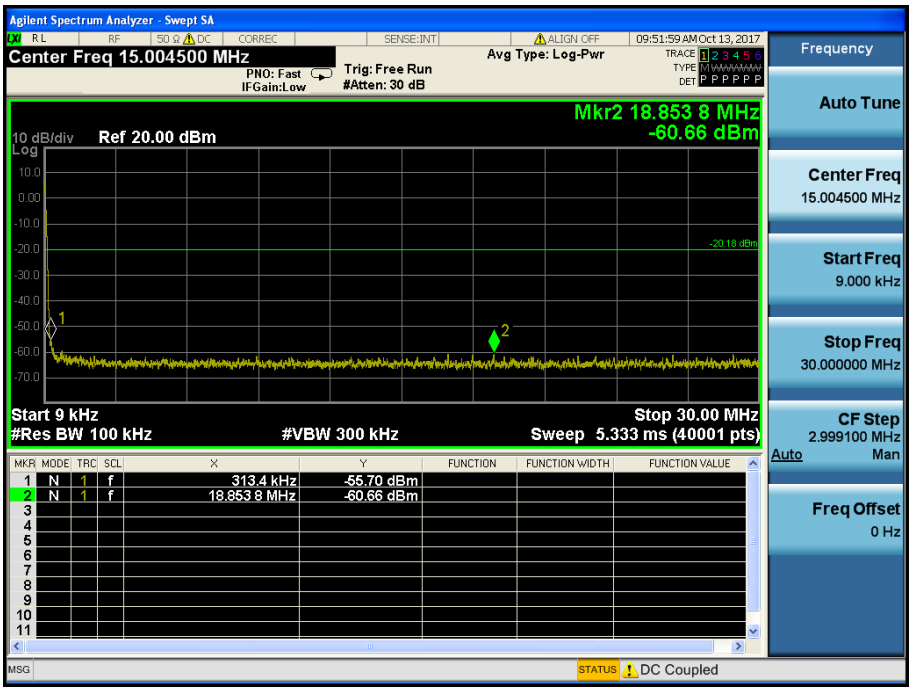
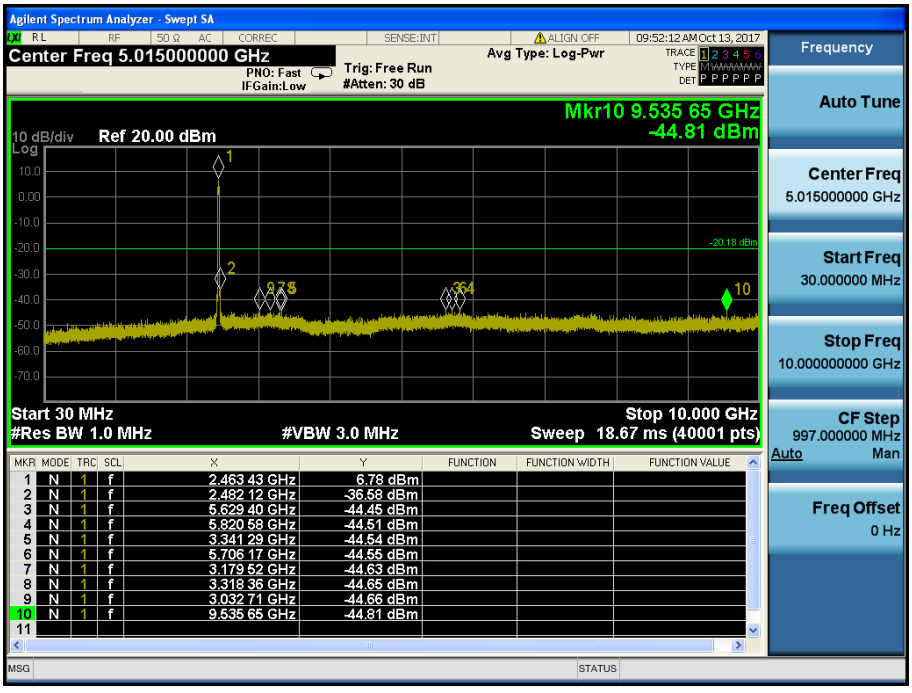
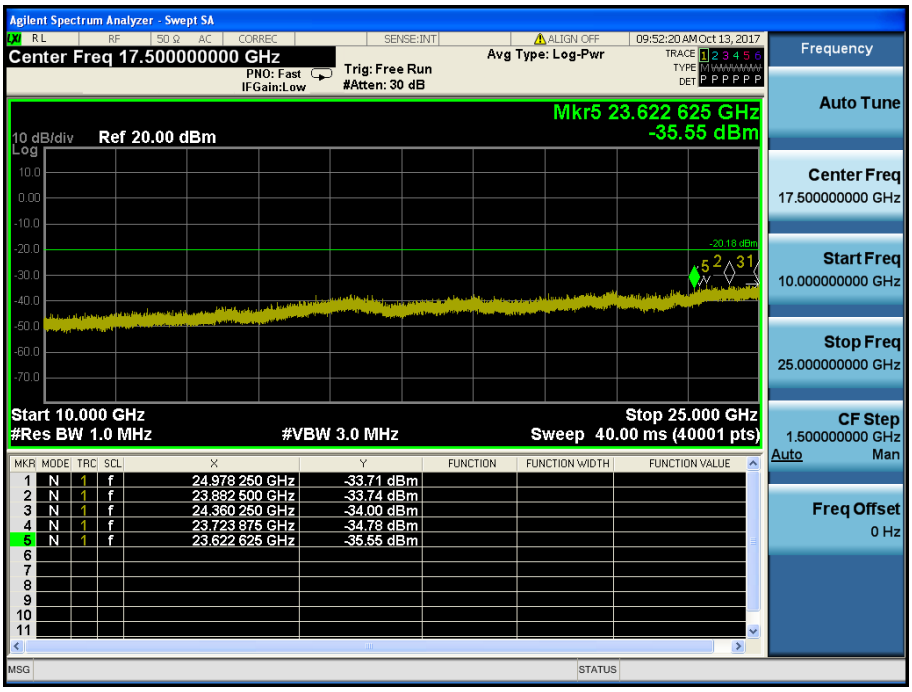
Conducted Spurious Emissions



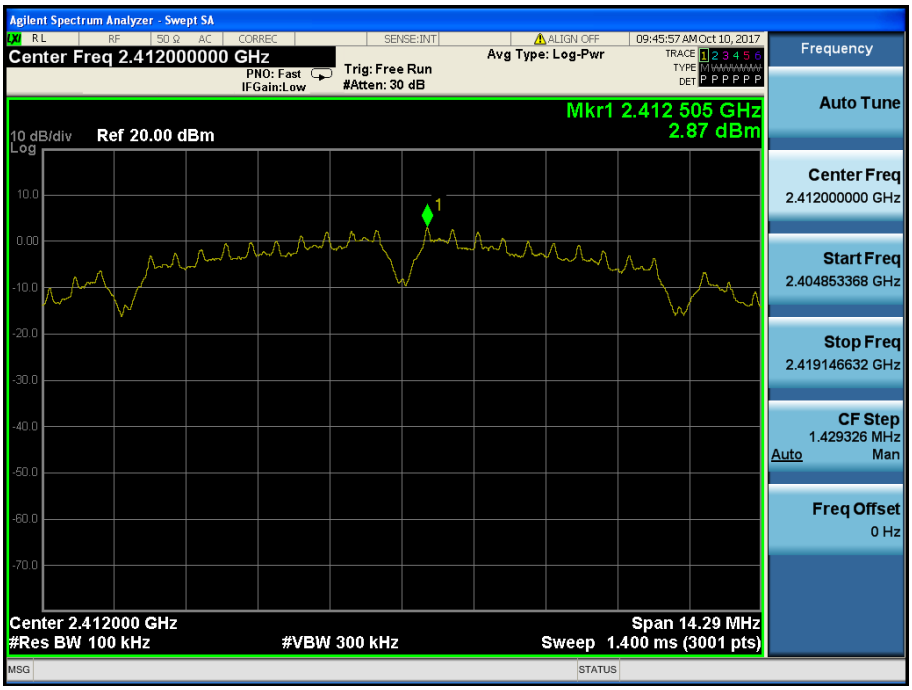


Conducted Spurious Emissions

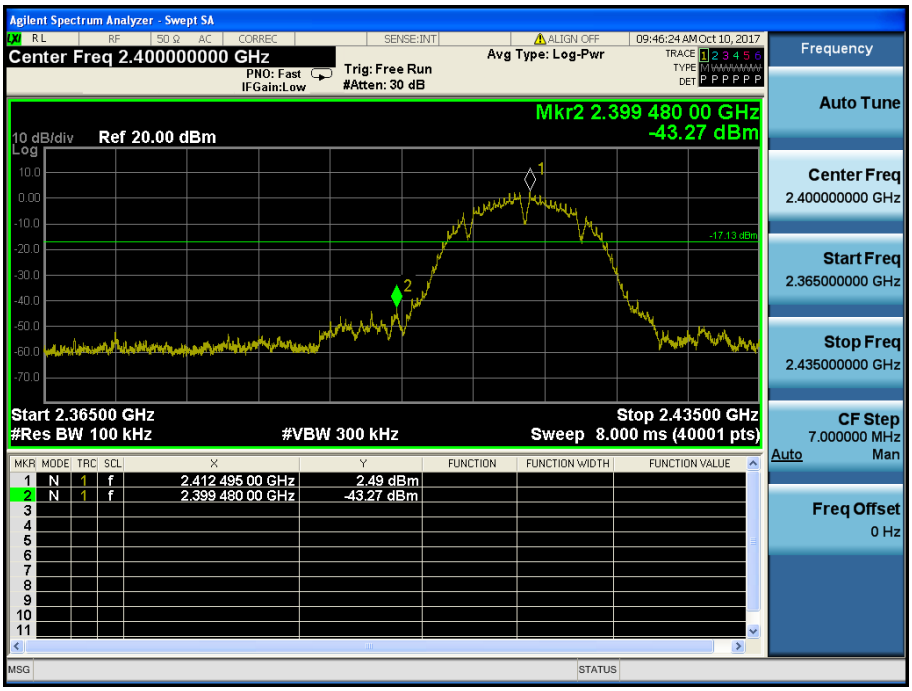


TM 1 & ANT 2 & Lowest

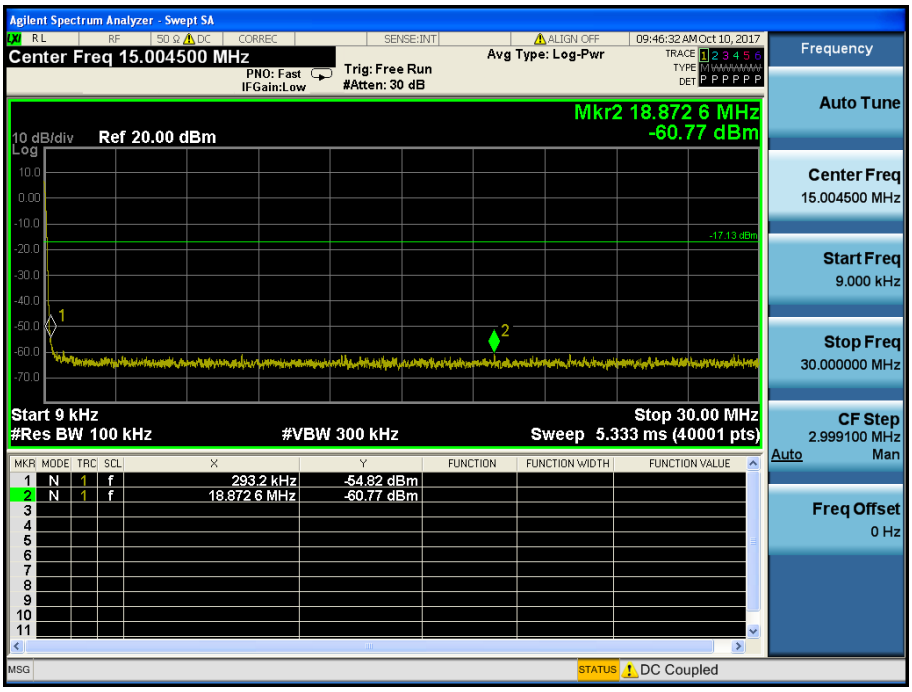
Reference

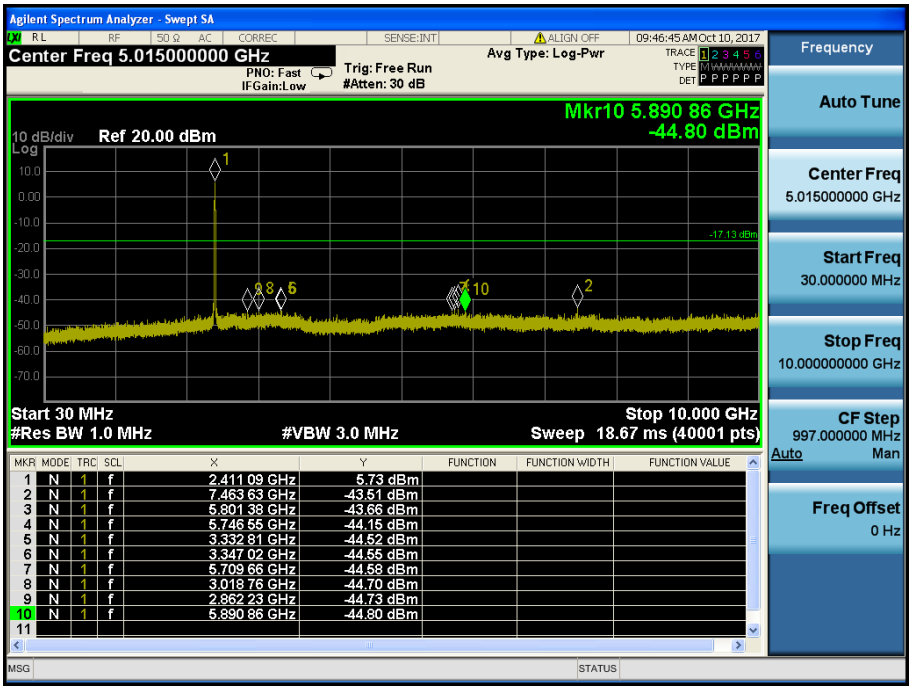


Low Band-edge

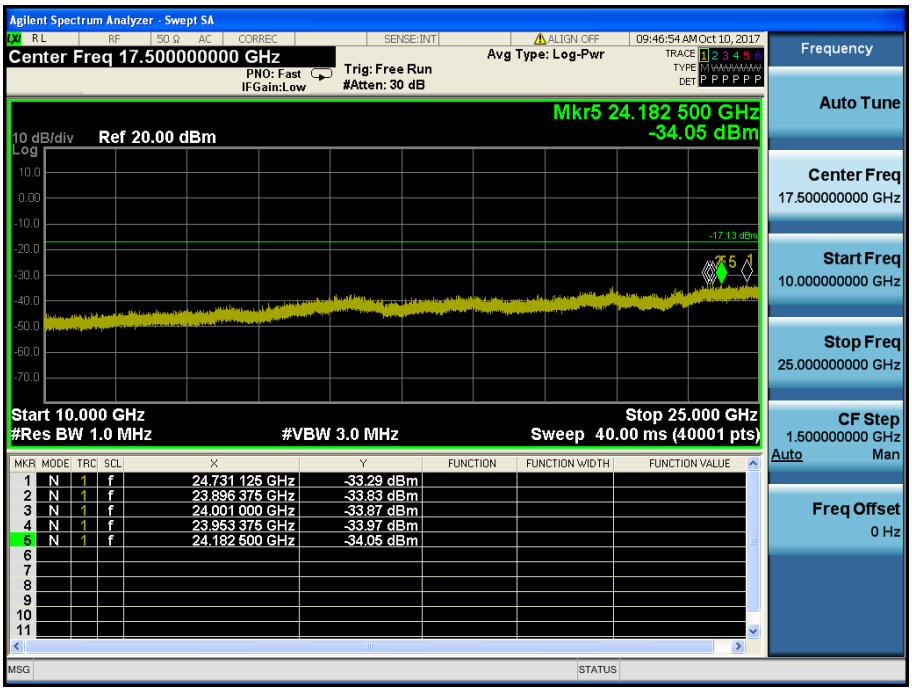


Conducted Spurious Emissions



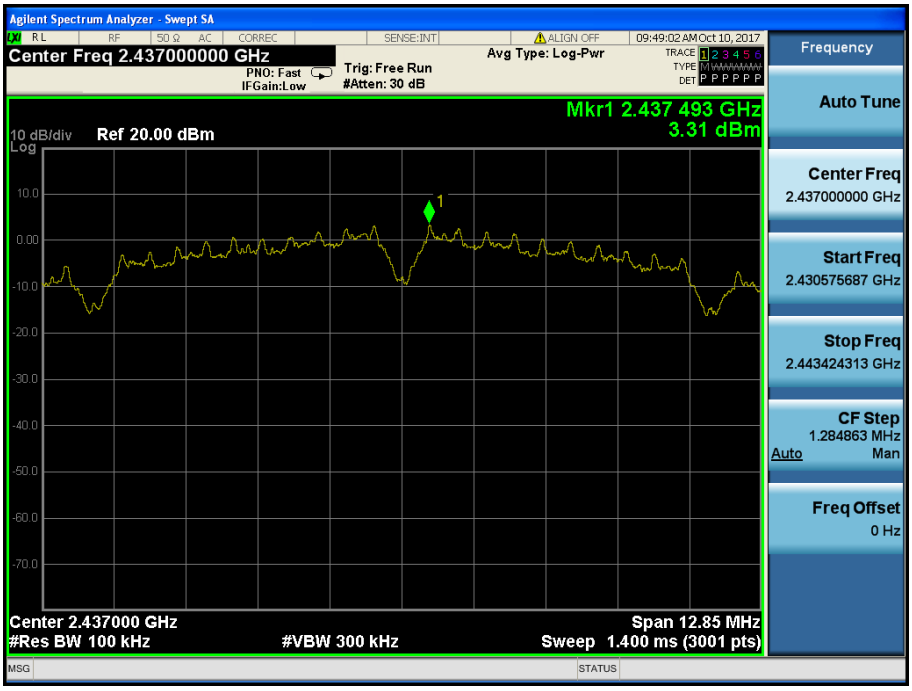


Conducted Spurious Emissions



TM 1 & ANT 2 & Middle

Reference



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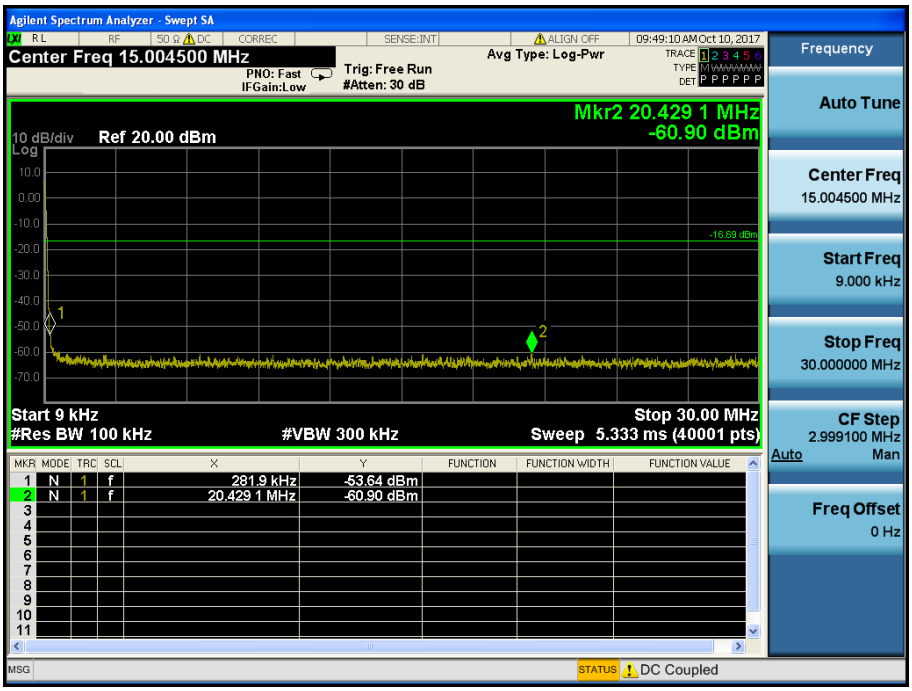

