

2.14.1.2 UHF Radiated Spurious Emissions Plots

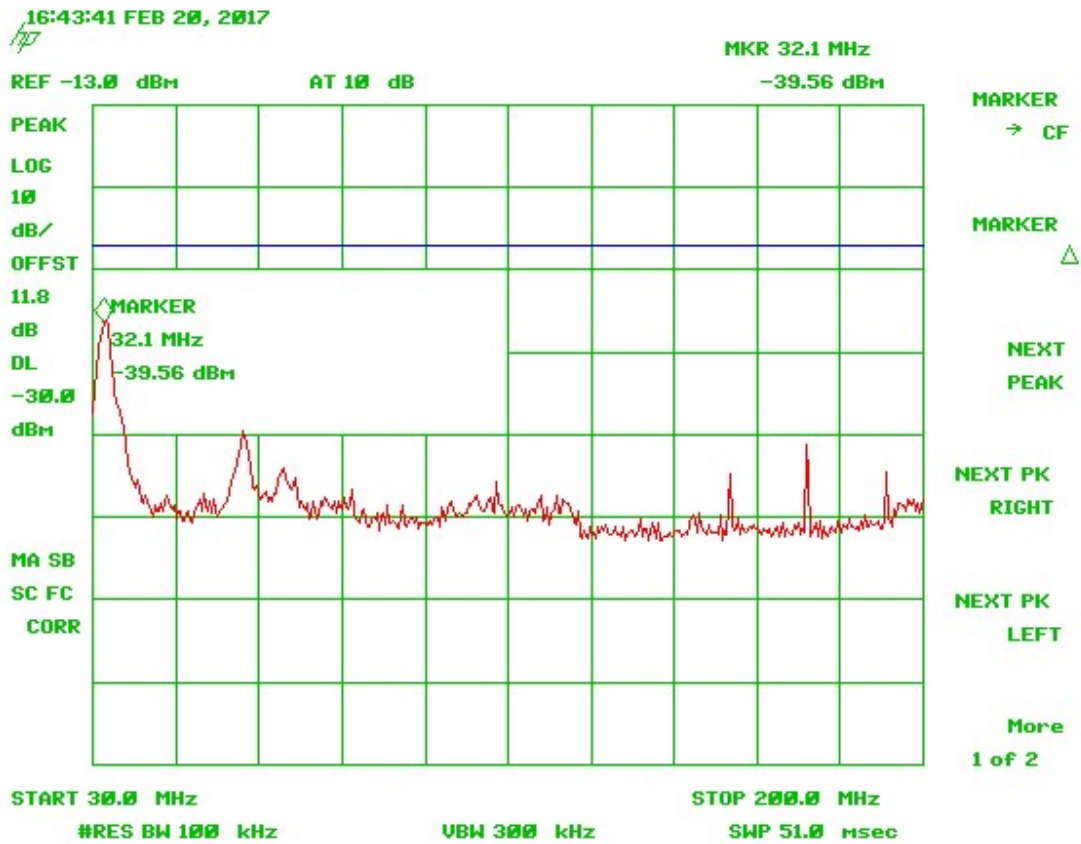


Figure 125. 450 MHz Vertical 30 - 200 MHz

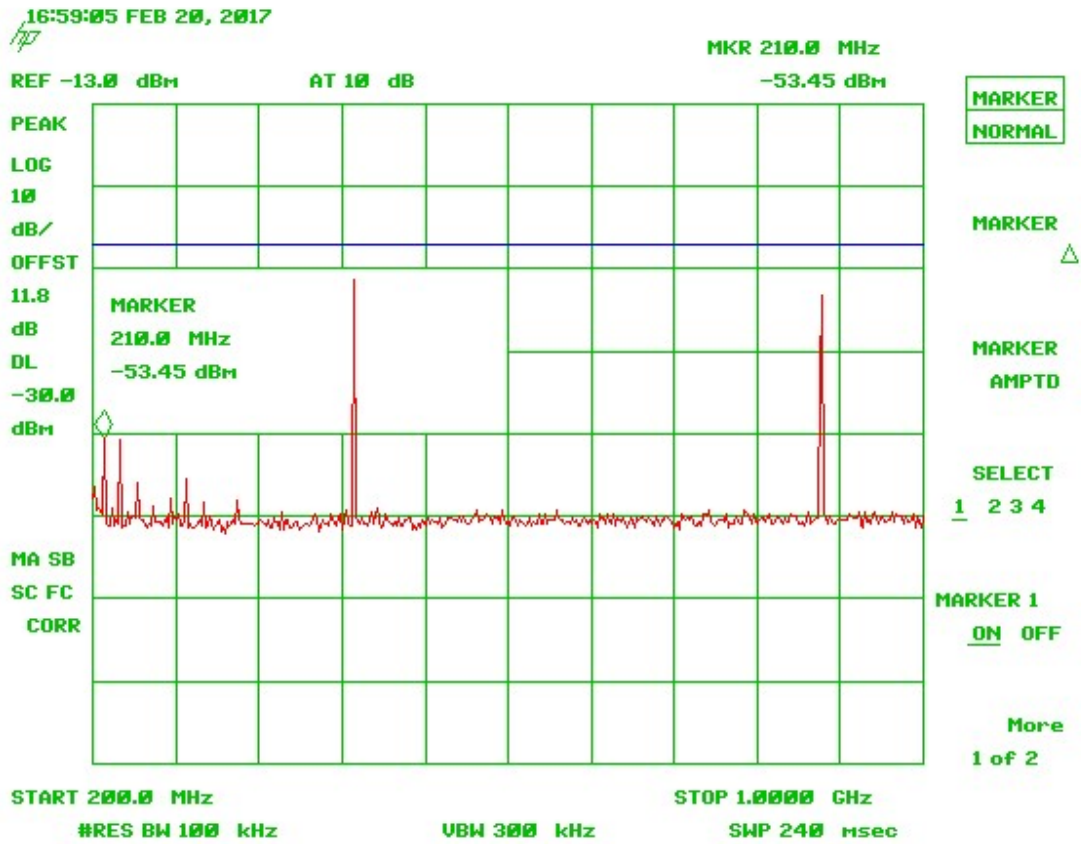


Figure 126. 450 MHz Vertical 200 – 1000 MHz

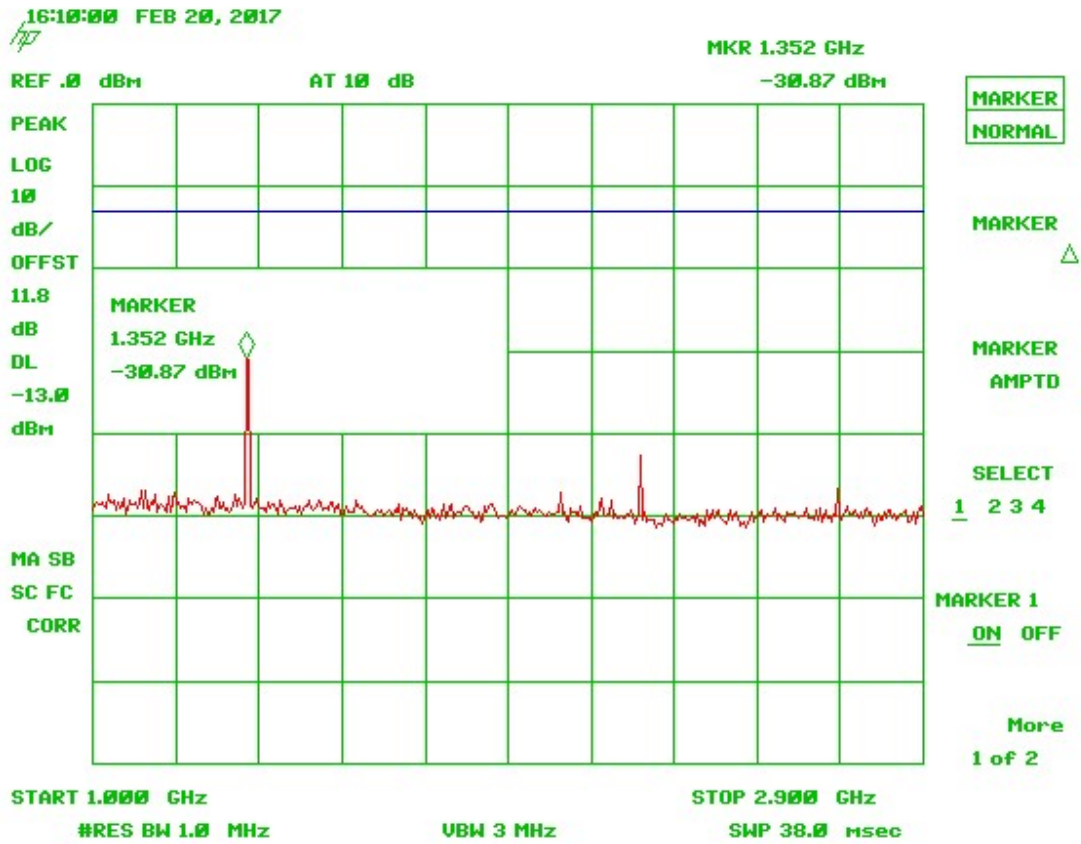


Figure 127. 450 MHz Vertical 1 – 2.9 GHz

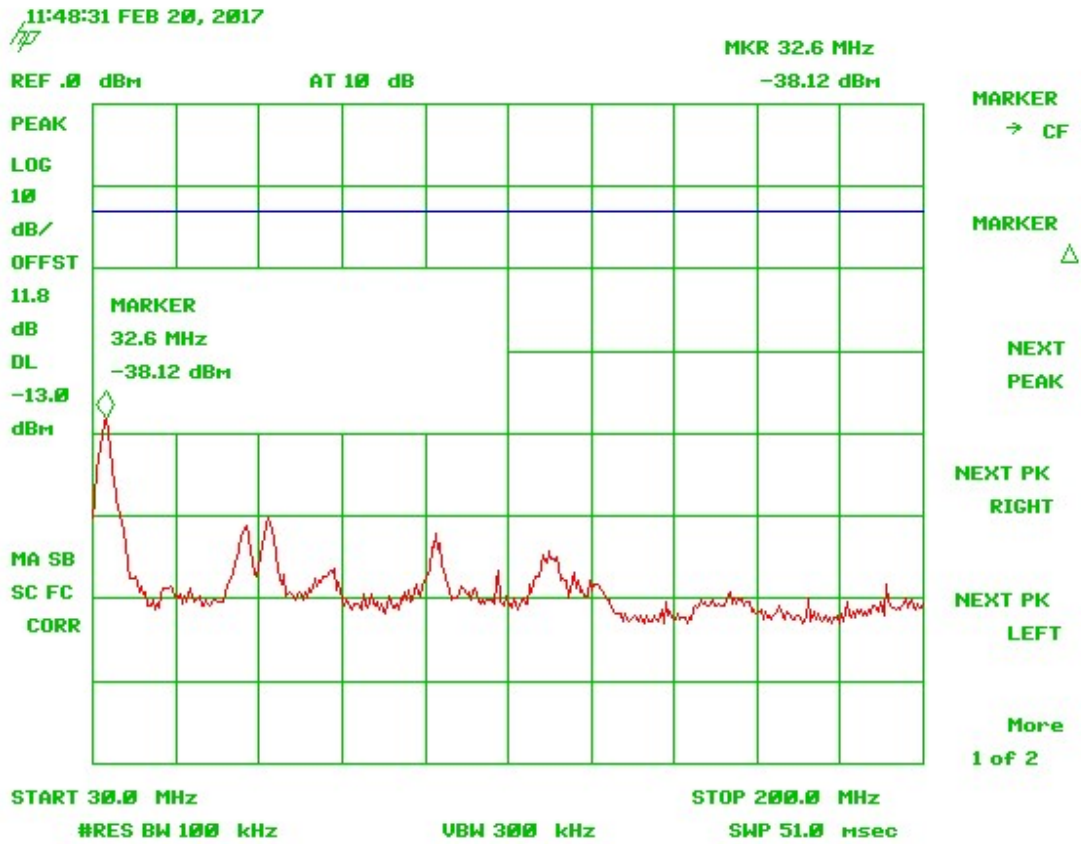


Figure 129. 459 MHz Vertical 30 - 200 MHz

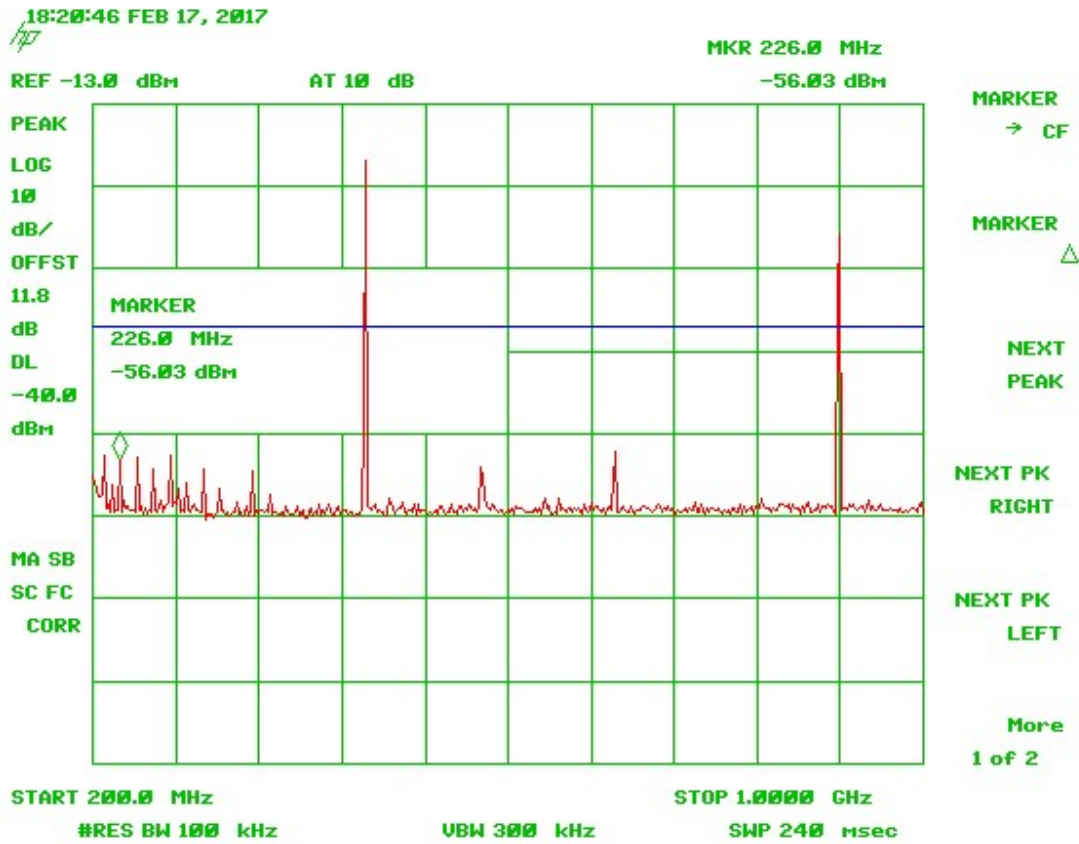


Figure 130. 459 MHz 200 -1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

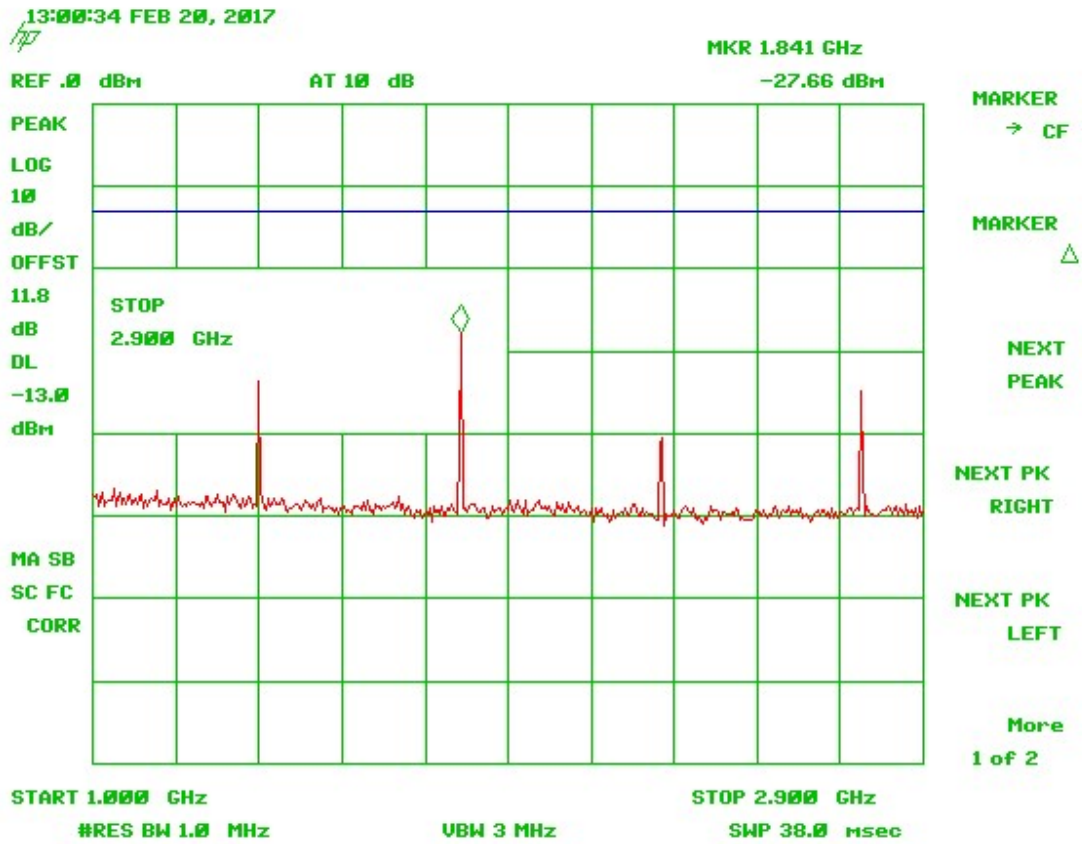


Figure 131. 459 MHz Vertical 1 -2.9 GHz

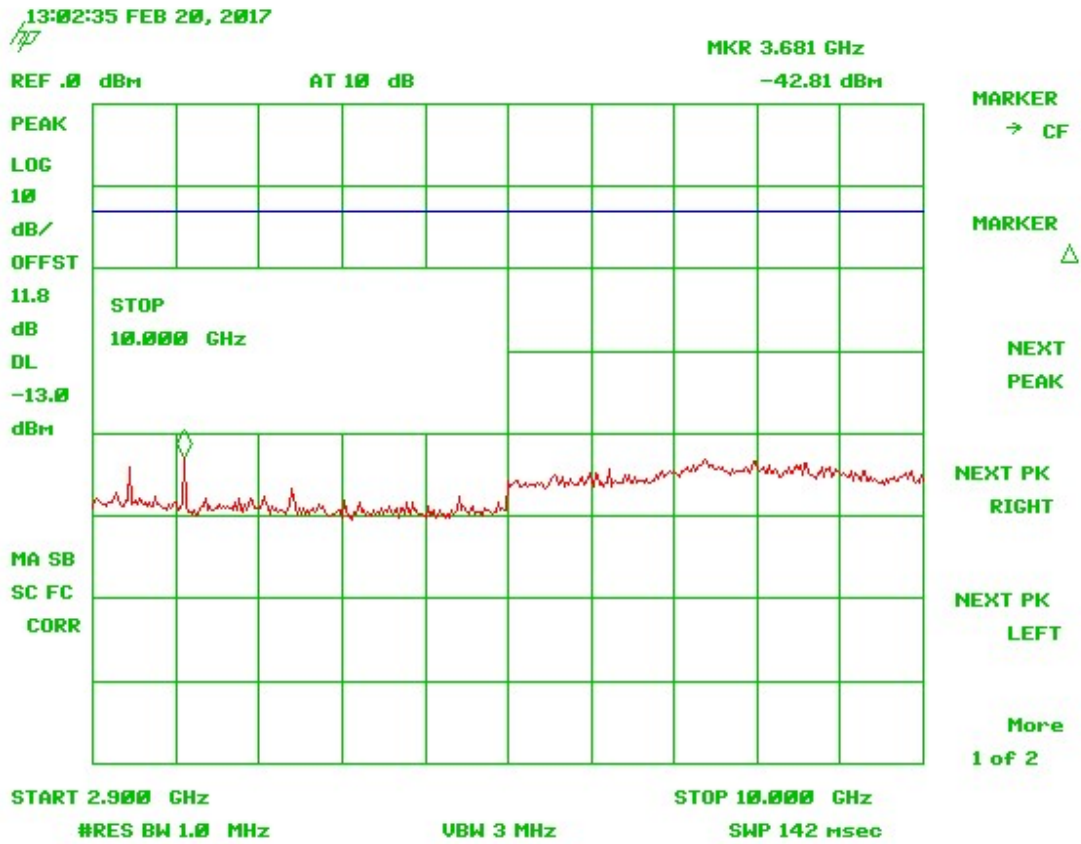


Figure 132. 459 MHz Vertical 2.9 – 10 GHz

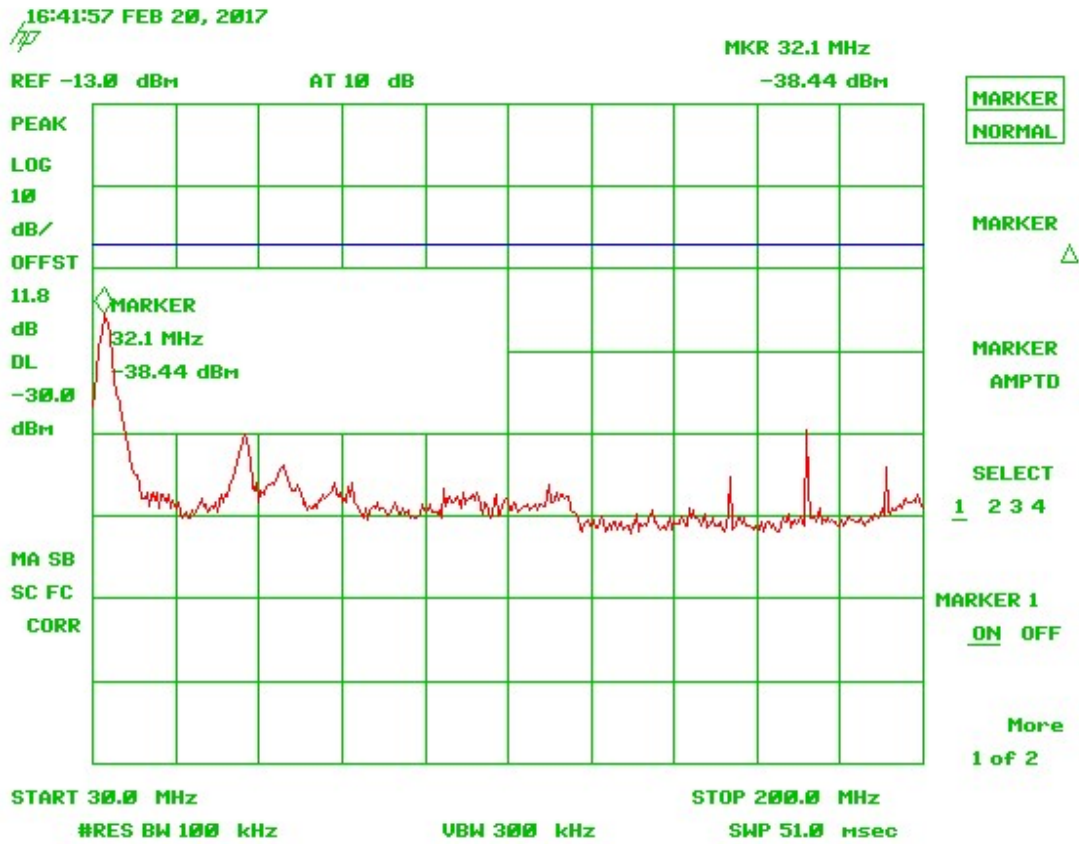


Figure 133. 490 MHz Vertical 30 - 200 MHz

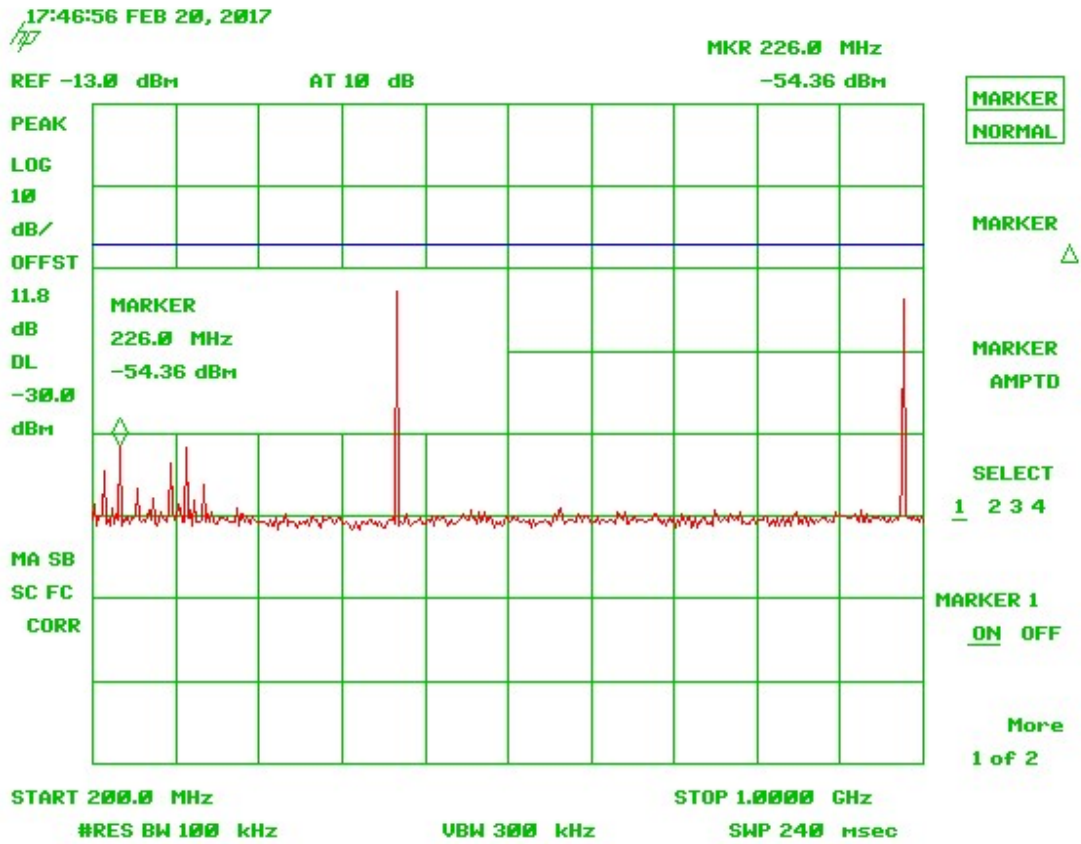


Figure 134. 490 MHz Vertical 200 - 1000 MHz

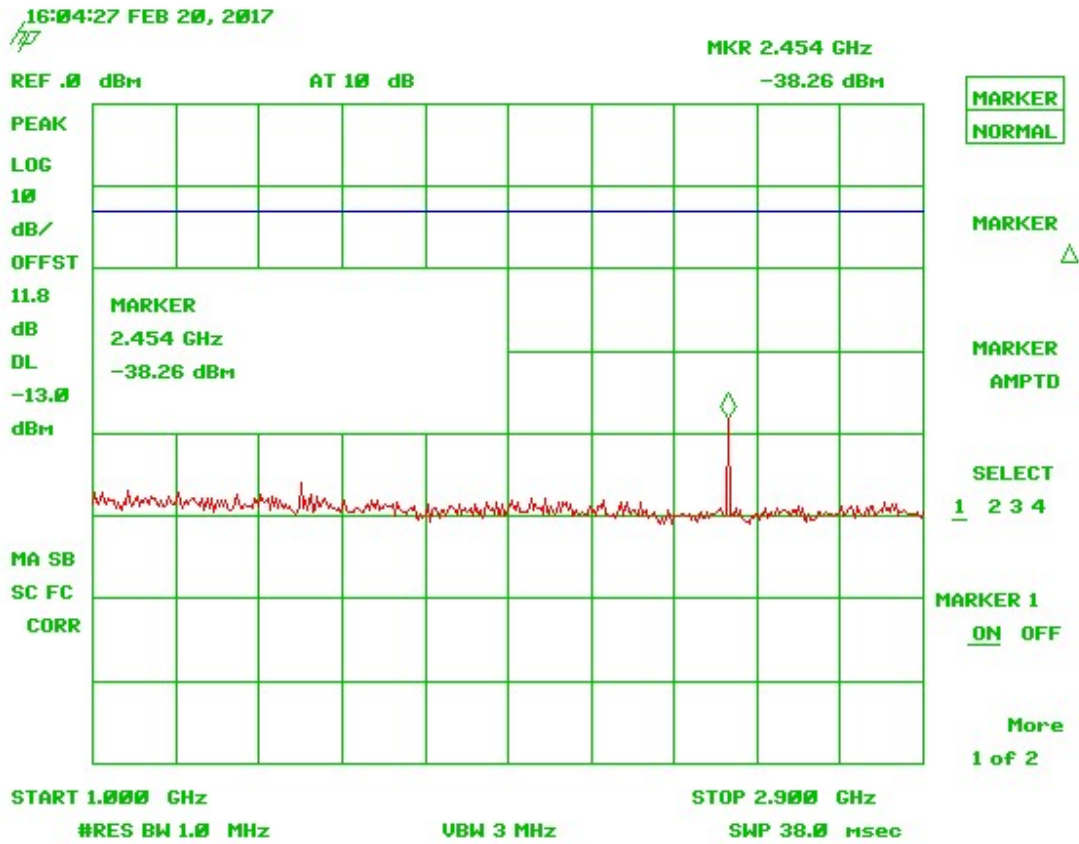


Figure 135. 490 MHz Vertical 1 - 2.9 GHz

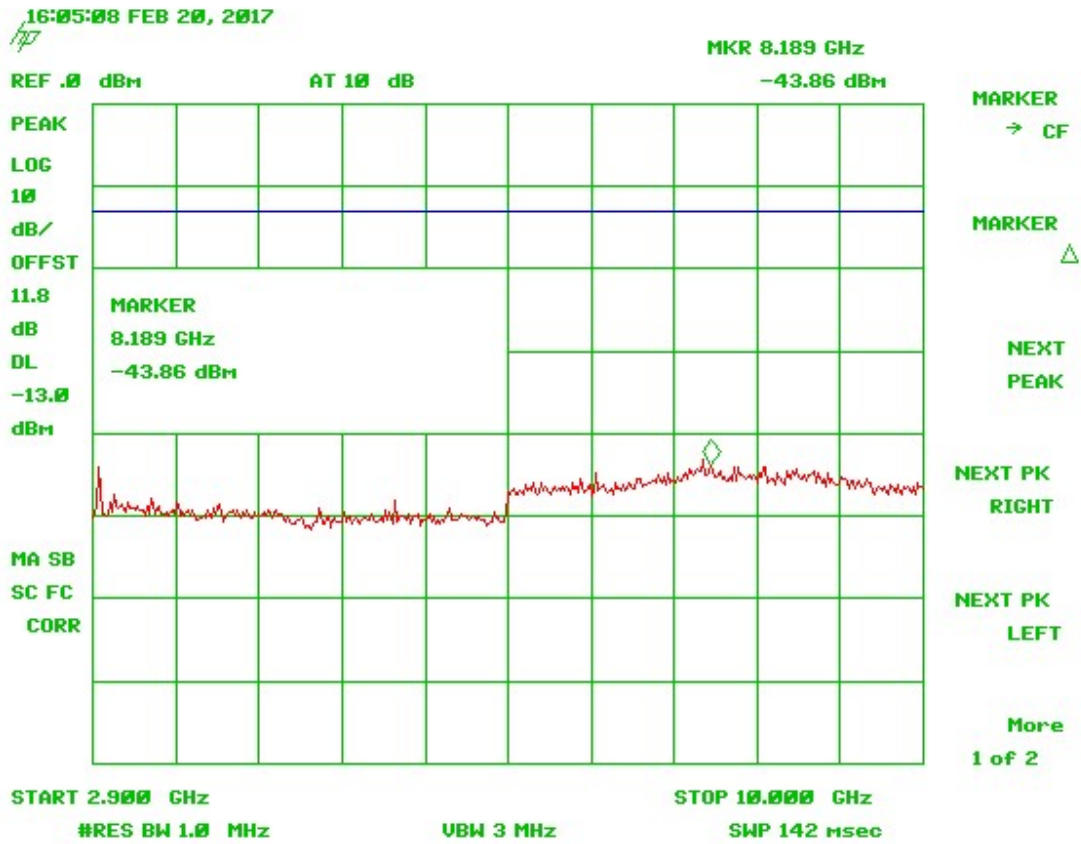


Figure 136. 490 MHz Vertical 2.9 -10 GHz

