

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

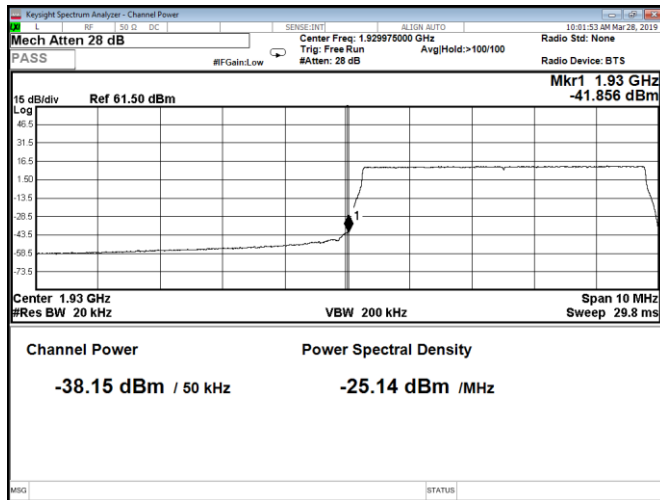


Figure 8.2-33: Conducted band edge emission at 1930 MHz, 5 MHz single carrier, QPSK (RBW = 1% of EBW)

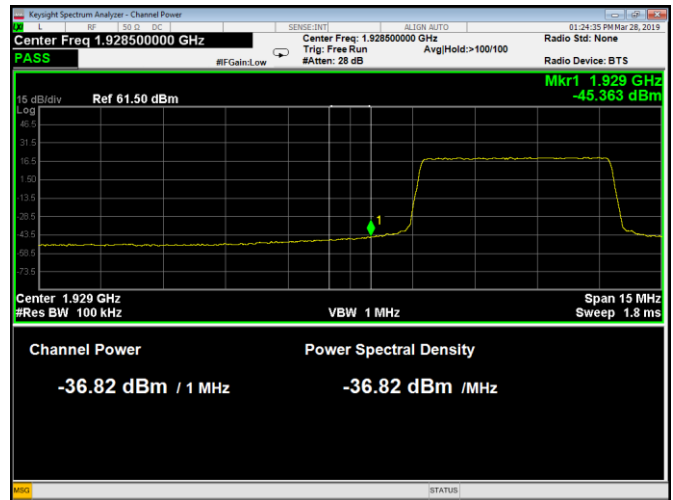


Figure 8.2-34: Conducted band edge emission at 1929 MHz, 5 MHz single carrier, QPSK (RBW = 1 MHz)

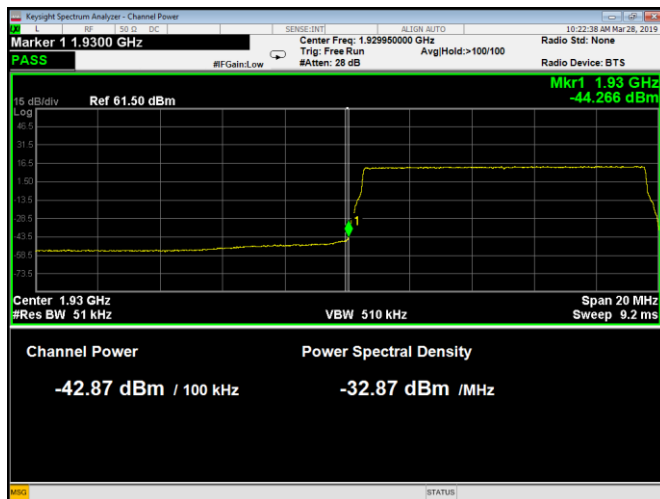


Figure 8.2-35: Conducted band edge emission at 1930 MHz, 10 MHz single carrier, QPSK (RBW = 1% of EBW)