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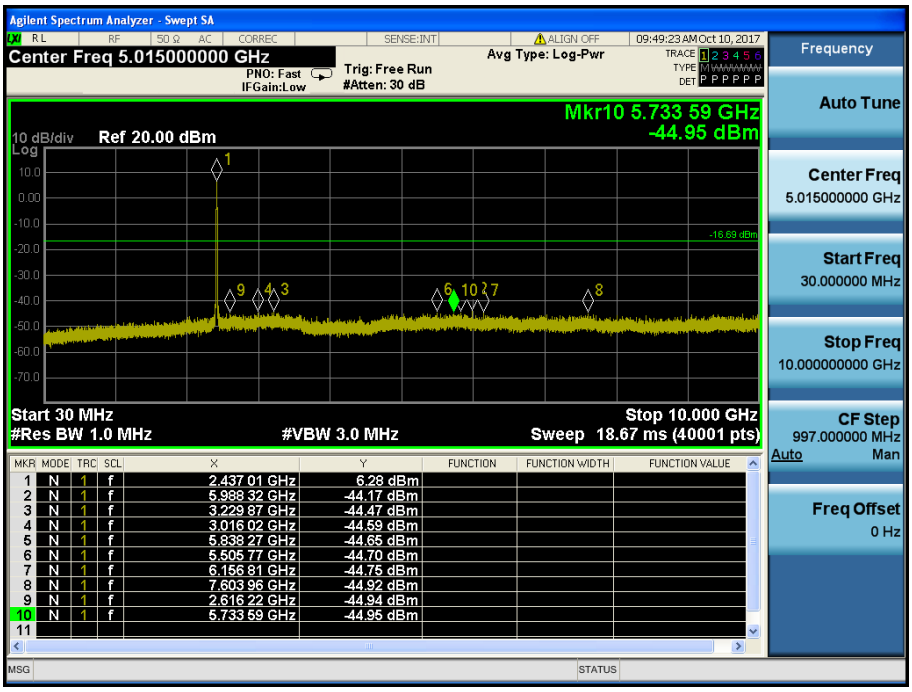
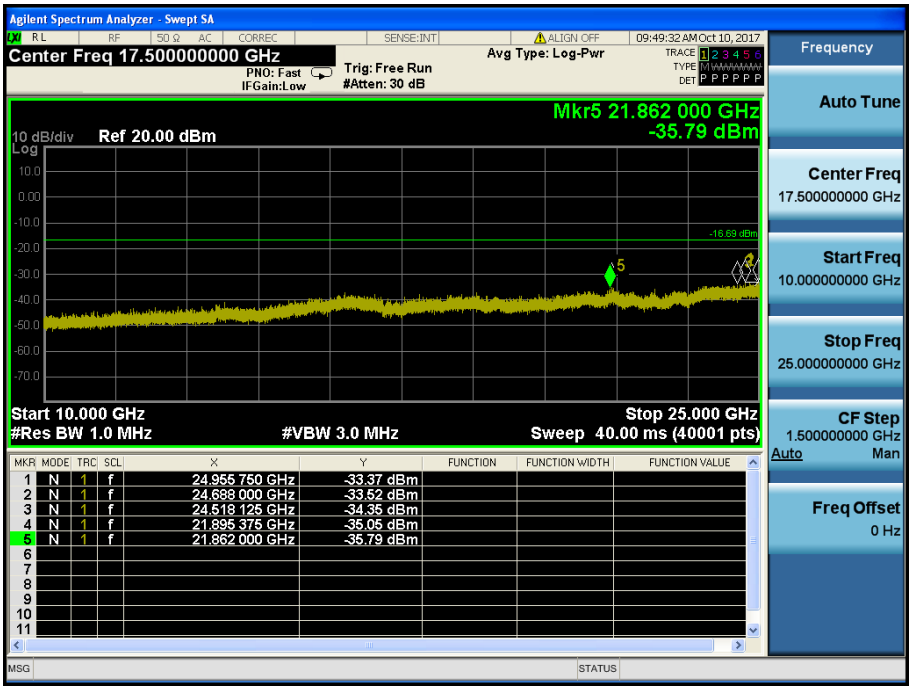
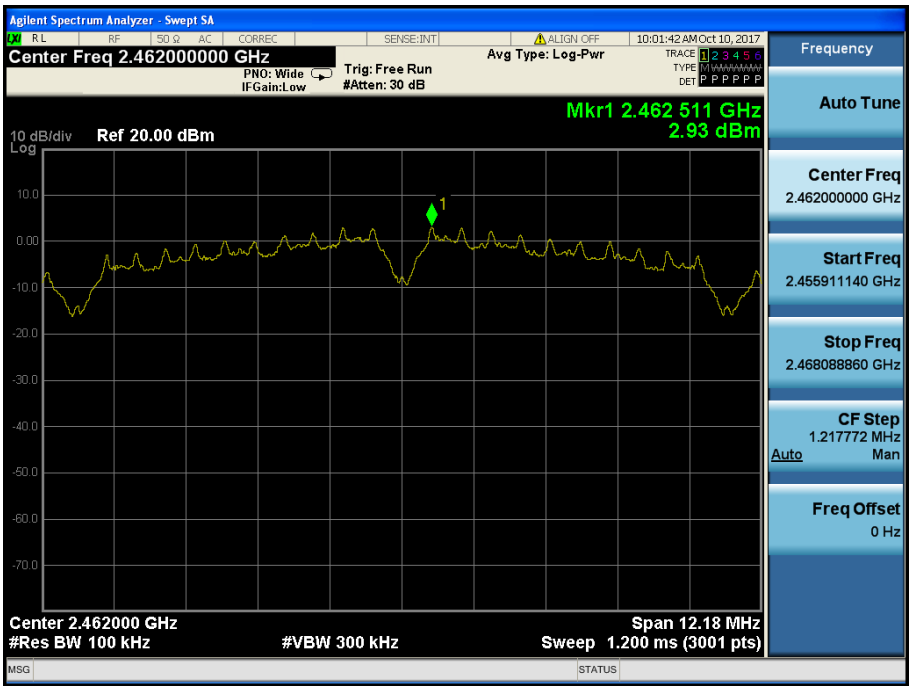


