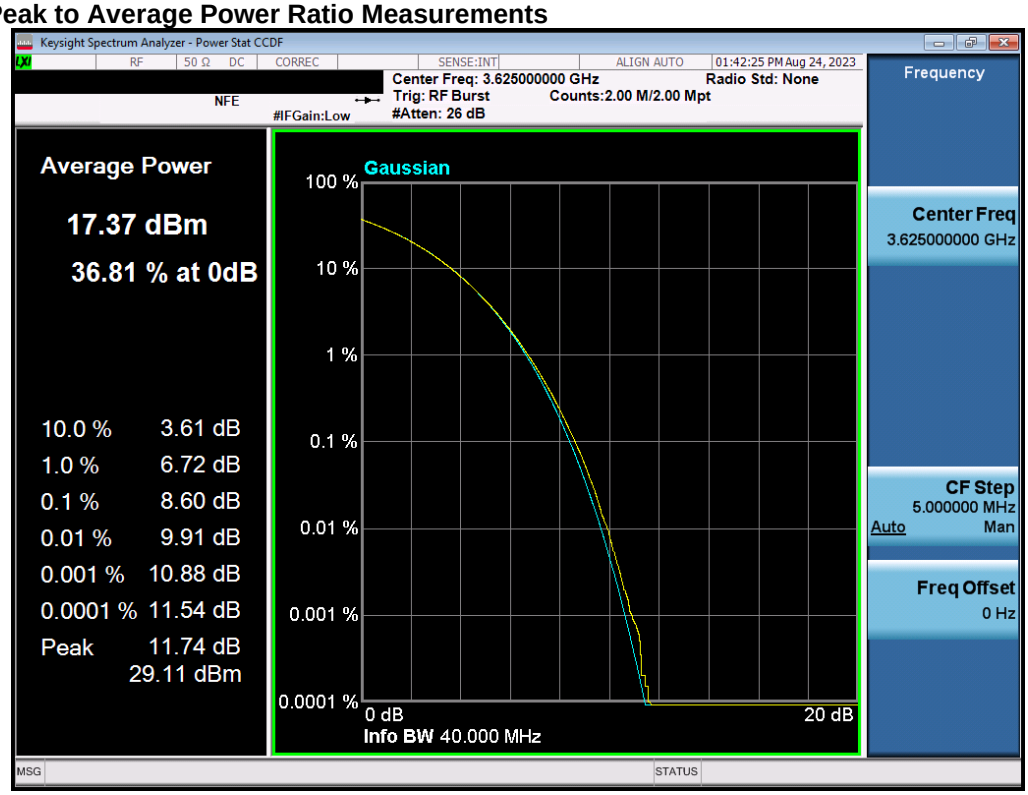
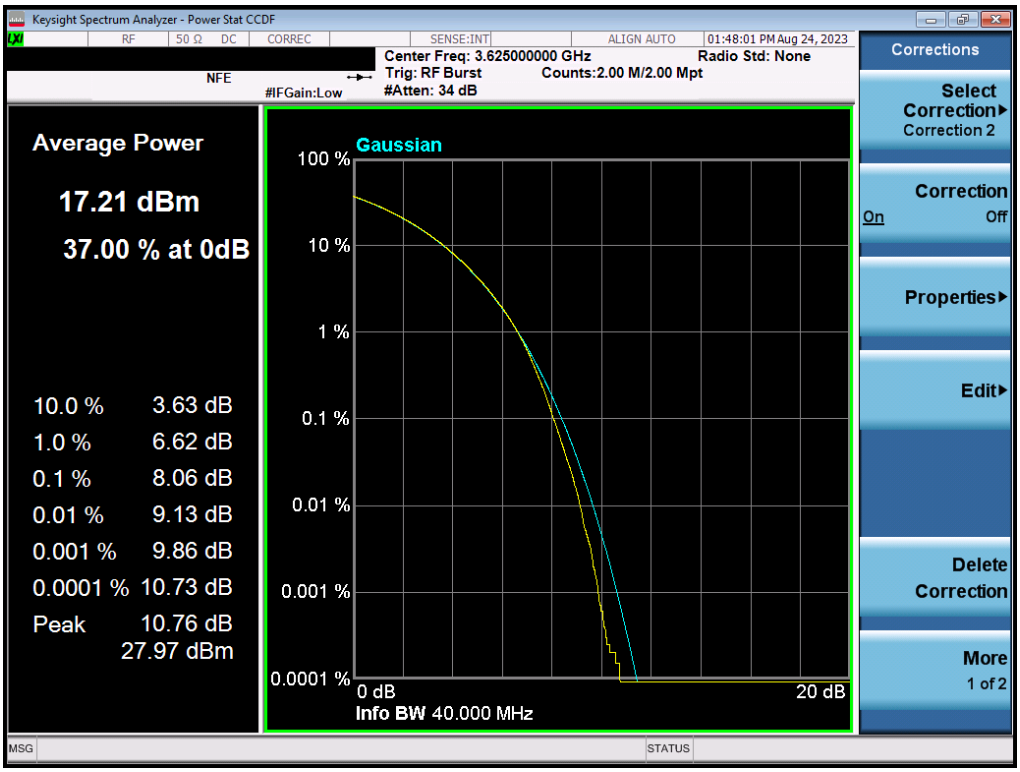
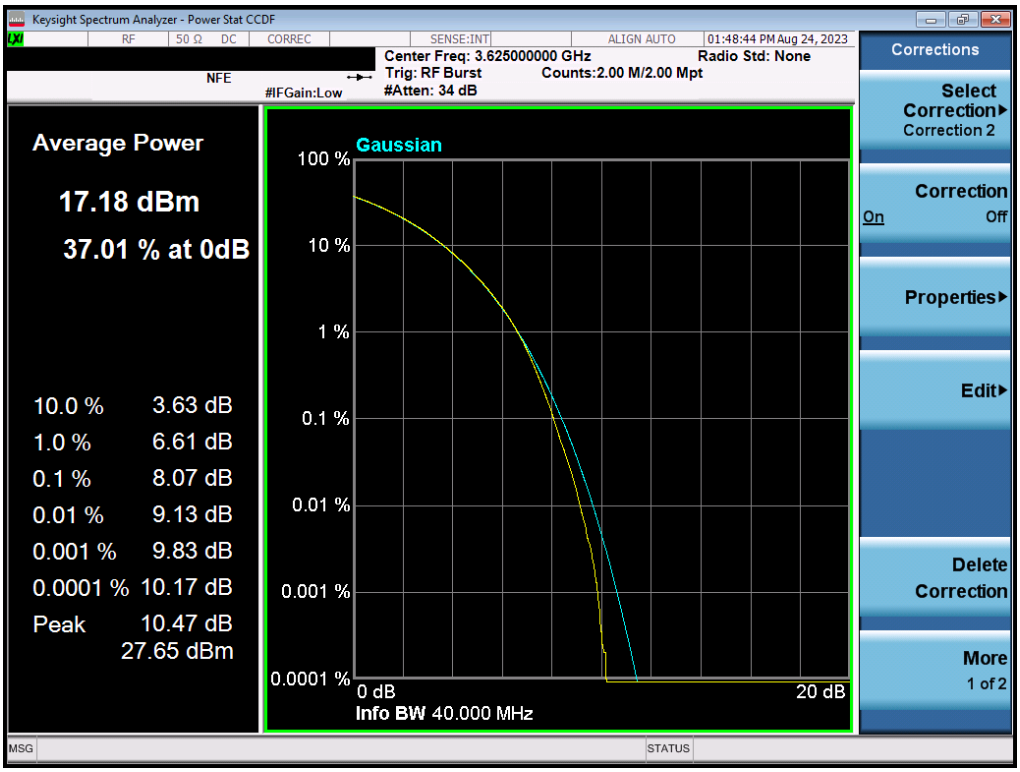
Channel B Peak to Average Power Ratio Measurements



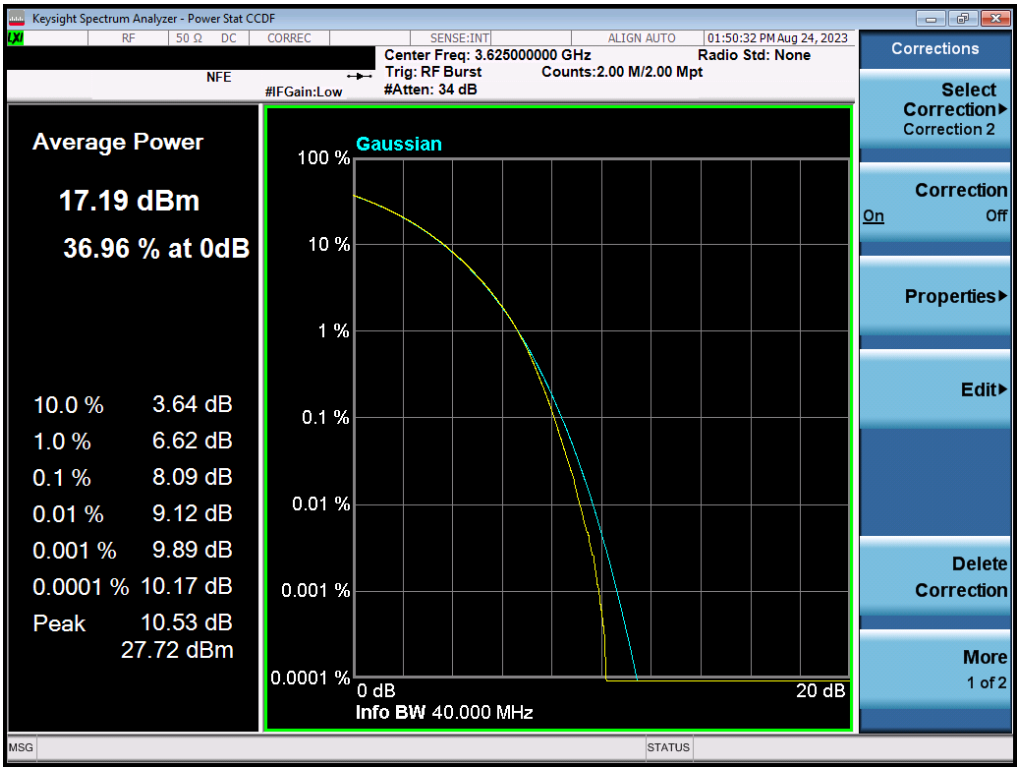
Plot 7.113. Peak to Average Power Ratio Plot (40MHz, QPSK – Mid Channel) – Ch.B



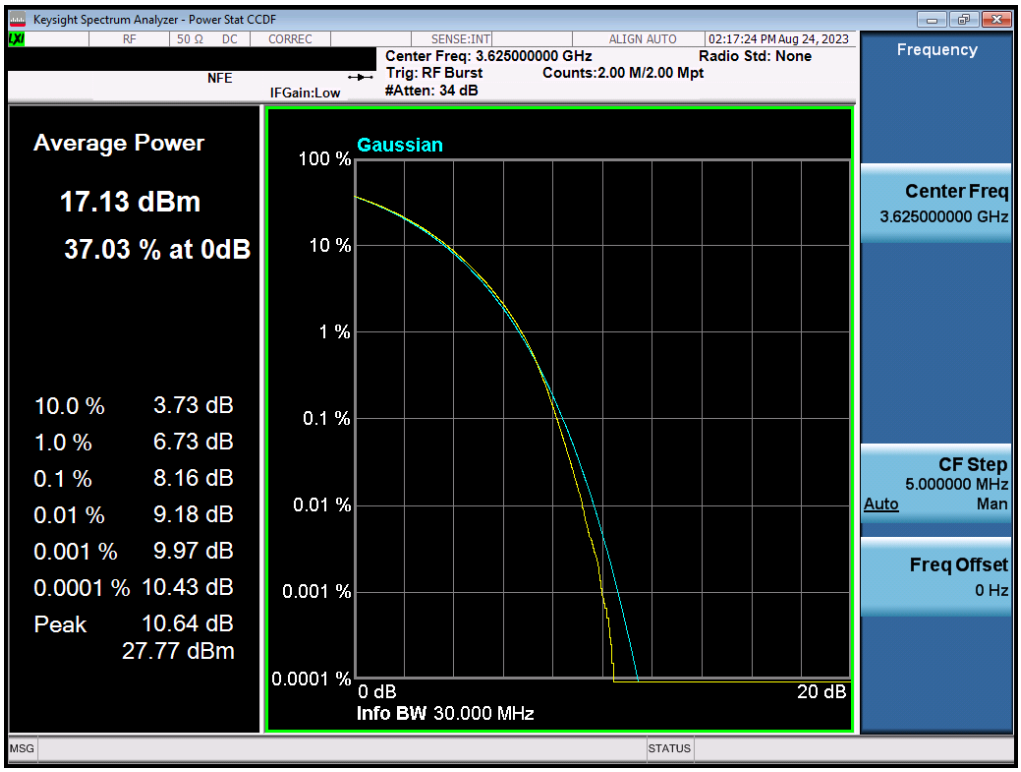
Plot 7.114. Peak to Average Power Ratio Plot (40MHz, 16QAM – Mid Channel) – Ch.B



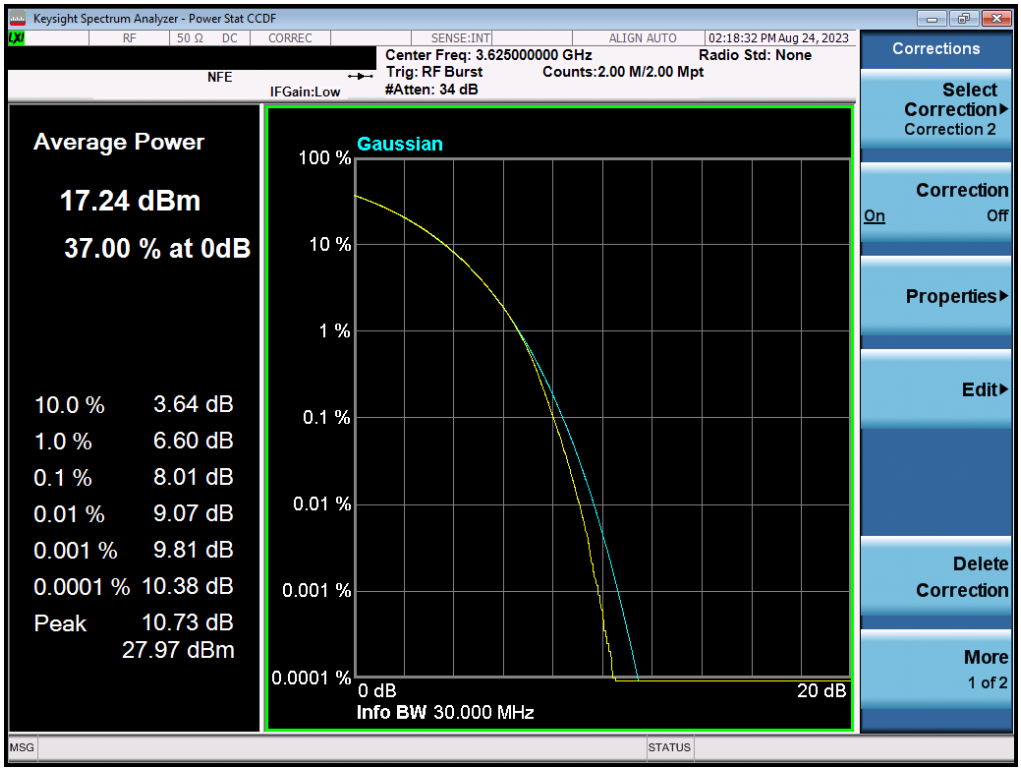
Plot 7.115. Peak to Average Power Ratio Plot (40MHz, 64QAM – Mid Channel) – Ch.B



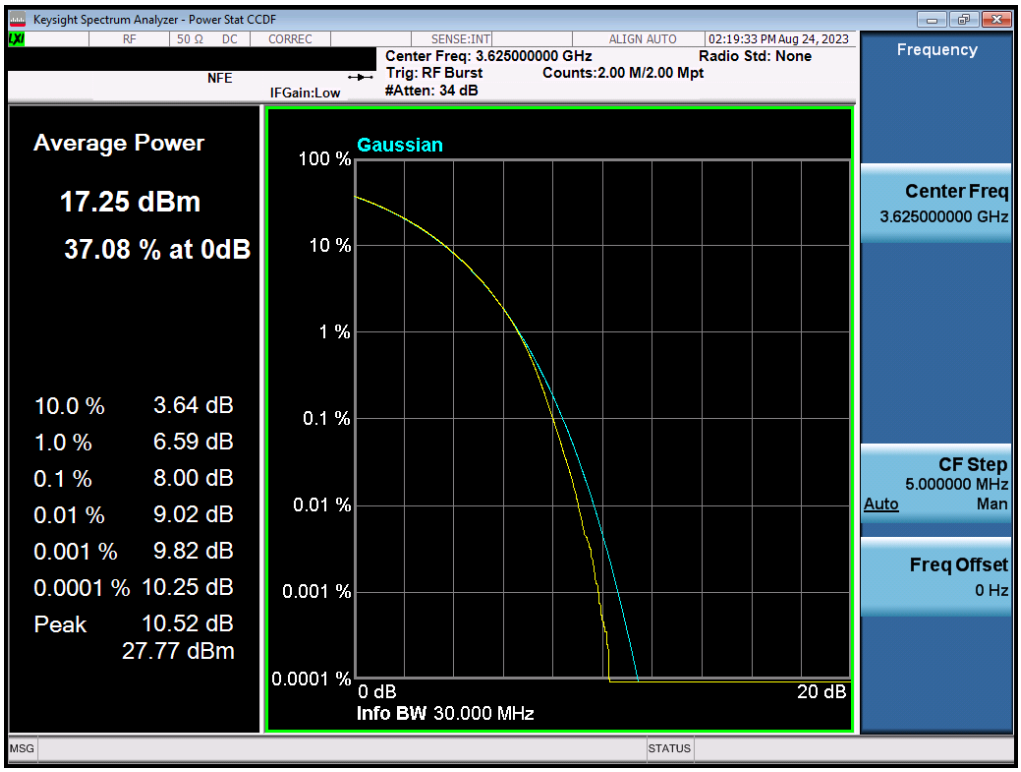
Plot 7.116. Peak to Average Power Ratio Plot (40MHz, 256QAM – Mid Channel) – Ch.B



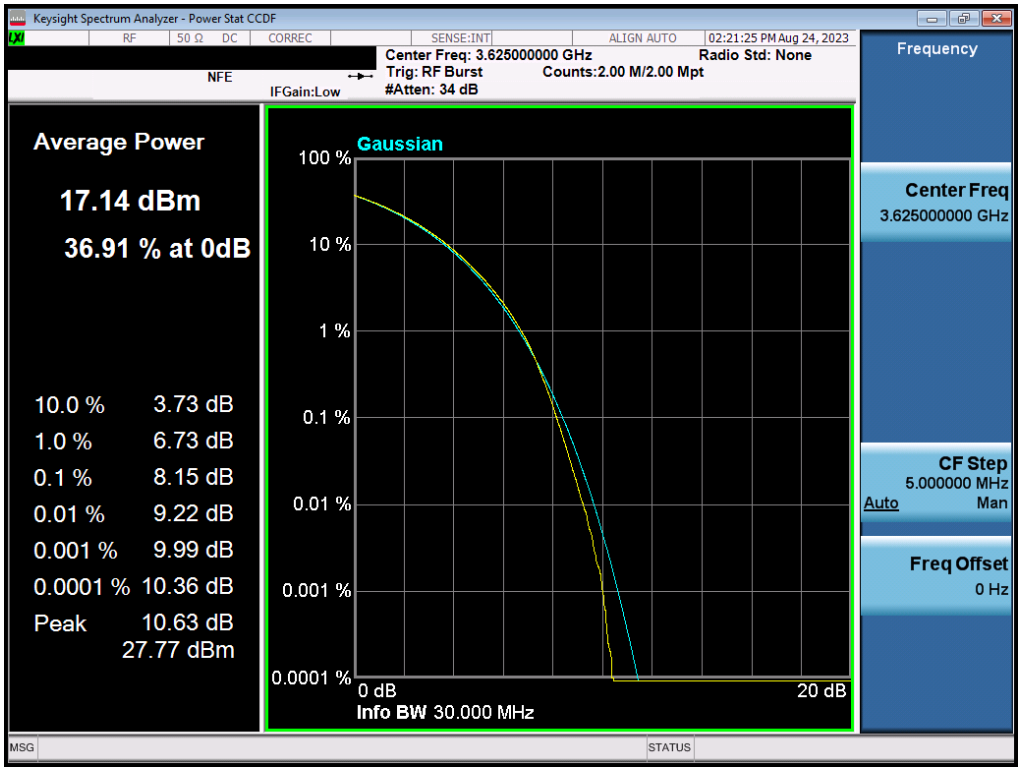
Plot 7.117. Peak to Average Power Ratio Plot (30MHz, QPSK – Mid Channel) – Ch.B



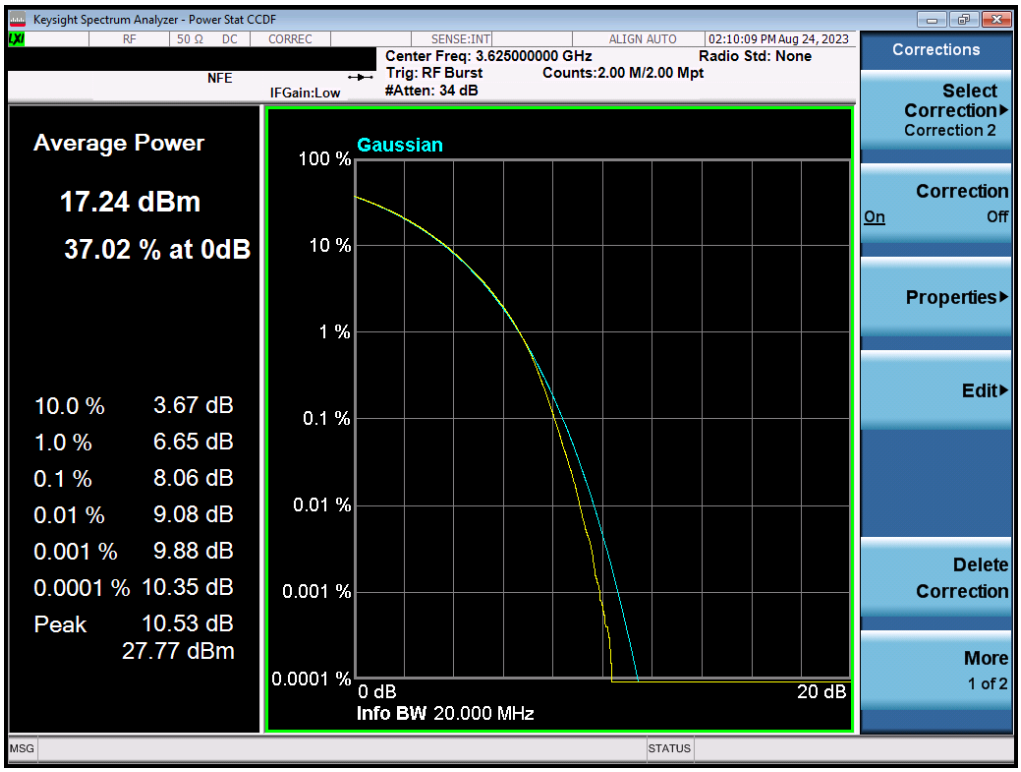
Plot 7.118. Peak to Average Power Ratio Plot (30MHz, 16QAM – Mid Channel) – Ch.B



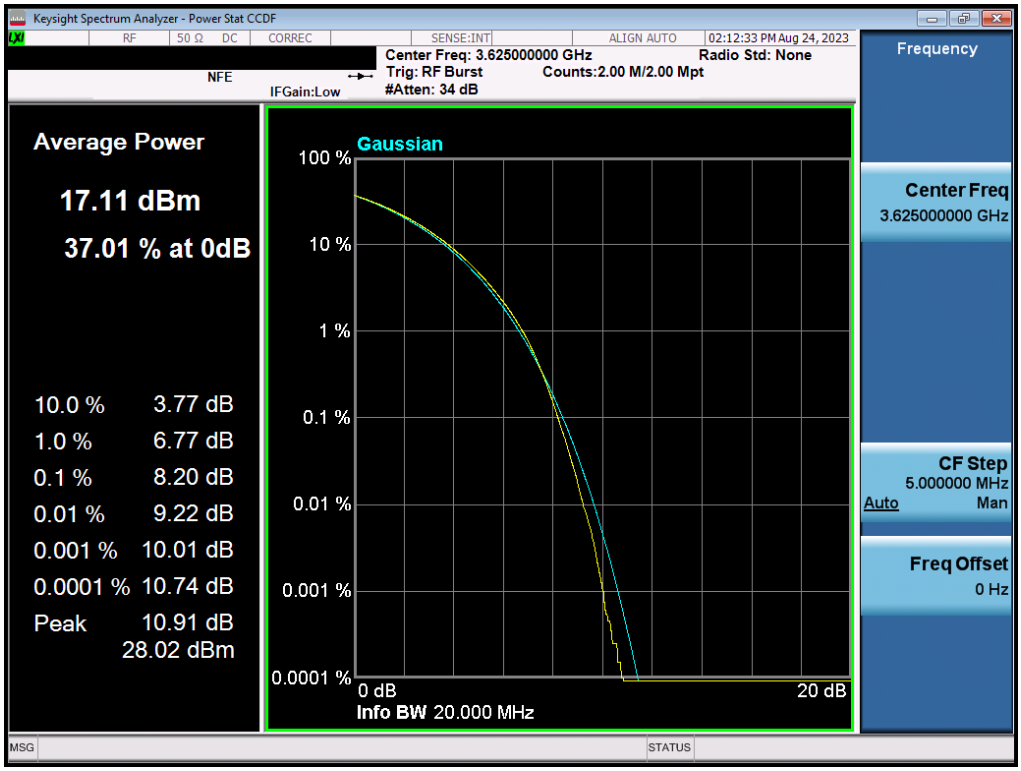
Plot 7.119. Peak to Average Power Ratio Plot (30MHz, 64QAM – Mid Channel) – Ch.B



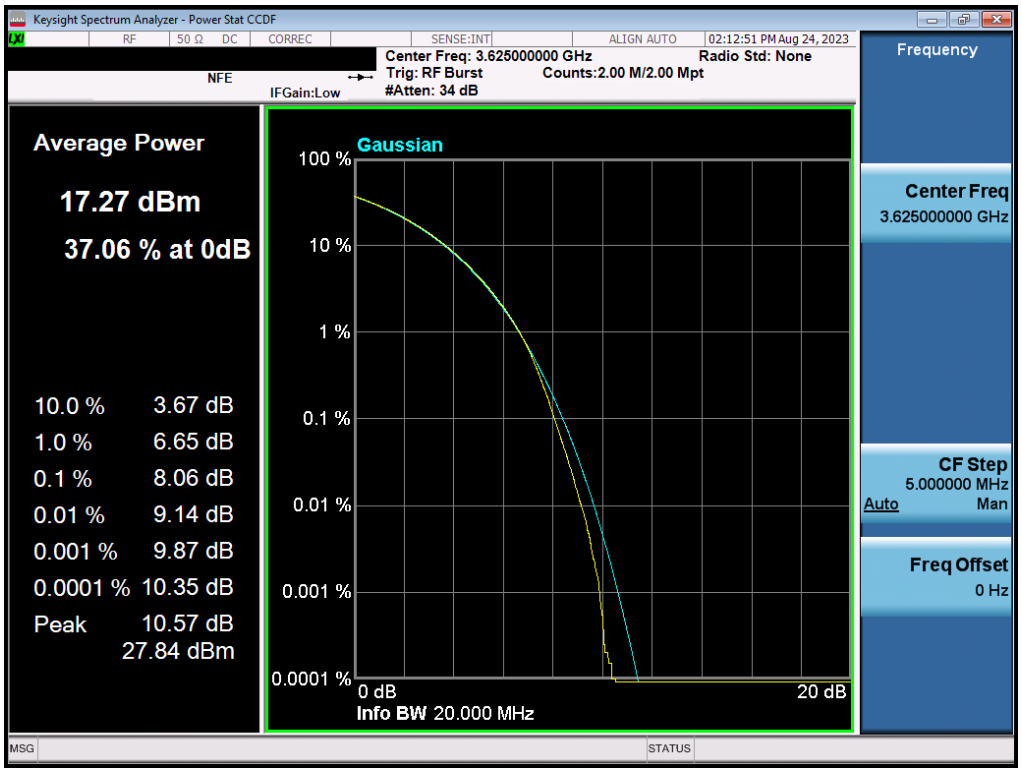
Plot 7.120. Peak to Average Power Ratio Plot (30MHz, 256QAM – Mid Channel) – Ch.B