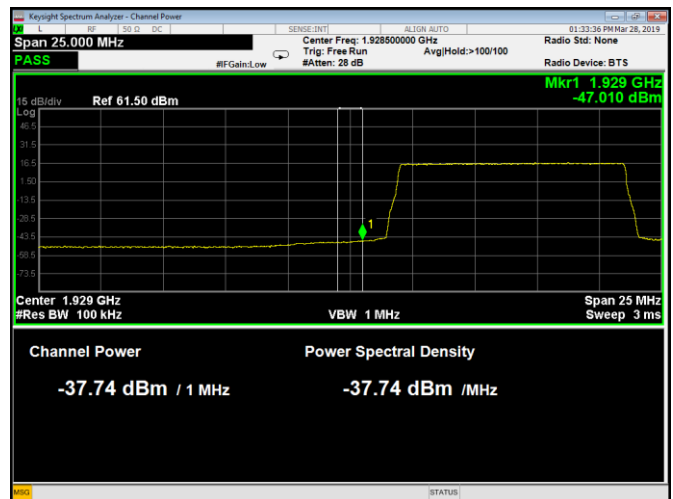


Figure 8.2-36: Conducted band edge emission at 1929 MHz, 10 MHz single carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

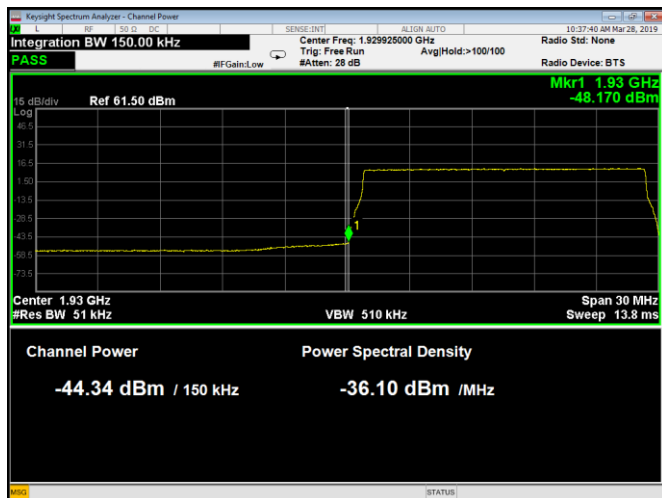


Figure 8.2-37: Conducted band edge emission at 1930 MHz, 15 MHz single carrier, QPSK (RBW = 1% of EBW)

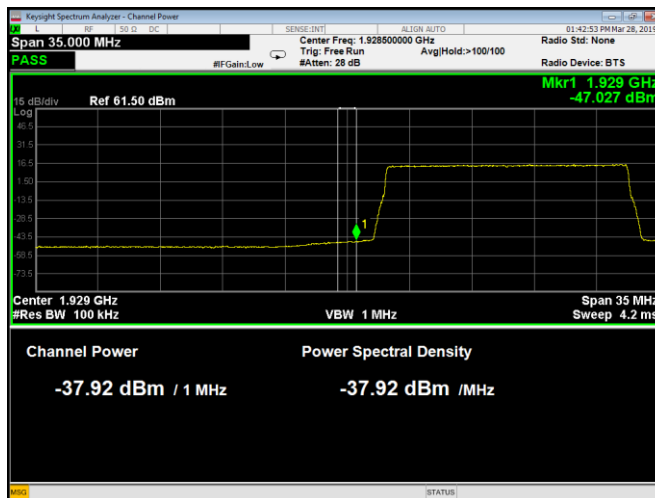


Figure 8.2-38: Conducted band edge emission at 1929 MHz, 15 MHz single carrier, QPSK (RBW = 1 MHz)

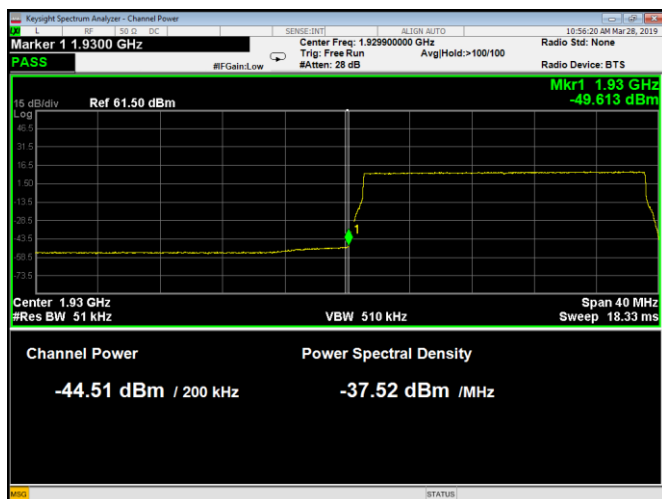


Figure 8.2-39: Conducted band edge emission at 1930 MHz, 20 MHz single carrier, QPSK (RBW = 1% of EBW)

