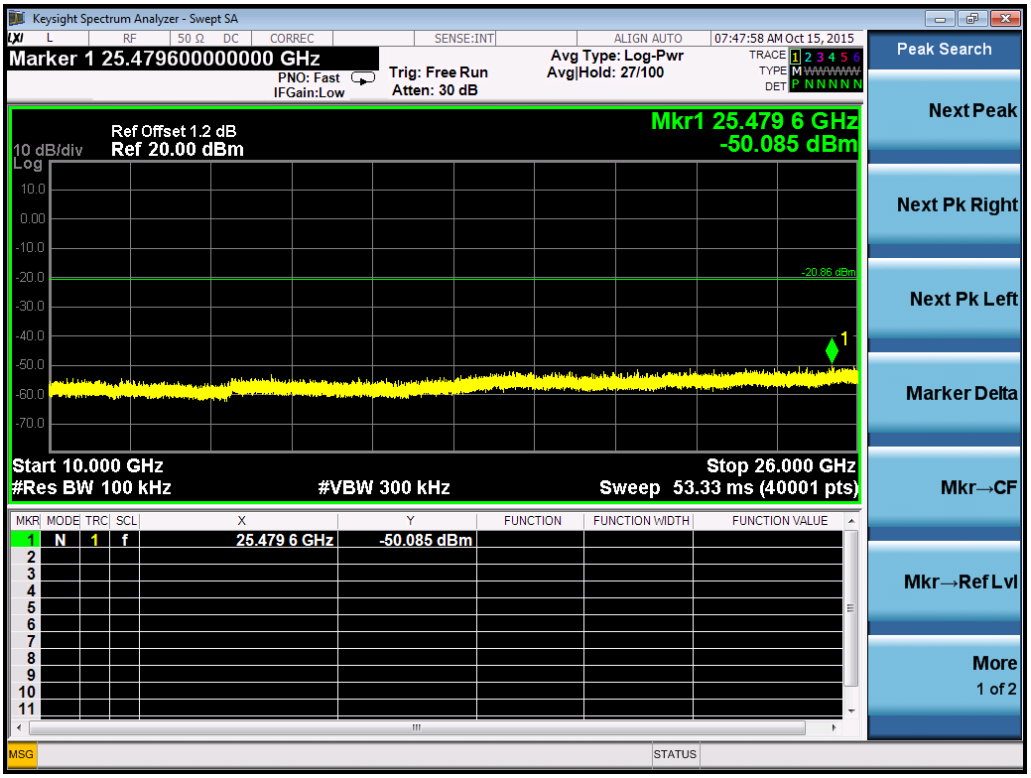
Frequency H – Port 1

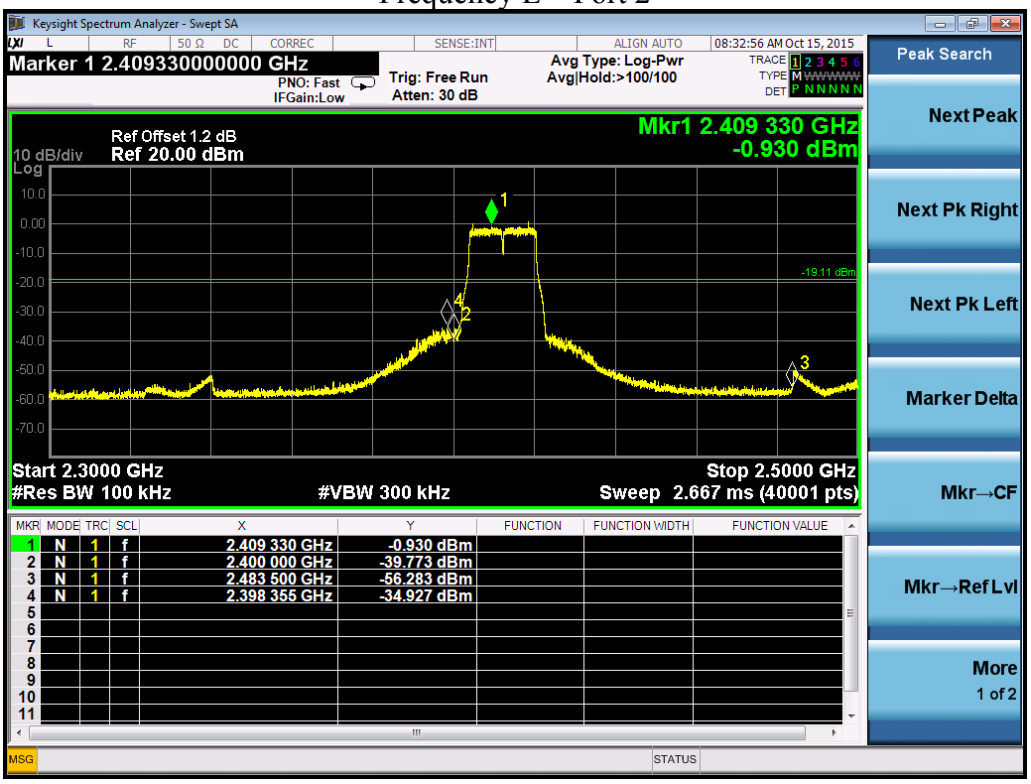


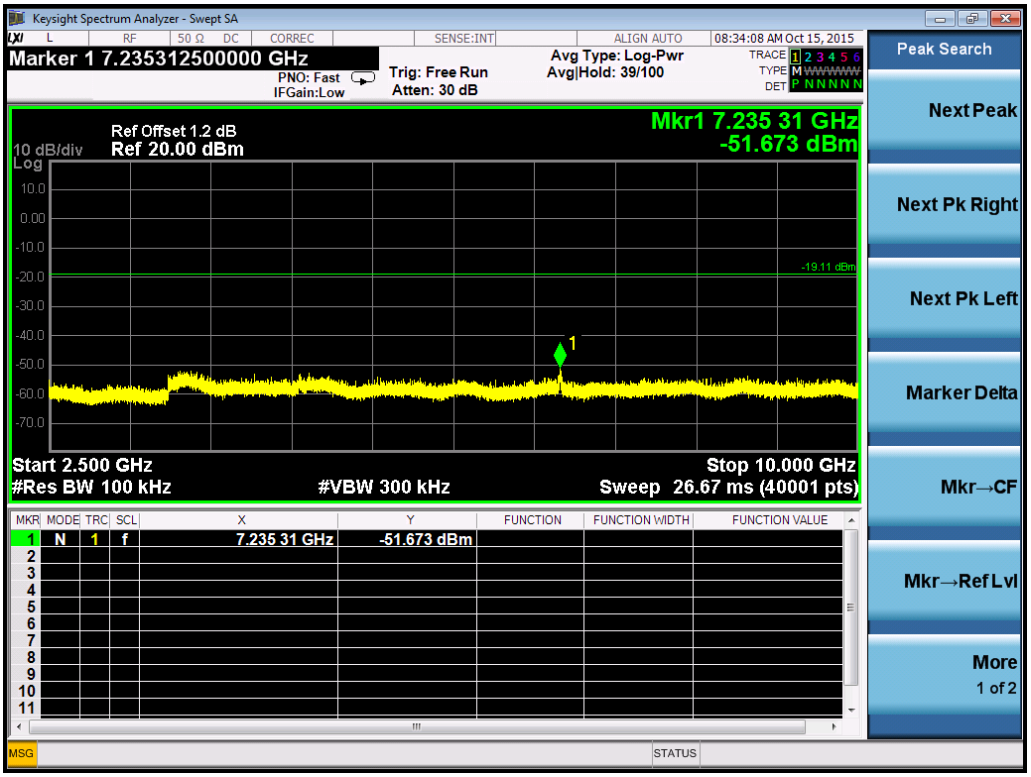


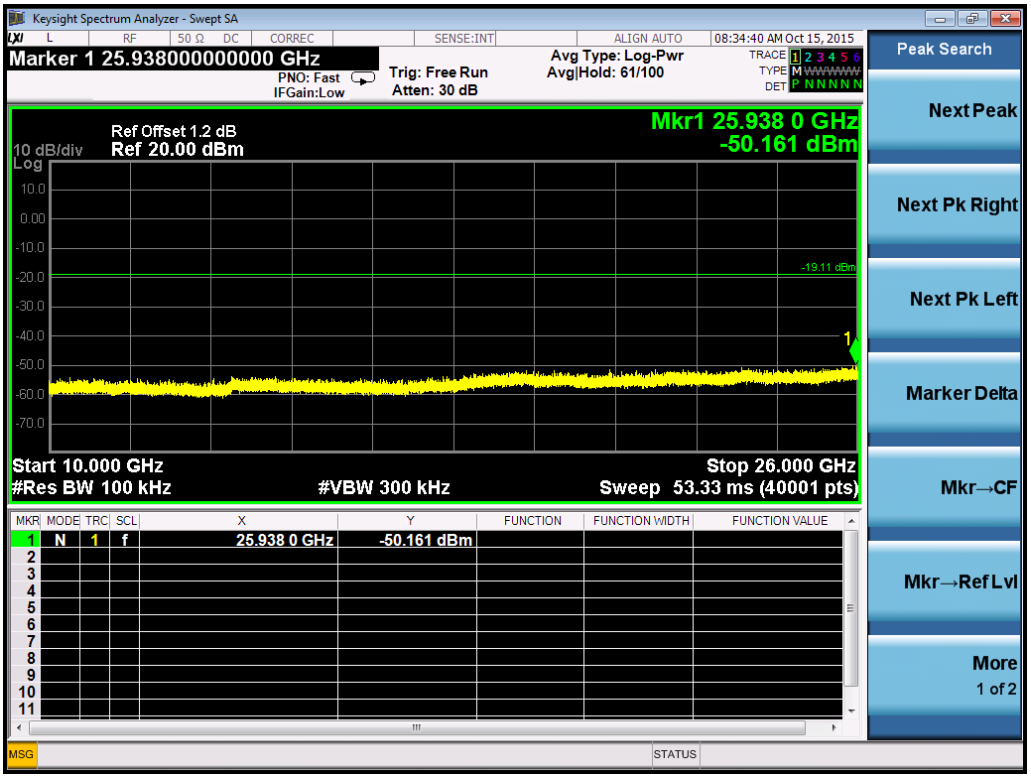




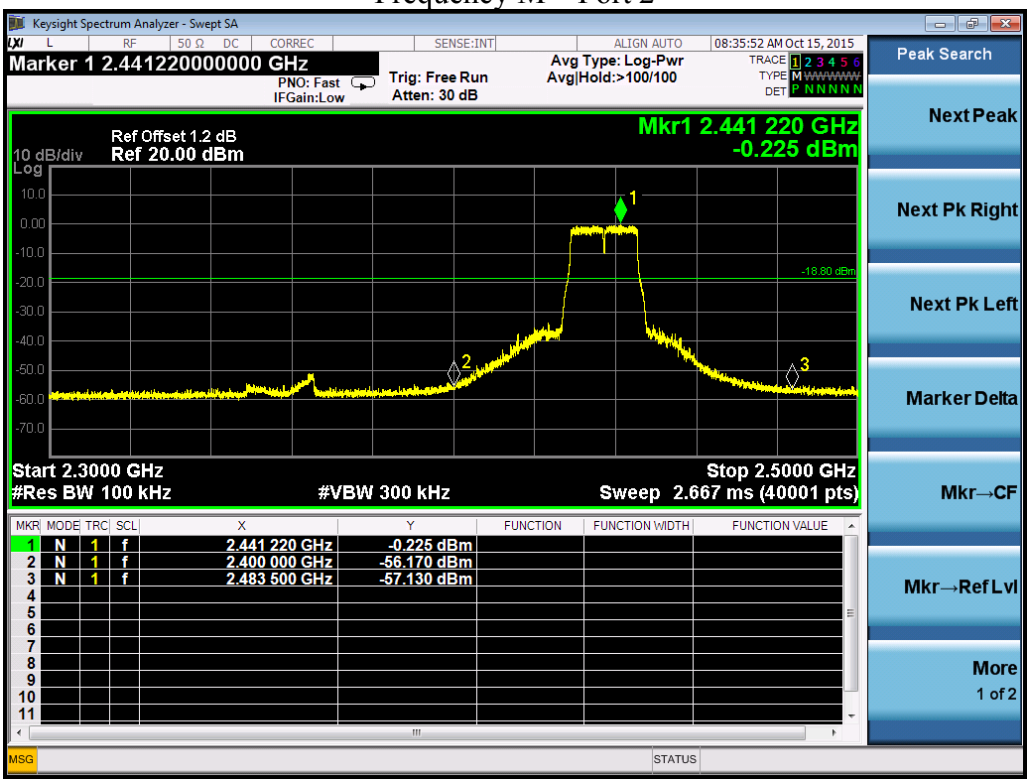
Frequency L – Port 2

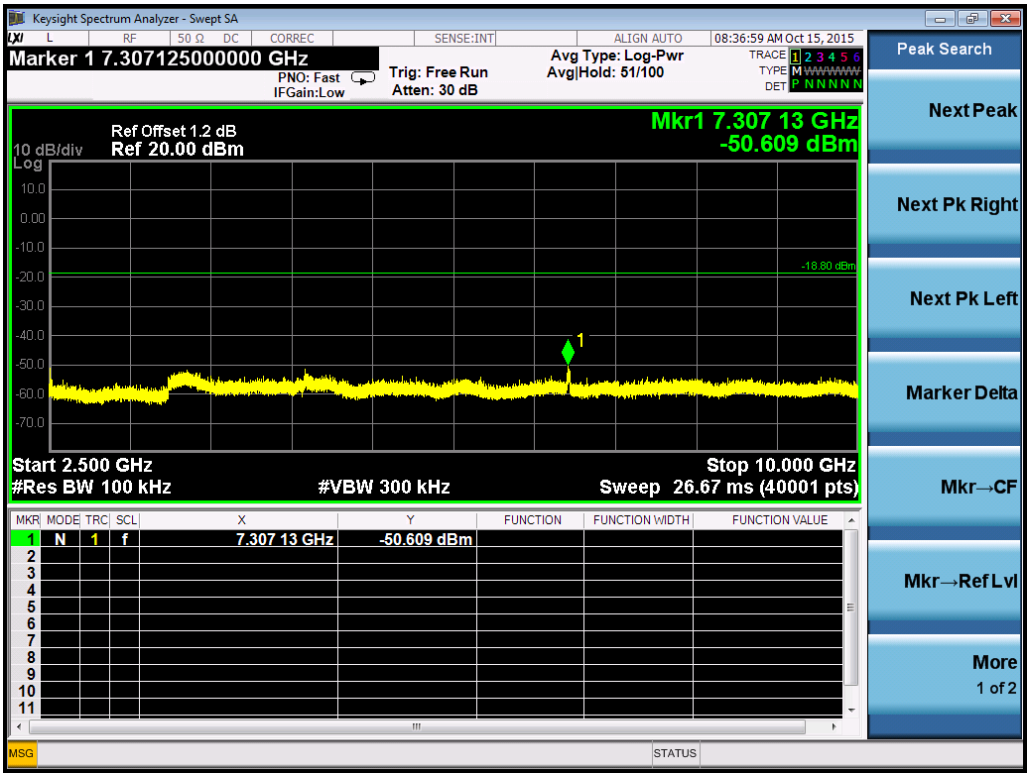


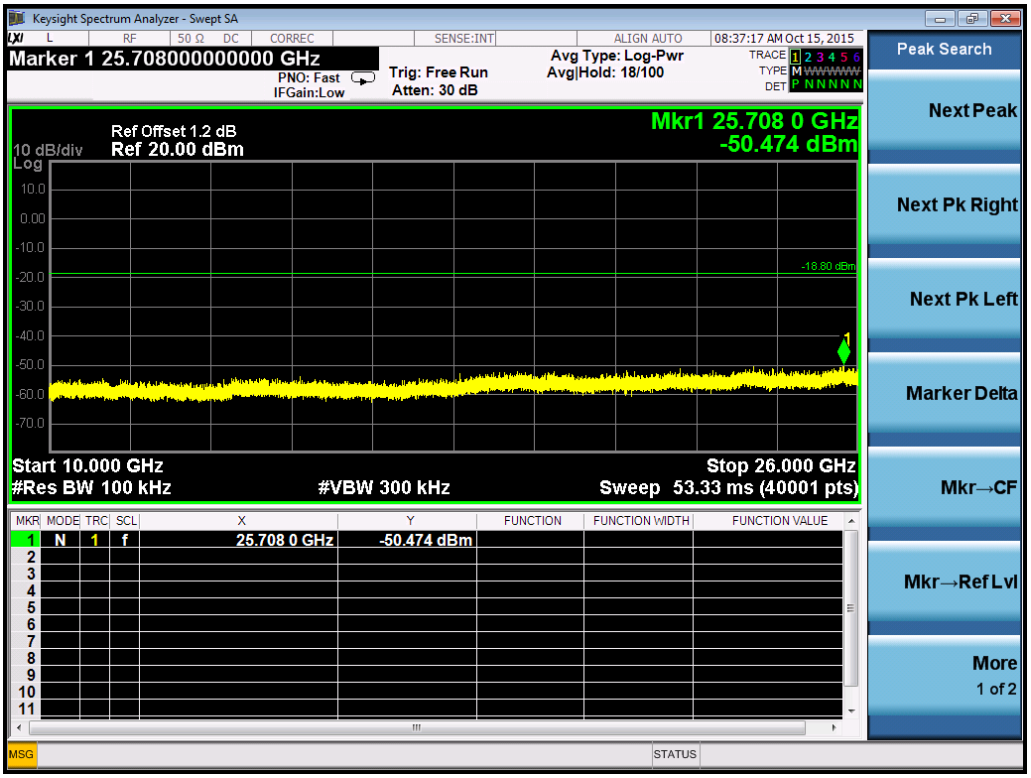