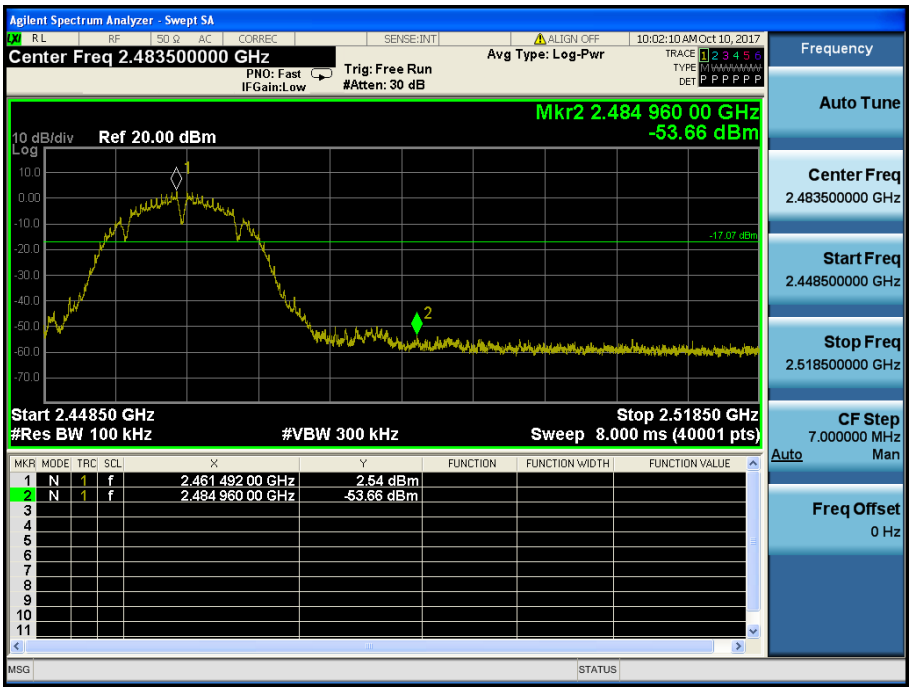


TM 1 & ANT 2 & Highest

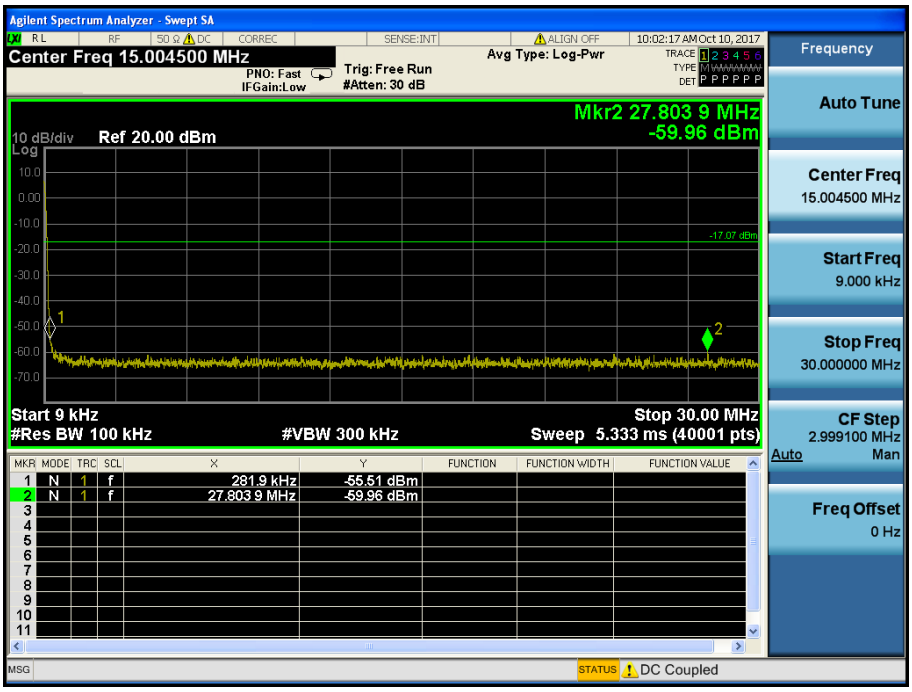
Reference

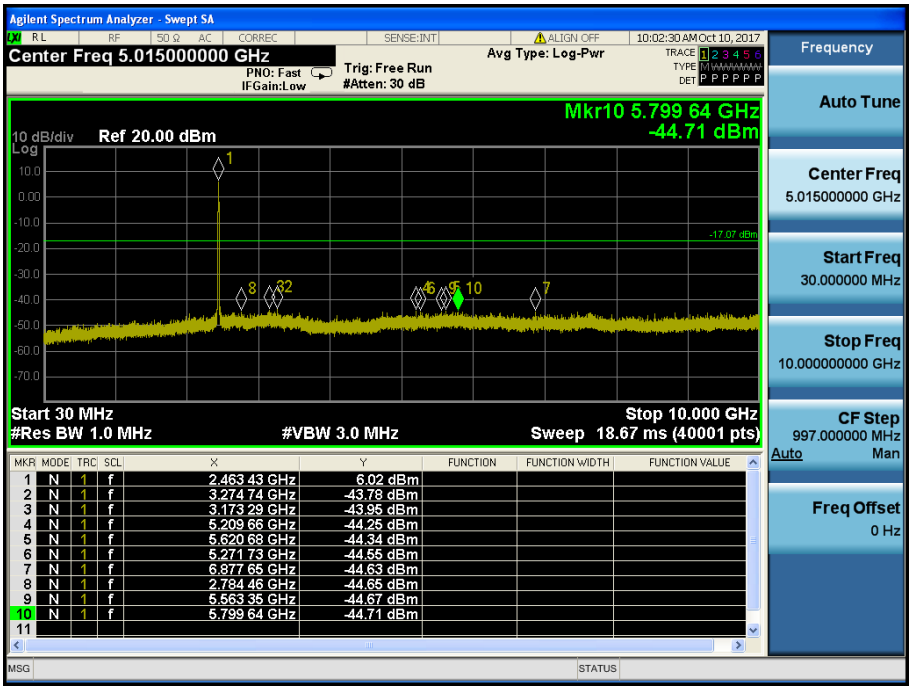


High Band-edge

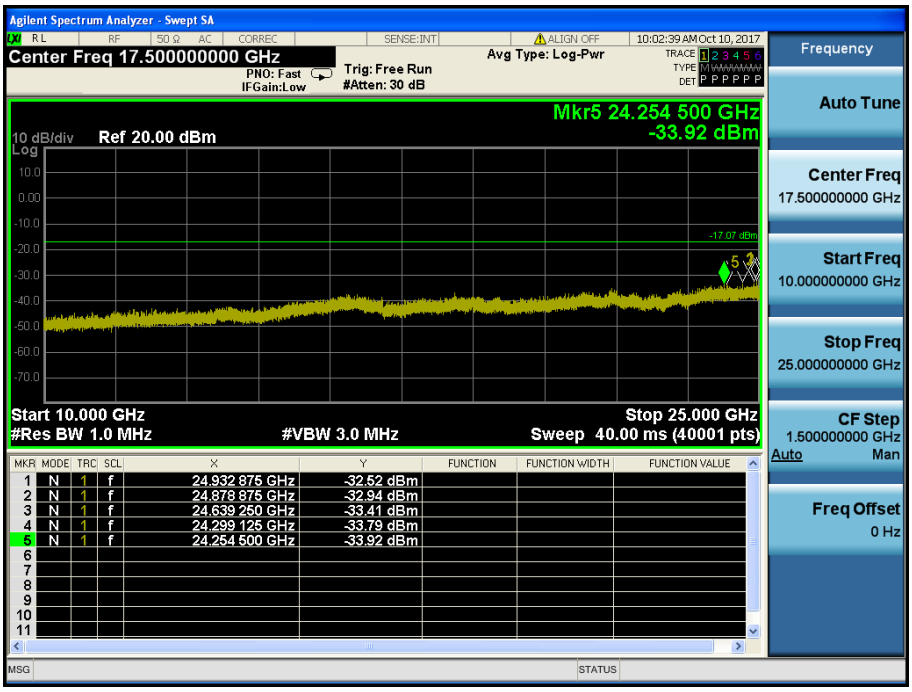


Conducted Spurious Emissions



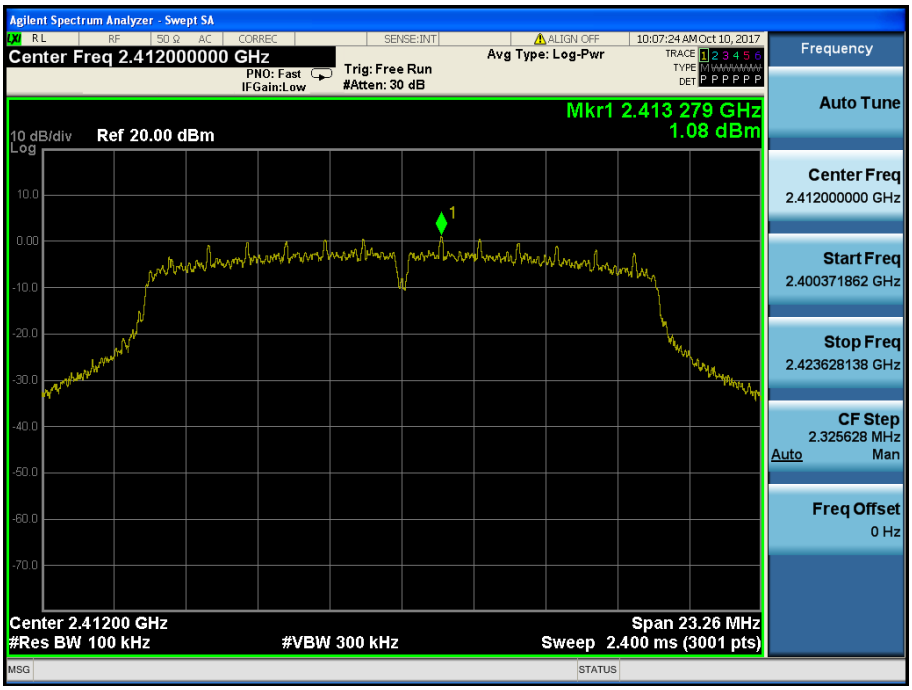


Conducted Spurious Emissions

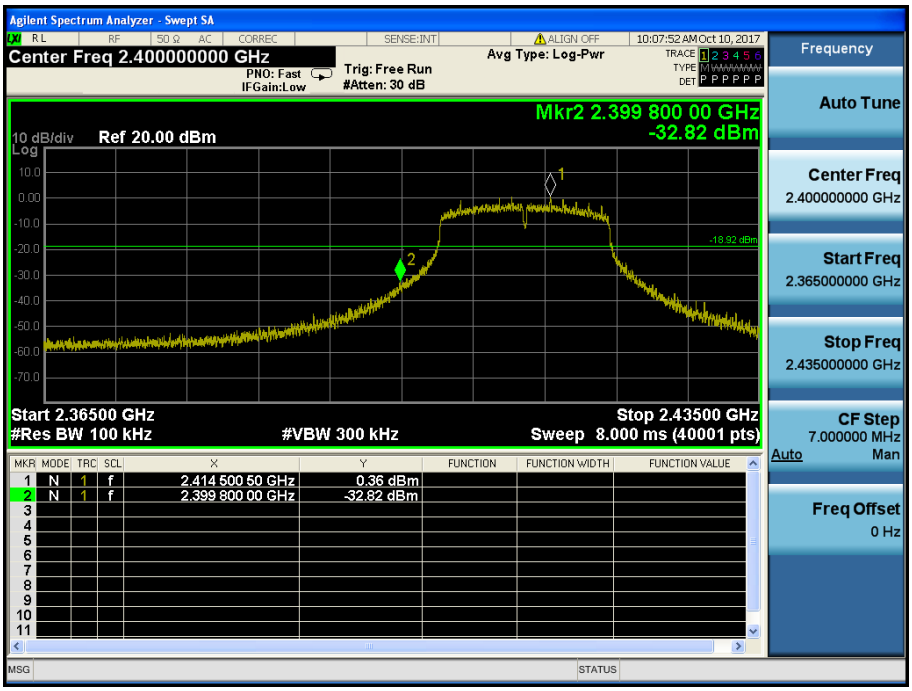


TM 2 & ANT 2 & Lowest

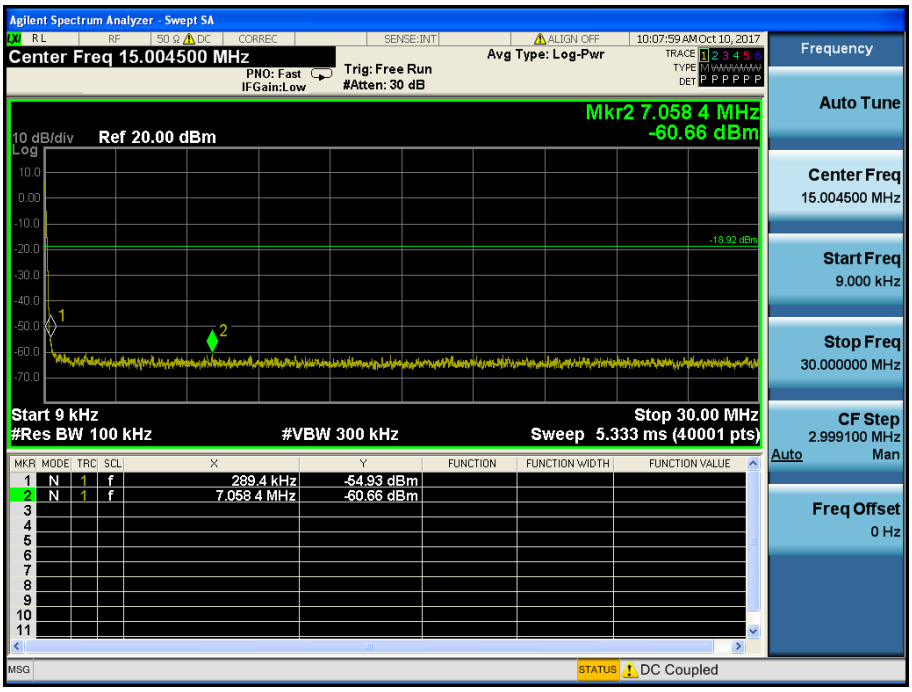
Reference

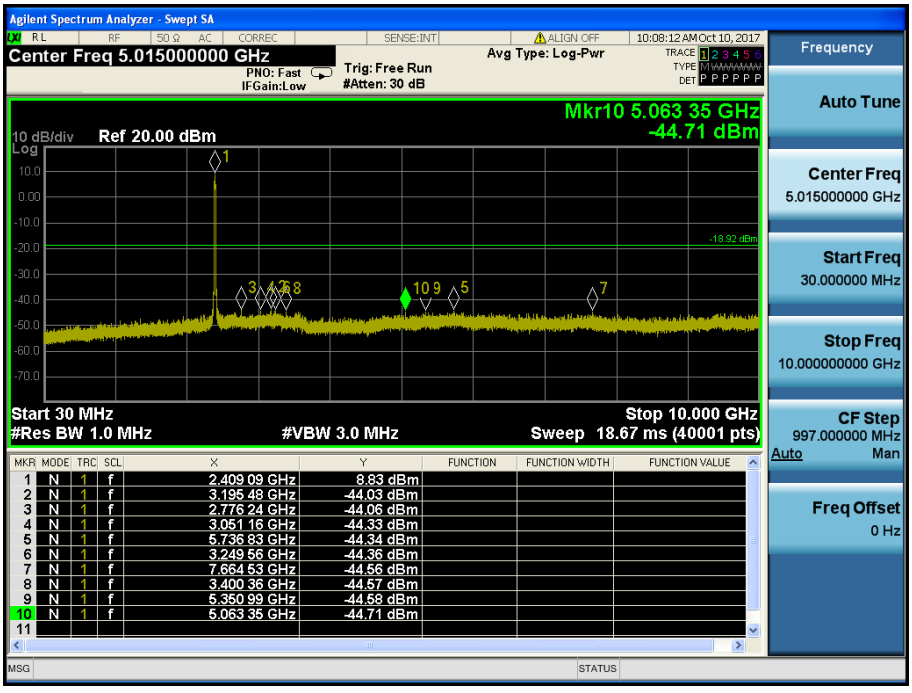


Low Band-edge



Conducted Spurious Emissions





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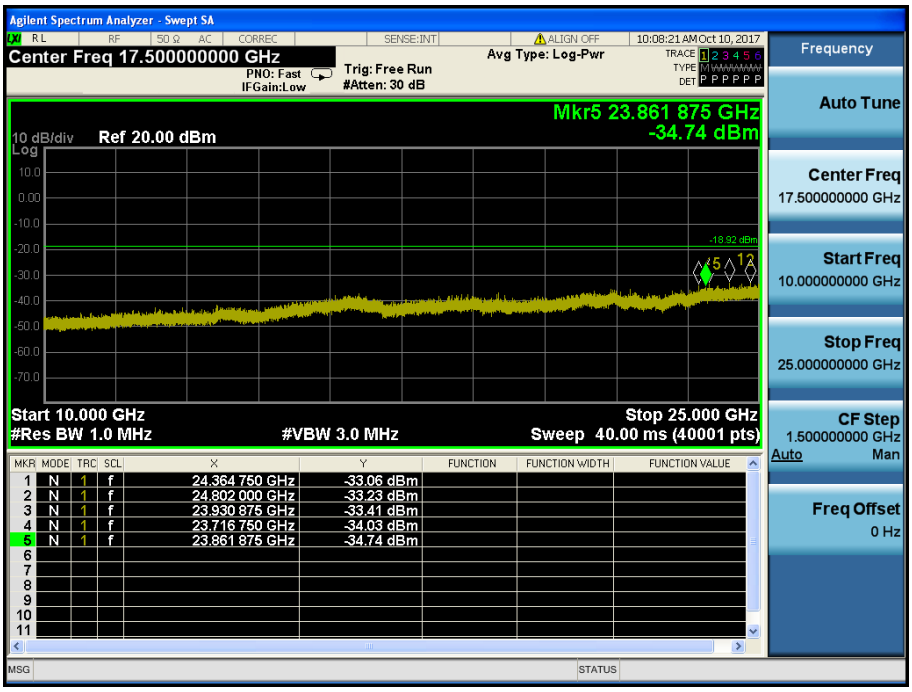
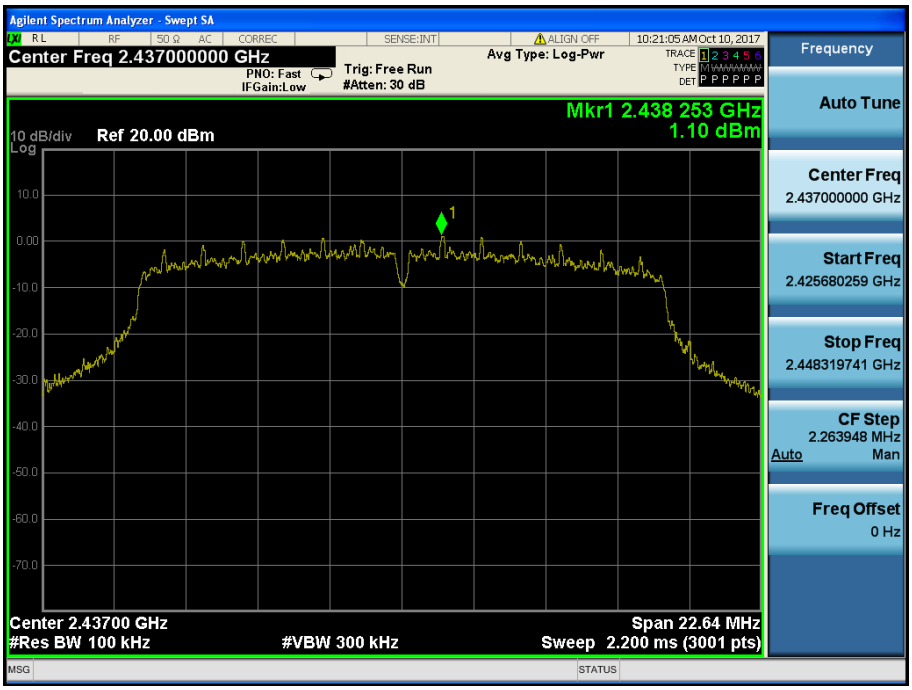
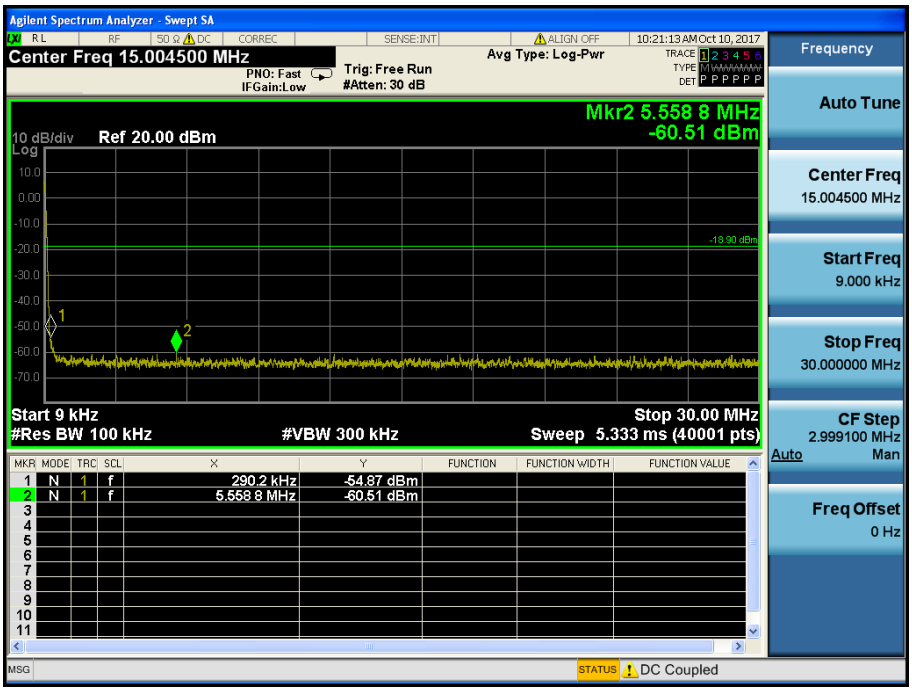