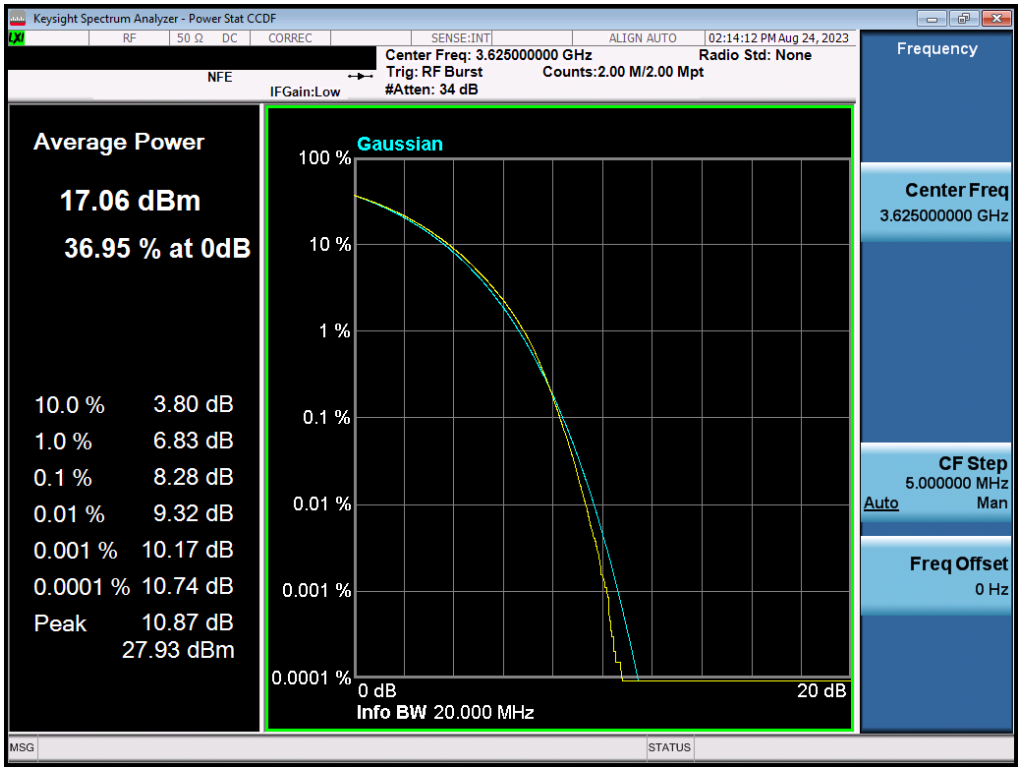
Plot 7.121. Peak to Average Power Ratio Plot (20MHz, QPSK – Mid Channel) – Ch.B



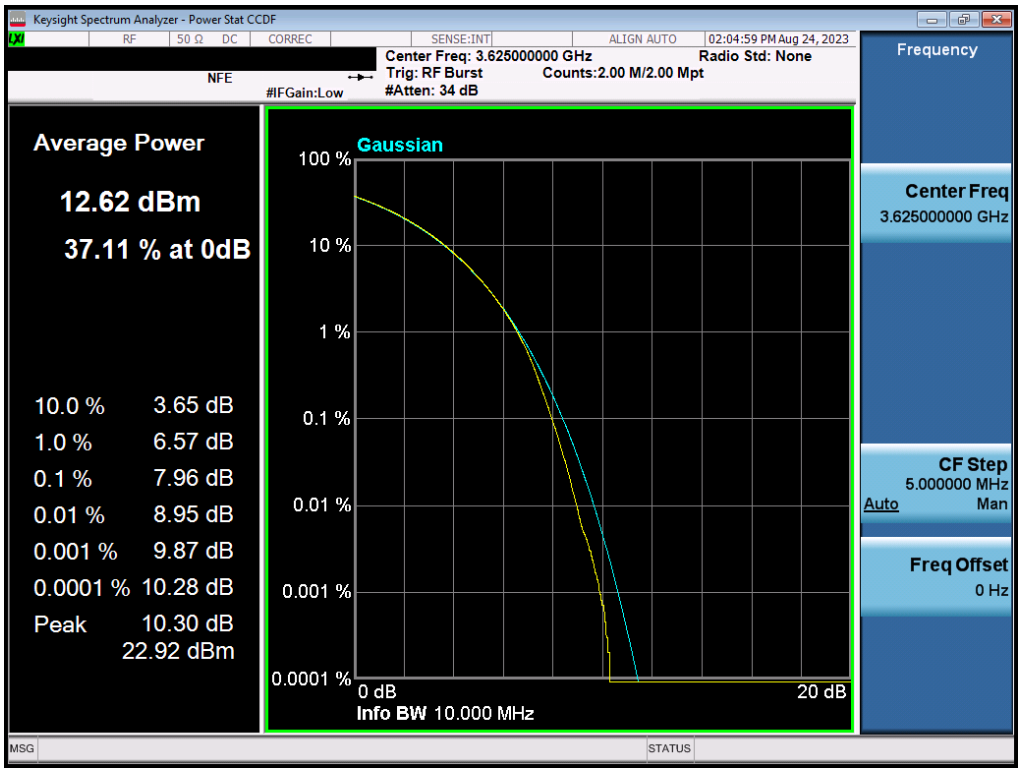
Plot 7.122. Peak to Average Power Ratio Plot (20MHz, 16QAM – Mid Channel) – Ch.B



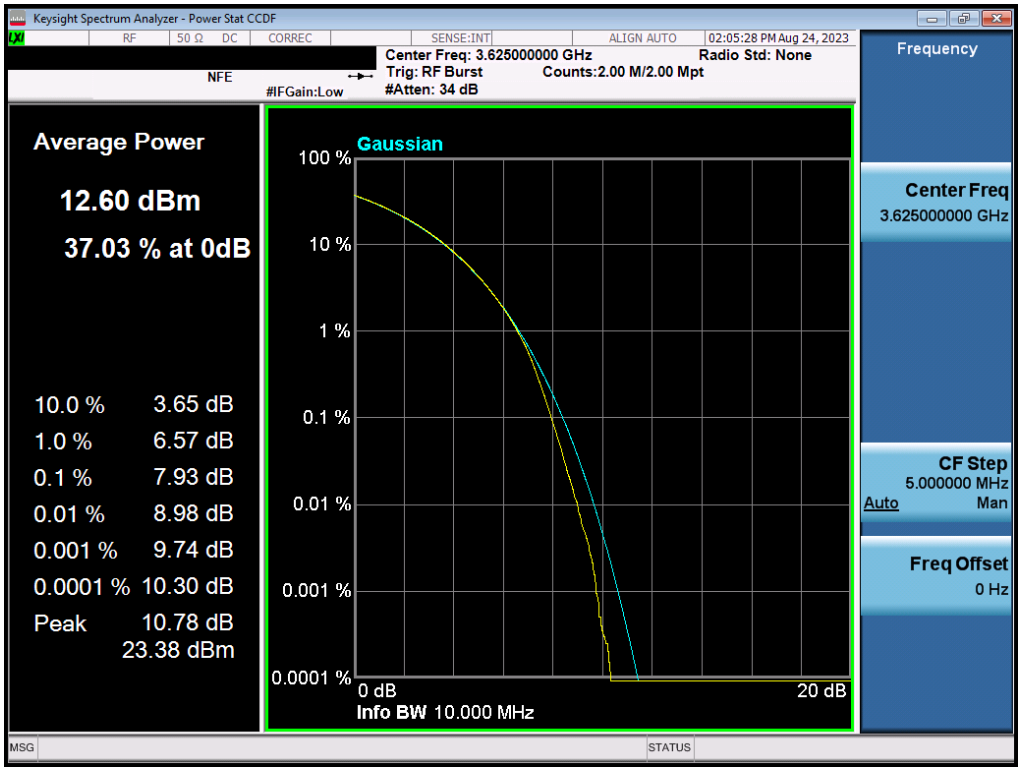
Plot 7.123. Peak to Average Power Ratio Plot (20MHz, 64QAM – Mid Channel) – Ch.B



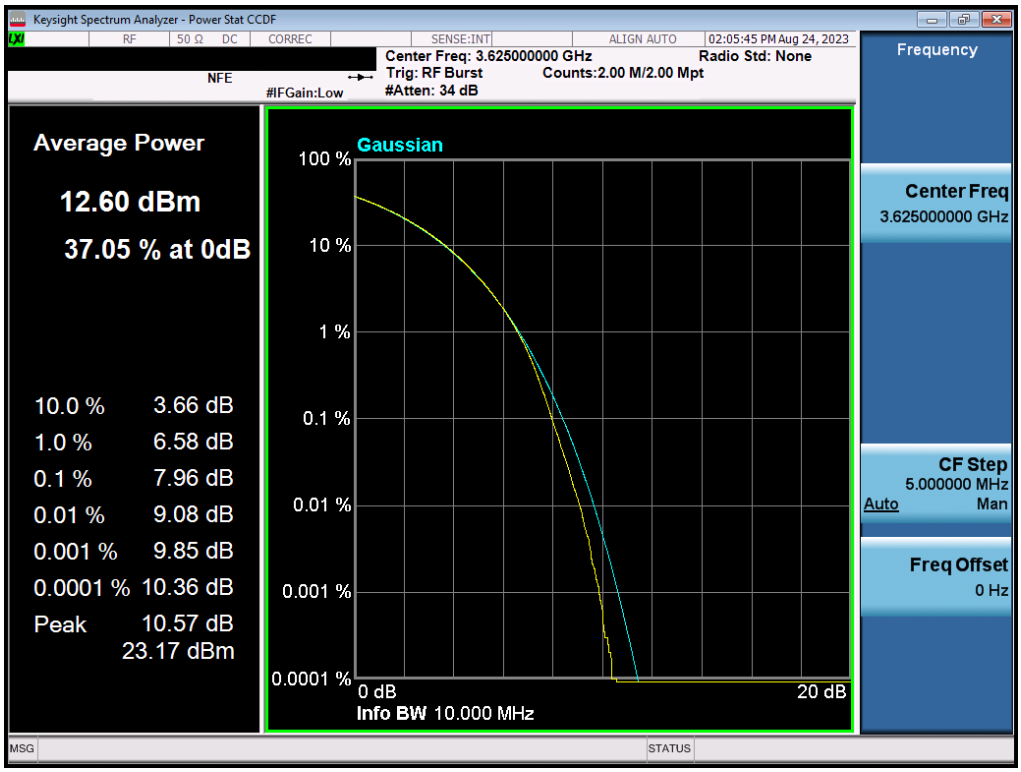
Plot 7.124. Peak to Average Power Ratio Plot (20MHz, 256QAM – Mid Channel) – Ch.B



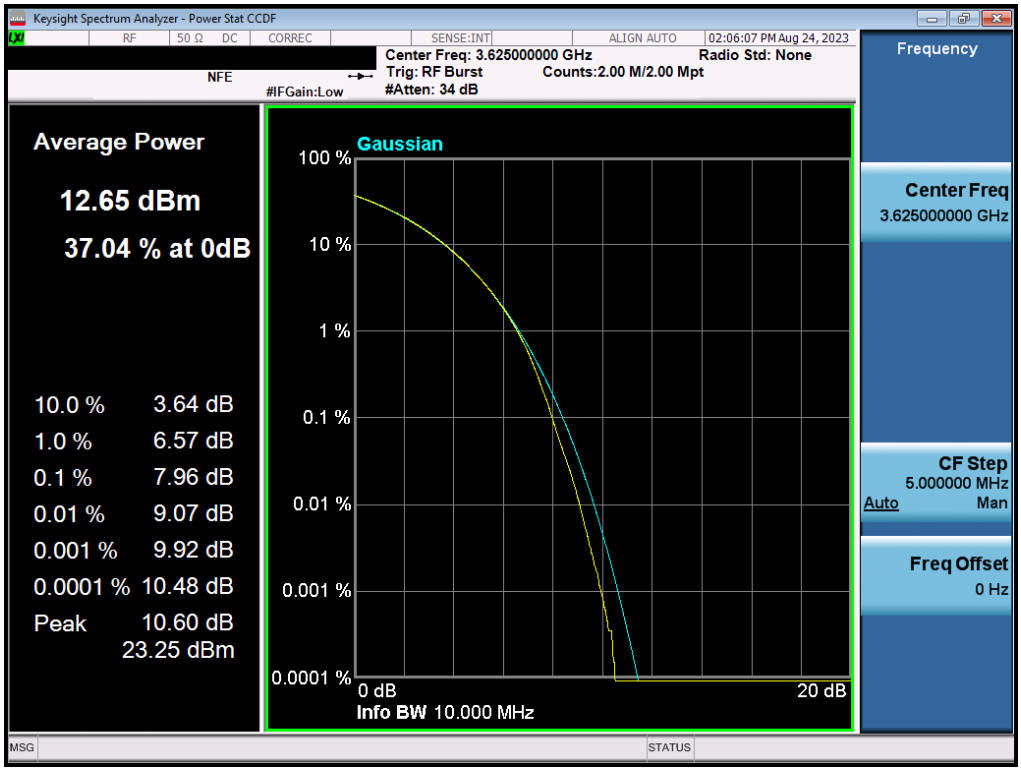
Plot 7.125. Peak to Average Power Ratio Plot (10MHz, QPSK – Mid Channel) – Ch.B



Plot 7.126. Peak to Average Power Ratio Plot (10MHz, 16QAM – Mid Channel) – Ch.B



Plot 7.127. Peak to Average Power Ratio Plot (10MHz, 64QAM – Mid Channel) – Ch.B



Plot 7.128. Peak to Average Power Ratio Plot (10MHz, 256QAM – Mid Channel) – Ch.B

7.6 Spurious and Harmonic Emissions at Antenna Terminal

Test Overview

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/Mhz.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.4

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = Max Hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

Test Setup

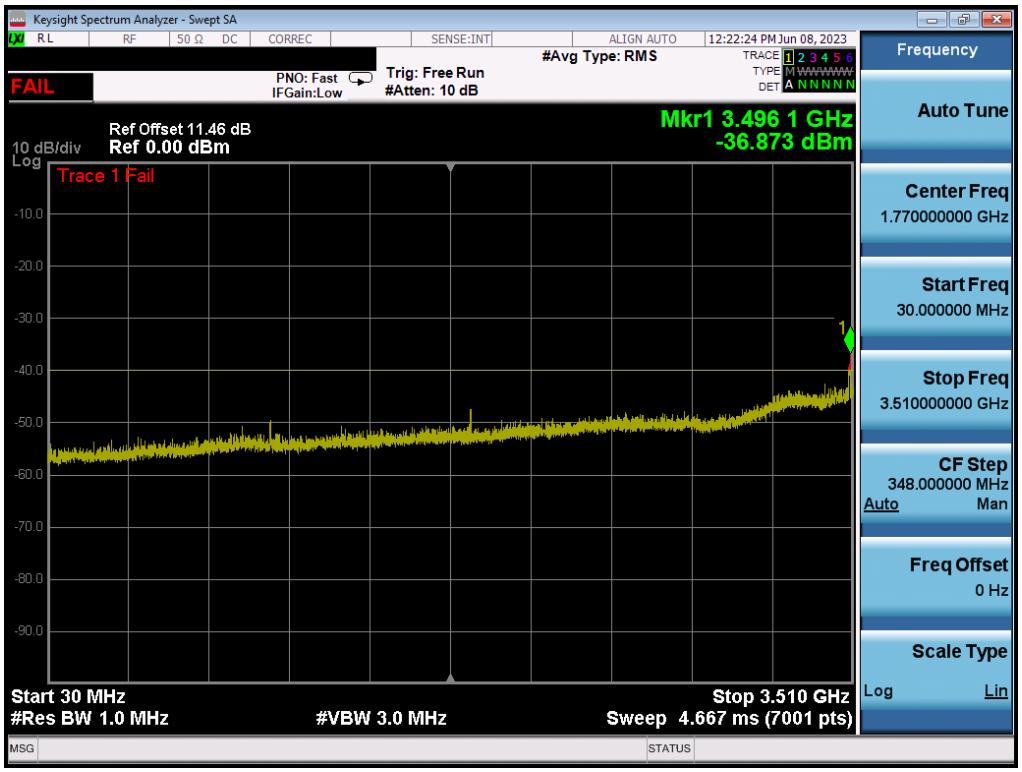
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-5. Test Instrument & Measurement Setup

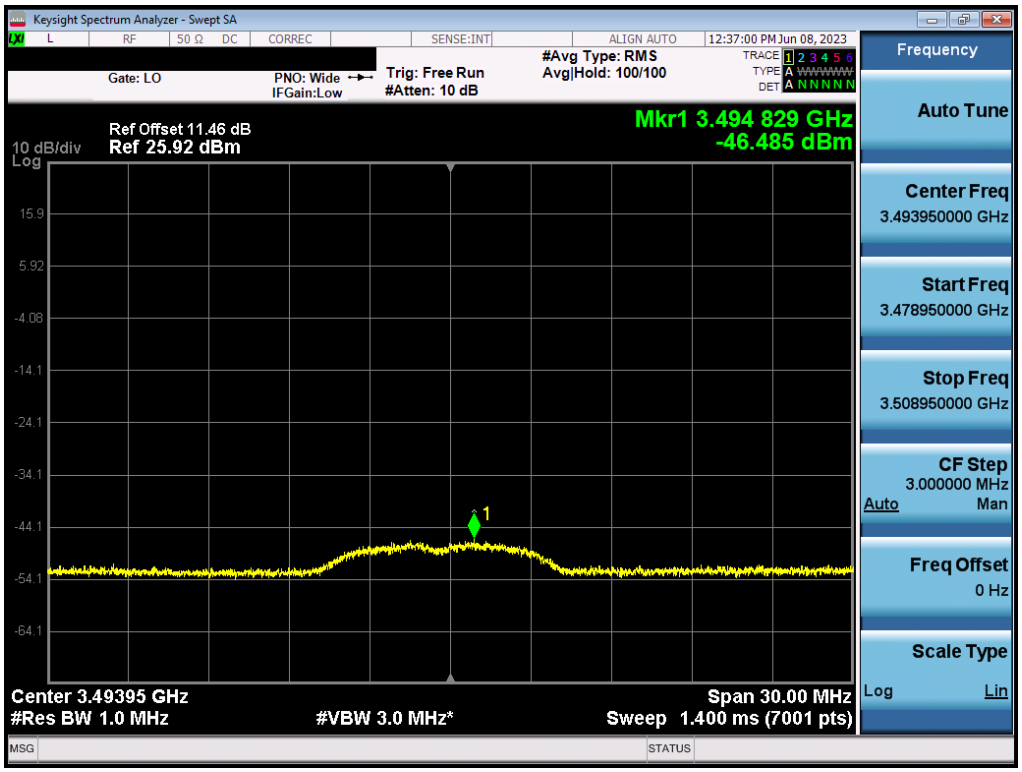
Test Notes

1. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz.
2. The Plots in this section have a 11.46dB (10*log(total ports[14])) correction applied to the individual plots to address the MIMO requirements in ANSI C63.26
3. Any emissions failing in max hold wide spectrum sweeps were found to be passing when more closely examined with gated average measurements

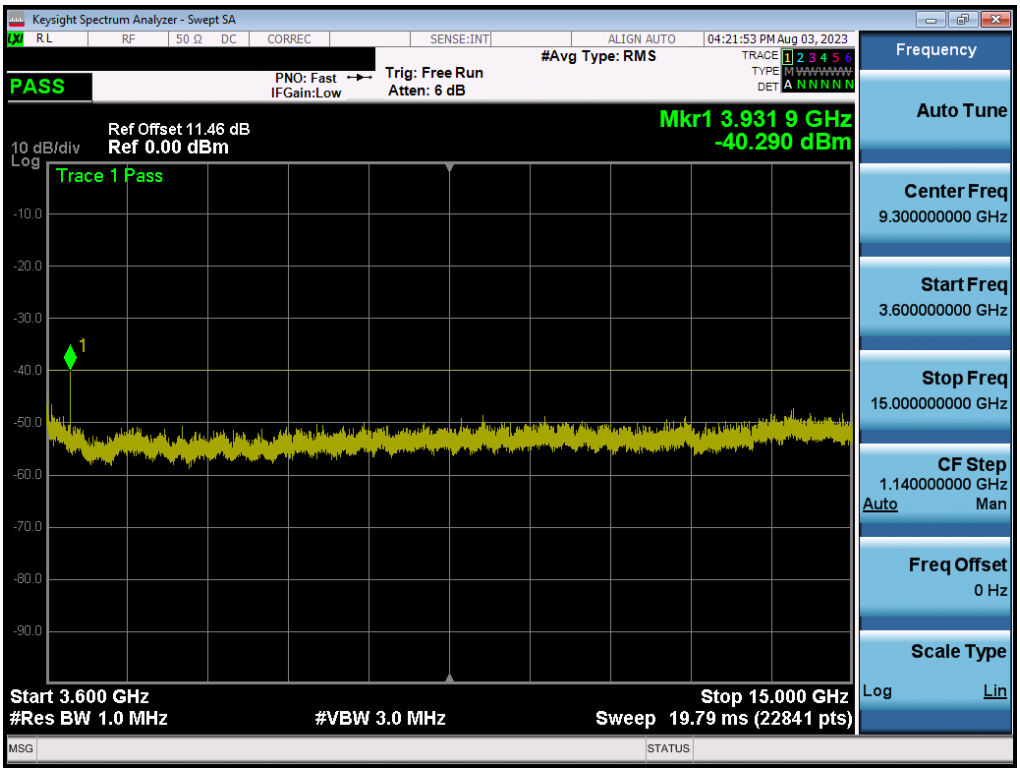
Channel A Conducted Spurious Emissions



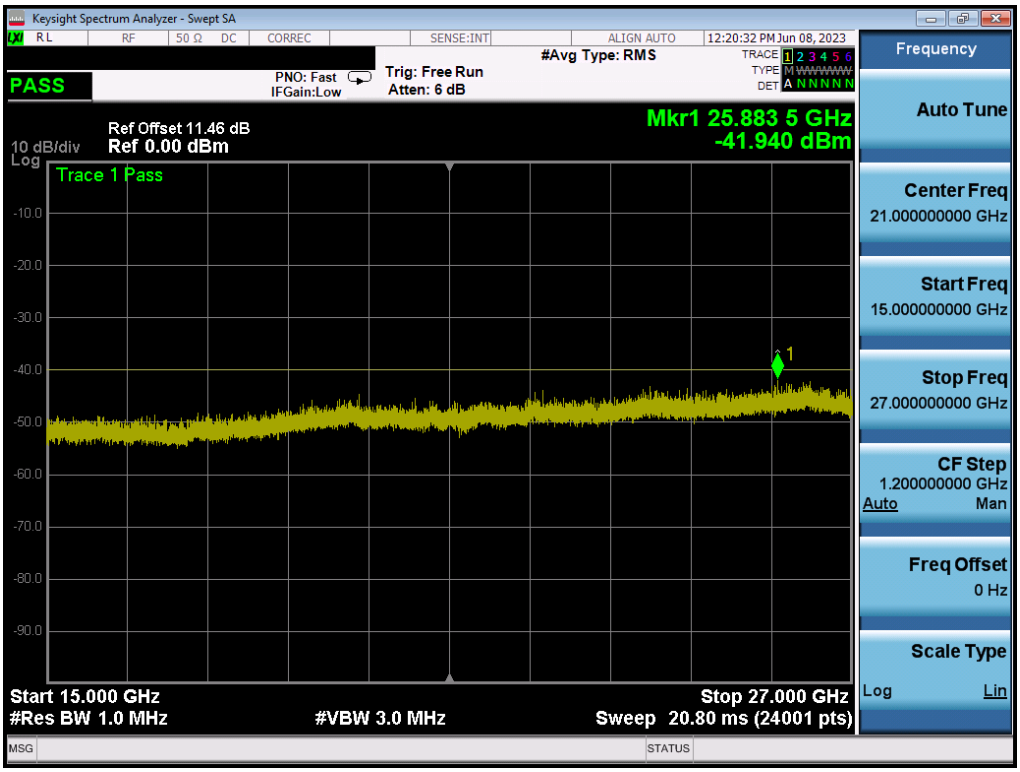
Plot 7.129. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.A)



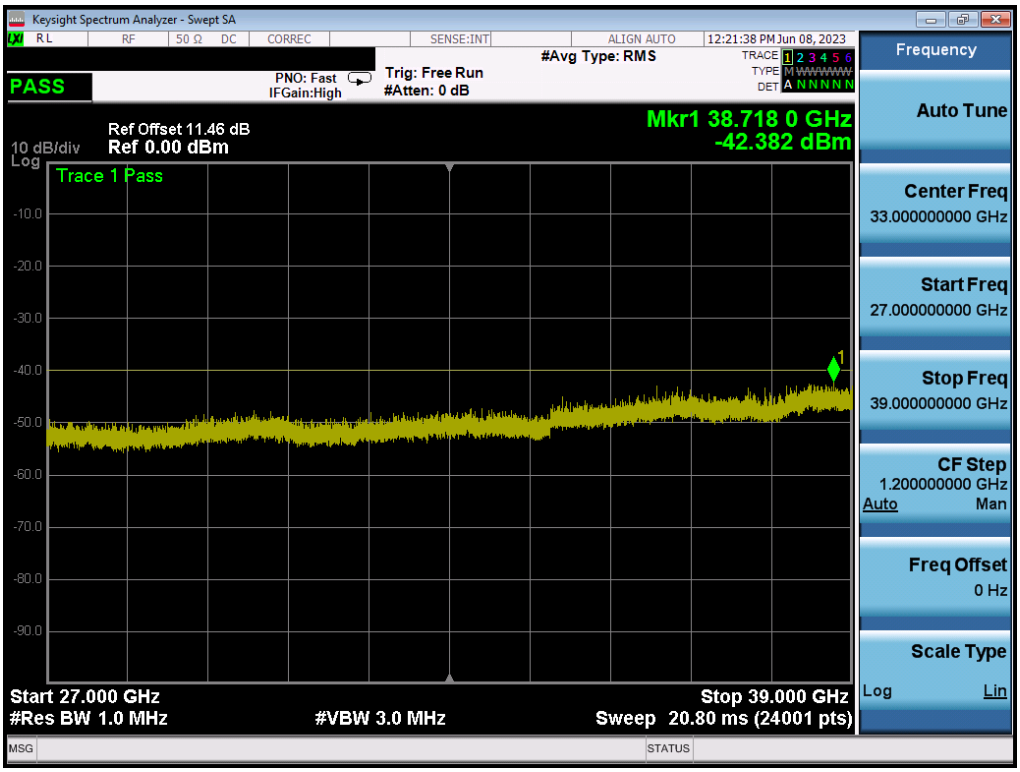
Plot 7.130. Conducted Spurious Plot (10MHz QPSK, Low Channel - 3495 MHz – Ch.A)