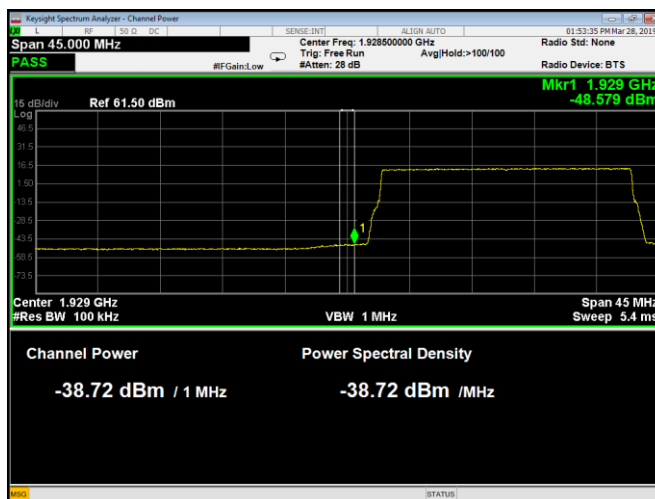


Figure 8.2-40: Conducted band edge emission at 1929 MHz, 20 MHz single carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

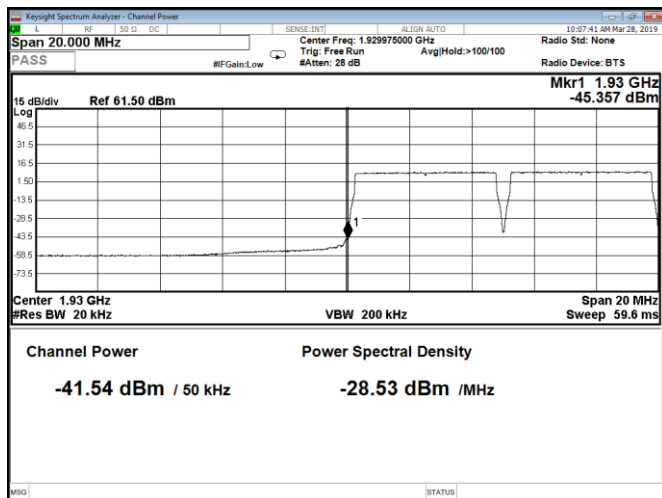


Figure 8.2-41: Conducted band edge emission at 1930 MHz, 5 MHz 2-carrier, QPSK (RBW = 1% of EBW)

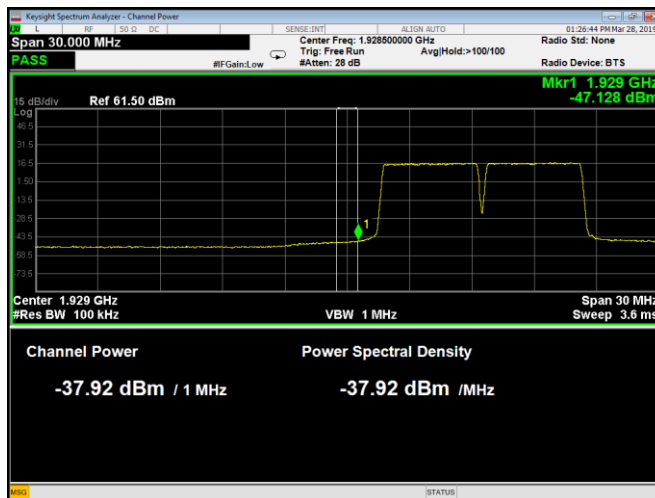


Figure 8.2-42: Conducted band edge emission at 1929 MHz, 5 MHz 2-carrier, QPSK (RBW = 1 MHz)