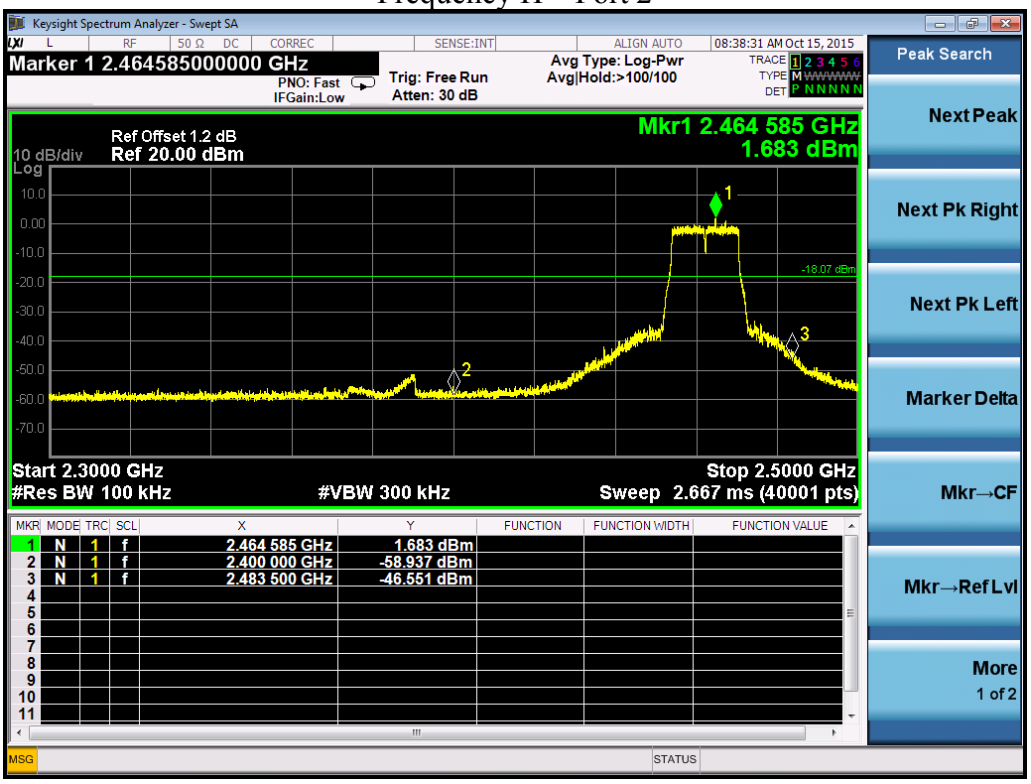
Frequency M – Port 2

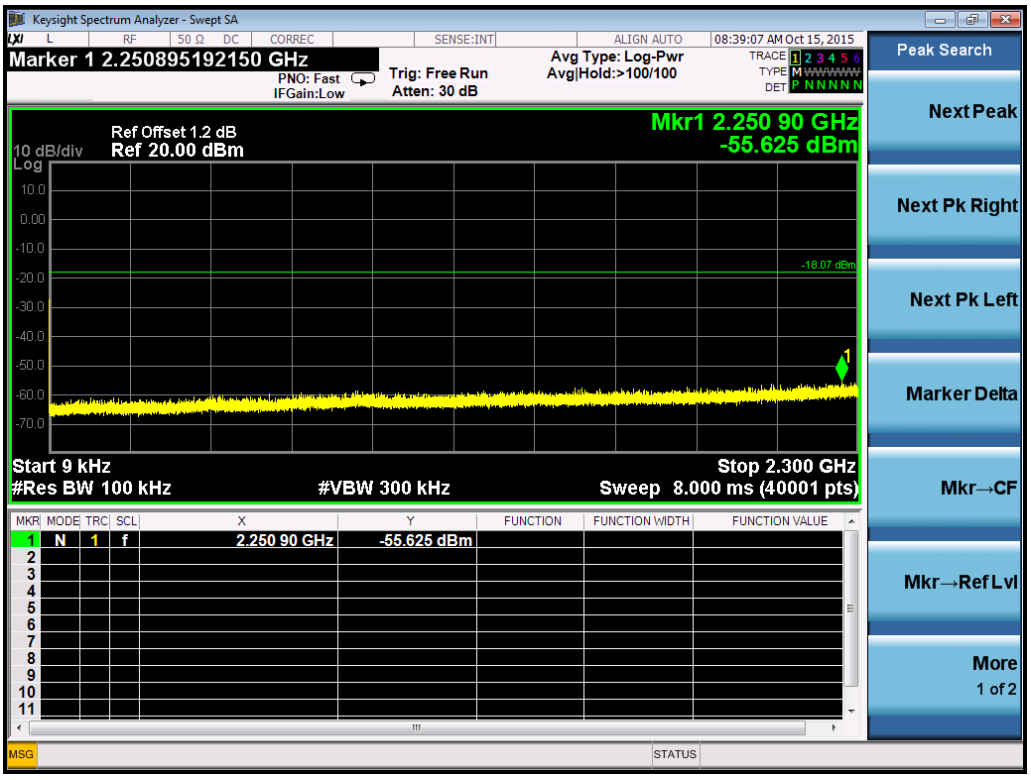


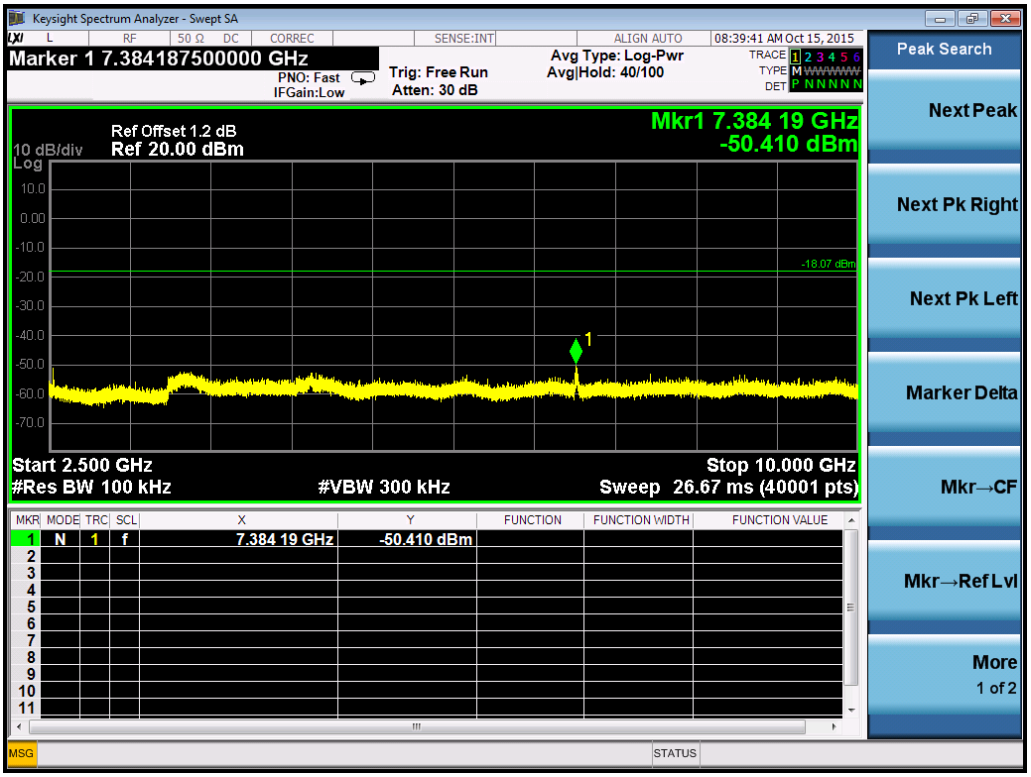


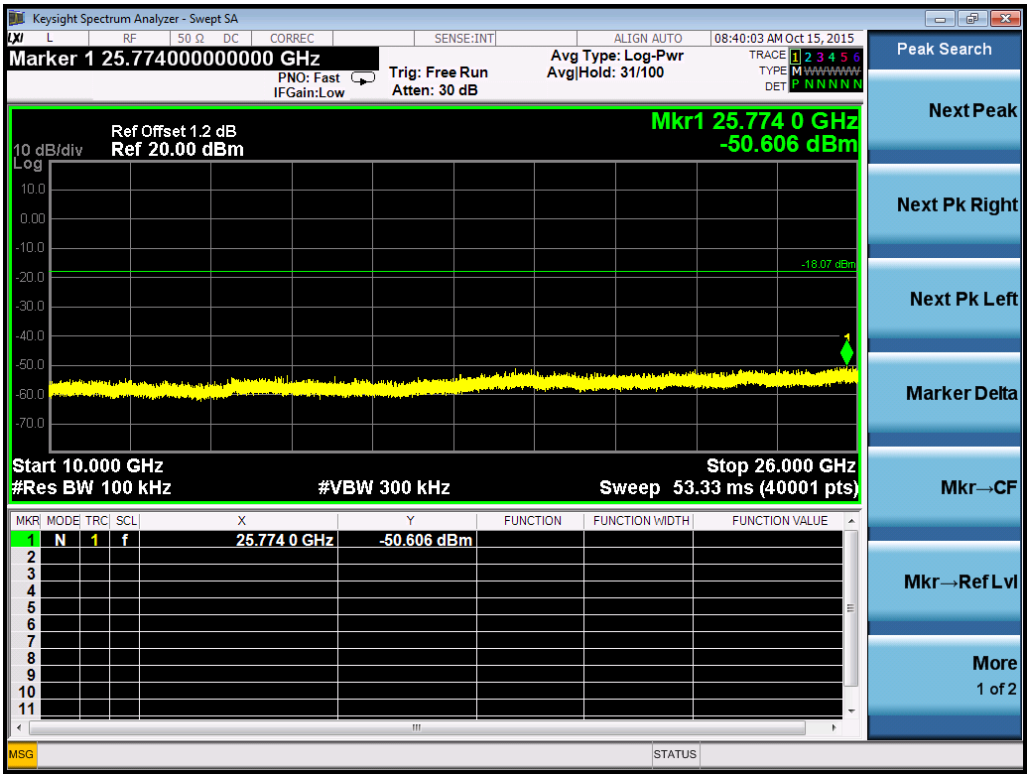


Frequency H – Port 2



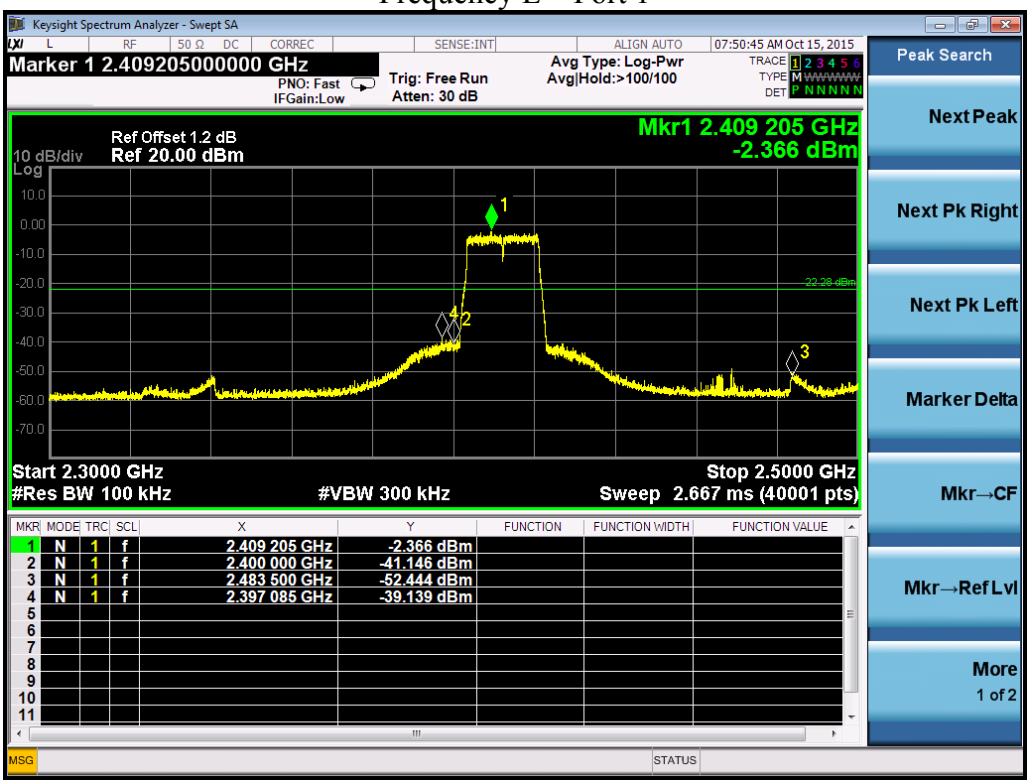


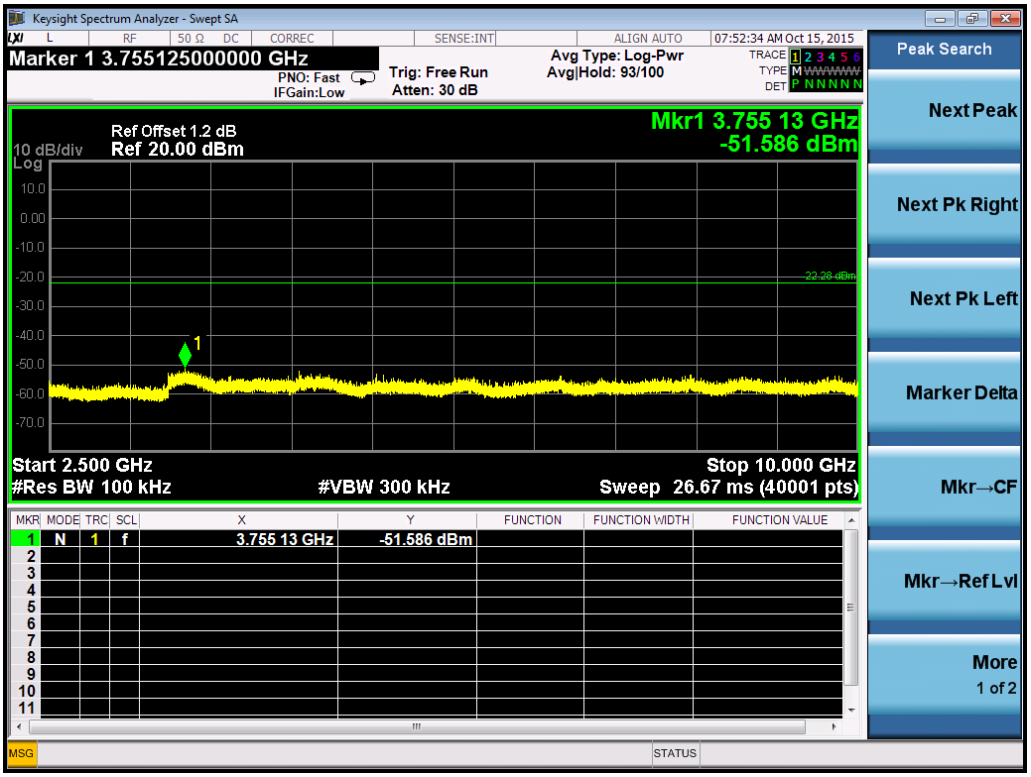


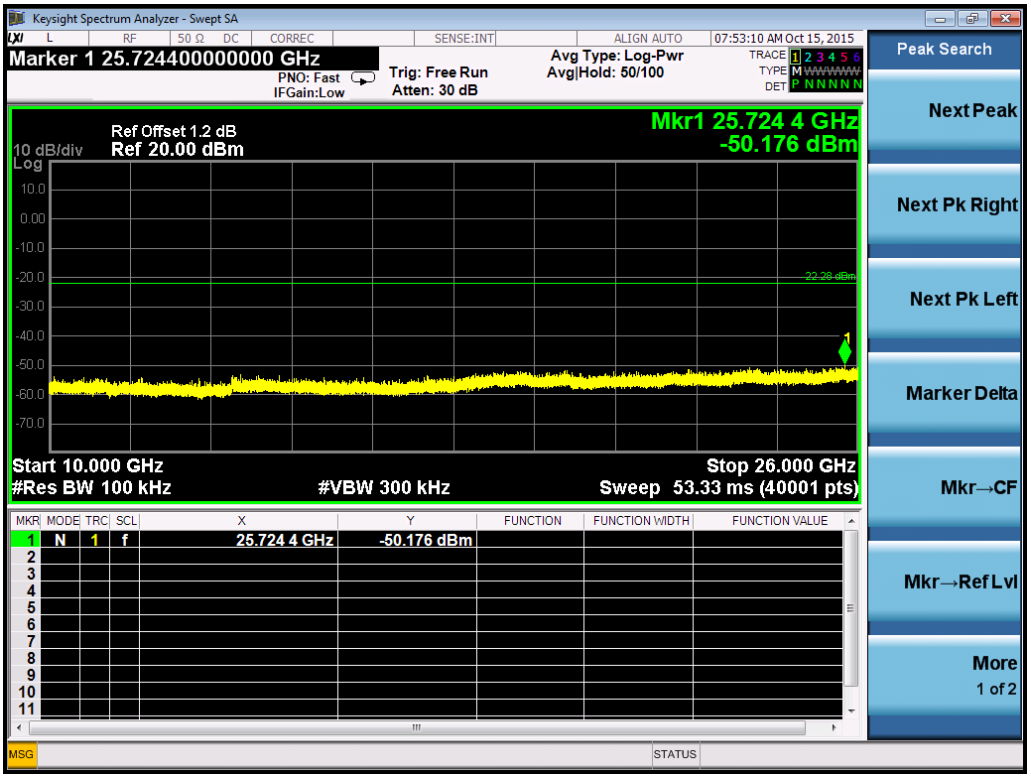


802.11n (HT20)