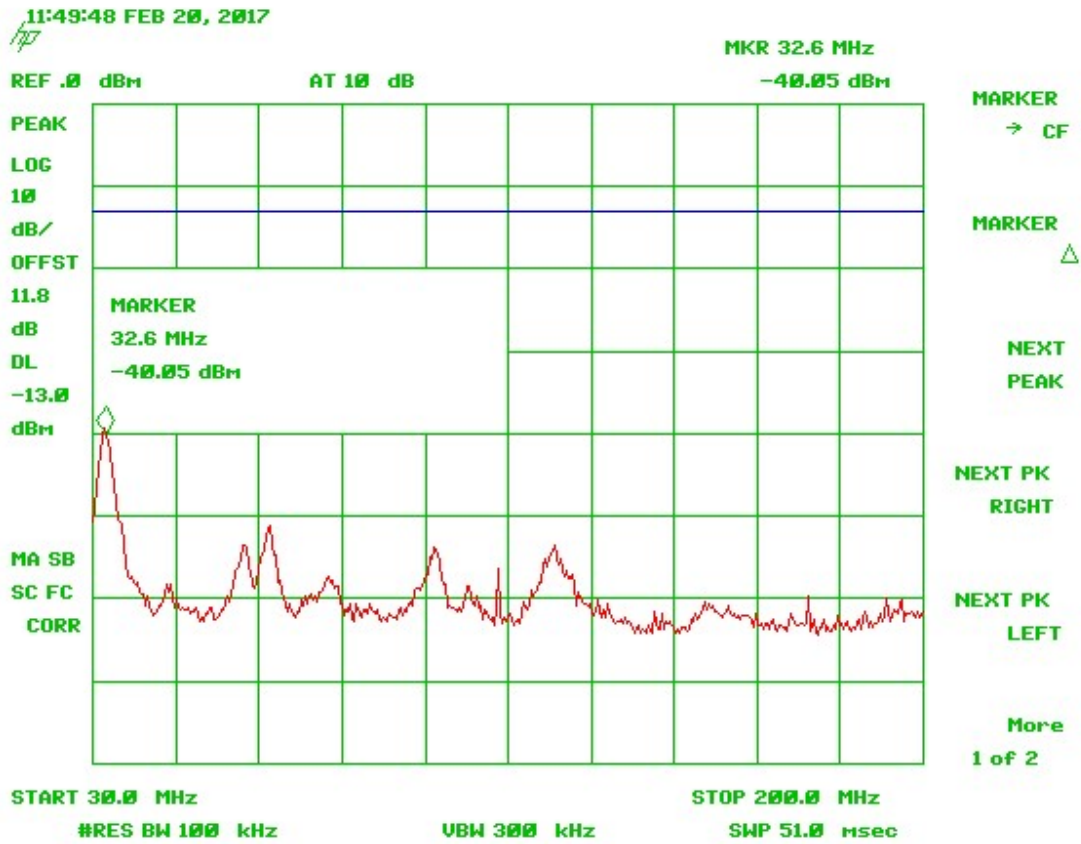


Figure 137. 512 MHz Vertical 30 - 200 MHz

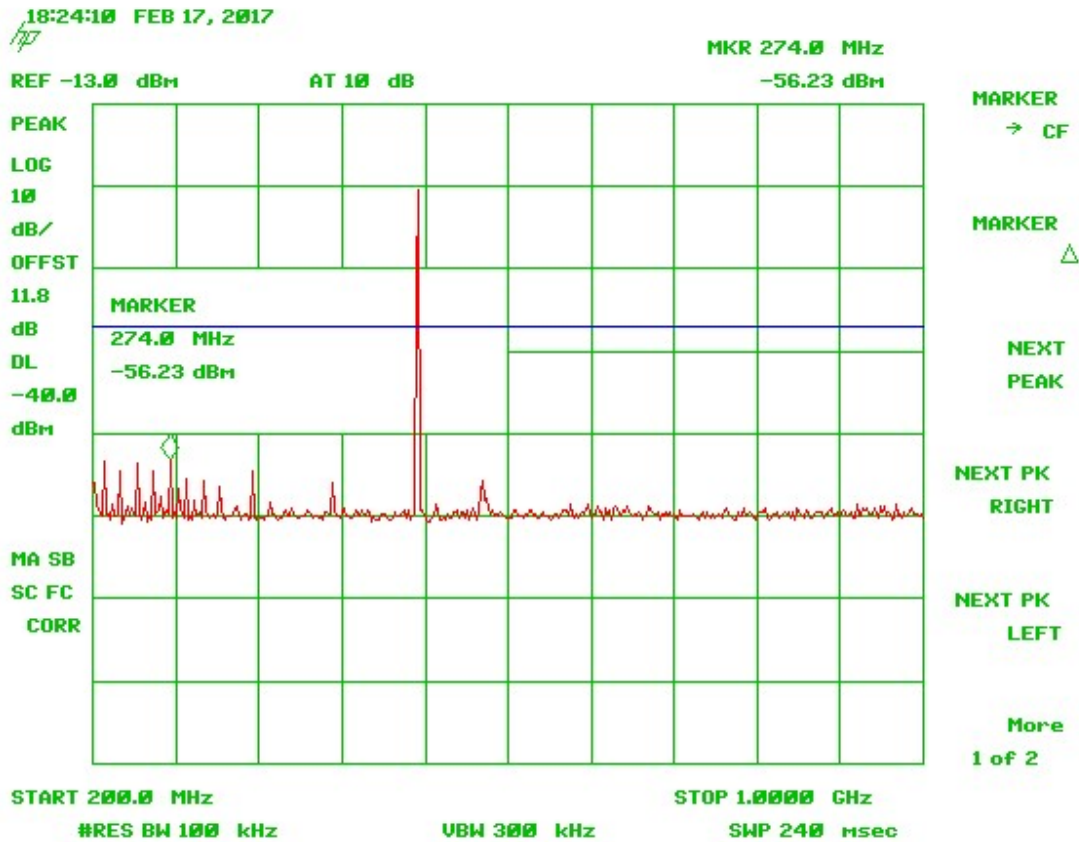


Figure 138. 512 MHz Vertical 200 – 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

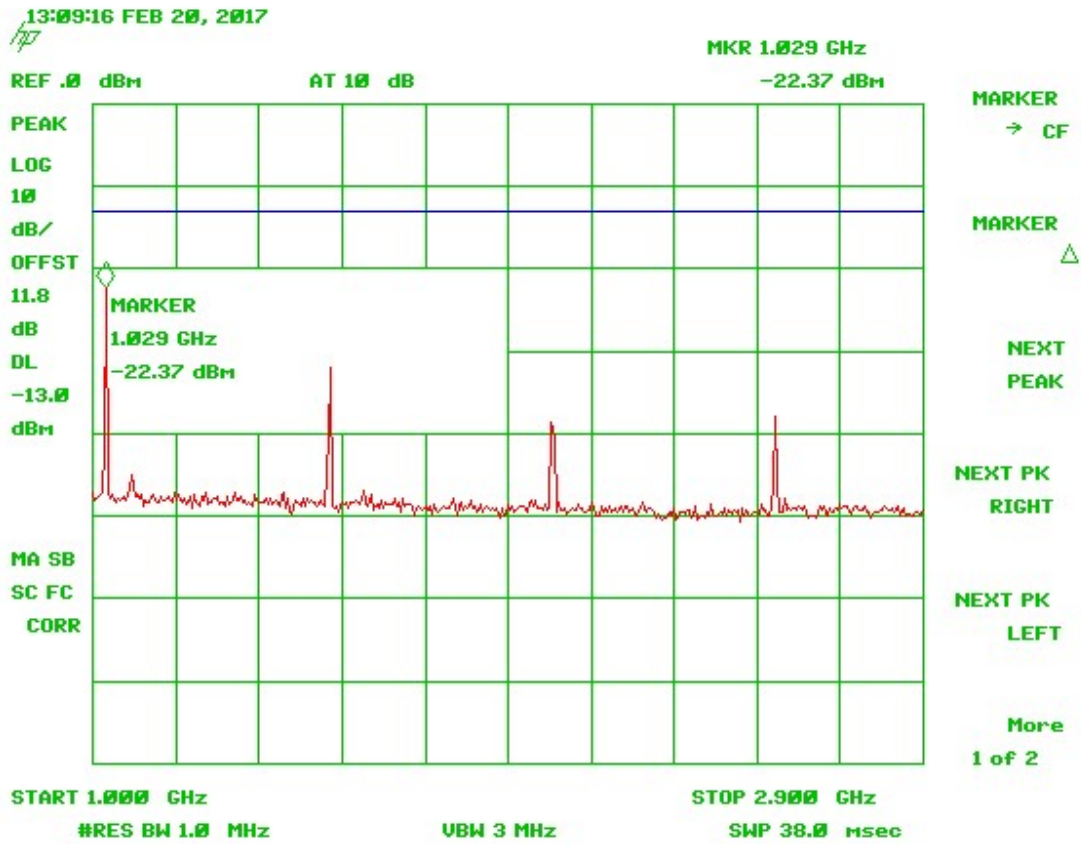


Figure 139. 512 MHz Vertical 1 -2.9 GHz

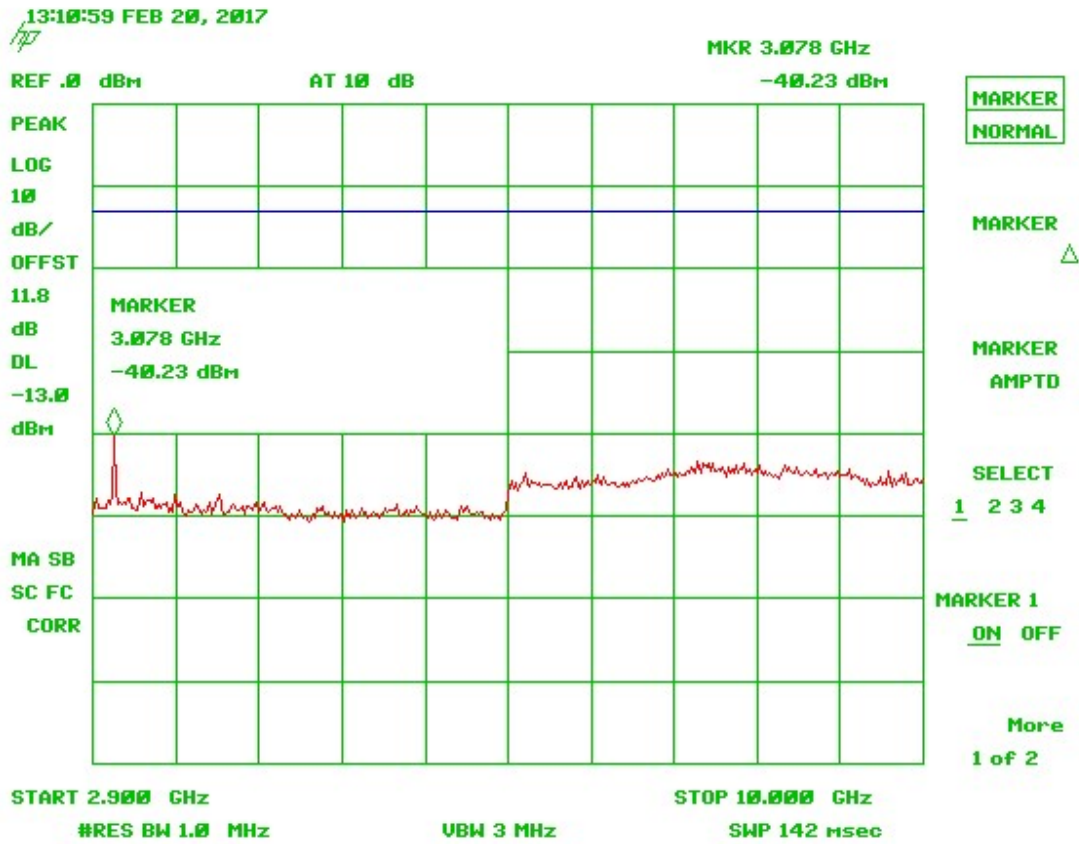


Figure 140. 512 MHz Vertical 2.9 -10 GHz

2.14.1.3 700 MHz Radiated Spurious Emissions Plots

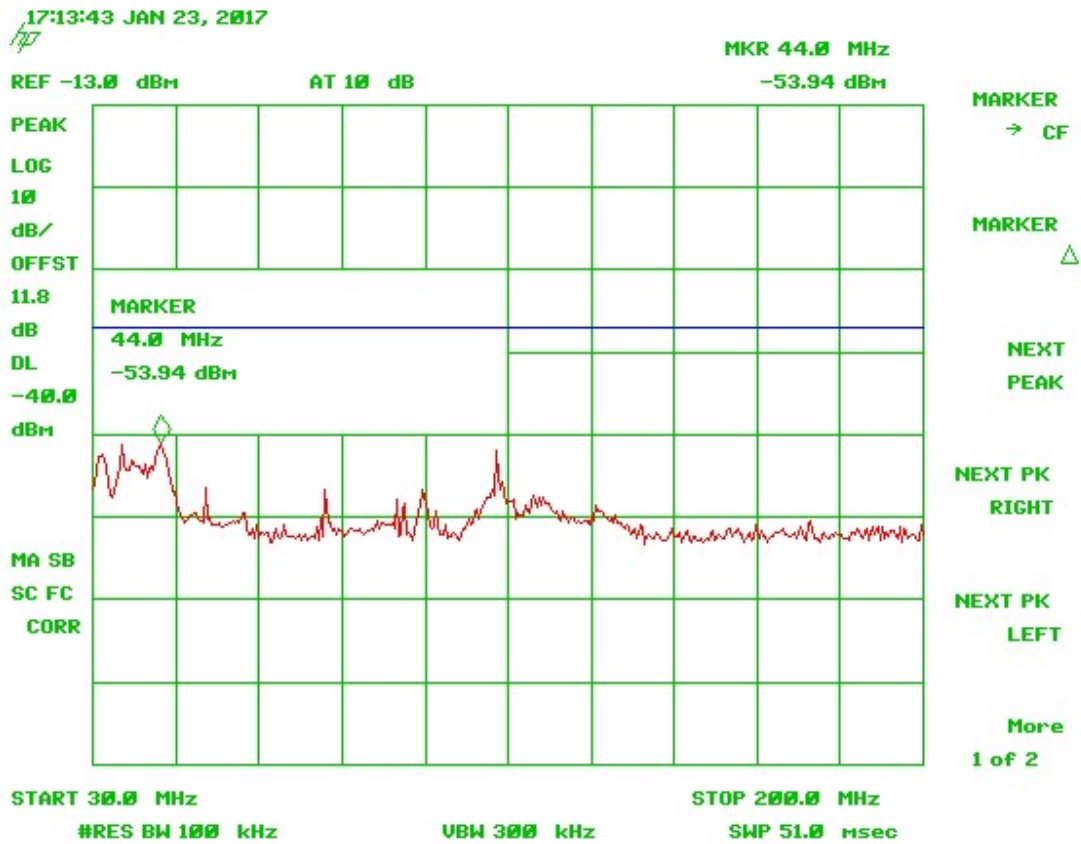


Figure 141. 763 MHz Vertical 30 – 200 MHz

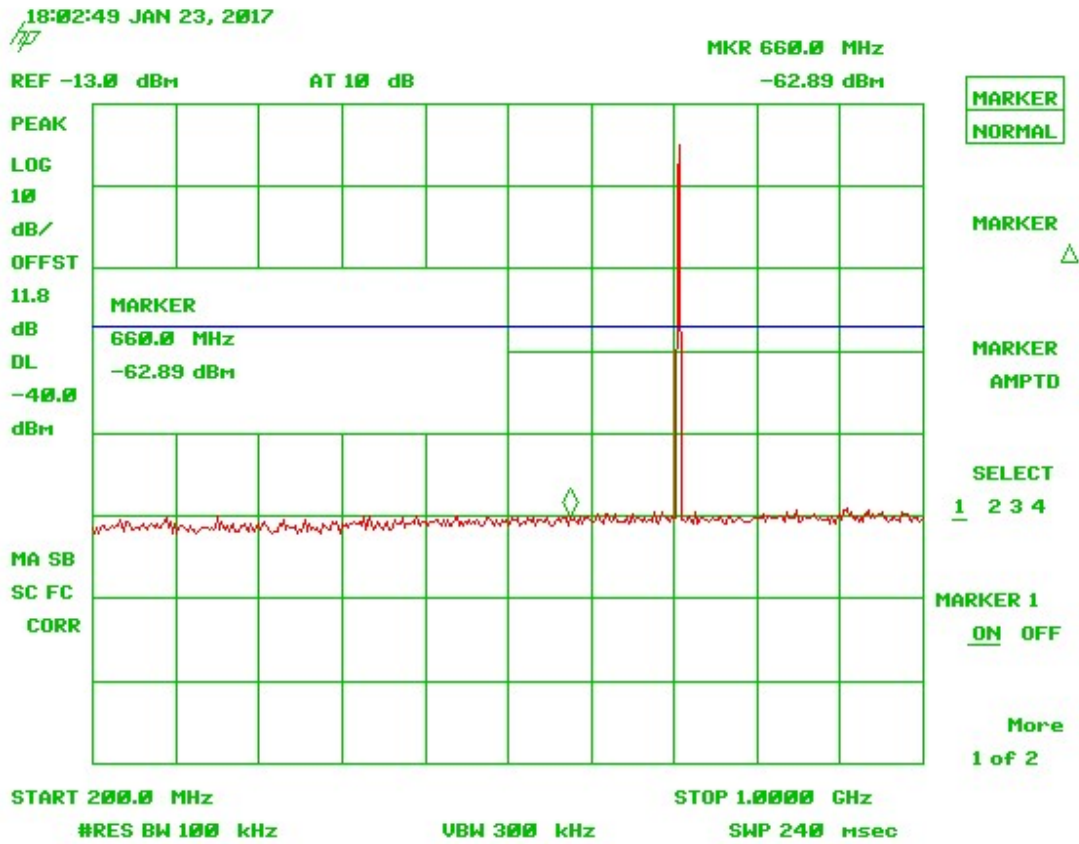


Figure 142. 763 MHz Vertical 200 - 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

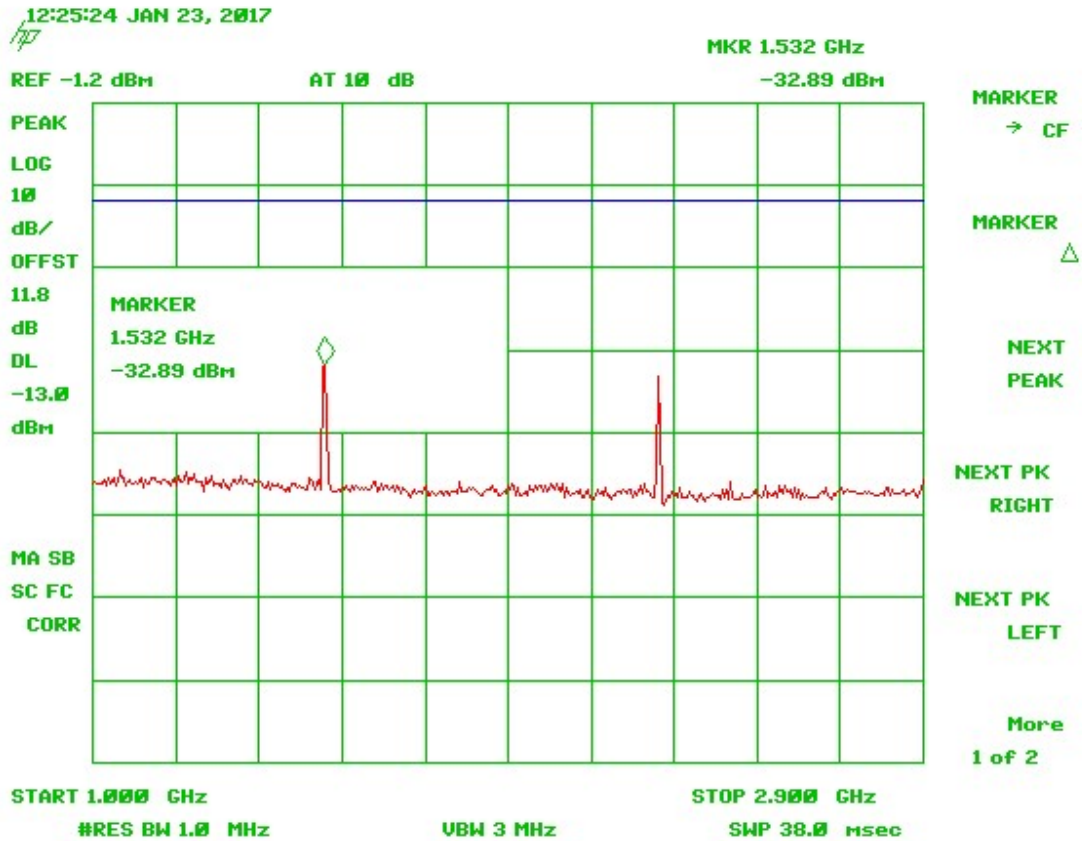


Figure 143. 763 MHz Vertical 1 – 2.9 GHz

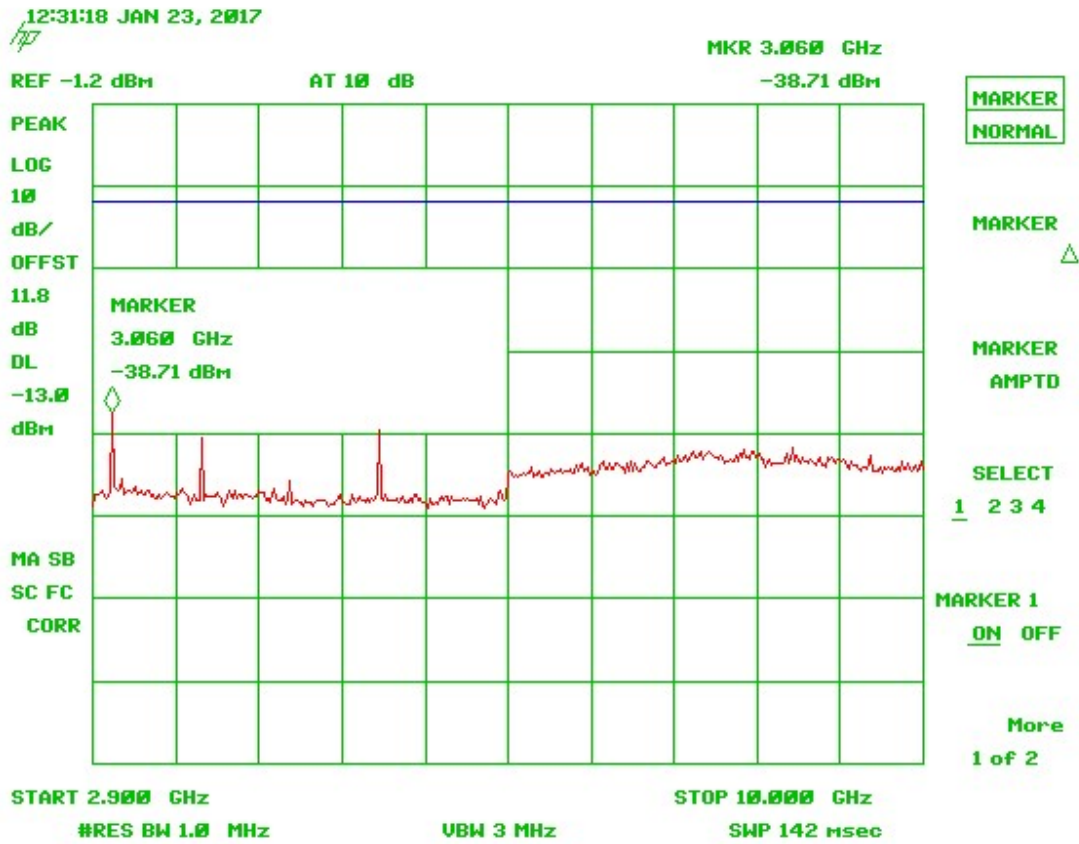


Figure 144. 763 MHz Vertical 2.9 - 10 GHz

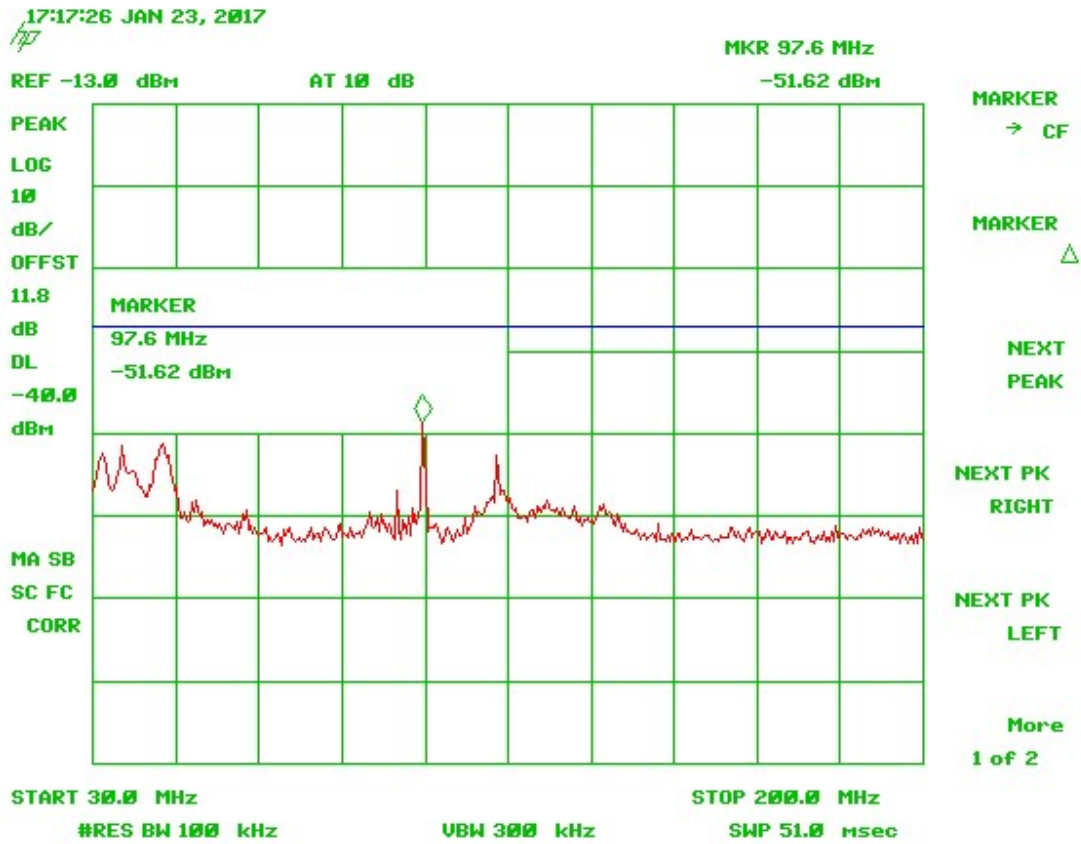


Figure 145. 768 MHz Vertical 30 – 200 MHz

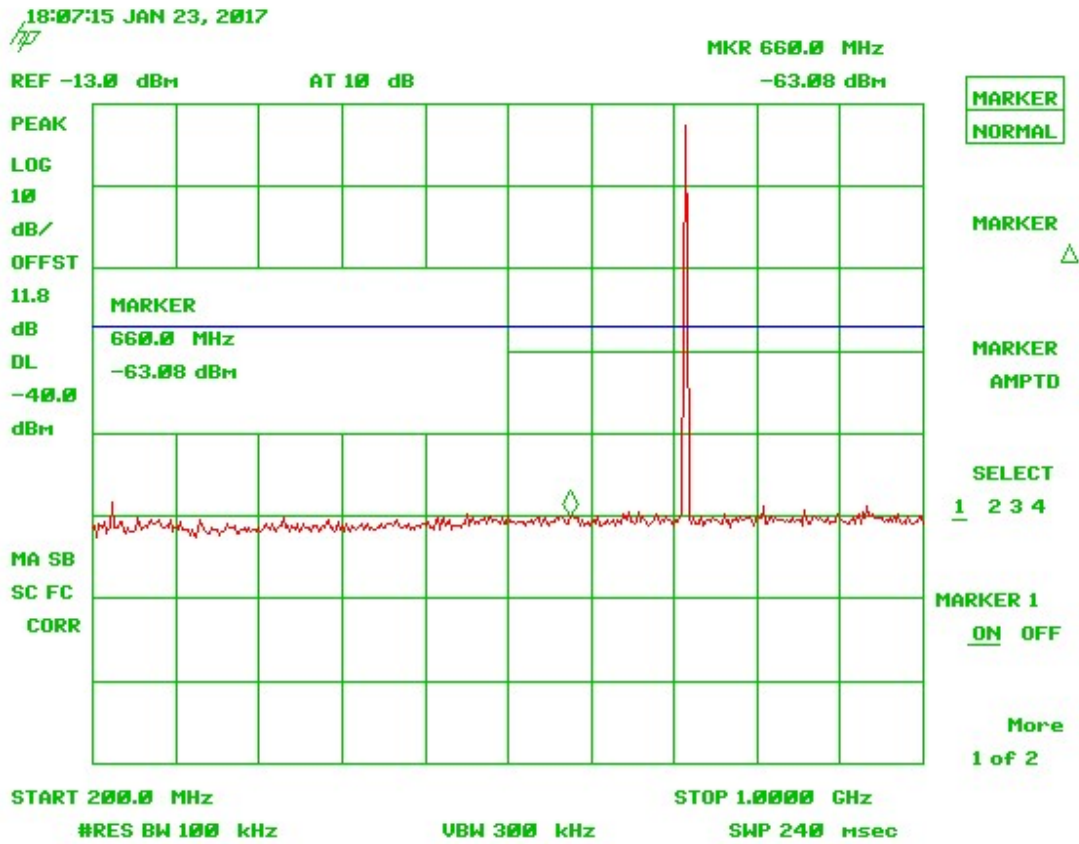


Figure 146. 768 MHz Vertical 200 -1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