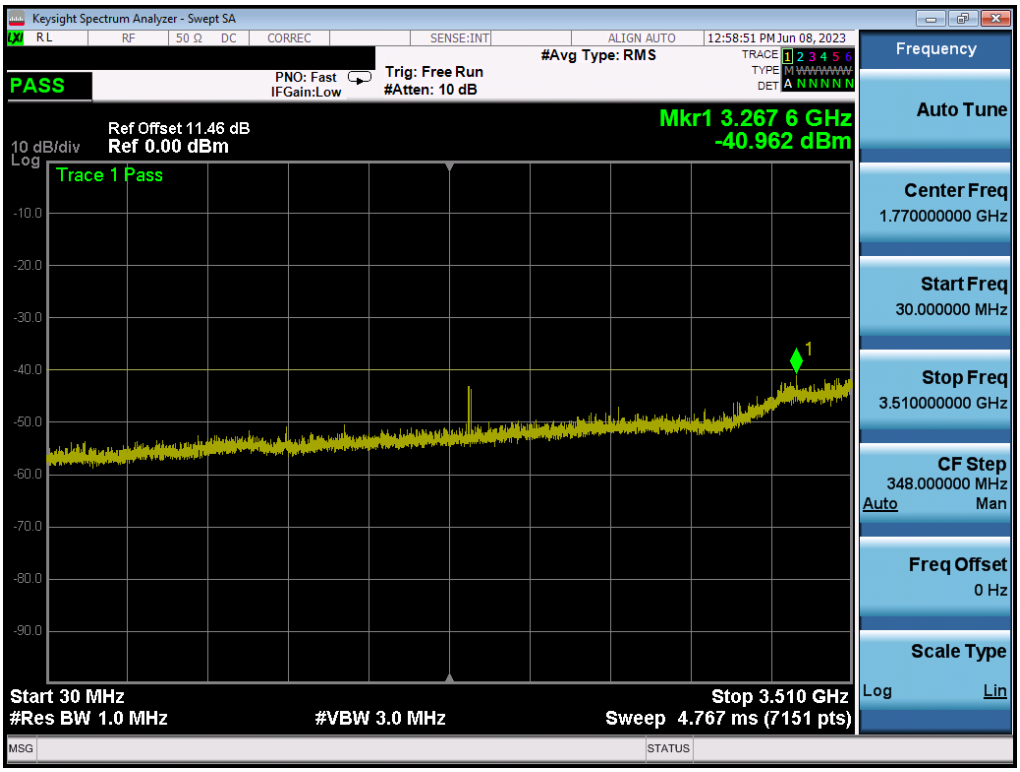
Plot 7.131. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.A)



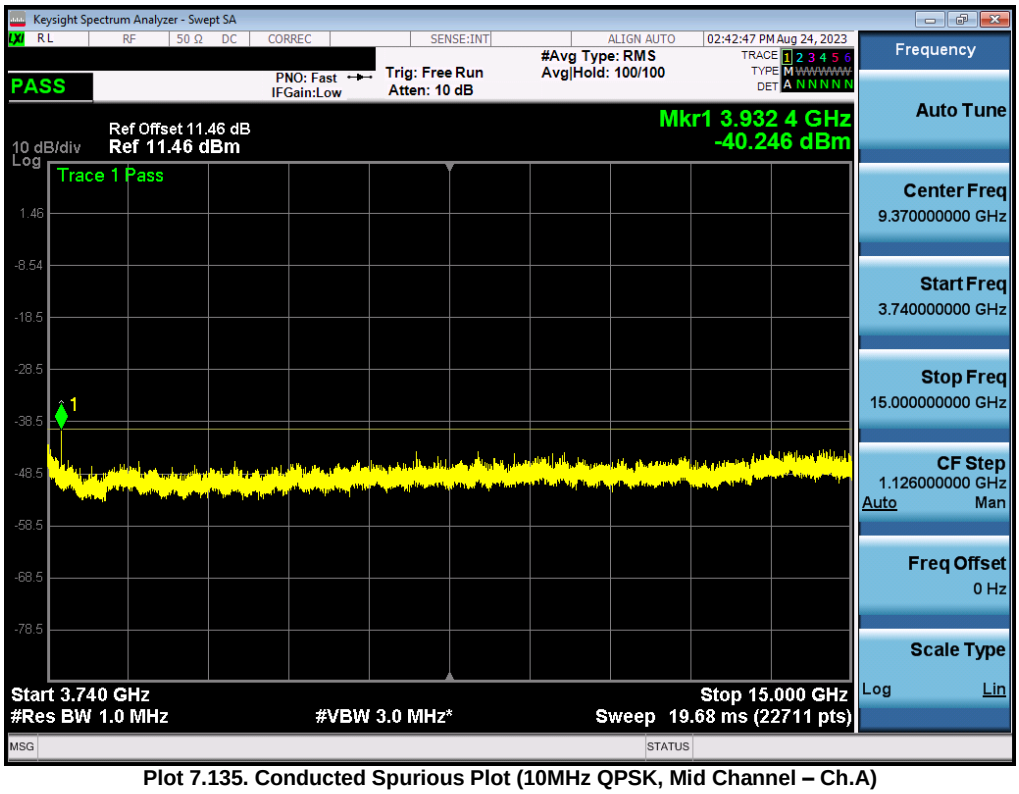
Plot 7.132. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.A)



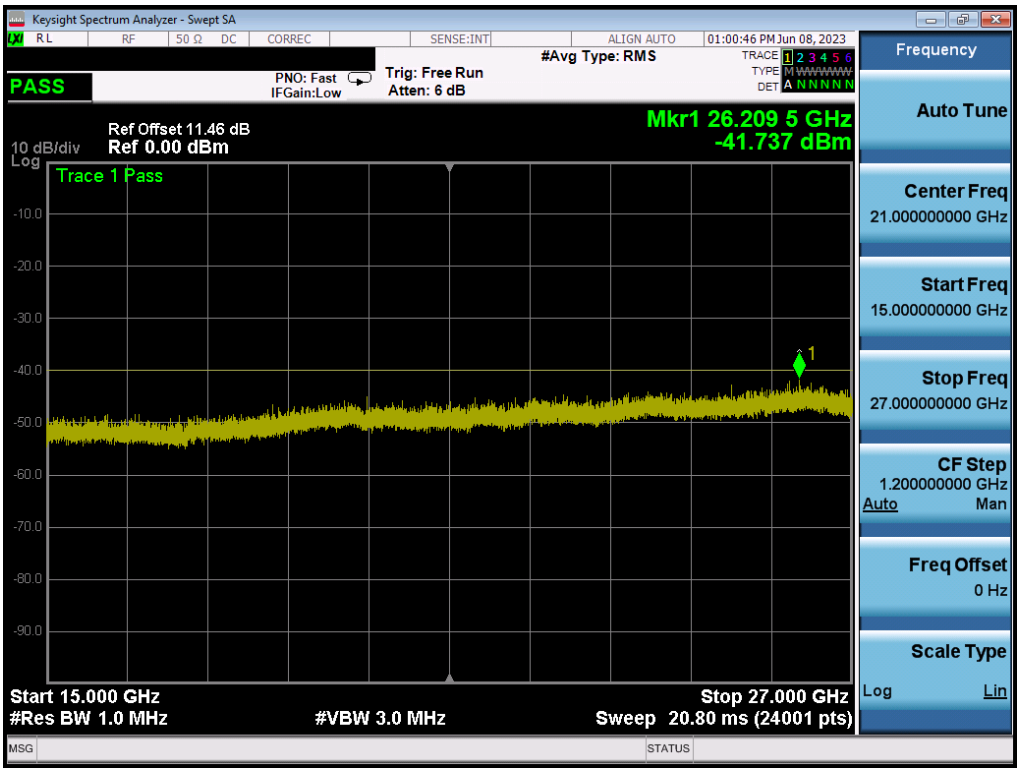
Plot 7.133. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.A)



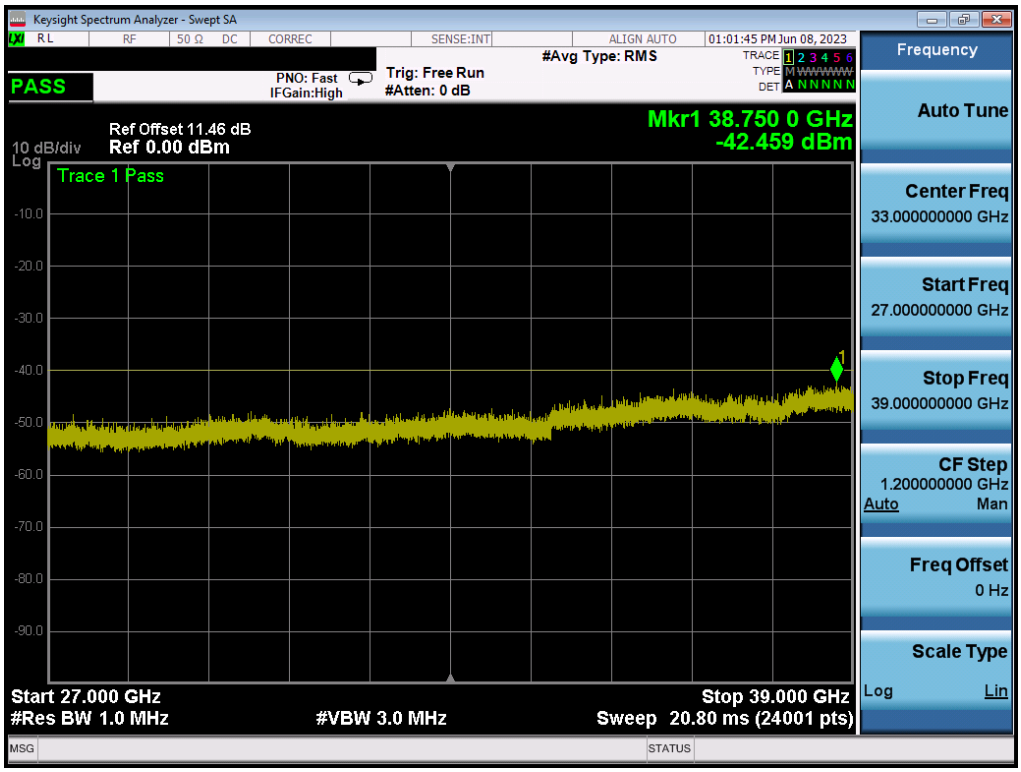
Plot 7.134. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.A)



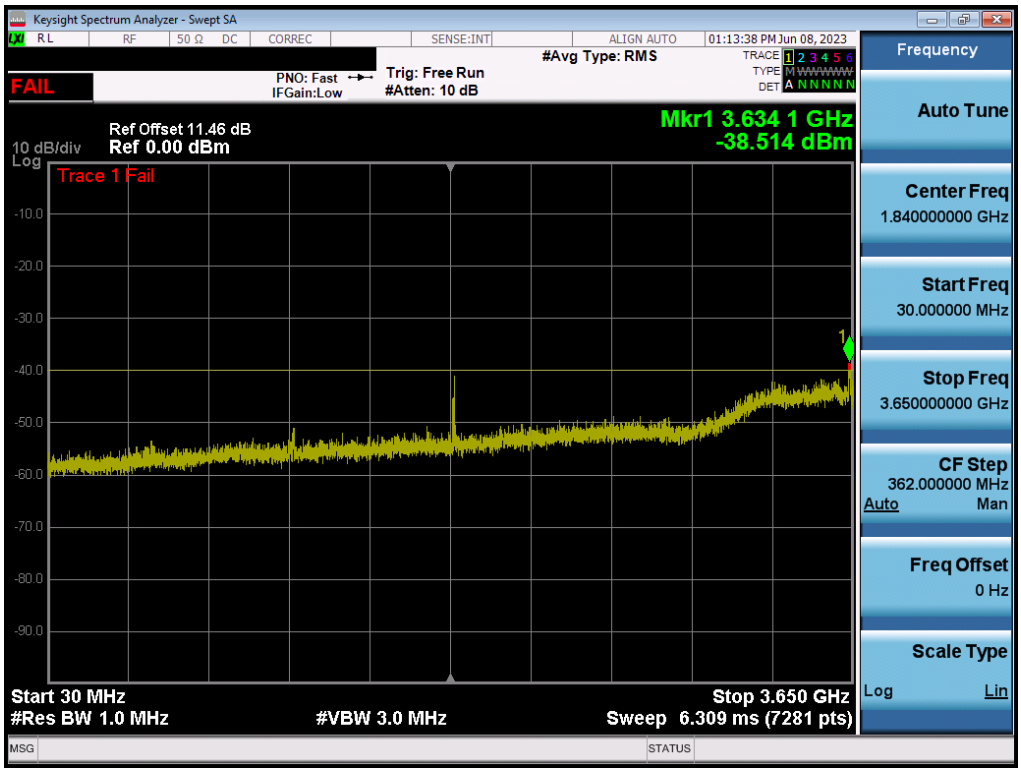
Plot 7.135. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.A)



Plot 7.136. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.A)

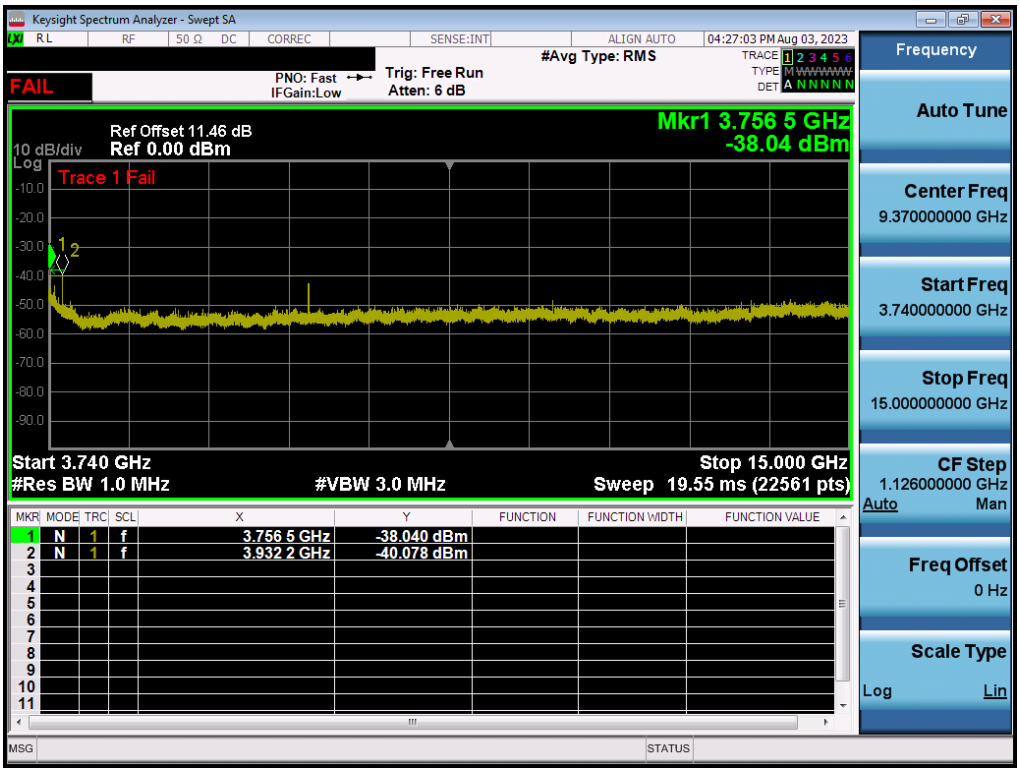


Plot 7.137. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.A)

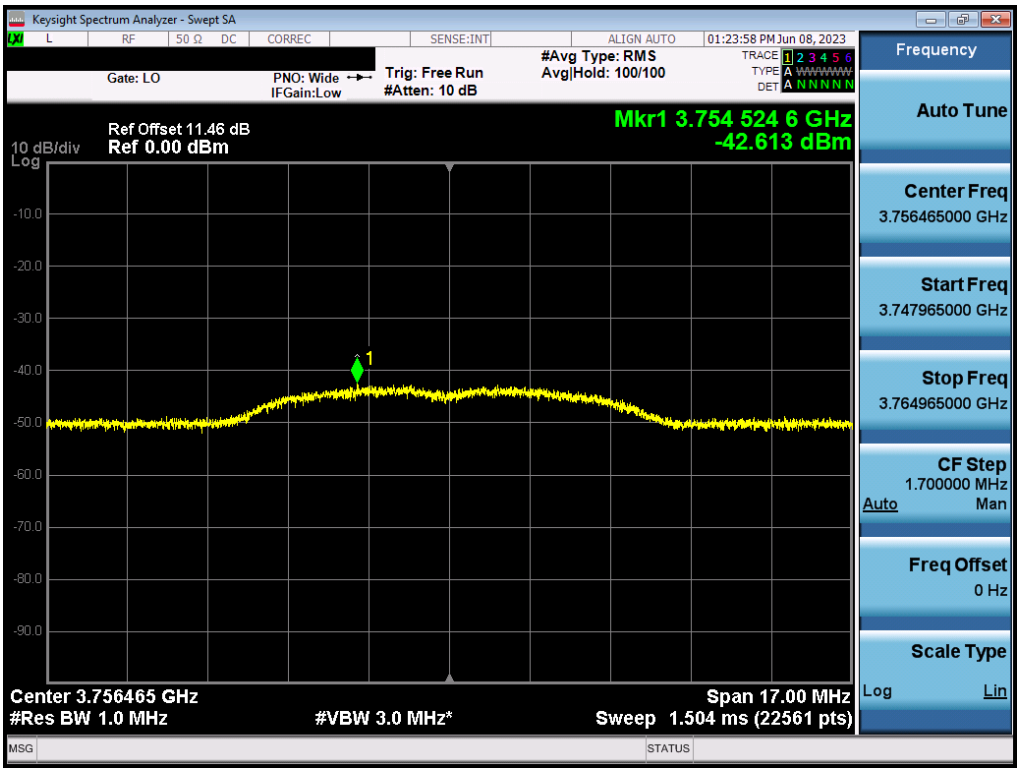


Plot 7.138. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.A)

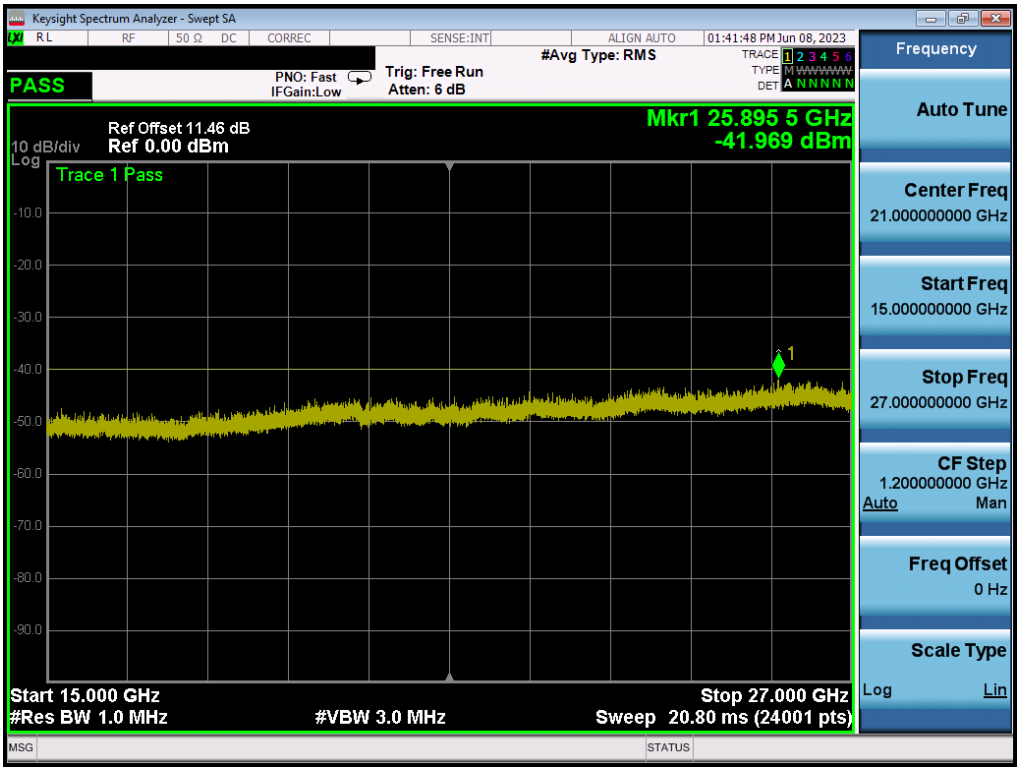
Plot 7.139. Conducted Spurious Plot (10MHz QPSK, High Channel – 3634 MHz - Ch.A)



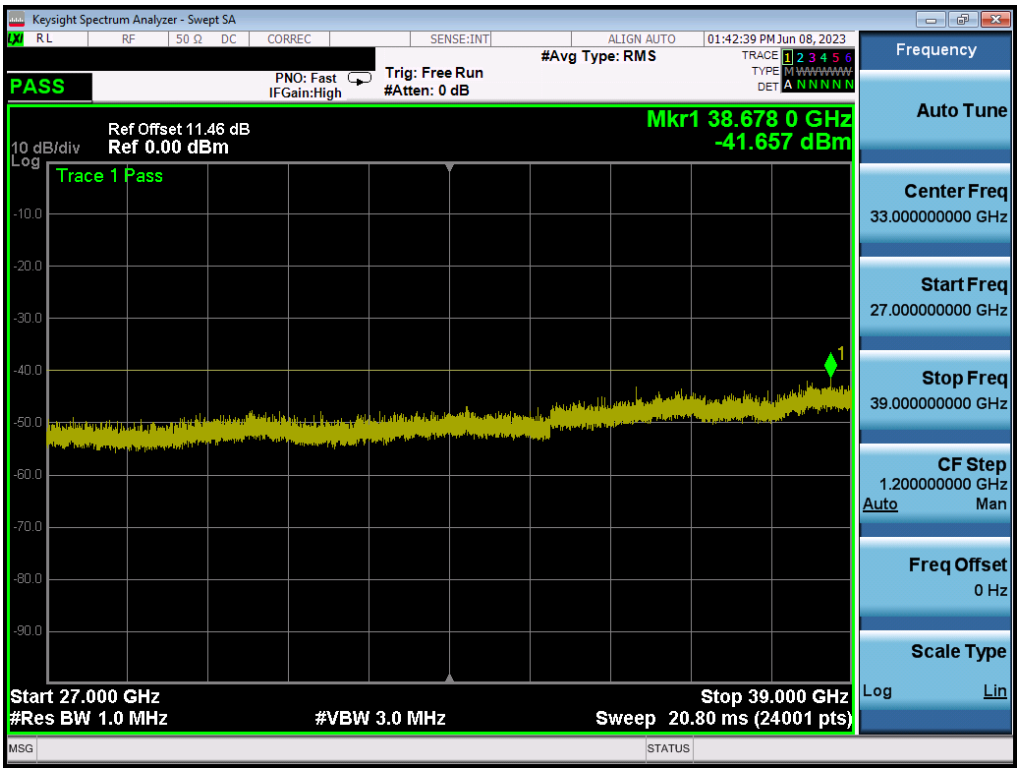
Plot 7.140. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.A)



Plot 7.141. Conducted Spurious Plot (10MHz QPSK, High Channel – 3755 MHz Ch.A)

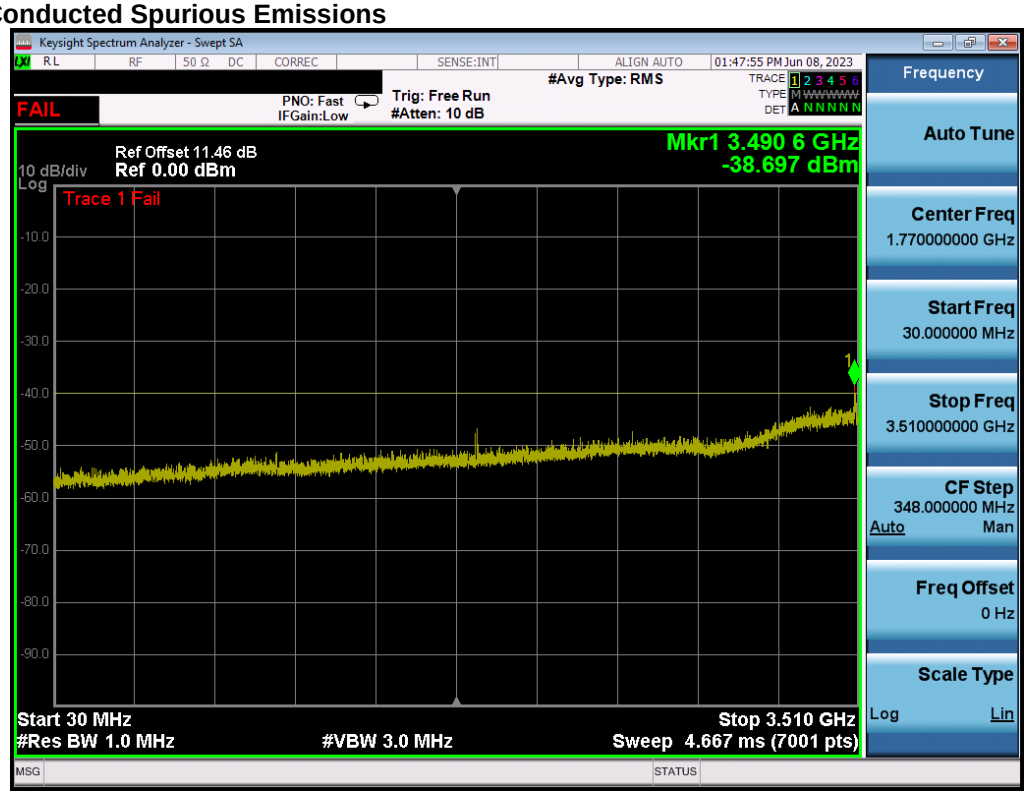


Plot 7.142. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.A)

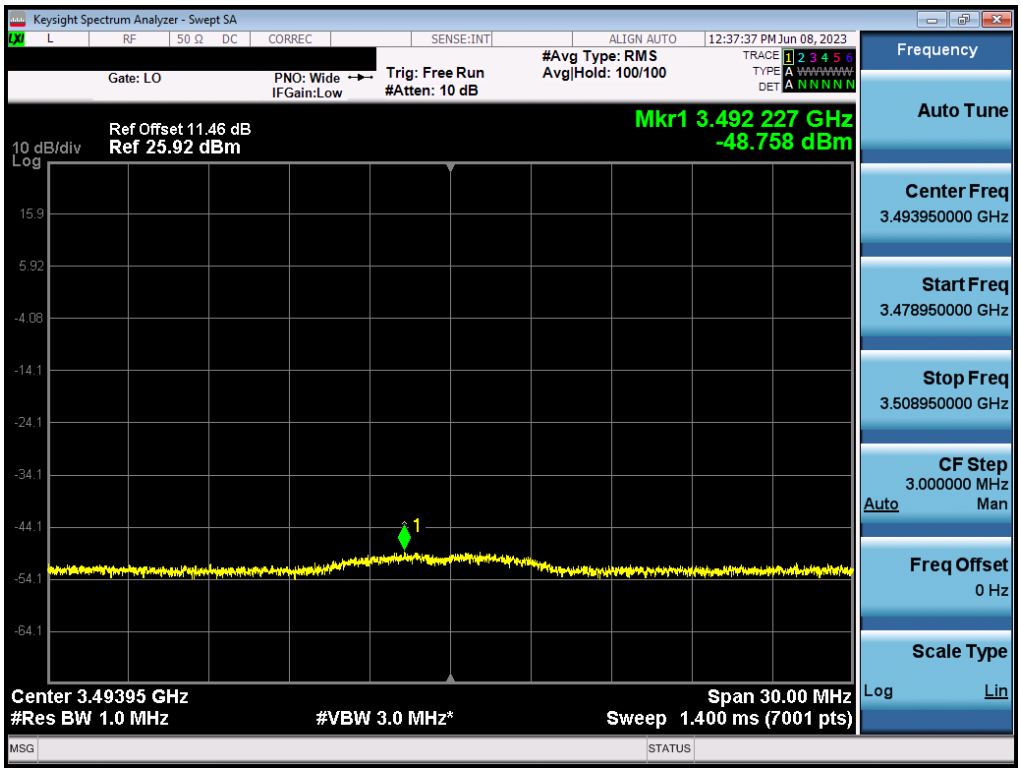


Plot 7.143. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.A)