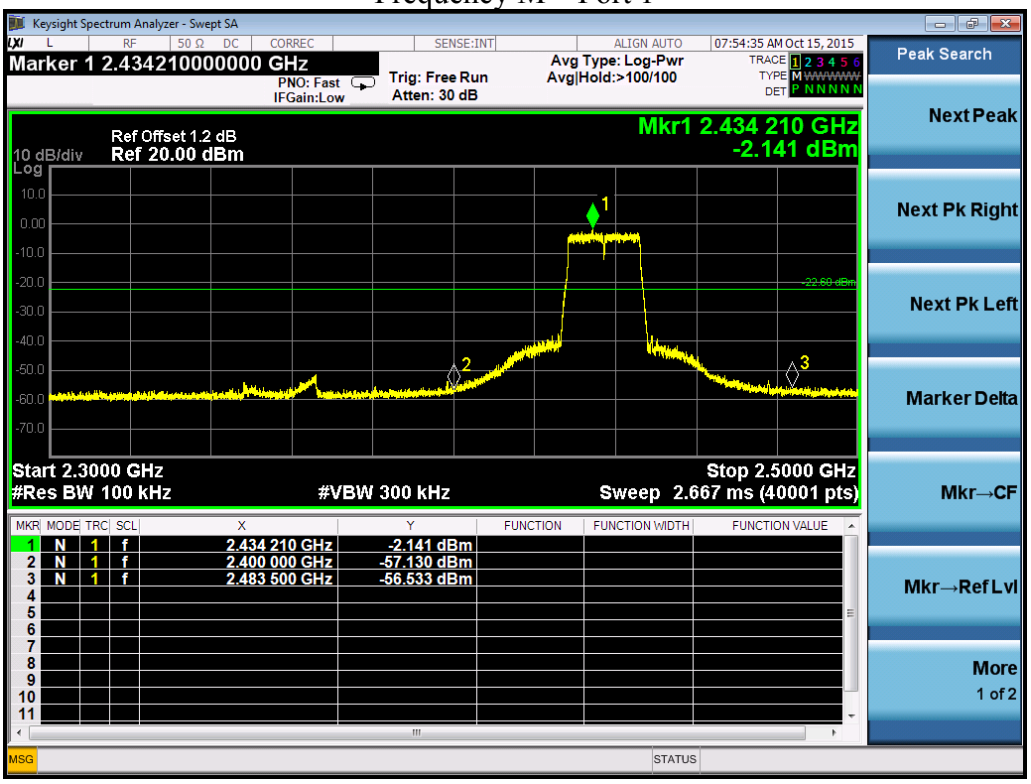
Frequency L – Port 1

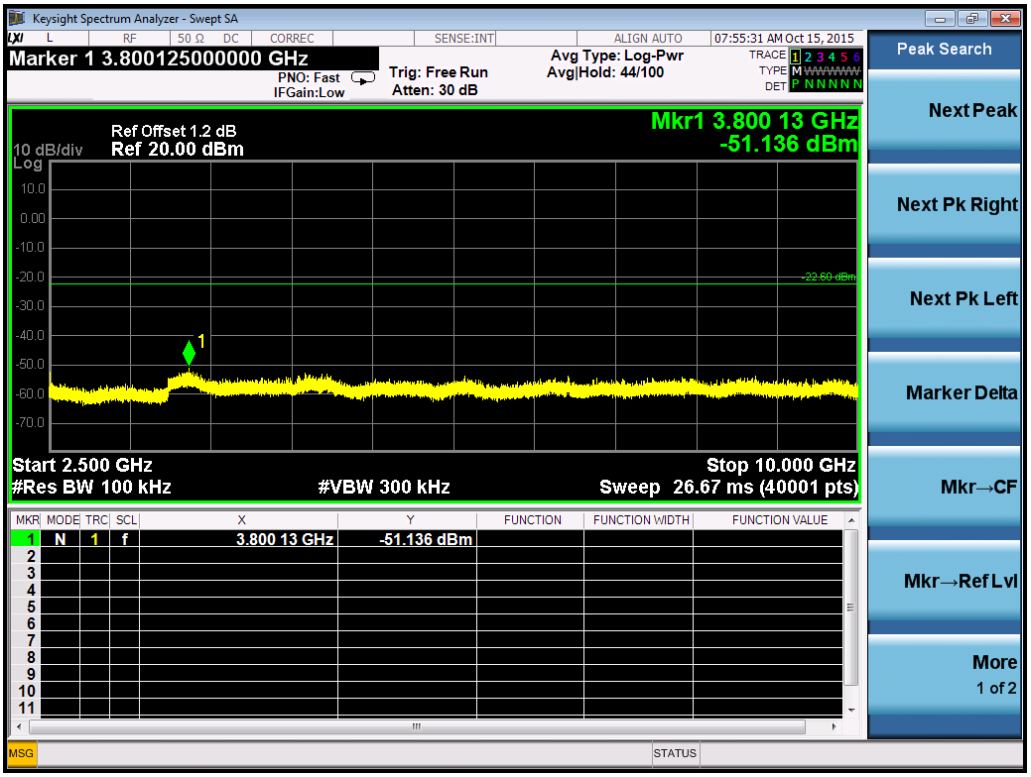


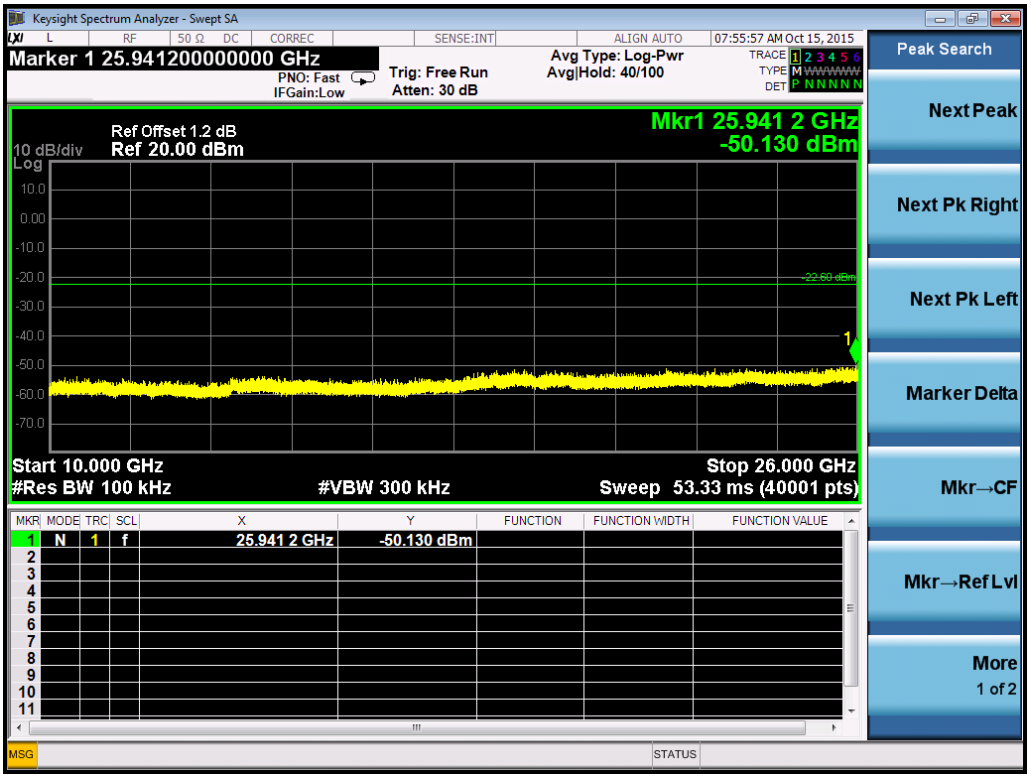




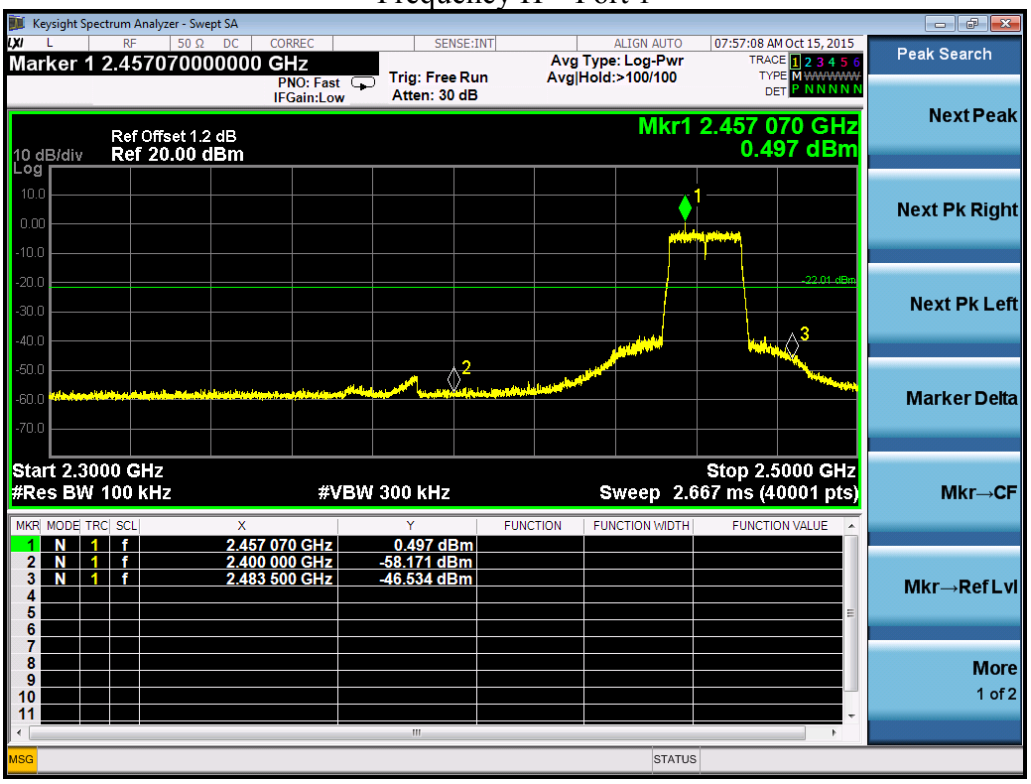
Frequency M – Port 1

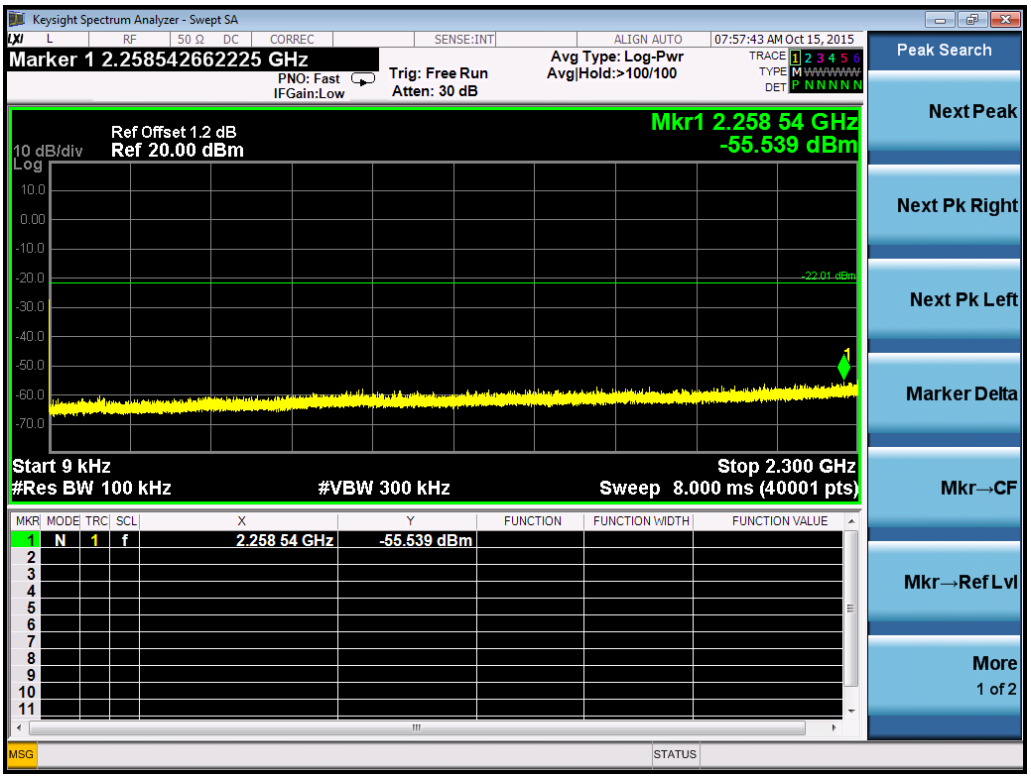


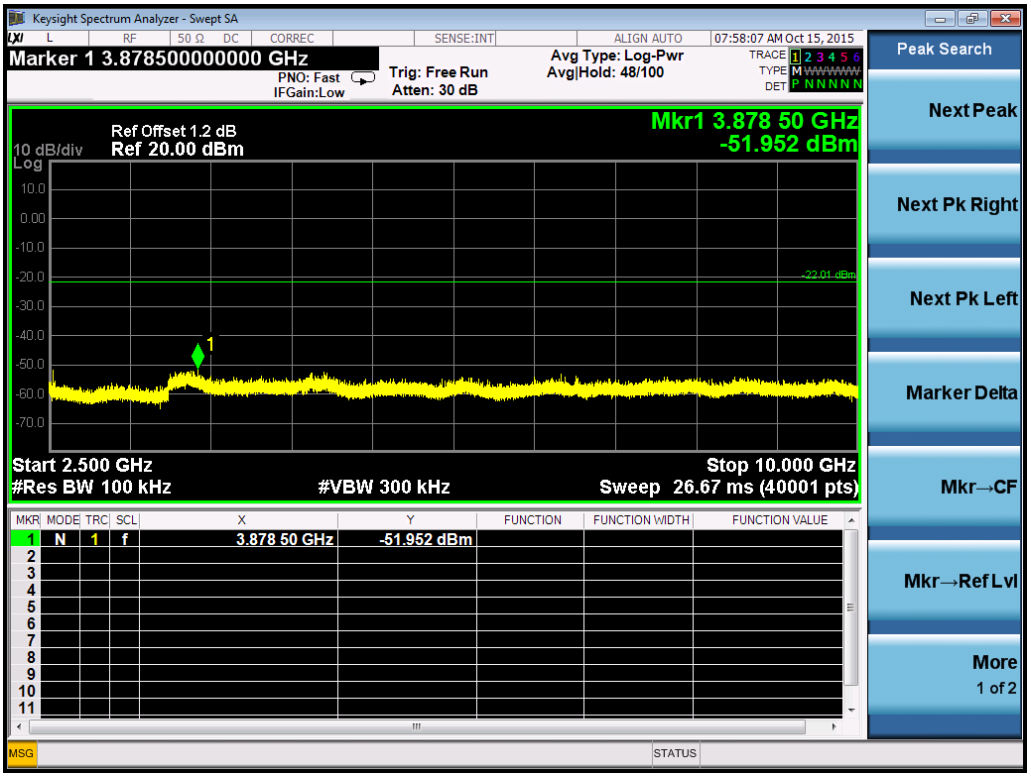


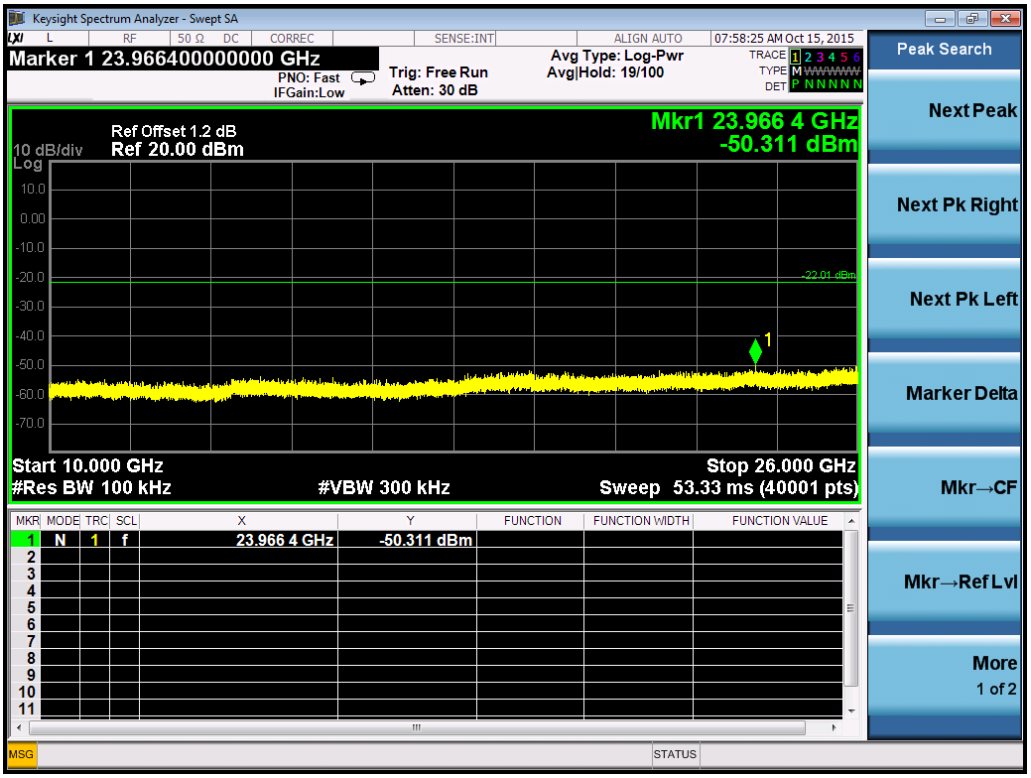