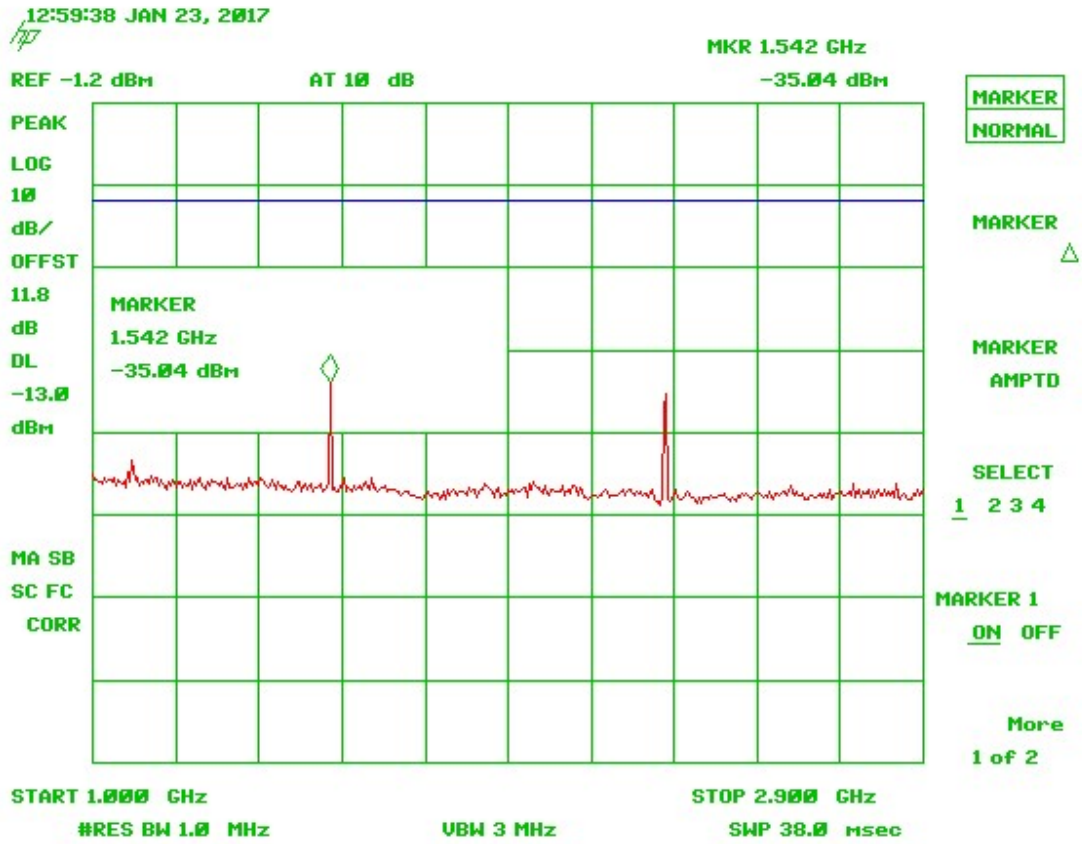


Figure 147. 768 MHz Vertical 1 – 2.9 GHz

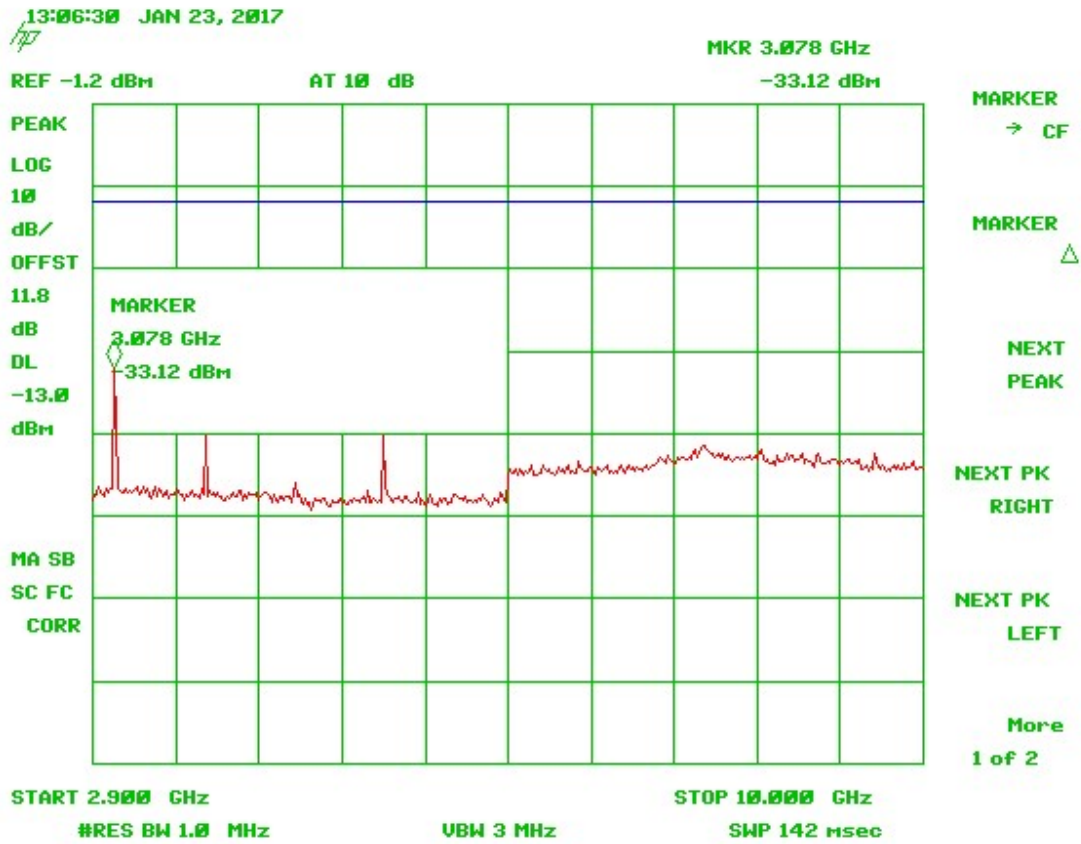


Figure 148. 768 MHz Vertical 2.9 – 10 GHz

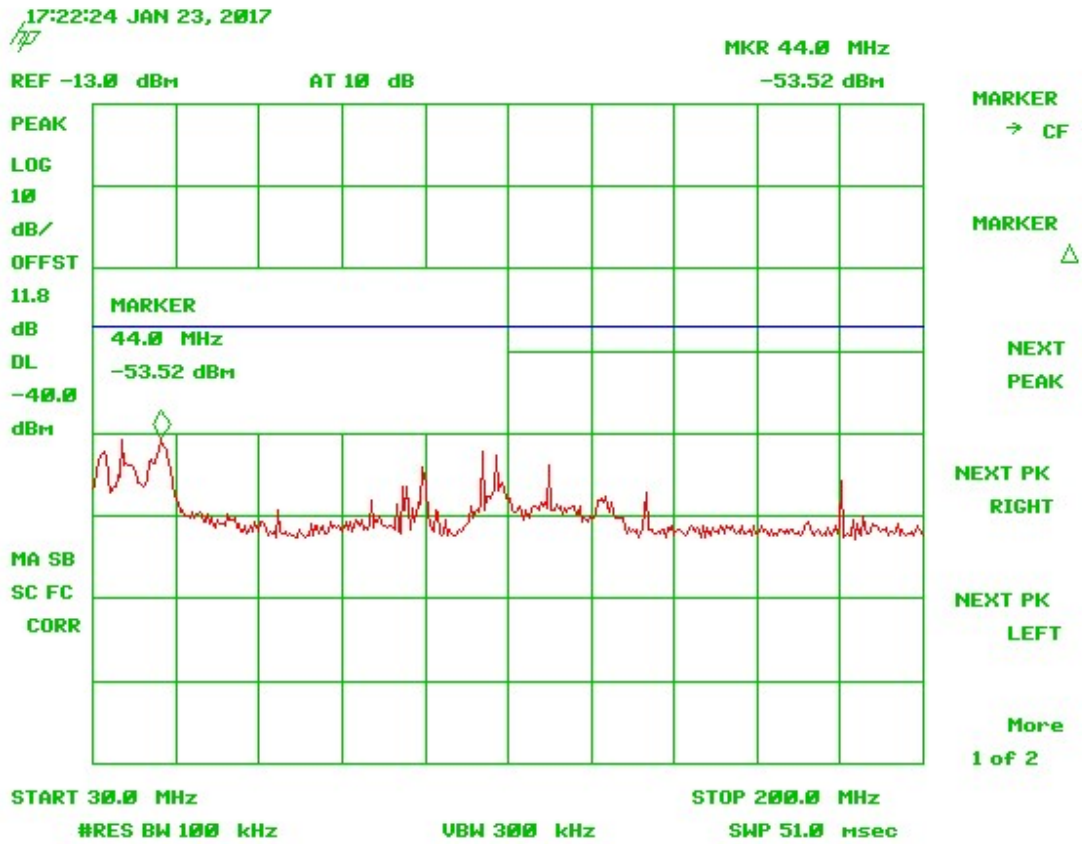


Figure 149. 774 MHz Vertical 30 – 200 MHz

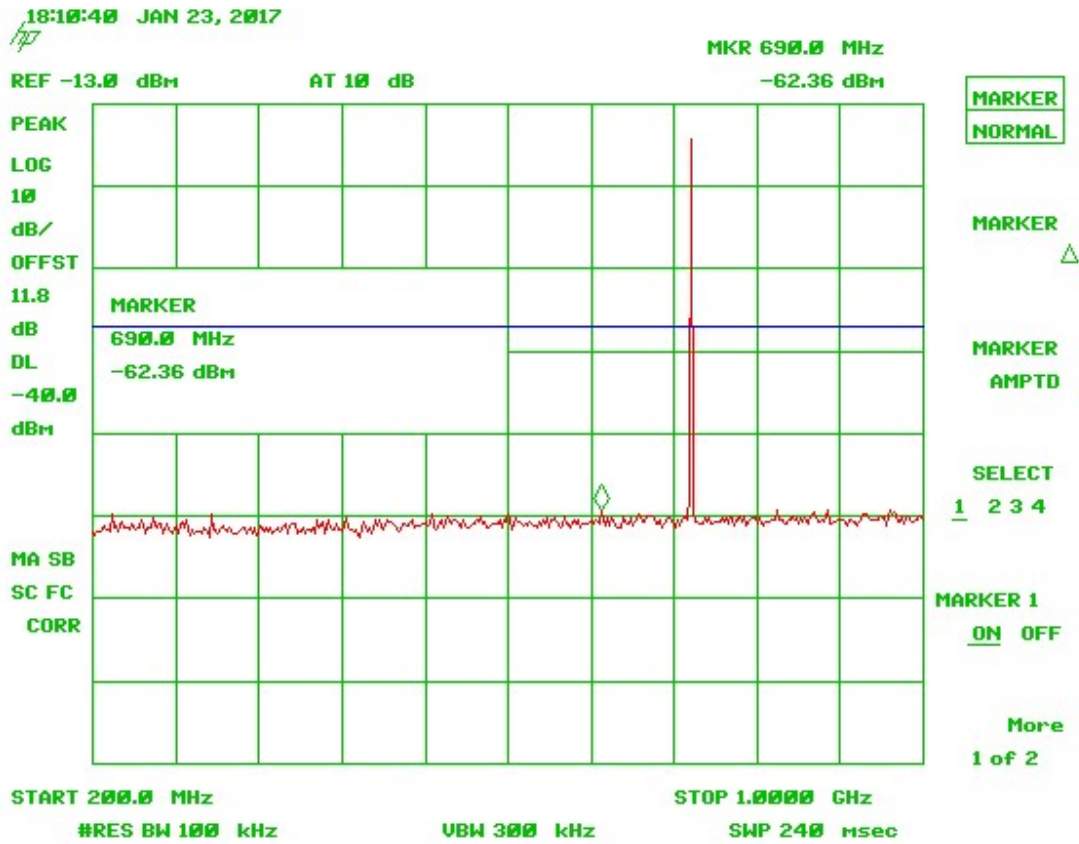


Figure 150. 774 MHz Vertical 200 -1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

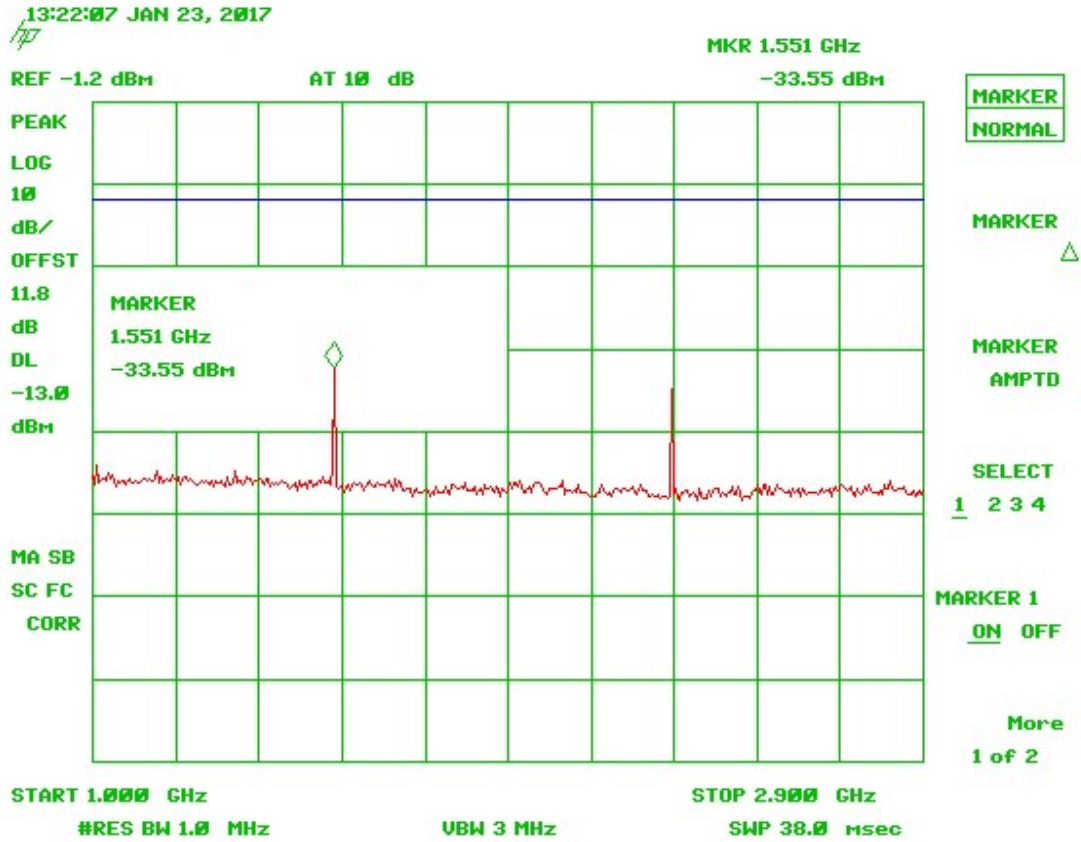


Figure 151. 774 MHz Vertical 1 - 2.9 GHz

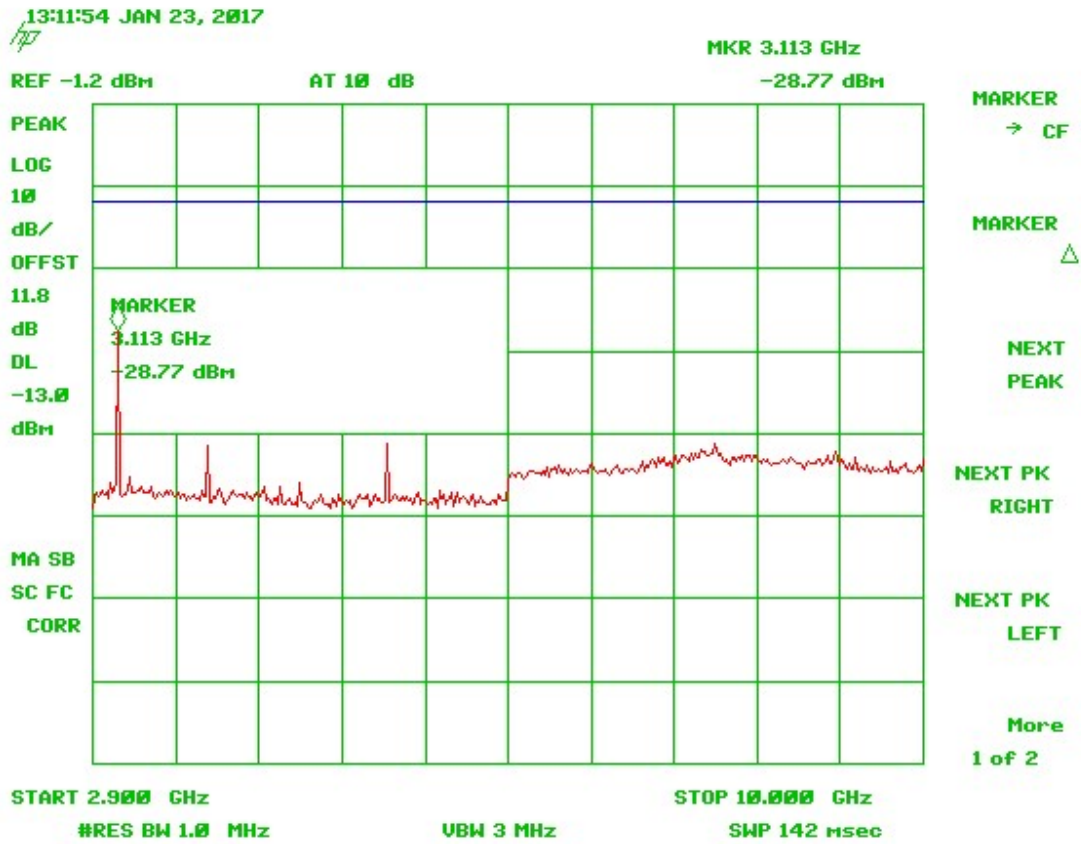


Figure 152. 774 MHz Vertical 2.9 - 10 GHz

2.14.1.4 800 MHz Radiated Spurious Emissions Plots

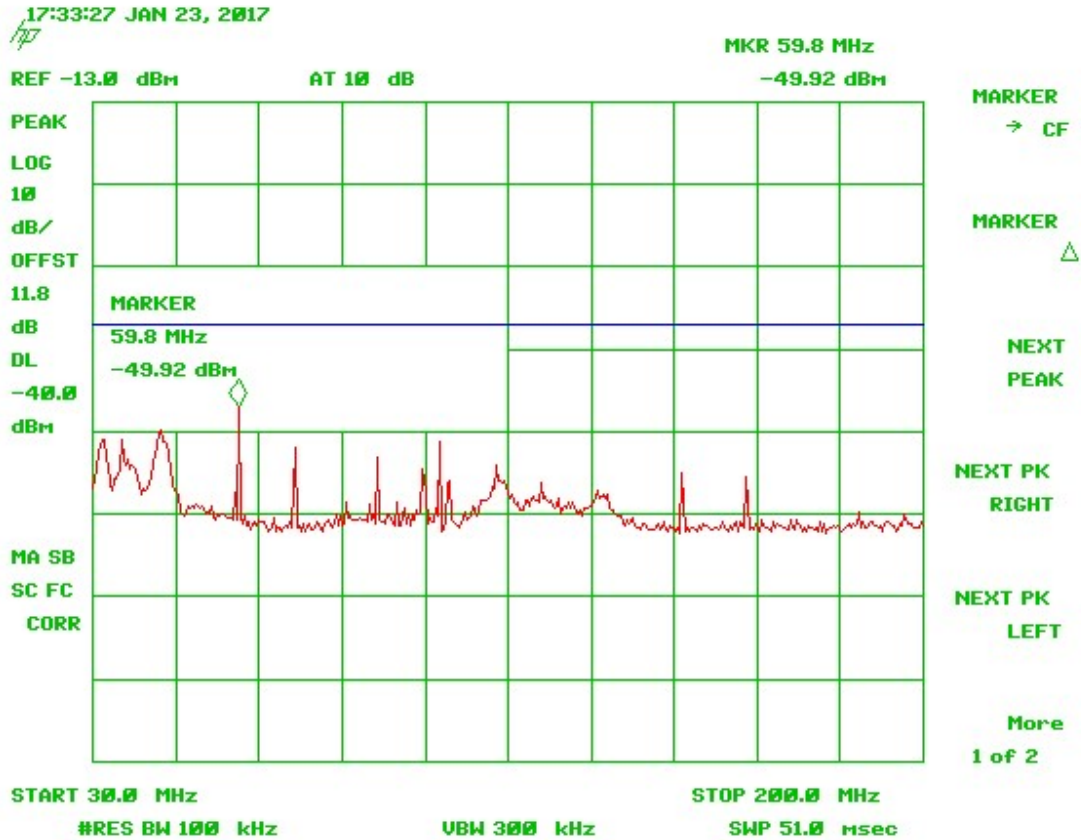


Figure 153. 851 MHz Vertical 30 – 200 MHz

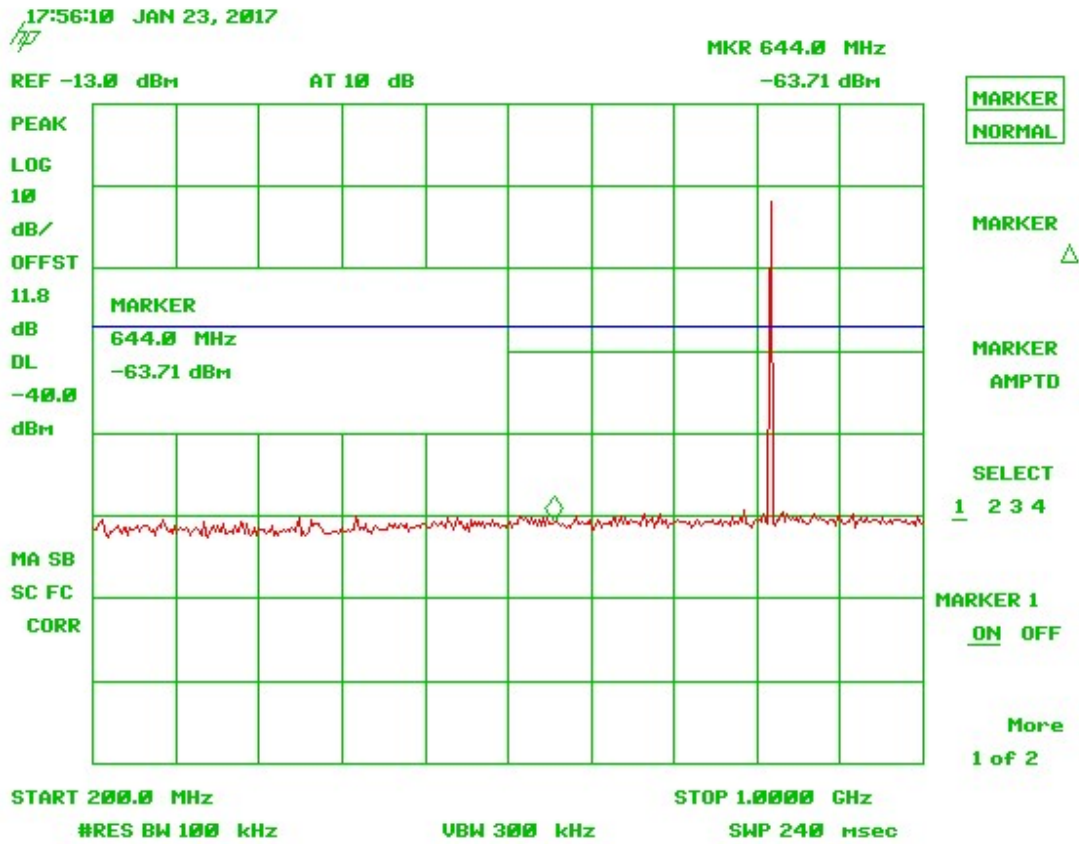


Figure 154. 851 MHz Vertical 200 - 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

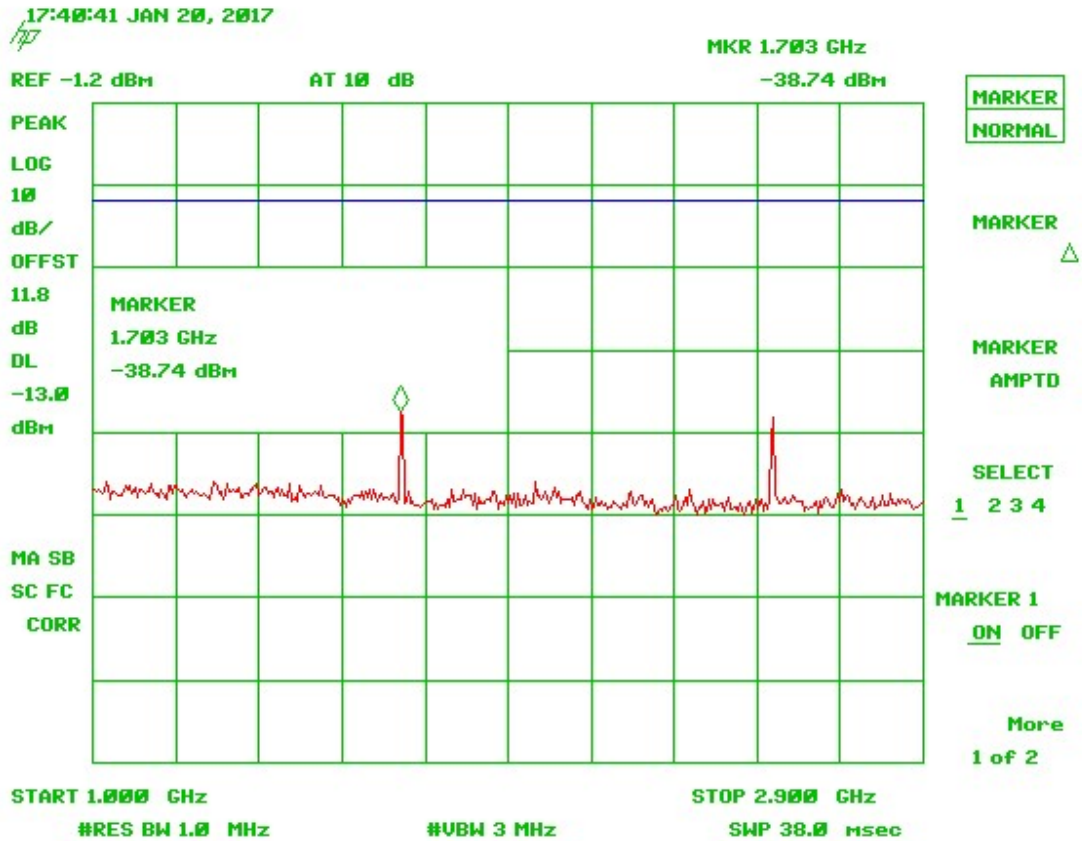


Figure 155. 851 MHz Vertical 1 – 2.9 GHz

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Customer:
Model:

FCC Part 90 Certification
2AKSM-SAFE1
22303-SAFE1
17-0001
March 14, 2017
Safe-Com Wireless
SAFE-1000

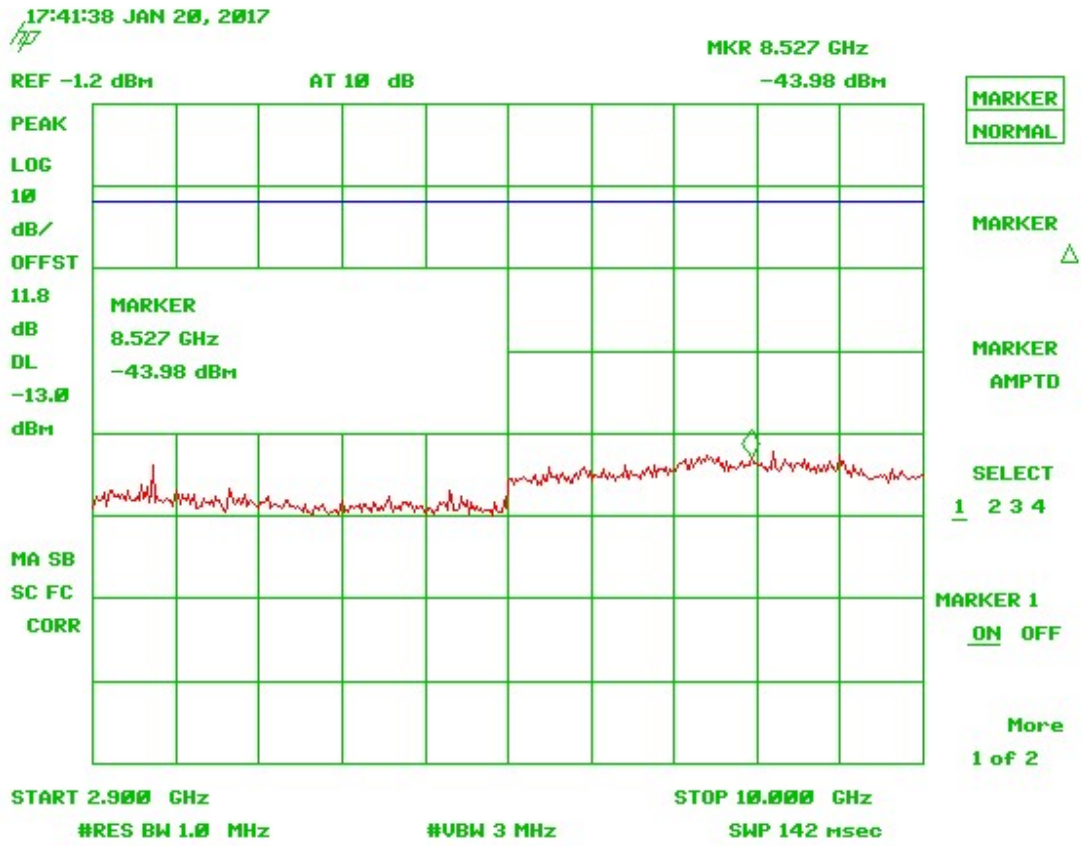


Figure 156. 851 MHz Vertical 2.9 – 10 GHz

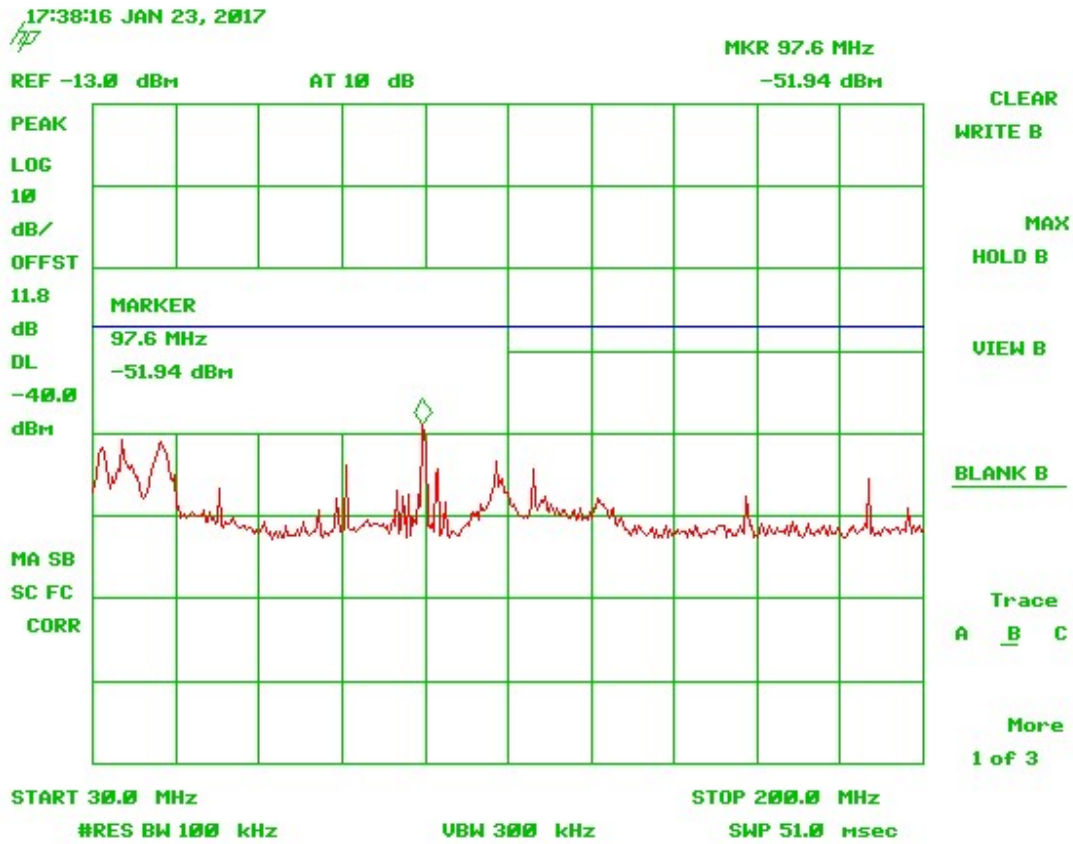


Figure 157. 860 MHz Vertical 30 - 200 MHz

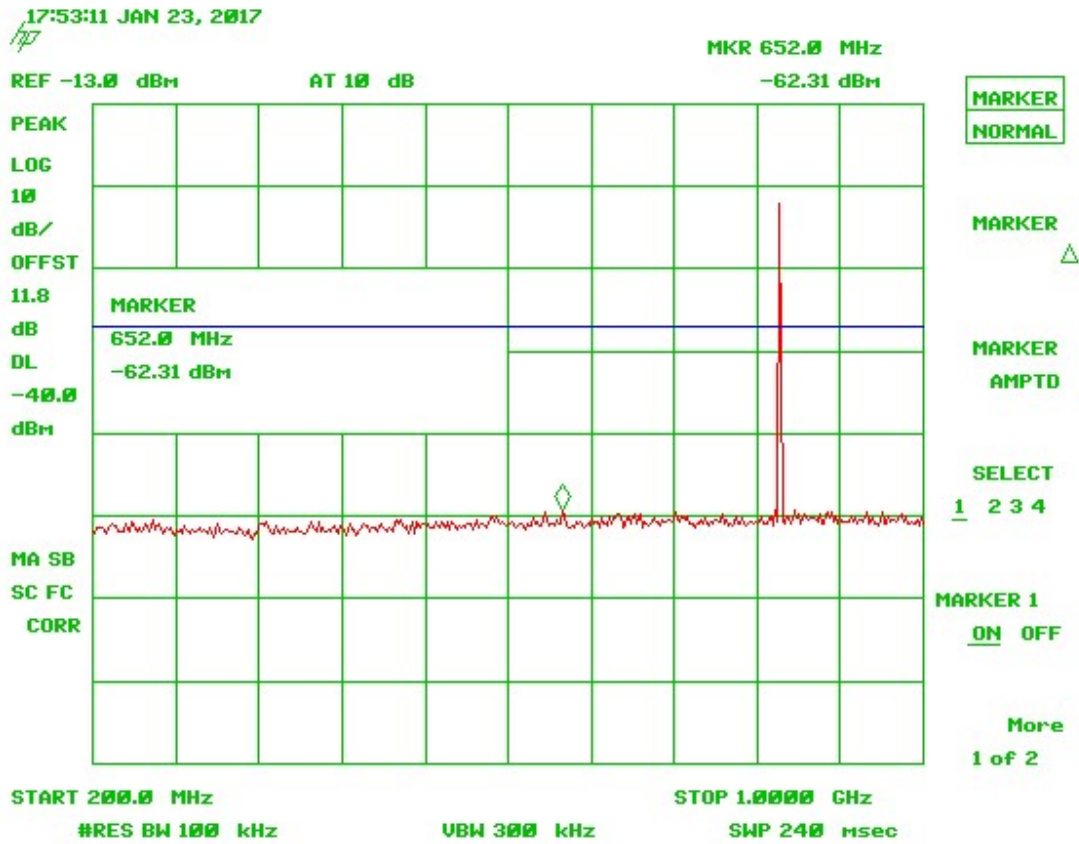


Figure 158. 860 MHz Vertical 200 – 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