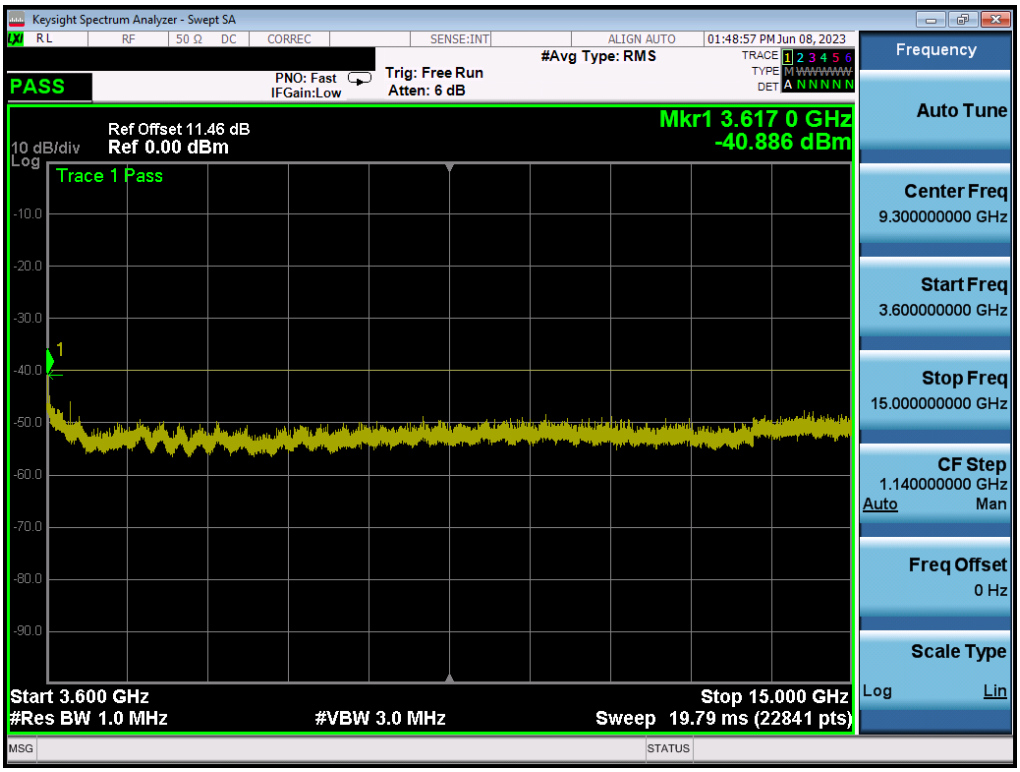
Channel B Conducted Spurious Emissions



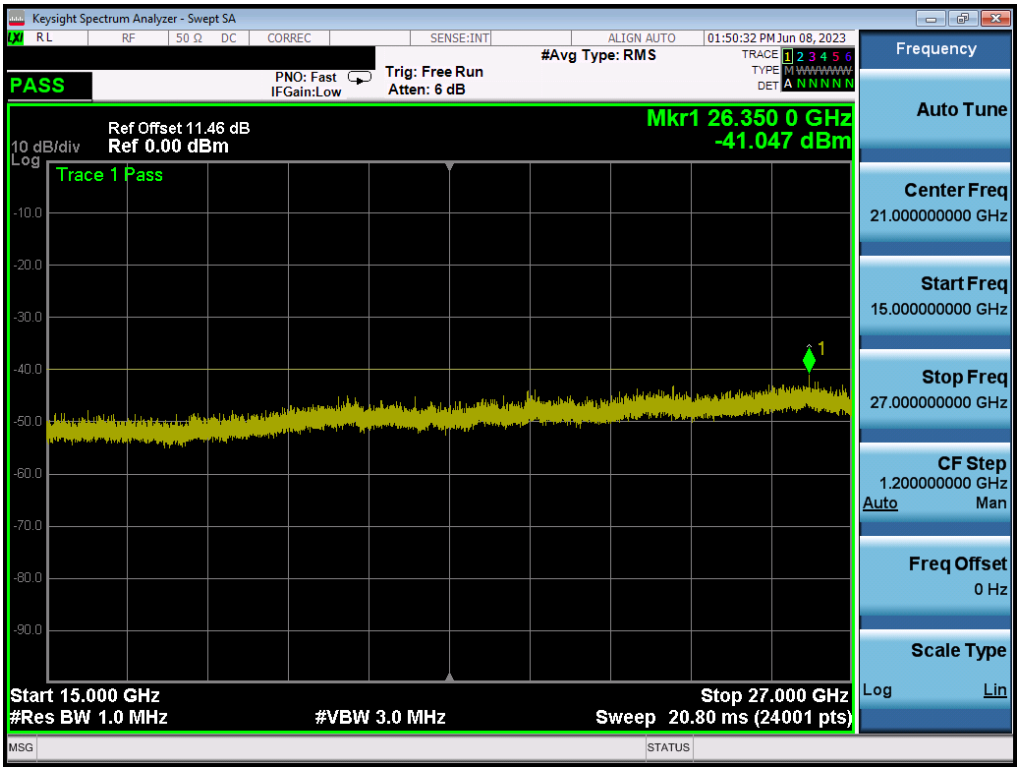
Plot 7.144. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.B)



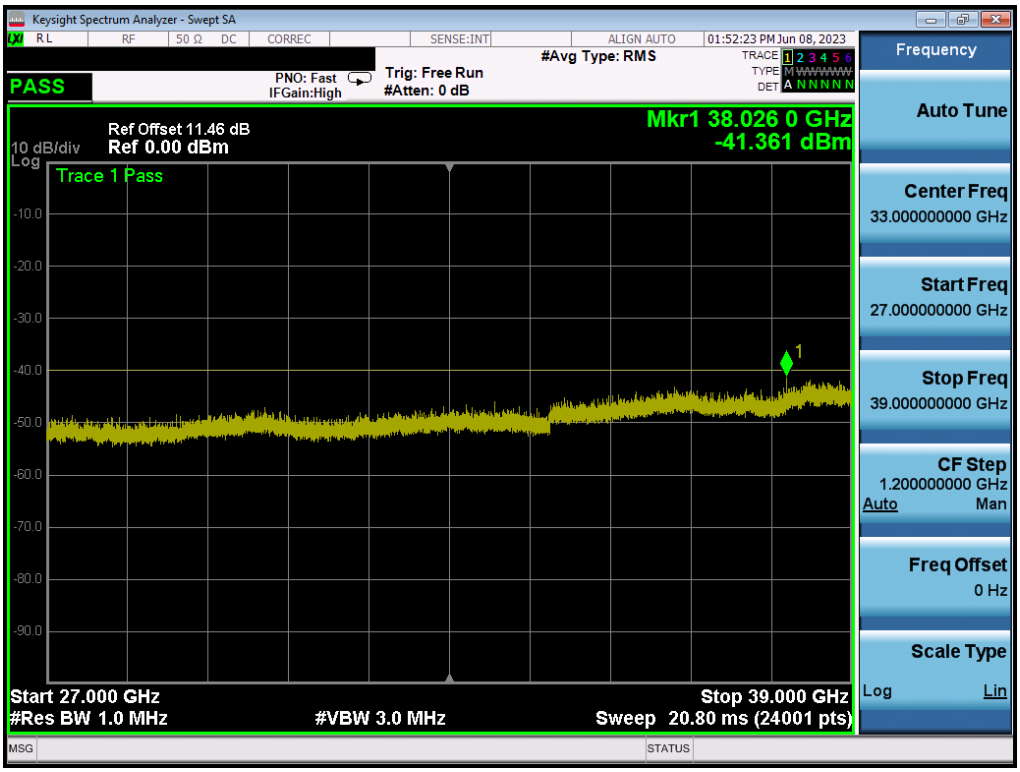
Plot 7.145. Conducted Spurious Plot (10MHz QPSK, Low Channel – 3495 MHz Ch.B)



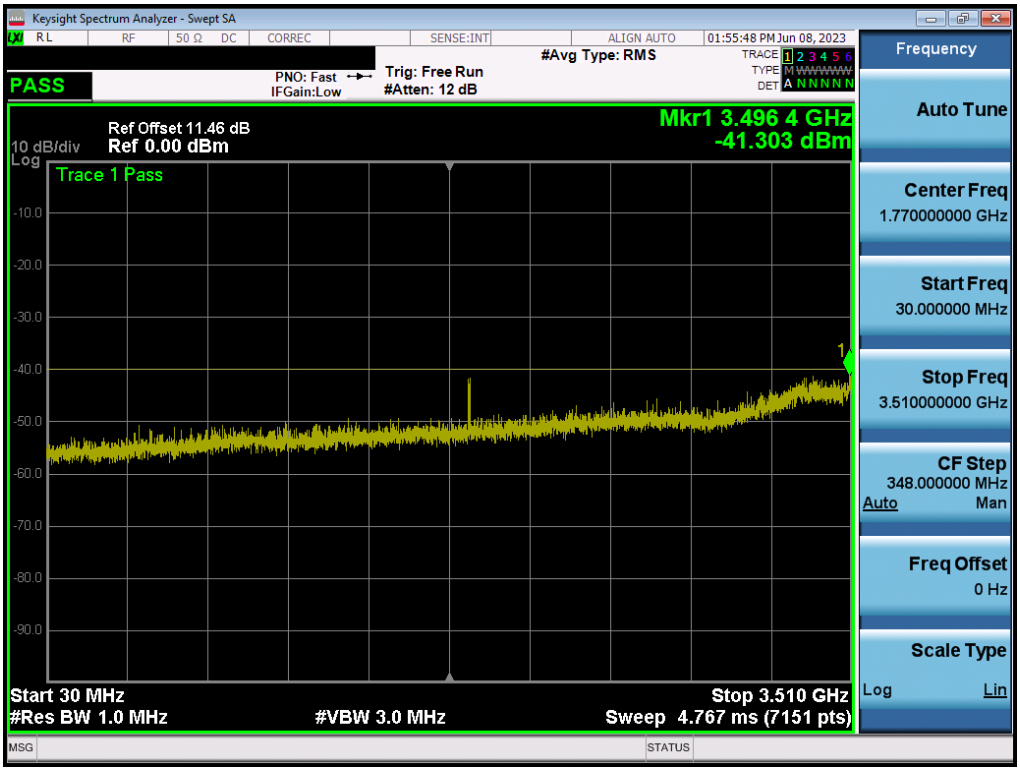
Plot 7.146. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.B)



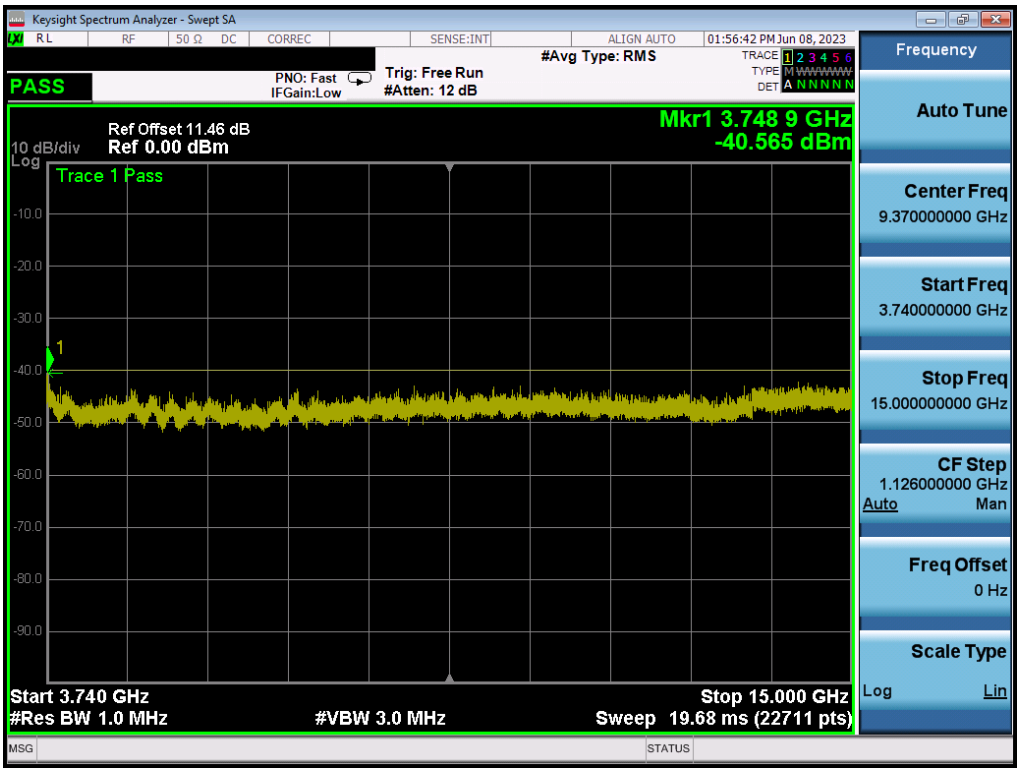
Plot 7.147. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.B)



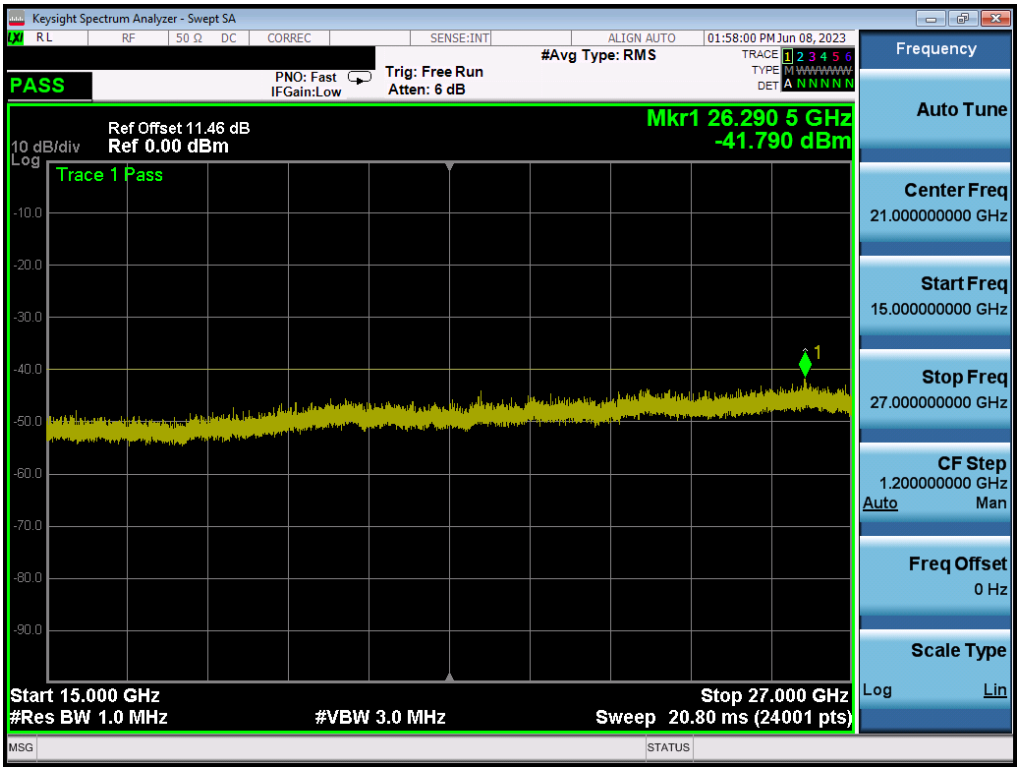
Plot 7.148. Conducted Spurious Plot (10MHz QPSK, Low Channel – Ch.B)



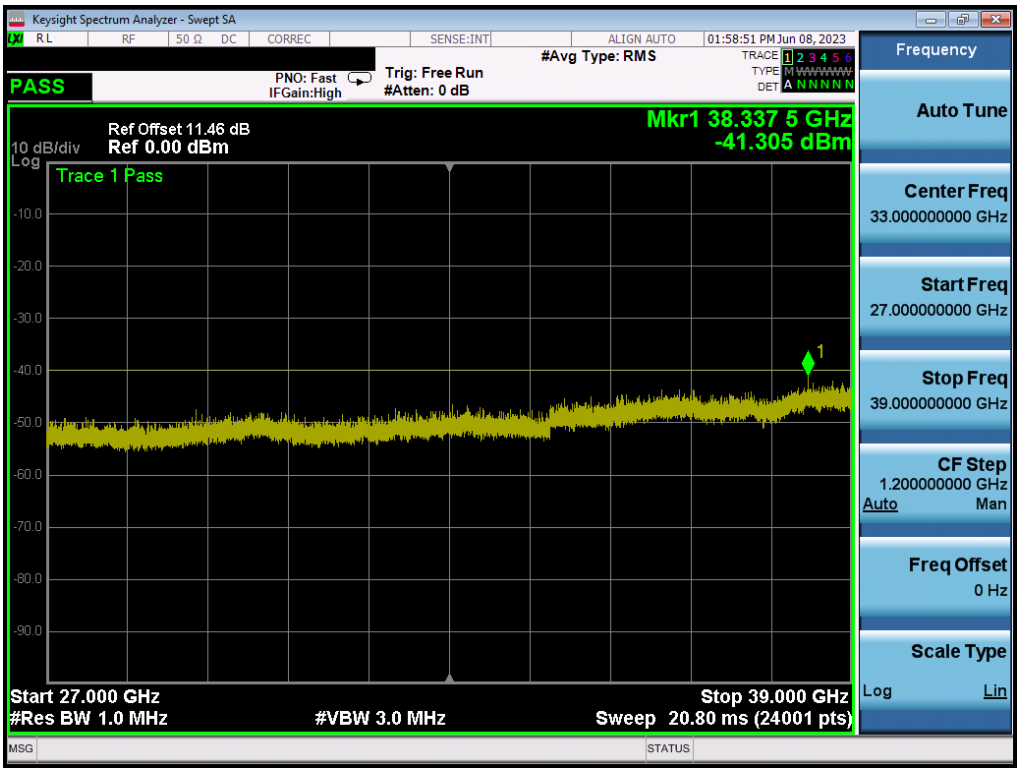
Plot 7.149. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.B)



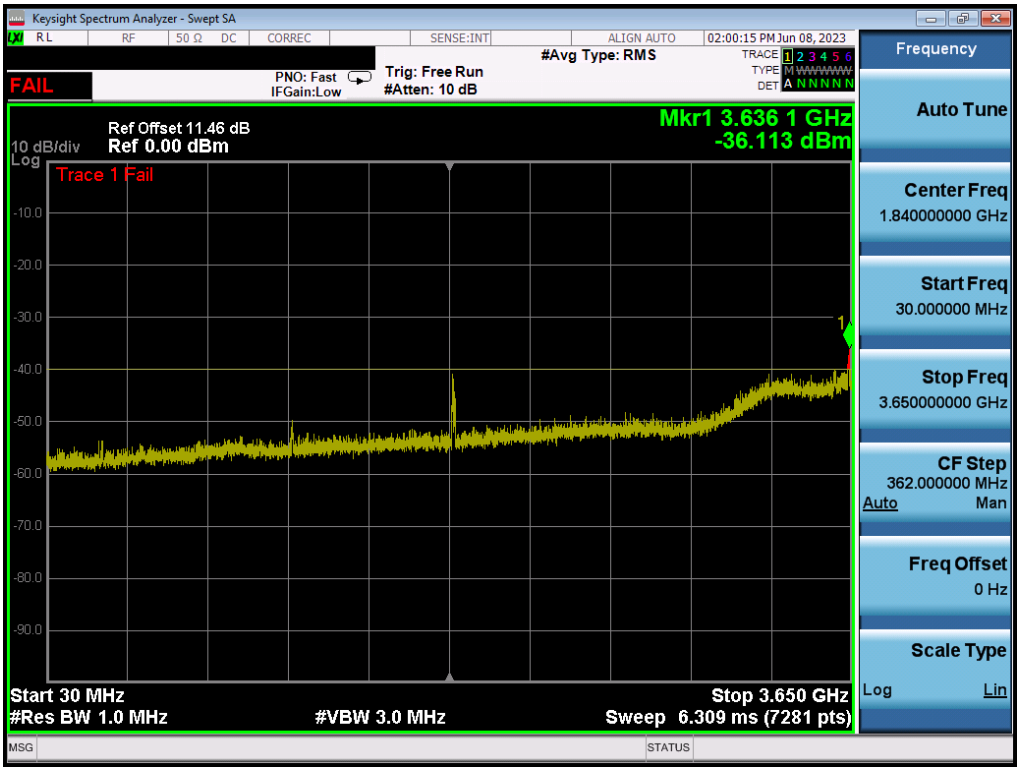
Plot 7.150. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.B)



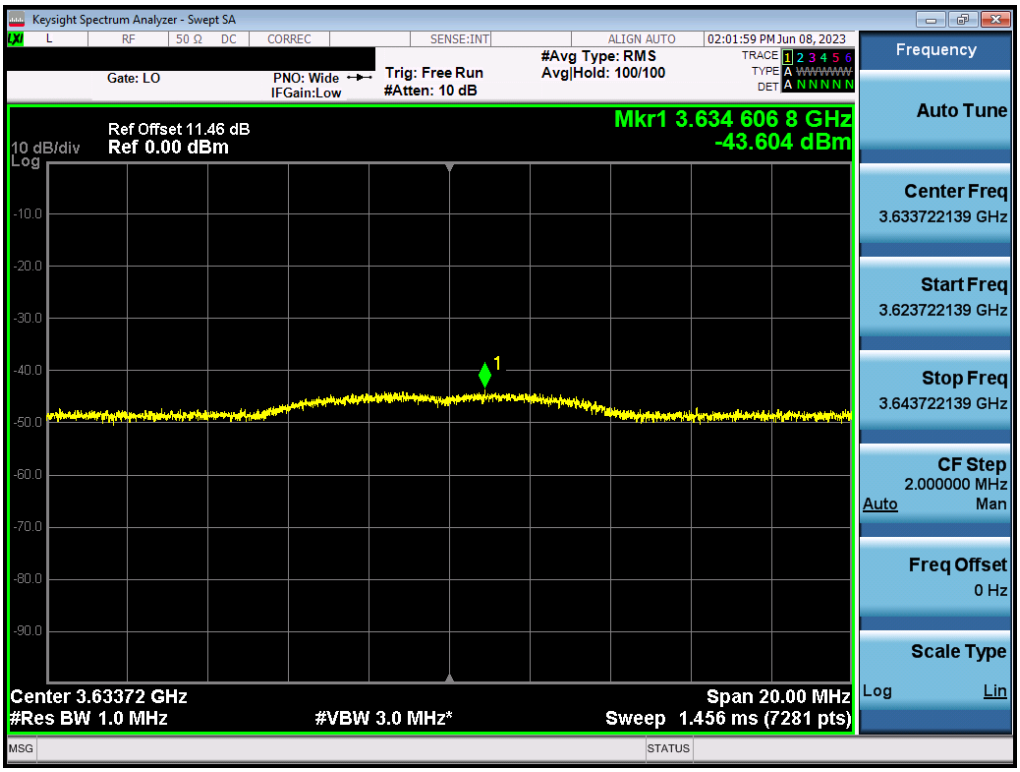
Plot 7.151. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.B)



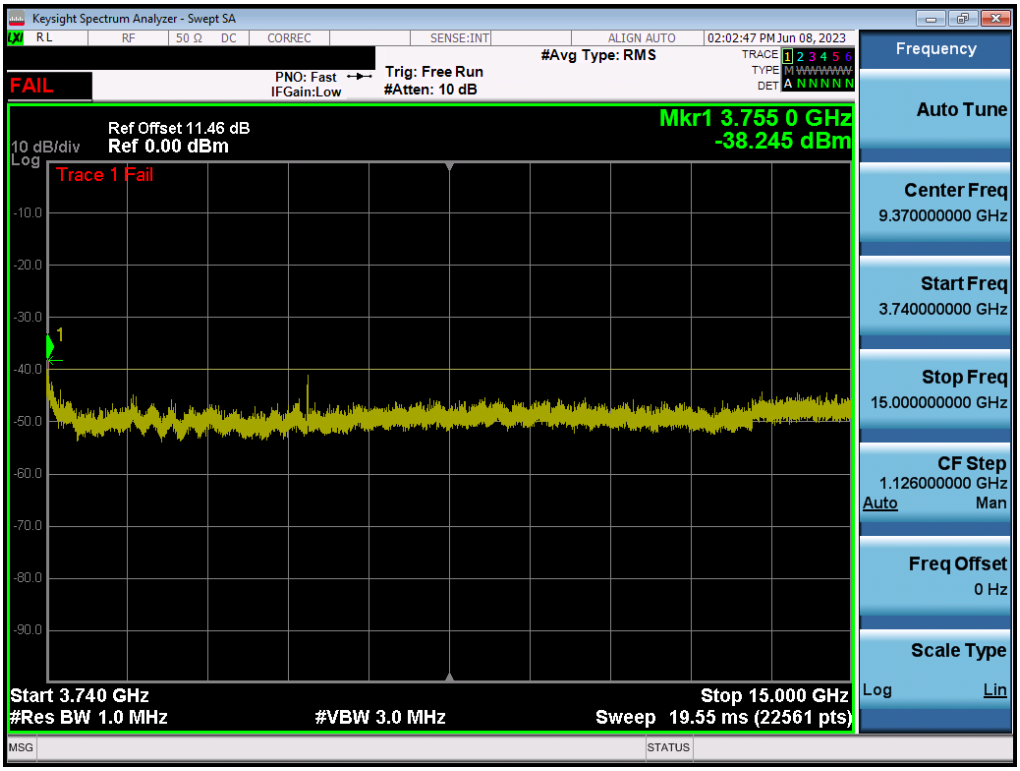
Plot 7.152. Conducted Spurious Plot (10MHz QPSK, Mid Channel – Ch.B)



Plot 7.153. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.B)