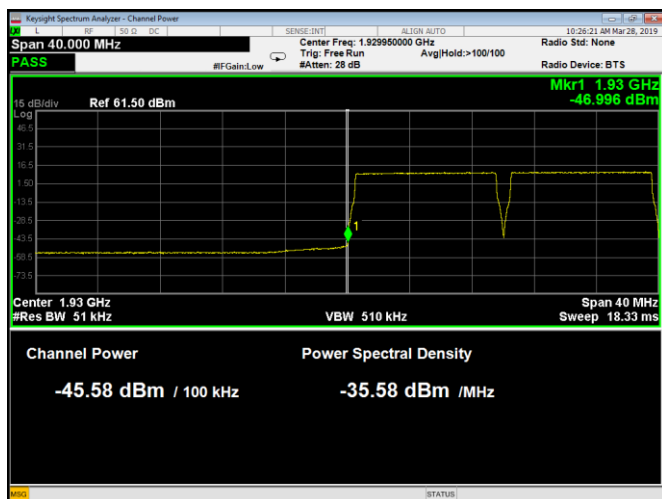


Figure 8.2-43: Conducted band edge emission at 1930 MHz, 10 MHz 2-carrier, QPSK (RBW = 1% of EBW)

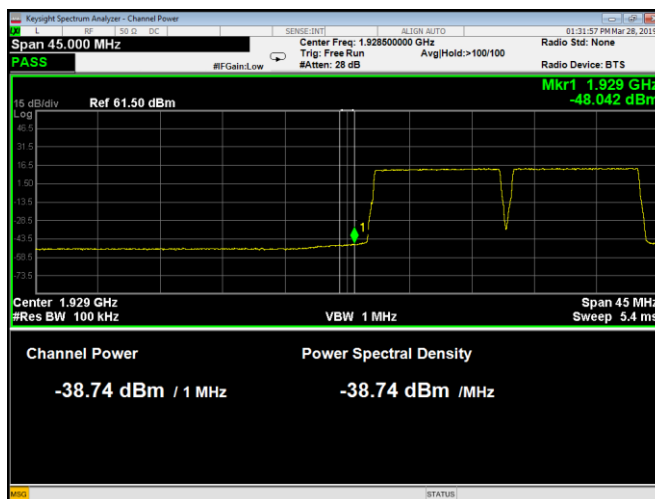


Figure 8.2-44: Conducted band edge emission at 1929 MHz, 10 MHz 2-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

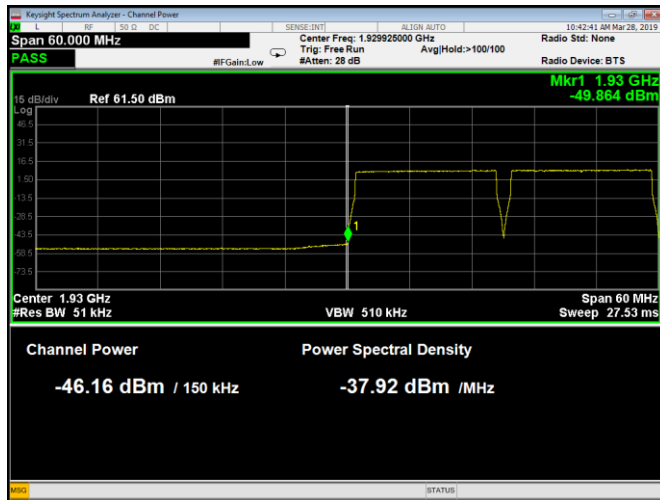


Figure 8.2-45: Conducted band edge emission at 1930 MHz, 15 MHz 2-carrier, QPSK (RBW = 1% of EBW)

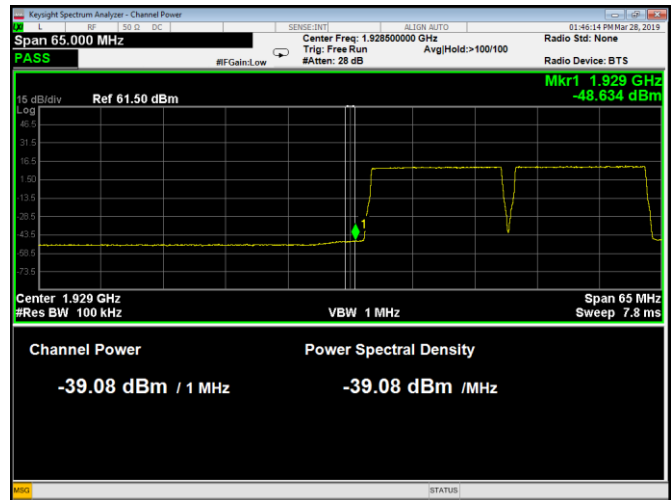


Figure 8.2-46: Conducted band edge emission at 1929 MHz, 15 MHz 2-carrier, QPSK (RBW = 1 MHz)