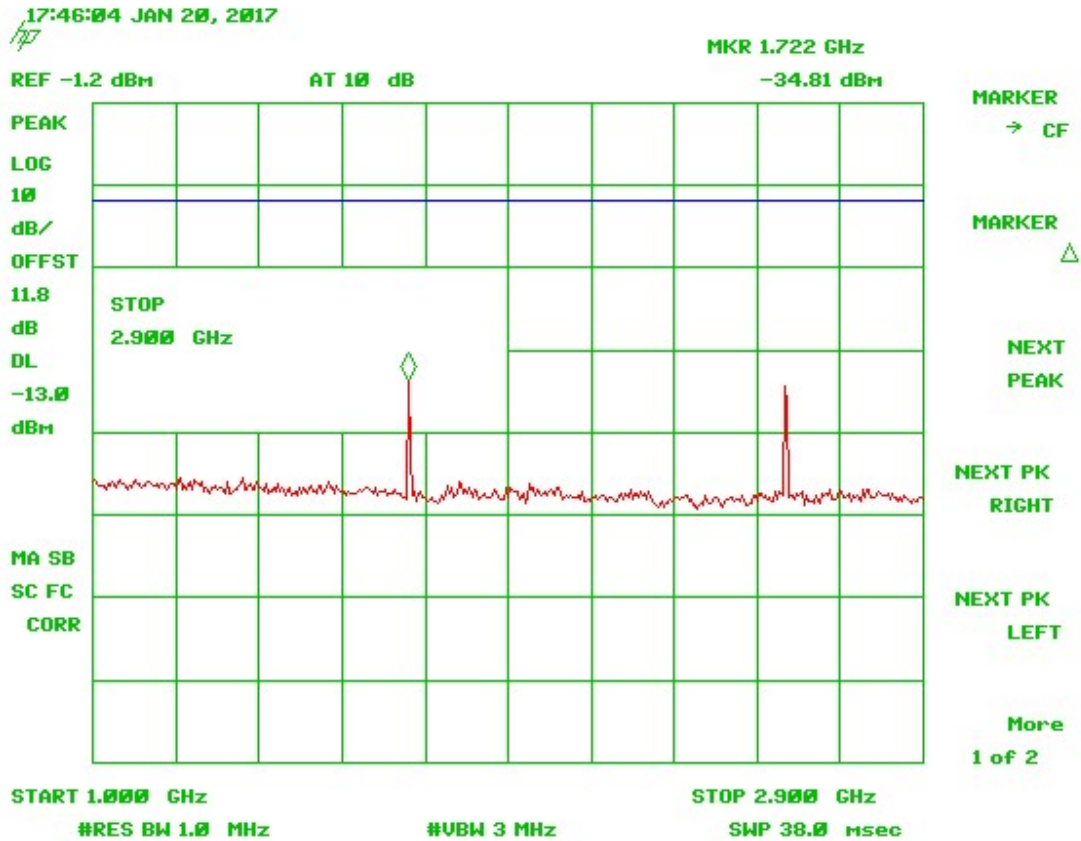


Figure 159. 860 MHz Vertical 1 – 2.9 GHz

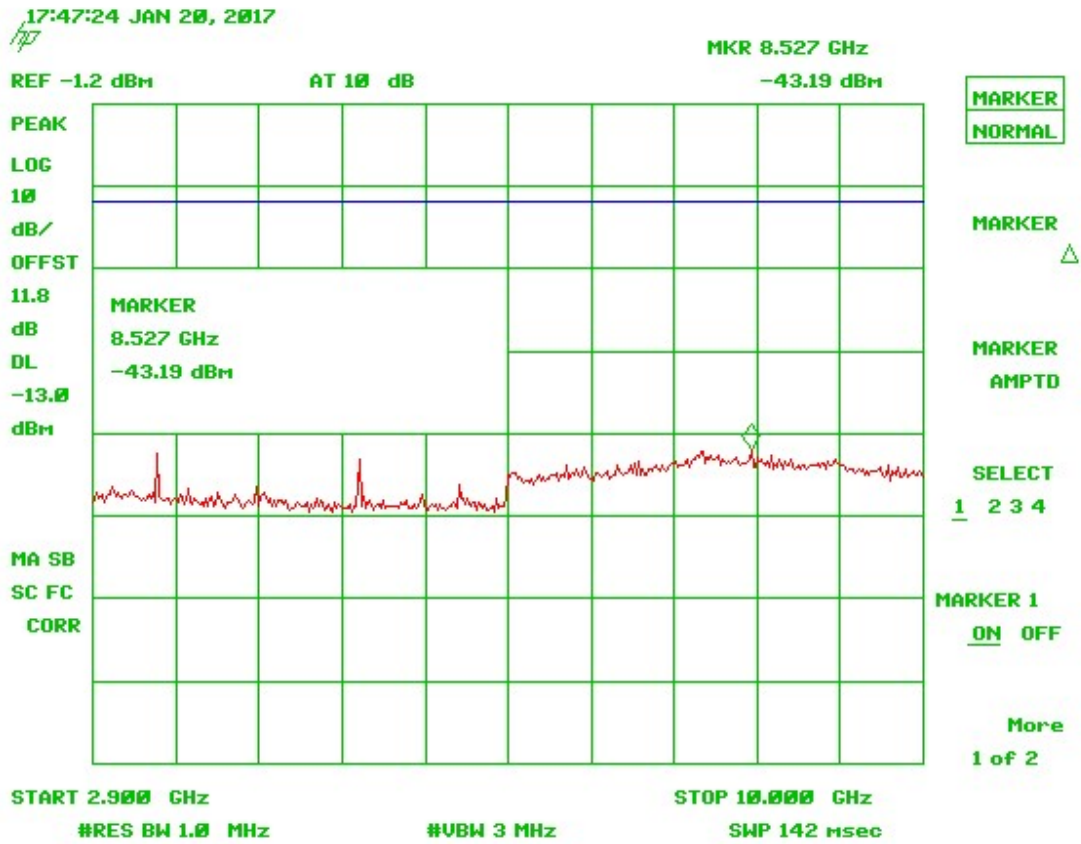


Figure 160. 860 MHz Vertical 2.9 - 10 GHz

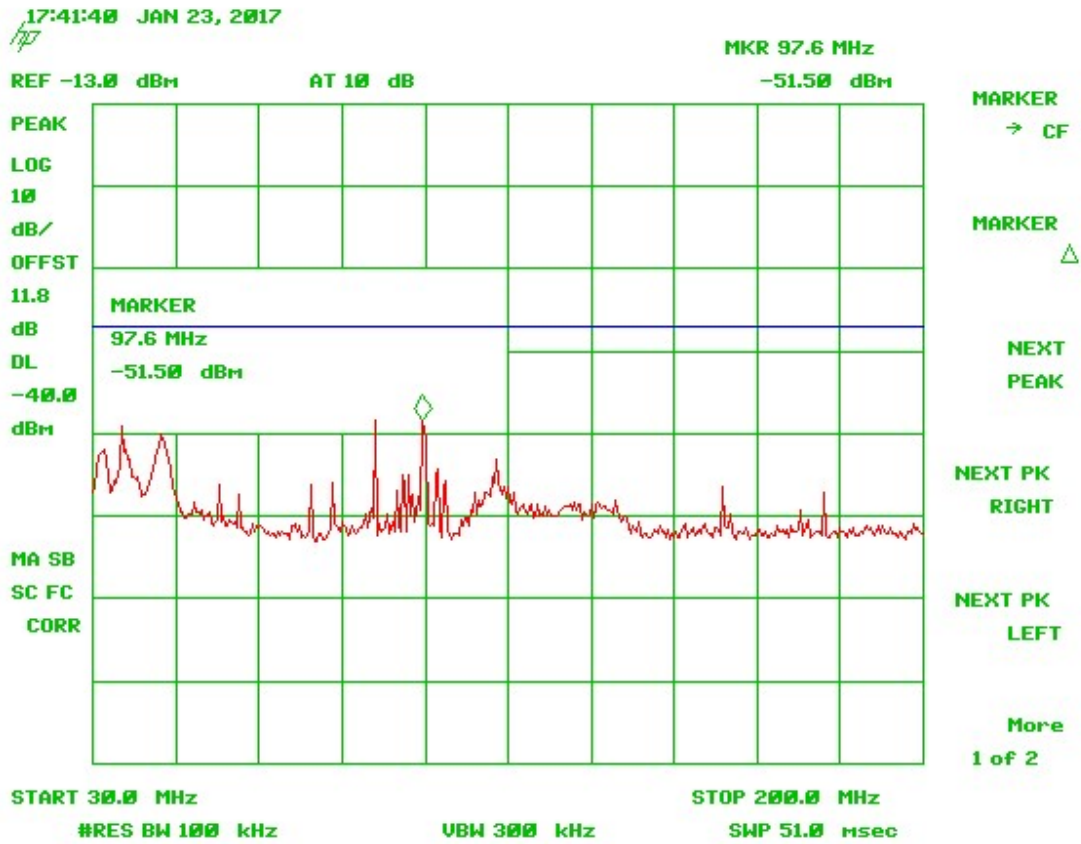


Figure 161. 869 MHz Vertical 30 - 200 MHz

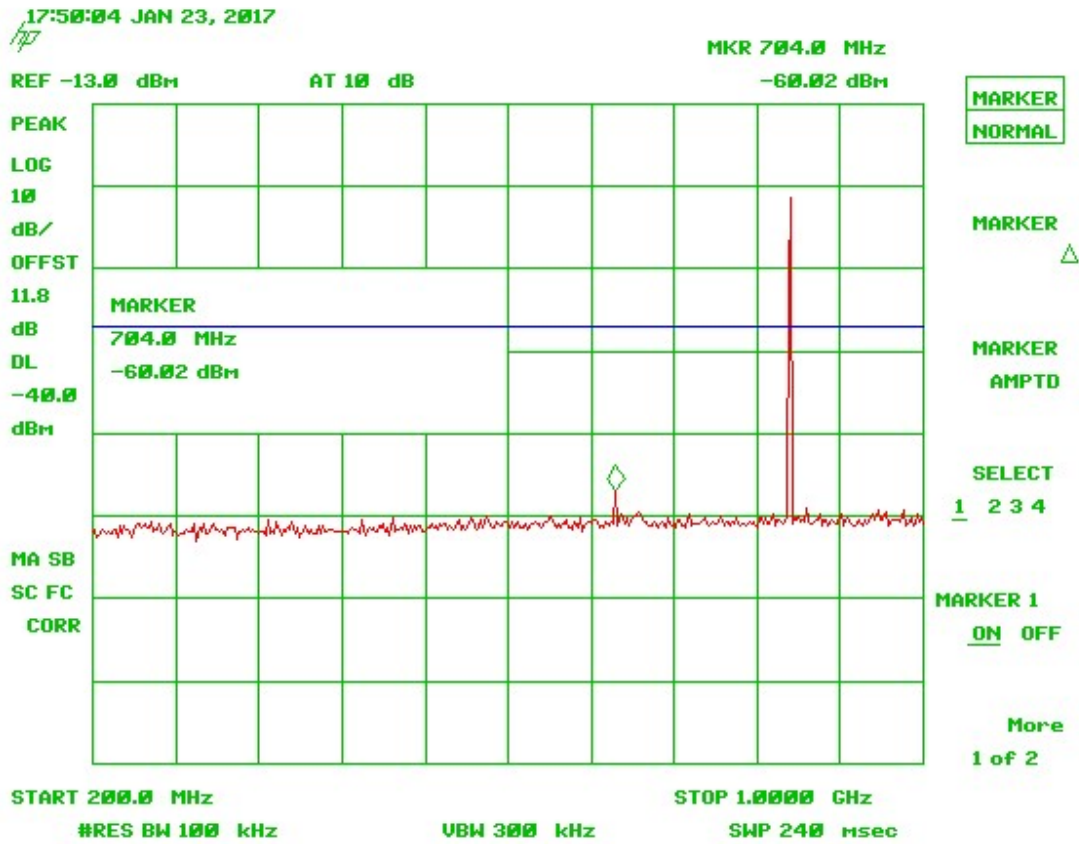


Figure 162. 869 MHz Vertical 200 - 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

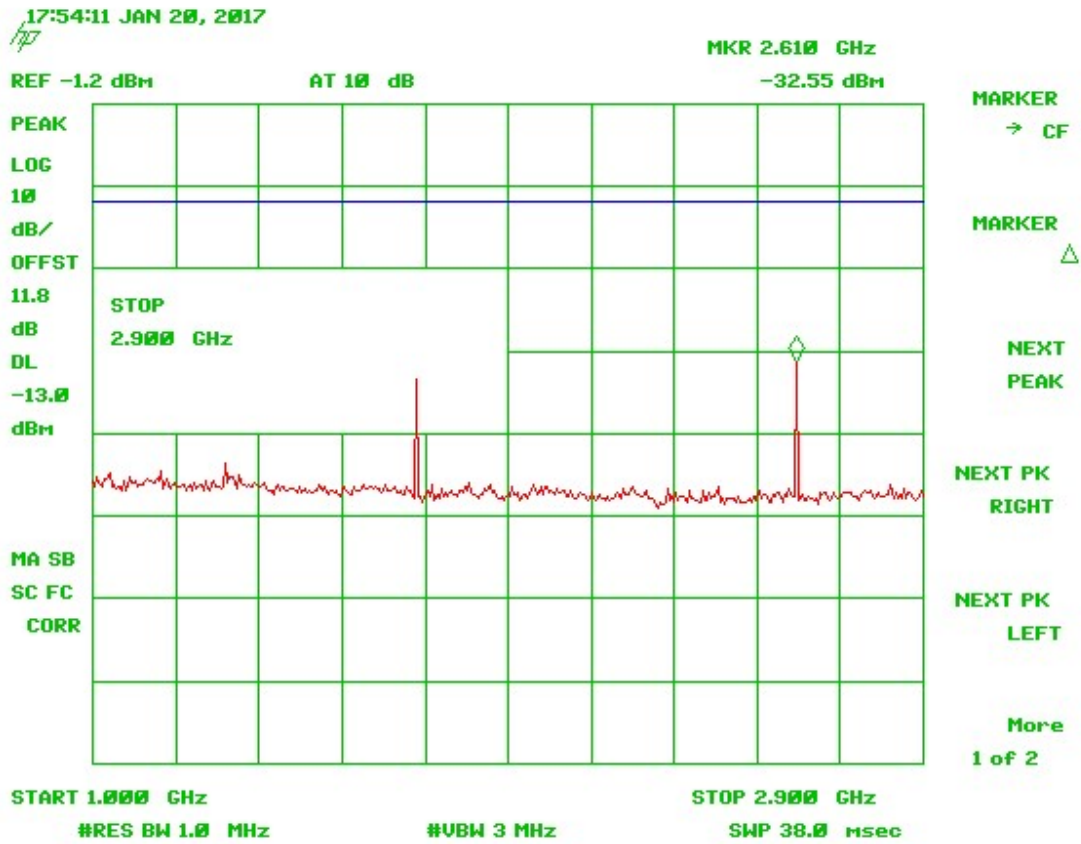


Figure 163. 869 MHz Vertical 1 - 2.9 GHz

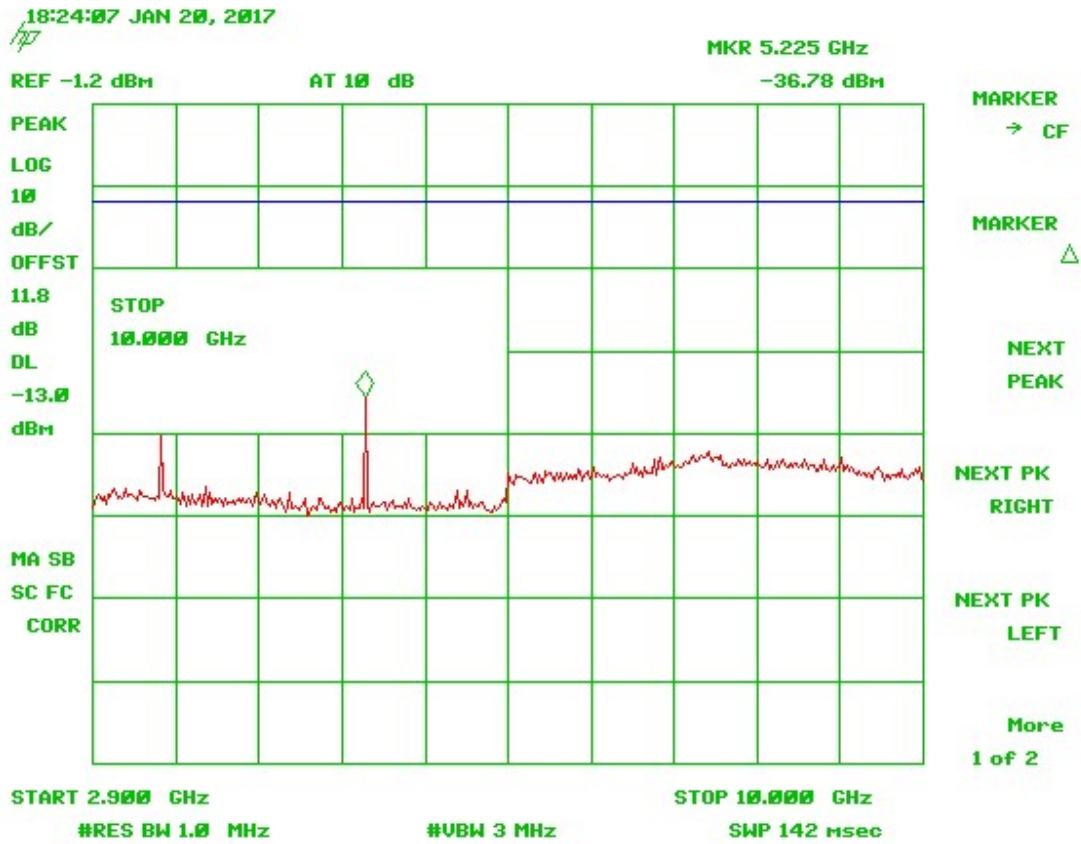


Figure 164. 869 MHz Vertical 2.9 -10 GHz

2.14.1.5 900 MHz Radiated Spurious Emissions Plots

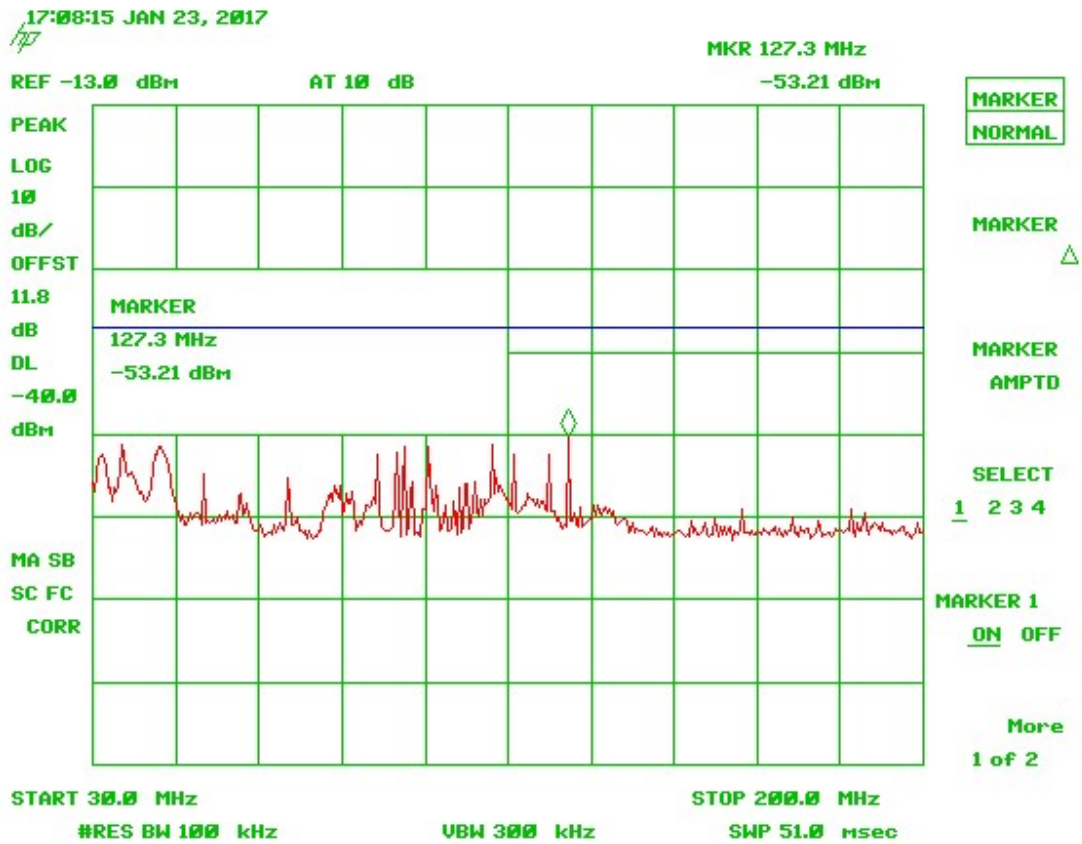


Figure 165. 929.5 MHz Vertical 30 - 200 MHz

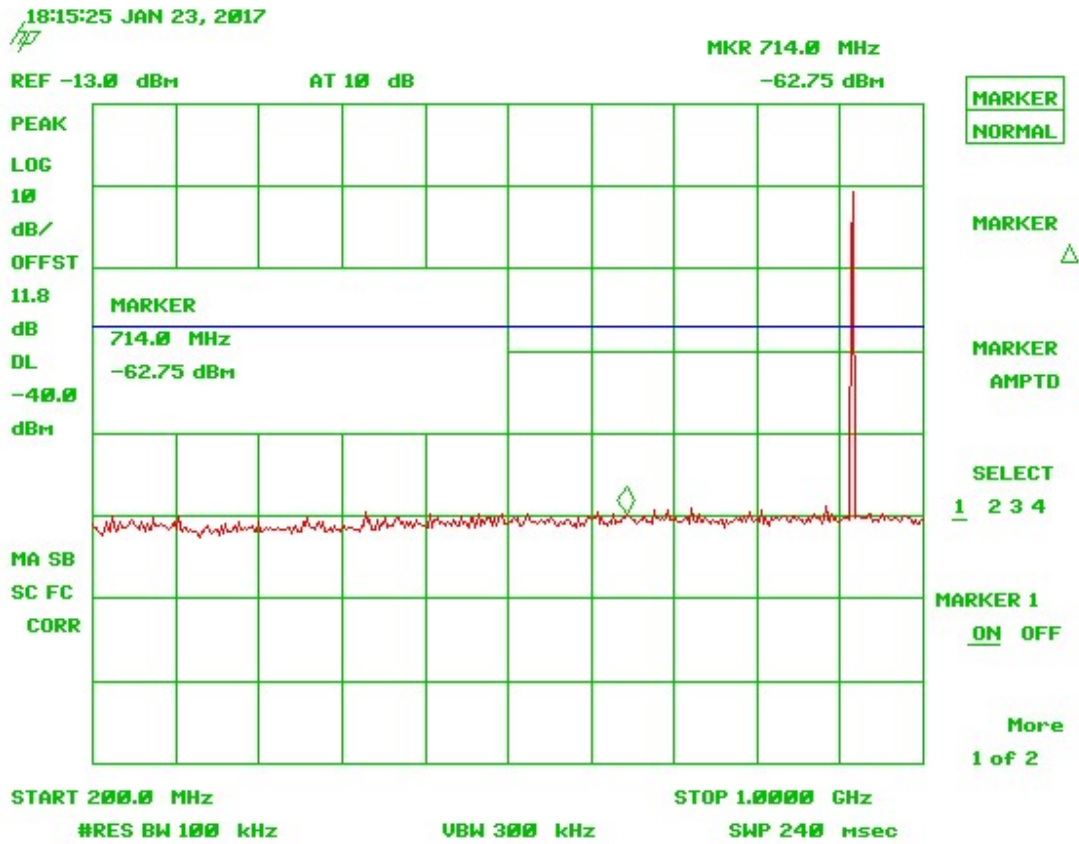


Figure 166. 929.5 MHz Vertical 200 - 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

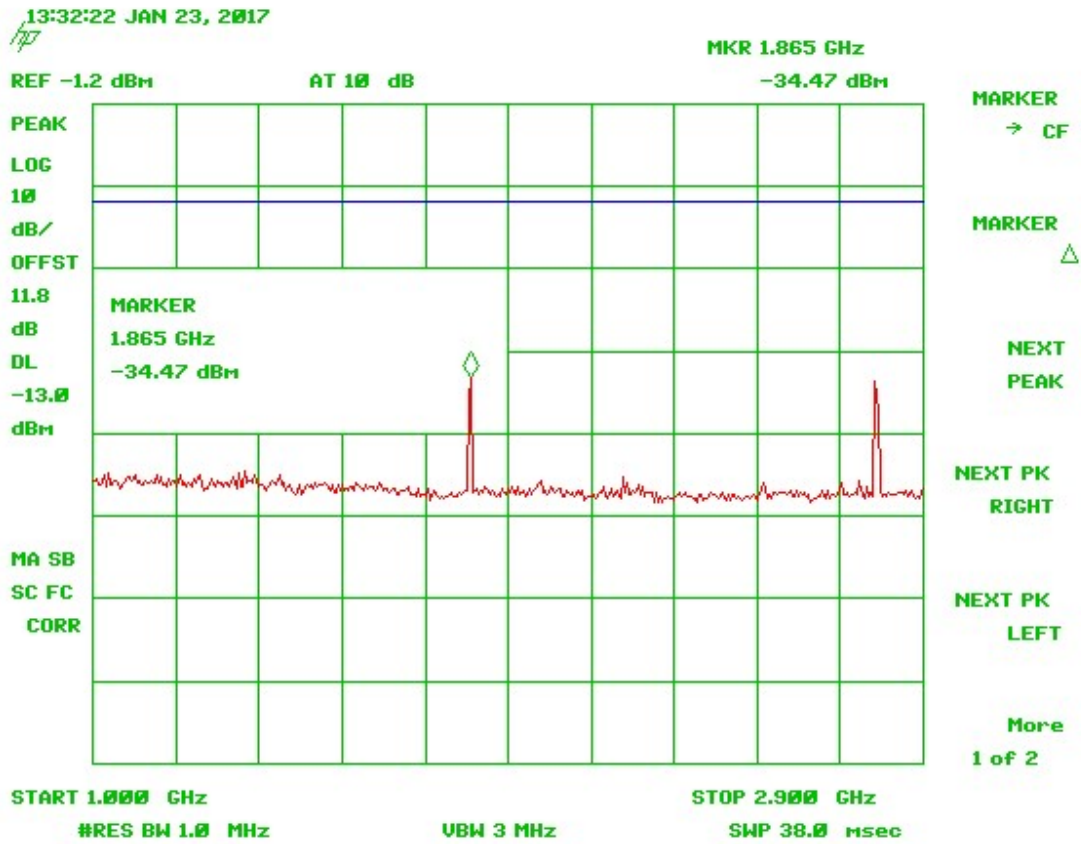


Figure 167. 929.5 MHz Vertical 1 - 2.9 GHz

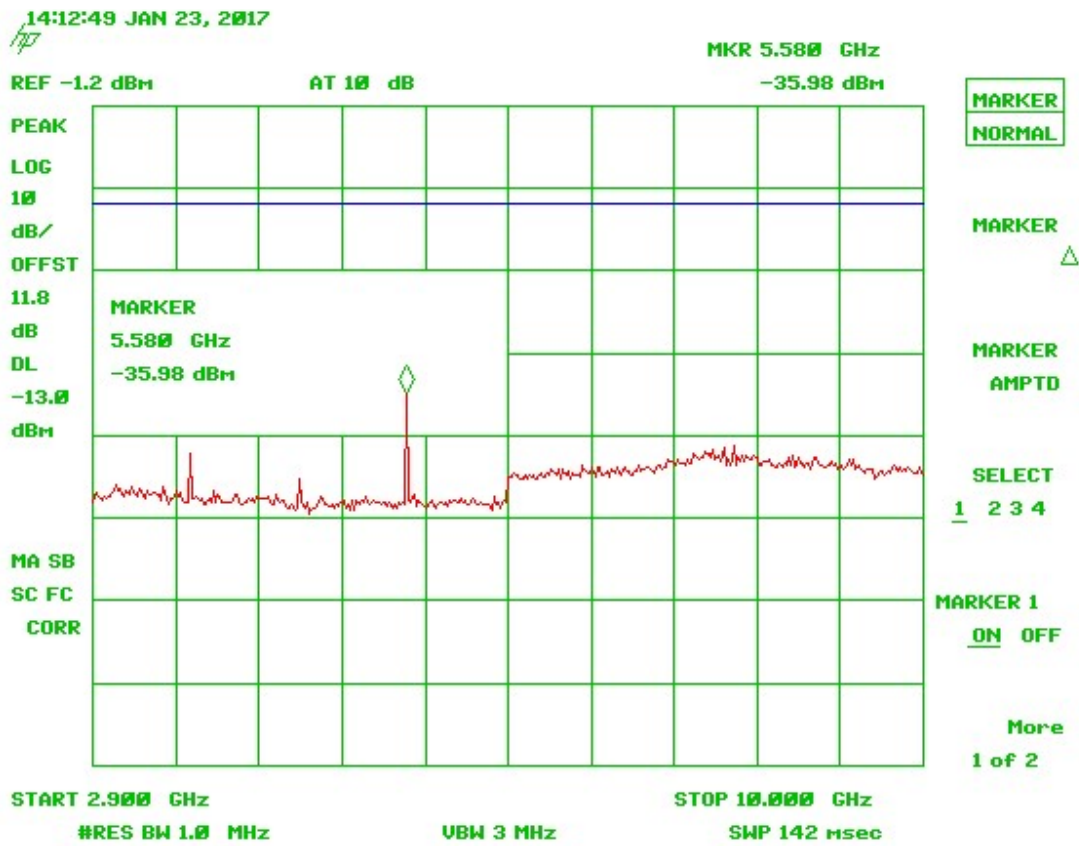


Figure 168. 929.5 MHz Vertical 2.9 - 10 GHz

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Customer:
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2AKSM-SAFE1
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March 14, 2017
Safe-Com Wireless
SAFE-1000