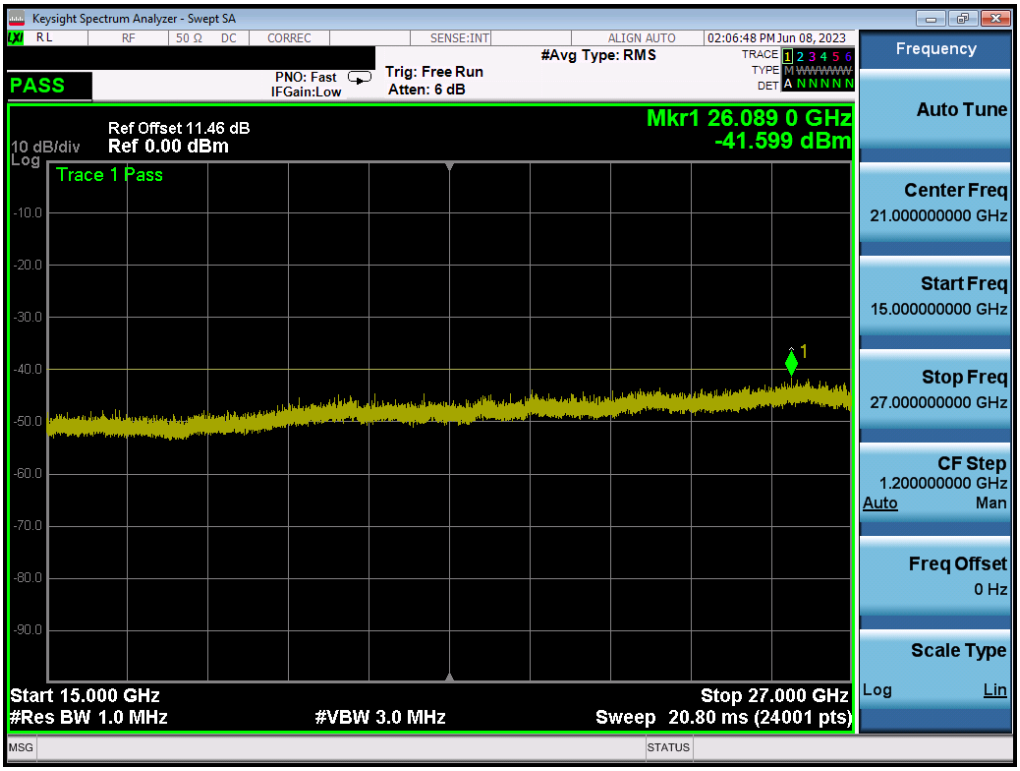


Plot 7.154. Conducted Spurious Plot (10MHz QPSK, High Channel – 3634MHz Ch.B)

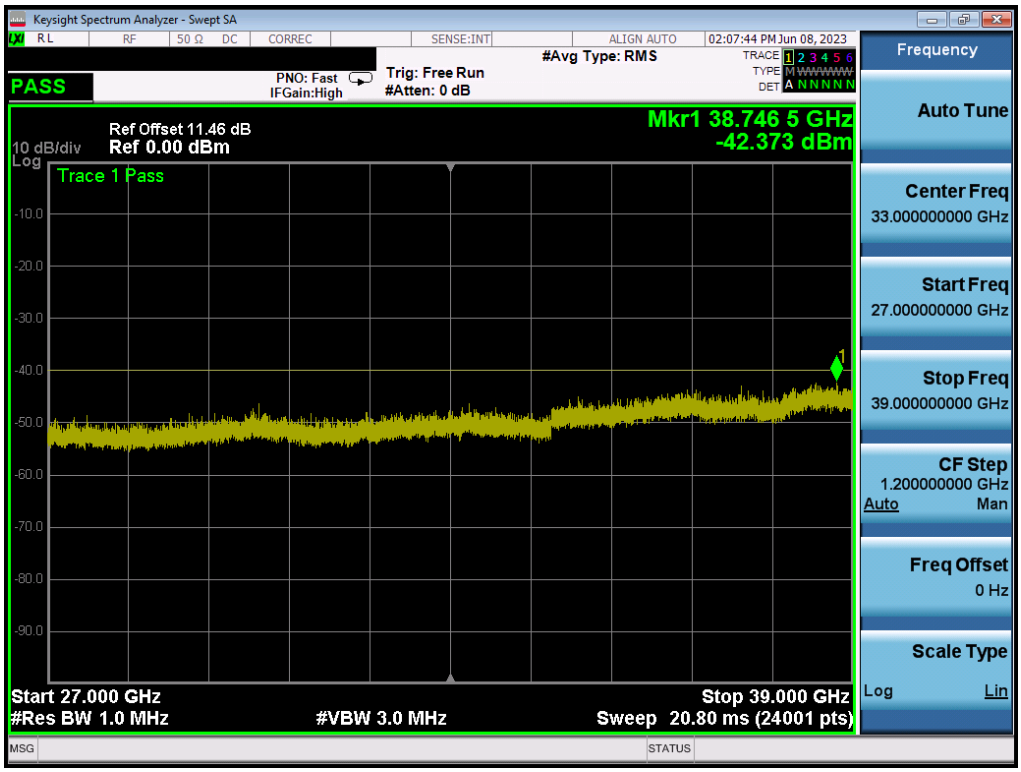


Plot 7.155. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.B)

Plot 7.156. Conducted Spurious Plot (10MHz QPSK, High Channel – 3755MHz Ch.B)



Plot 7.157. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.B)



Plot 7.158. Conducted Spurious Plot (10MHz QPSK, High Channel – Ch.B)

7.7 Band Edge Emissions at Antenna Terminal

Test Overview

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

For an End User Device, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed −13 dBm/MHz within 0 to B MHz (where B is the bandwidth in MHz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B MHz below the lower CBSD-assigned channel edge. At all frequencies greater than B MHz above the upper CBSD assigned channel edge and less than B MHz below the lower CBSD-assigned channel edge, the conducted power of any end user device emission shall not exceed −25 dBm/MHz. The conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed −40dBm/MHz.

Test Procedure Used

ANSI C63.26-2015 – Section 5.7.3

Test Settings

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW ≥ 1% of the emission bandwidth
4. VBW ≥ 3 x RBW
5. Detector = RMS
6. Number of sweep points ≥ 2 x Span/RBW
7. Trace mode = trace average
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Test Setup

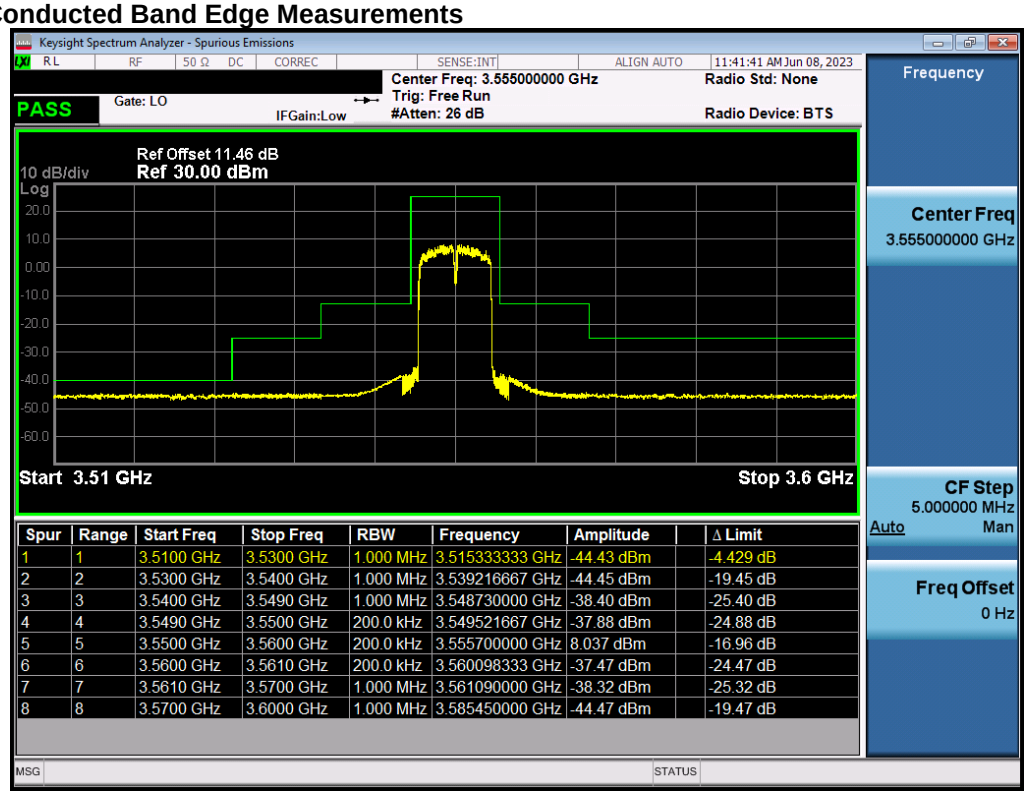
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-6. Test Instrument & Measurement Setup

Test Notes

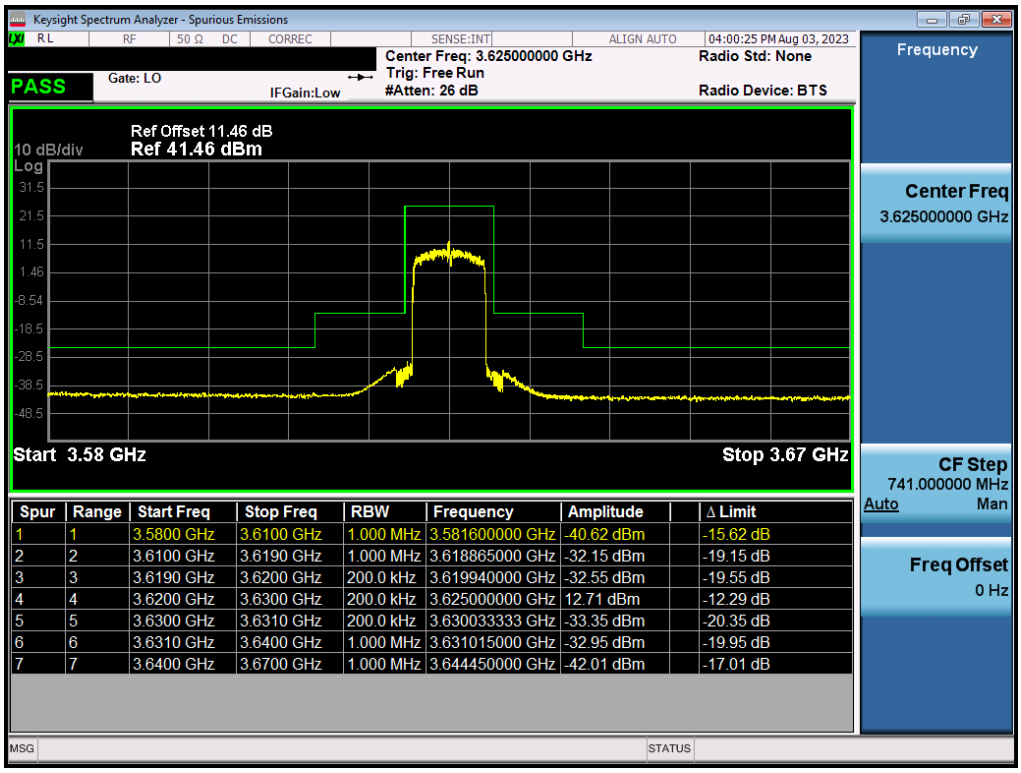
1. Per 96.41(e)(3)(i), compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's authorized frequency channel, a resolution bandwidth of no less than one percent of the fundamental emission bandwidth may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full reference bandwidth (i.e., 1 MHz or 1 percent of emission bandwidth, as specified). The fundamental emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.
2. The Plots in this section have a 11.46dB (10*log(total ports[14]))correction applied to the individual plots to address the MIMO requirements in ANSI C63.26

Channel A Conducted Band Edge Measurements



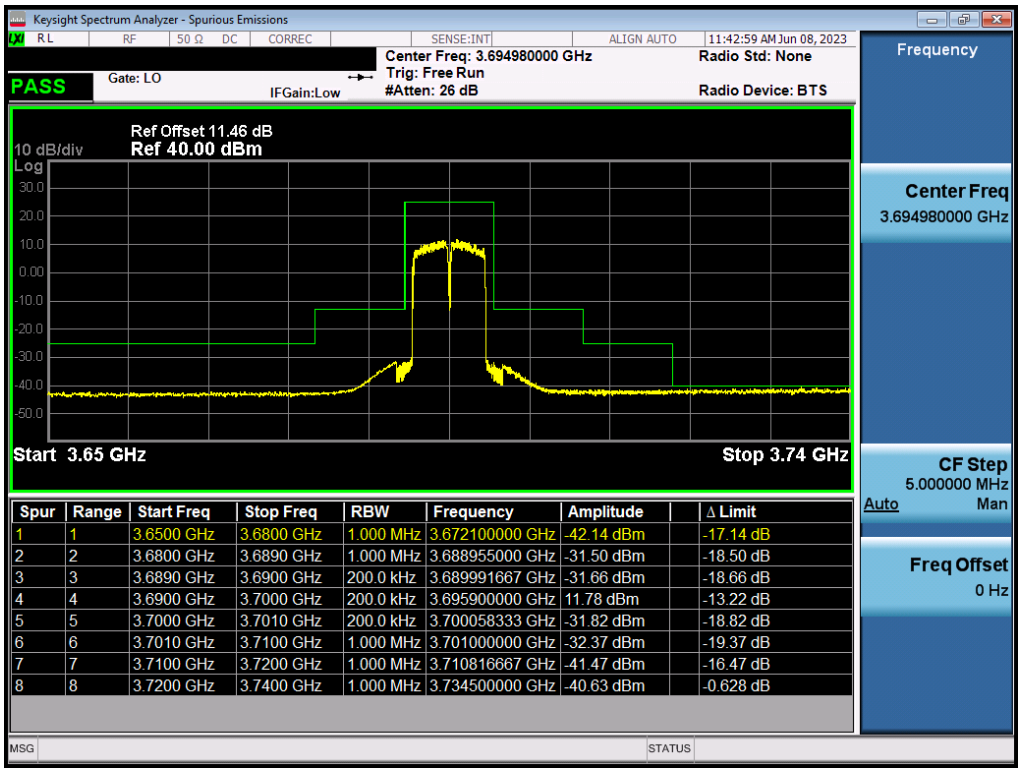
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5100 GHz	3.5300 GHz	1.000 MHz	3.515333333 GHz	-44.43 dBm	-4.429 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.539216667 GHz	-44.45 dBm	-19.45 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548730000 GHz	-38.40 dBm	-25.40 dB
4	4	3.5490 GHz	3.5500 GHz	200.0 kHz	3.549521667 GHz	-37.88 dBm	-24.88 dB
5	5	3.5500 GHz	3.5600 GHz	200.0 kHz	3.555700000 GHz	8.037 dBm	-16.96 dB
6	6	3.5600 GHz	3.5610 GHz	200.0 kHz	3.560098333 GHz	-37.47 dBm	-24.47 dB
7	7	3.5610 GHz	3.5700 GHz	1.000 MHz	3.561090000 GHz	-38.32 dBm	-25.32 dB
8	8	3.5700 GHz	3.6000 GHz	1.000 MHz	3.585450000 GHz	-44.47 dBm	-19.47 dB

Plot 7.159. Conducted Band Edge Plot (10MHz, QPSK, Low Channel, Ch.A)



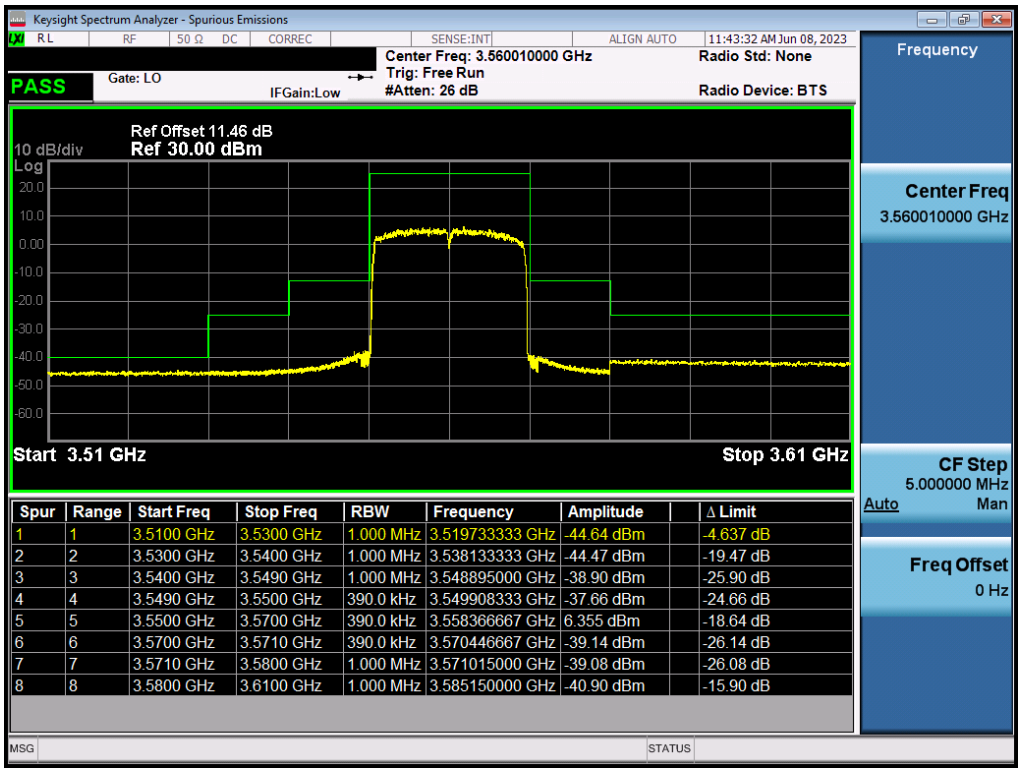
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5800 GHz	3.6100 GHz	1.000 MHz	3.581600000 GHz	-40.62 dBm	-15.62 dB
2	2	3.6100 GHz	3.6190 GHz	1.000 MHz	3.618865000 GHz	-32.15 dBm	-19.15 dB
3	3	3.6190 GHz	3.6200 GHz	200.0 kHz	3.619940000 GHz	-32.55 dBm	-19.55 dB
4	4	3.6200 GHz	3.6300 GHz	200.0 kHz	3.625000000 GHz	12.71 dBm	-12.29 dB
5	5	3.6300 GHz	3.6310 GHz	200.0 kHz	3.630033333 GHz	-33.35 dBm	-20.35 dB
6	6	3.6310 GHz	3.6400 GHz	1.000 MHz	3.631015000 GHz	-32.95 dBm	-19.95 dB
7	7	3.6400 GHz	3.6700 GHz	1.000 MHz	3.644450000 GHz	-42.01 dBm	-17.01 dB

Plot 7.160. Conducted Band Edge Plot (10MHz, QPSK, Mid Channel, Ch.A)



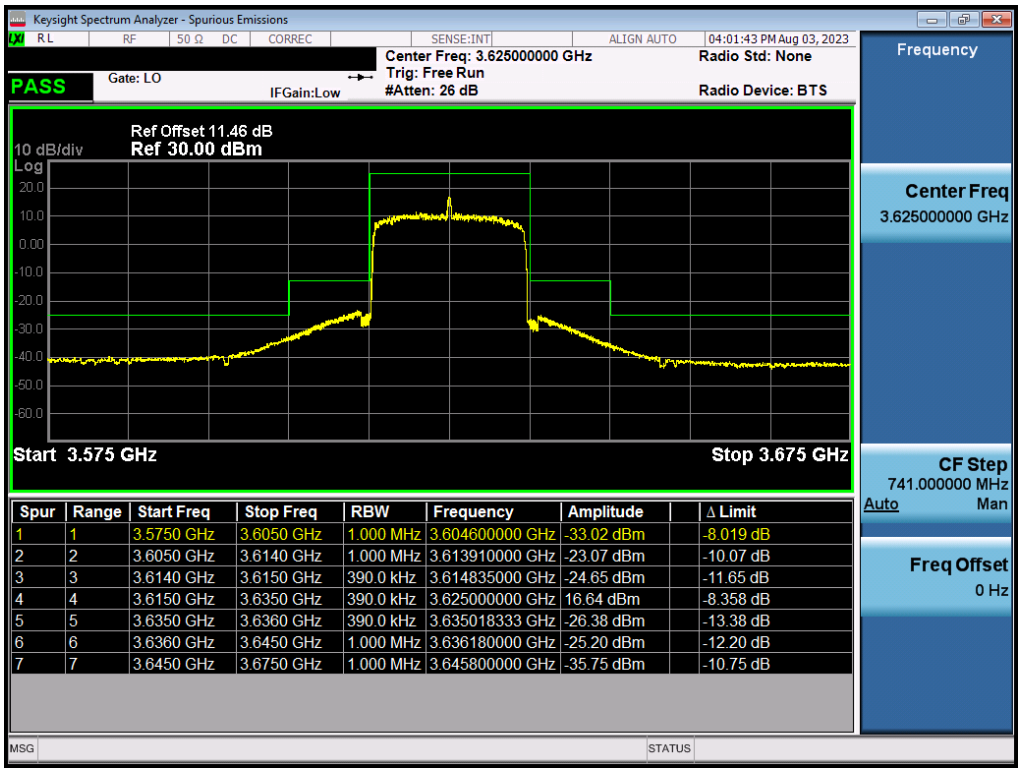
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6500 GHz	3.6800 GHz	1.000 MHz	3.672100000 GHz	-42.14 dBm	-17.14 dB
2	2	3.6800 GHz	3.6890 GHz	1.000 MHz	3.688955000 GHz	-31.50 dBm	-18.50 dB
3	3	3.6890 GHz	3.6900 GHz	200.0 kHz	3.689991667 GHz	-31.66 dBm	-18.66 dB
4	4	3.6900 GHz	3.7000 GHz	200.0 kHz	3.695900000 GHz	11.78 dBm	-13.22 dB
5	5	3.7000 GHz	3.7010 GHz	200.0 kHz	3.700058333 GHz	-31.82 dBm	-18.82 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701000000 GHz	-32.37 dBm	-19.37 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710816667 GHz	-41.47 dBm	-16.47 dB
8	8	3.7200 GHz	3.7400 GHz	1.000 MHz	3.734500000 GHz	-40.63 dBm	-0.628 dB

Plot 7.161. Conducted Band Edge Plot (10MHz, QPSK, High Channel, Ch.A)



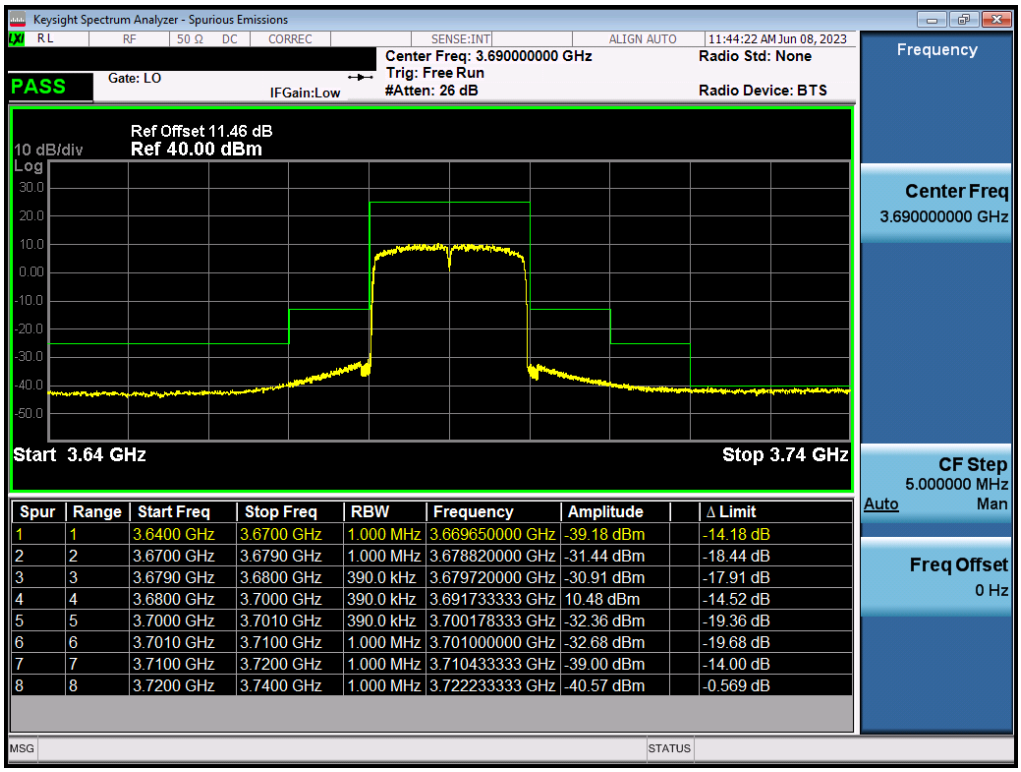
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5100 GHz	3.5300 GHz	1.000 MHz	3.519733333 GHz	-44.64 dBm	-4.637 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.538133333 GHz	-44.47 dBm	-19.47 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548895000 GHz	-38.90 dBm	-25.90 dB
4	4	3.5490 GHz	3.5500 GHz	390.0 kHz	3.549908333 GHz	-37.66 dBm	-24.66 dB
5	5	3.5500 GHz	3.5700 GHz	390.0 kHz	3.558366667 GHz	6.355 dBm	-18.64 dB
6	6	3.5700 GHz	3.5710 GHz	390.0 kHz	3.570446667 GHz	-39.14 dBm	-26.14 dB
7	7	3.5710 GHz	3.5800 GHz	1.000 MHz	3.571015000 GHz	-39.08 dBm	-26.08 dB
8	8	3.5800 GHz	3.6100 GHz	1.000 MHz	3.585150000 GHz	-40.90 dBm	-15.90 dB

Plot 7.162. Conducted Band Edge Plot (20MHz, QPSK, Low Channel, Ch.A)



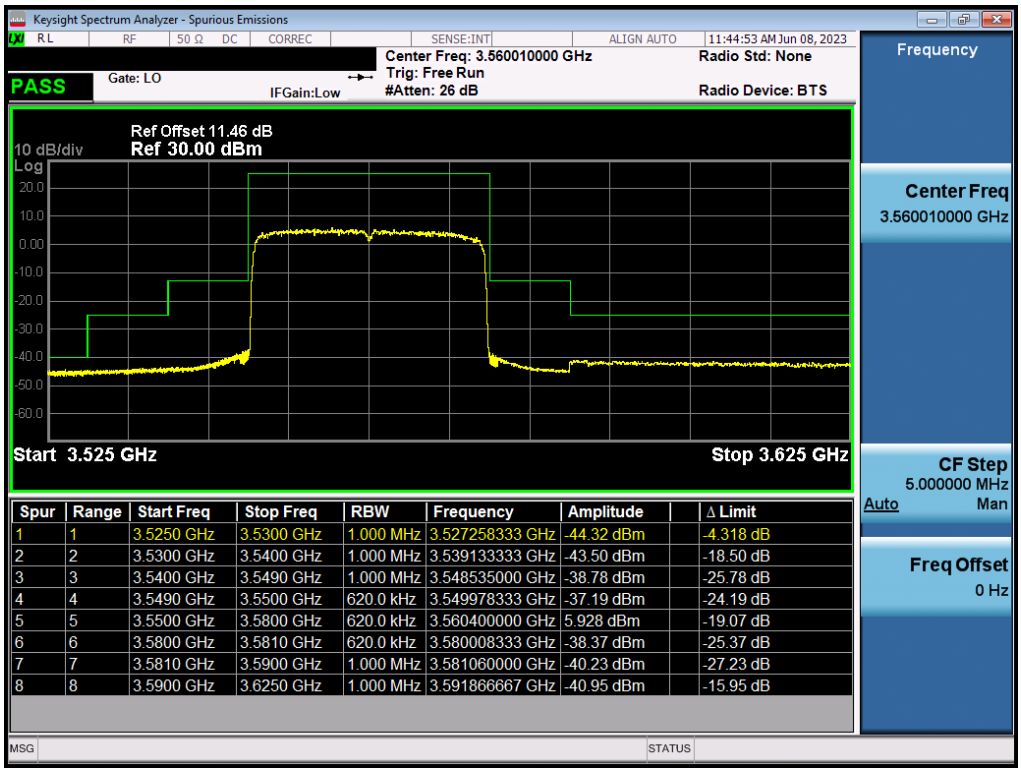
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5750 GHz	3.6050 GHz	1.000 MHz	3.604600000 GHz	-33.02 dBm	-8.019 dB
2	2	3.6050 GHz	3.6140 GHz	1.000 MHz	3.613910000 GHz	-23.07 dBm	-10.07 dB
3	3	3.6140 GHz	3.6150 GHz	390.0 kHz	3.614835000 GHz	-24.65 dBm	-11.65 dB
4	4	3.6150 GHz	3.6350 GHz	390.0 kHz	3.625000000 GHz	16.64 dBm	-8.358 dB
5	5	3.6350 GHz	3.6360 GHz	390.0 kHz	3.635018333 GHz	-26.38 dBm	-13.38 dB
6	6	3.6360 GHz	3.6450 GHz	1.000 MHz	3.636180000 GHz	-25.20 dBm	-12.20 dB
7	7	3.6450 GHz	3.6750 GHz	1.000 MHz	3.645800000 GHz	-35.75 dBm	-10.75 dB