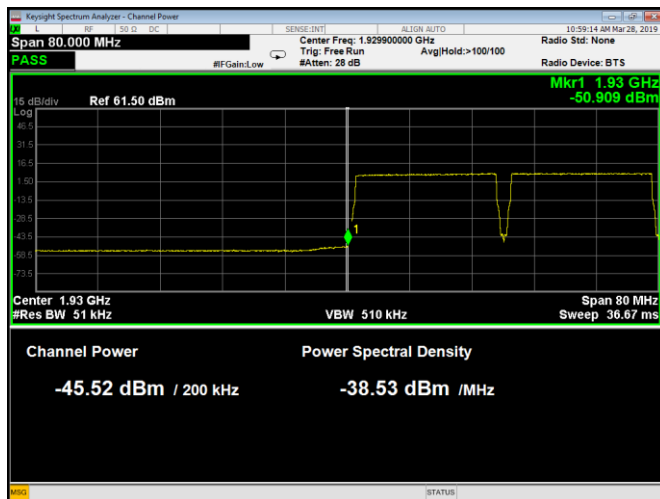


Figure 8.2-47: Conducted band edge emission at 1930 MHz, 20 MHz 2-carrier, QPSK (RBW = 1% of EBW)

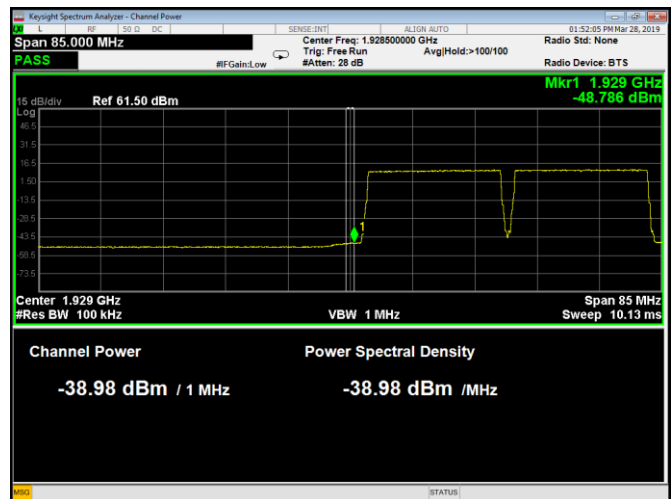


Figure 8.2-48: Conducted band edge emission at 1929 MHz, 20 MHz 2-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

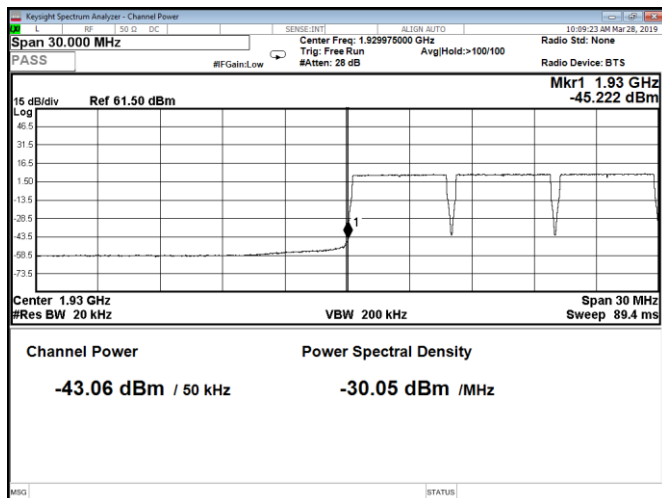


Figure 8.2-49: Conducted band edge emission at 1930 MHz, 5 MHz 3-carrier, QPSK (RBW = 1% of EBW)