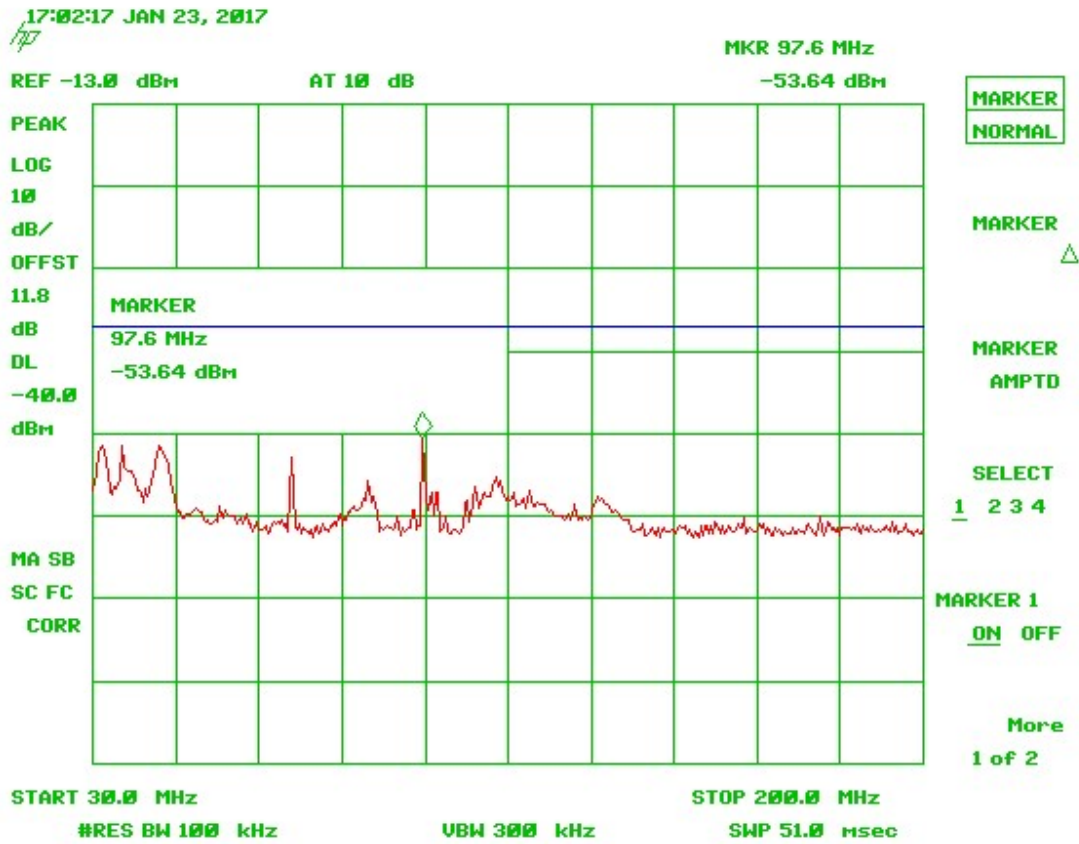


Figure 169. 937 MHz Vertical 30 - 200 MHz

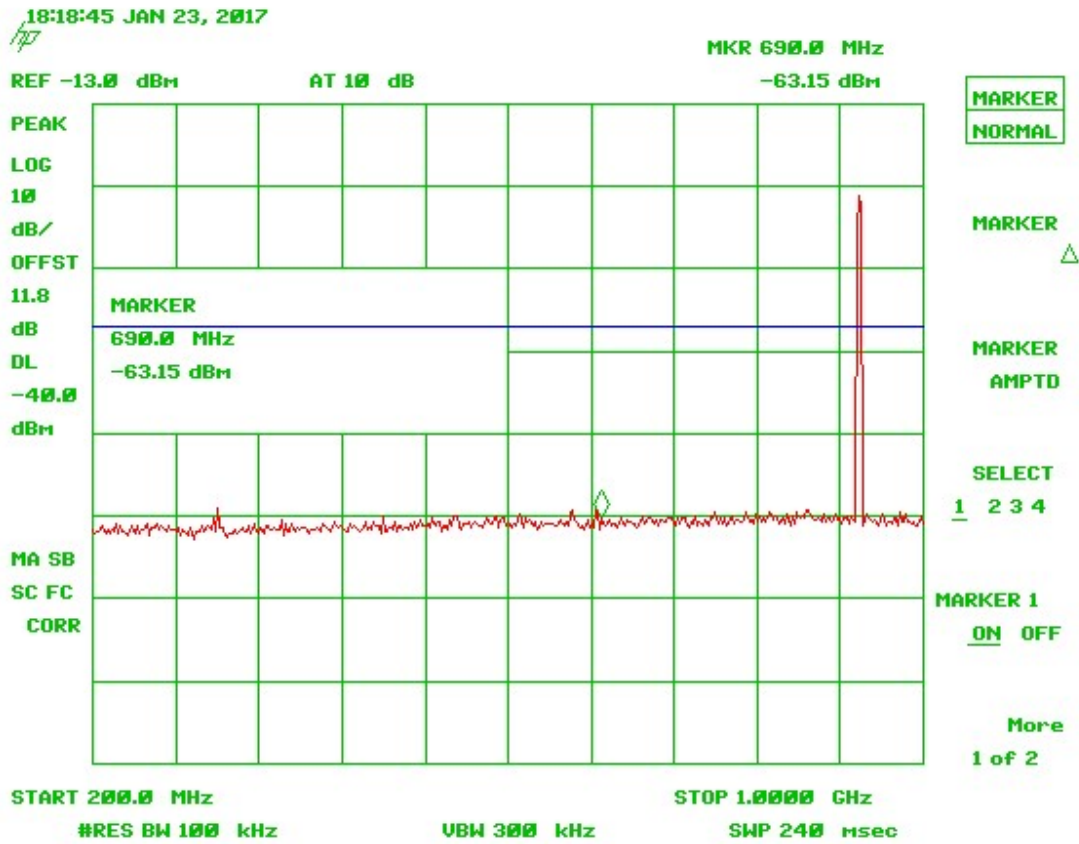


Figure 170. 937 MHz Vertical 200 - 1000 MHz

Note: All spurious emissions other than fundamental and harmonics are below the display line level.

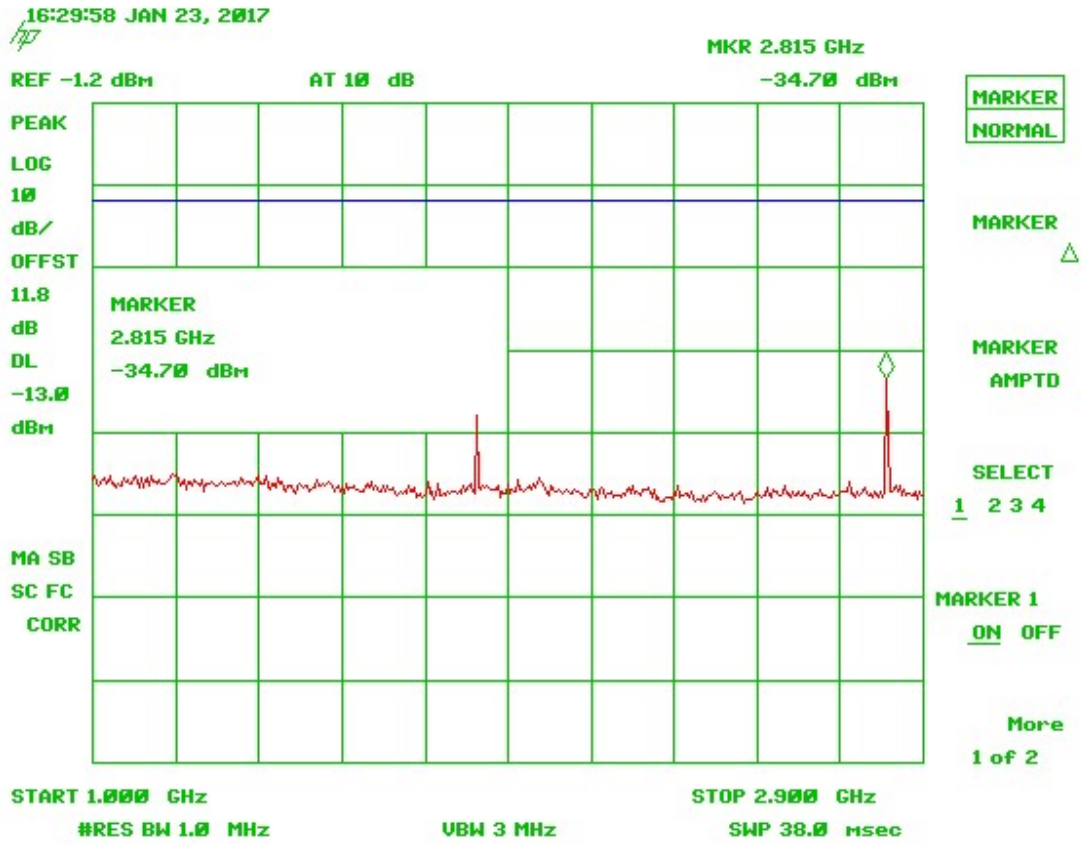


Figure 171. 937 MHz Vertical 1 - 2.9 GHz

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 IC:
 Report Number:
 Issue Date:
 Customer:
 Model:

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 2AKSM-SAFE1
 22303-SAFE1
 17-0001
 March 14, 2017
 Safe-Com Wireless
 SAFE-1000

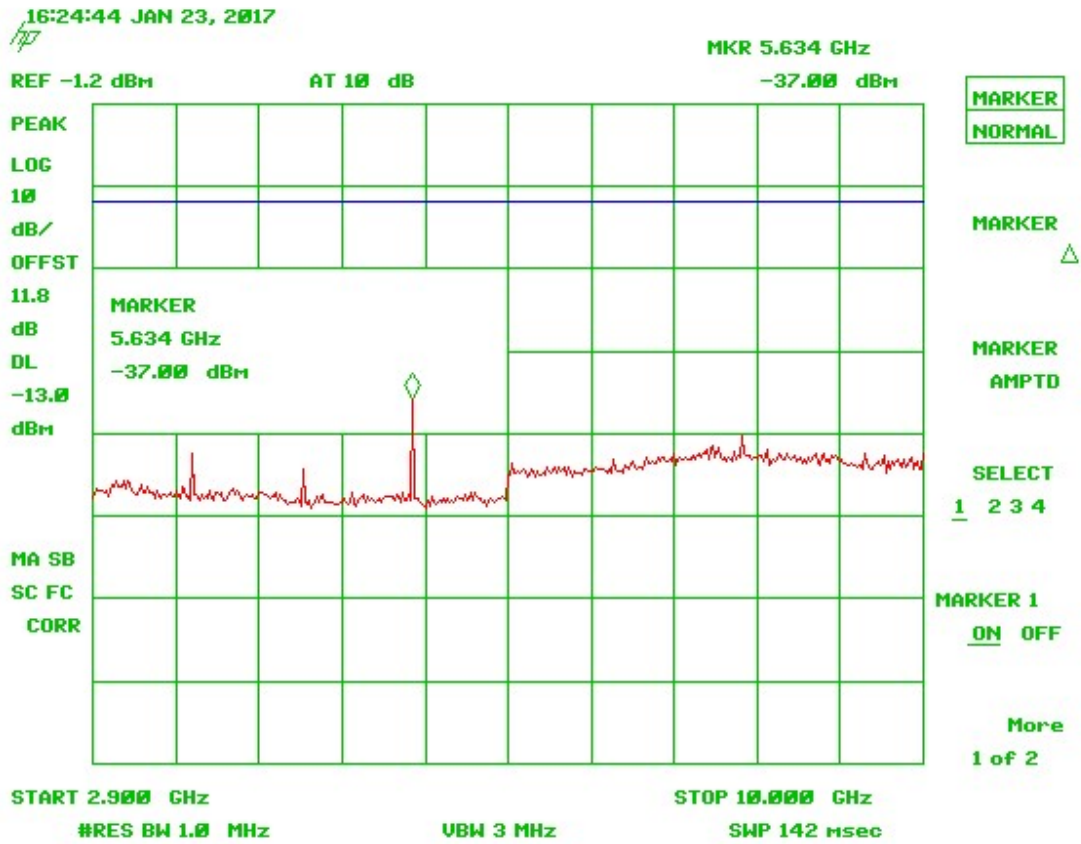


Figure 172. 937 MHz Vertical 2.9 - 10 GHz

U.S. Tech Test Report:
FCC ID:
IC:
Report Number:
Issue Date:
Customer:
Model:

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2AKSM-SAFE1
22303-SAFE1
17-0001
March 14, 2017
Safe-Com Wireless
SAFE-1000

2.14.2 Conducted Spurious Emissions Measurement

The EUT was connected to a spectrum analyzer through a 20 dB power attenuator. All cable and attenuator losses were input into the spectrum analyzer as a combination of reference level offset and correction factors as needed to ensure the accuracy of the readings obtained.

A CW signal was used to set the center frequency of the transmitter. The RF input signal level was set to at least 0.2 dB below the ACG threshold.

The RBW was set to 100 KHz for measurements below 1 GHz and 1 MHz for measurements above 1 GHz. The VBW was 3 times the RBW.

Limit = -13 dBm

Emissions were investigated from 30 MHz to the 10th harmonic of the applicable frequency band of concern.

The following plots show the worst-case measurements.