Plot 7.163. Conducted Band Edge Plot (20MHz, QPSK, Mid Channel, Ch.A)



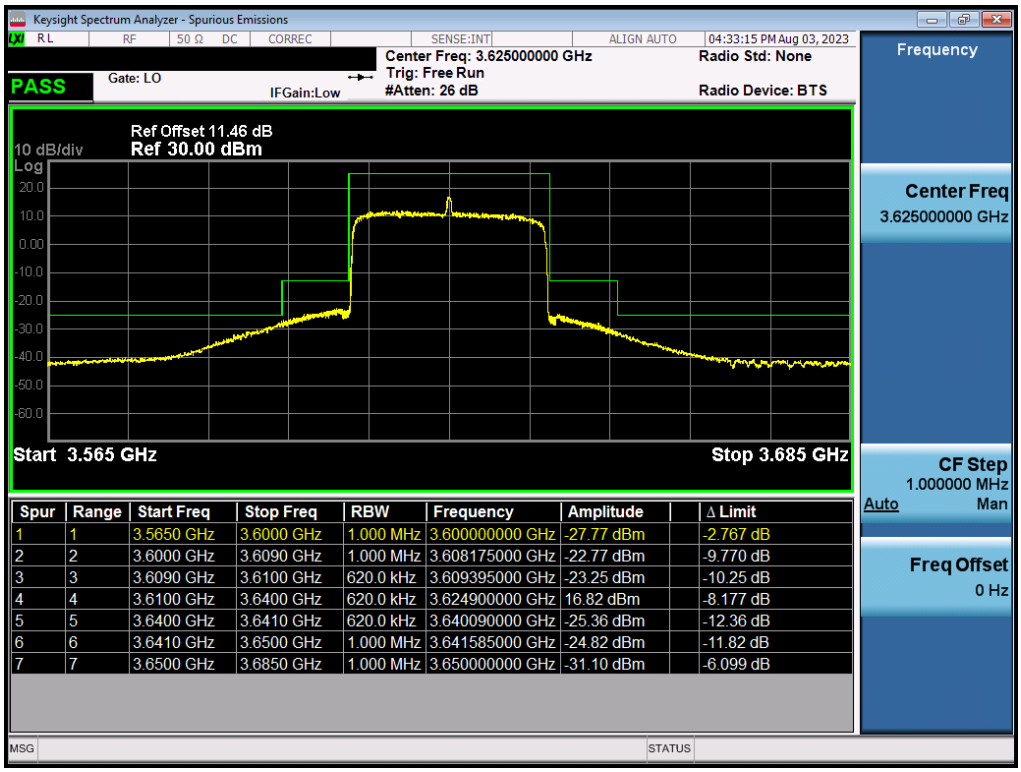
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6400 GHz	3.6700 GHz	1.000 MHz	3.669650000 GHz	-39.18 dBm	-14.18 dB
2	2	3.6700 GHz	3.6790 GHz	1.000 MHz	3.678820000 GHz	-31.44 dBm	-18.44 dB
3	3	3.6790 GHz	3.6800 GHz	390.0 kHz	3.679720000 GHz	-30.91 dBm	-17.91 dB
4	4	3.6800 GHz	3.7000 GHz	390.0 kHz	3.691733333 GHz	10.48 dBm	-14.52 dB
5	5	3.7000 GHz	3.7010 GHz	390.0 kHz	3.700178333 GHz	-32.36 dBm	-19.36 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701000000 GHz	-32.68 dBm	-19.68 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710433333 GHz	-39.00 dBm	-14.00 dB
8	8	3.7200 GHz	3.7400 GHz	1.000 MHz	3.722233333 GHz	-40.57 dBm	-0.569 dB

Plot 7.164. Conducted Band Edge Plot (20MHz, QPSK, High Channel, Ch.A)



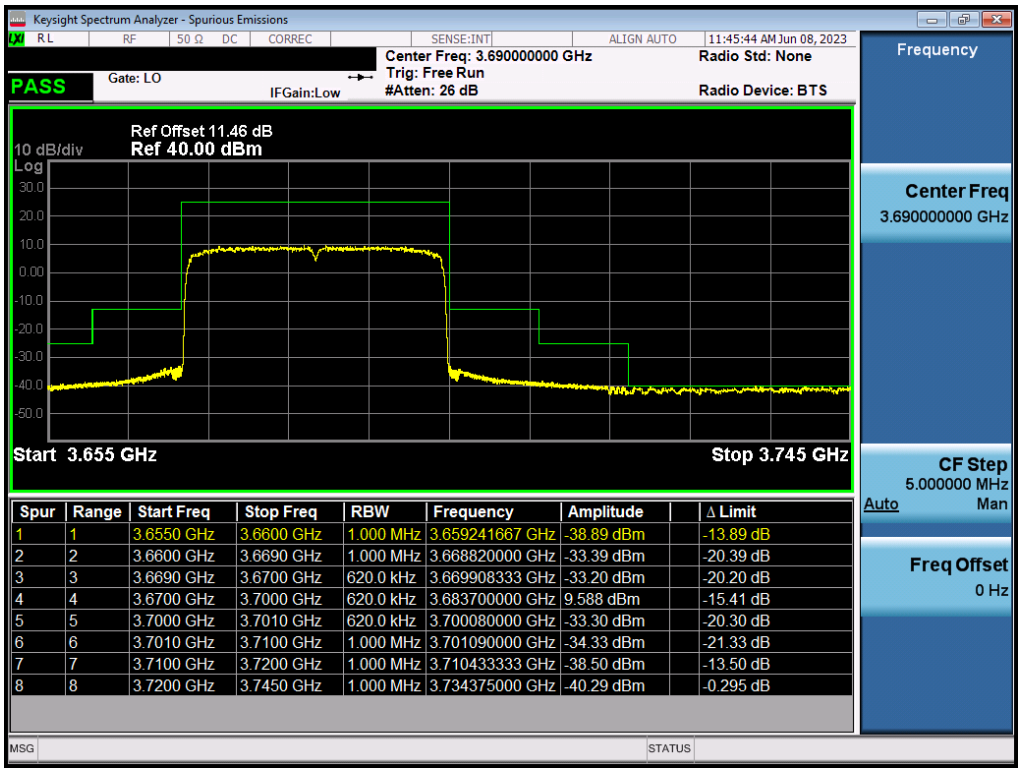
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.527258333 GHz	-44.32 dBm	-4.318 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.539133333 GHz	-43.50 dBm	-18.50 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548535000 GHz	-38.78 dBm	-25.78 dB
4	4	3.5490 GHz	3.5500 GHz	620.0 kHz	3.549978333 GHz	-37.19 dBm	-24.19 dB
5	5	3.5500 GHz	3.5800 GHz	620.0 kHz	3.560400000 GHz	5.928 dBm	-19.07 dB
6	6	3.5800 GHz	3.5810 GHz	620.0 kHz	3.580008333 GHz	-38.37 dBm	-25.37 dB
7	7	3.5810 GHz	3.5900 GHz	1.000 MHz	3.581060000 GHz	-40.23 dBm	-27.23 dB
8	8	3.5900 GHz	3.6250 GHz	1.000 MHz	3.591866667 GHz	-40.95 dBm	-15.95 dB

Plot 7.165. Conducted Band Edge Plot (30MHz, QPSK, Low Channel, Ch.A)



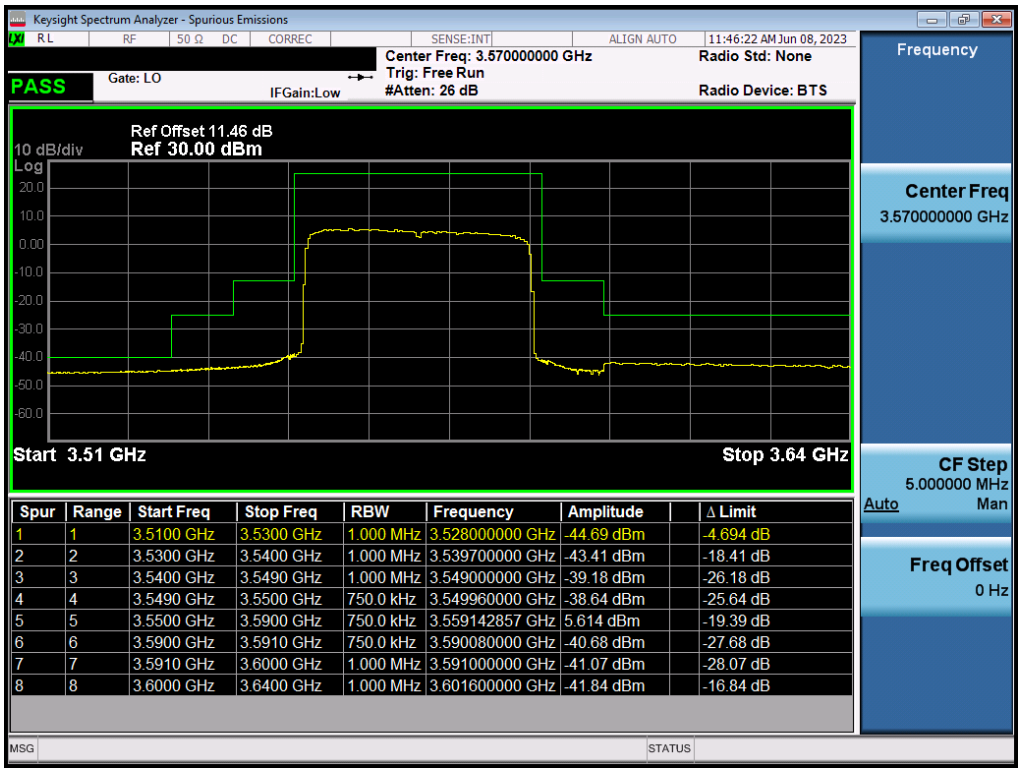
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5650 GHz	3.6000 GHz	1.000 MHz	3.600000000 GHz	-27.77 dBm	-2.767 dB
2	2	3.6000 GHz	3.6090 GHz	1.000 MHz	3.608175000 GHz	-22.77 dBm	-9.770 dB
3	3	3.6090 GHz	3.6100 GHz	620.0 kHz	3.609395000 GHz	-23.25 dBm	-10.25 dB
4	4	3.6100 GHz	3.6400 GHz	620.0 kHz	3.624900000 GHz	16.82 dBm	-8.177 dB
5	5	3.6400 GHz	3.6410 GHz	620.0 kHz	3.640090000 GHz	-25.36 dBm	-12.36 dB
6	6	3.6410 GHz	3.6500 GHz	1.000 MHz	3.641585000 GHz	-24.82 dBm	-11.82 dB
7	7	3.6500 GHz	3.6850 GHz	1.000 MHz	3.650000000 GHz	-31.10 dBm	-6.099 dB

Plot 7.166. Conducted Band Edge Plot (30MHz, QPSK, Mid Channel, Ch.A)



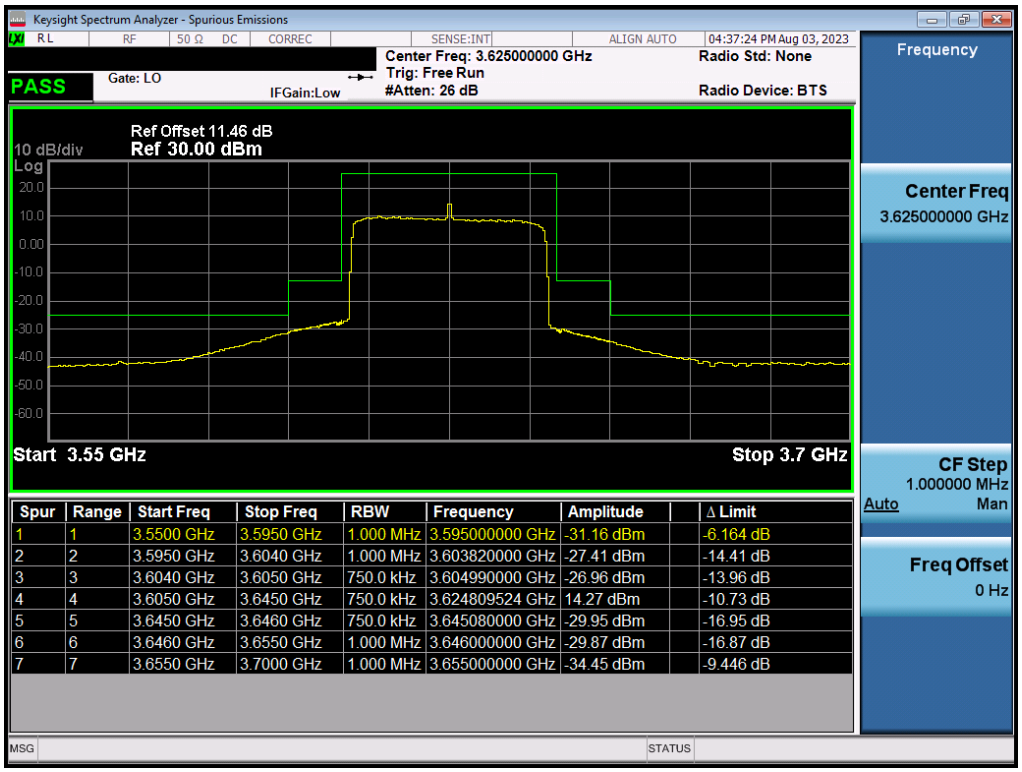
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6550 GHz	3.6600 GHz	1.000 MHz	3.659241667 GHz	-38.89 dBm	-13.89 dB
2	2	3.6600 GHz	3.6690 GHz	1.000 MHz	3.668820000 GHz	-33.39 dBm	-20.39 dB
3	3	3.6690 GHz	3.6700 GHz	620.0 kHz	3.669908333 GHz	-33.20 dBm	-20.20 dB
4	4	3.6700 GHz	3.7000 GHz	620.0 kHz	3.683700000 GHz	9.588 dBm	-15.41 dB
5	5	3.7000 GHz	3.7010 GHz	620.0 kHz	3.700080000 GHz	-33.30 dBm	-20.30 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701090000 GHz	-34.33 dBm	-21.33 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710433333 GHz	-38.50 dBm	-13.50 dB
8	8	3.7200 GHz	3.7450 GHz	1.000 MHz	3.734375000 GHz	-40.29 dBm	-0.295 dB

Plot 7.167. Conducted Band Edge Plot (30MHz, QPSK, High Channel, Ch.A)



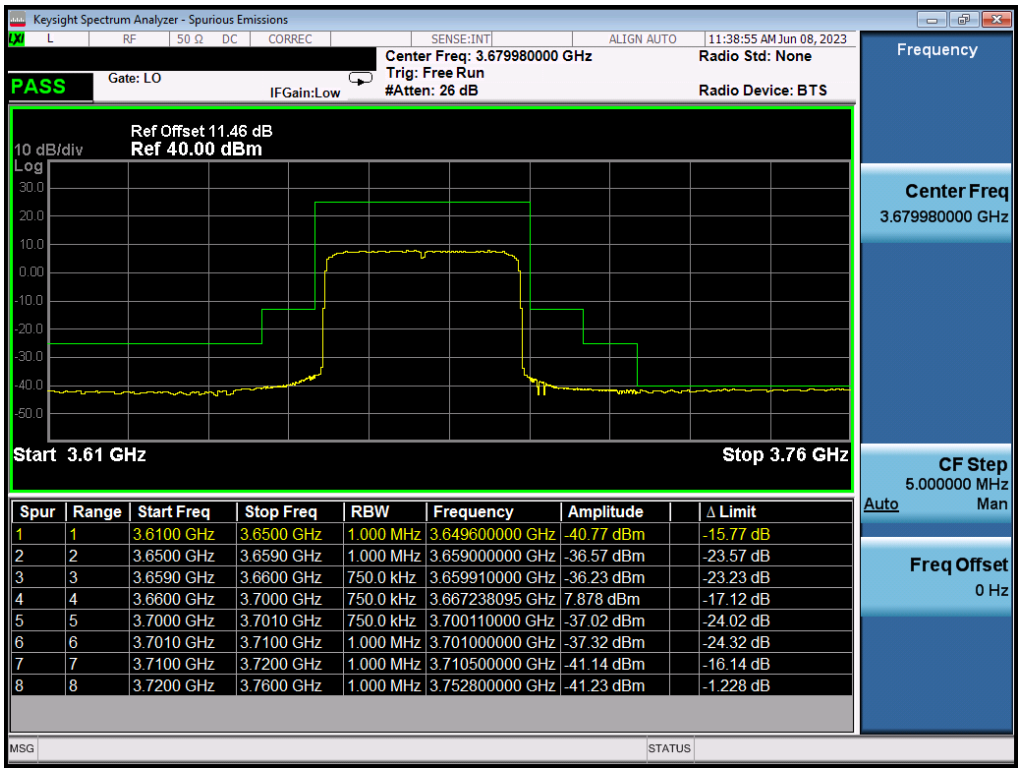
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5100 GHz	3.5300 GHz	1.000 MHz	3.528000000 GHz	-44.69 dBm	-4.694 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.539700000 GHz	-43.41 dBm	-18.41 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.549000000 GHz	-39.18 dBm	-26.18 dB
4	4	3.5490 GHz	3.5500 GHz	750.0 kHz	3.549960000 GHz	-38.64 dBm	-25.64 dB
5	5	3.5500 GHz	3.5900 GHz	750.0 kHz	3.559142857 GHz	5.614 dBm	-19.39 dB
6	6	3.5900 GHz	3.5910 GHz	750.0 kHz	3.590080000 GHz	-40.68 dBm	-27.68 dB
7	7	3.5910 GHz	3.6000 GHz	1.000 MHz	3.591000000 GHz	-41.07 dBm	-28.07 dB
8	8	3.6000 GHz	3.6400 GHz	1.000 MHz	3.601600000 GHz	-41.84 dBm	-16.84 dB

Plot 7.168. Conducted Band Edge Plot (40MHz, QPSK, Low Channel, Ch.A)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5500 GHz	3.5950 GHz	1.000 MHz	3.595000000 GHz	-31.16 dBm	-6.164 dB
2	2	3.5950 GHz	3.6040 GHz	1.000 MHz	3.603820000 GHz	-27.41 dBm	-14.41 dB
3	3	3.6040 GHz	3.6050 GHz	750.0 kHz	3.604990000 GHz	-26.96 dBm	-13.96 dB
4	4	3.6050 GHz	3.6450 GHz	750.0 kHz	3.624809524 GHz	14.27 dBm	-10.73 dB
5	5	3.6450 GHz	3.6460 GHz	750.0 kHz	3.645080000 GHz	-29.95 dBm	-16.95 dB
6	6	3.6460 GHz	3.6550 GHz	1.000 MHz	3.646000000 GHz	-29.87 dBm	-16.87 dB
7	7	3.6550 GHz	3.7000 GHz	1.000 MHz	3.655000000 GHz	-34.45 dBm	-9.446 dB

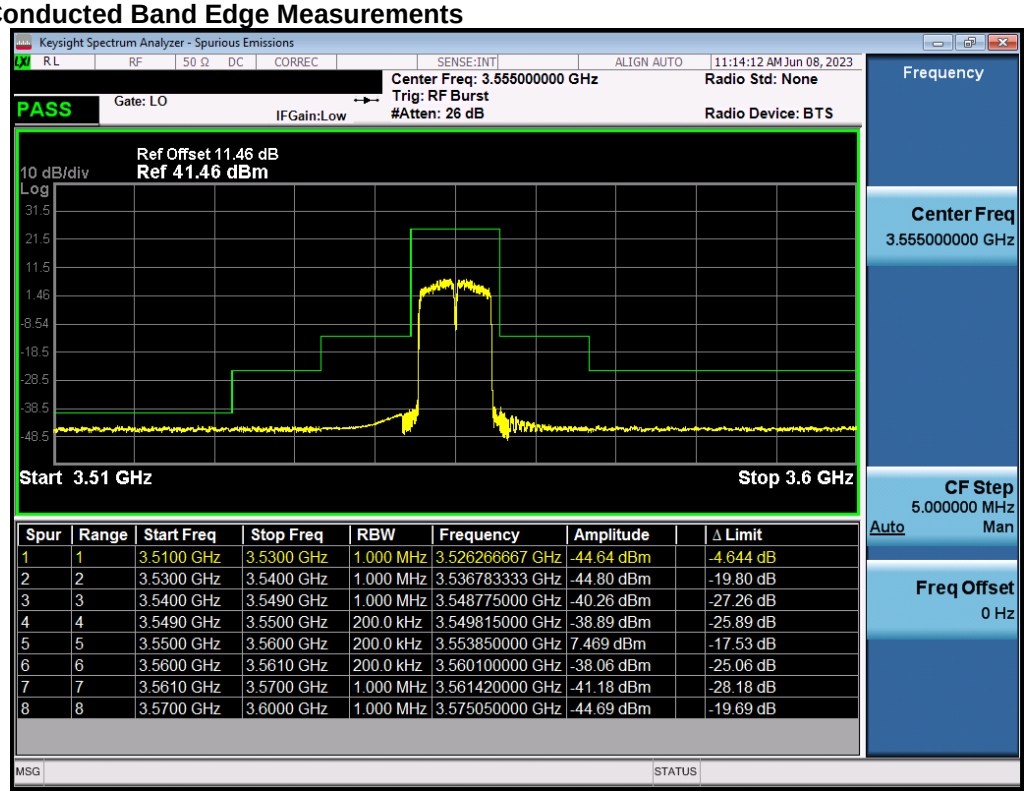
Plot 7.169. Conducted Band Edge Plot (40MHz, QPSK, Mid Channel, Ch.A)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6100 GHz	3.6500 GHz	1.000 MHz	3.649600000 GHz	-40.77 dBm	-15.77 dB
2	2	3.6500 GHz	3.6590 GHz	1.000 MHz	3.659000000 GHz	-36.57 dBm	-23.57 dB
3	3	3.6590 GHz	3.6600 GHz	750.0 kHz	3.659910000 GHz	-36.23 dBm	-23.23 dB
4	4	3.6600 GHz	3.7000 GHz	750.0 kHz	3.667238095 GHz	7.878 dBm	-17.12 dB
5	5	3.7000 GHz	3.7010 GHz	750.0 kHz	3.700110000 GHz	-37.02 dBm	-24.02 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701000000 GHz	-37.32 dBm	-24.32 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710500000 GHz	-41.14 dBm	-16.14 dB
8	8	3.7200 GHz	3.7600 GHz	1.000 MHz	3.752800000 GHz	-41.23 dBm	-1.228 dB

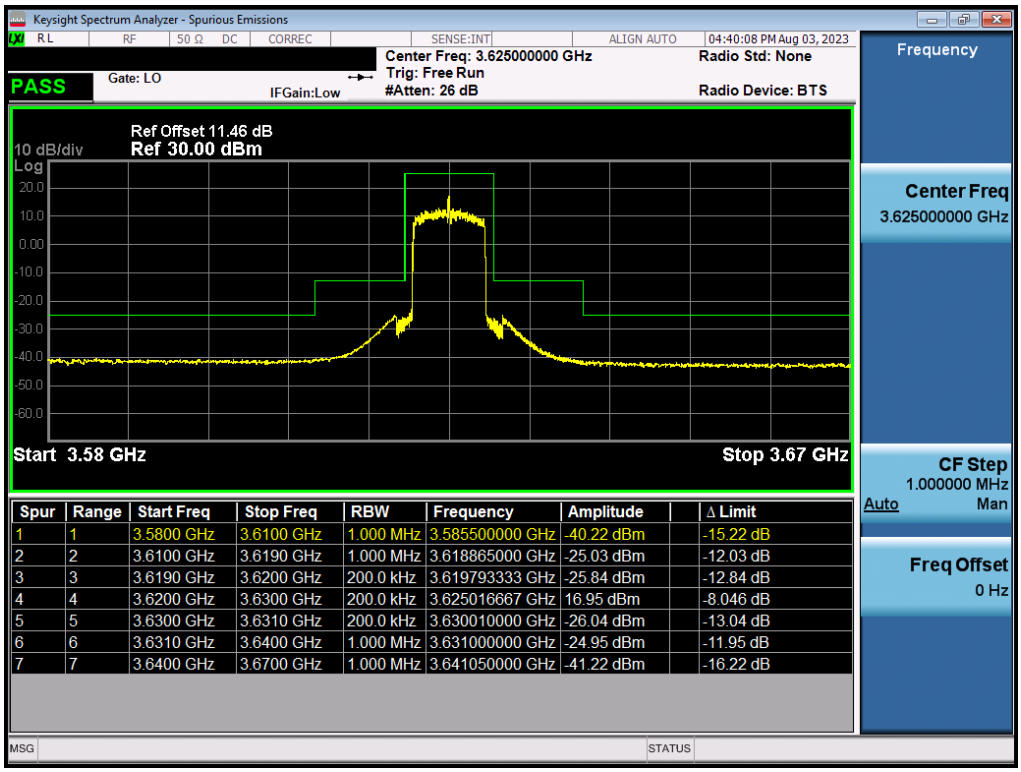
Plot 7.170. Conducted Band Edge Plot (40MHz, QPSK, High Channel, Ch.A)

Channel B Conducted Band Edge Measurements



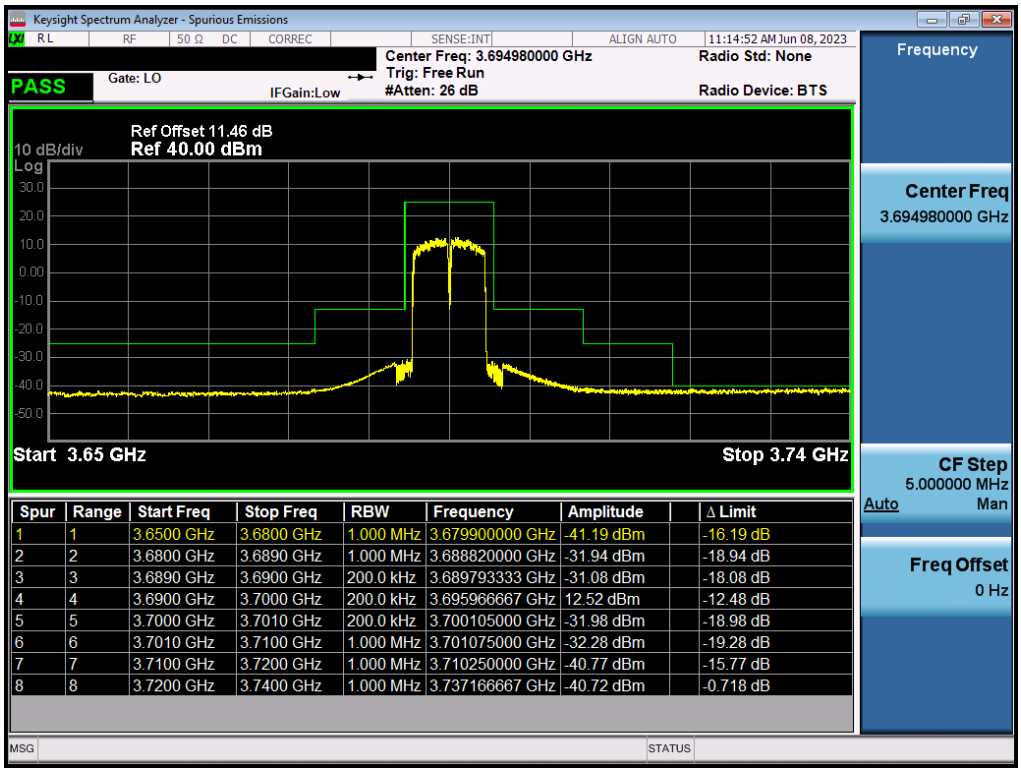
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5100 GHz	3.5300 GHz	1.000 MHz	3.526266667 GHz	-44.64 dBm	-4.644 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.536783333 GHz	-44.80 dBm	-19.80 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548775000 GHz	-40.26 dBm	-27.26 dB
4	4	3.5490 GHz	3.5500 GHz	200.0 kHz	3.549815000 GHz	-38.89 dBm	-25.89 dB
5	5	3.5500 GHz	3.5600 GHz	200.0 kHz	3.553850000 GHz	7.469 dBm	-17.53 dB
6	6	3.5600 GHz	3.5610 GHz	200.0 kHz	3.560100000 GHz	-38.06 dBm	-25.06 dB
7	7	3.5610 GHz	3.5700 GHz	1.000 MHz	3.561420000 GHz	-41.18 dBm	-28.18 dB
8	8	3.5700 GHz	3.6000 GHz	1.000 MHz	3.575050000 GHz	-44.69 dBm	-19.69 dB