Frequency H – Port 1

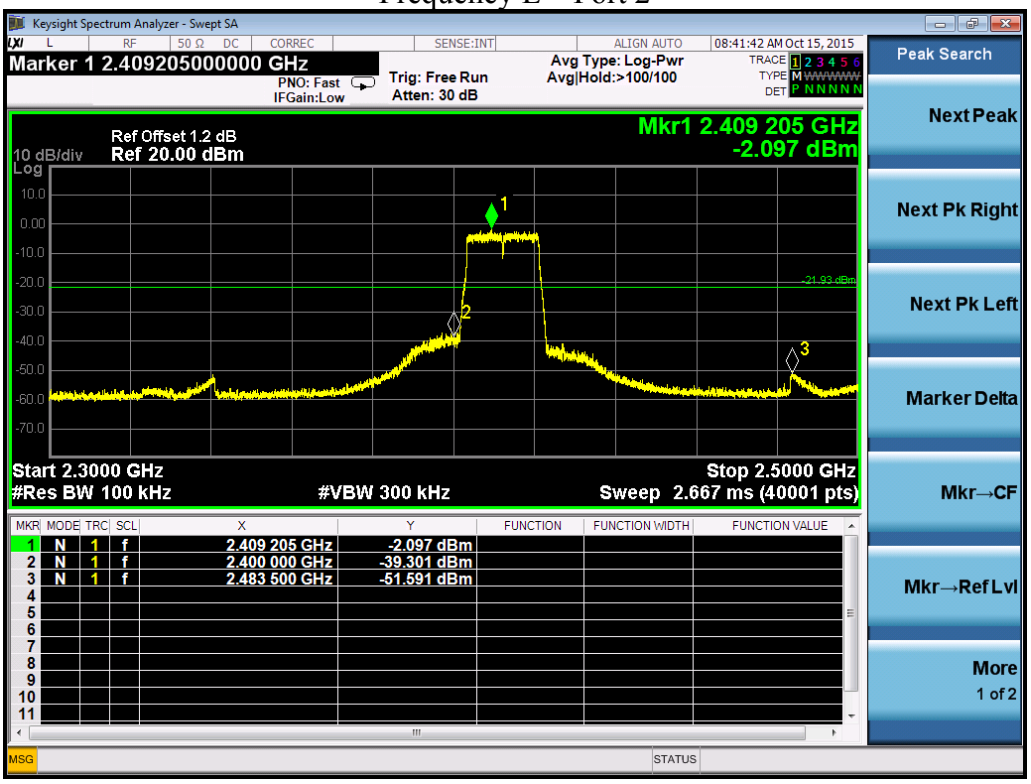


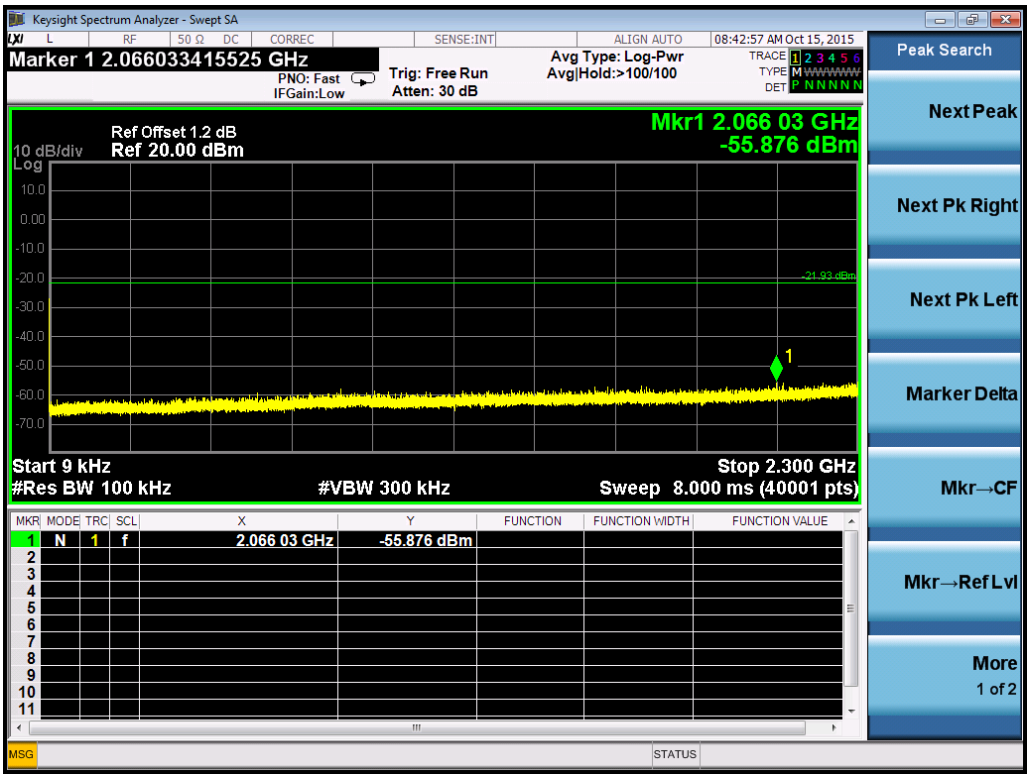


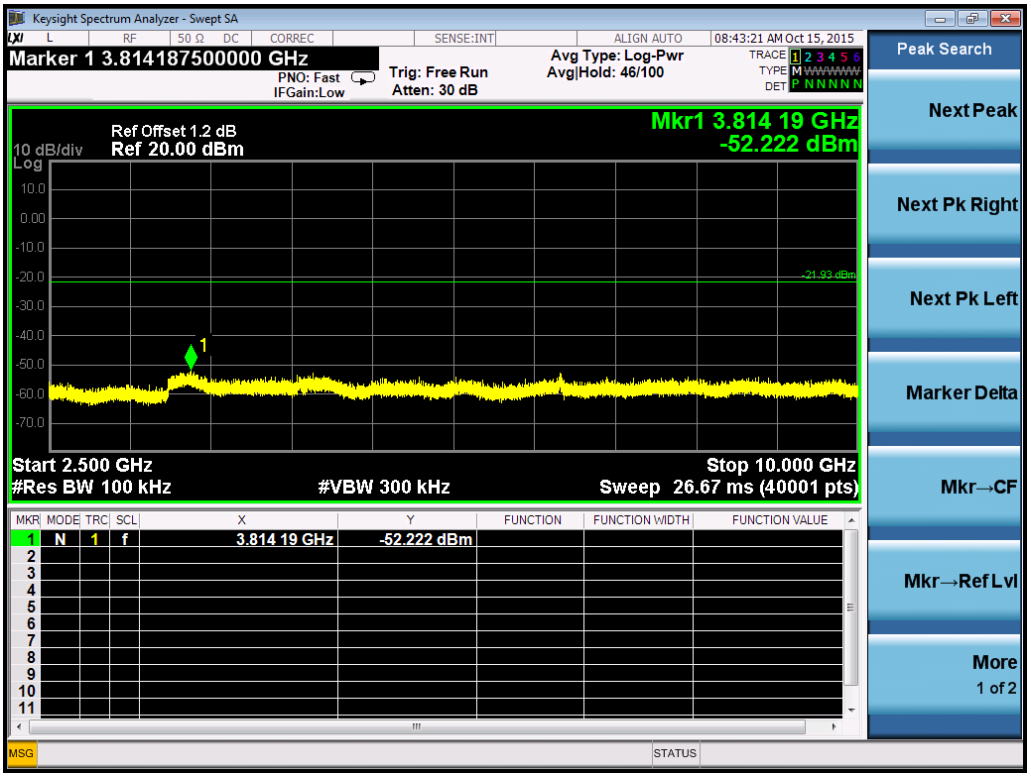


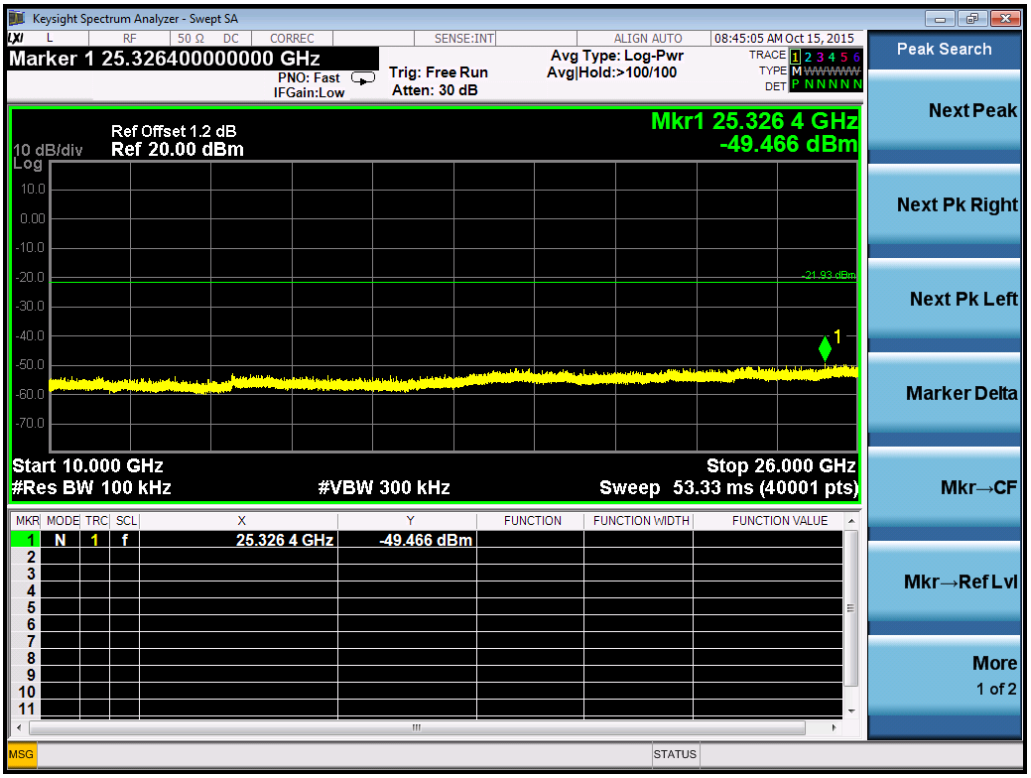


Frequency L – Port 2

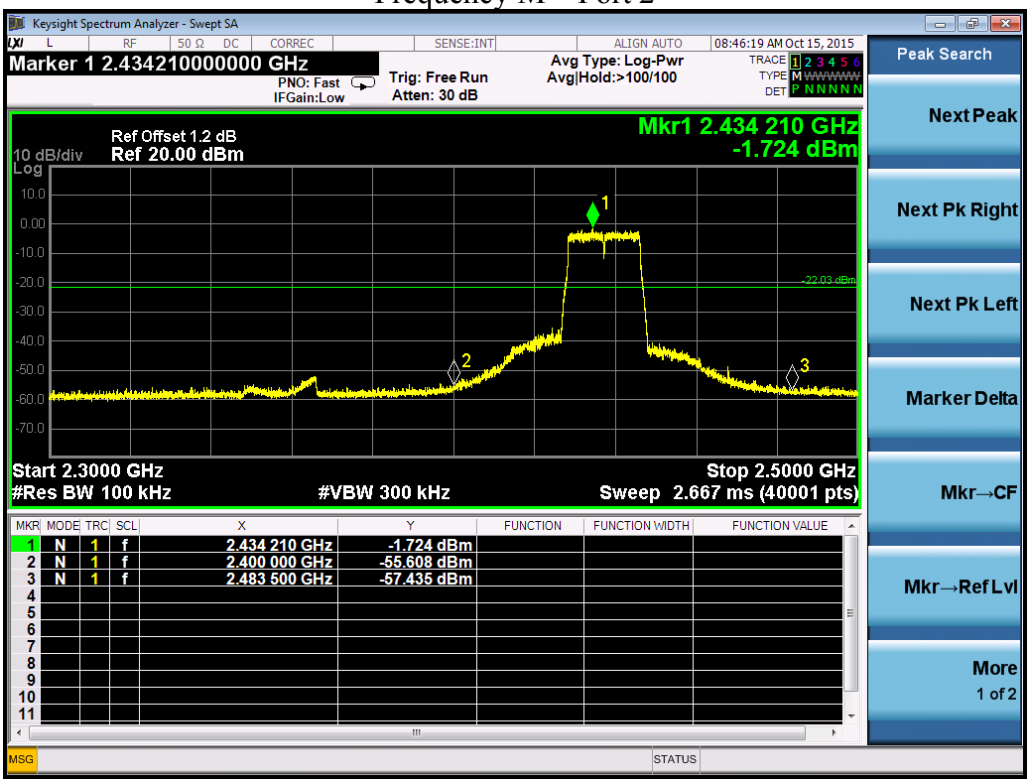


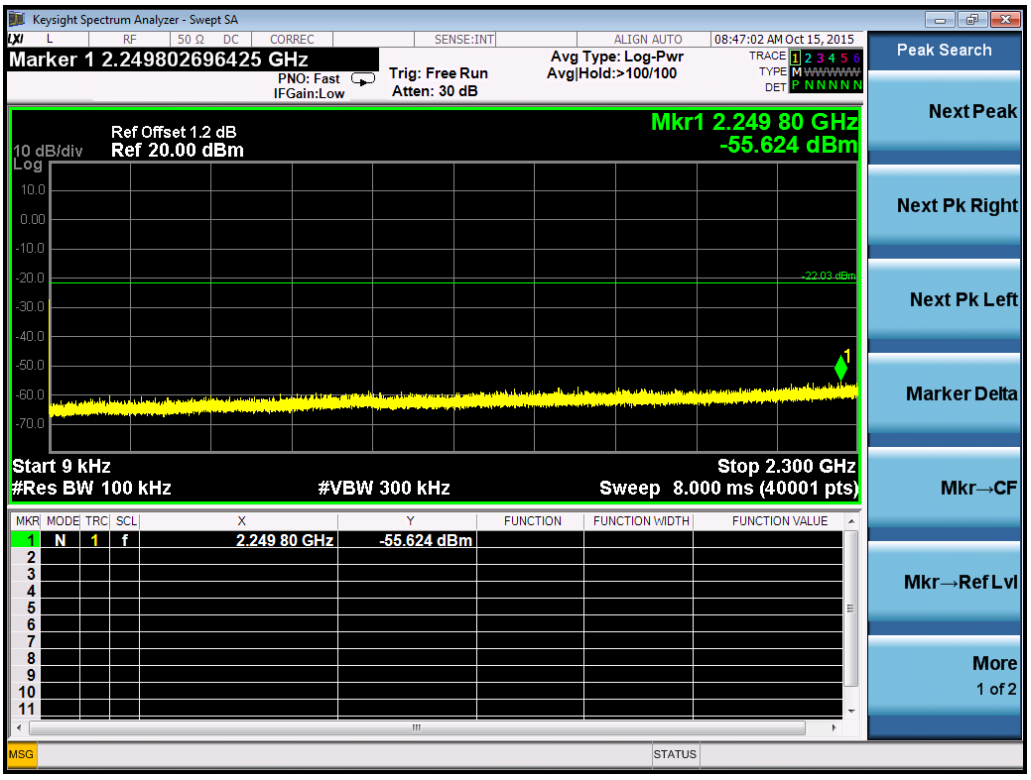


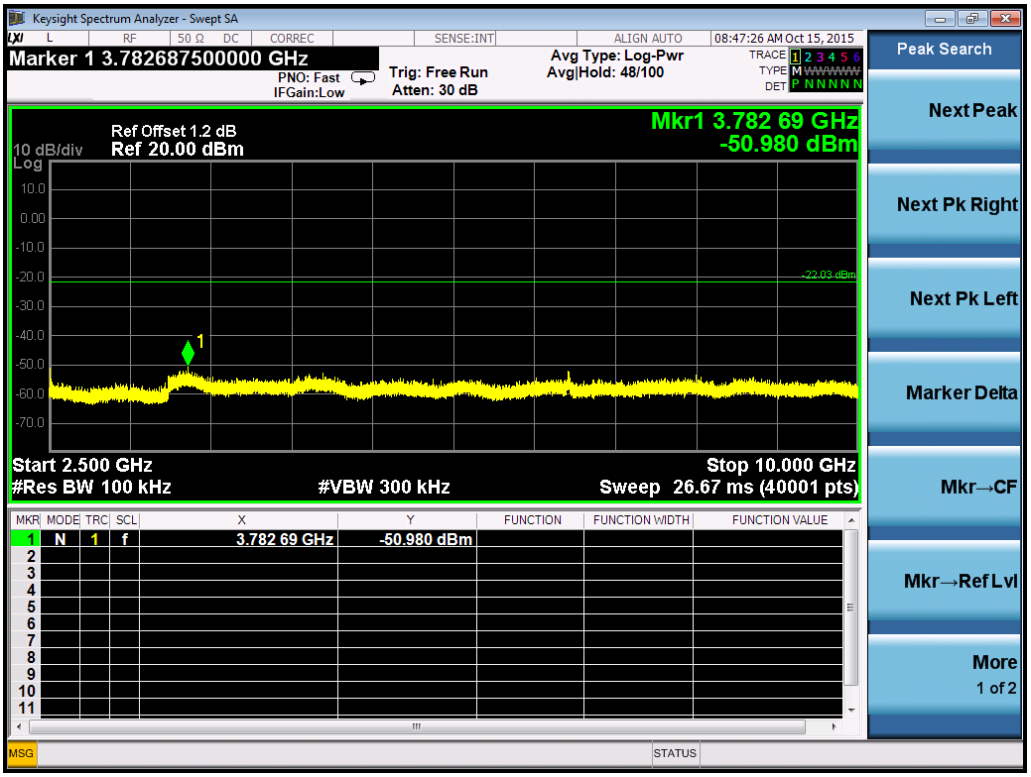