2.14.2.1 VHF Conducted Spurious Emissions

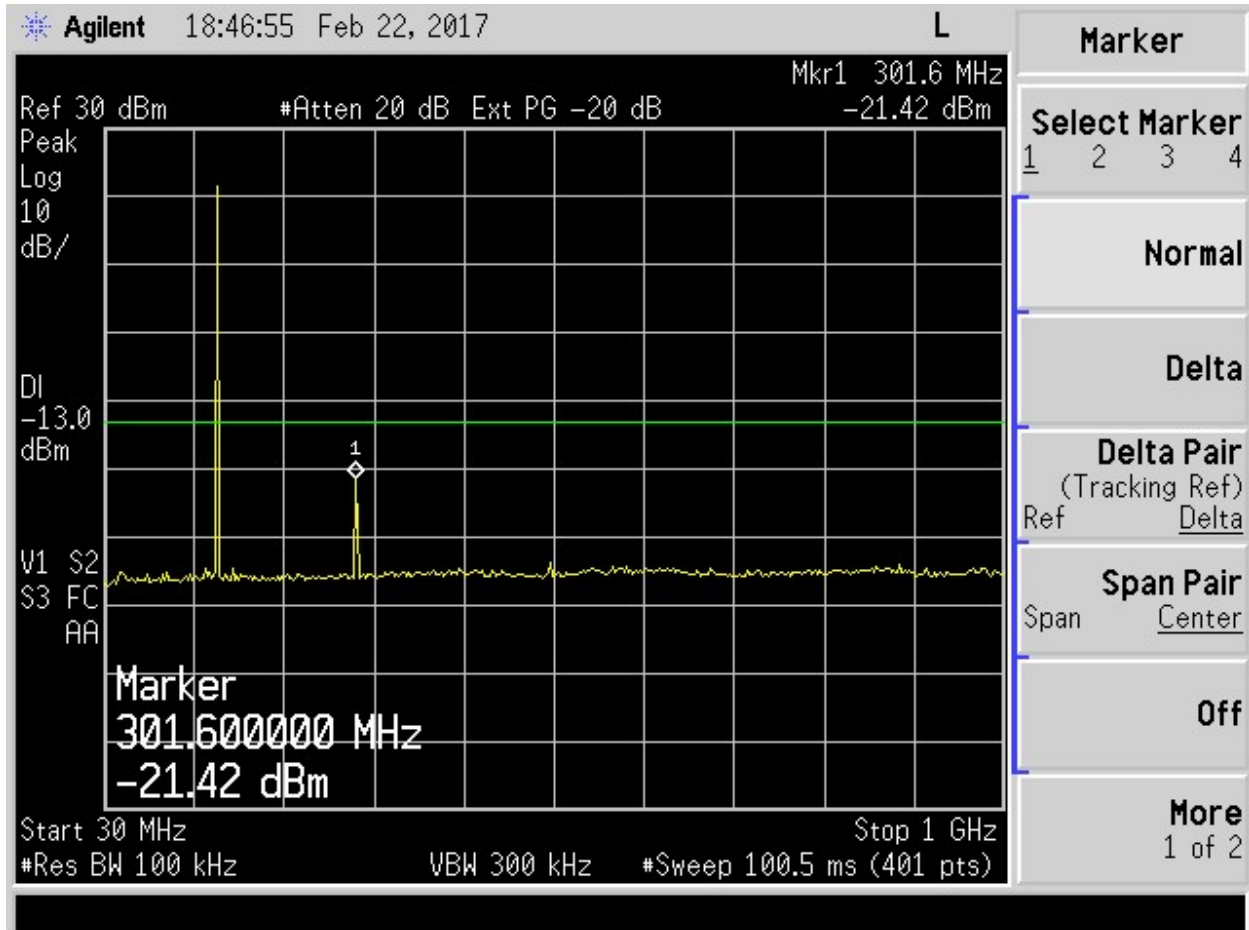


Figure 173. 150 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

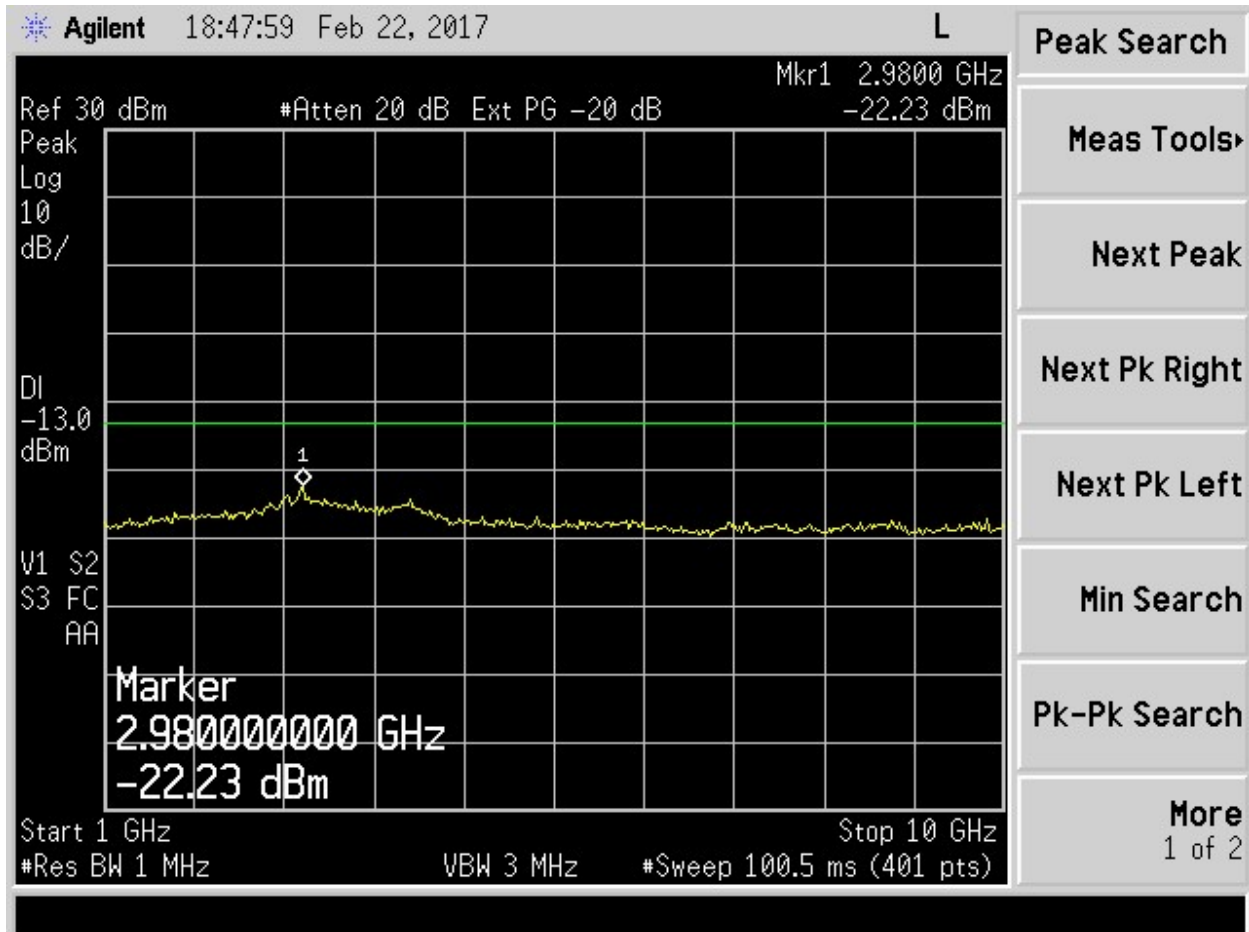


Figure 174. 150 MHz above 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

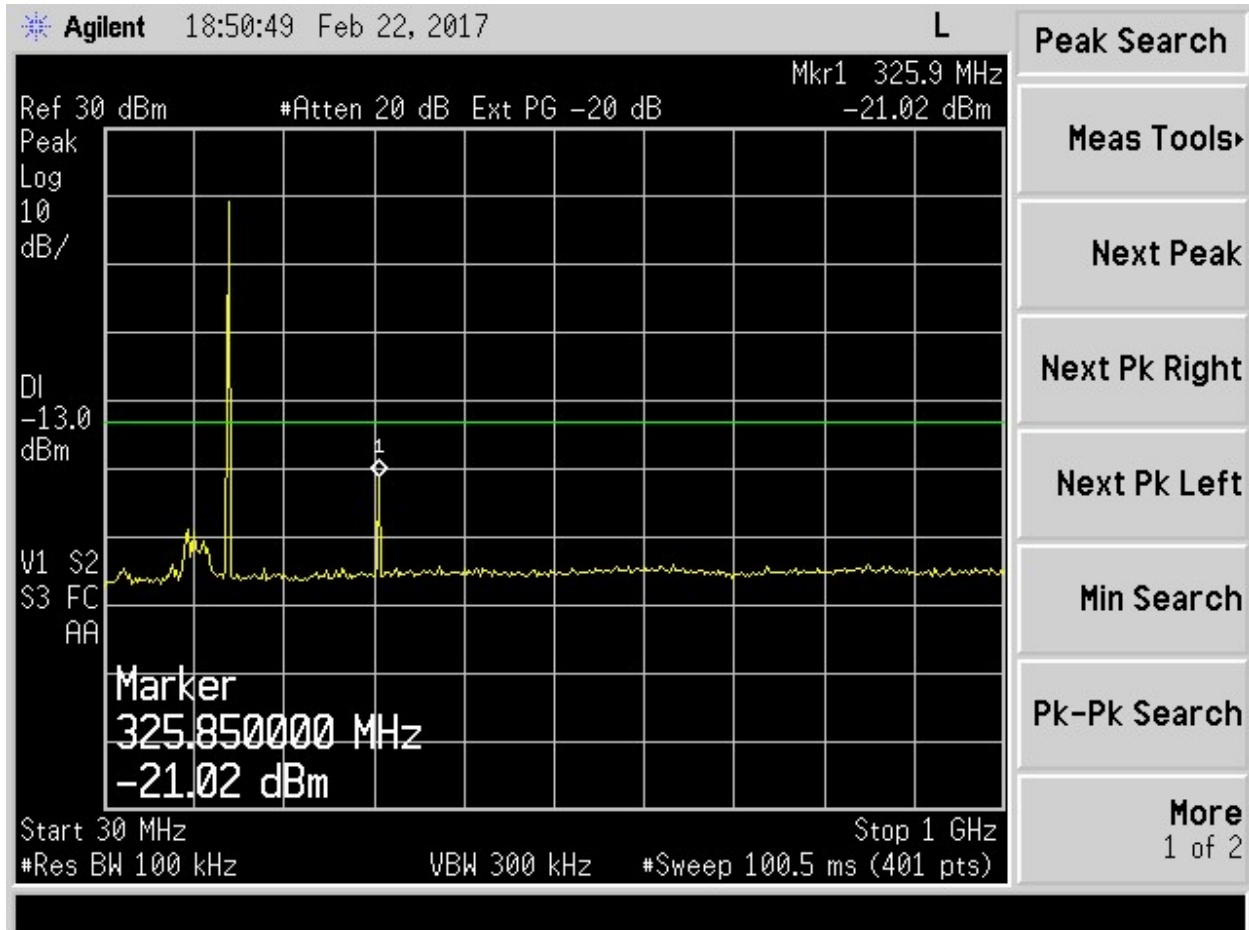


Figure 175. 162 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

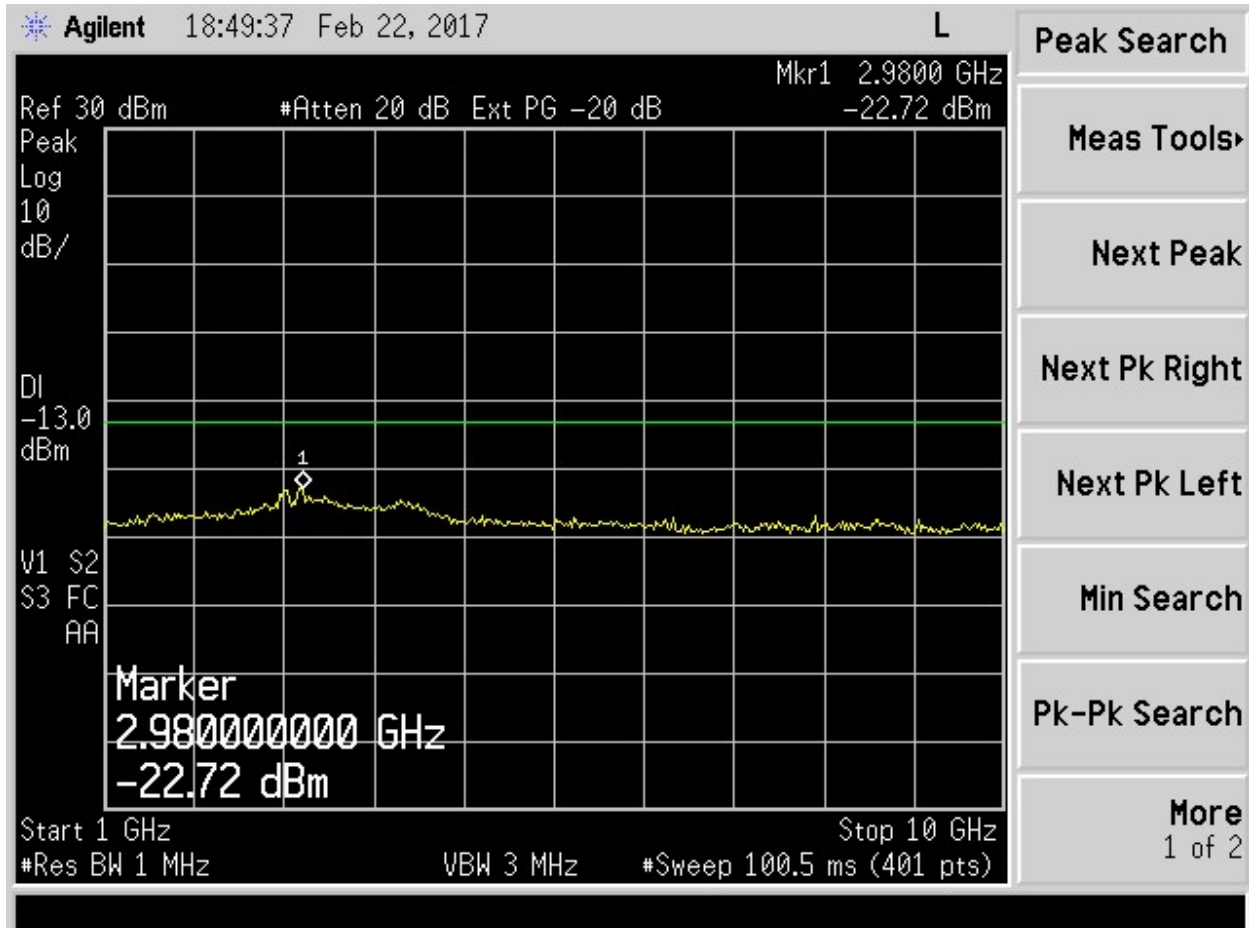


Figure 176. 162 MHz above 1 GHz

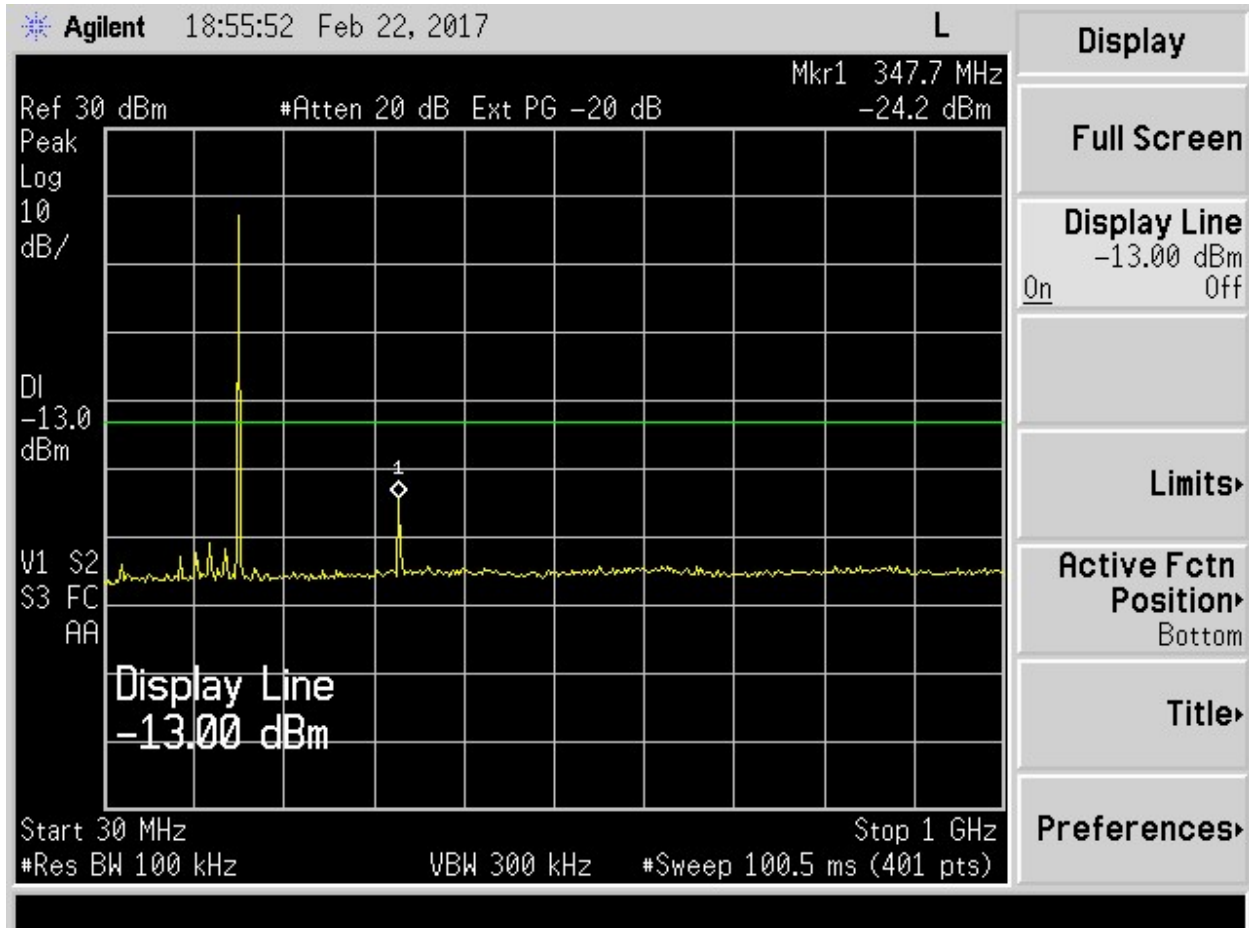


Figure 177. 174 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

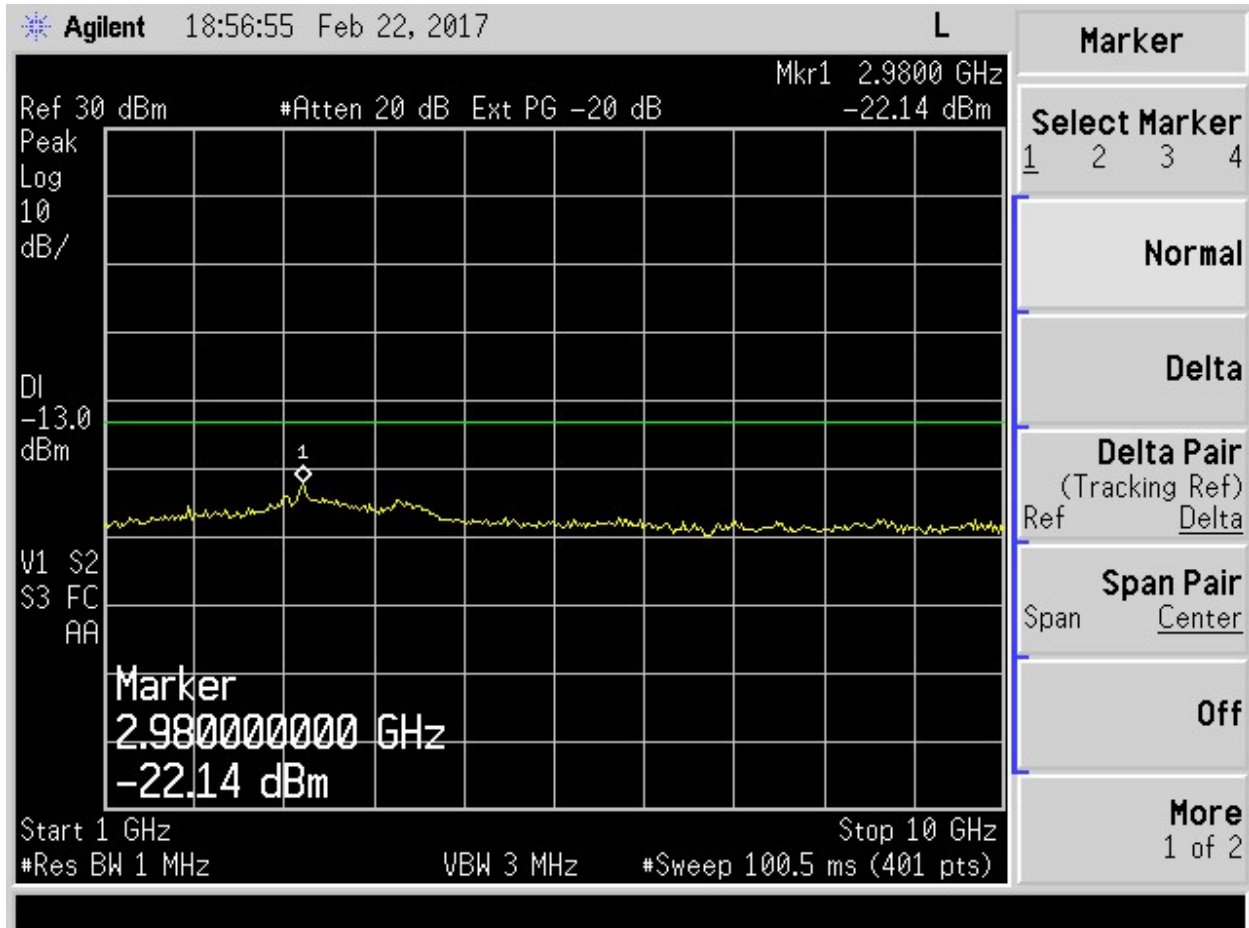


Figure 178. 174 MHz above 1 GHz

2.14.2.2 UHF Conducted Spurious Emissions

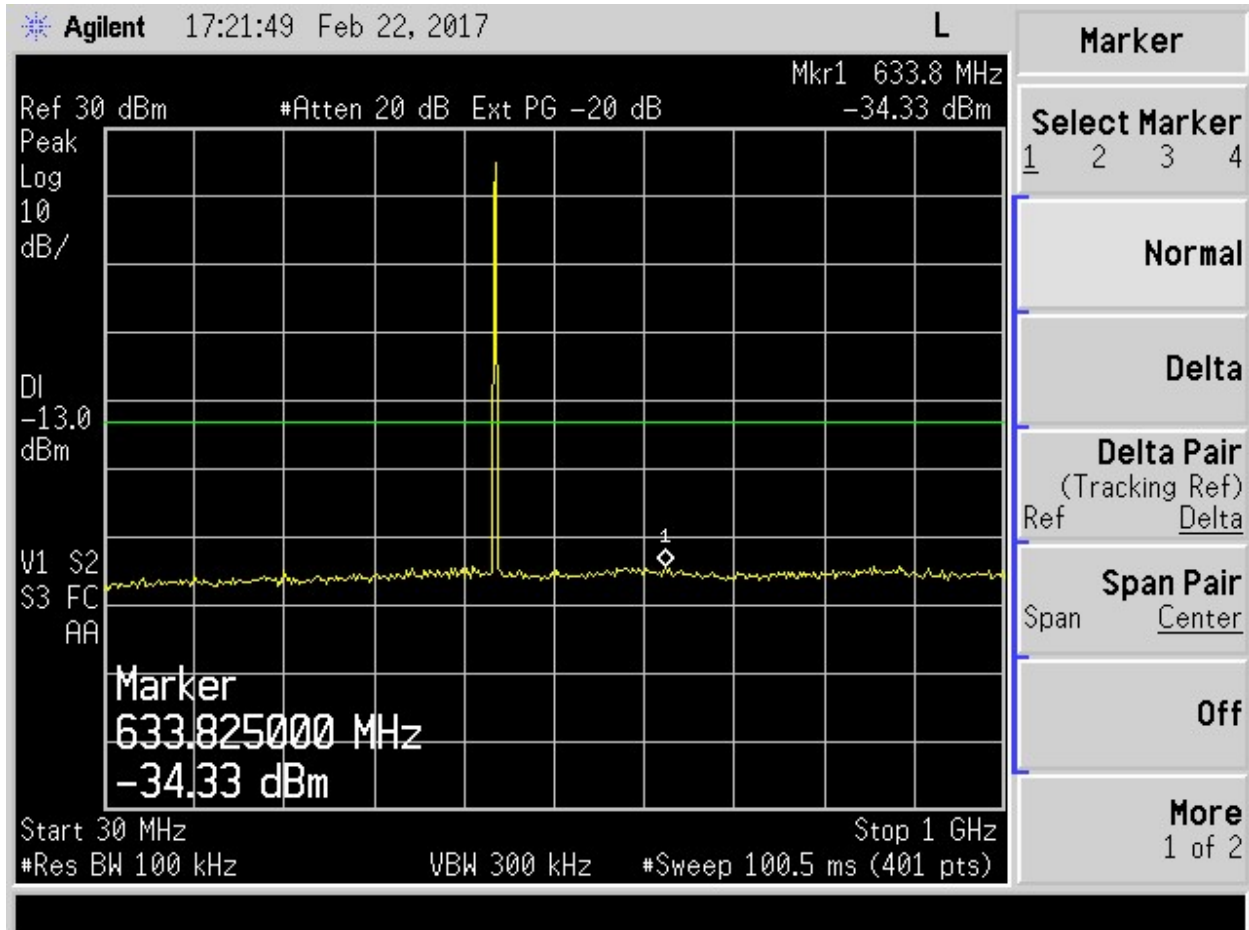


Figure 179. 450 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

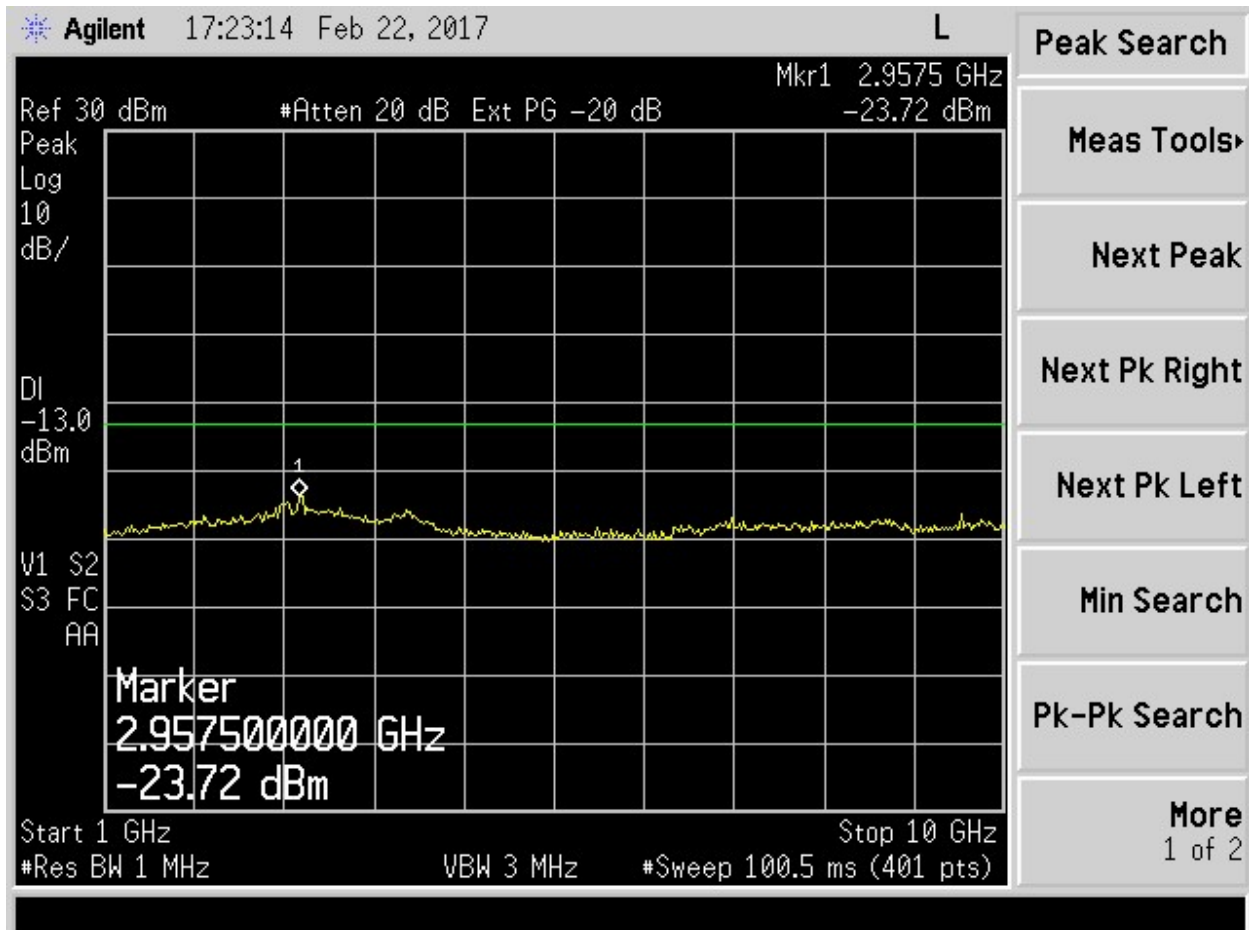


Figure 180. 450 MHz above 1 GHz

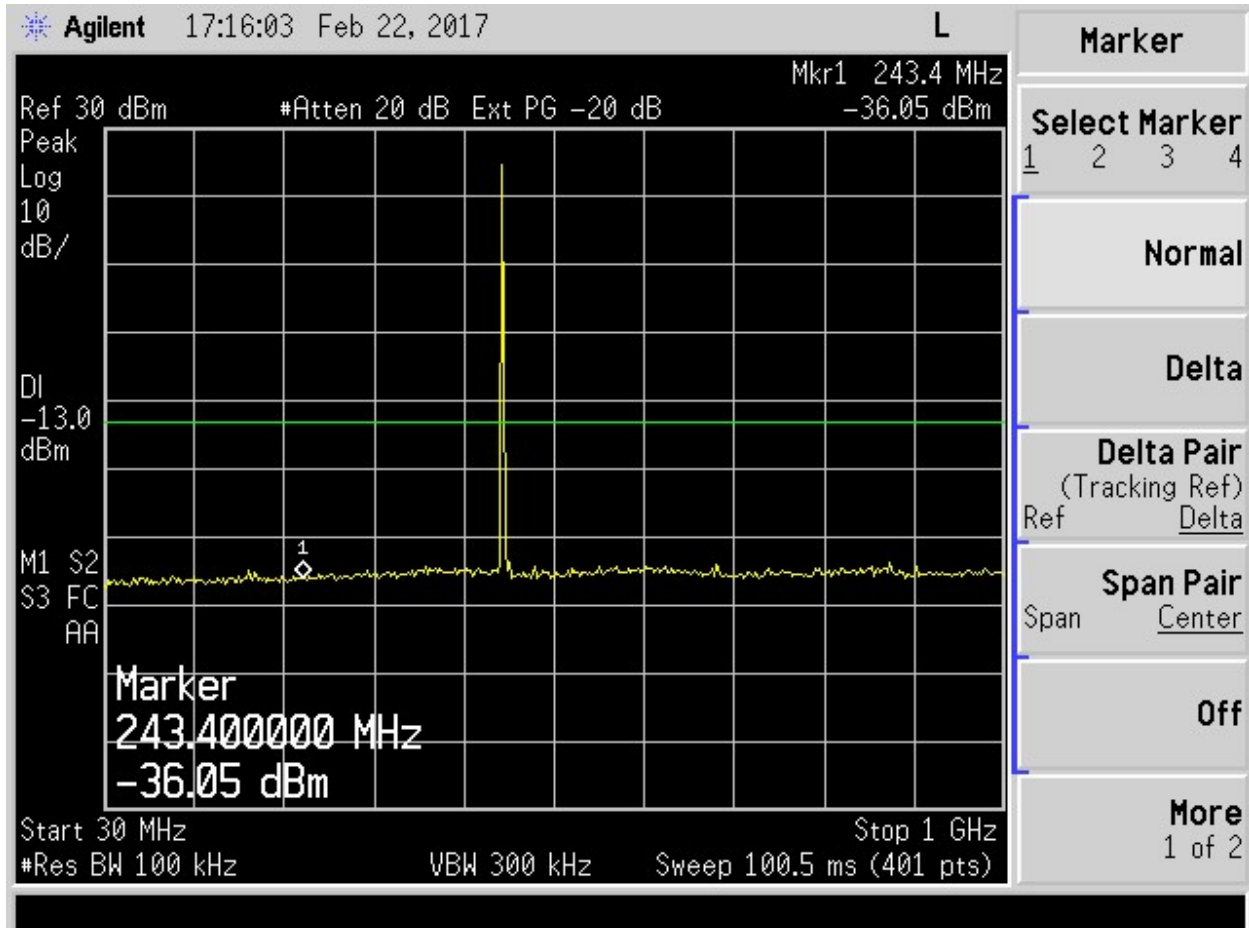


Figure 181. 459 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

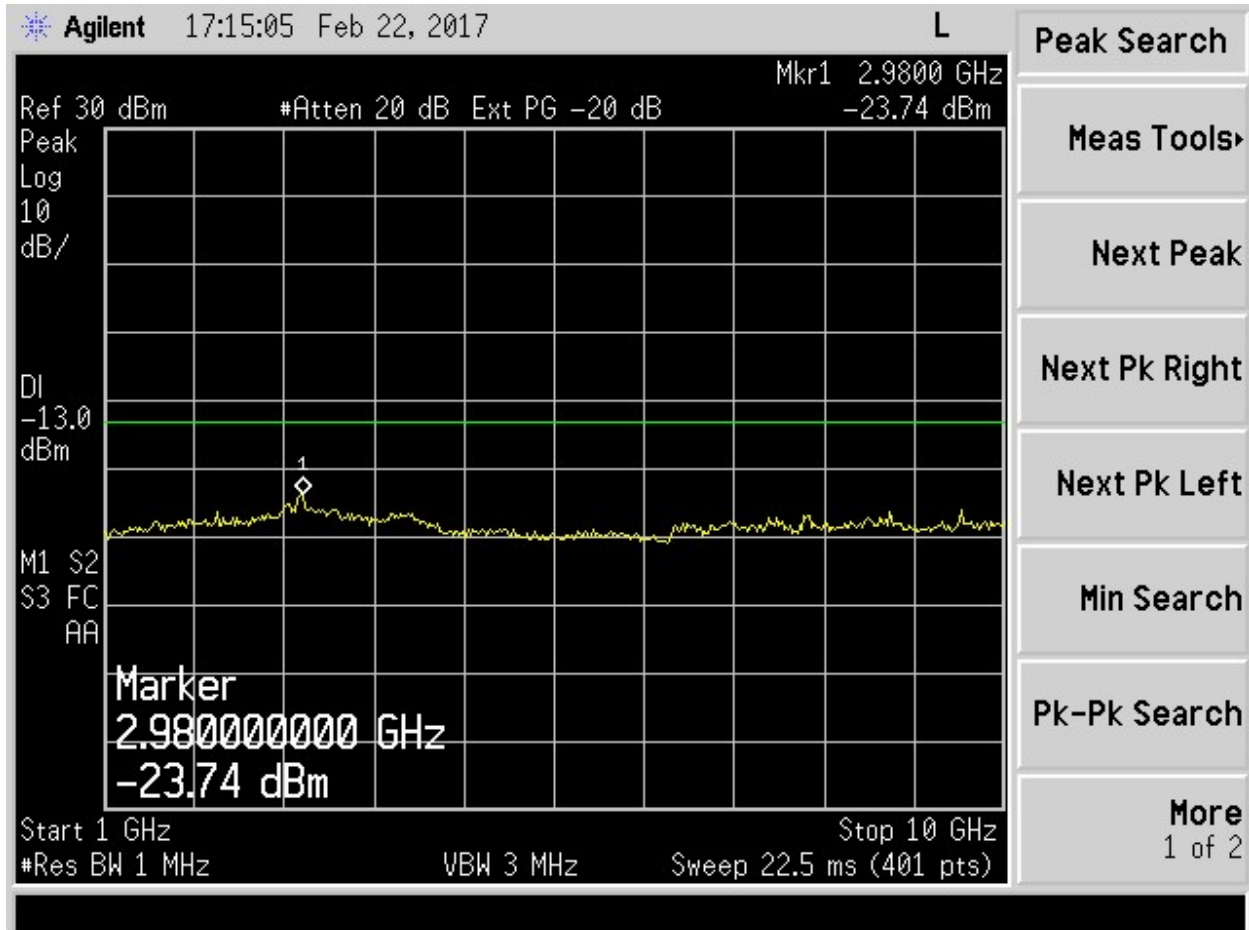


Figure 182. 459 MHz above 1 GHz

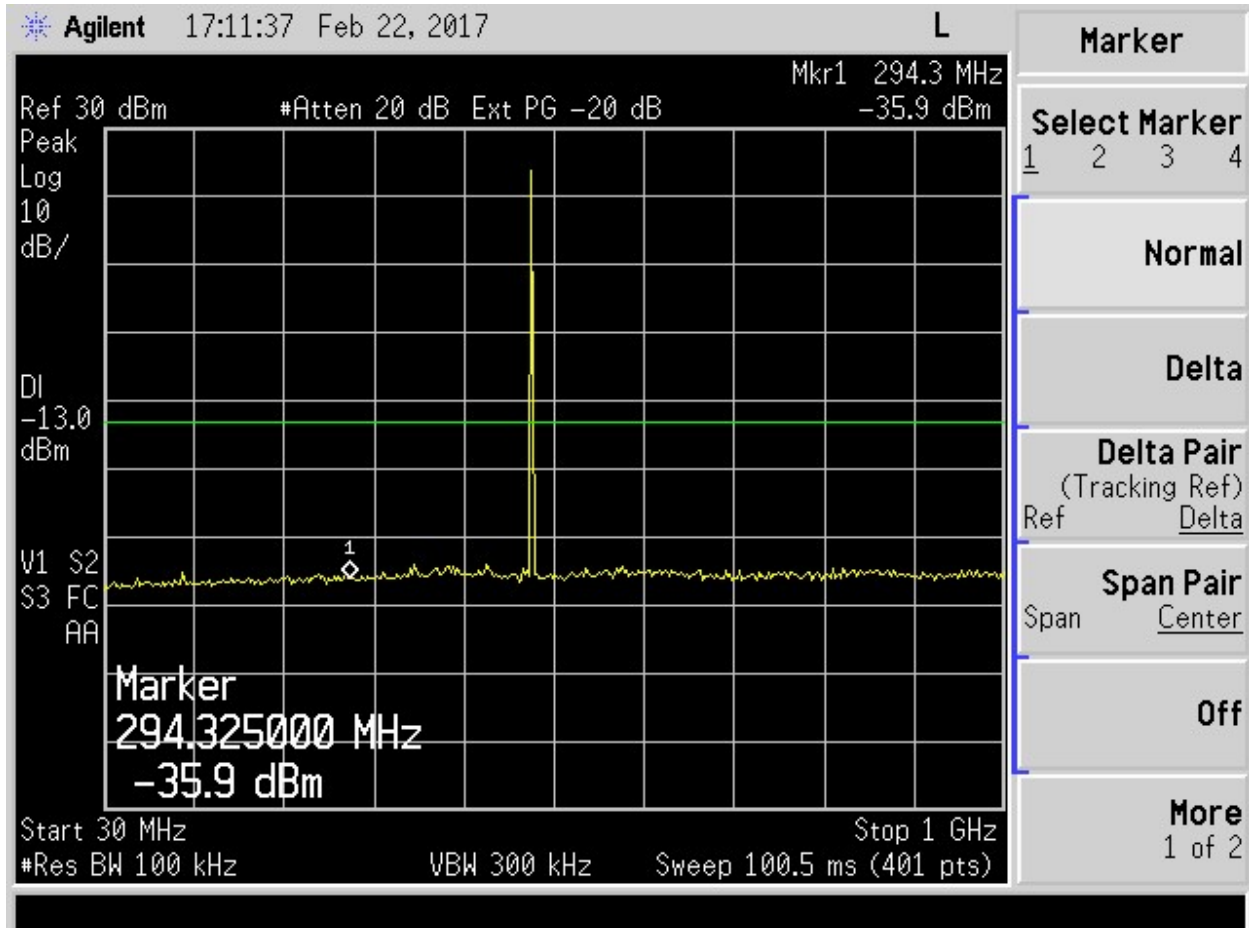


Figure 183. 490 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

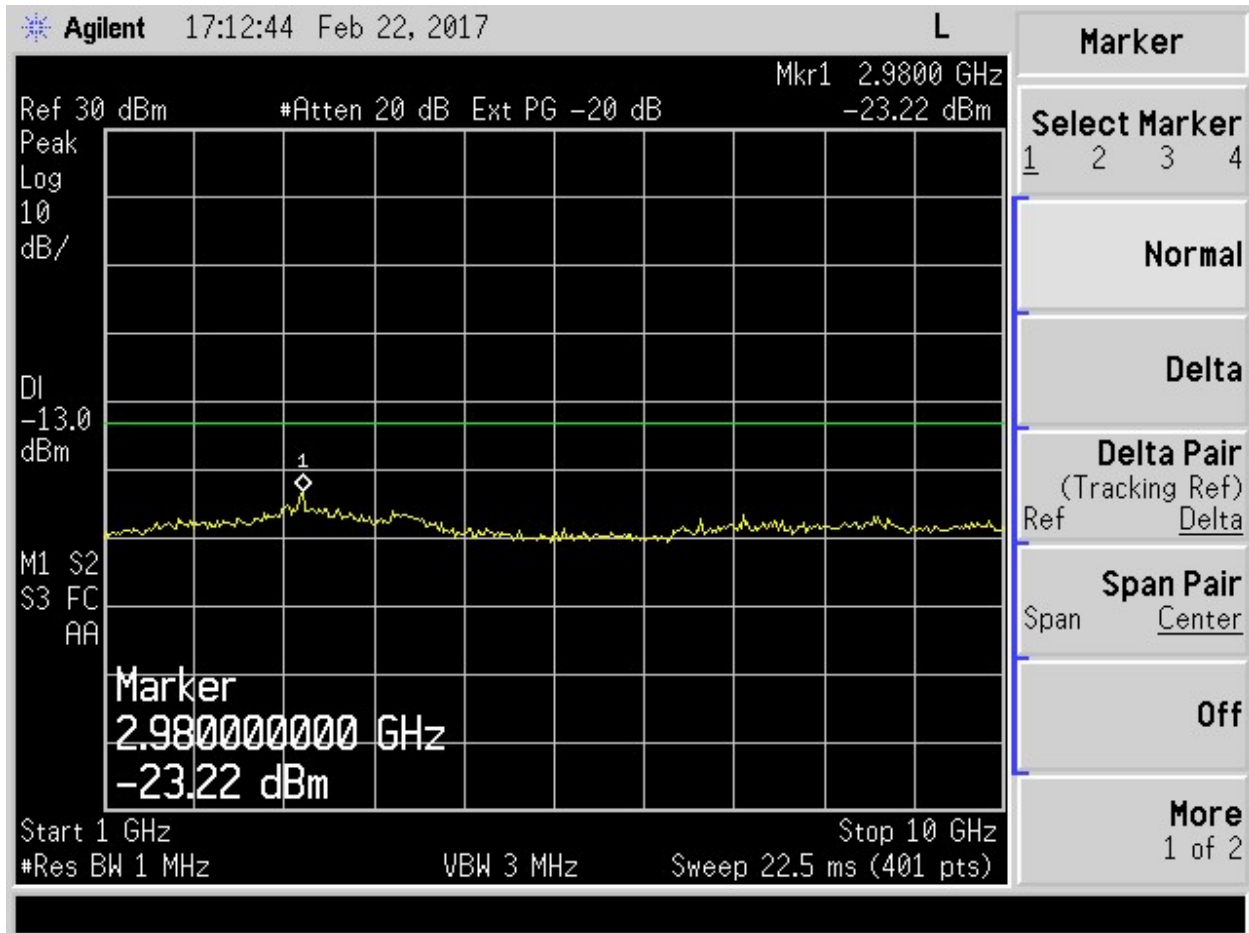


Figure 184. 490 MHz above 1 GHz

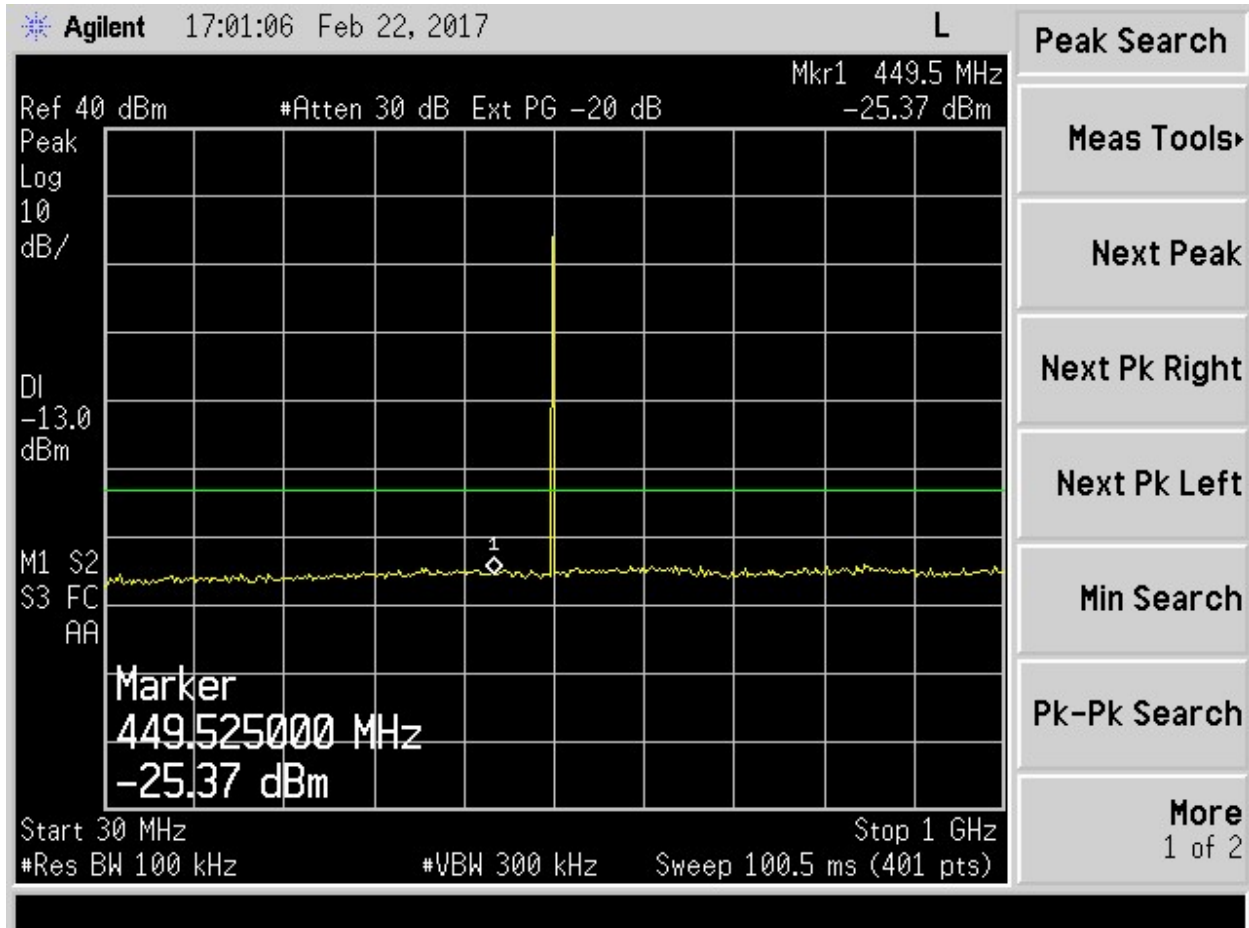


Figure 185. 512 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

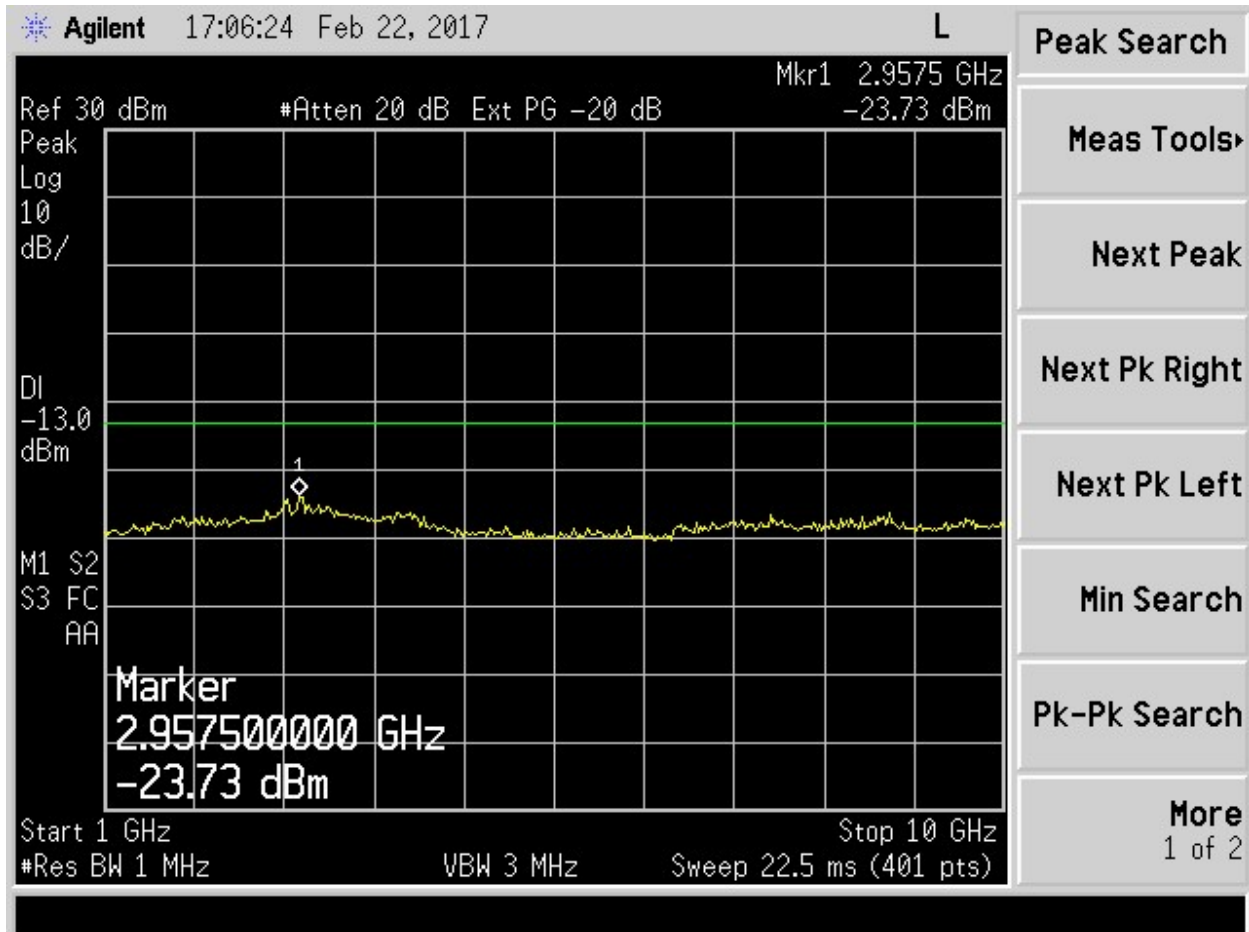


Figure 186. 512 MHz above 1 GHz

2.14.2.3 700 MHz Conducted Spurious Emissions

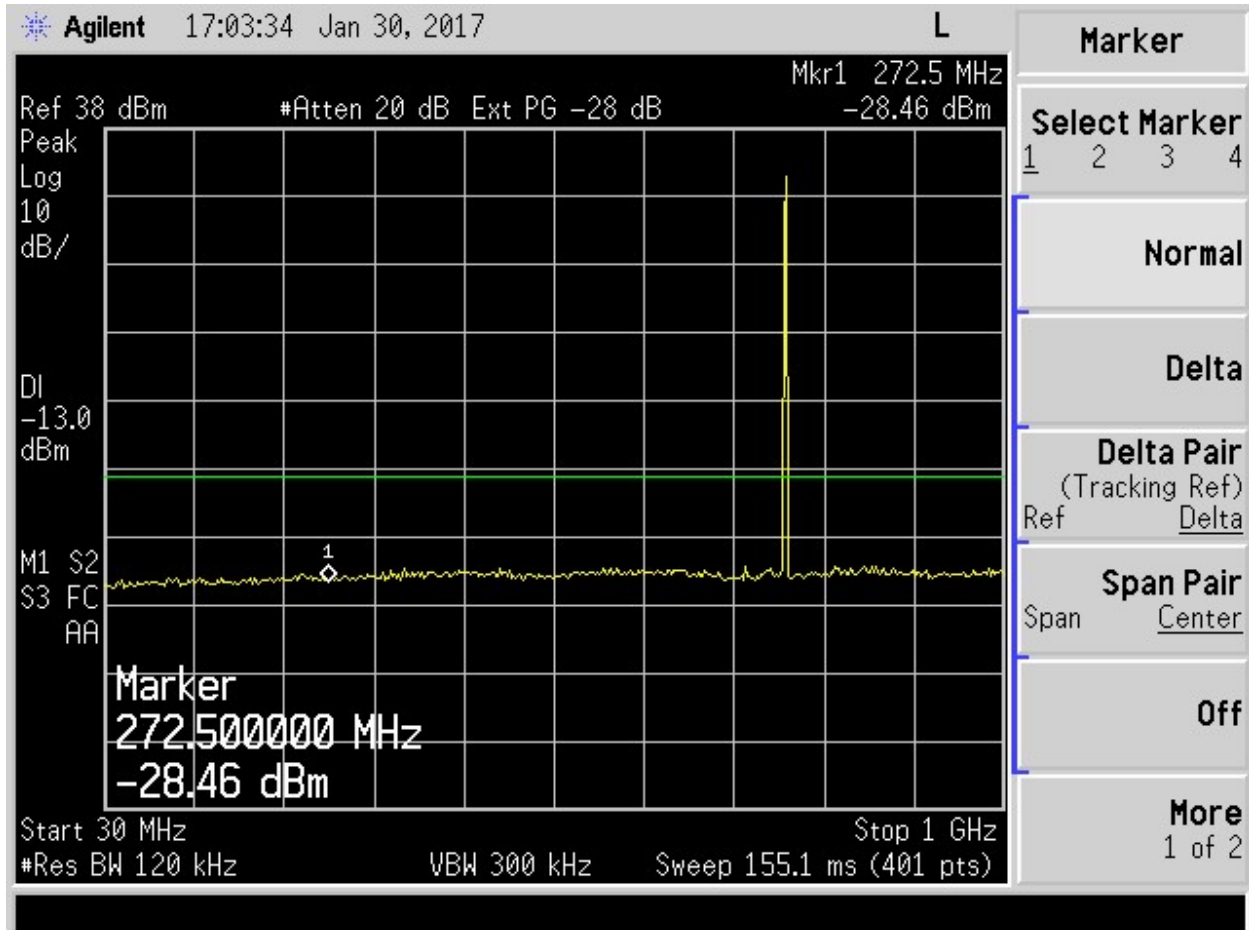


Figure 187. 763 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

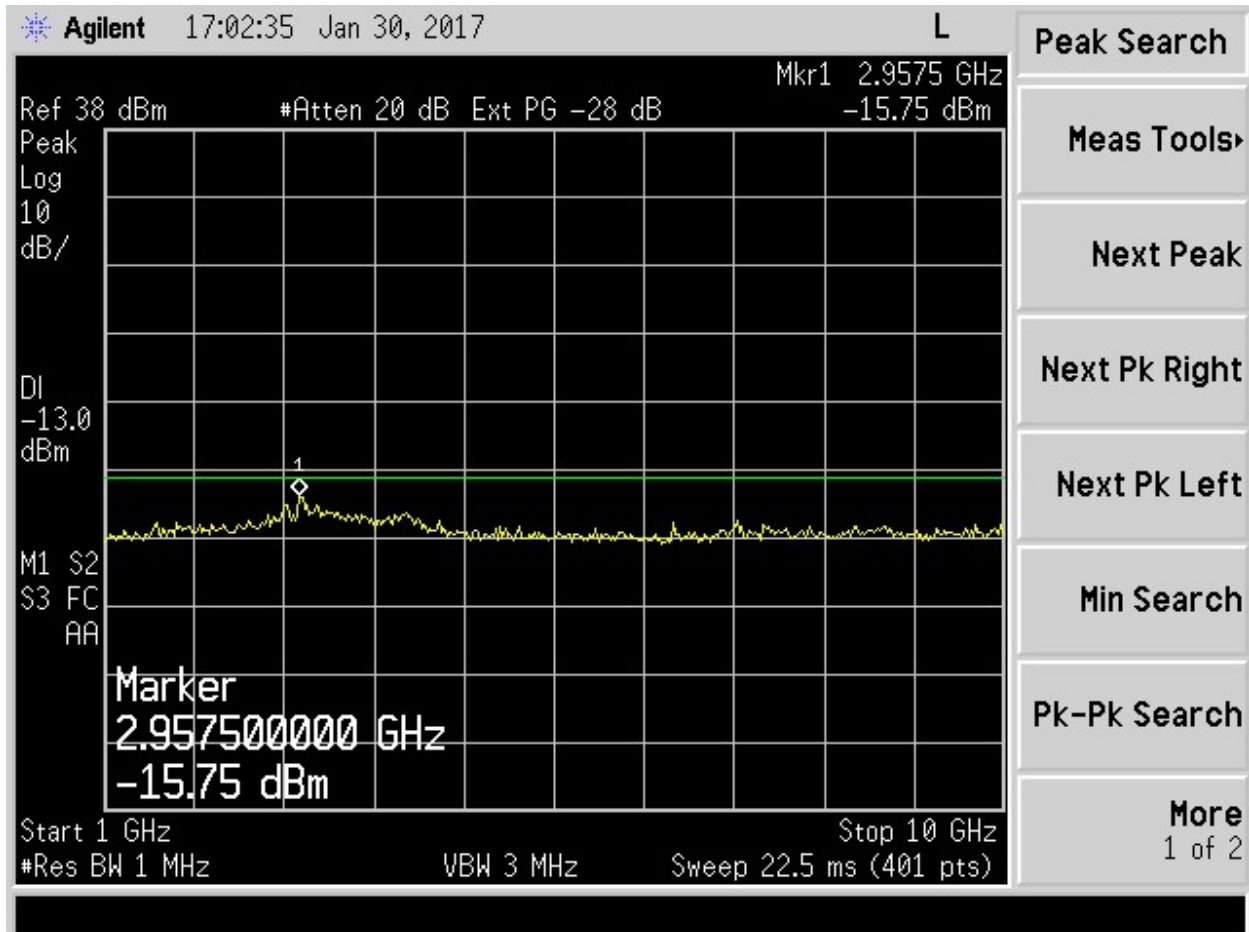


Figure 188. 763 MHz above 1 GHz

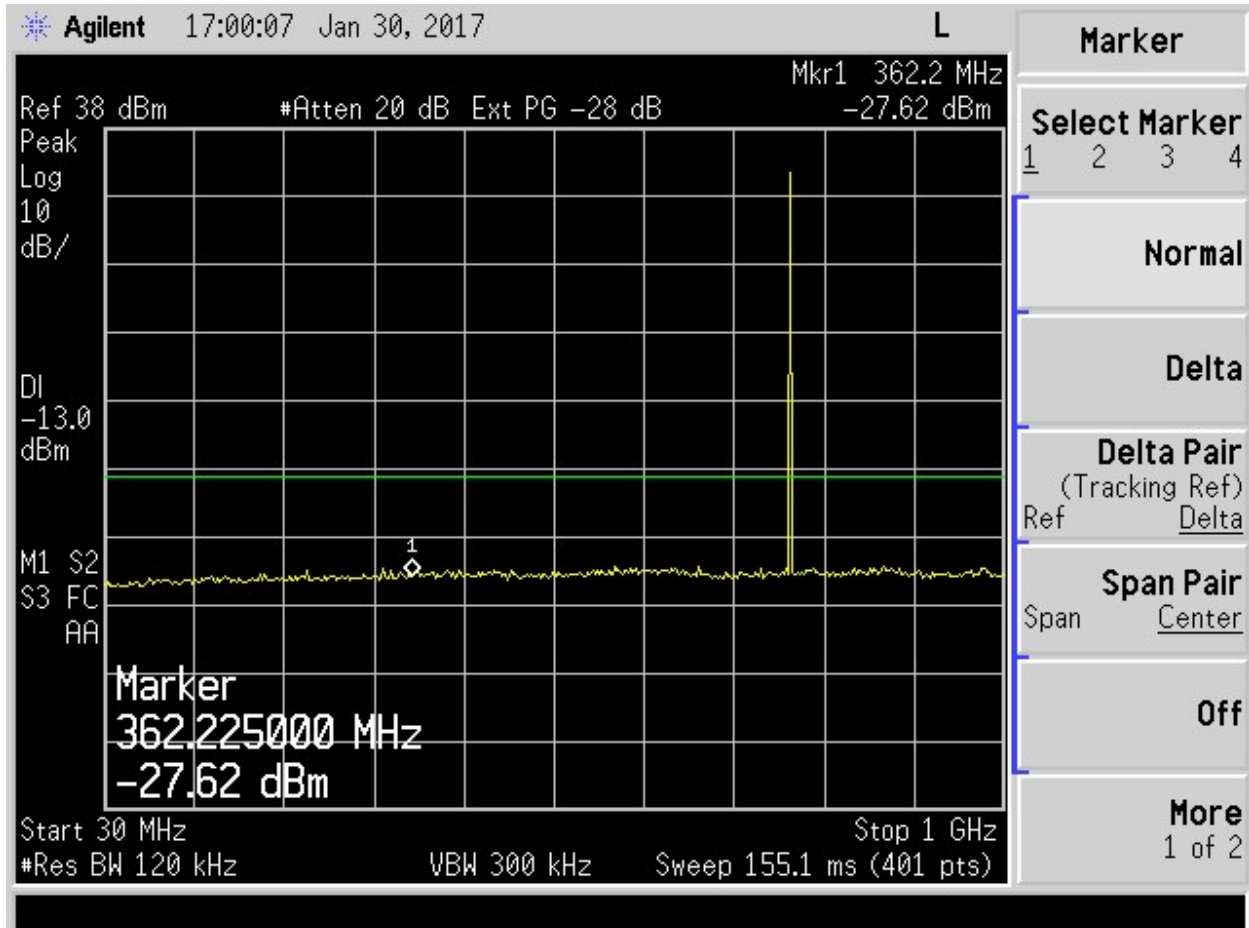


Figure 189. 768 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

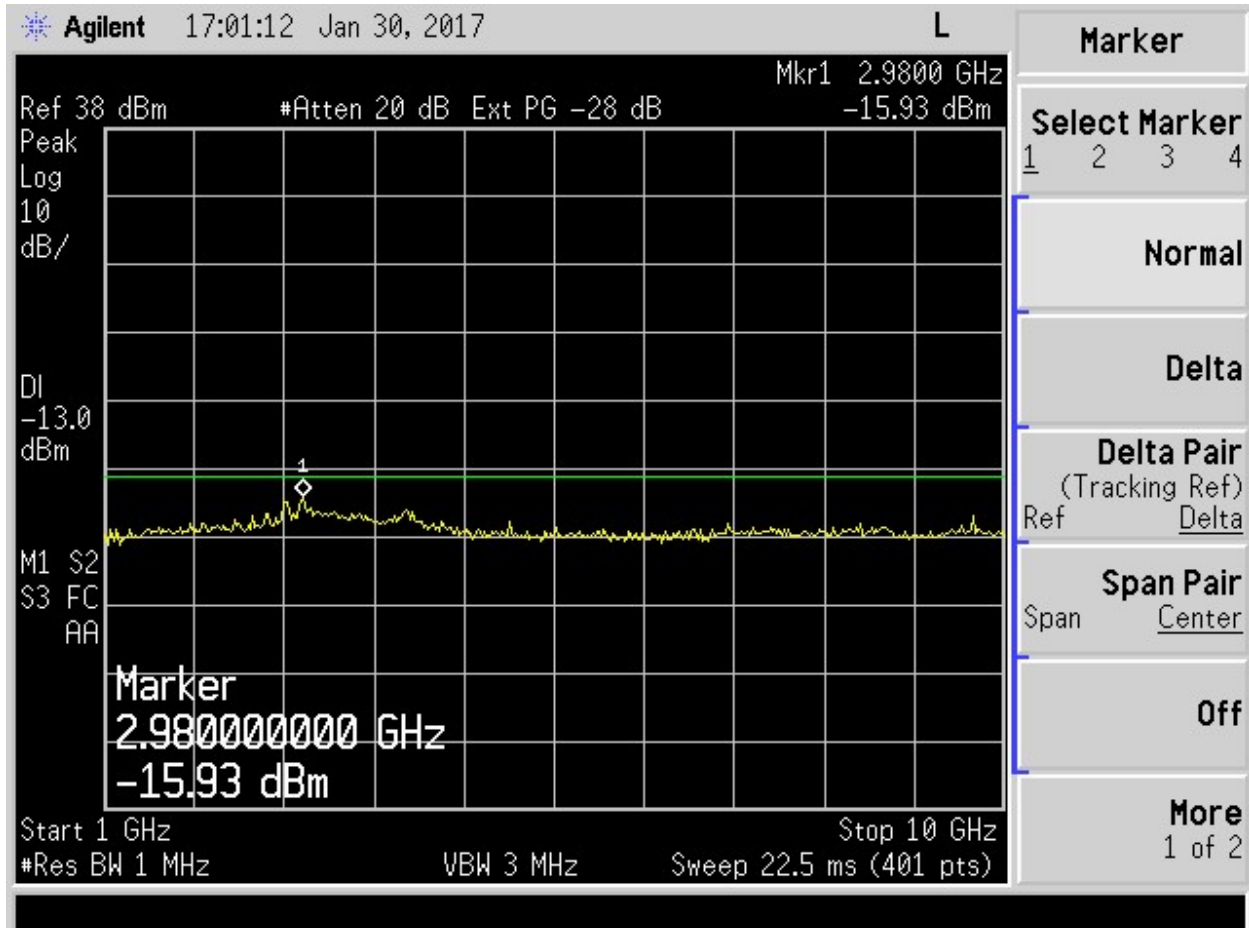


Figure 190. 768 MHz above 1 GHz

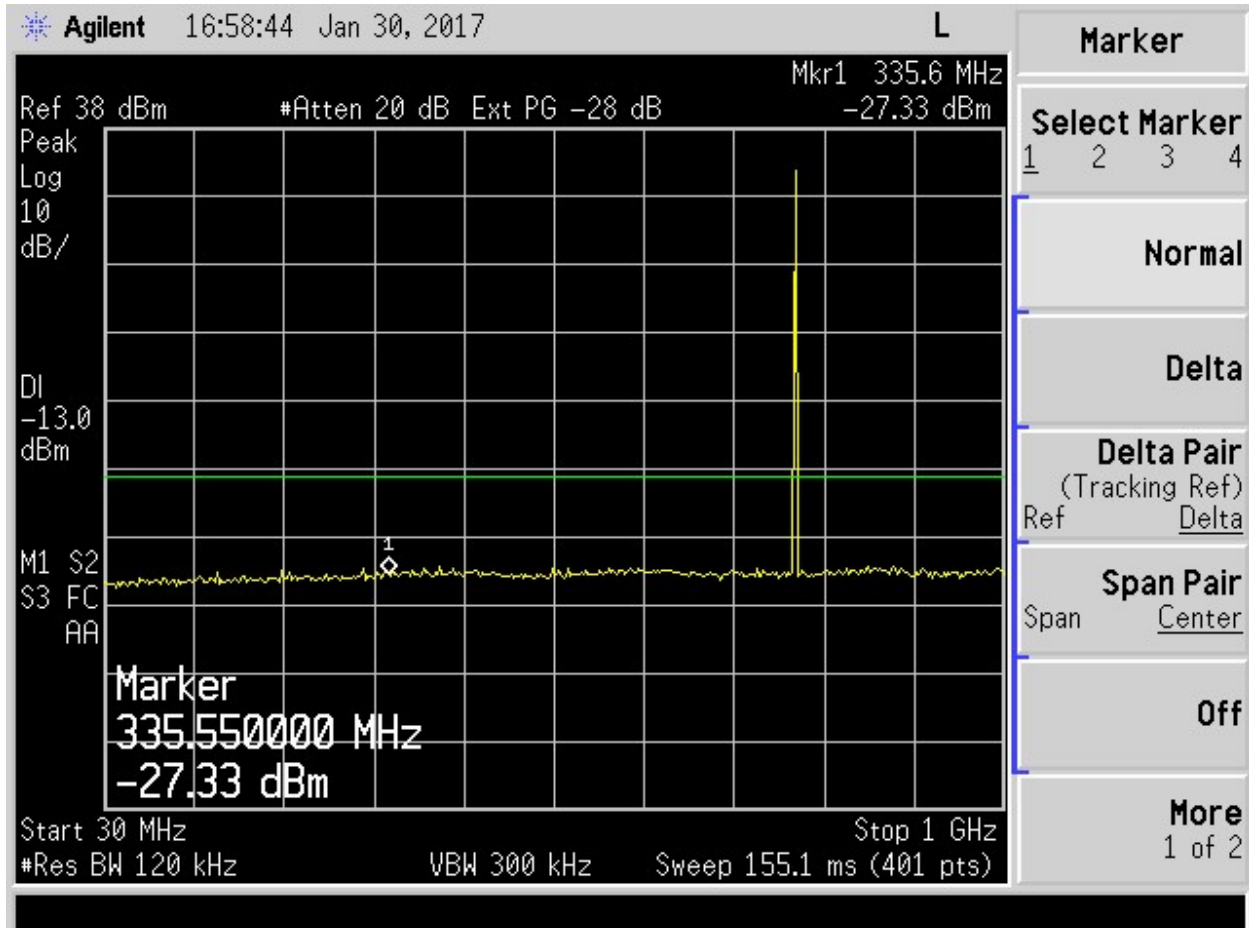


Figure 191. 774 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

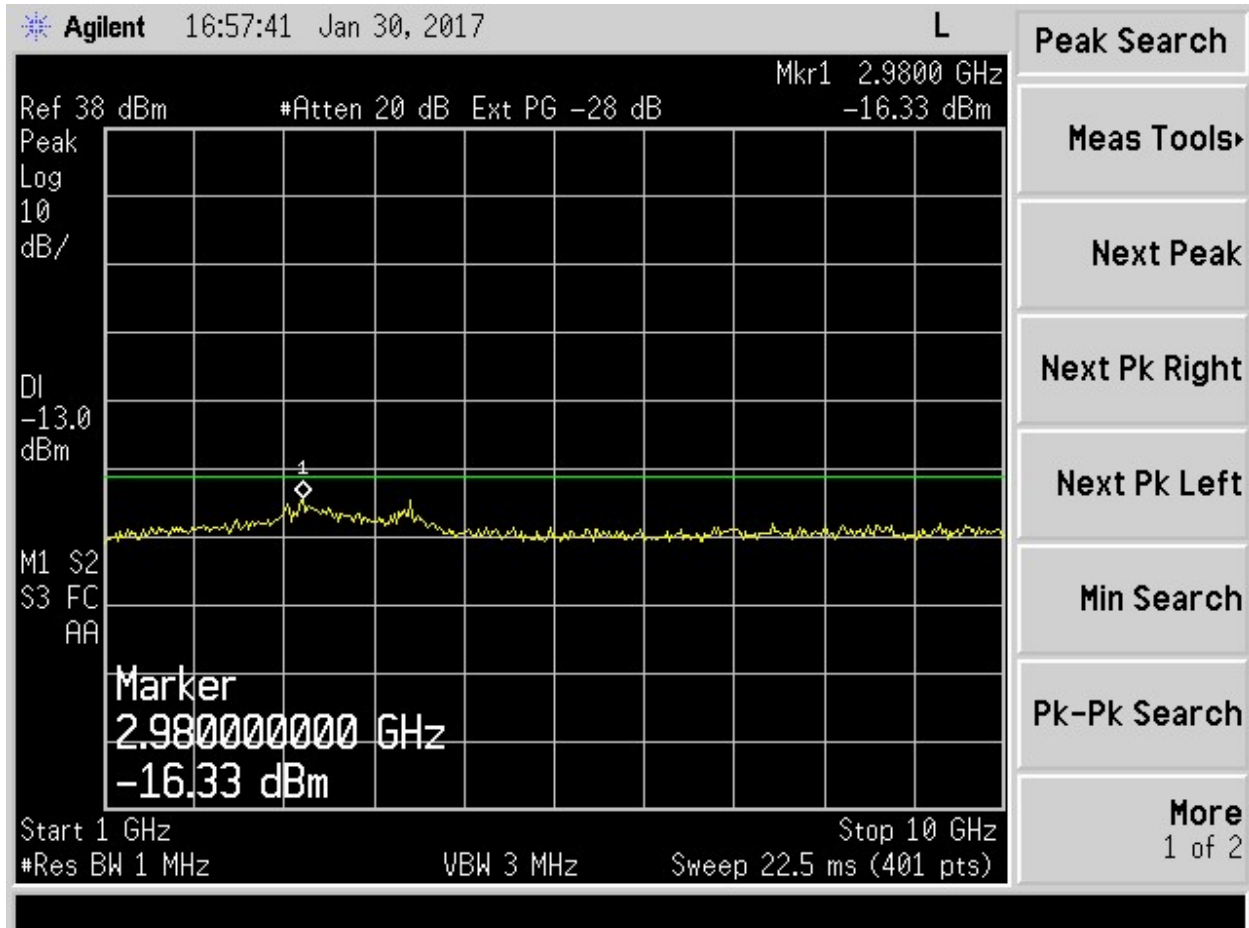


Figure 192. 774 MHz above 1 GHz

2.14.2.4 800 MHz Conducted Spurious Emissions

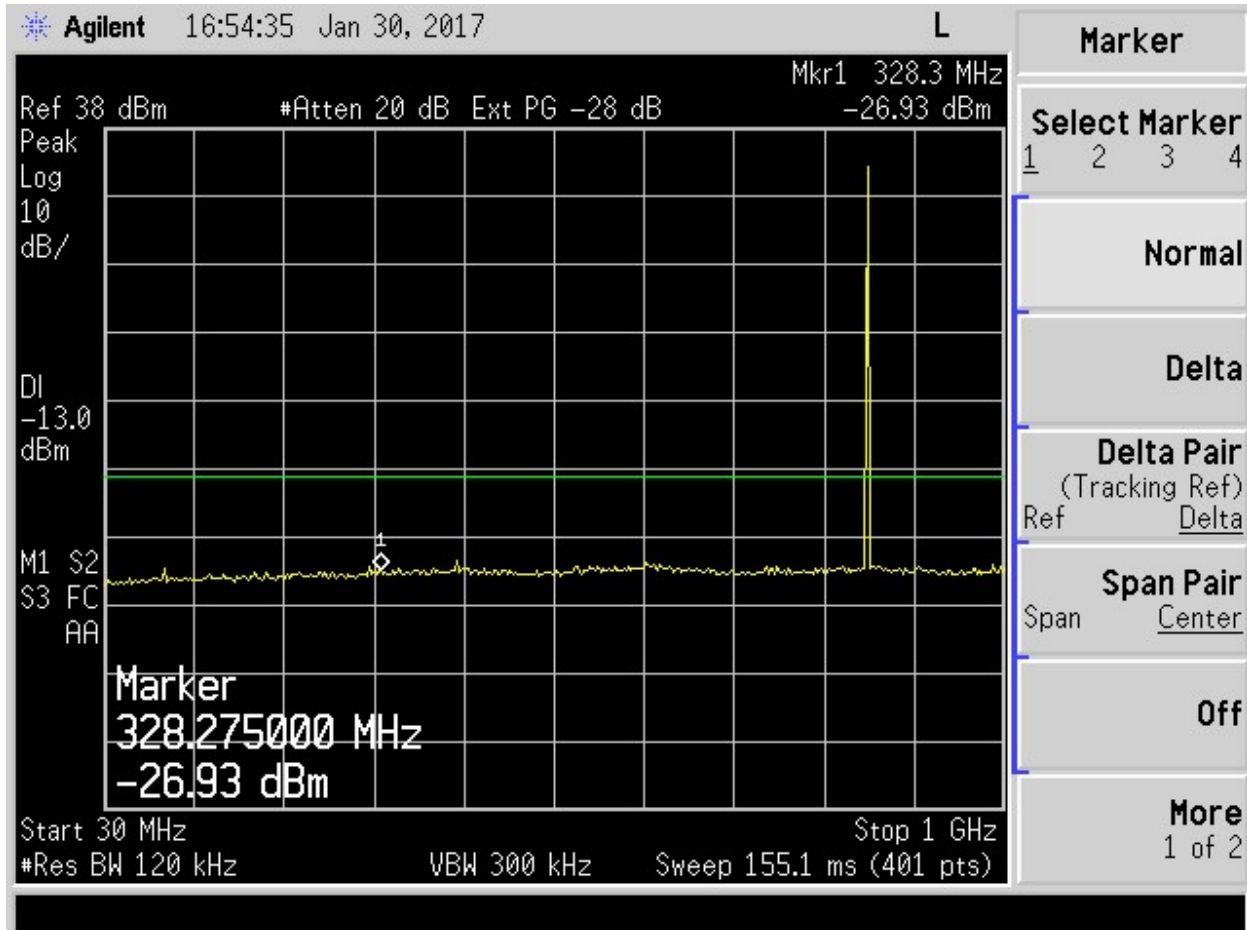


Figure 193. 851 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

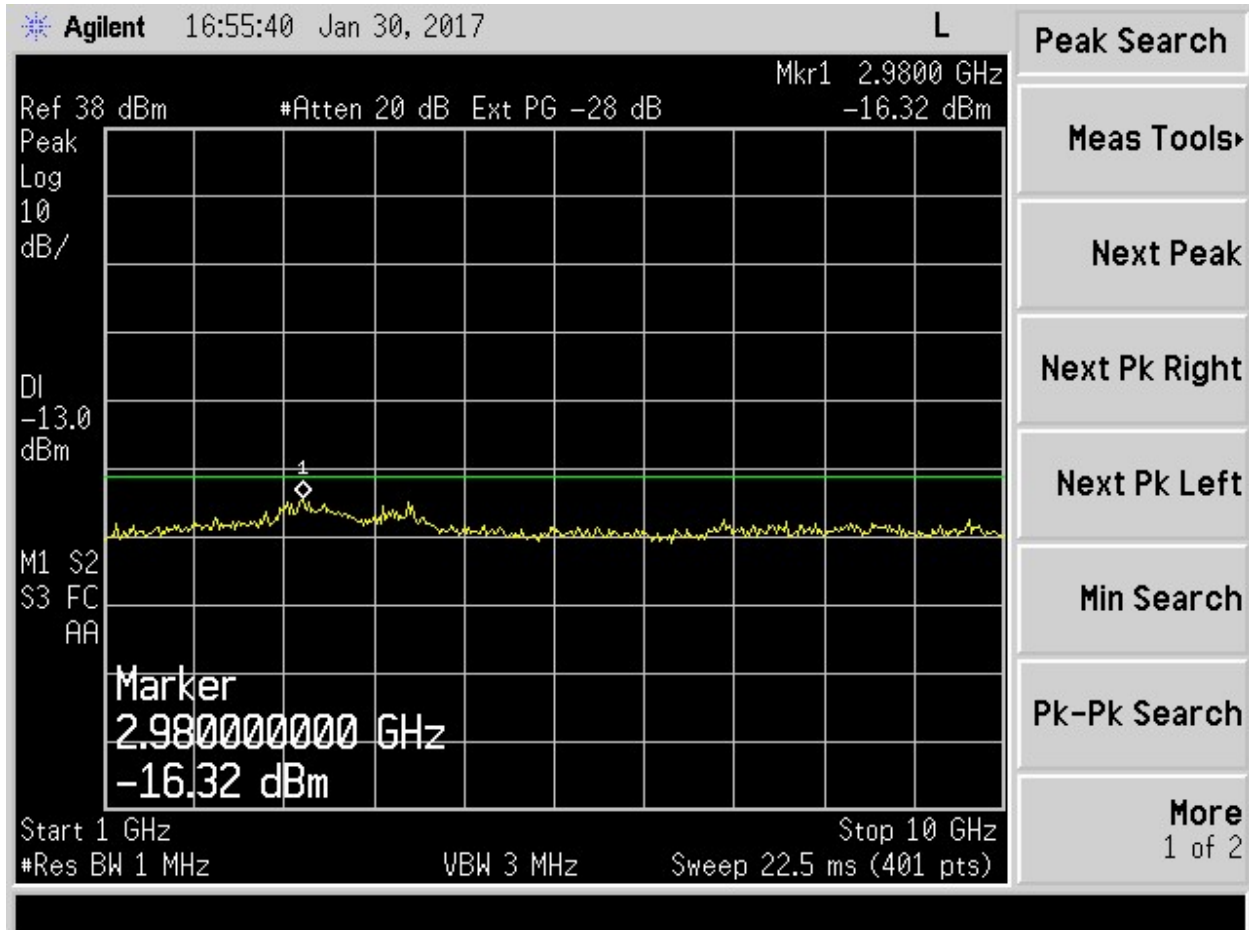