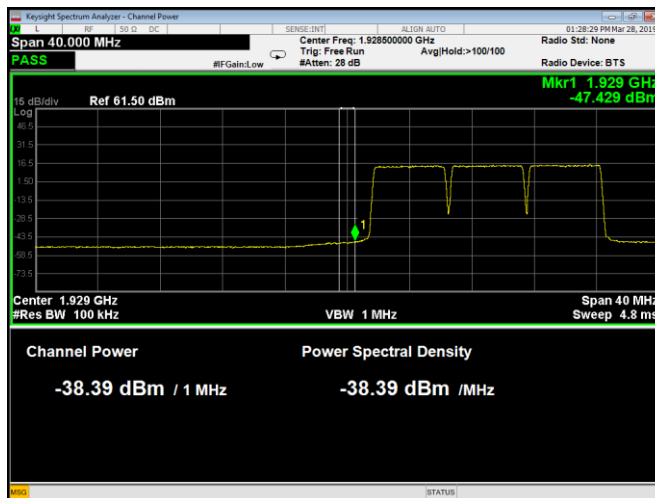


Figure 8.2-50: Conducted band edge emission at 1929 MHz, 5 MHz 3-carrier, QPSK (RBW = 1 MHz)

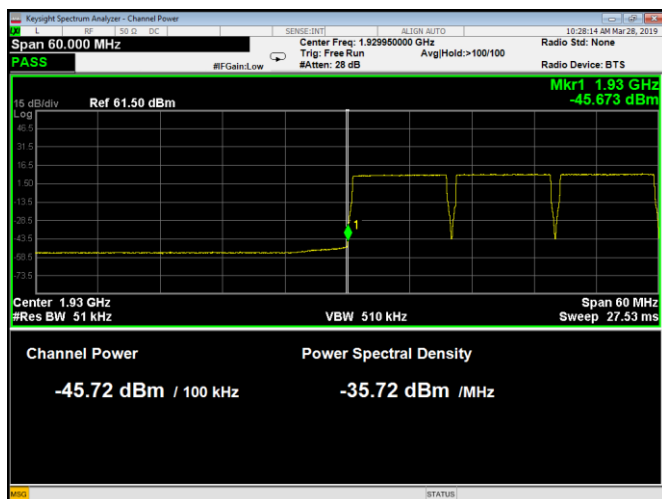


Figure 8.2-51: Conducted band edge emission at 1930 MHz, 10 MHz 3-carrier, QPSK (RBW = 1% of EBW)

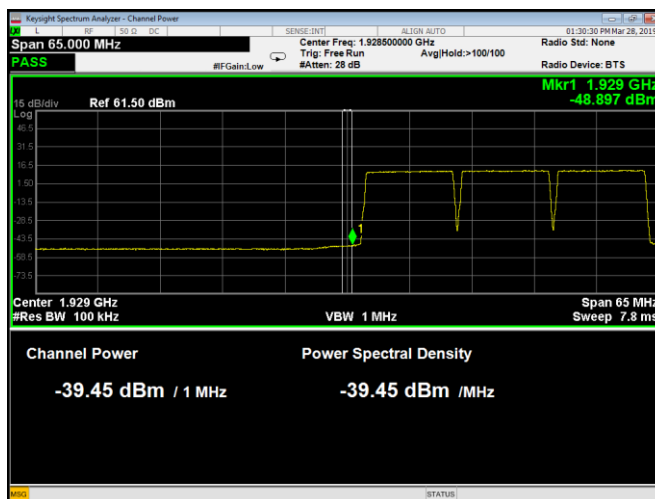


Figure 8.2-52: Conducted band edge emission at 1929 MHz, 10 MHz 3-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

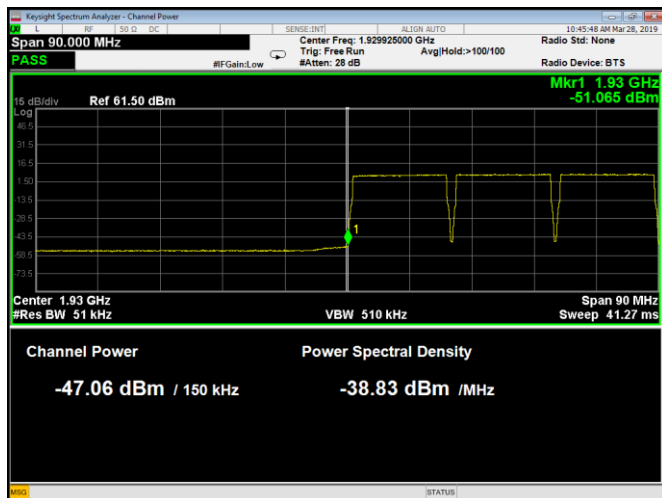


Figure 8.2-53: Conducted band edge emission at 1930 MHz, 15 MHz 3-carrier, QPSK (RBW = 1% of EBW)