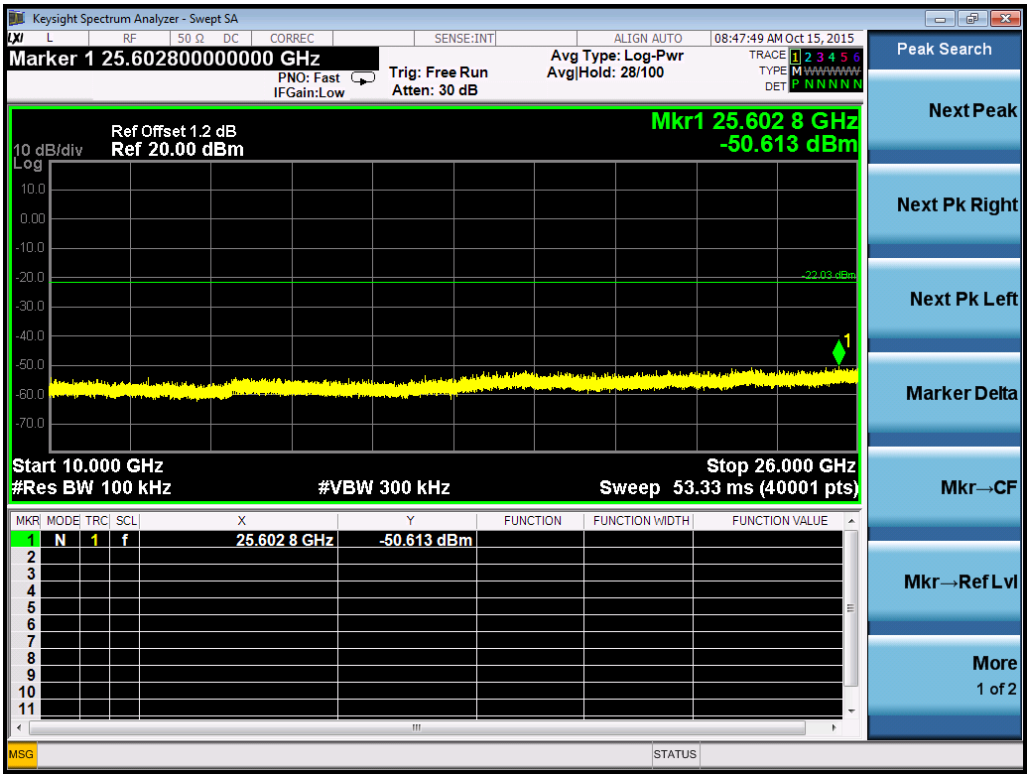


Frequency M – Port 2

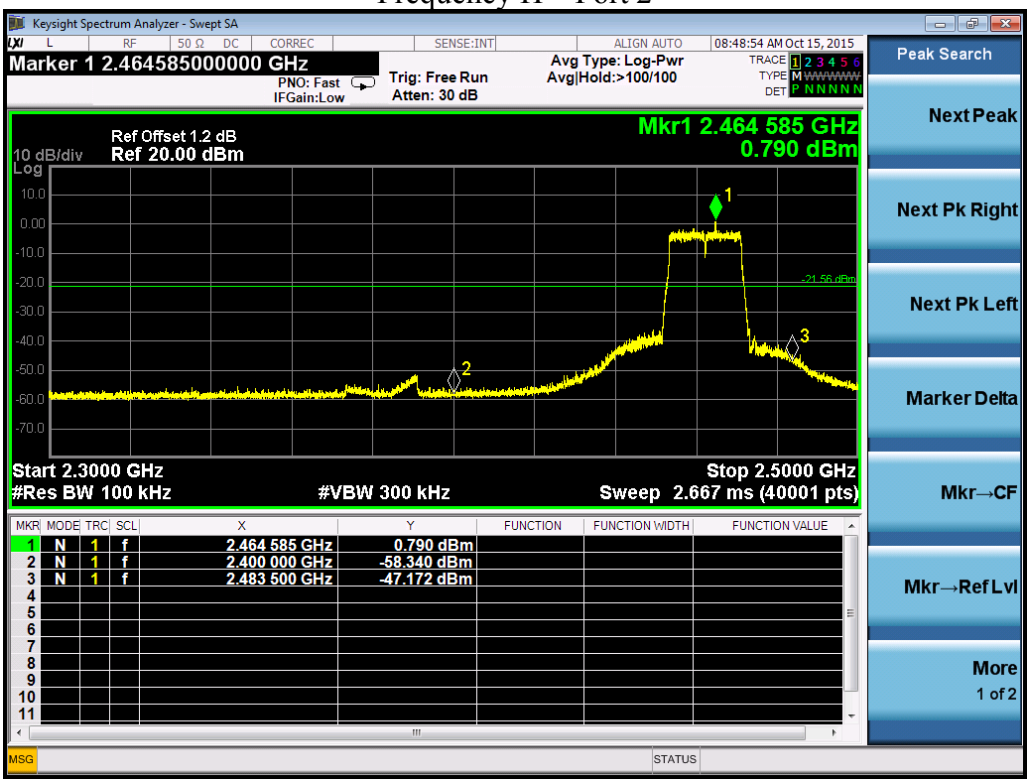


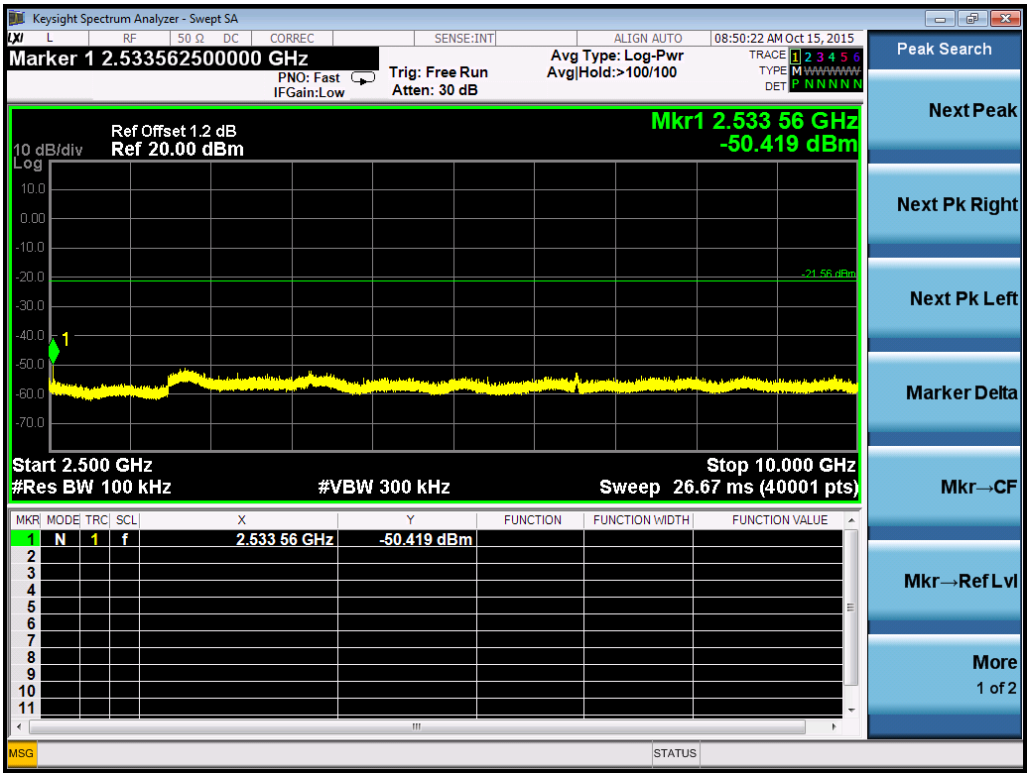


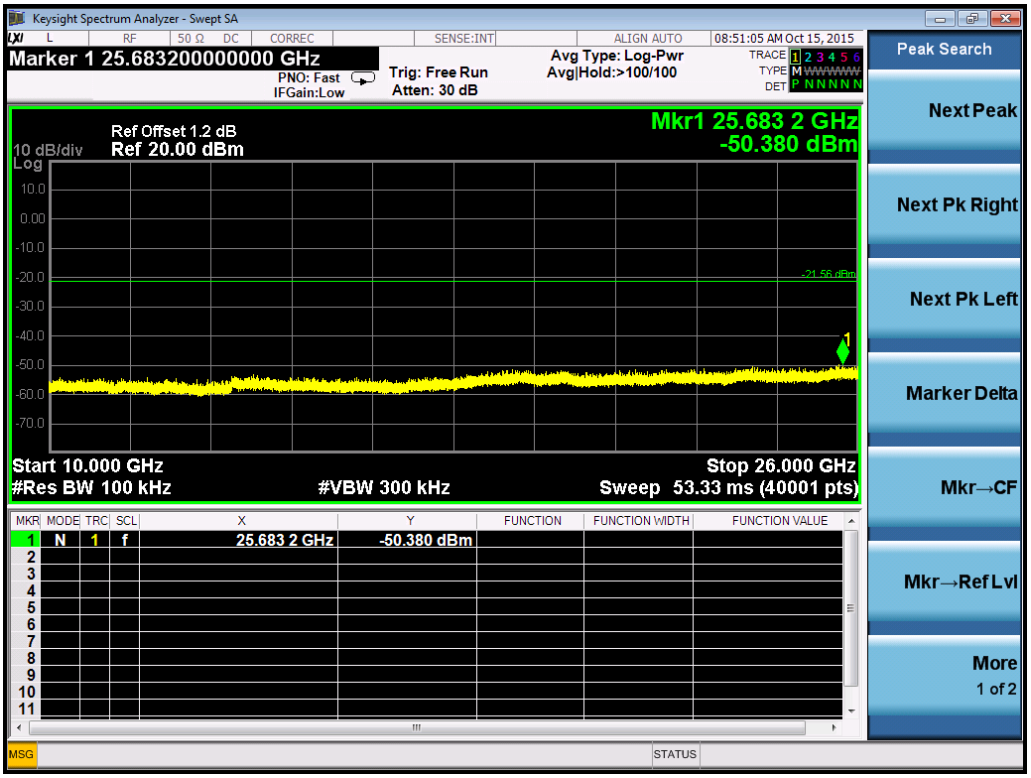




Frequency H – Port 2

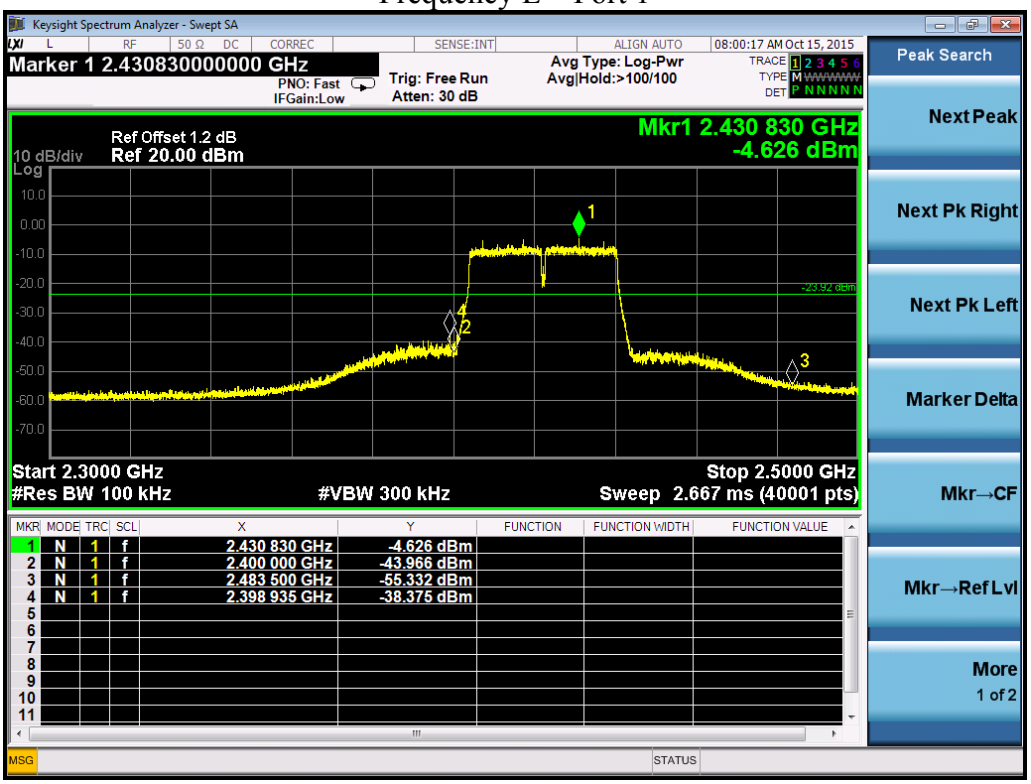


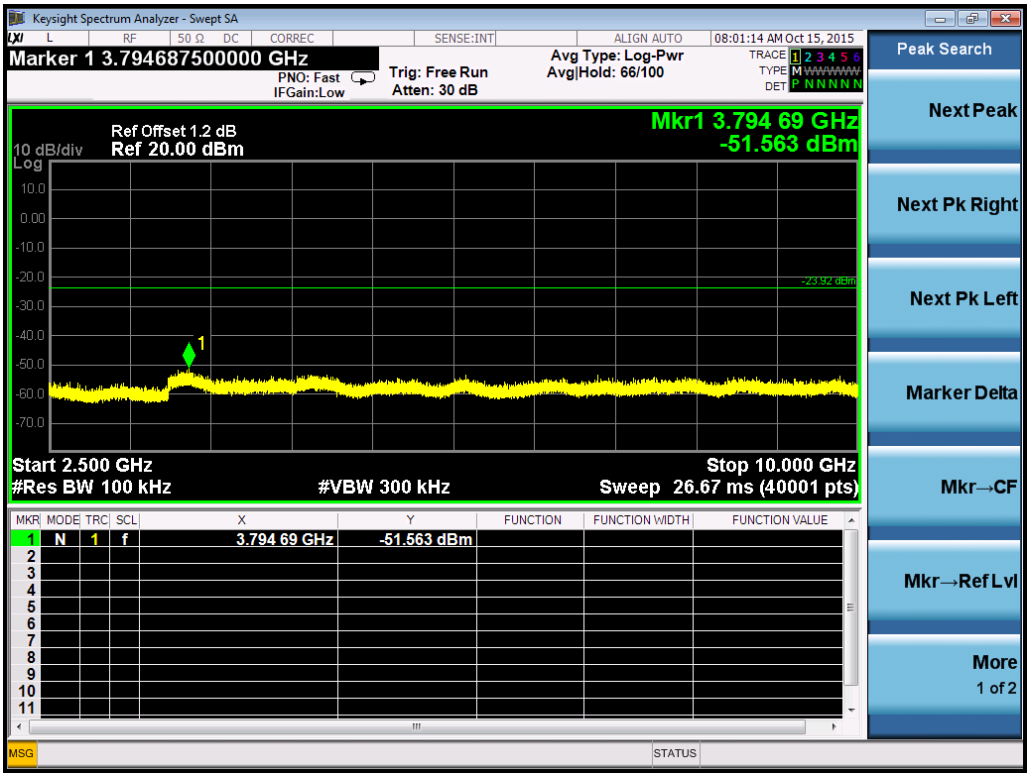


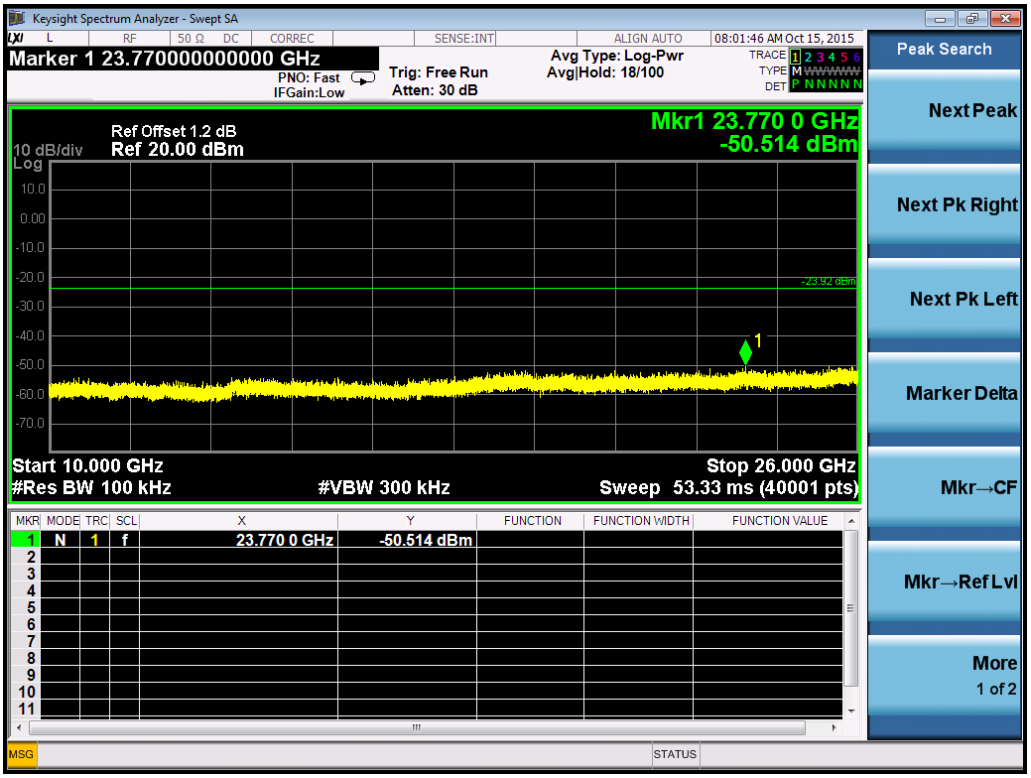


802.11n (HT40)