TM 2 & ANT 2 & Middle

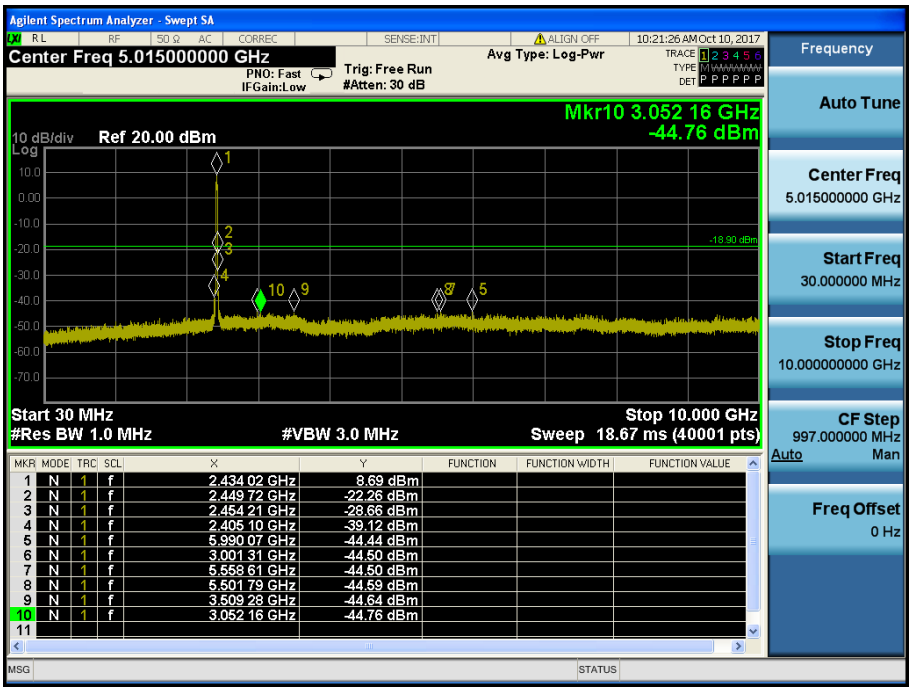
Reference

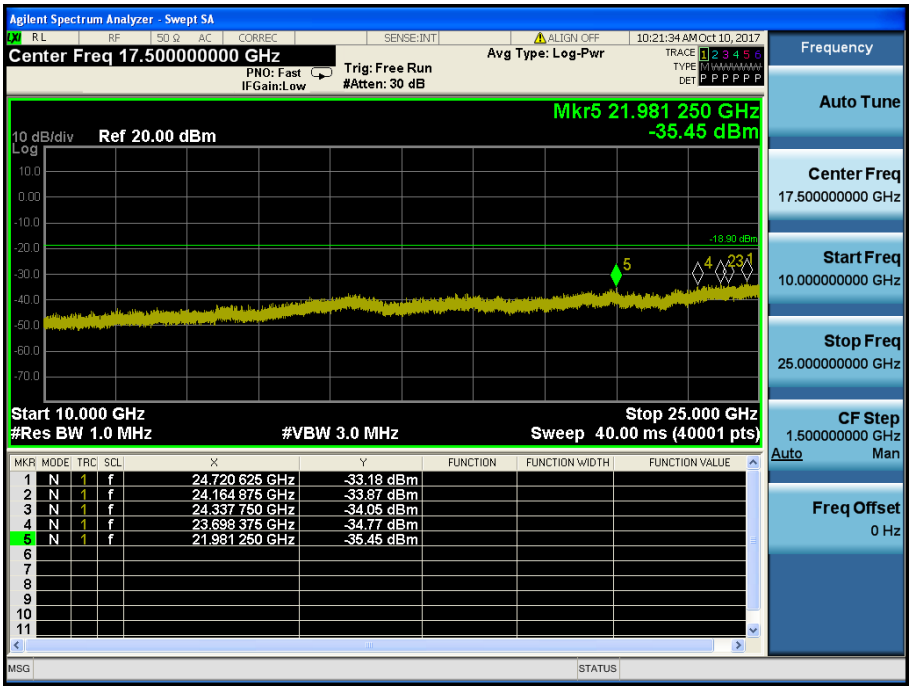


Conducted Spurious Emissions



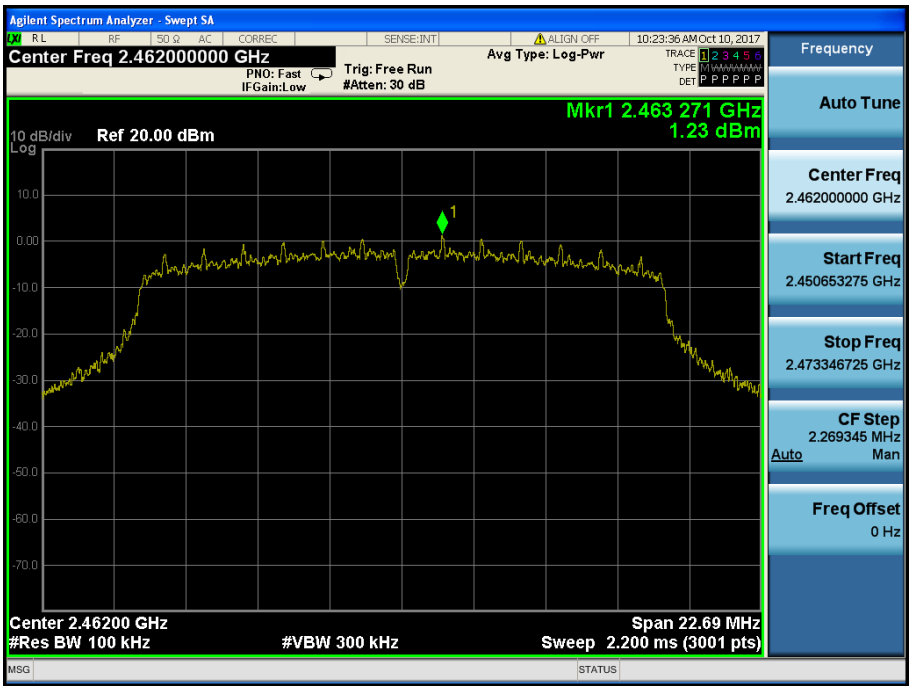
Conducted Spurious Emissions



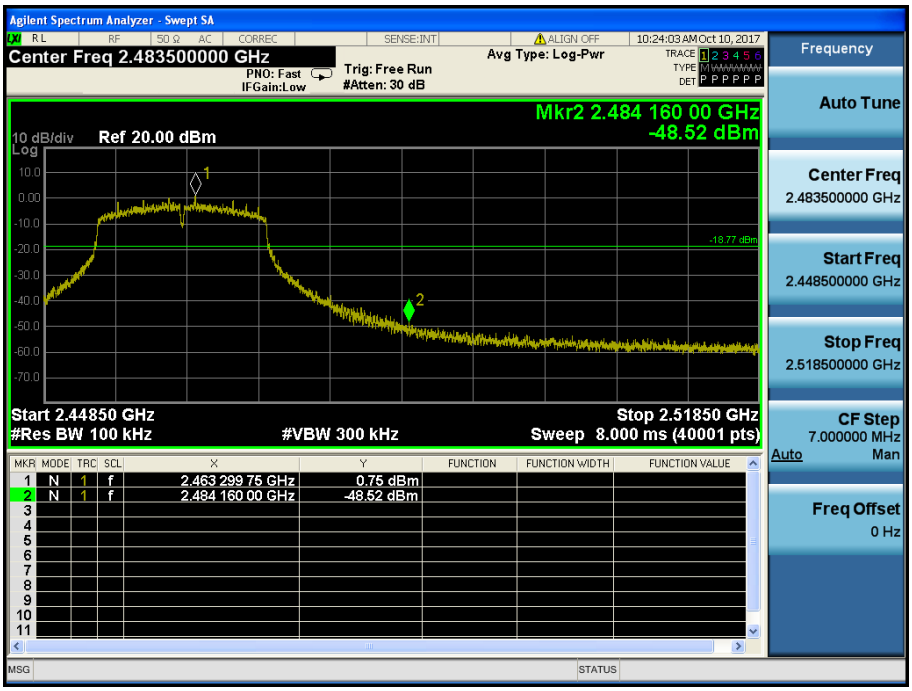


TM 2 & ANT 2 & Highest

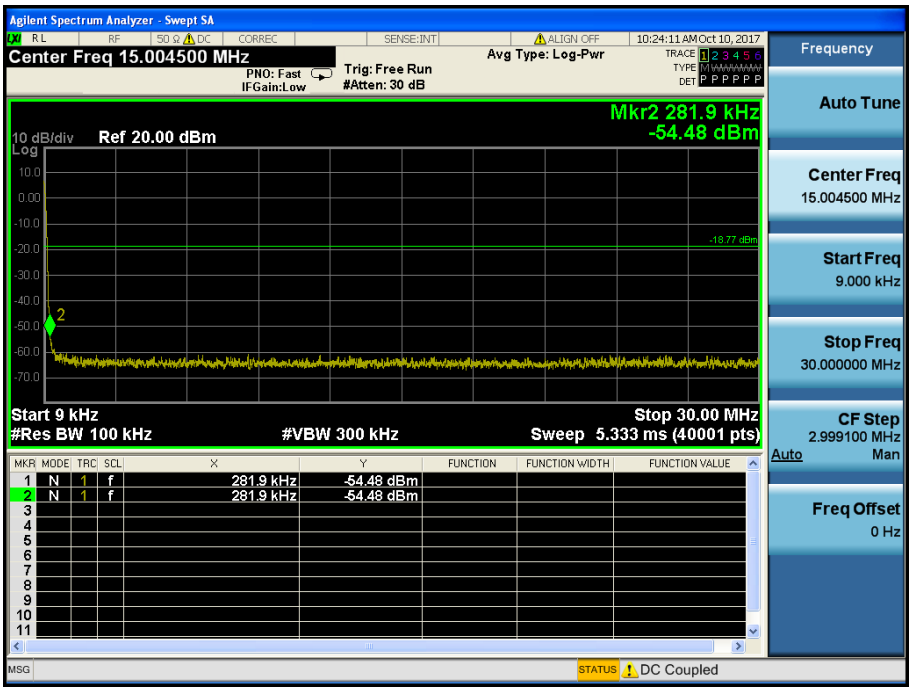
Reference

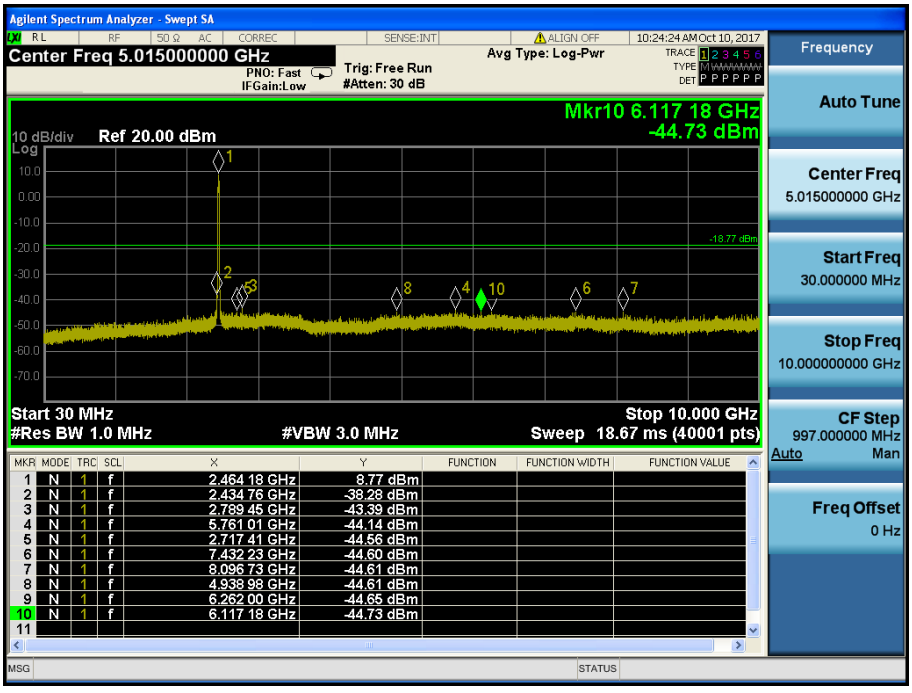


High Band-edge



Conducted Spurious Emissions

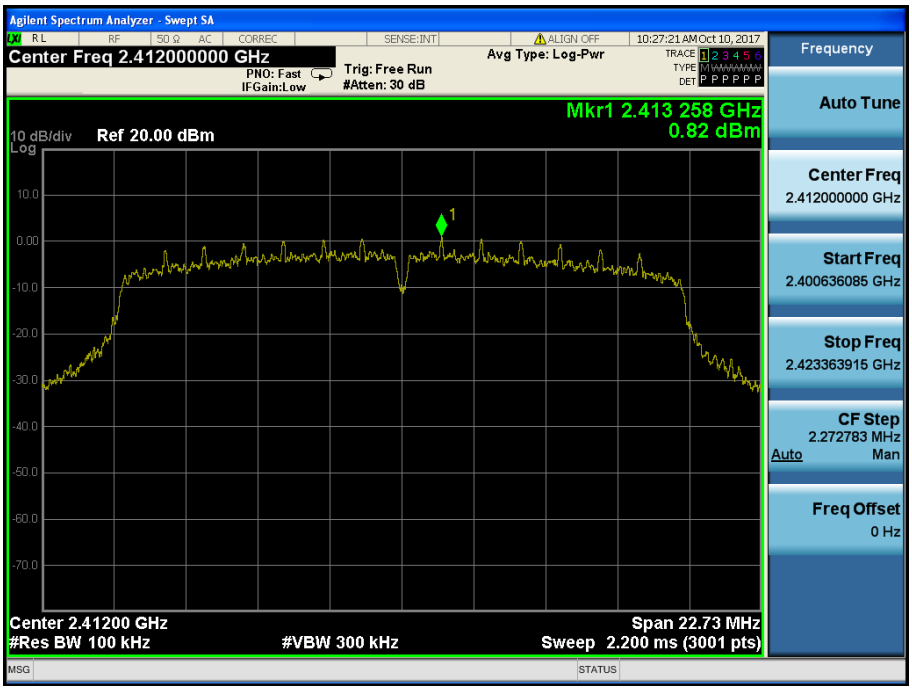




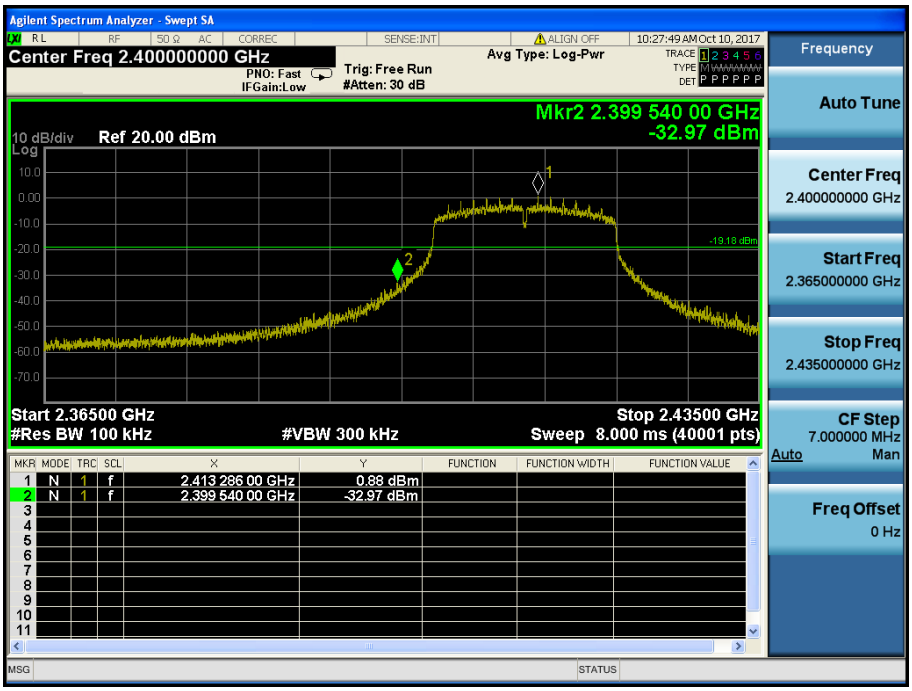
Conducted Spurious Emissions

TM 3 & ANT 2 & Lowest

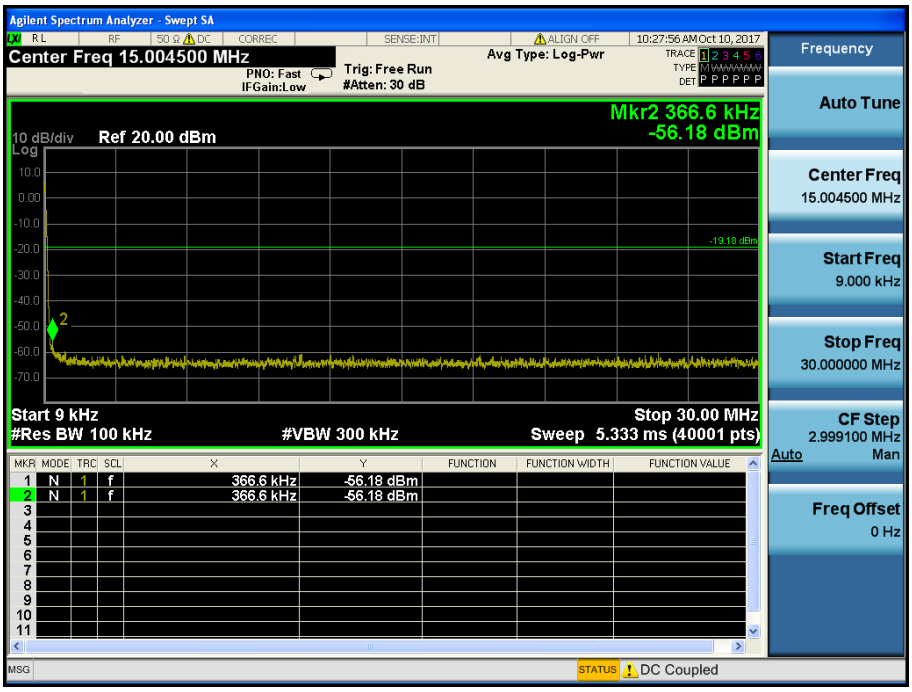
Reference

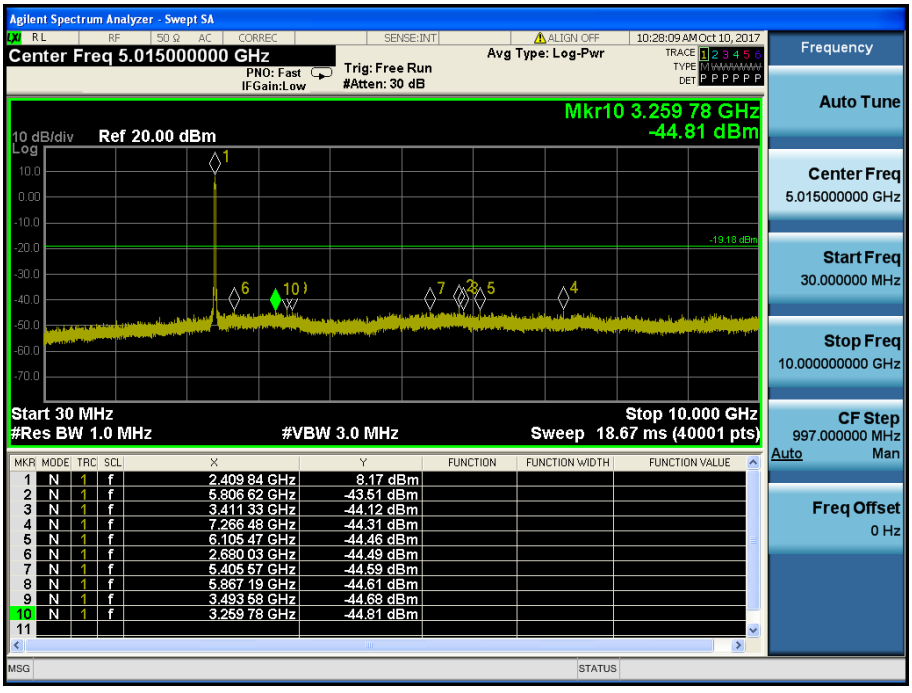


Low Band-edge



Conducted Spurious Emissions





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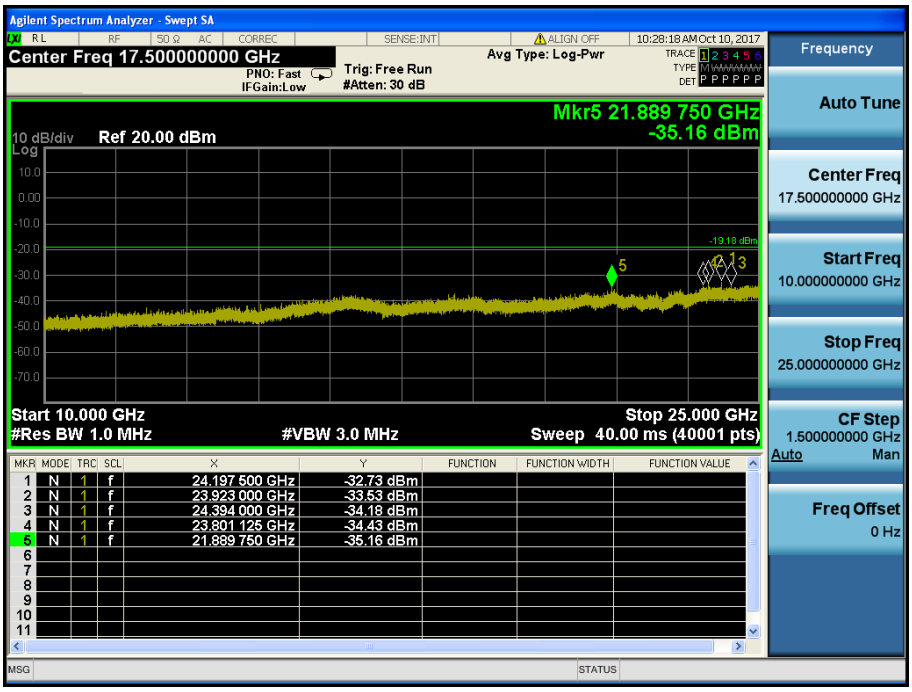
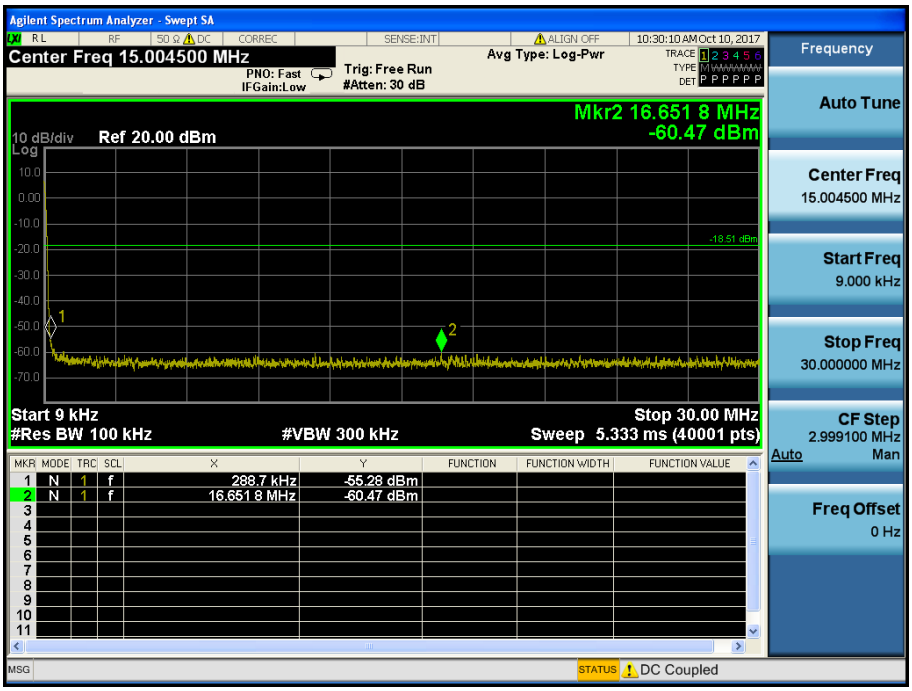


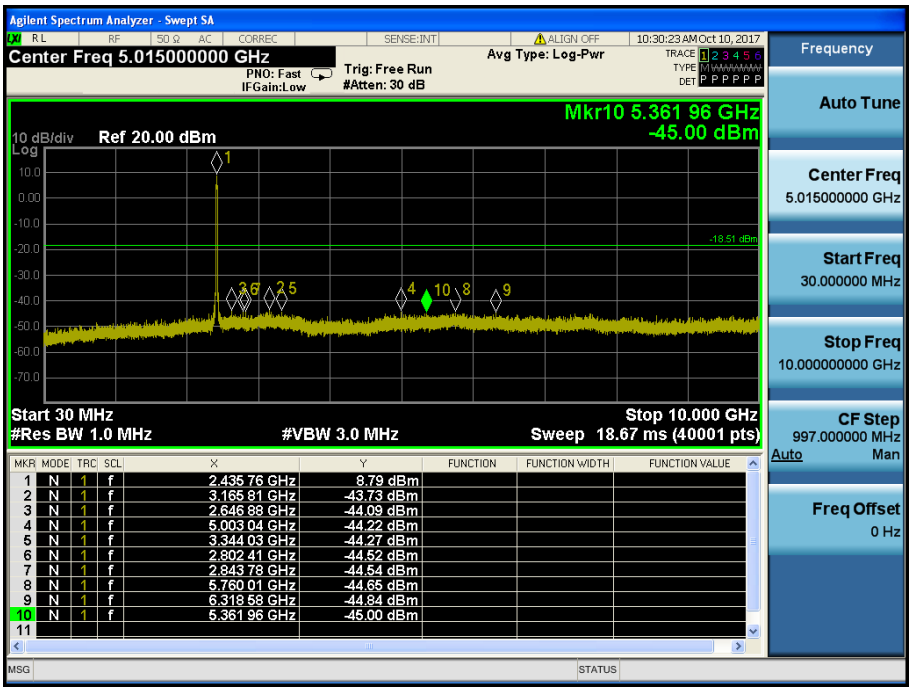
TM 3 & ANT 2 & Middle

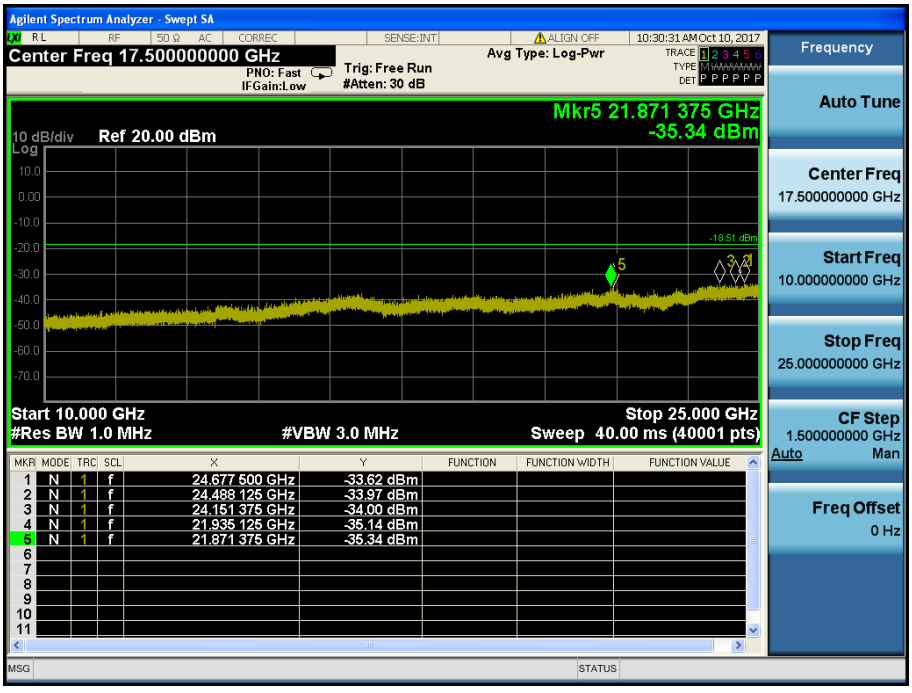
Reference

Conducted Spurious Emissions



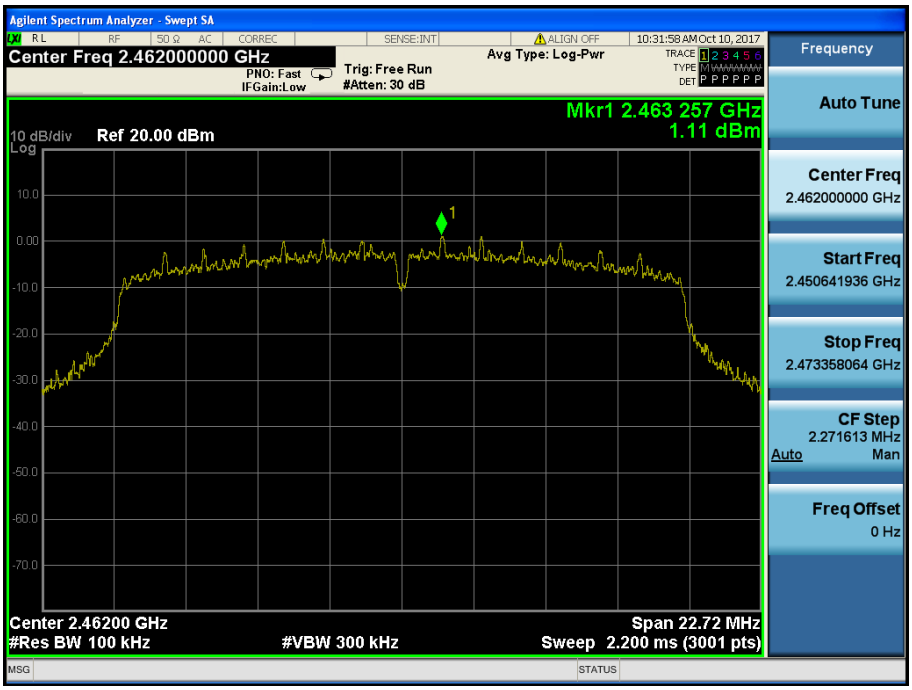
Conducted Spurious Emissions





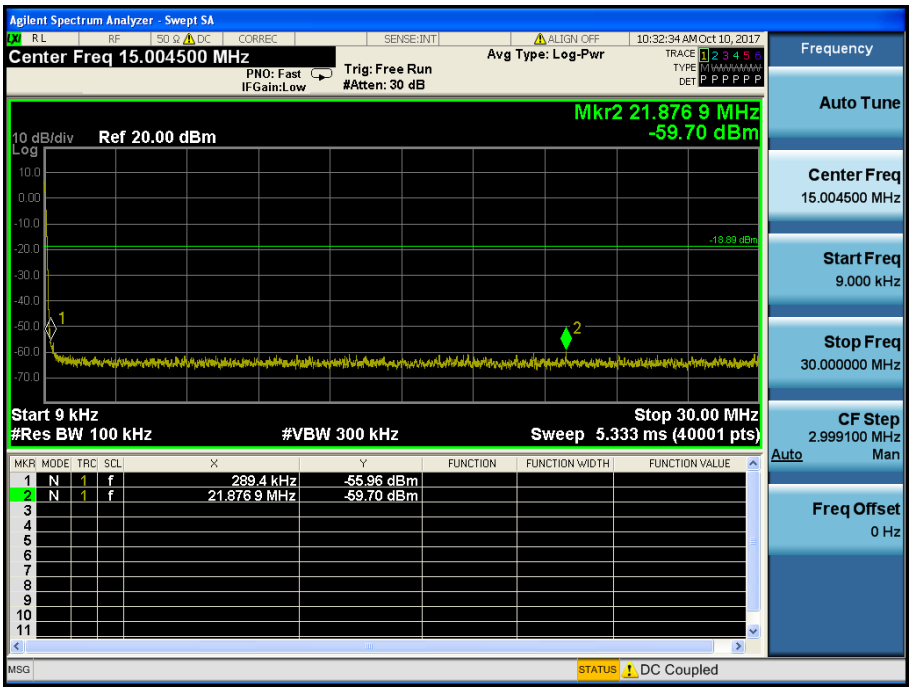
TM 3 & ANT 2 & Highest

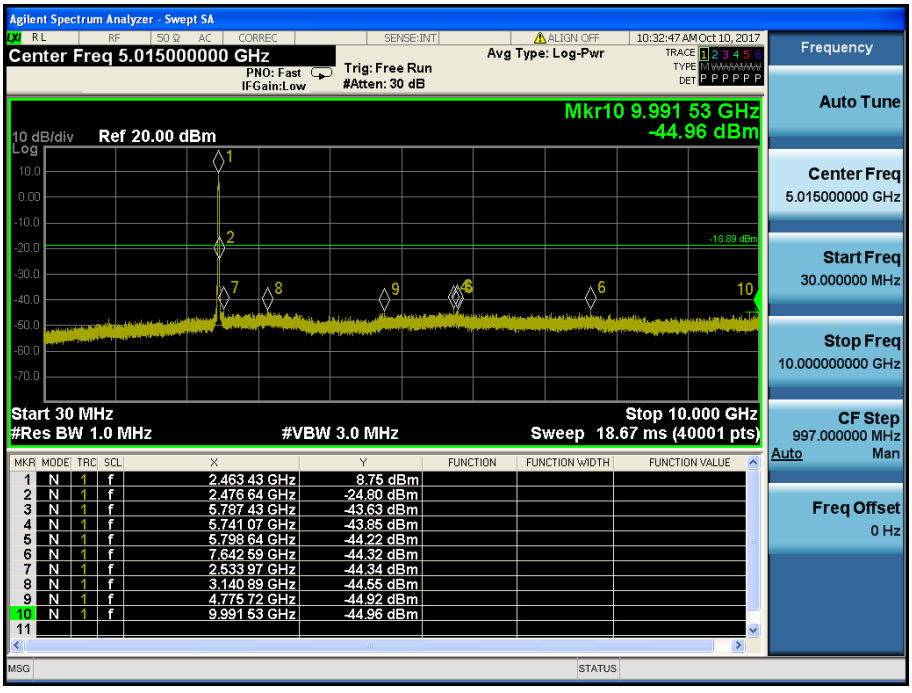
Reference



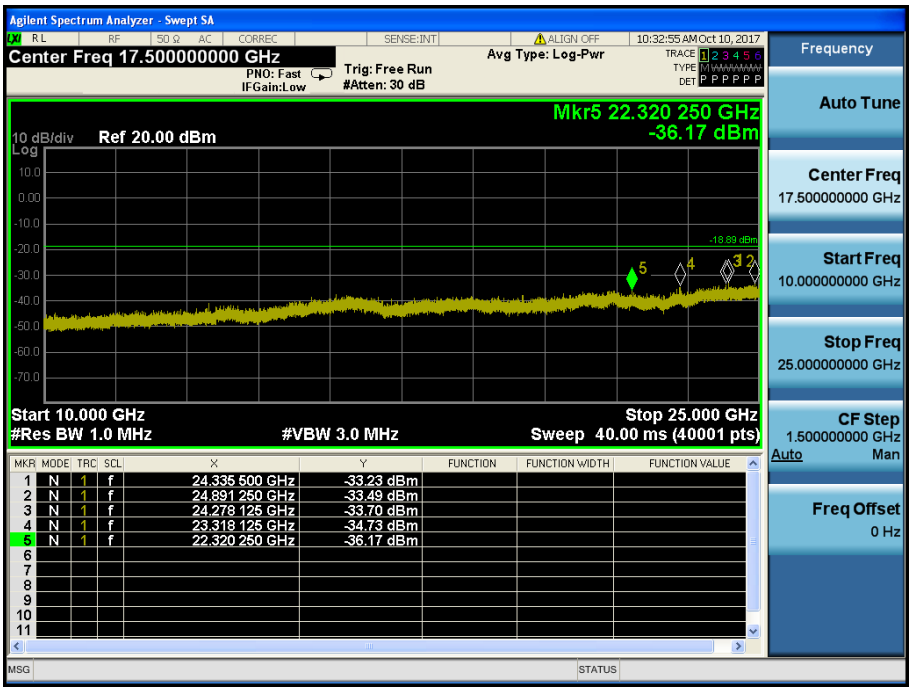
High Band-edge

Conducted Spurious Emissions





Conducted Spurious Emissions



8.5 Radiated Spurious Emissions

Test Requirements and limit,

§15.247(d), §15.205, §15.209

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) and (b), then the 15.209(a) limit in the table below has to be followed

▪ **FCC Part 15.209(a) and (b)**

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
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

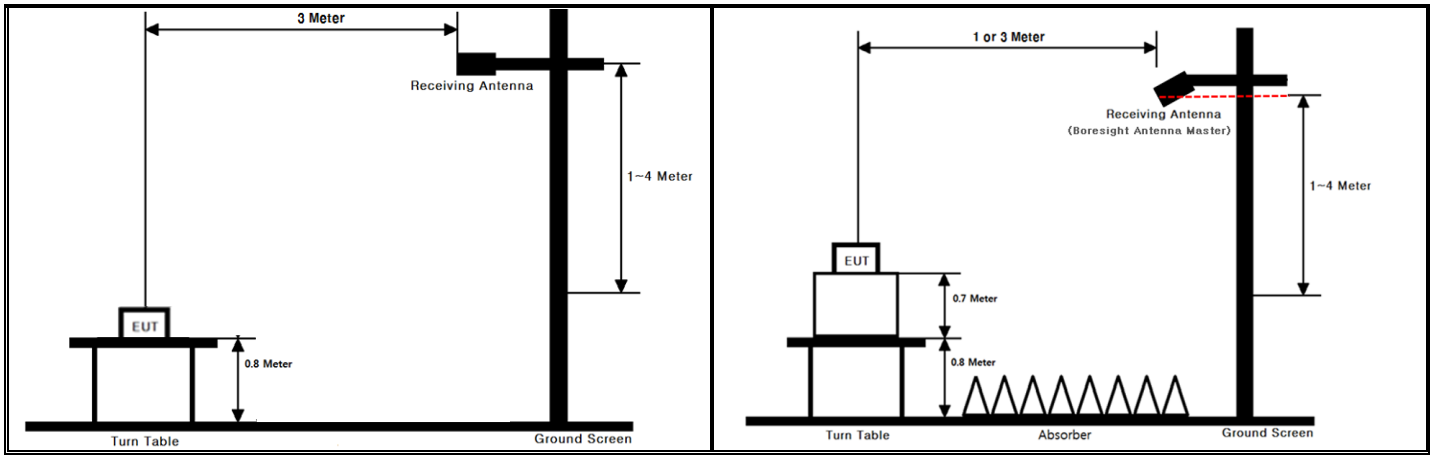
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 - 72 MHz, 76 - 88 MHz, 174 - 216 MHz or 470 - 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ **FCC Part 15.205 (a):** Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900		
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240	3600 ~ 4400		
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

▣ Test Configuration



▣ Test Procedure

1. The EUT is placed on a non-conductive table, emission measurements at below 1 GHz, the table height is 80 cm and above 1 GHz, the table height is 1.5 m.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 1 or 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

▣ Measurement Instrument Setting for Radiated Emission Measurements.