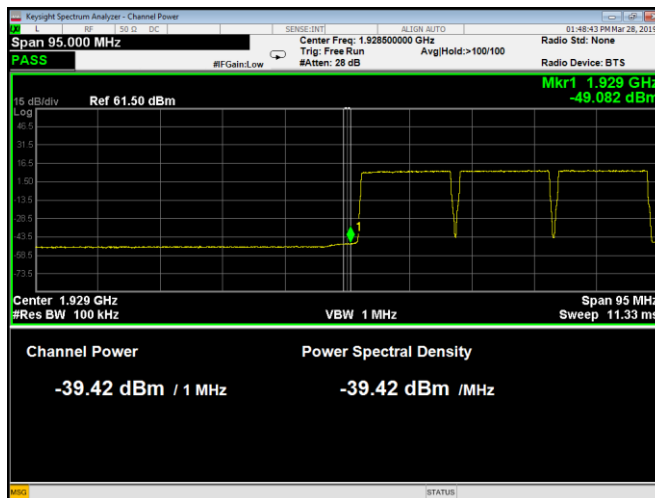


Figure 8.2-54: Conducted band edge emission at 1929 MHz, 15 MHz 3-carrier, QPSK (RBW = 1 MHz)

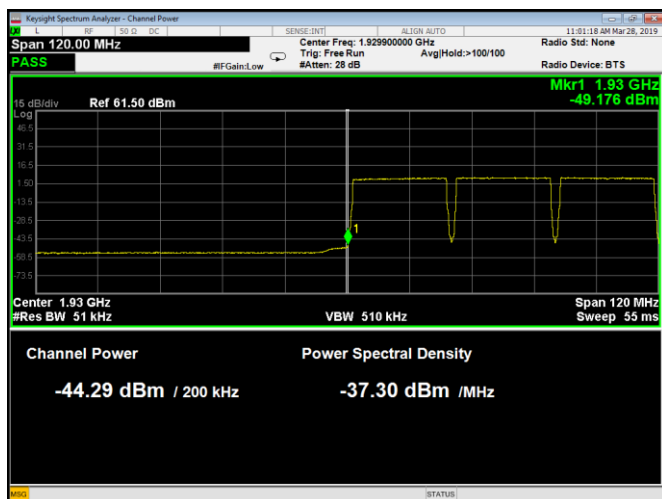


Figure 8.2-55: Conducted band edge emission at 1930 MHz, 20 MHz 3-carrier, QPSK (RBW = 1% of EBW)

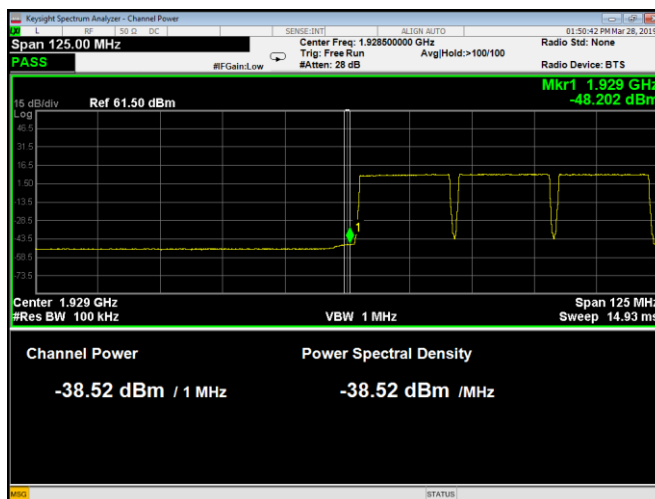


Figure 8.2-56: Conducted band edge emission at 1929 MHz, 20 MHz 3-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured "Channel power" value must be lower, than -28.05 dBm