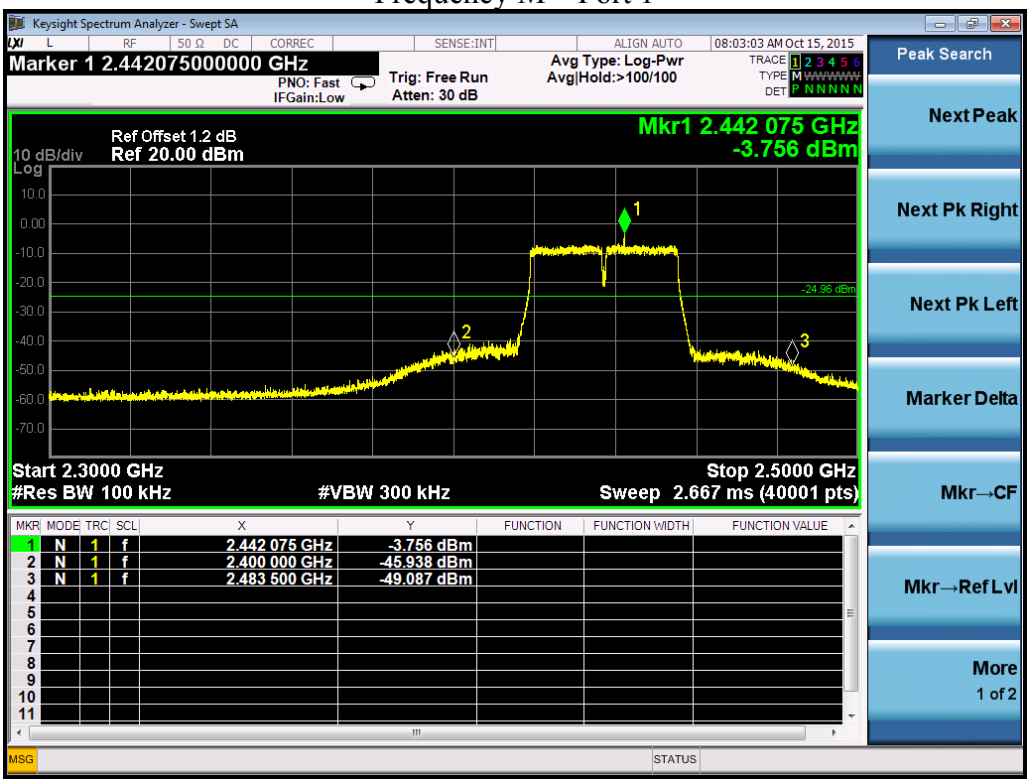
Frequency L – Port 1

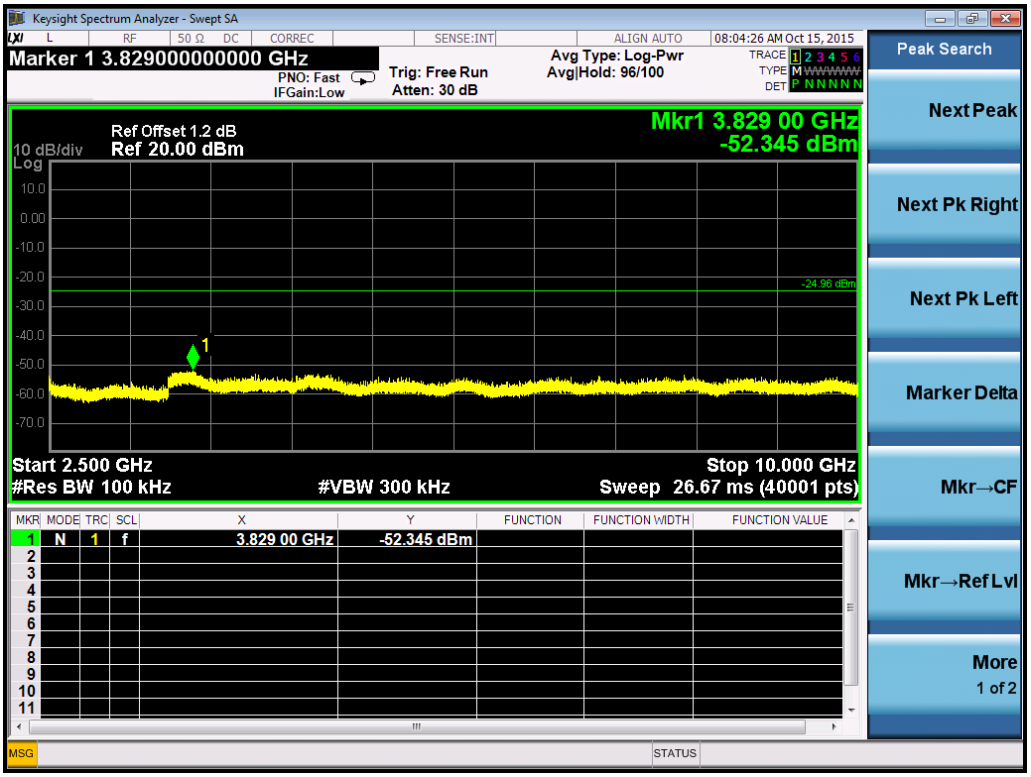


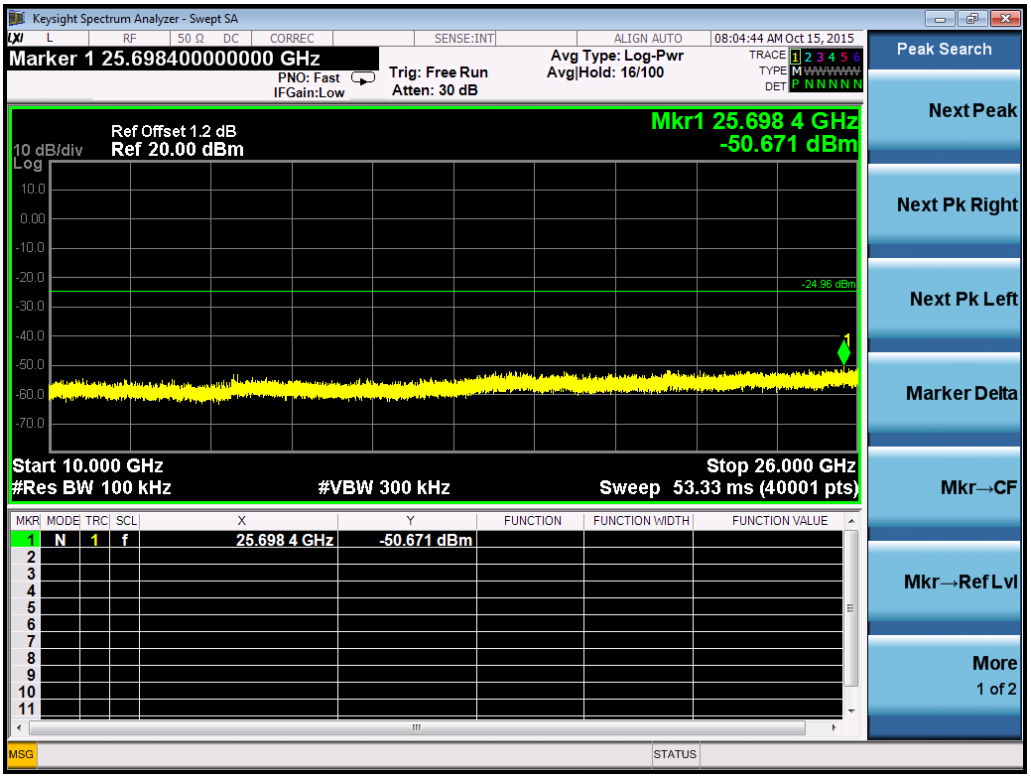




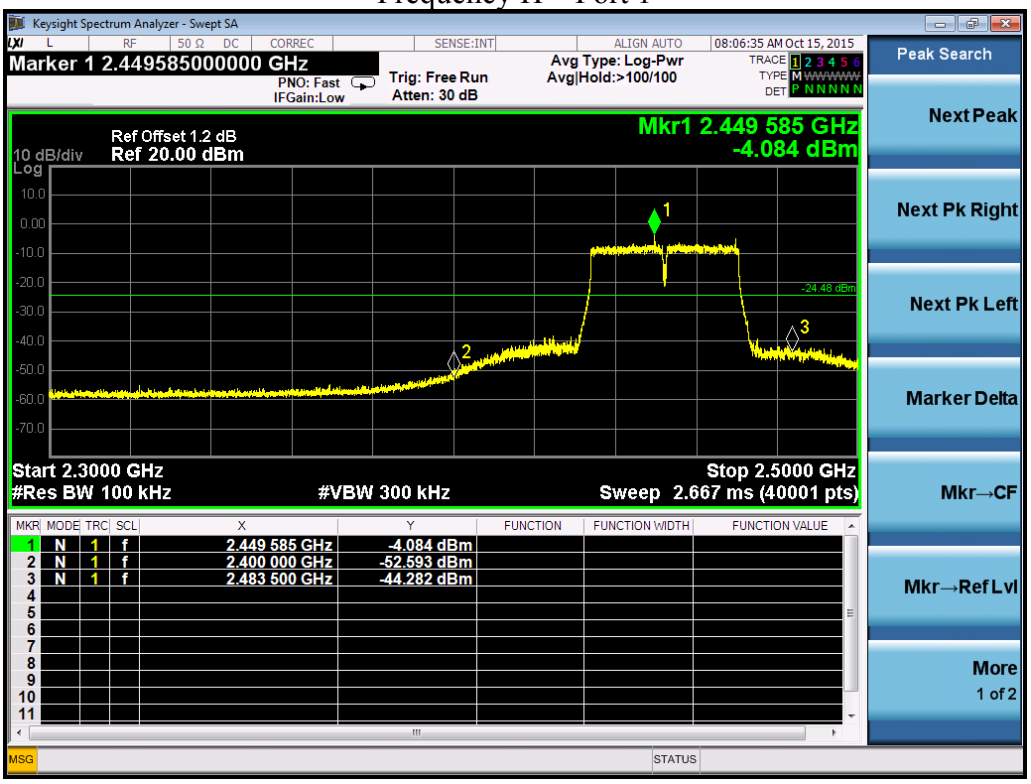
Frequency M – Port 1

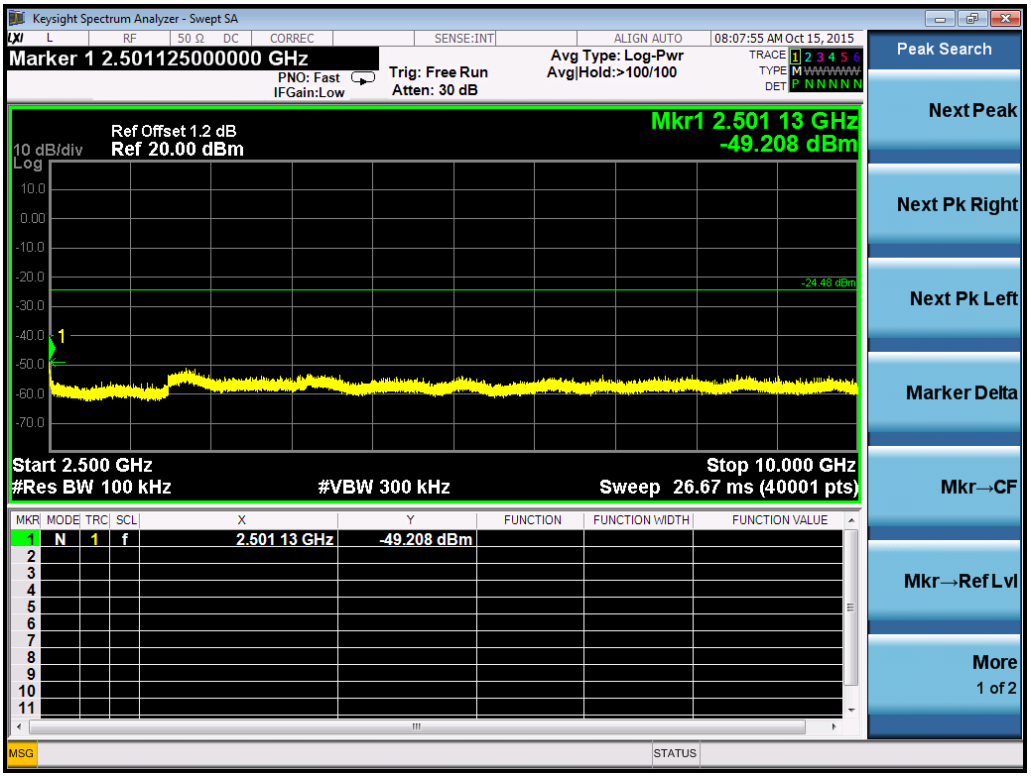


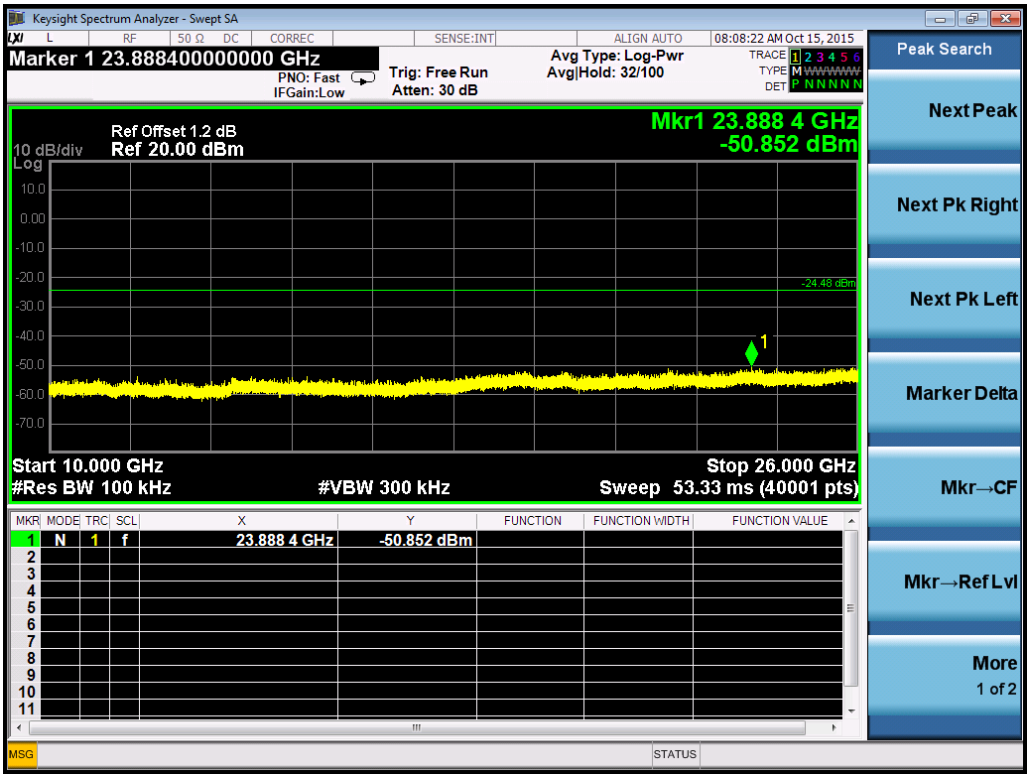




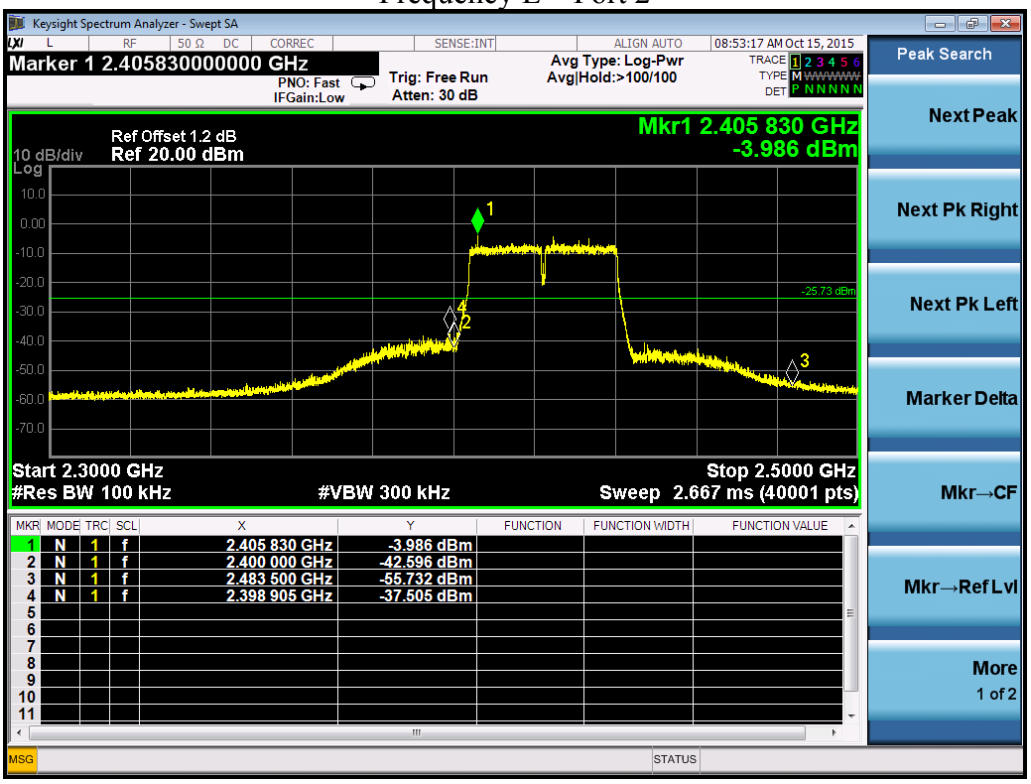
Frequency H – Port 1

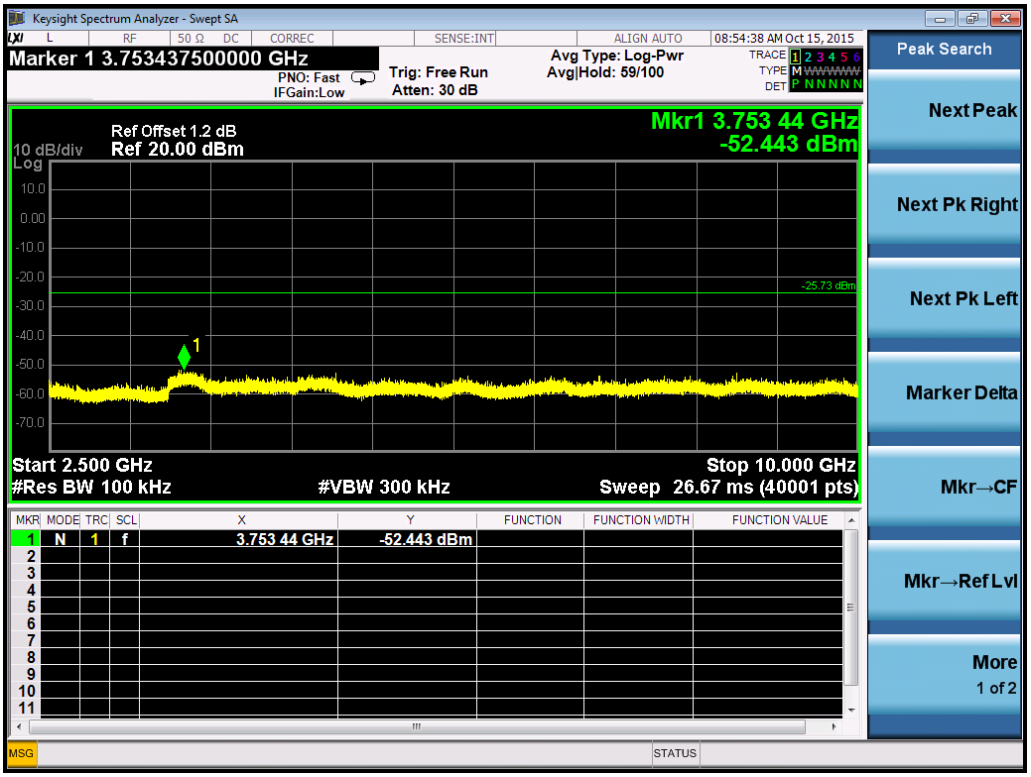


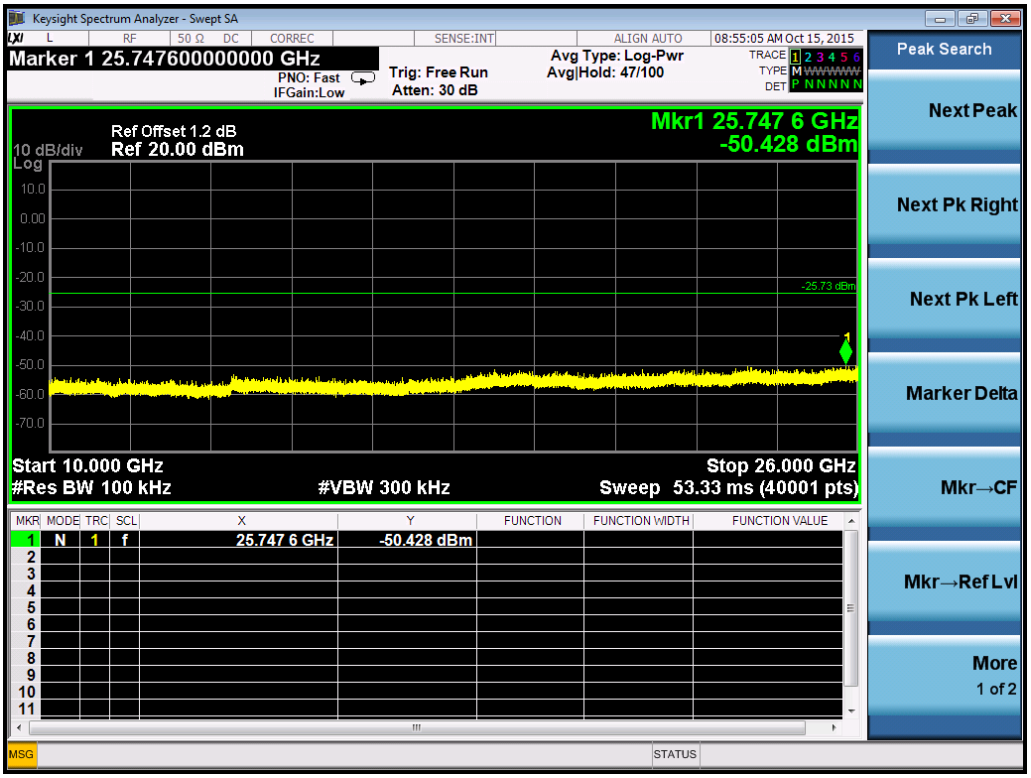




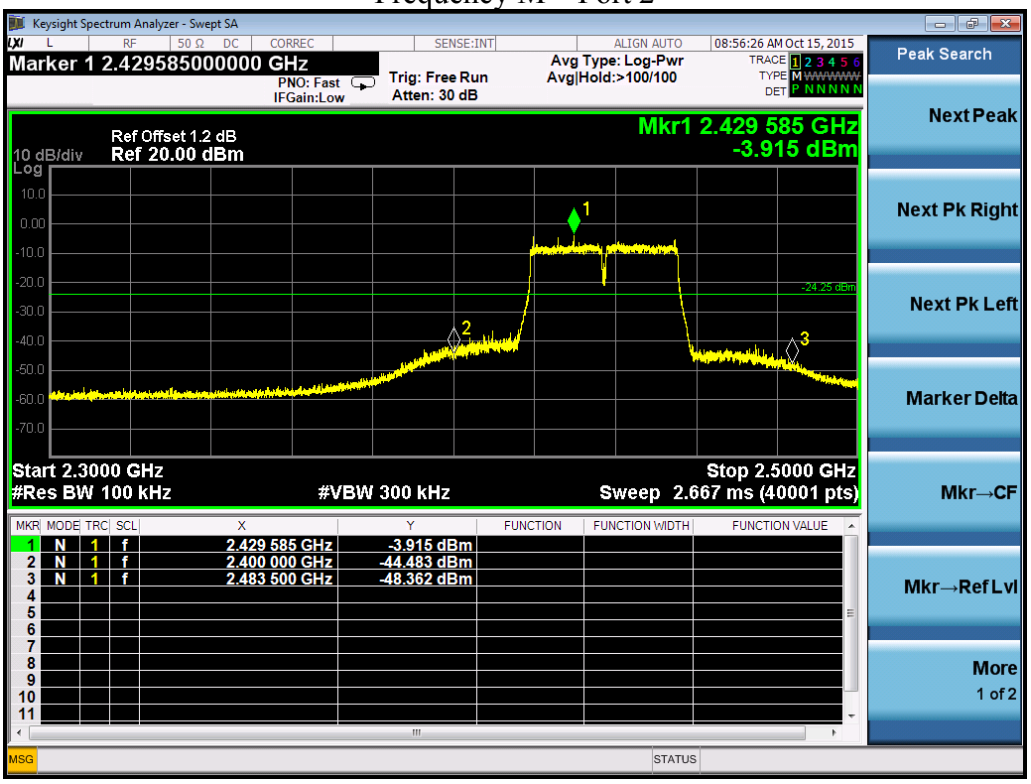
Frequency L – Port 2

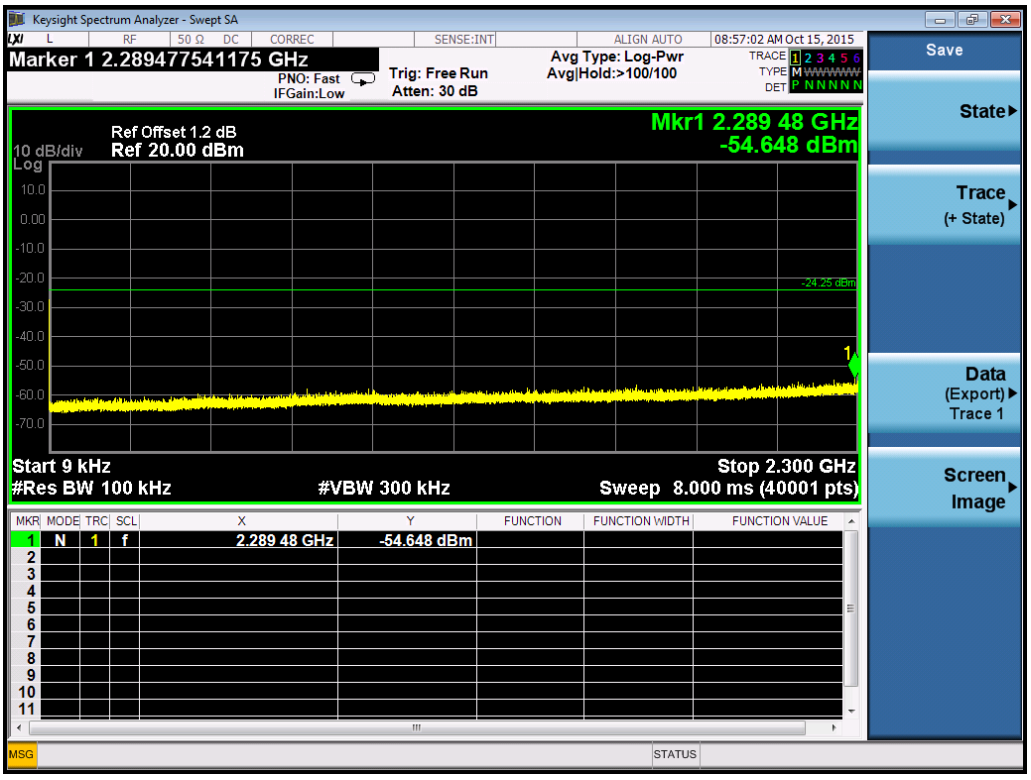


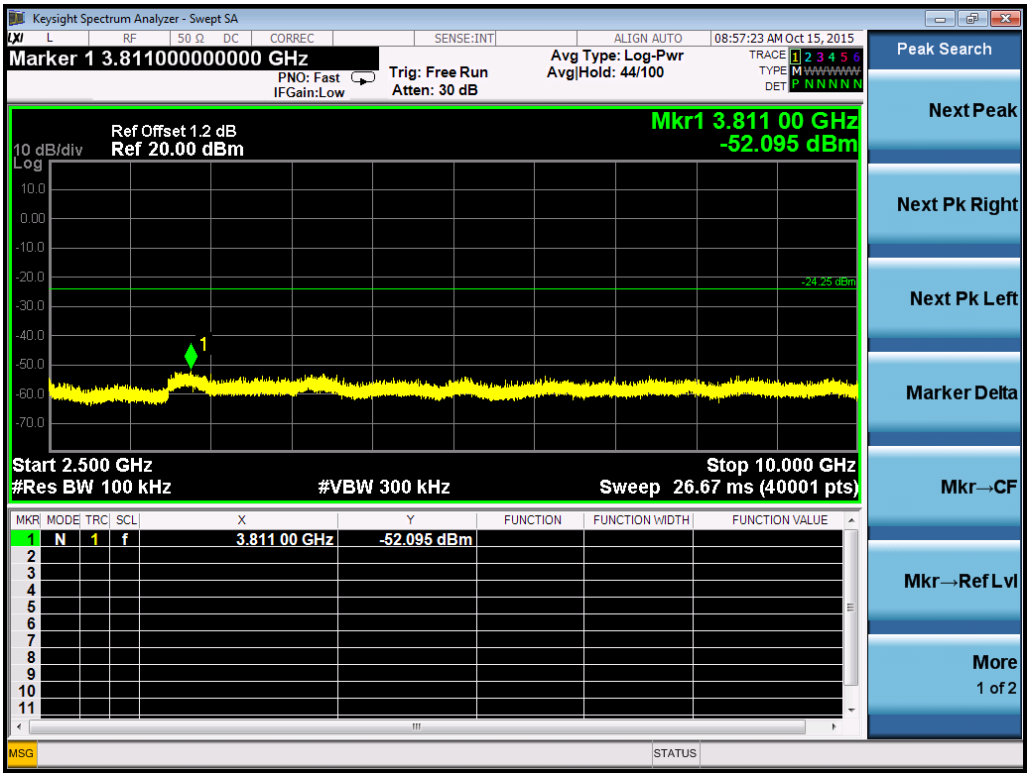


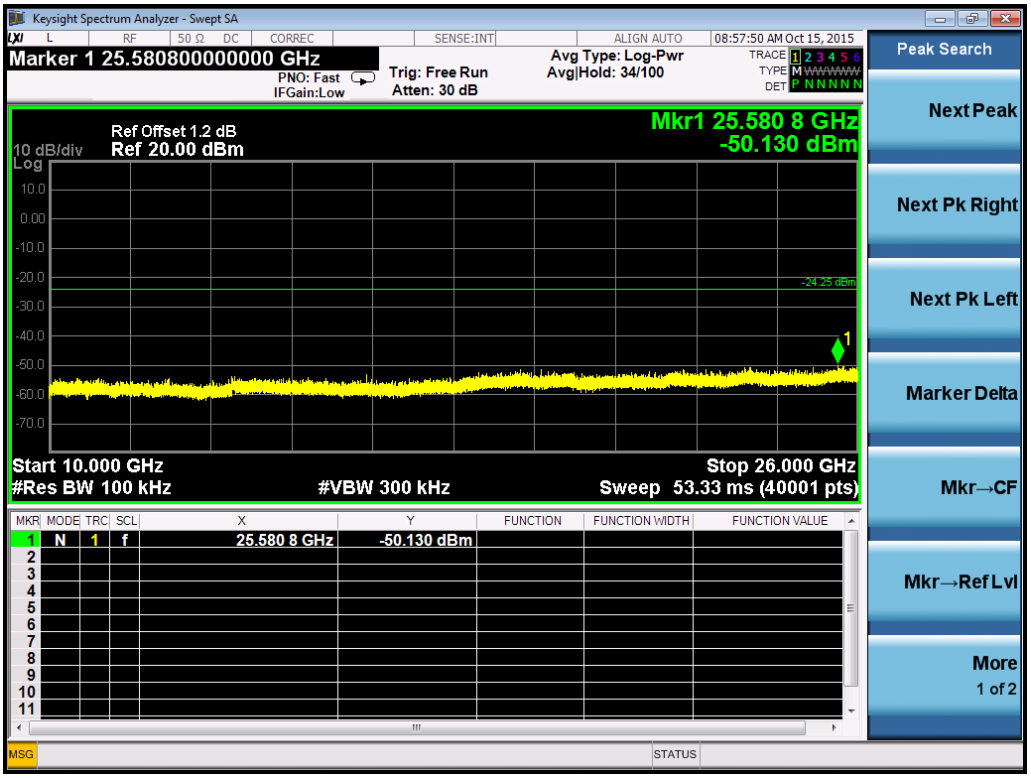


Frequency M – Port 2

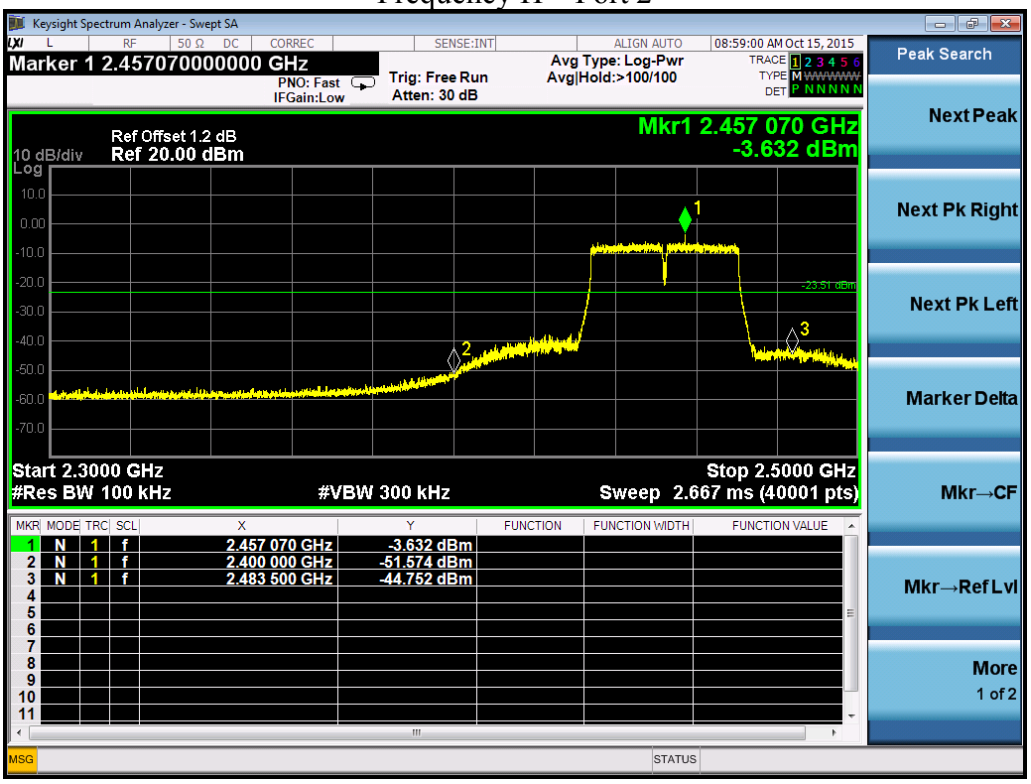


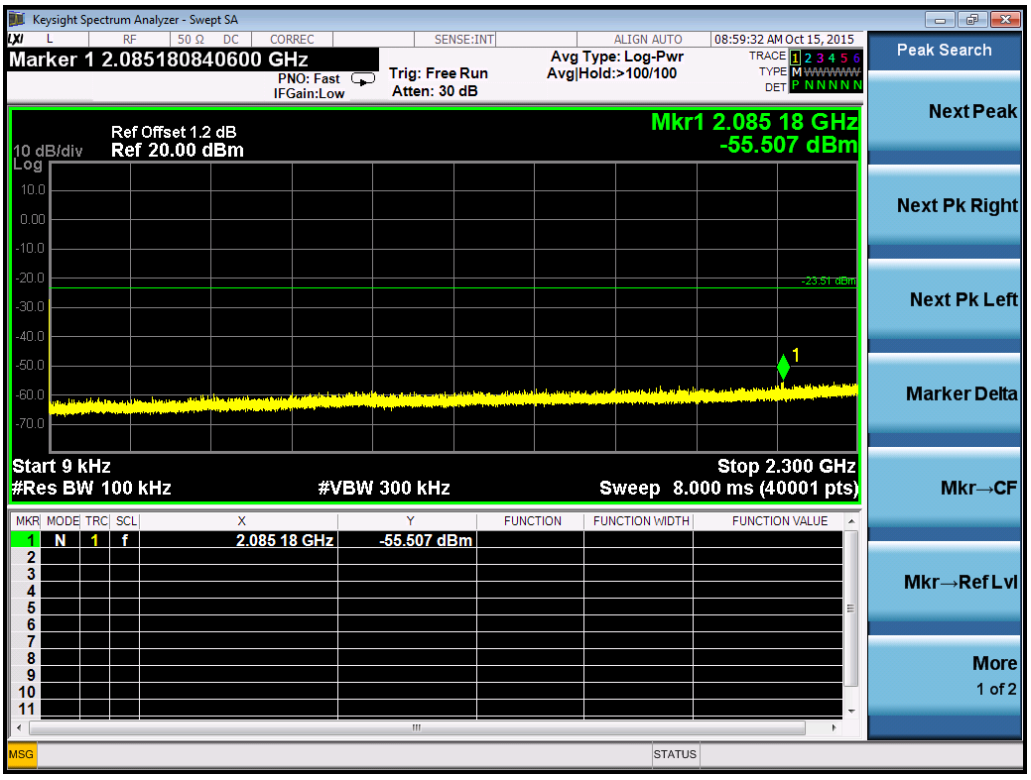


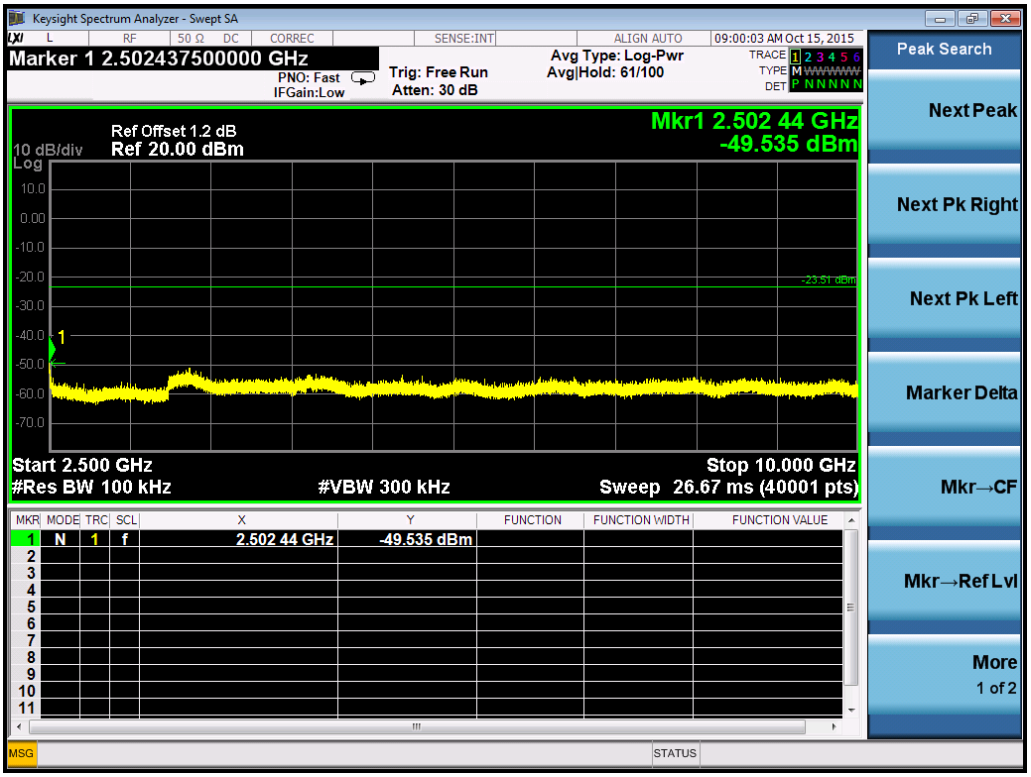


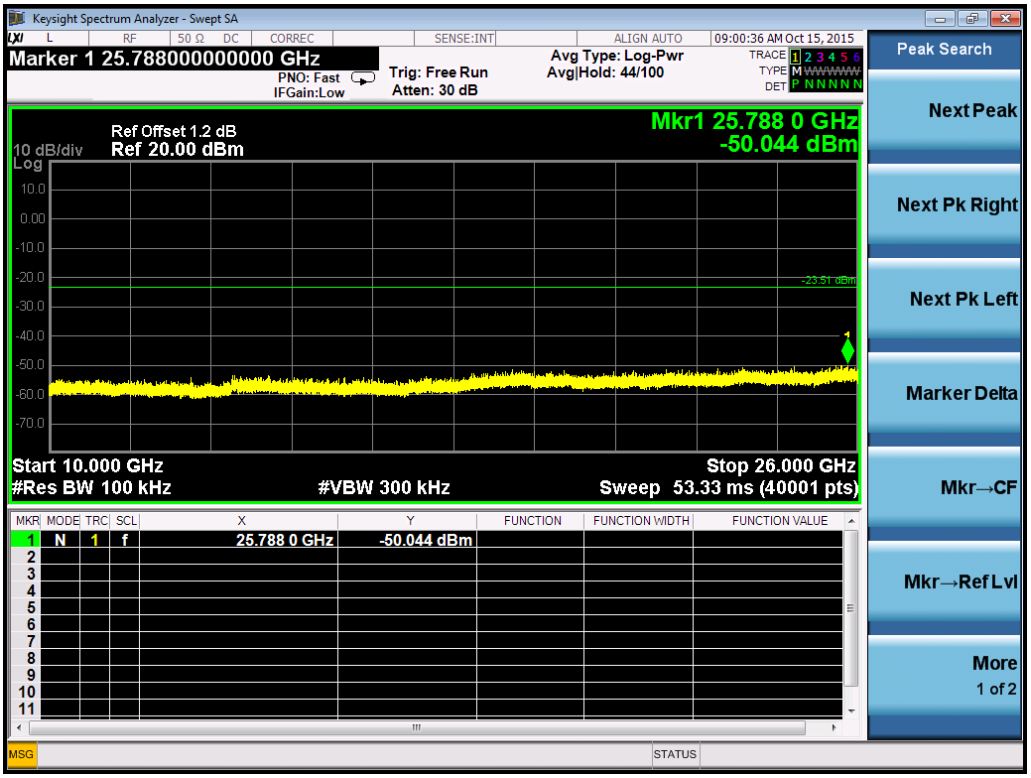


Frequency H – Port 2









8. Radiated Emissions in restricted frequency bands

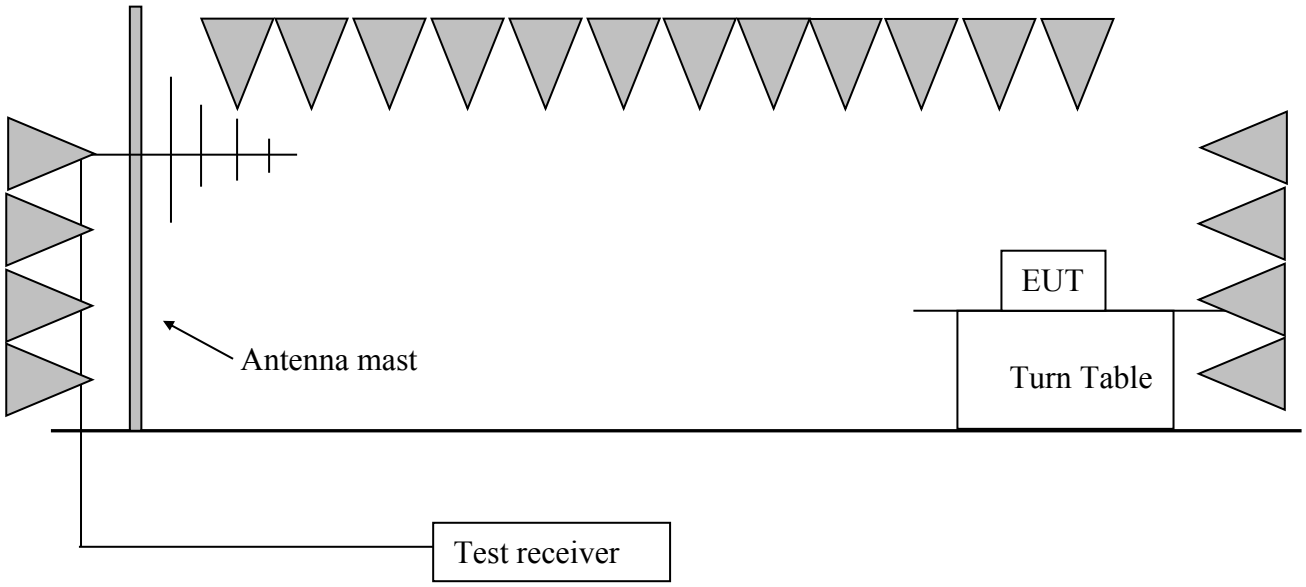
Test result: **Pass**

8.1 Test limit

The radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) showed as below:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

8.2 Test Configuration



8.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a non-conducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to DTS test procedure of KDB558074 D01 DTS "Meas Guidance v03r02" for compliance to FCC 47CFR 15.247 requirements.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100 kHz, VBW = 300 kHz (30MHz-1GHz)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

Remark:
1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Measured level= Original Receiver Reading + Factor
3. Margin = limit – Measured level
4. If the PK measured level is lower than AV limit, the AV test can be elided.

Example:

Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
Measured level = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m,
Measured level = 10.20dBuV/m, then Margin = 54 -10.20 = 43.80dBuV/m.