The radiated emission was tested according to the section 6.3, 6.4, 6.5 and 6.6 of the ANSI C63.10-2013 with following settings.

Peak Measurement

RBW = As specified in below table, VBW ≥ 3 x RBW, Sweep = Auto, Detector = Peak, Trace mode = Max Hold until the trace stabilizes.

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

Average Measurement:

1. RBW = 1 MHz (unless otherwise specified).
2. VBW ≥ 3 x RBW.
3. Detector = RMS (Number of points ≥ 2 x Span / RBW)
4. Averaging type = power. (i.e., RMS)
5. Sweep time = auto.
6. Perform a trace average of at least 100 traces.
7. A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:

1) If power averaging (RMS) mode was used in step 4, then the applicable correction factor is 10 log(1/x), where x is the duty cycle.
2) If linear voltage averaging mode was used in step 4, then the applicable correction factor is 20 log(1/x), where x is the duty cycle.
3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

Duty Cycle Correction factor

<ANT 1>

Test Mode	Date rate	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
TM 1	1 Mbps	99.53	0.02
TM 2	6 Mbps	95.52	0.20
TM 3	MCS 0	96.28	0.16

<ANT 2>

Test Mode	Date rate	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
TM 1	1 Mbps	99.53	0.02
TM 2	6 Mbps	96.52	0.15
TM 3	MCS 0	95.93	0.18

Note: Please refer to the appendix I for duty cycle plots.

▣ Test Results: Comply

Please refer to next page for data table and the appendix II for worst data plots.

9 kHz ~ 1 GHz Data

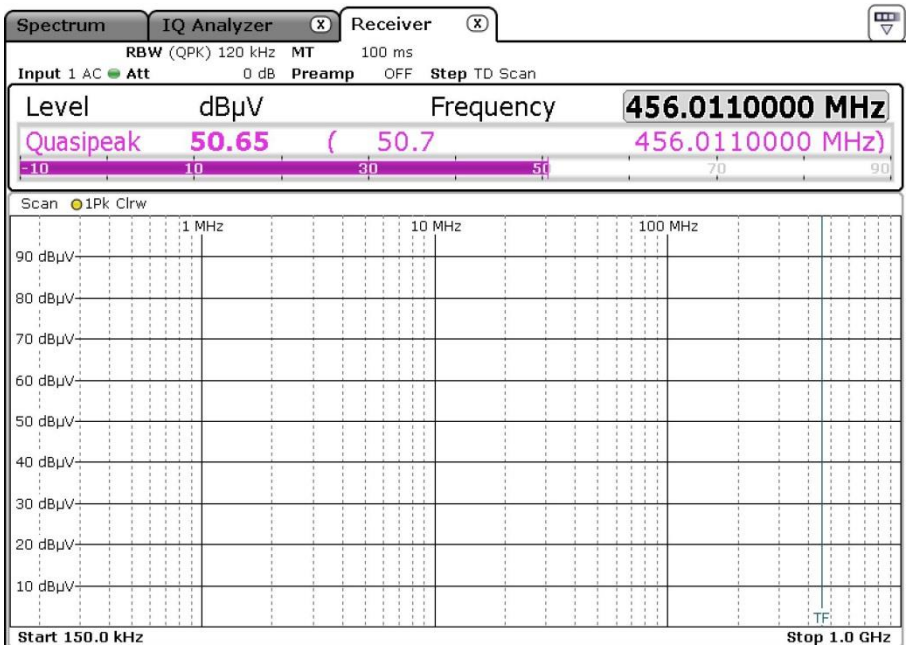
Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F (dB)	Distance Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
263.01	H	Y	QP	55.50	-12.20	N/A	N/A	43.30	46.00	2.70
408.01	H	Y	QP	50.30	-7.10	N/A	N/A	43.20	46.00	2.80
456.01	H	Y	QP	50.70	-5.70	N/A	N/A	45.00	46.00	1.00
503.97	H	Y	QP	46.20	-4.30	N/A	N/A	41.90	46.00	4.10
792.01	H	Y	QP	41.10	1.50	N/A	N/A	42.60	46.00	3.40
840.05	H	Y	QP	41.80	2.90	N/A	N/A	44.70	46.00	1.30
-	-	-	-	-	-	-	-	-	-	-

1. Exploratory testing has been performed to determine the emissions characteristic of this device.
   And low channel of 802.11b & ANT2 mode was selected for final testing and reported.

2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

Worst-case plot

802.11b & Lowest & Y & Hor **Detector Mode : QP**



1 ~ 25 GHz Data (*TM1 & ANT1*)

▪ 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.54	H	Y	PK	52.49	0.70	N/A	N/A	53.19	74.00	20.81
2389.34	H	Y	AV	45.06	0.70	0.02	N/A	45.78	54.00	8.22
4823.72	V	X	PK	43.72	4.85	N/A	N/A	48.57	74.00	25.43
4823.78	V	X	AV	34.14	4.86	0.02	N/A	39.02	54.00	14.98

▪ 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.24	V	X	PK	43.94	5.07	N/A	N/A	49.01	74.00	24.99
4874.02	V	X	AV	34.30	5.07	0.02	N/A	39.39	54.00	14.61

▪ 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.71	H	Y	PK	50.70	0.94	N/A	N/A	51.64	74.00	22.36
2483.64	H	Y	AV	39.74	0.94	0.02	N/A	40.70	54.00	13.30
2488.22	H	Y	PK	50.78	0.97	N/A	N/A	51.75	74.00	22.25
2488.21	H	Y	AV	42.00	0.97	0.02	N/A	42.99	54.00	11.01
4923.77	V	X	PK	44.27	5.23	N/A	N/A	49.50	74.00	24.50
4923.86	V	X	AV	34.11	5.23	0.02	N/A	39.36	54.00	14.64

Note.

1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)

1 ~ 25 GHz Data (*TM2 & ANT1*)

▪ 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.89	H	Z	PK	55.54	0.70	N/A	N/A	56.24	74.00	17.76
2389.85	H	Z	AV	46.03	0.70	0.20	N/A	46.93	54.00	7.07
4822.60	V	X	PK	44.29	4.85	N/A	N/A	49.14	74.00	24.86
4822.60	V	X	AV	32.79	4.85	0.20	N/A	37.84	54.00	16.16

▪ 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4872.87	V	X	PK	42.91	5.07	N/A	N/A	47.98	74.00	26.02
4872.88	V	X	AV	32.29	5.07	0.20	N/A	37.56	54.00	16.44

▪ 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.87	H	Z	PK	56.96	0.94	N/A	N/A	57.90	74.00	16.10
2483.71	H	Z	AV	45.45	0.94	0.20	N/A	46.59	54.00	7.41
4925.26	V	X	PK	43.82	5.24	N/A	N/A	49.06	74.00	24.94
4925.32	V	X	AV	32.62	5.24	0.20	N/A	38.06	54.00	15.94

Note.

1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)

1 ~ 25 GHz Data (*TM3 & ANT1*)

▪ 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.38	H	Z	PK	58.19	0.70	N/A	N/A	58.89	74.00	15.11
2389.41	H	Z	AV	46.52	0.70	0.16	N/A	47.38	54.00	6.62
4824.65	V	X	PK	43.41	4.86	N/A	N/A	48.27	74.00	25.73
4824.69	V	X	AV	32.21	4.86	0.16	N/A	37.23	54.00	16.77

▪ 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4875.32	V	X	PK	43.43	5.08	N/A	N/A	48.51	74.00	25.49
4875.35	V	X	AV	32.45	5.08	0.16	N/A	37.69	54.00	16.31

▪ 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.74	H	Z	PK	63.08	0.94	N/A	N/A	64.02	74.00	9.98
2483.92	H	Z	AV	46.78	0.94	0.16	N/A	47.88	54.00	6.12
4924.46	V	X	PK	43.47	5.23	N/A	N/A	48.70	74.00	25.30
4924.44	V	X	AV	32.71	5.23	0.16	N/A	38.10	54.00	15.90

Note.

1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)

1 ~ 25 GHz Data (*TM 1 & ANT2*)

▪ 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.27	H	Y	PK	49.80	0.70	N/A	N/A	50.50	74.00	23.50
2389.10	H	Y	AV	41.47	0.70	0.02	N/A	42.19	54.00	11.81
4823.87	V	X	PK	44.45	4.86	N/A	N/A	49.31	74.00	24.69
4823.88	V	X	AV	34.49	4.86	0.02	N/A	39.37	54.00	14.63

▪ 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.41	V	X	PK	44.61	5.07	N/A	N/A	49.68	74.00	24.32
4874.04	V	X	AV	35.94	5.07	0.02	N/A	41.03	54.00	12.97

▪ 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.83	H	Y	PK	49.46	0.94	N/A	N/A	50.40	74.00	23.60
2483.84	H	Y	AV	39.88	0.94	0.02	N/A	40.84	54.00	13.16
2488.65	H	Y	PK	51.64	0.98	N/A	N/A	52.62	74.00	21.38
2488.57	H	Y	AV	43.16	0.98	0.02	N/A	44.16	54.00	9.84
4923.68	V	X	PK	45.63	5.23	N/A	N/A	50.86	74.00	23.14
4924.10	V	X	AV	37.02	5.23	0.02	N/A	42.27	54.00	11.73

Note.

1 The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

2 Sample Calculation.
Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

3 Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)

1 ~ 25 GHz Data (*TM 2 & ANT2*)

▪ 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.34	H	Z	PK	51.82	0.70	N/A	N/A	52.52	74.00	21.48
2389.49	H	Z	AV	41.68	0.70	0.15	N/A	42.53	54.00	11.47
4825.40	V	X	PK	44.07	4.86	N/A	N/A	48.93	74.00	25.07
4825.40	V	X	AV	33.35	4.86	0.15	N/A	38.36	54.00	15.64

▪ 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4871.61	V	X	PK	43.79	5.06	N/A	N/A	48.85	74.00	25.15
4871.62	V	X	AV	33.60	5.06	0.15	N/A	38.81	54.00	15.19

▪ 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.61	H	Z	PK	58.07	0.94	N/A	N/A	59.01	74.00	14.99
2483.53	H	Z	AV	45.61	0.94	0.15	N/A	46.70	54.00	7.30
4823.50	V	X	PK	44.74	5.23	N/A	N/A	49.97	74.00	24.03
4823.52	V	X	AV	33.40	5.23	0.15	N/A	38.78	54.00	15.22

Note.

1 The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.

2 Sample Calculation.
Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

3 Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)

1 ~ 25 GHz Data (*TM 3 & ANT2*)

▪ 2412 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2389.47	H	Z	PK	51.43	0.70	N/A	N/A	52.13	74.00	21.87
2389.47	H	Z	AV	40.66	0.70	0.18	N/A	41.54	54.00	12.46
4820.85	V	X	PK	43.82	4.84	N/A	N/A	48.66	74.00	25.34
4820.88	V	X	AV	33.26	4.84	0.18	N/A	38.28	54.00	15.72

▪ 2437 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4876.00	H	Z	PK	44.50	5.08	N/A	N/A	49.58	74.00	24.42
4875.98	H	Z	AV	32.79	5.08	0.18	N/A	38.05	54.00	15.95

▪ 2462 MHz

Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	DCF (dB)	Distance Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.02	H	Z	PK	60.66	0.94	N/A	N/A	61.60	74.00	12.40
2483.95	H	Z	AV	45.41	0.94	0.18	N/A	46.53	54.00	7.47
4922.53	V	X	PK	44.71	5.23	N/A	N/A	49.94	74.00	24.06
4922.52	V	X	AV	33.04	5.23	0.18	N/A	38.45	54.00	15.55

Note.

1. The radiated emissions were investigated up to 25GHz. And no other spurious and harmonic emissions were found above listed frequencies.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCCF + DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor
3. Measurement Distance = 3 m for below 10 GHz, Measurement Distance = 1 m for above 10 GHz.
   Therefore Distance Correction Factor(DCF) : - 9.54 dB = 20*log(1m/3m)

8.6 Power-line conducted emissions

Test Requirements and limit, §15.207

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
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

▣ TEST CONFIGURATION

See test photographs for the actual connections between EUT and support equipment.

▣ TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to the test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

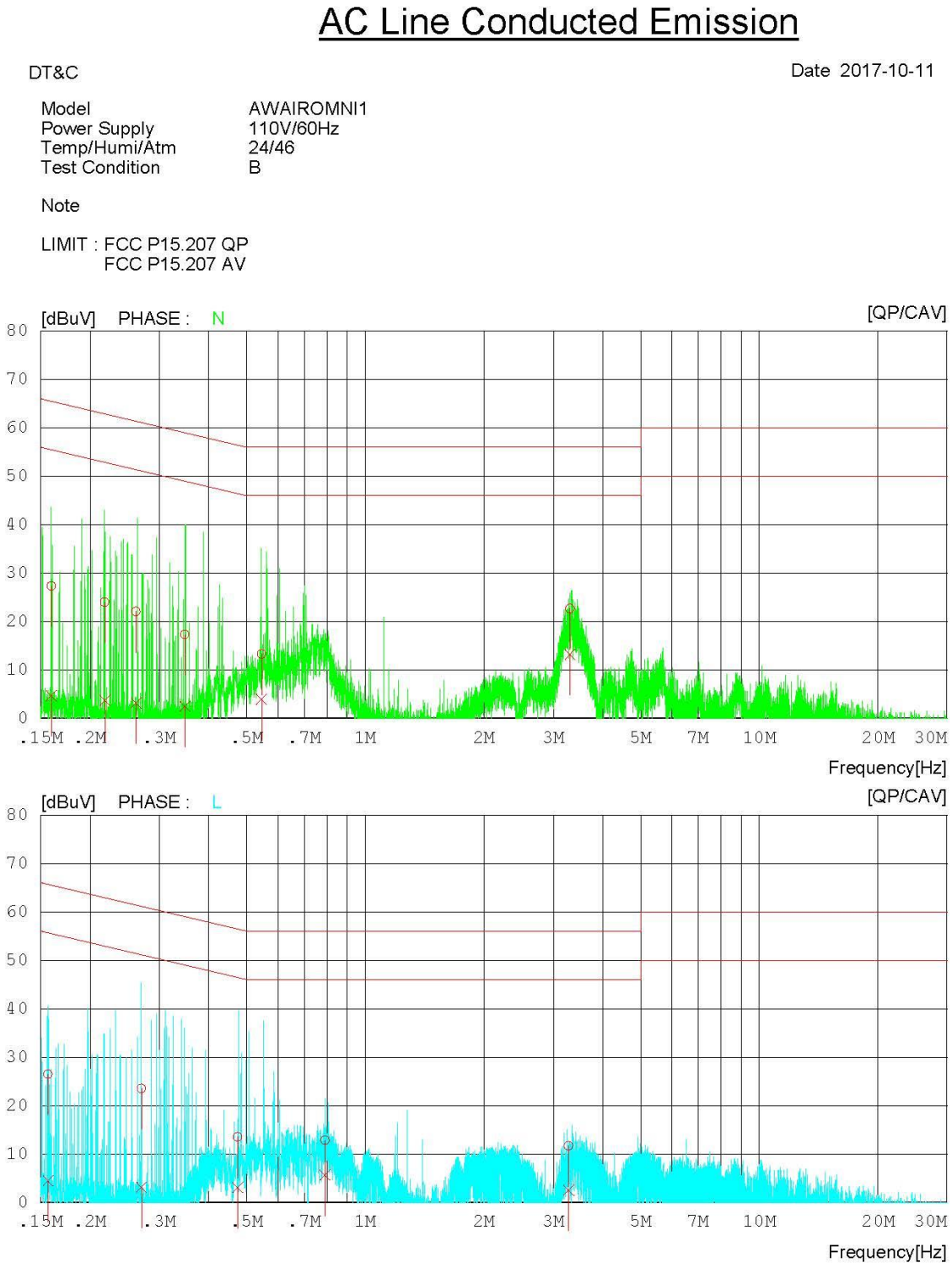
▣ Test Results: Comply(Refer to next page.)

The worst data was reported.

▣ RESULT PLOTS

AC Line Conducted Emissions (Graph)

TM 1 & ANT 2 & Lowest



AC Line Conducted Emissions (List)

TM 1 & ANT 2 & Lowest

AC Line Conducted Emission

DT&C Date 2017-10-11

Model	AWAIROMNI1
Power Supply	110V/60Hz
Temp/Humi/Atm	24/46
Test Condition	B

Note

LIMIT : FCC P15.207 QP
FCC P15.207 AV

NO	FREQ	READING QP	READING CAV	C.FACTOR	RESULT QP	RESULT CAV	LIMIT QP	LIMIT CAV	MARGIN QP	MARGIN CAV	PHASE
	[MHz]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	
1	0.15954	27.19	4.62	0.08	27.27	4.70	65.49	55.49	38.22	50.79	N
2	0.21820	23.87	3.59	0.08	23.95	3.67	62.89	52.89	38.94	49.22	N
3	0.26196	22.00	3.07	0.07	22.07	3.14	61.37	51.37	39.30	48.23	N
4	0.34842	17.23	2.34	0.08	17.31	2.42	59.00	49.00	41.69	46.58	N
5	0.54527	13.14	3.79	0.08	13.22	3.87	56.00	46.00	42.78	42.13	N
6	3.30606	22.41	13.03	0.17	22.58	13.20	56.00	46.00	33.42	32.80	N
7	0.15654	26.35	4.36	0.08	26.43	4.44	65.65	55.65	39.22	51.21	L
8	0.27026	23.46	3.06	0.07	23.53	3.13	61.11	51.11	37.58	47.98	L
9	0.47380	13.44	2.95	0.08	13.52	3.03	56.45	46.45	42.93	43.42	L
10	0.79000	12.66	5.58	0.09	12.75	5.67	56.00	46.00	43.25	40.33	L
11	3.28097	11.50	2.39	0.16	11.66	2.55	56.00	46.00	44.34	43.45	L

8.7 Occupied Bandwidth

Test Requirements, RSS-Gen [6.6]

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

▣ TEST CONFIGURATION

Refer to the APPENDIX I.

▣ TEST PROCEDURE

- The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
- The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
- The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3x RBW.

▣ TEST RESULTS: NT

7. LIST OF TEST EQUIPMENT

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	Agilent Technologies	N9020A	17/01/11	18/01/11	MY50200828
Spectrum Analyzer	Agilent Technologies	N9020A	17/09/05	18/09/05	MY46471251
Multimeter	FLUKE	17B	17/04/12	18/04/12	26030065WS
DC Power Supply	Agilent	66332A	17/09/05	18/09/05	GB42110550
Signal Generator	Rohde Schwarz	SMBV100A	17/01/04	18/01/04	255571
Signal Generator	Rohde Schwarz	SMF100A	17/04/21	18/04/21	102341
Thermohygrometer	BODYCOM	BJ5478	17/04/11	18/04/11	120612-2
50W 10dB ATT	SMAJK	SMAJK-50-10	17/09/06	18/09/06	2-50-10
Loop Antenna	Schwarzbeck	FMZB1513	16/04/22	18/04/22	1513-128
BILOG ANTENNA	Schwarzbeck	VULB 9160	16/05/13	18/05/13	3358
Horn Antenna	ETS-LINDGREN	3117	16/05/03	18/05/03	00140394
Horn Antenna	A.H.Systems Inc.	SAS-574	17/07/31	19/07/31	155
PreAmplifier	Agilent	8449B	17/01/11	18/01/11	3008A00370
PreAmplifier	TSJ	MLA-010K01-B01-27	17/03/06	18/03/06	1844539
EMI Test Receiver	Rohde Schwarz	ESR7	17/02/16	18/02/16	101061
High-pass filter	Wainwright	WHKX12-2580-3000-18000-80SS	16/09/09 17/09/05	18/09/05	3
High-pass filter	Wainwright	WHNX6-6320-8000-26500-40CC	16/09/13 17/09/05	18/09/05	1
Power Meter & Wide Bandwidth Sensor	Anritsu	ML2496A MA2411B	17/04/11	18/04/11	1338004 1306053
EMI Test Receiver	R&S	ESCI	17/02/26	18/02/16	100364
SINGLE-PHASE MASTER	NF	4420	17/09/01	18/09/01	3049354420023
LISN	SCHWARZBECK	NNLK 8121	17/04/03	18/04/03	06182

Note: The measurement antennas were calibrated in accordance to the requirements of ANSI C63.5-2006.

APPENDIX I

Duty cycle plots

▣ TEST PROCEDURE

Duty Cycle measured using **section 6.0 b) of KDB558074 D01V04**

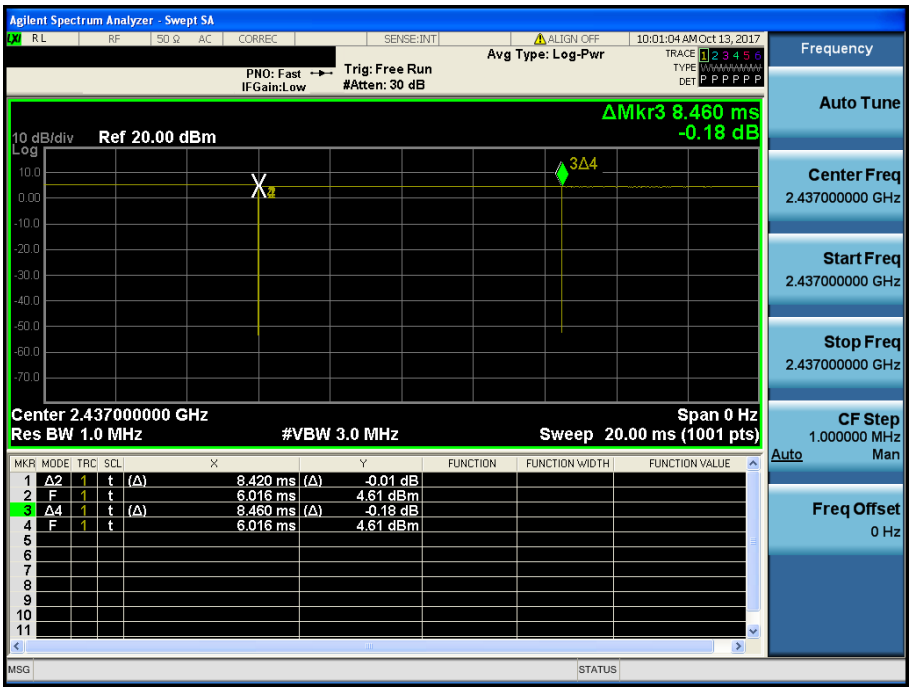
The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal.

Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ OBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average.

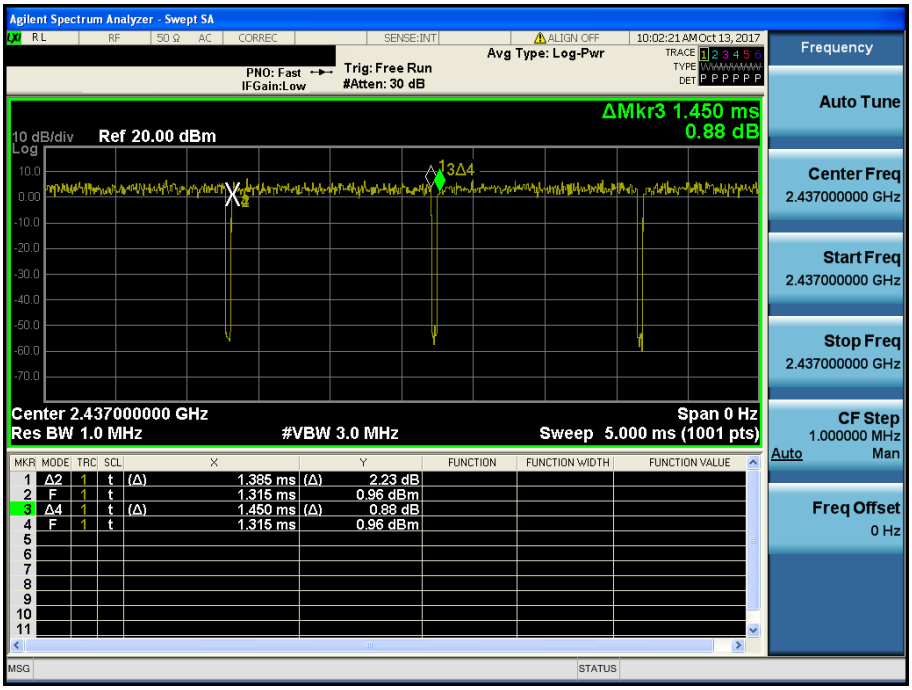
The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

Test Plots :

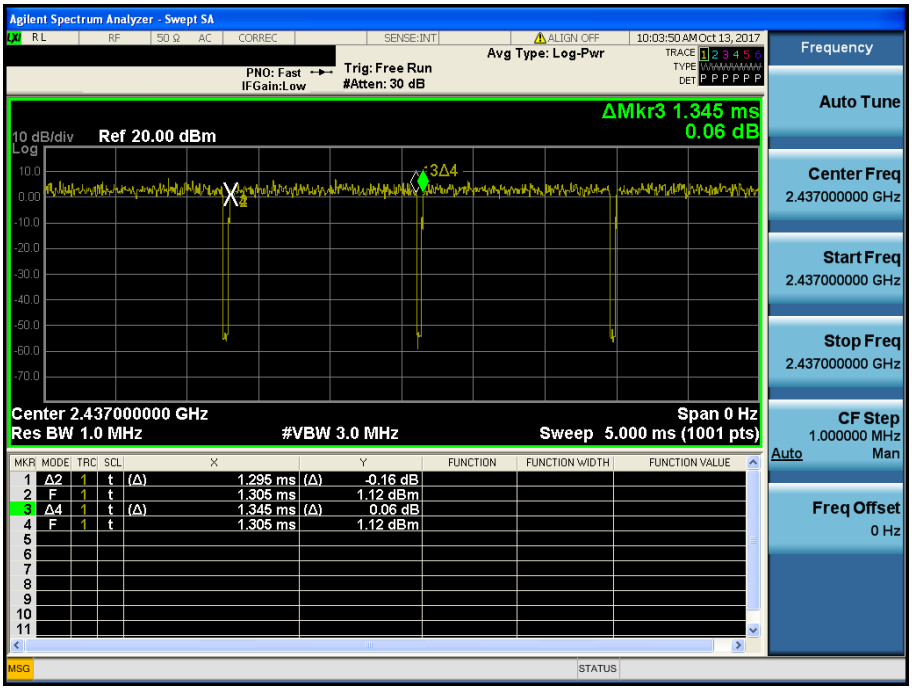
Duty Cycle TM1 & ANT1 & Lowest



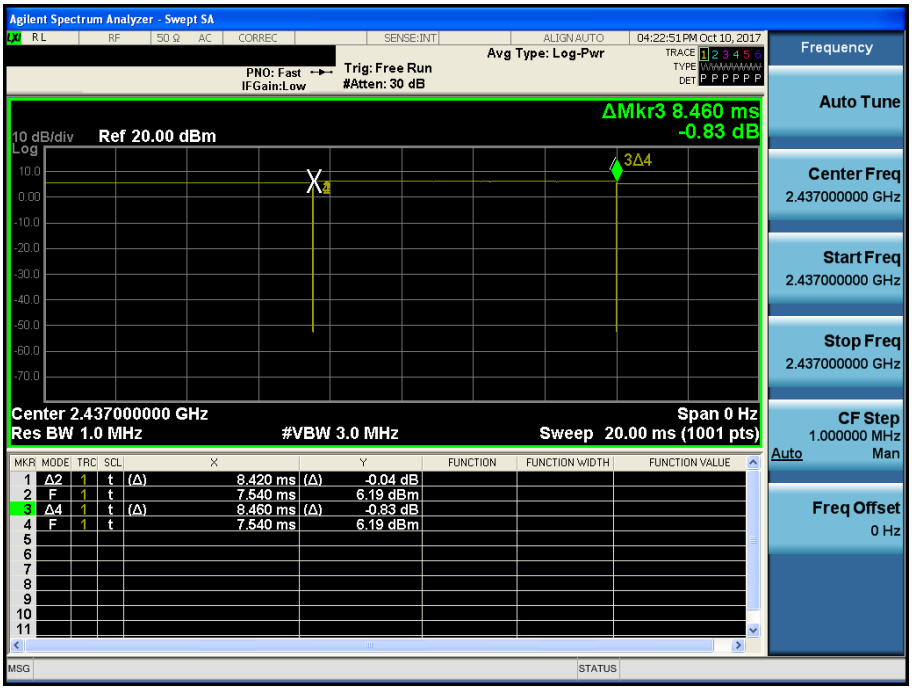
Duty Cycle TM2 & ANT1 & Middle



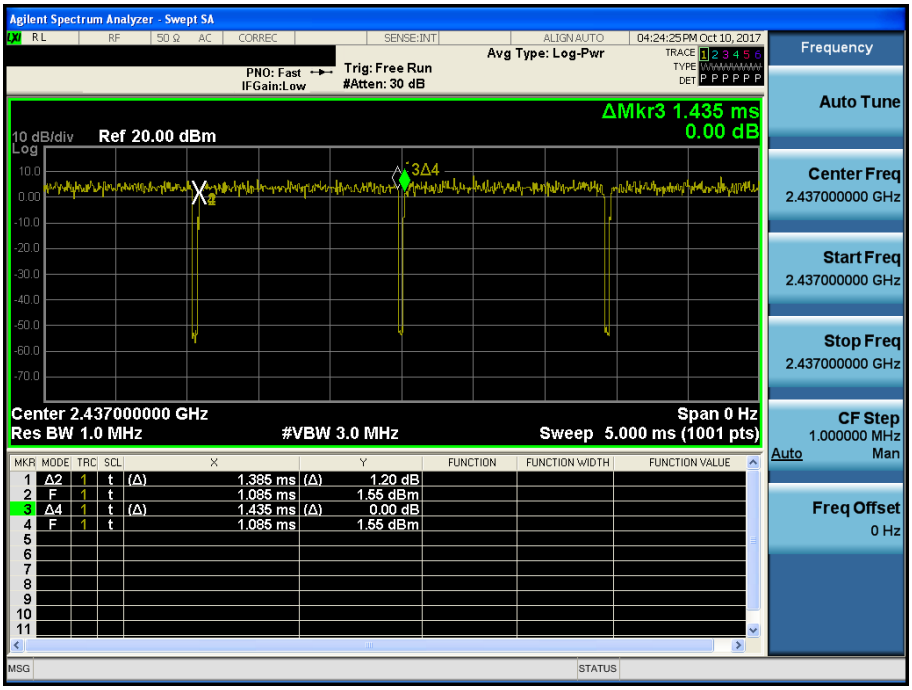
Duty Cycle TM3 & ANT1 & Middle



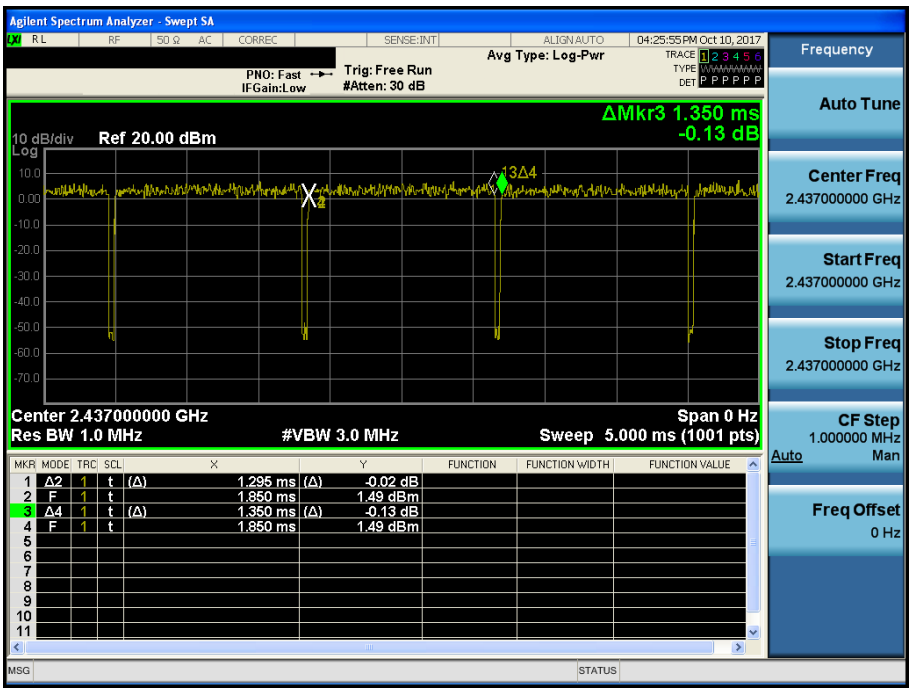
Duty Cycle TM1 & ANT2 Middle



Duty Cycle TM2 & ANT2 & Middle



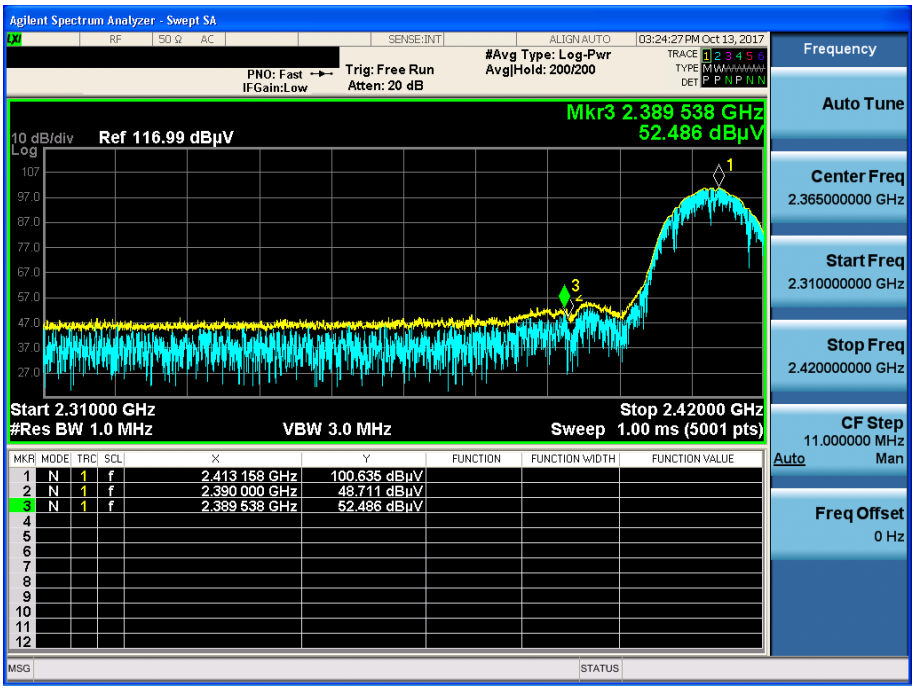
Duty Cycle TM3 & ANT2 & Middle



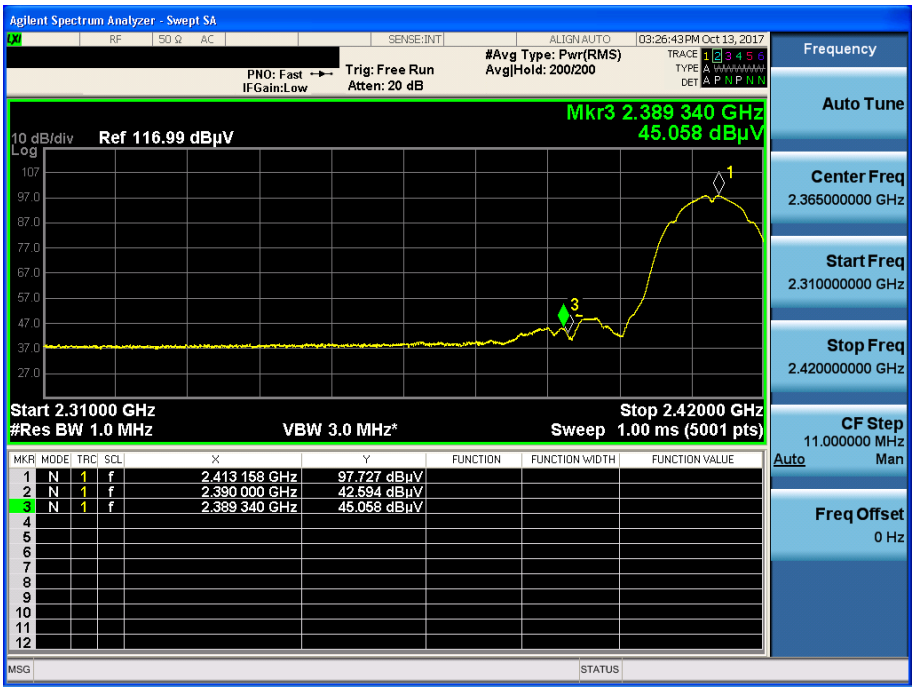
APPENDIX II

Unwanted Emissions (Radiated) Test Plot

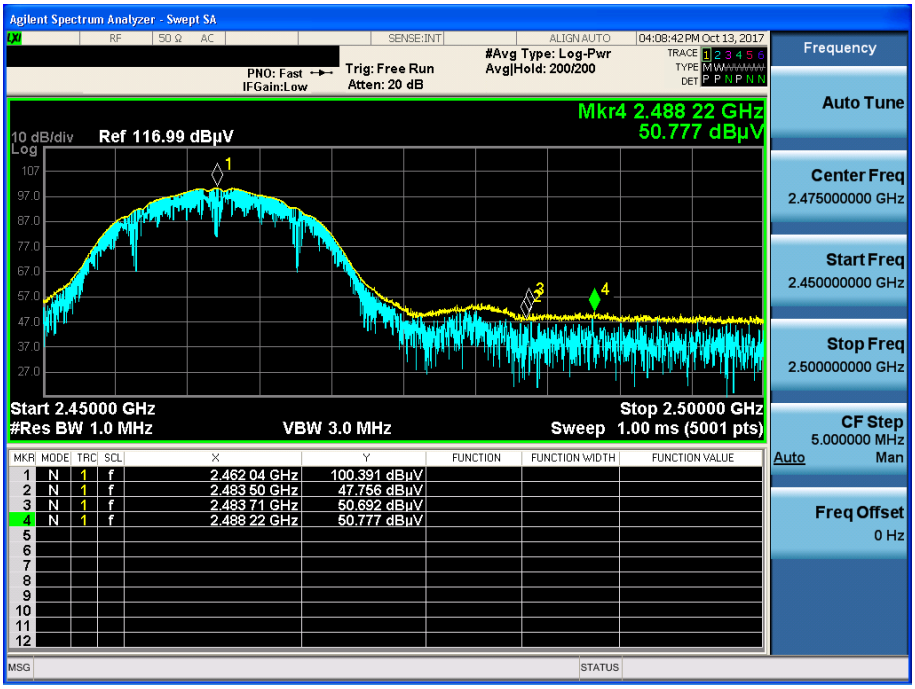
TM1 & ANT1 & Lowest & Y & Hor — Detector Mode : PK



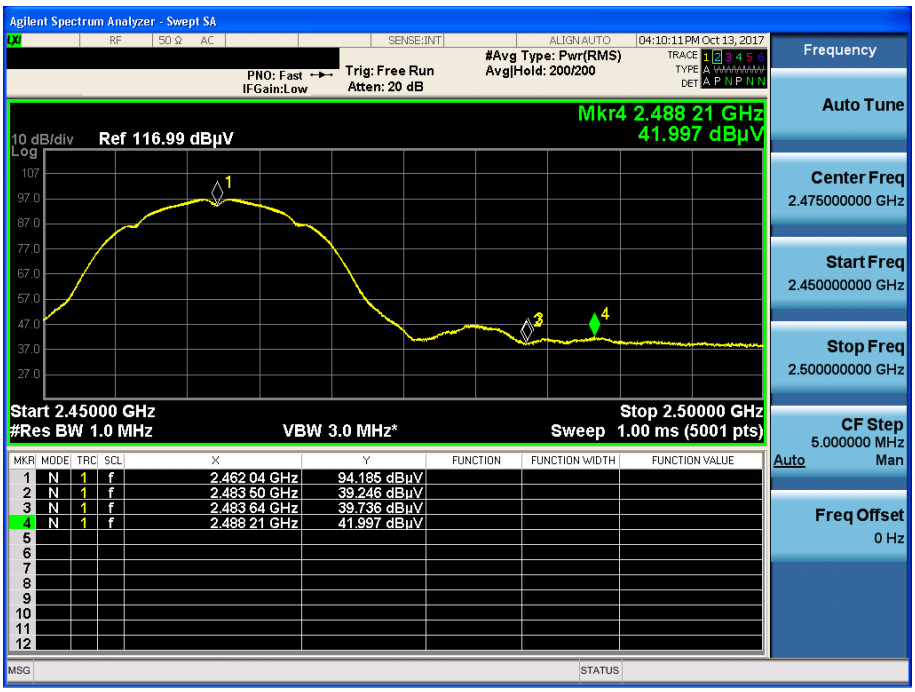
TM1 & ANT1 & Lowest & Y & Hor — Detector Mode : AV



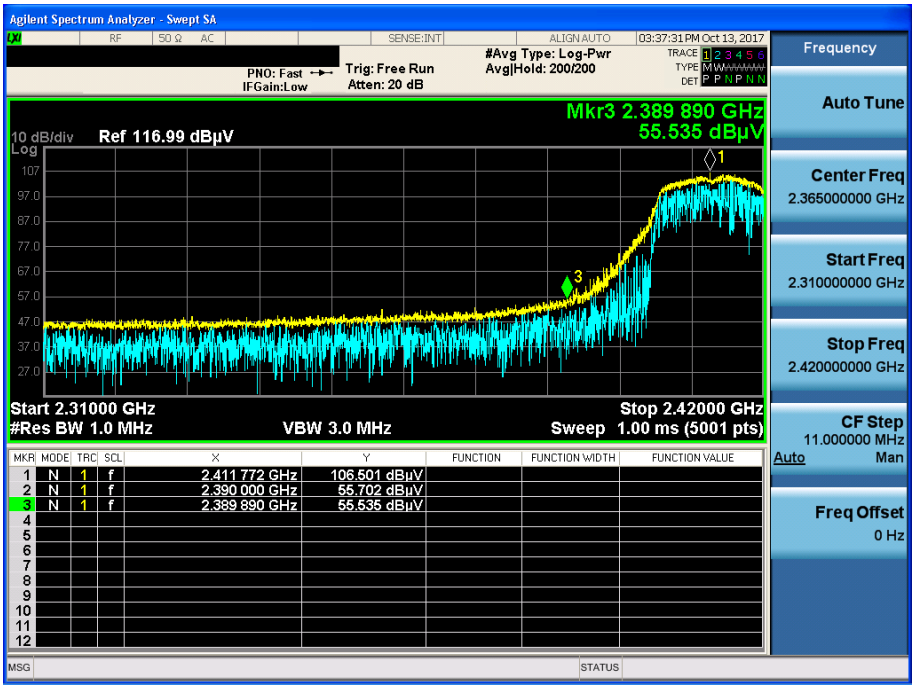
TM1 & ANT1 & Highest & Y & Hor **Detector Mode : PK**