Plot 7.171. Conducted Band Edge Plot (10MHz, QPSK, Low Channel, Ch.B)



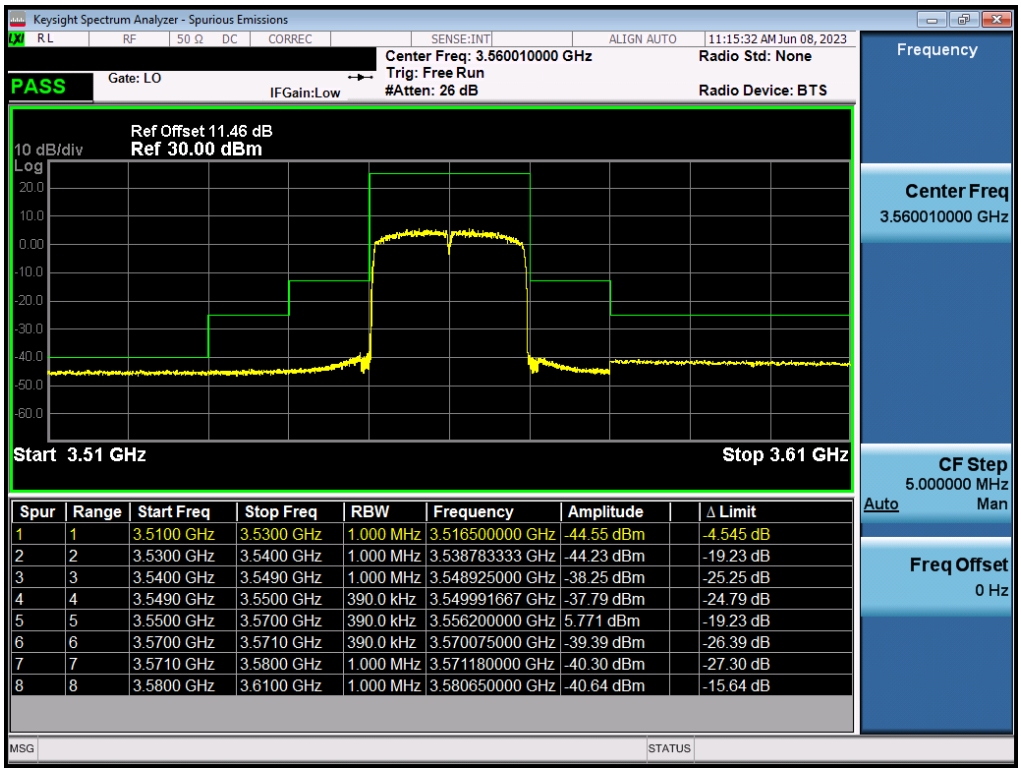
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5800 GHz	3.6100 GHz	1.000 MHz	3.585500000 GHz	-40.22 dBm	-15.22 dB
2	2	3.6100 GHz	3.6190 GHz	1.000 MHz	3.618865000 GHz	-25.03 dBm	-12.03 dB
3	3	3.6190 GHz	3.6200 GHz	200.0 kHz	3.619793333 GHz	-25.84 dBm	-12.84 dB
4	4	3.6200 GHz	3.6300 GHz	200.0 kHz	3.625016667 GHz	16.95 dBm	-8.046 dB
5	5	3.6300 GHz	3.6310 GHz	200.0 kHz	3.630010000 GHz	-26.04 dBm	-13.04 dB
6	6	3.6310 GHz	3.6400 GHz	1.000 MHz	3.631000000 GHz	-24.95 dBm	-11.95 dB
7	7	3.6400 GHz	3.6700 GHz	1.000 MHz	3.641050000 GHz	-41.22 dBm	-16.22 dB

Plot 7.172. Conducted Band Edge Plot (10MHz, QPSK, Mid Channel, Ch.B)



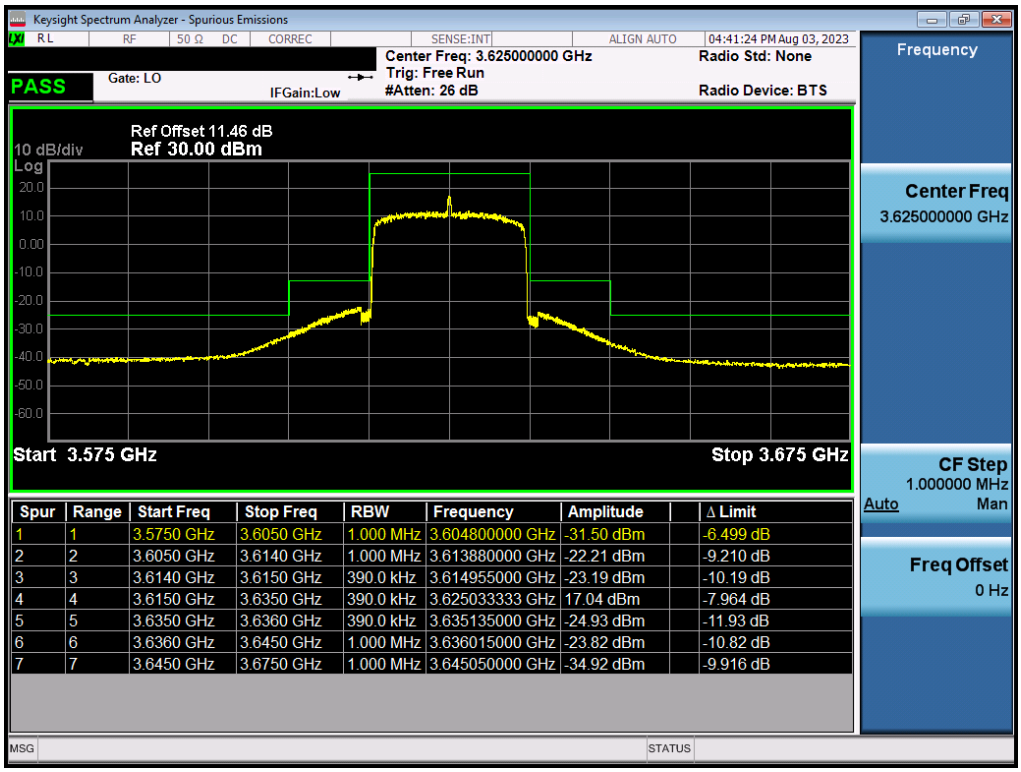
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6500 GHz	3.6800 GHz	1.000 MHz	3.679900000 GHz	-41.19 dBm	-16.19 dB
2	2	3.6800 GHz	3.6890 GHz	1.000 MHz	3.688820000 GHz	-31.94 dBm	-18.94 dB
3	3	3.6890 GHz	3.6900 GHz	200.0 kHz	3.689793333 GHz	-31.08 dBm	-18.08 dB
4	4	3.6900 GHz	3.7000 GHz	200.0 kHz	3.695966667 GHz	12.52 dBm	-12.48 dB
5	5	3.7000 GHz	3.7010 GHz	200.0 kHz	3.700105000 GHz	-31.98 dBm	-18.98 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701075000 GHz	-32.28 dBm	-19.28 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710250000 GHz	-40.77 dBm	-15.77 dB
8	8	3.7200 GHz	3.7400 GHz	1.000 MHz	3.737166667 GHz	-40.72 dBm	-0.718 dB

Plot 7.173. Conducted Band Edge Plot (10MHz, QPSK, High Channel, Ch.B)



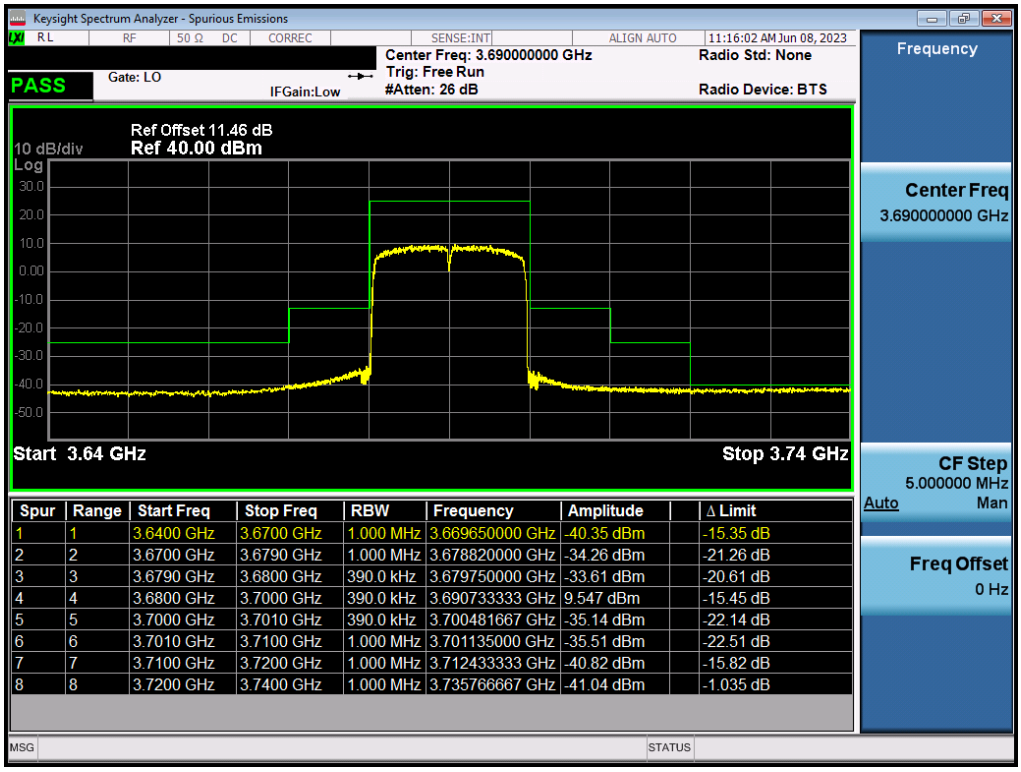
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5100 GHz	3.5300 GHz	1.000 MHz	3.516500000 GHz	-44.55 dBm	-4.545 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.538783333 GHz	-44.23 dBm	-19.23 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548925000 GHz	-38.25 dBm	-25.25 dB
4	4	3.5490 GHz	3.5500 GHz	390.0 kHz	3.549991667 GHz	-37.79 dBm	-24.79 dB
5	5	3.5500 GHz	3.5700 GHz	390.0 kHz	3.556200000 GHz	5.771 dBm	-19.23 dB
6	6	3.5700 GHz	3.5710 GHz	390.0 kHz	3.570075000 GHz	-39.39 dBm	-26.39 dB
7	7	3.5710 GHz	3.5800 GHz	1.000 MHz	3.571180000 GHz	-40.30 dBm	-27.30 dB
8	8	3.5800 GHz	3.6100 GHz	1.000 MHz	3.580650000 GHz	-40.64 dBm	-15.64 dB

Plot 7.174. Conducted Band Edge Plot (20MHz, QPSK, Low Channel, Ch.B)



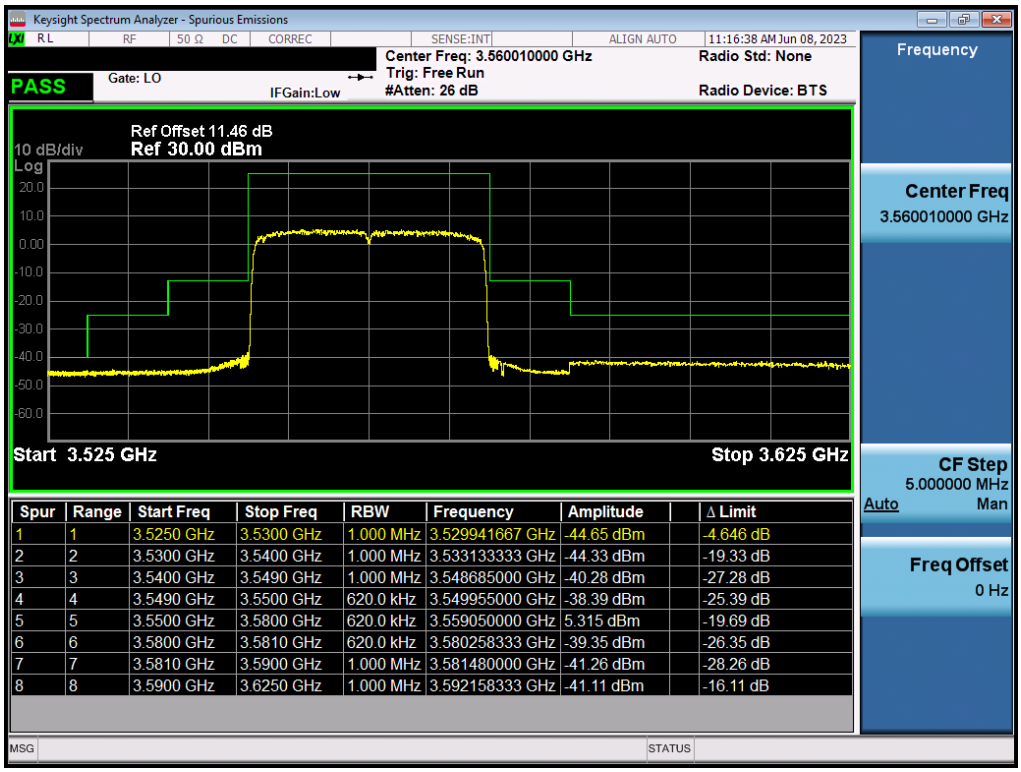
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5750 GHz	3.6050 GHz	1.000 MHz	3.604800000 GHz	-31.50 dBm	-6.499 dB
2	2	3.6050 GHz	3.6140 GHz	1.000 MHz	3.613880000 GHz	-22.21 dBm	-9.210 dB
3	3	3.6140 GHz	3.6150 GHz	390.0 kHz	3.614955000 GHz	-23.19 dBm	-10.19 dB
4	4	3.6150 GHz	3.6350 GHz	390.0 kHz	3.625033333 GHz	17.04 dBm	-7.964 dB
5	5	3.6350 GHz	3.6360 GHz	390.0 kHz	3.635135000 GHz	-24.93 dBm	-11.93 dB
6	6	3.6360 GHz	3.6450 GHz	1.000 MHz	3.636015000 GHz	-23.82 dBm	-10.82 dB
7	7	3.6450 GHz	3.6750 GHz	1.000 MHz	3.645050000 GHz	-34.92 dBm	-9.916 dB

Plot 7.175. Conducted Band Edge Plot (20MHz, QPSK, Mid Channel, Ch.B)



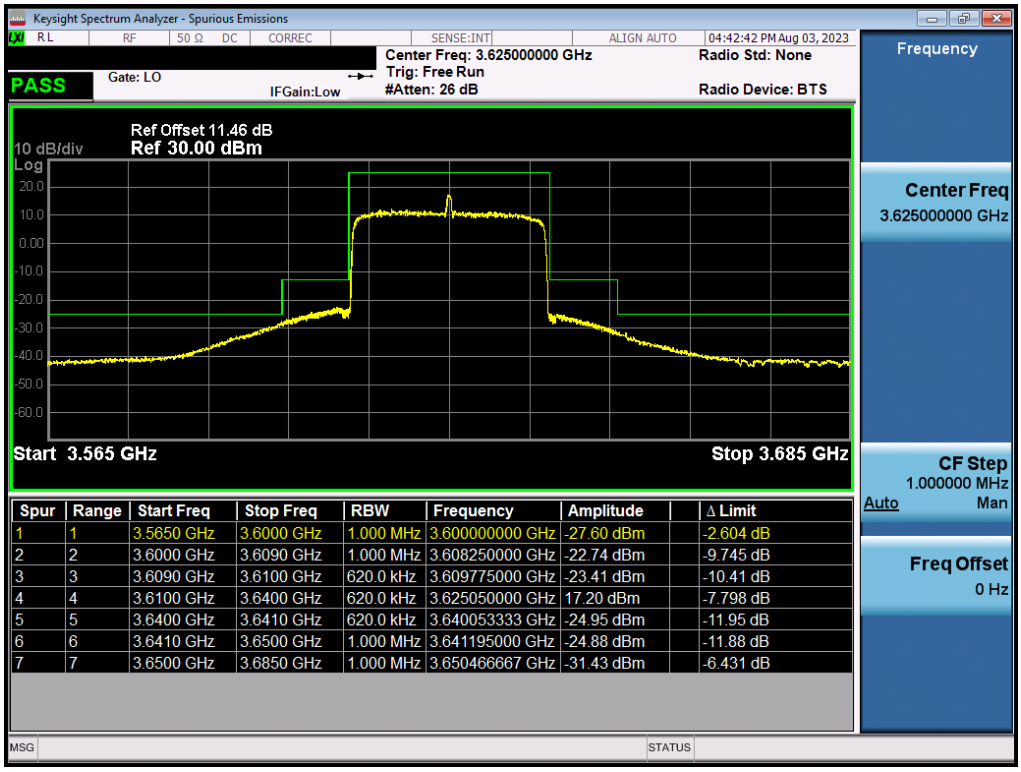
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6400 GHz	3.6700 GHz	1.000 MHz	3.669650000 GHz	-40.35 dBm	-15.35 dB
2	2	3.6700 GHz	3.6790 GHz	1.000 MHz	3.678820000 GHz	-34.26 dBm	-21.26 dB
3	3	3.6790 GHz	3.6800 GHz	390.0 kHz	3.679750000 GHz	-33.61 dBm	-20.61 dB
4	4	3.6800 GHz	3.7000 GHz	390.0 kHz	3.690733333 GHz	9.547 dBm	-15.45 dB
5	5	3.7000 GHz	3.7010 GHz	390.0 kHz	3.700481667 GHz	-35.14 dBm	-22.14 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701135000 GHz	-35.51 dBm	-22.51 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.712433333 GHz	-40.82 dBm	-15.82 dB
8	8	3.7200 GHz	3.7400 GHz	1.000 MHz	3.735766667 GHz	-41.04 dBm	-1.035 dB

Plot 7.176. Conducted Band Edge Plot (20MHz, QPSK, High Channel, Ch.B)



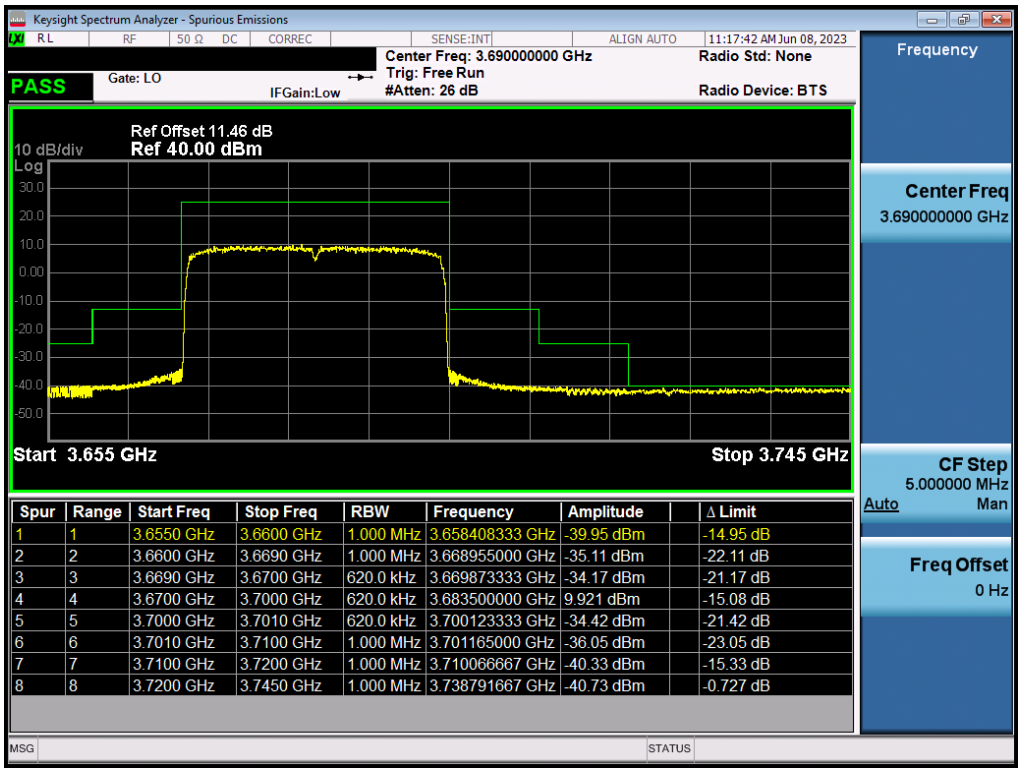
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5250 GHz	3.5300 GHz	1.000 MHz	3.529941667 GHz	-44.65 dBm	-4.646 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.533133333 GHz	-44.33 dBm	-19.33 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548685000 GHz	-40.28 dBm	-27.28 dB
4	4	3.5490 GHz	3.5500 GHz	620.0 kHz	3.549955000 GHz	-38.39 dBm	-25.39 dB
5	5	3.5500 GHz	3.5800 GHz	620.0 kHz	3.559050000 GHz	5.315 dBm	-19.69 dB
6	6	3.5800 GHz	3.5810 GHz	620.0 kHz	3.580258333 GHz	-39.35 dBm	-26.35 dB
7	7	3.5810 GHz	3.5900 GHz	1.000 MHz	3.581480000 GHz	-41.26 dBm	-28.26 dB
8	8	3.5900 GHz	3.6250 GHz	1.000 MHz	3.592158333 GHz	-41.11 dBm	-16.11 dB

Plot 7.177. Conducted Band Edge Plot (30MHz, QPSK, Low Channel, Ch.B)



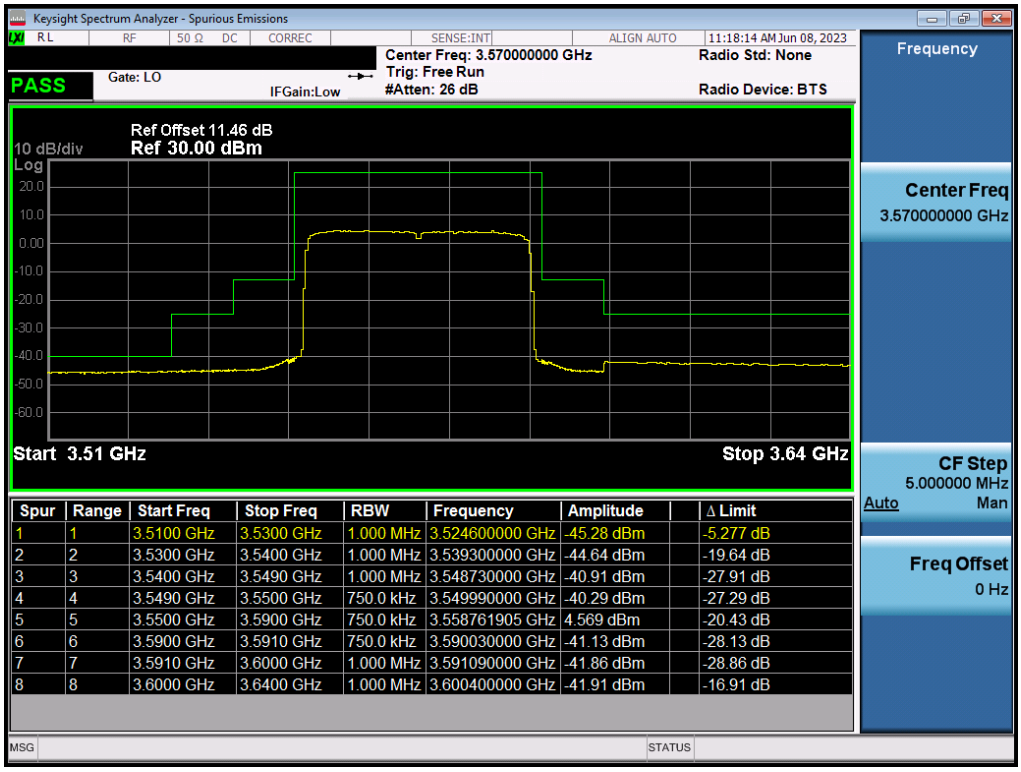
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5650 GHz	3.6000 GHz	1.000 MHz	3.600000000 GHz	-27.60 dBm	-2.604 dB
2	2	3.6000 GHz	3.6090 GHz	1.000 MHz	3.608250000 GHz	-22.74 dBm	-9.745 dB
3	3	3.6090 GHz	3.6100 GHz	620.0 kHz	3.609775000 GHz	-23.41 dBm	-10.41 dB
4	4	3.6100 GHz	3.6400 GHz	620.0 kHz	3.625050000 GHz	17.20 dBm	-7.798 dB
5	5	3.6400 GHz	3.6410 GHz	620.0 kHz	3.640053333 GHz	-24.95 dBm	-11.95 dB
6	6	3.6410 GHz	3.6500 GHz	1.000 MHz	3.641195000 GHz	-24.88 dBm	-11.88 dB
7	7	3.6500 GHz	3.6850 GHz	1.000 MHz	3.650466667 GHz	-31.43 dBm	-6.431 dB

Plot 7.178. Conducted Band Edge Plot (30MHz, QPSK, Mid Channel, Ch.B)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6550 GHz	3.6600 GHz	1.000 MHz	3.658408333 GHz	-39.95 dBm	-14.95 dB
2	2	3.6600 GHz	3.6690 GHz	1.000 MHz	3.668955000 GHz	-35.11 dBm	-22.11 dB
3	3	3.6690 GHz	3.6700 GHz	620.0 kHz	3.669873333 GHz	-34.17 dBm	-21.17 dB
4	4	3.6700 GHz	3.7000 GHz	620.0 kHz	3.683500000 GHz	9.921 dBm	-15.08 dB
5	5	3.7000 GHz	3.7010 GHz	620.0 kHz	3.700123333 GHz	-34.42 dBm	-21.42 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701165000 GHz	-36.05 dBm	-23.05 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710066667 GHz	-40.33 dBm	-15.33 dB
8	8	3.7200 GHz	3.7450 GHz	1.000 MHz	3.738791667 GHz	-40.73 dBm	-0.727 dB

Plot 7.179. Conducted Band Edge Plot (30MHz, QPSK, High Channel, Ch.B)