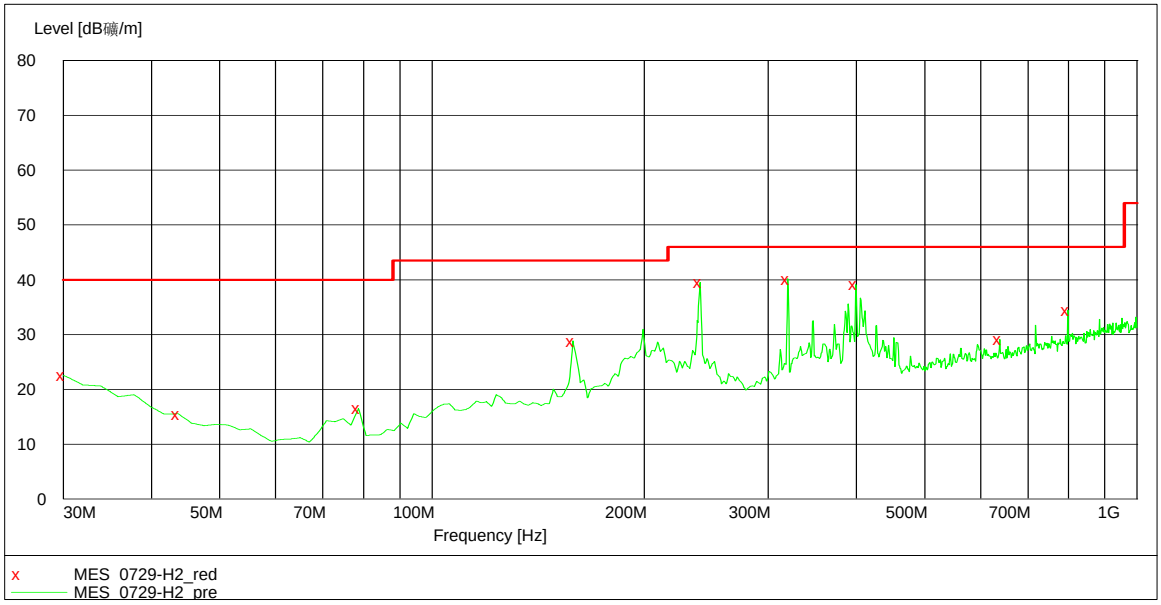
8.4 Test Protocol

Temperature: 25 °C
Relative Humidity: 55 %

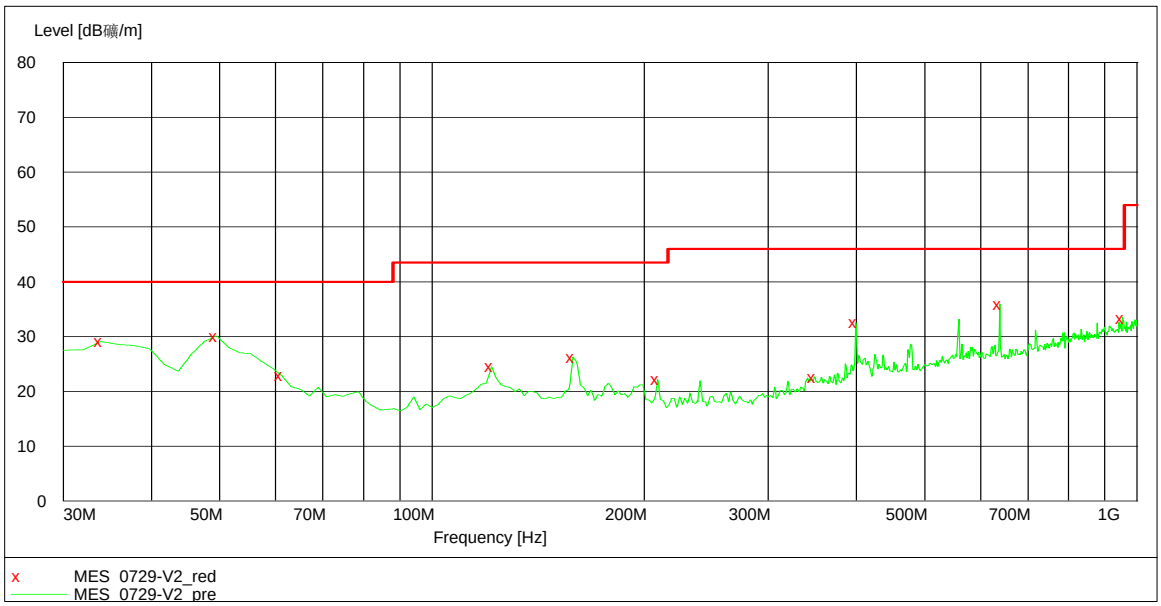
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

Mode 1, 30MHz~1GHz, 802.11b mode,

Horizontal



Vertical



Mode 1, 30MHz~1GHz, Test data:

Polarization	Frequency (MHz)	Measured level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector
H	30.00	22.6	40.0	17.4	PK
	43.61	15.5	40.0	24.5	PK
	78.60	16.5	40.0	23.5	PK
	158.30	28.8	43.5	14.7	PK
	239.94	39.5	46.0	6.5	PK
	319.64	40.2	46.0	5.8	PK
	399.34	39.1	46.0	6.9	PK
	638.44	29.1	46.0	16.9	PK
	797.84	34.4	46.0	11.6	PK
V	33.89	29.1	40.0	10.9	PK
	49.44	30.1	40.0	9.9	PK
	61.10	22.9	40.0	17.1	PK
	121.36	24.5	43.5	19.0	PK
	158.30	26.3	43.5	17.2	PK
	208.84	22.2	43.5	21.3	PK
	348.80	22.6	46.0	23.4	PK
	399.34	32.5	46.0	13.5	PK
	638.44	35.9	46.0	10.1	PK
	953.35	33.4	46.0	12.6	PK

Note: The worst test result (30MHz to 1GHz) of channel L (2412MHz) was chosen to list in the report as representative.

Test result above 1GHz:

The emission was conducted from 1GHz to 25GHz.

Mode 1：

1：2.4G band 802.11b

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2390	51.25	74	-7.80	100	190	22.75	PK
		41.15	54	-7.80	100	190	12.85	AV
	2412	108.33	-	-7.80	100	190	-	PK
		99.42	-	-7.80	100	190	-	AV
	4824	51.16	74	-2.10	100	190	22.84	PK
		40.55	54	-2.10	100	190	13.45	AV
Note:	2412MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2437	107.58	-	-7.80	100	190	-	PK
		99.44	-	-7.80	100	190	-	AV
	4874	51.43	74	-2.10	100	190	22.57	PK
		40.31	54	-2.10	100	190	13.69	AV
	7311	48.48	74	6.50	100	190	25.52	PK
		38.45	54	6.50	100	190	15.55	AV
Note:	2437MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2462	107.80	-	-7.80	100	190	-	PK
		98.23	-	-7.80	100	190	-	AV
	2483.5	50.33	74	-7.50	100	190	23.67	PK
		41.17	54	-7.50	100	190	12.83	AV
	4924	51.51	74	-2.10	100	190	22.49	PK
		40.81	54	-2.10	100	190	13.19	AV
	7386	48.12	74	6.50	100	190	25.88	PK
		38.54	54	6.50	100	190	15.46	AV
Note:	2462MHz is fundamental signal.							

2：2.4G band 802.11g

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2390	50.62	74	-7.80	100	190	23.38	PK
		41.47	54	-7.80	100	190	12.53	AV
	2412	105.66	-	-7.80	100	190	-	PK
		96.25	-	-7.80	100	190	-	AV
	4824	49.55	74	-2.10	100	190	24.45	PK
		36.44	54	-2.10	100	190	17.56	AV
Note:	2412MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2437	105.46	-	-7.80	100	190	-	PK
		95.36	-	-7.80	100	190	-	AV
	4874	51.15	74	-2.10	100	190	22.85	PK
		41.24	54	-2.10	100	190	12.76	AV
	7311	46.85	74	6.50	100	190	25.15	PK
		39.52	54	6.50	100	190	14.48	AV
Note:	2437MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2462	106.88	-	-7.80	100	190	-	PK
		94.52	-	-7.80	100	190	-	AV
	2483.5	50.08	74	-7.50	100	190	23.92	PK
		40.12	54	-7.50	100	190	13.88	AV
	4924	52.08	74	-2.10	100	190	21.92	PK
		40.58	54	-2.10	100	190	13.42	AV
	7386	45.15	74	6.50	100	190	28.85	PK
		36.25	54	6.50	100	190	17.75	AV
Note:	2462MHz is fundamental signal.							

3：2.4G band 802.11n HT20

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2390	51.40	74	-7.80	100	190	22.60	PK
		42.33	54	-7.80	100	190	11.67	AV
	2412	106.45	-	-7.80	100	190	-	PK
		93.66	-	-7.80	100	190	-	AV
	4824	49.86	74	-2.10	100	190	24.14	PK
		38.94	54	-2.10	100	190	15.06	AV
Note:	2412MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2437	105.45	-	-7.80	100	190	-	PK
		94.52	-	-7.80	100	190	-	AV
	4874	47.87	74	-2.10	100	190	26.13	PK
		39.67	54	-2.10	100	190	14.33	AV
	7311	45.77	74	6.50	100	190	28.23	PK
		38.97	54	6.50	100	190	14.03	AV
Note:	2437MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2462	103.93	-	-7.80	100	190	-	PK
		92.16	-	-7.80	100	190	-	AV
	2483.5	50.77	74	-7.50	100	190	23.23	PK
		40.45	54	-7.50	100	190	13.55	AV
	4924	48.48	74	-2.10	100	190	25.52	PK
		37.98	54	-2.10	100	190	16.02	AV
	7386	44.08	74	6.50	100	190	29.92	PK
		38.07	54	6.50	100	190	15.93	AV
Note:	2462MHz is fundamental signal.							

4：2.4G band 802.11n HT40

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2390	51.30	74	-7.80	100	190	22.70	PK
		41.23	54	-7.80	100	190	12.77	AV
	2422	104.64	-	-7.80	100	190	-	PK
		91.26	-	-7.80	100	190	-	AV
	4844	48.55	74	-2.10	100	190	25.45	PK
		38.67	54	-2.10	100	190	15.33	AV
Note:	2422MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2437	104.15	-	-7.80	100	190	-	PK
		92.35	-	-7.80	100	190	-	AV
	4874	48.83	74	-2.10	100	190	25.17	PK
		38.34	54	-2.10	100	190	15.66	AV
	7311	45.44	74	6.50	100	190	28.56	PK
		38.37	54	6.50	100	190	14.63	AV
Note:	2437MHz is fundamental signal.							

Polarity	Frequency (MHz)	Measured level (dBuv/m)	Limit (dBuv/m)	Factor (dB)	Antenna (cm)	Turn table (deg)	Margin (dB)	Remark
Ver/Hor	2452	101.56	-	-7.80	100	190	-	PK
		90.36	-	-7.80	100	190	-	AV
	2483.5	49.54	74	-7.50	100	190	24.46	PK
		40.26	54	-7.50	100	190	13.74	AV
	4904	48.68	74	-2.10	100	190	25.32	PK
		35.95	54	-2.10	100	190	18.05	AV
	7356	43.18	74	6.50	100	190	30.82	PK
		36.57	54	6.50	100	190	17.43	AV
Note:	2452MHz is fundamental signal.							

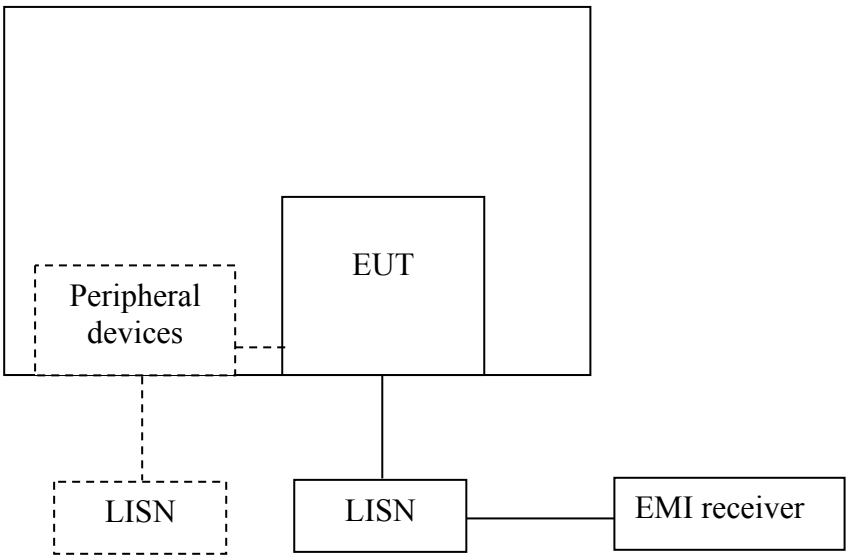
9. Power line conducted emission

Test result: **Pass**

9.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50
* Decreases with the logarithm of the frequency.		

9.2 Test configuration



☒ For table top equipment, wooden support is 0.8m height table

☐ For floor standing equipment, wooden support is 0.1m height rack.

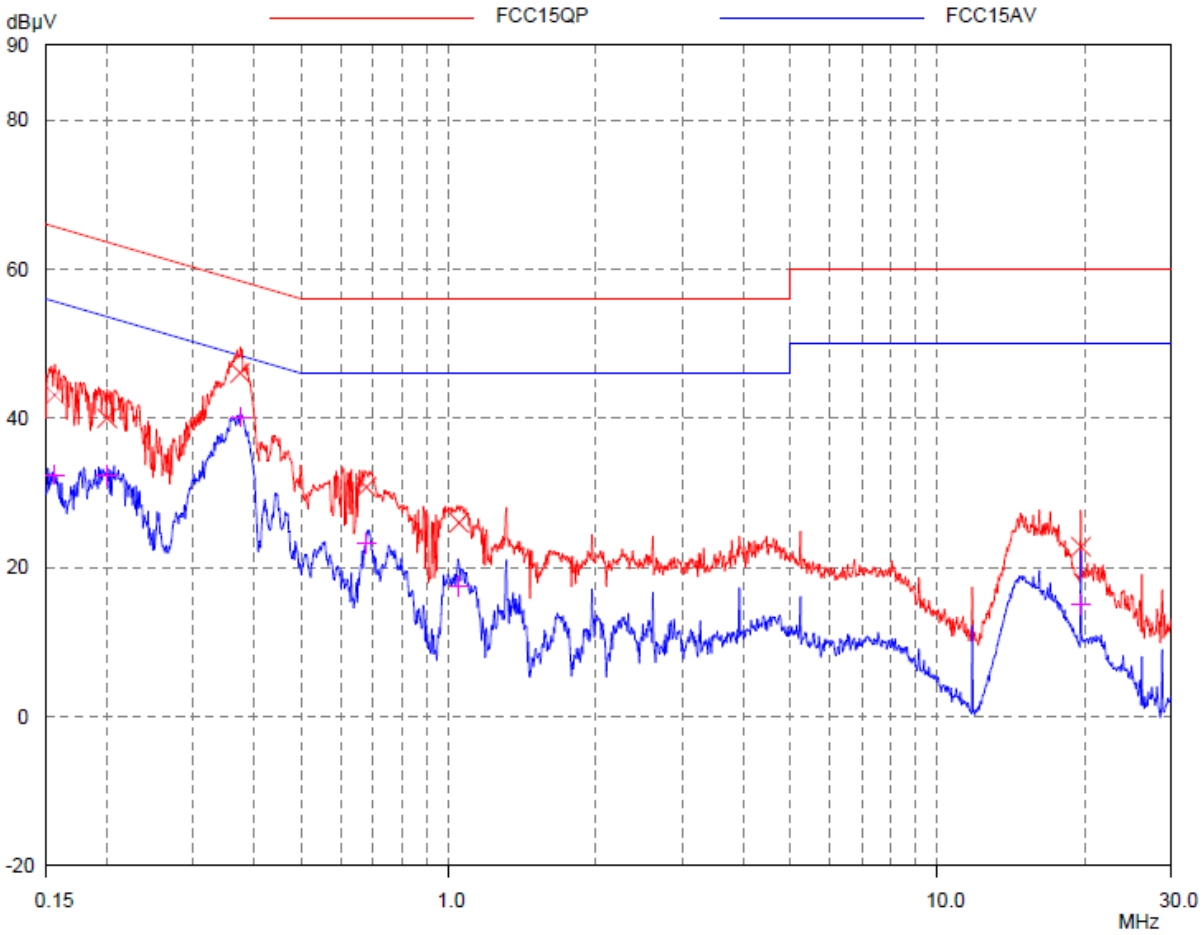
9.3 Test procedure and test set up

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50Ω/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50Ω/50uH coupling impedance with 50Ω termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement.
The bandwidth of the test receiver is set at 9 kHz.

9.4 Test protocol

Temperature : 22°C
Relative Humidity : 52%

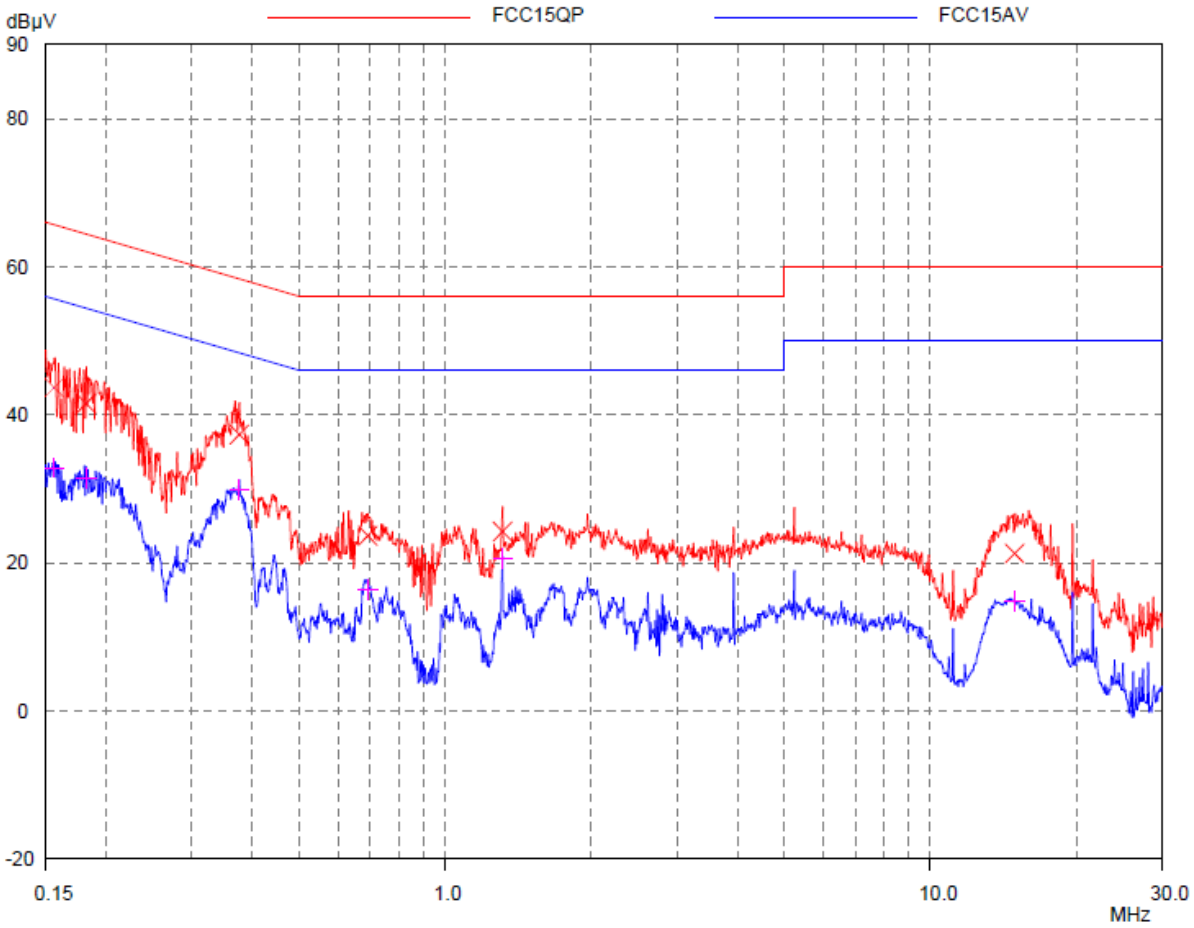
L line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)
0.156	43.11	65.67	22.56	32.37	55.67	23.30
0.200	40.01	63.61	23.60	32.27	53.61	21.34
0.374	46.07	58.41	12.34	40.19	48.41	8.22
0.678	30.79	56.00	25.21	23.29	46.00	22.71
1.048	25.99	56.00	30.01	17.50	46.00	28.50
19.632	22.79	60.00	37.21	15.11	50.00	34.89

N line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)
0.156	43.71	65.67	21.96	32.83	55.67	22.84
0.182	41.54	64.41	22.87	31.43	54.41	22.98
0.376	37.35	58.37	21.02	29.89	48.37	18.48
0.692	23.66	56.00	32.34	16.36	46.00	29.64
1.311	24.25	56.00	31.75	20.59	46.00	25.41
14.905	21.29	60.00	38.71	14.82	50.00	35.18

Note: The worst test results of channel L (2412MHz, 802.11b, 1Mbps) was chosen to list in the report as representative.