Figure 194. 851 MHz above 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

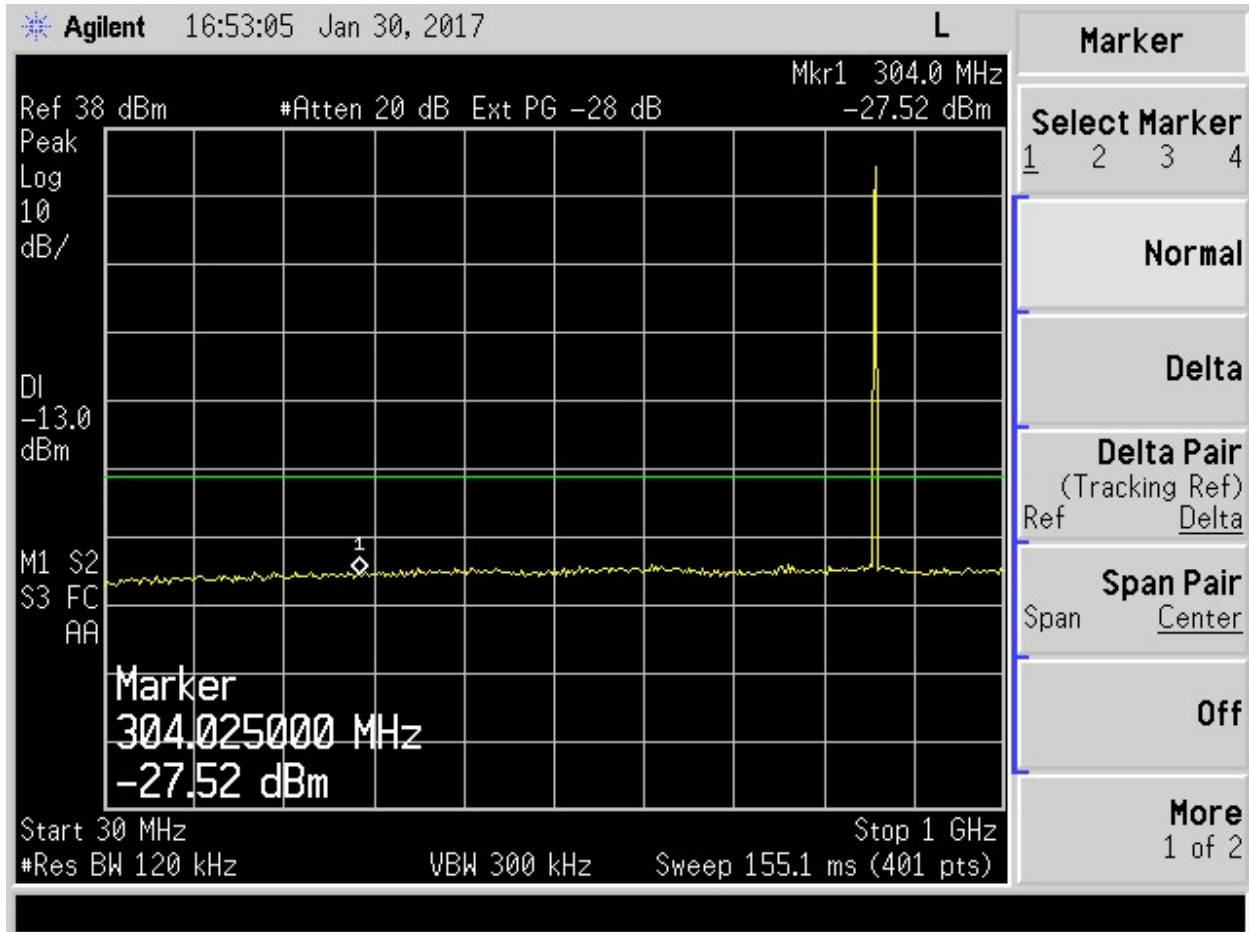


Figure 195. 860 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

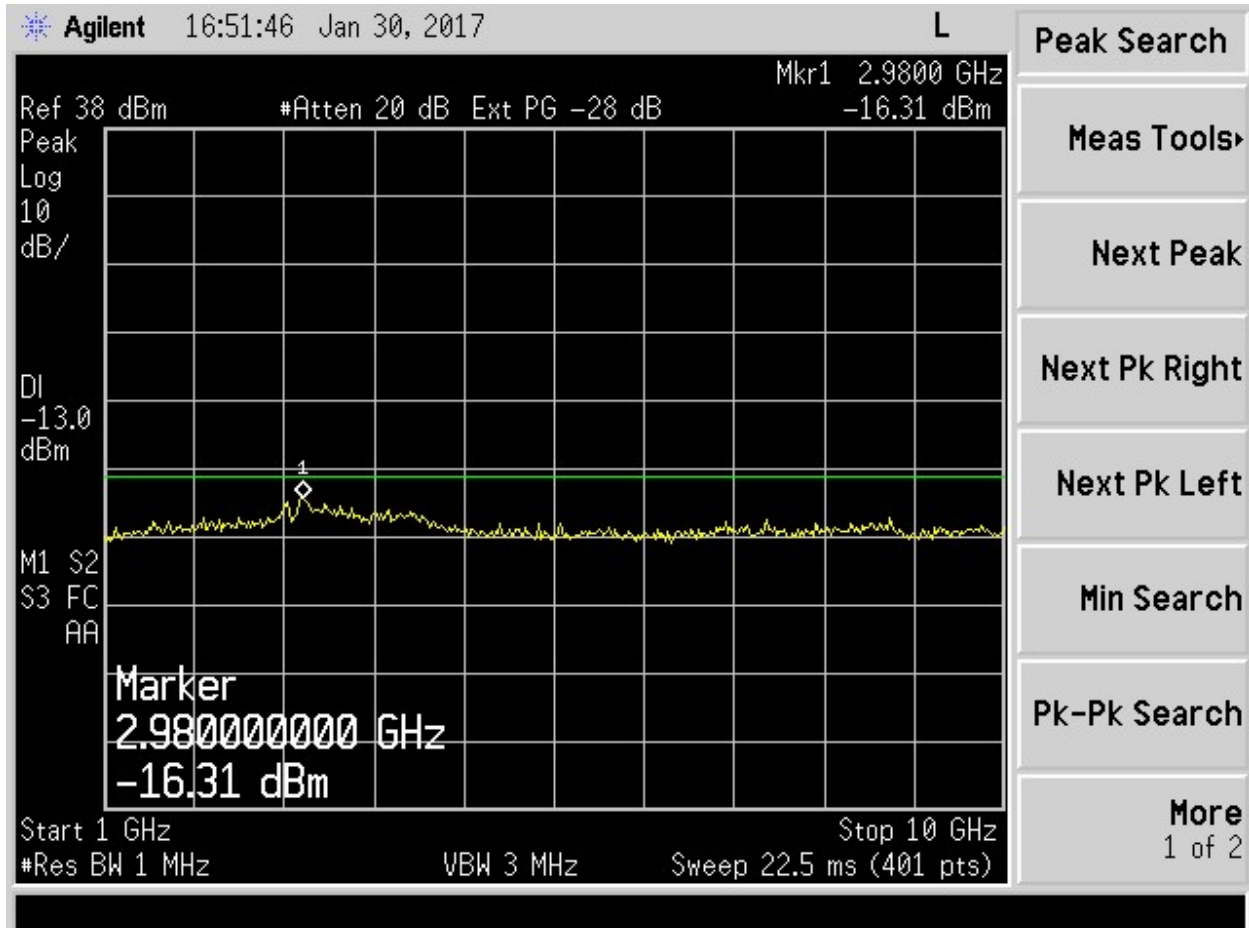


Figure 196. 860 MHz above 1 GHz

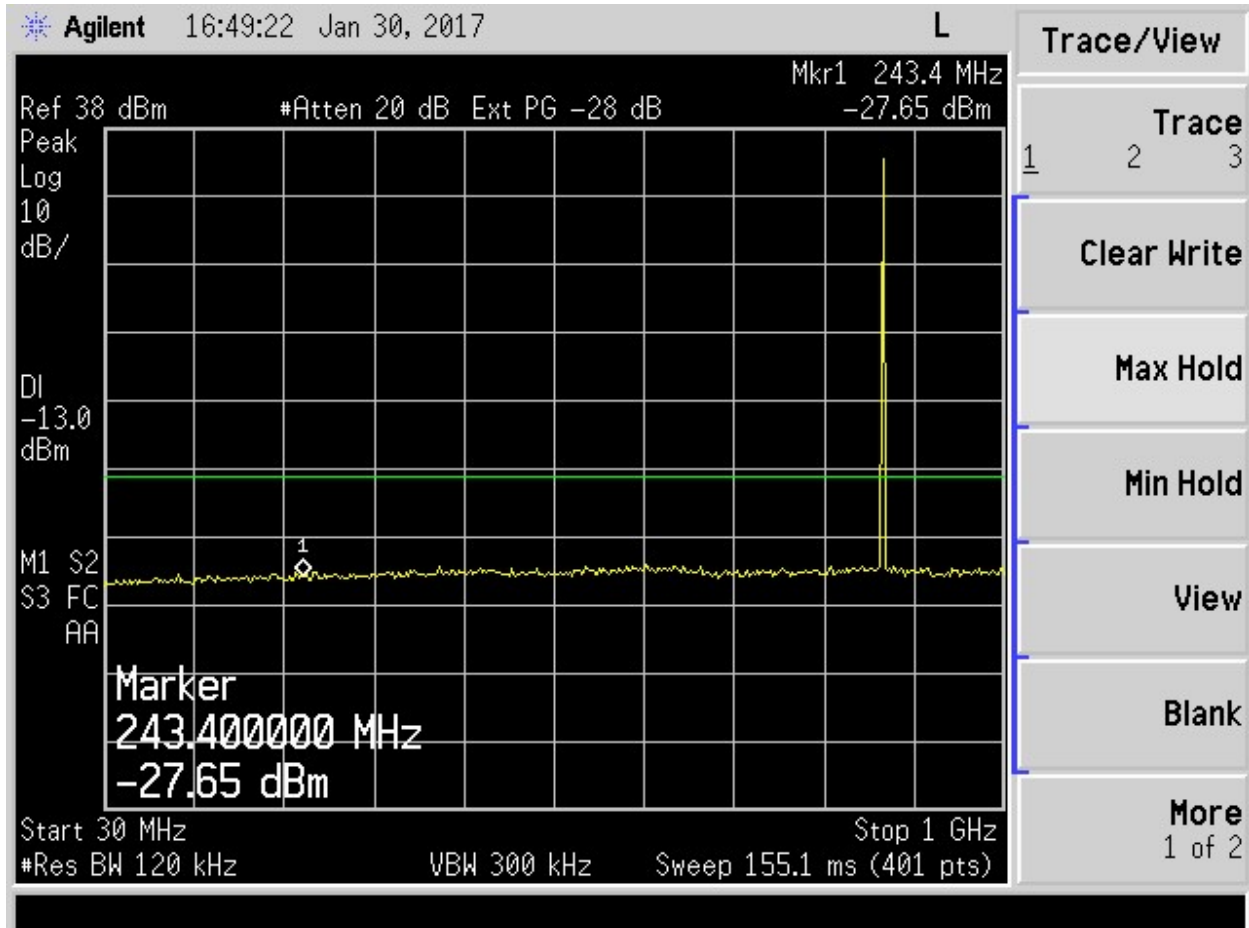


Figure 197. 869 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

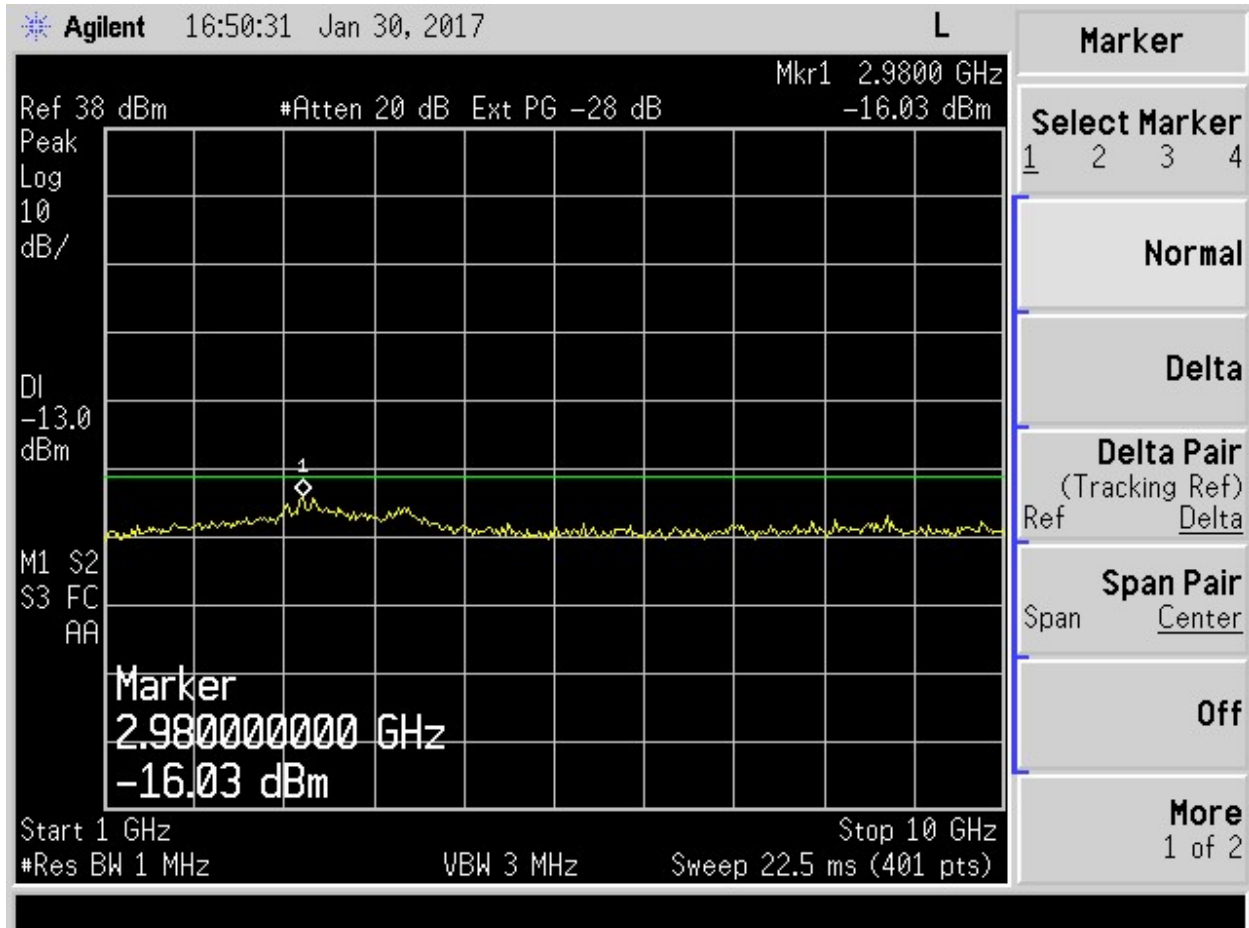


Figure 198. 869 MHz above 1 GHz

2.14.2.5 900 MHz Conducted Spurious Emissions

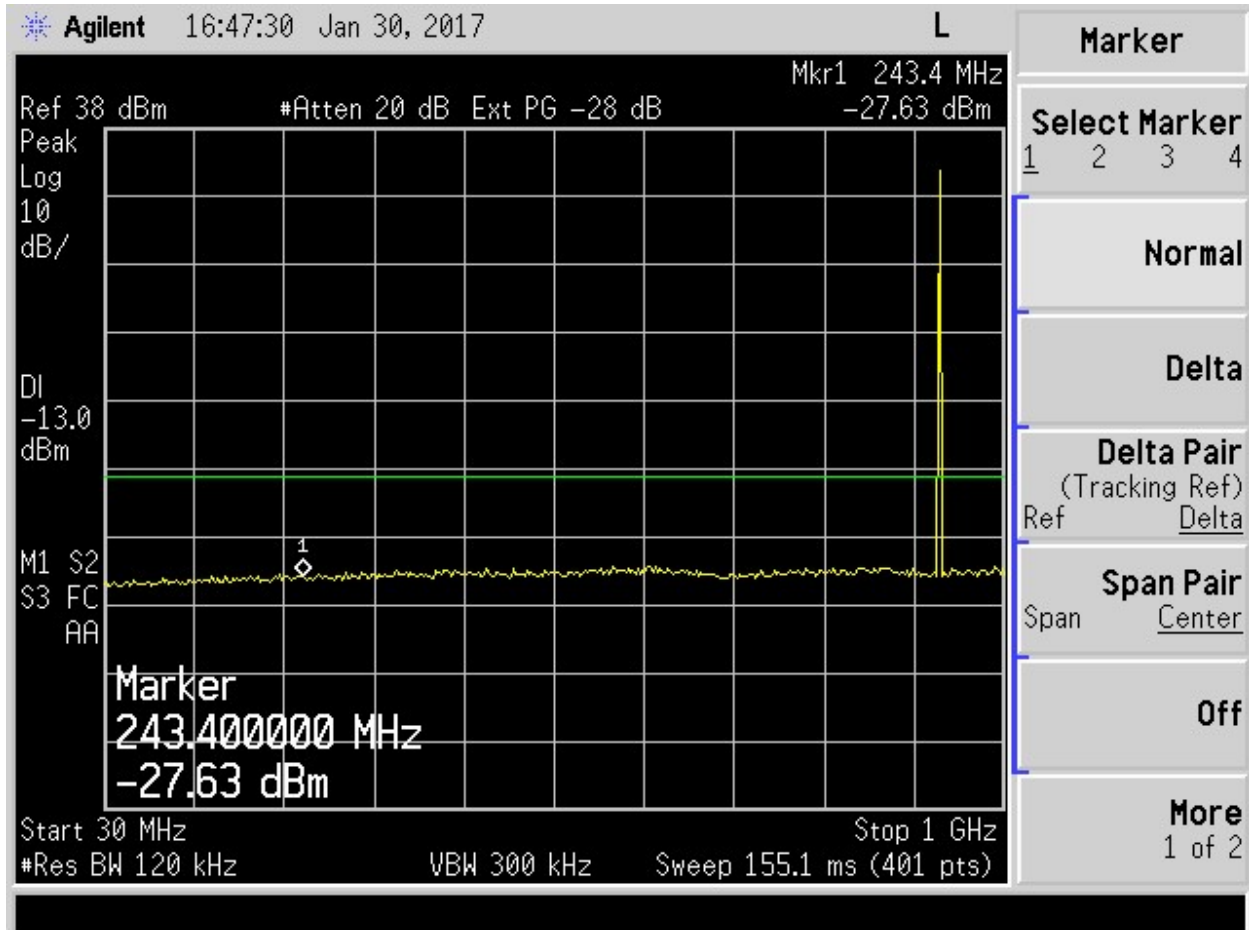


Figure 199. 929.5 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

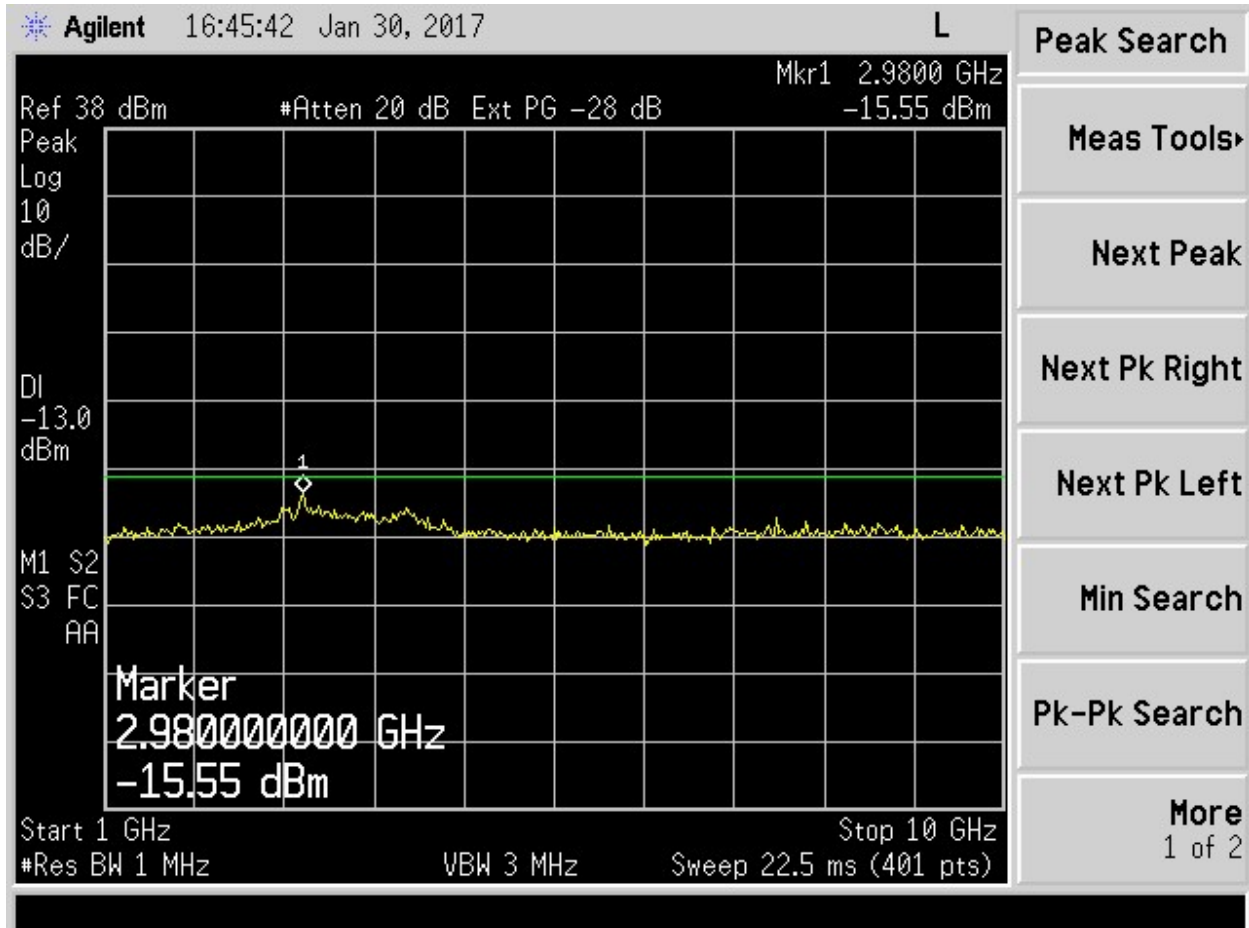


Figure 200. 929.5 MHz above 1 GHz

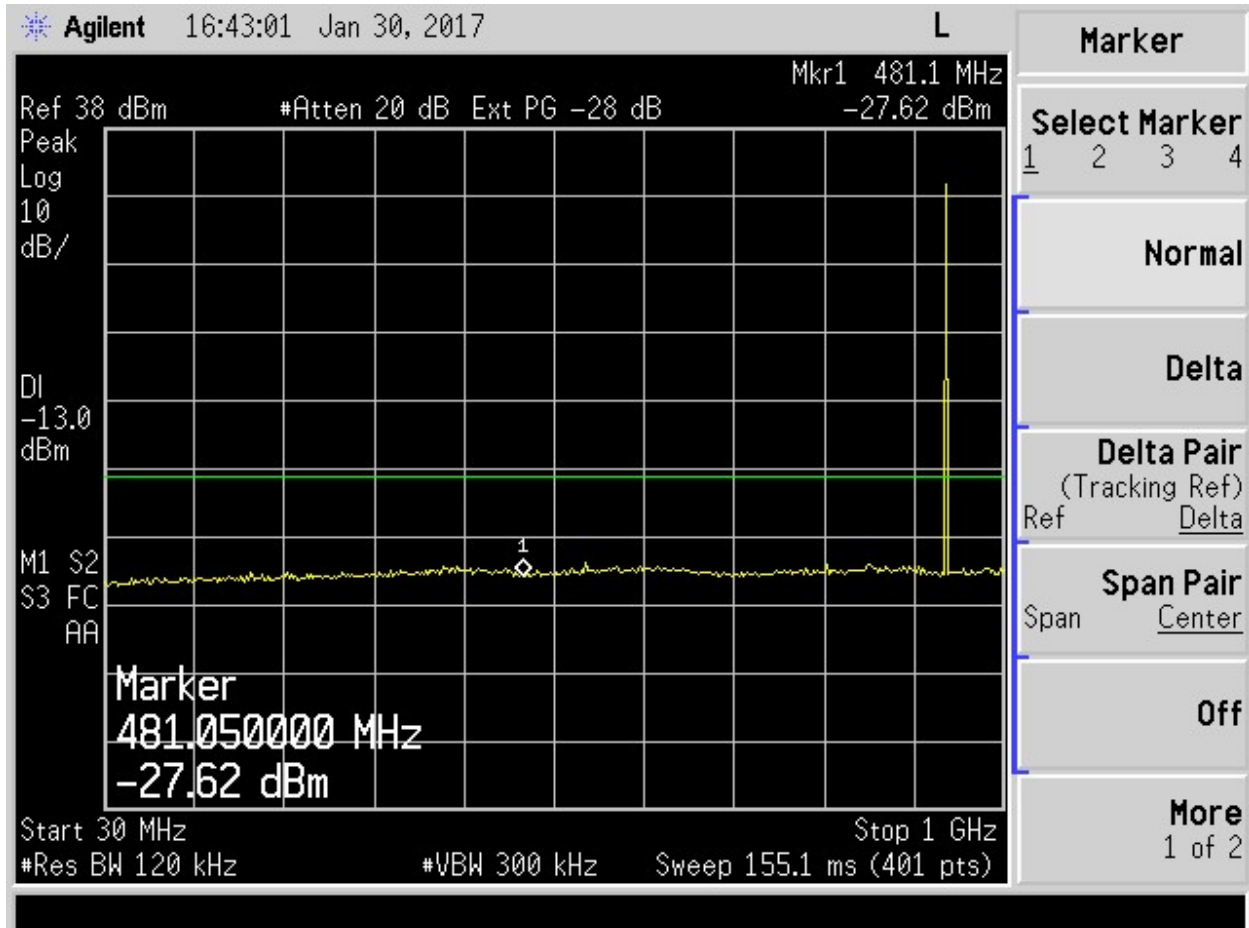


Figure 201. 937 MHz below 1 GHz

Note: All spurious emissions other than the fundamental are below -13 dBm.

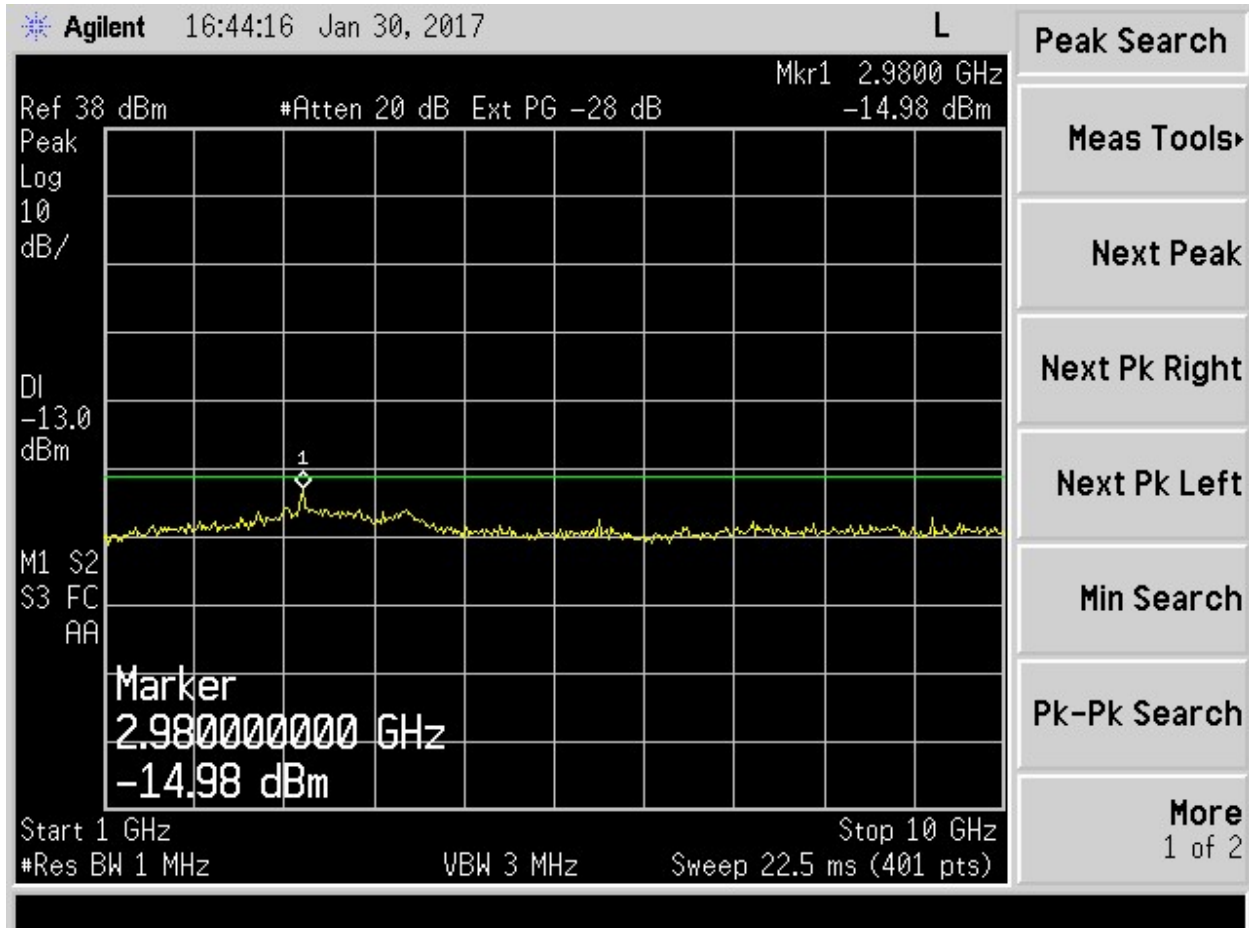


Figure 202. 937 MHz above 1 GHz

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2.15 Unintentional Emissions (FCC Section 15.109, 15.107 and RSS-Gen)

2.15.1 Radiated Spurious Emissions

The EUT was evaluated for unintentional spurious emissions per verification procedures for the enclosure unit. Those results are presented in this section of the test report.

Table 3. Radiated Spurious Emissions


Frequency (MHz)	Test Data (dBuV)	AF+CA-AMP+DC (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Distance / Polarization	Margin (dB)	Detector PK/QP/AVG
106.10	41.41	-20.86	20.55	43.5	3m./HORZ	22.9	PK
97.60	43.21	-21.64	21.57	43.5	3m./HORZ	21.9	PK
109.63	42.78	-20.66	22.12	43.5	3m./HORZ	21.4	PK
31.30	41.45	-17.66	23.79	39.0	3m./VERT	15.2	PK
81.40	40.37	-22.31	18.06	39.0	3m./VERT	20.9	PK
97.60	37.41	-20.94	16.47	43.5	3m./VERT	27.0	PK
51.30	37.33	-21.47	15.86	39.0	3m./VERT	23.1	PK
208.13	34.44	-18.41	16.03	43.5	3m./HORZ	27.5	PK
849.05	37.89	-6.37	31.52	46.4	3m./HORZ	14.9	PK
1615.00	59.34	-17.94	41.40	49.5	3.0m./HORZ	8.1	PK
1528.00	57.04	-18.37	38.67	49.5	3.0m./HORZ	10.8	PK
2292.00	56.12	-15.38	40.74	49.5	3.0m./HORZ	8.8	PK
2422.00	57.86	-14.77	43.09	49.5	3.0m./HORZ	6.4	PK

Sample Calculation at 106.10 MHz:

Magnitude of Measured Frequency	41.41	dBuV
+Antenna Factor + Cable Loss+ Amplifier Gain	-20.86	dB/m
Corrected Result	20.55	dBuV/m

Test Date: January 18-19, 2017