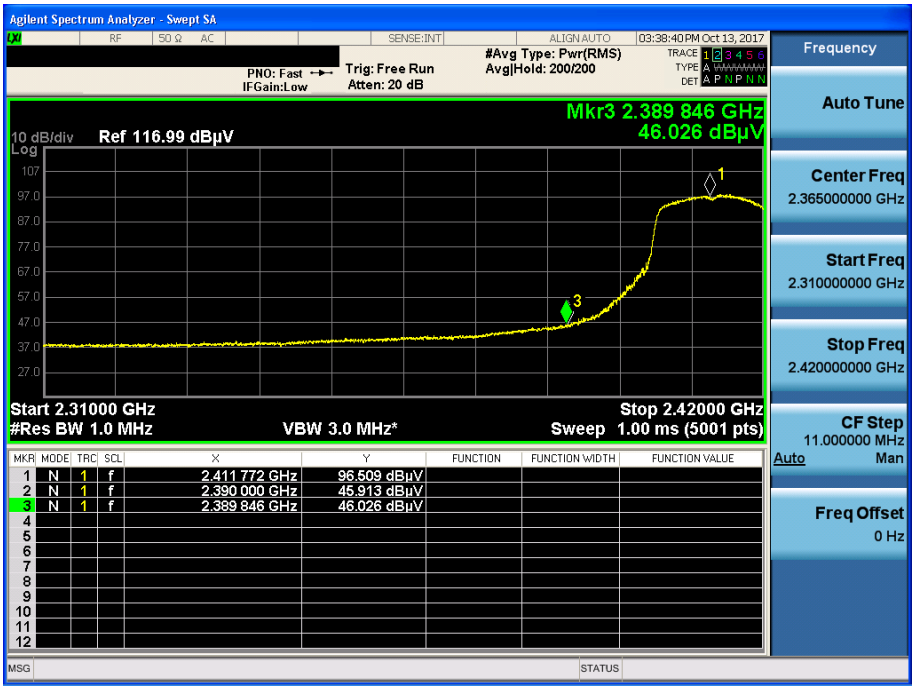
TM1 & ANT1 & Highest & Y & Hor **Detector Mode : AV**



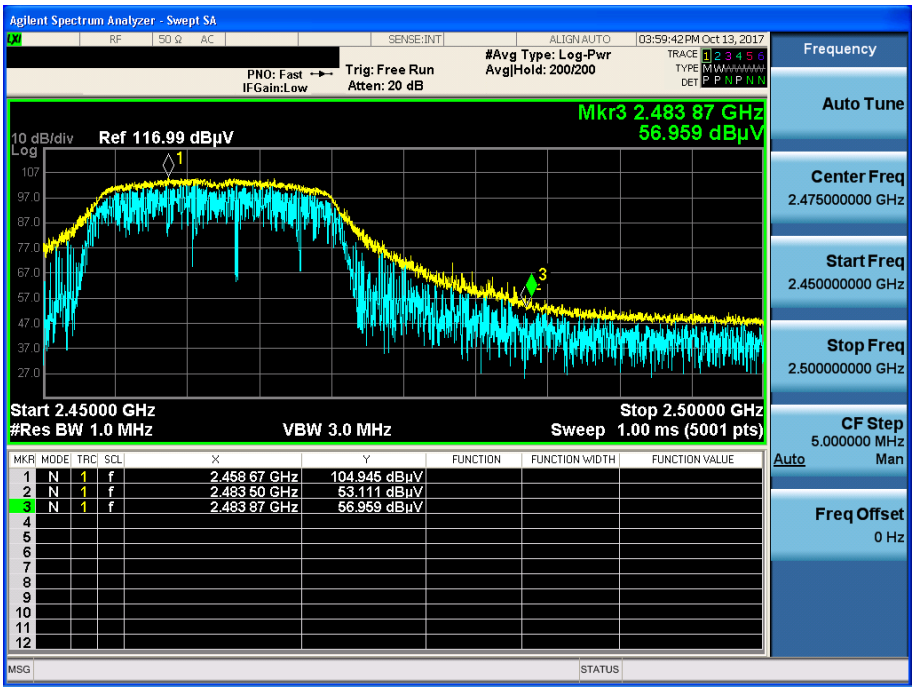
TM2 & ANT1 & Lowest & Z & Hor **Detector Mode : PK**



TM2 & ANT1 & Lowest & Z & Hor **Detector Mode : AV**

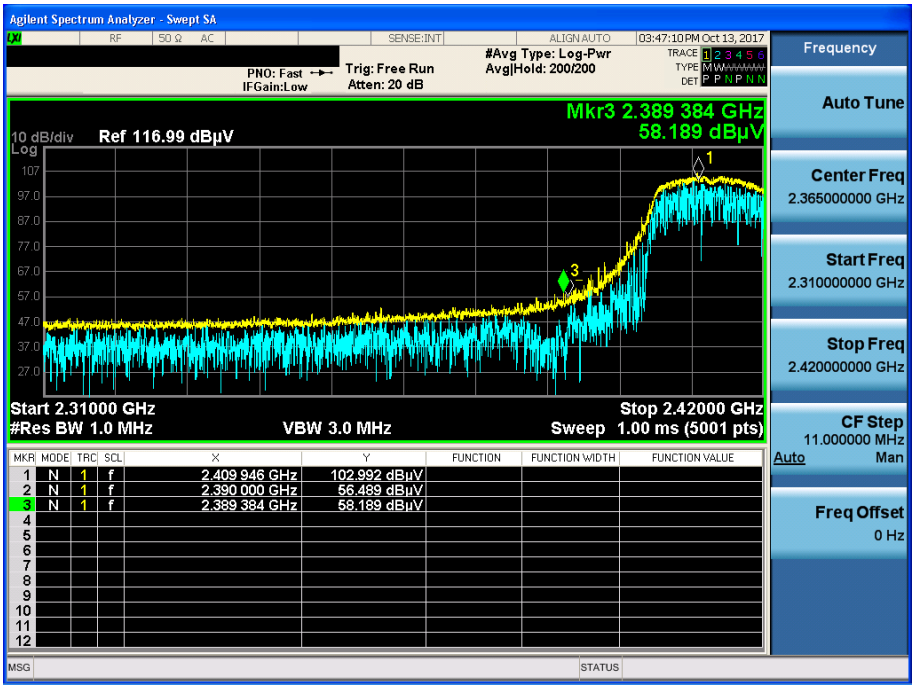


TM2 & ANT1 Highest & Z & Hor **Detector Mode : PK**

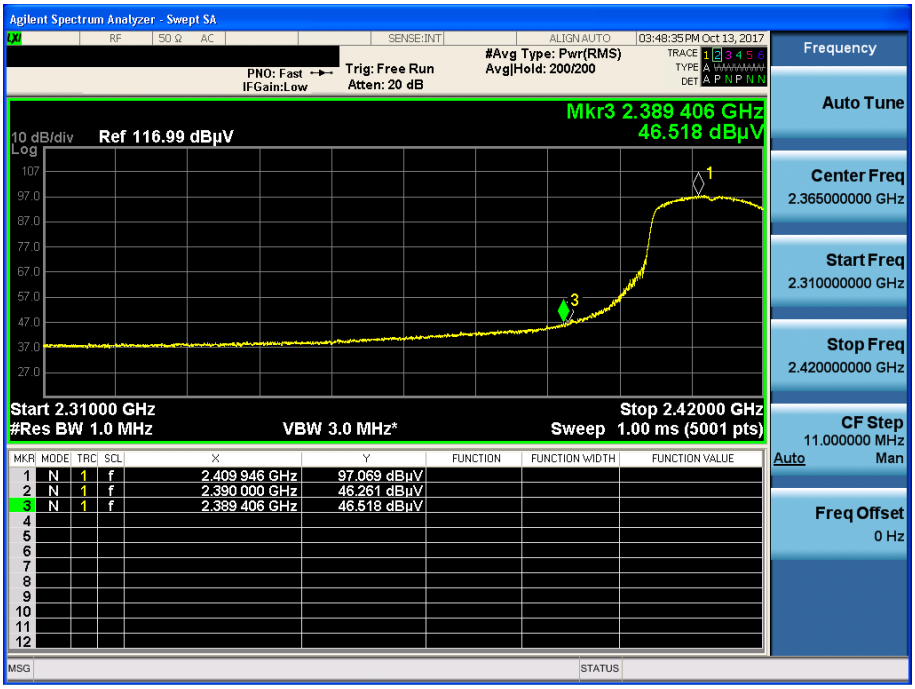


TM2 & ANT1 & Highest & Z & Hor **Detector Mode : AV**

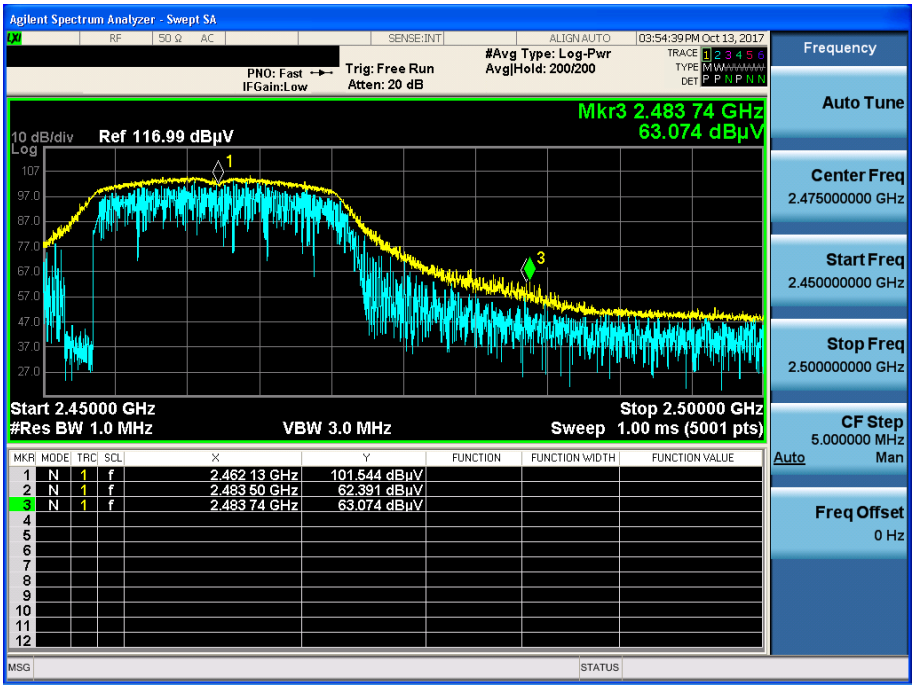
TM3 & ANT1 & Lowest & Z & Hor **Detector Mode : PK**



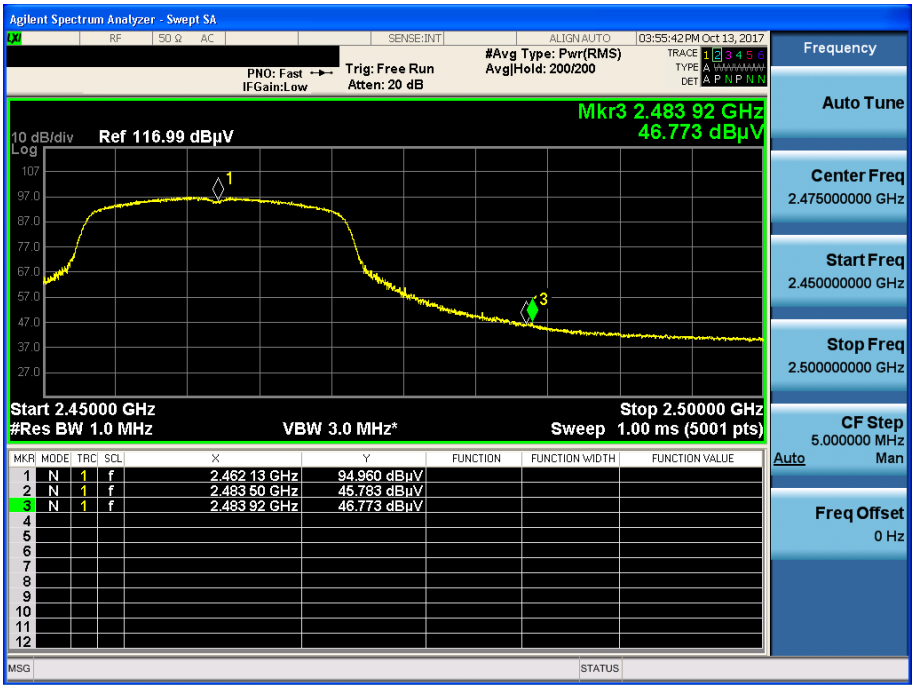
TM3 & ANT1 & Lowest & Z & Hor **Detector Mode : AV**



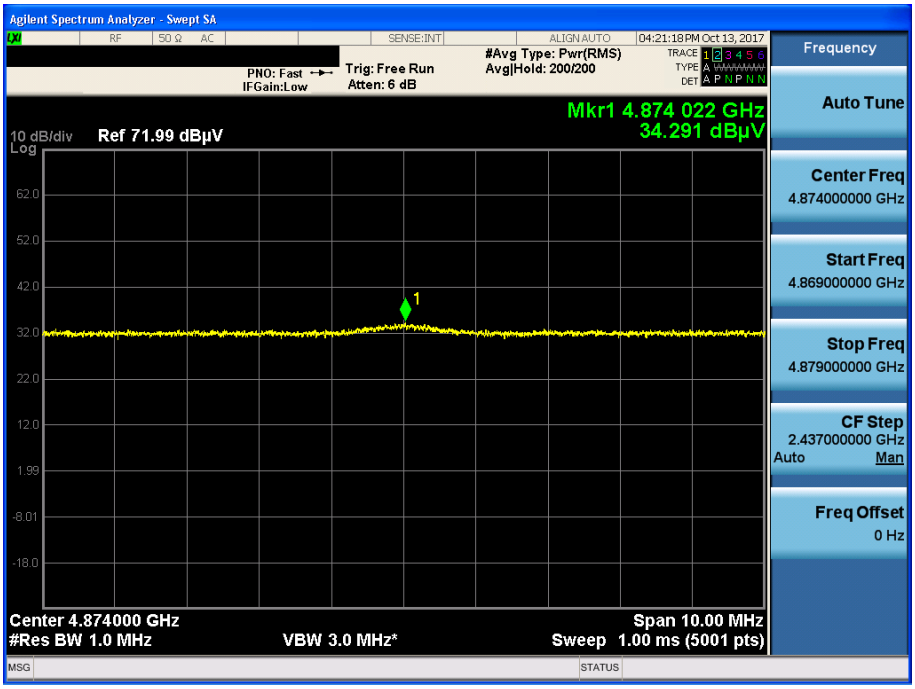
TM3 & ANT1 & Highest & Z & Hor **Detector Mode : PK**



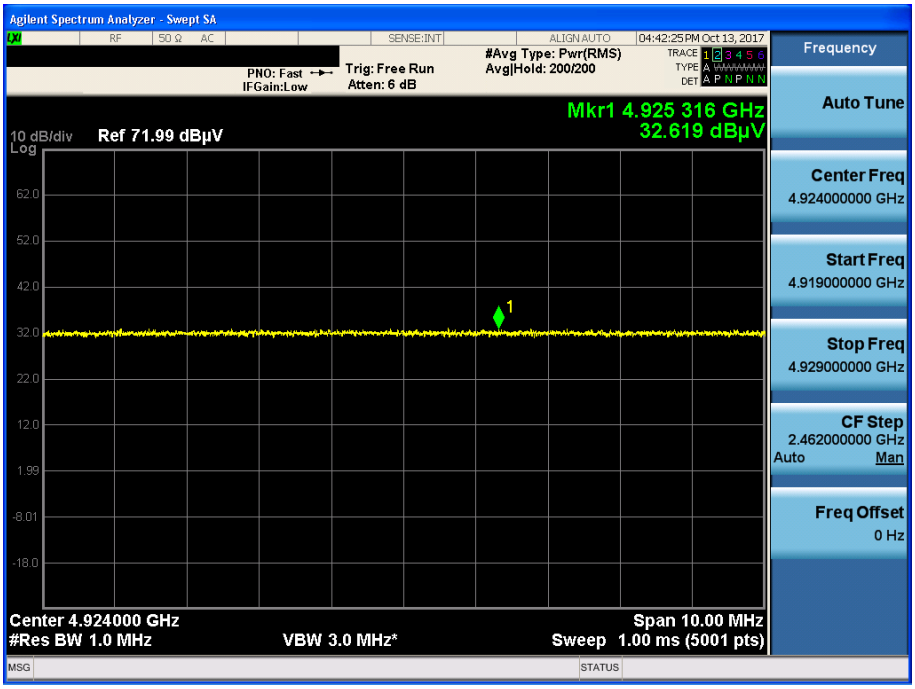
TM3 & ANT1 & Highest & Z & Hor **Detector Mode : AV**



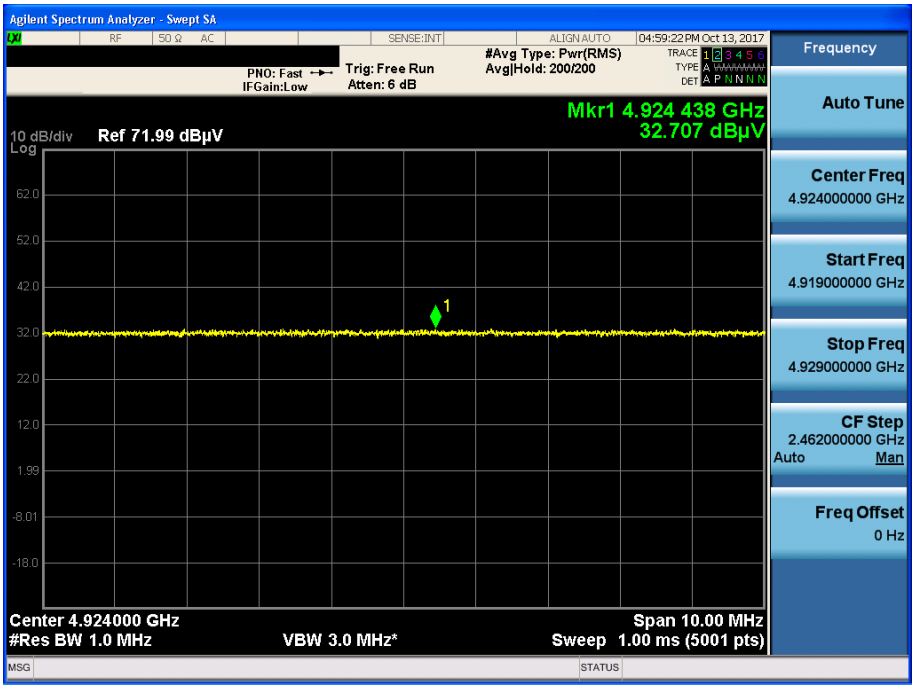
TM1 & ANT1 & Middle & X & Ver **Detector Mode : AV**



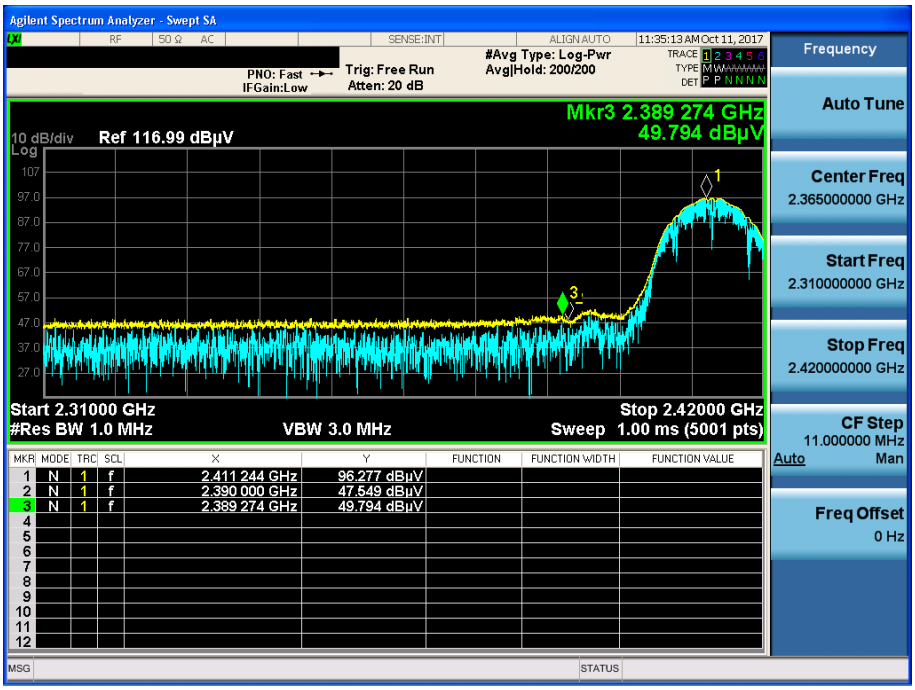
TM2 & ANT1 & Middle & X & Ver **Detector Mode : AV**



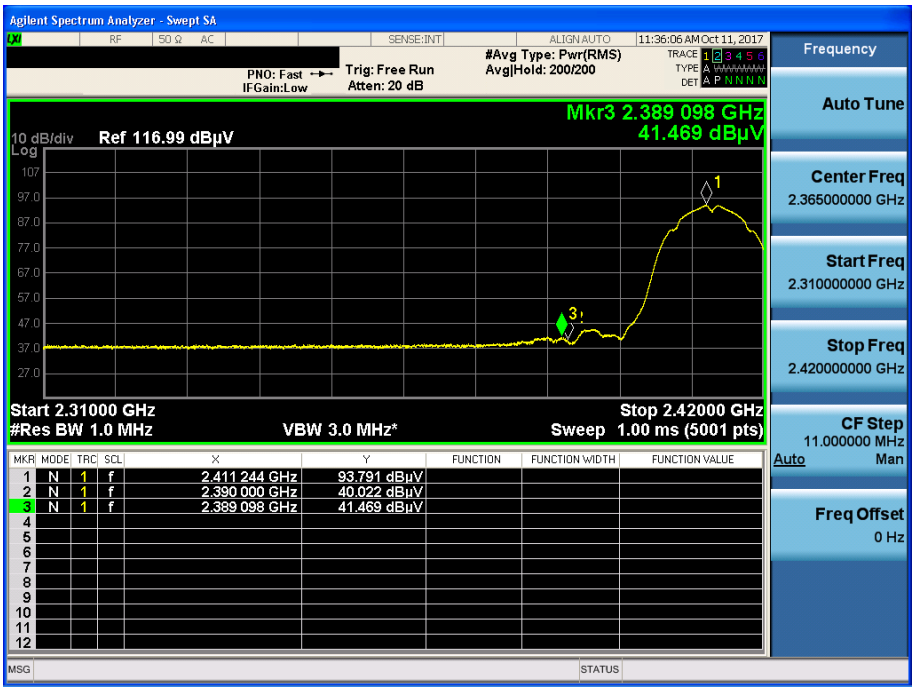
TM3 & ANT1 & Highest & X & Ver **Detector Mode : AV**