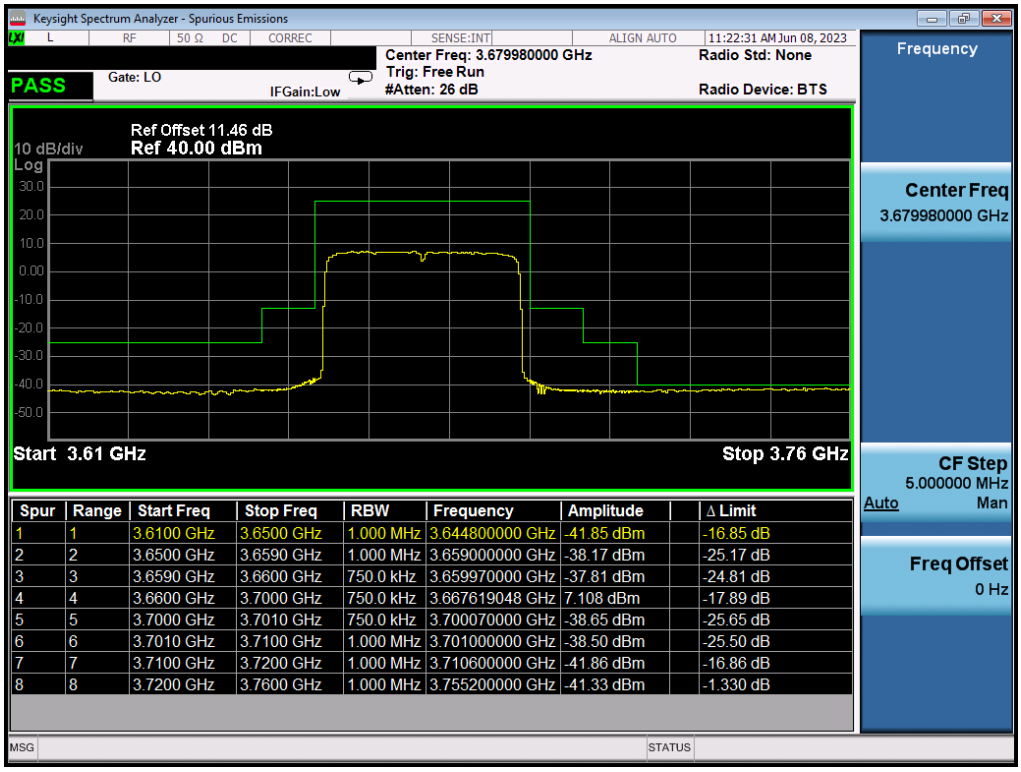


Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5100 GHz	3.5300 GHz	1.000 MHz	3.524600000 GHz	-45.28 dBm	-5.277 dB
2	2	3.5300 GHz	3.5400 GHz	1.000 MHz	3.539300000 GHz	-44.64 dBm	-19.64 dB
3	3	3.5400 GHz	3.5490 GHz	1.000 MHz	3.548730000 GHz	-40.91 dBm	-27.91 dB
4	4	3.5490 GHz	3.5500 GHz	750.0 kHz	3.549990000 GHz	-40.29 dBm	-27.29 dB
5	5	3.5500 GHz	3.5900 GHz	750.0 kHz	3.558761905 GHz	4.569 dBm	-20.43 dB
6	6	3.5900 GHz	3.5910 GHz	750.0 kHz	3.590030000 GHz	-41.13 dBm	-28.13 dB
7	7	3.5910 GHz	3.6000 GHz	1.000 MHz	3.591090000 GHz	-41.86 dBm	-28.86 dB
8	8	3.6000 GHz	3.6400 GHz	1.000 MHz	3.600400000 GHz	-41.91 dBm	-16.91 dB

Plot 7.180. Conducted Band Edge Plot (40MHz, QPSK, Low Channel, Ch.B)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.5500 GHz	3.5950 GHz	1.000 MHz	3.594550000 GHz	-33.30 dBm	-8.296 dB
2	2	3.5950 GHz	3.6040 GHz	1.000 MHz	3.603910000 GHz	-30.93 dBm	-17.93 dB
3	3	3.6040 GHz	3.6050 GHz	750.0 kHz	3.604940000 GHz	-30.85 dBm	-17.85 dB
4	4	3.6050 GHz	3.6450 GHz	750.0 kHz	3.613000000 GHz	11.35 dBm	-13.65 dB
5	5	3.6450 GHz	3.6460 GHz	750.0 kHz	3.645000000 GHz	-32.97 dBm	-19.97 dB
6	6	3.6460 GHz	3.6550 GHz	1.000 MHz	3.646090000 GHz	-33.16 dBm	-20.16 dB
7	7	3.6550 GHz	3.7000 GHz	1.000 MHz	3.656350000 GHz	-36.51 dBm	-11.51 dB

Plot 7.181. Conducted Band Edge Plot (40MHz, QPSK, Mid Channel, Ch.B)



Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Δ Limit
1	1	3.6100 GHz	3.6500 GHz	1.000 MHz	3.644800000 GHz	-41.85 dBm	-16.85 dB
2	2	3.6500 GHz	3.6590 GHz	1.000 MHz	3.659000000 GHz	-38.17 dBm	-25.17 dB
3	3	3.6590 GHz	3.6600 GHz	750.0 kHz	3.659970000 GHz	-37.81 dBm	-24.81 dB
4	4	3.6600 GHz	3.7000 GHz	750.0 kHz	3.667619048 GHz	7.108 dBm	-17.89 dB
5	5	3.7000 GHz	3.7010 GHz	750.0 kHz	3.700070000 GHz	-38.65 dBm	-25.65 dB
6	6	3.7010 GHz	3.7100 GHz	1.000 MHz	3.701000000 GHz	-38.50 dBm	-25.50 dB
7	7	3.7100 GHz	3.7200 GHz	1.000 MHz	3.710600000 GHz	-41.86 dBm	-16.86 dB
8	8	3.7200 GHz	3.7600 GHz	1.000 MHz	3.755200000 GHz	-41.33 dBm	-1.330 dB

Plot 7.182. Conducted Band Edge Plot (40MHz, QPSK, High Channel, Ch.B)

7.8 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the field strength conversion method described in ANSI C63.26-2015 with the EUT transmitting into a 50ohm load. Measurements on signals operating below 1GHz are performed using hybrid (biconical/log) antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

Test Procedures Used

ANSI C63.26-2015 – Section 5.5.4

Test Settings

1. RBW = 1MHz
2. VBW ≥ 3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points ≥ 2 x span / RBW
5. Detector = RMS
6. Trace mode = Max Hold (In cases where the level is within 2dB of the limit, the final measurement is taken using triggering/gating and trace averaging.)
7. The trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

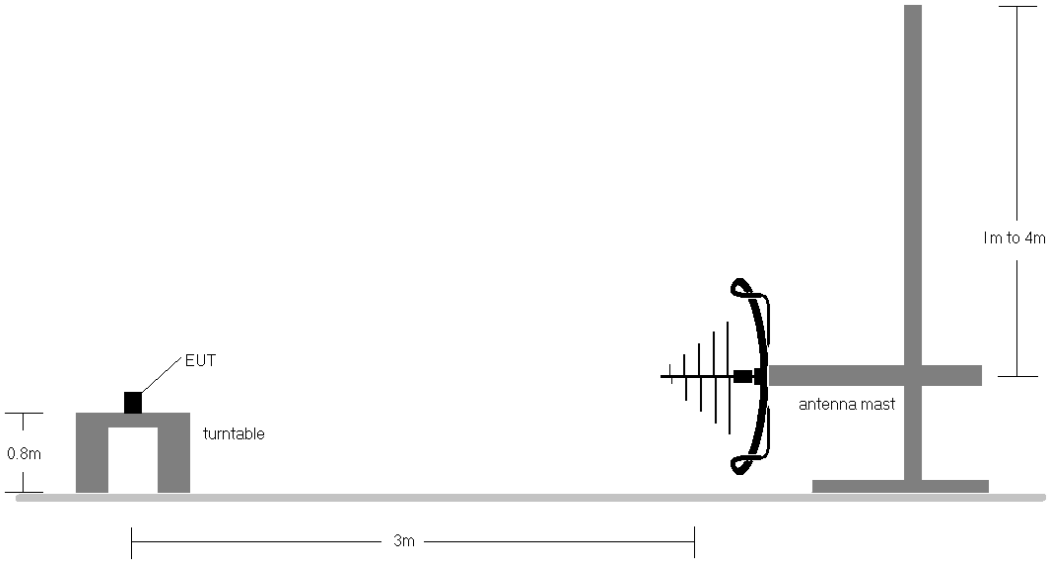


Figure 7-7. Test Instrument & Measurement Setup < 1GHz

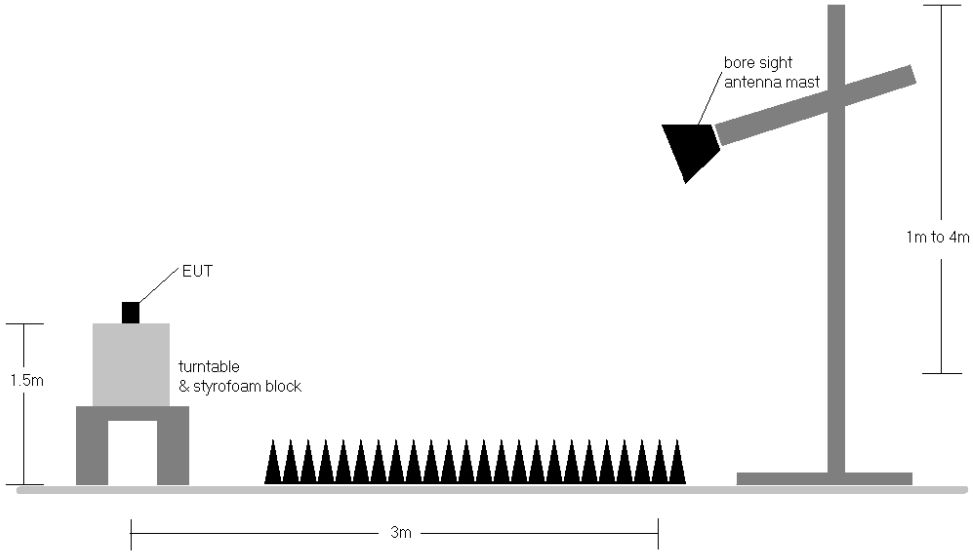


Figure 7-8. Test Instrument & Measurement Setup >1 GHz

Test Notes

1) Field strengths are calculated using the Measurement quantity conversions in ANSI C63.26-2015 Section 5.2.7:
   a) E(dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)
   b) EIRP (dBm) = E(dBµV/m) + 20logD – 104.8; where D is the measurement distance in meters.

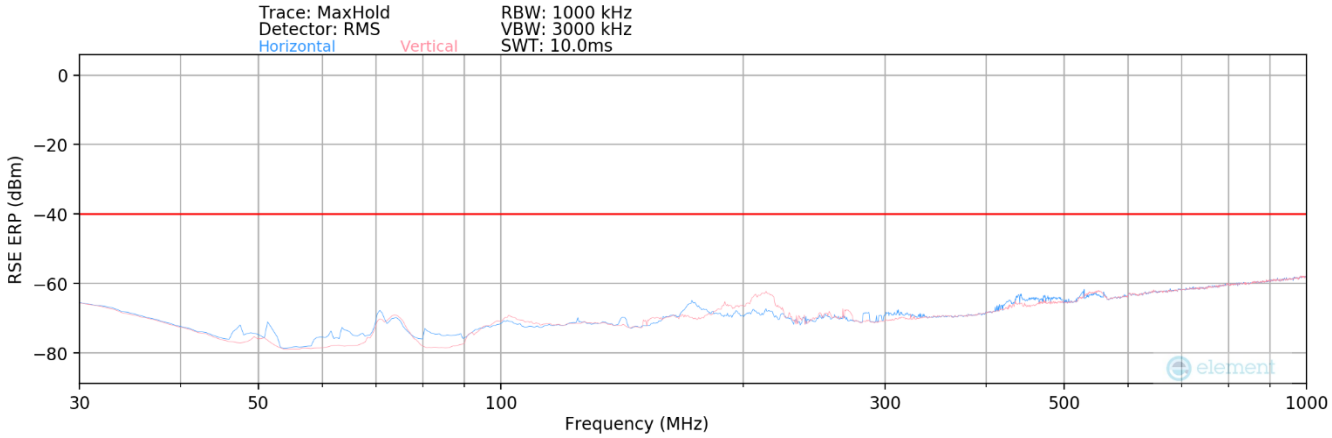
2) The worst case emissions are reported with the EUT modulations and channel bandwidth configurations shown in the tables below.

3) The spectrum is measured from 30MHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.

4) Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

6) Any failing emissions shown on wide band RSE plots were found to be passing upon closer inspection and measurement.

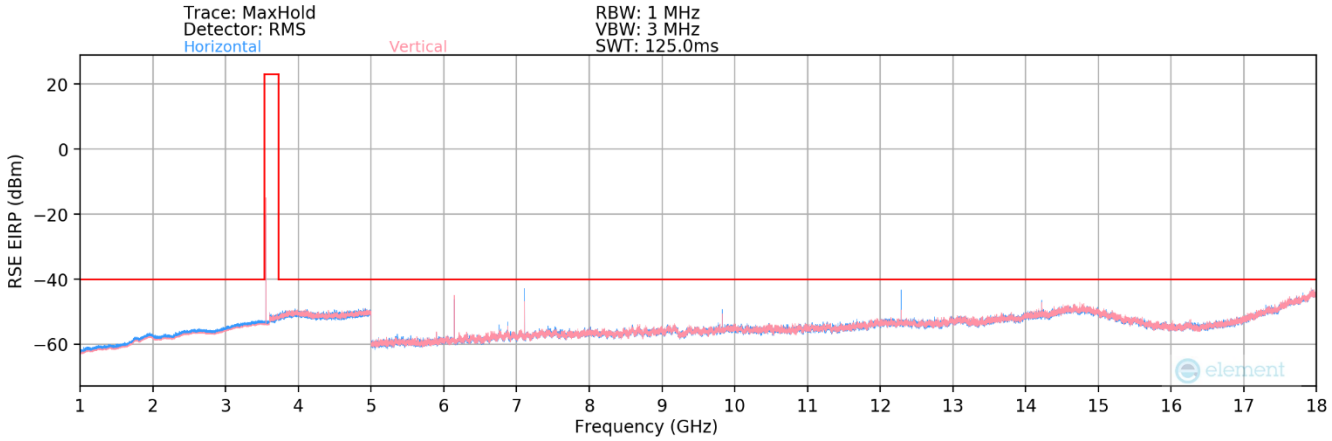


Plot 7.183. Radiated Spurious Plot 30MHz-1GHz

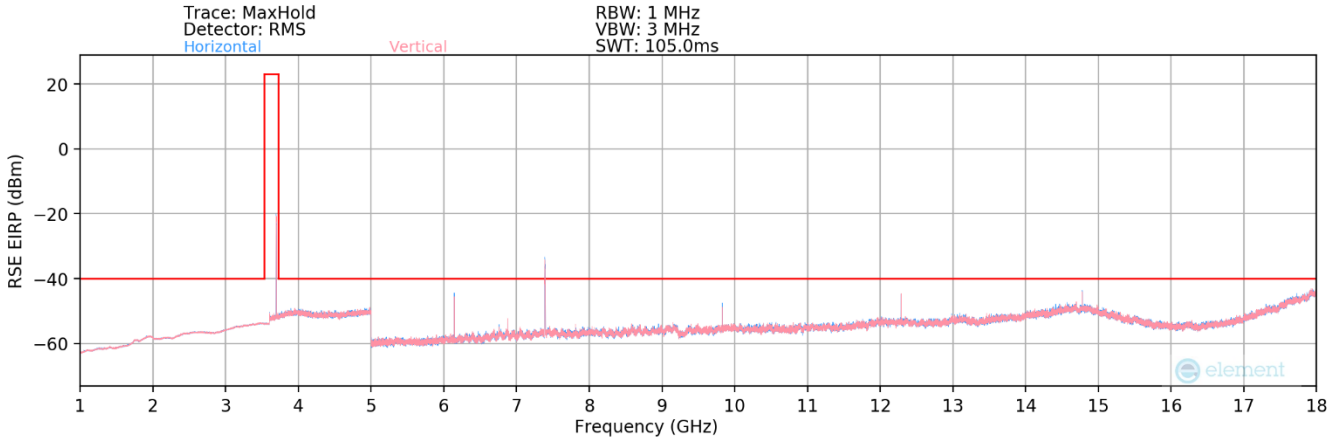
Bandwidth (MHz):	10
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
Detector / Trace Mode:	RMS / Max Hold
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
51.10	H	101	251	-95.65	14.34	25.69	-69.57	-40.00	-29.57
59.20	H	100	169	-96.46	13.93	24.47	-70.78	-40.00	-30.78
71.00	H	101	309	-91.33	14.45	30.12	-65.14	-40.00	-25.14
75.60	H	110	12	-93.92	14.38	27.46	-67.80	-40.00	-27.80
93.20	H	112	222	-96.20	15.44	26.24	-69.01	-40.00	-29.01
109.60	H	100	290	-97.07	19.33	29.26	-66.00	-40.00	-26.00
139.50	V	158	288	-99.52	20.05	27.53	-67.73	-40.00	-27.73
173.00	V	139	273	-95.44	18.99	30.55	-64.71	-40.00	-24.71
218.00	V	129	91	-80.73	17.82	44.09	-51.16	-40.00	-11.16
253.80	V	101	82	-81.01	18.74	44.73	-50.53	-40.00	-10.53
265.40	V	129	84	-86.11	20.13	41.02	-54.24	-40.00	-14.24

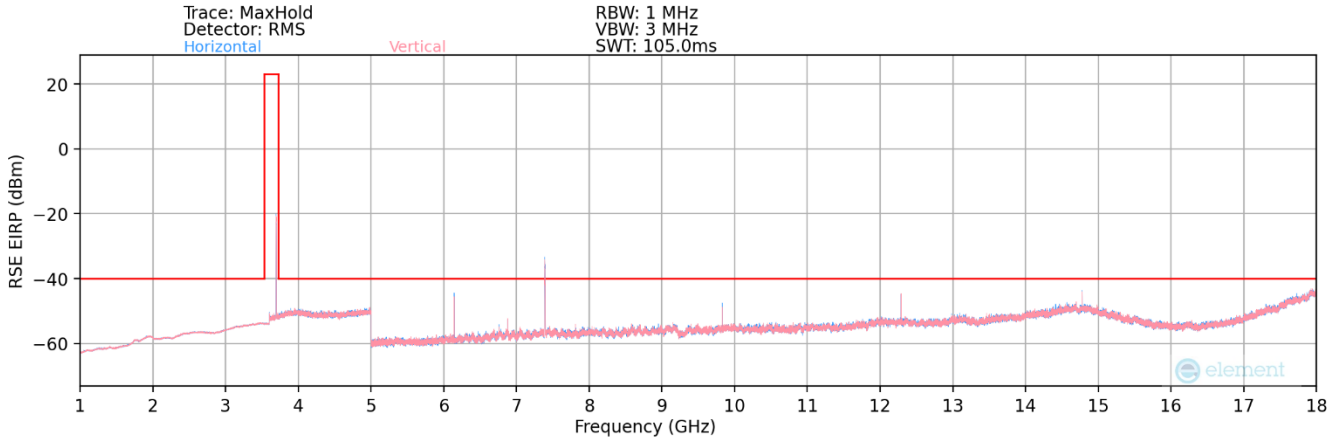
Table 7-7. Radiated Spurious Data 30MHz-1GHz - Mid Channel



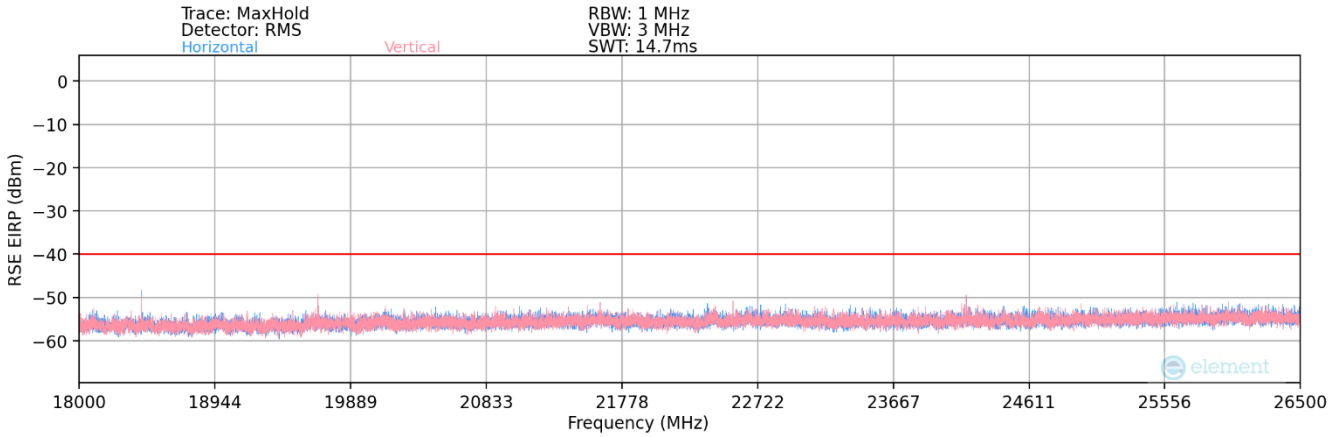
Plot 7.184. Radiated Spurious Plot 1-18GHz – Low Channel



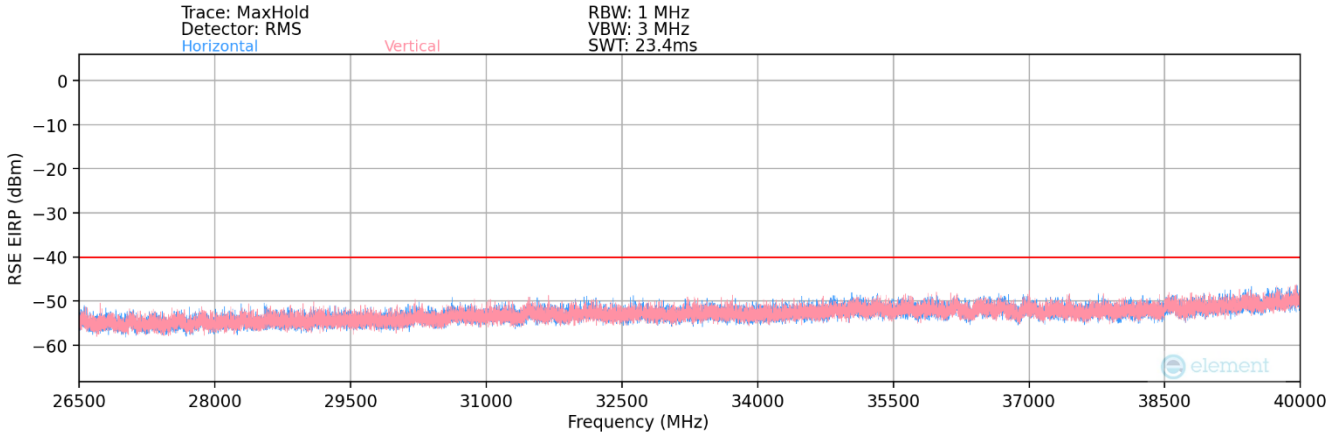
Plot 7.185. Radiated Spurious Plot 1-18GHz – Mid Channel



Plot 7.186. Radiated Spurious Plot 1-18GHz – High Channel



Plot 7.187. Radiated Spurious Plot 18-26.5GHz



Plot 7.188. Radiated Spurious Plot 26.5-40GHz

Bandwidth (MHz):	10
Frequency (MHz):	3555.0
Modulation Signal:	QPSK
Detector / Trace Mode:	RMS / Max Hold
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
6144.00	H	136	196	-57.02	1.34	51.32	-43.94	-40.00	-3.94
6758.50	H	122	180	-67.81	3.20	42.39	-52.87	-40.00	-12.87
6811.00	H	-	-	-75.60	2.98	34.38	-60.88	-40.00	-20.88
7110.00	H	155	239	-56.07	3.80	54.73	-40.53	-40.00	-0.53
10665.00	H	137	258	-78.42	7.81	36.39	-58.87	-40.00	-18.87
12288.00	V	167	191	-65.97	9.47	50.50	-44.76	-40.00	-4.76
14220.00	H	187	179	-73.26	12.22	45.96	-49.30	-40.00	-9.30
17775.00	H	-	-	-77.26	15.47	45.21	-50.05	-40.00	-10.05
21330.00	H	-	-	-57.89	4.04	53.15	-51.65	-40.00	-11.65
24885.00	H	-	-	-58.07	4.19	53.13	-51.67	-40.00	-11.67
28440.00	H	-	-	-58.04	5.26	54.21	-50.59	-40.00	-10.59

Table 7-8. Radiated Spurious Data – Low Channel

Bandwidth (MHz):	10
Frequency (MHz):	3625.0
Modulation Signal:	QPSK
Detector / Trace Mode:	RMS / Max Hold
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
6144.00	V	185	196	-62.69	1.34	45.65	-49.61	-40.00	-9.61
6758.50	H	250	240	-64.81	2.98	45.17	-50.09	-40.00	-10.09
6811.00	H	131	235	-65.24	3.20	44.96	-50.30	-40.00	-10.30
7250.00	H	176	224	-58.25	3.66	52.41	-42.85	-40.00	-2.85
10875.00	H	-	-	-78.22	8.05	36.83	-58.43	-40.00	-18.43
12288.00	V	210	216	-61.23	9.47	55.24	-40.02	-40.00	-0.02
14500.00	H	122	232	-75.94	13.04	44.10	-51.16	-40.00	-11.16
18125.00	H	-	-	-55.39	1.60	53.21	-51.59	-40.00	-11.59
18432.00	H	150	193	-52.44	1.66	56.22	-48.58	-40.00	-8.58
21750.00	H	-	-	-55.59	3.86	55.27	-49.53	-40.00	-9.53
24162.00	V	150	63	-54.17	4.27	57.10	-47.70	-40.00	-7.70
25375.00	H	-	-	-58.12	4.26	53.15	-51.66	-40.00	-11.66
29000.00	H	-	-	-58.32	5.40	54.08	-50.72	-40.00	-10.72
32625.00	H	-	-	-57.67	7.10	56.43	-48.37	-40.00	-8.37

Table 7-9. Radiated Spurious Data – Mid Channel

Bandwidth (MHz):	10
Frequency (MHz):	3695.0
Modulation Signal:	QPSK
Detector / Trace Mode:	RMS / Max Hold
RBW / VBW:	1MHz / 3MHz

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
6144.00	V	157	210	-57.89	1.34	50.45	-44.81	-40.00	-4.81
6758.50	V	110	182	-67.83	2.98	42.15	-53.11	-40.00	-13.11
6811.00	H	-	-	-75.67	3.20	34.53	-60.73	-40.00	-20.73
7390.00	H	197	243	-59.73	4.26	51.53	-43.73	-40.00	-3.73
11085.00	V	-	-	-78.69	8.18	36.49	-58.77	-40.00	-18.77
12288.00	V	179	191	-66.22	9.47	50.25	-45.01	-40.00	-5.01
14780.00	V	199	167	-71.10	13.43	49.33	-45.93	-40.00	-5.93
18475.00	V	-	-	-57.54	1.86	51.32	-53.48	-40.00	-13.48
22170.00	V	-	-	-58.54	3.80	52.27	-52.54	-40.00	-12.54
25865.00	V	-	-	-56.80	4.65	54.85	-49.95	-40.00	-9.95

Table 7-10. Radiated Spurious Data – High Channel

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Skylark Wireless, LLC CBRS Radio Module FCC ID: 2AS22-LUMACH2** complies with all of the Category B CBSD requirements of Part 96 of the FCC Rules for Band 48 operation only when integrating up to 7 modules into a single chassis.