Tested By

Signature:  Name: George Yang

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2.15.2 Conducted Powerline Emissions

The EUT was evaluated for conducted powerline emissions per verification procedures for the enclosure unit. Those results are presented in this section of the test report.

Table 4. Conducted Powerline Emissions

Frequency (MHz)	Test Data (dBuV)	IL+CA-AMP (dB)	Results (dBuV)	Limits (dBuV)	Phase Neutral	Margin (dB)	Limits QP/AVG	Detector PK/QP/AVG
0.1827	57.37	0.34	57.71	66.0	Neutral	8.3	AVG	PK
0.6017	38.33	0.20	38.53	60.0	Neutral	21.5	AVG	PK
4.5530	48.89	0.31	49.20	60.0	Neutral	10.8	AVG	PK
7.8830	50.36	0.36	50.72	60.0	Neutral	9.3	AVG	PK
10.0830	44.47	0.40	44.87	60.0	Neutral	15.1	AVG	PK
28.3160	31.23	0.79	32.02	60.0	Neutral	28.0	AVG	PK
0.1833	56.16	0.42	56.58	66.0	Phase	9.4	AVG	PK
0.5225	39.42	0.32	39.74	60.0	Phase	20.3	AVG	PK
4.7400	46.78	0.40	47.18	60.0	Phase	12.8	AVG	PK
8.1833	45.87	0.48	46.35	60.0	Phase	13.7	AVG	PK
10.4160	39.94	0.54	40.48	60.0	Phase	19.5	AVG	PK
29.2830	30.91	1.05	31.96	60.0	Phase	28.0	AVG	PK

SAMPLE CALCULATION at 0.1827 MHz:

Magnitude of Measured Frequency	57.37	dBuV
+ Cable Loss+ LISN Loss	0.34	dB
=Corrected Result	57.71	dBuV
Limit	66.00	dBuV
-Corrected Result	57.71	dBuV
Margin	8.30	dB

Test Date: January 25, 2017

Tested By

Signature: 

Name: George Yang

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2.16 Measurement Uncertainty

2.16.1 Radiated Spurious Emissions Measurement Uncertainty

For a measurement distance of 3 m, the measurement uncertainty (with a 95% confidence level) for this test using a Biconical Antenna (30 MHz to 200 MHz) is ± 5.39 dB. This value includes all elements of measurement.

The measurement uncertainty (with a 95% confidence level) for this test using a Log Periodic Antenna (200 MHz to 1000 MHz) is ± 5.18 dB

The measurement uncertainty (with a 95% confidence level) for this test using a Horn Antenna is ± 5.21 dB (3 m distance).

2.16.2 Conducted Powerline Emissions Measurement uncertainty

Measurement uncertainty (within a 95% confidence level) for this test is ± 2.78 dB.

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3 Conclusion

3.1 Test Outcome

Based on the test results shown above, the EUT is deemed to comply with all relevant requirements.