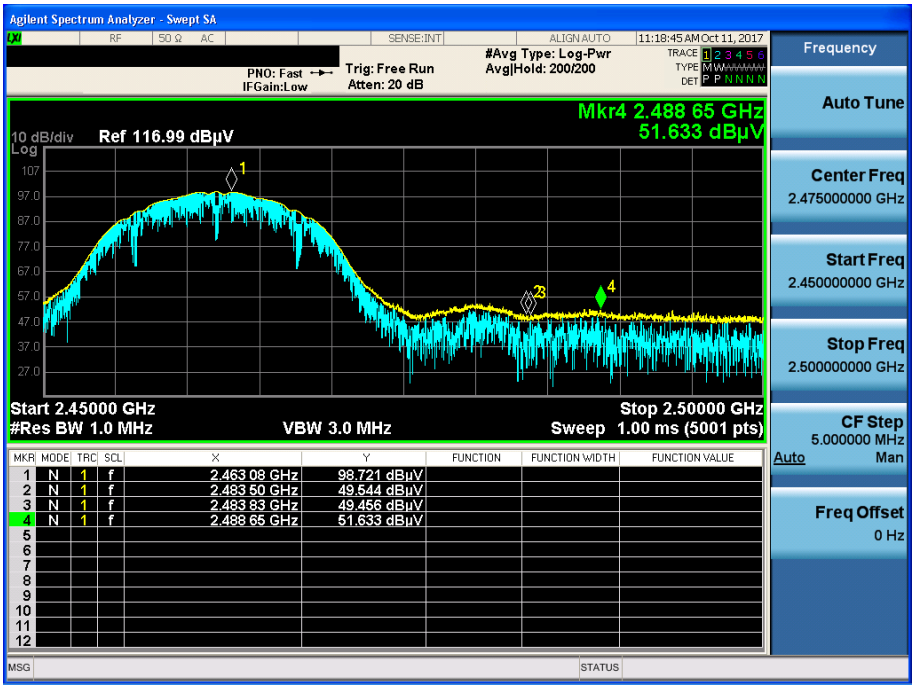
TM1 & ANT2 & Lowest & Y & Hor **Detector Mode : PK**



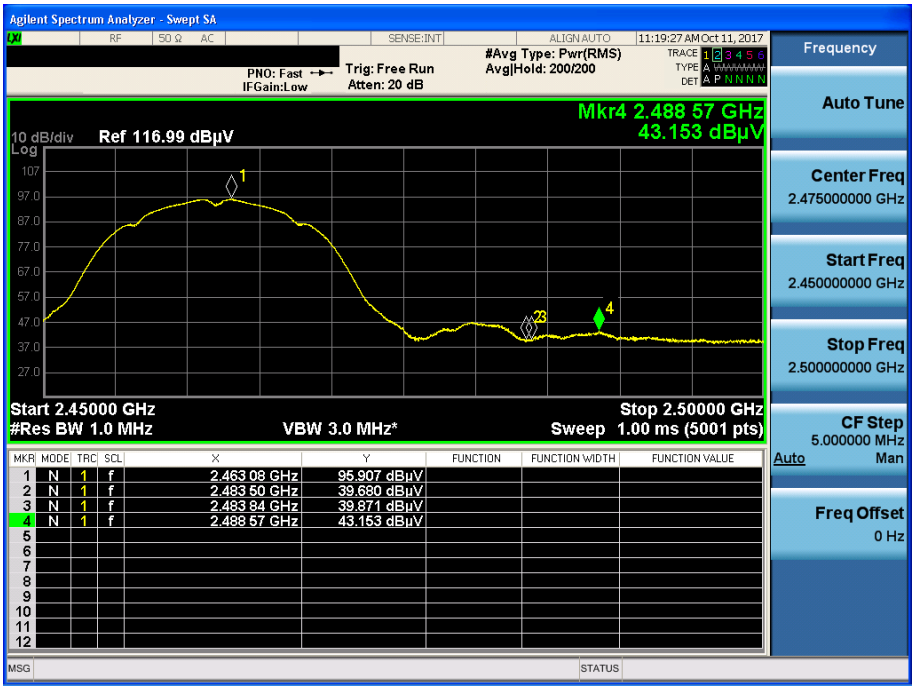
TM1 & ANT2 & Lowest & Y & Hor **Detector Mode : AV**



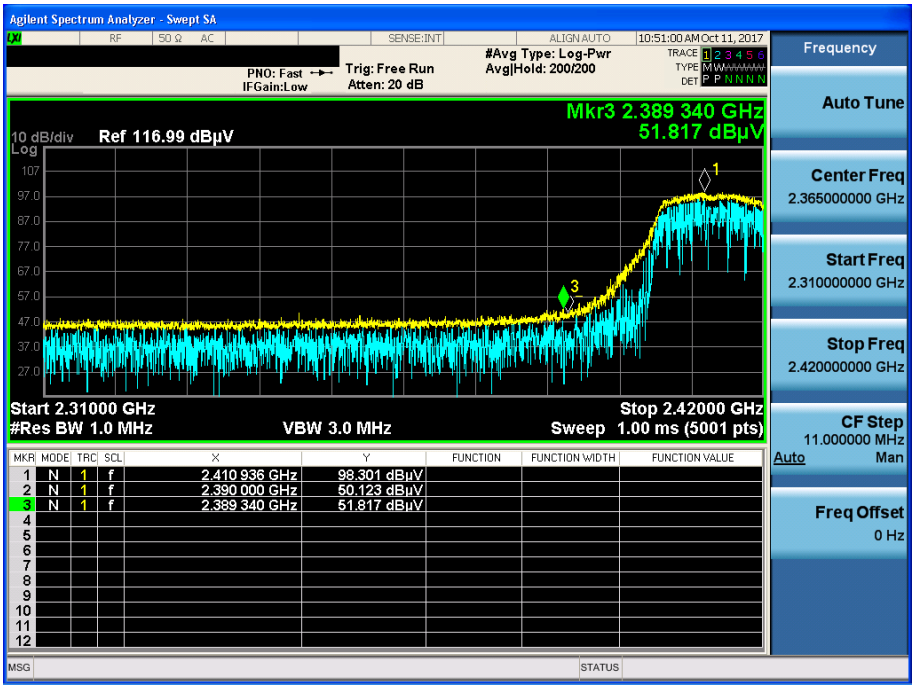
TM1 & ANT2 & Highest & Y & Hor **Detector Mode : PK**



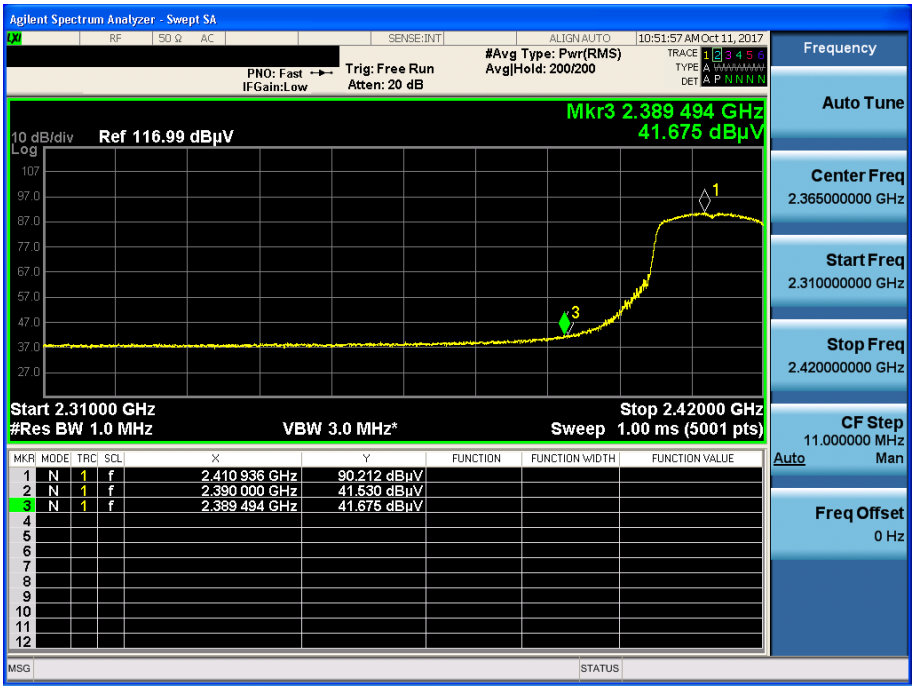
TM1 & ANT2 & Highest & Y & Hor **Detector Mode : AV**



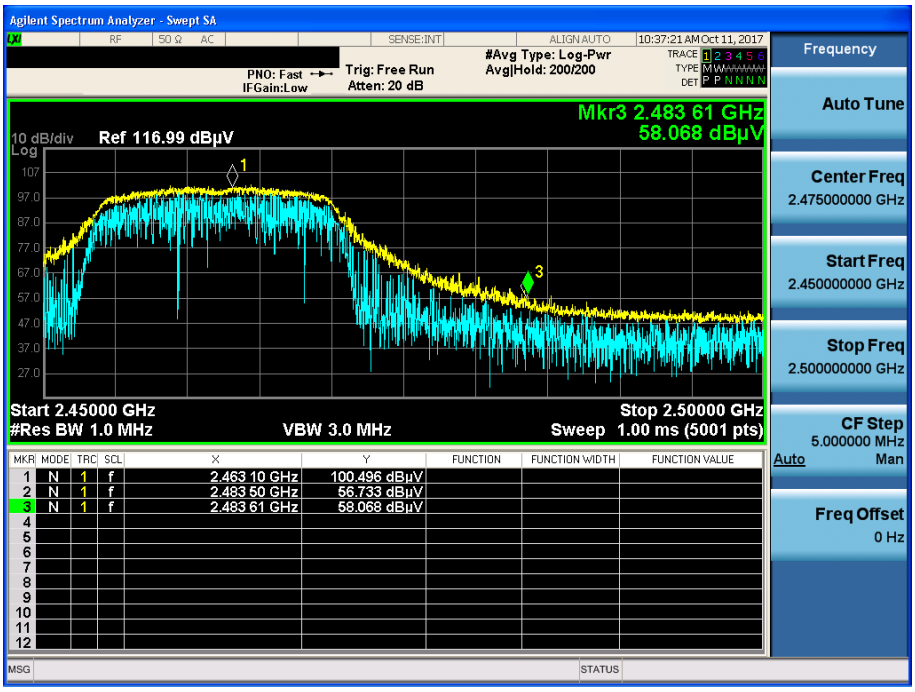
TM2 & ANT2 & Lowest & Z & Hor **Detector Mode : PK**



TM2 & ANT2 & Lowest & Z & Hor **Detector Mode : AV**

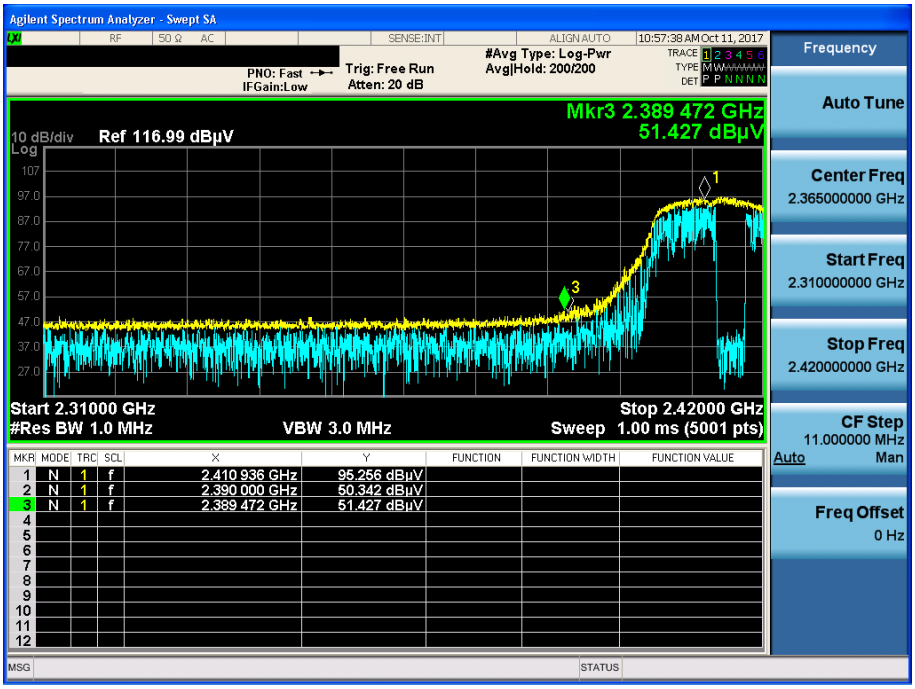


TM2 & ANT2 & Highest & Z & Hor **Detector Mode : PK**

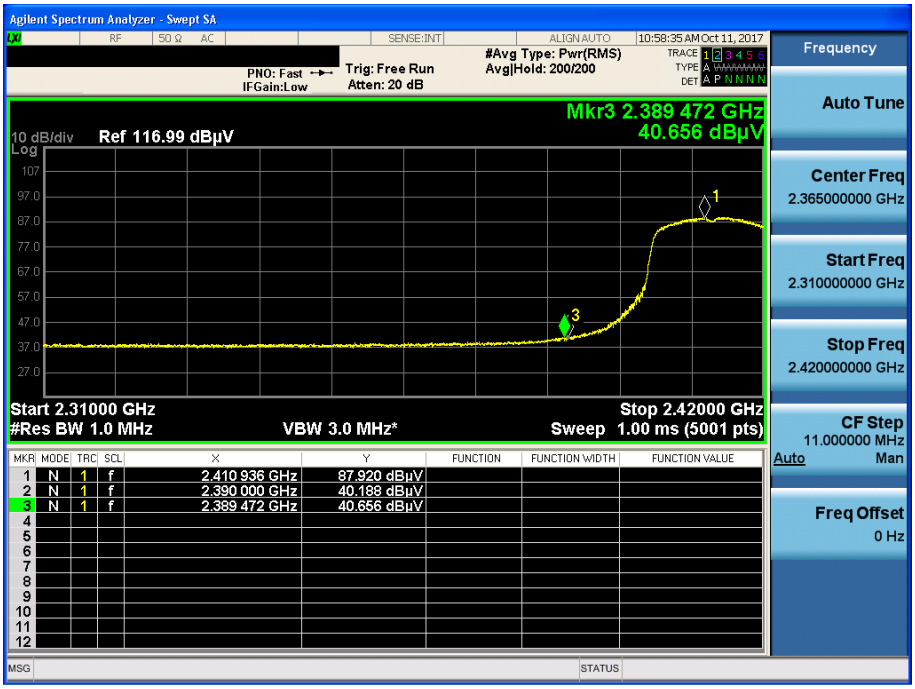


TM2 & ANT2 & Highest & Z & Hor **Detector Mode : AV**

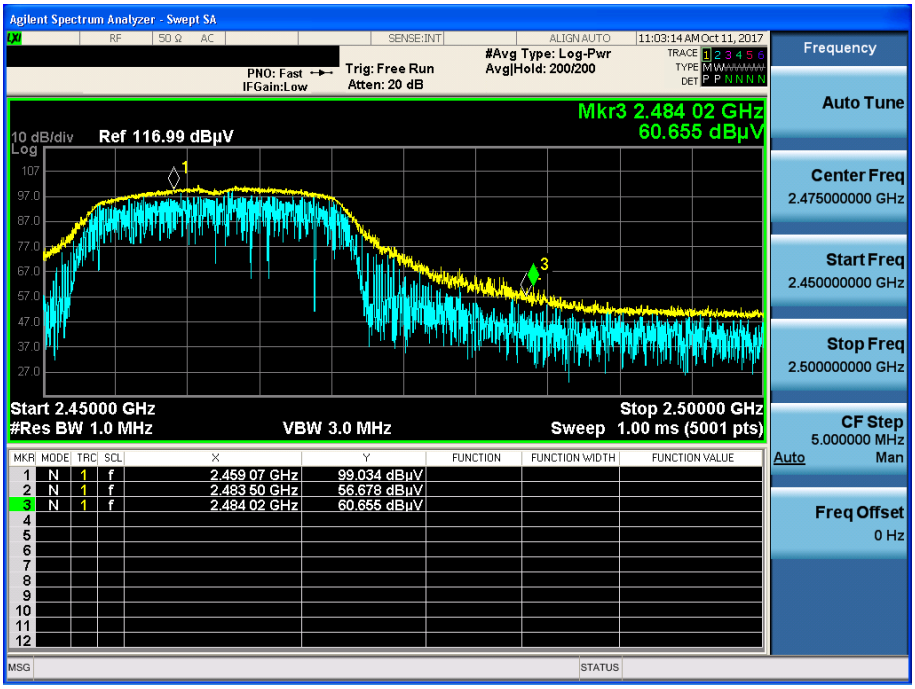
TM3 & ANT2 & Lowest & Z & Hor **Detector Mode : PK**



TM3 & ANT2 & Lowest & Z & Hor **Detector Mode : AV**

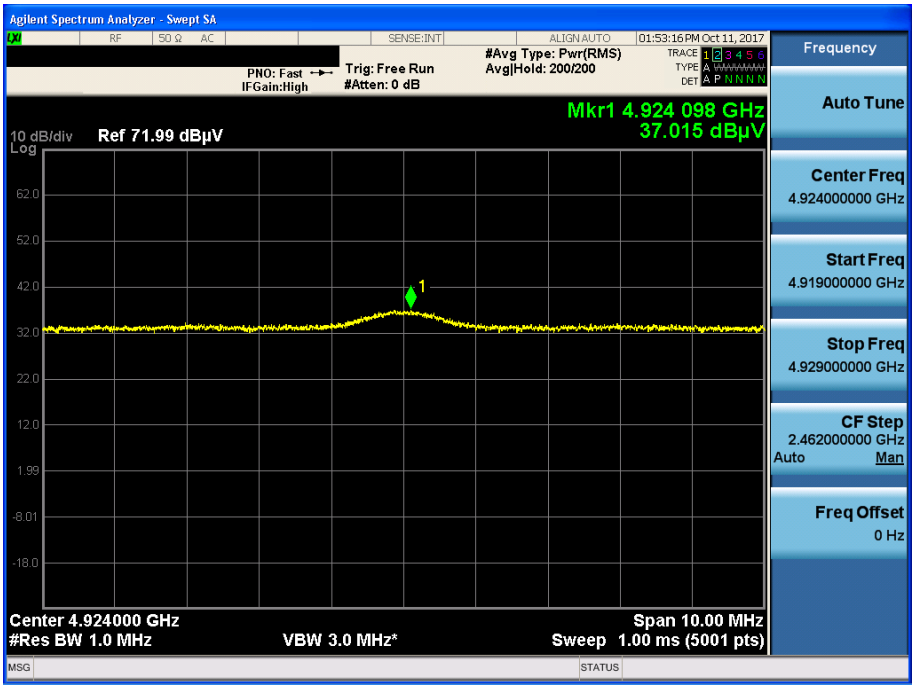


TM3 & ANT2 & Highest & Z & Hor **Detector Mode : PK**

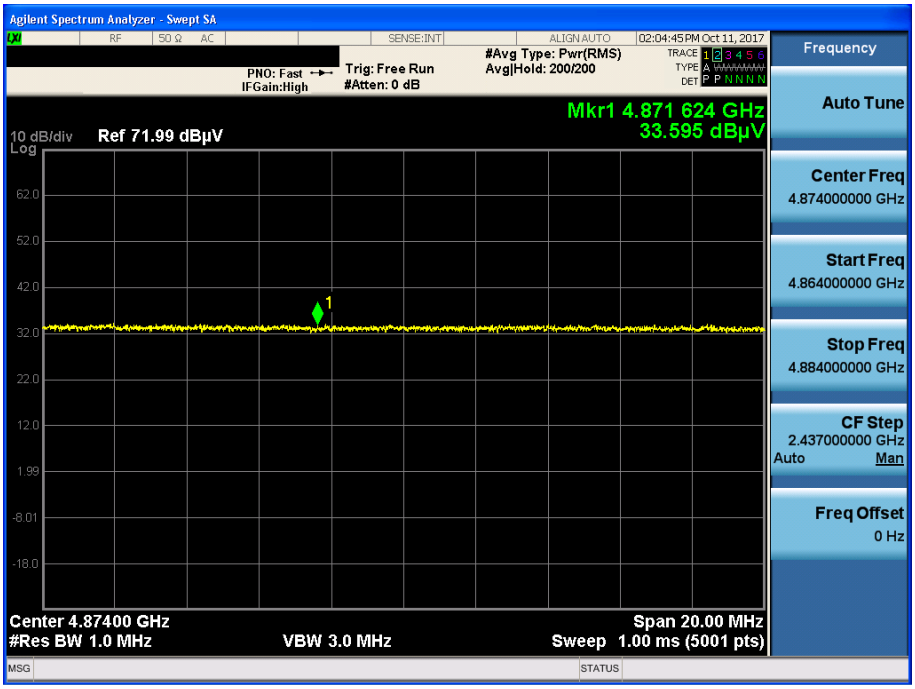


TM3 & ANT2 & Highest & Z & Hor **Detector Mode : AV**

TM1 & ANT2 & Highest & X & Ver **Detector Mode : AV**



TM2 & ANT2 & Middle & X & Ver **Detector Mode : AV**



TM3 & ANT2 & Highest & X & Ver **Detector Mode : AV**