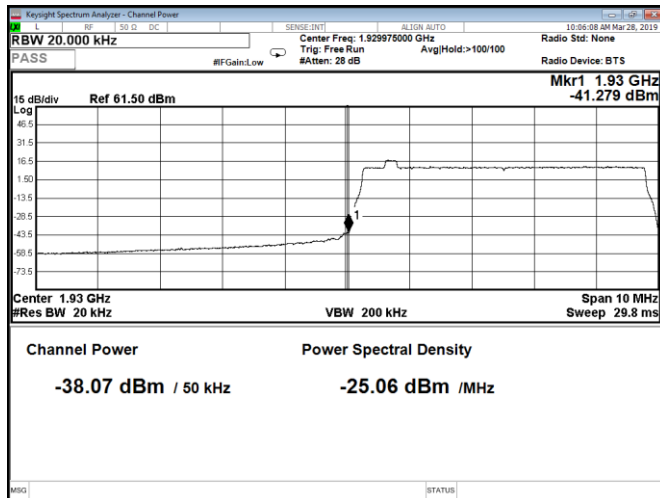


Figure 8.2-57: Conducted band edge emission at 1930 MHz, 5 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

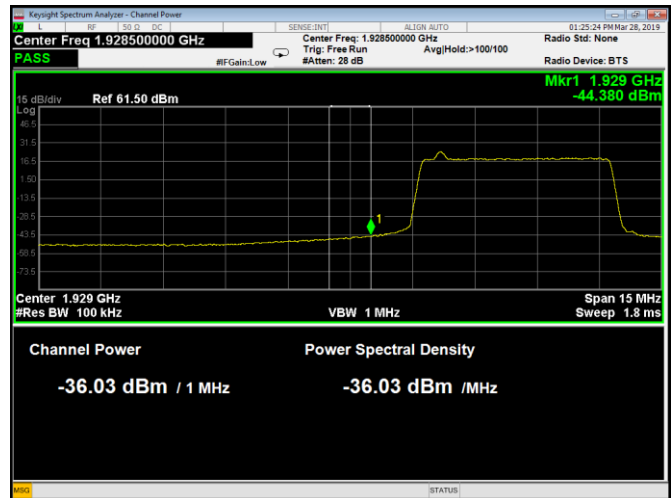


Figure 8.2-58: Conducted band edge emission at 1929 MHz, 5 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

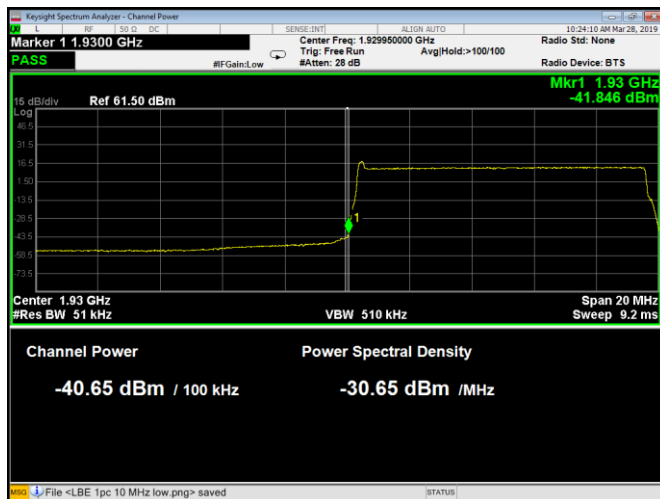


Figure 8.2-59: Conducted band edge emission at 1930 MHz, 10 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

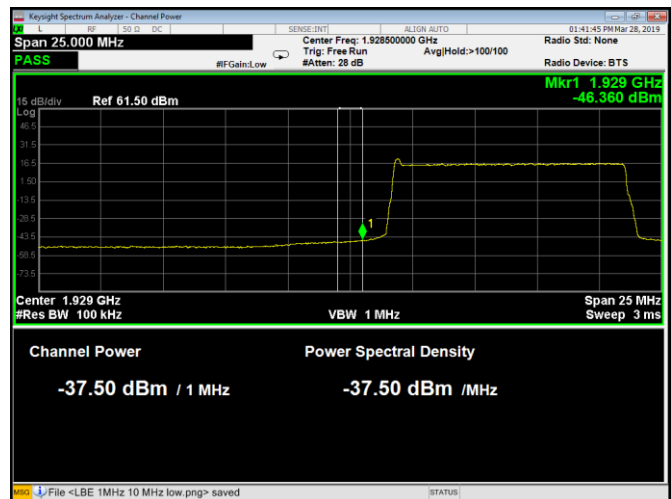


Figure 8.2-60: Conducted band edge emission at 1929 MHz, 10 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

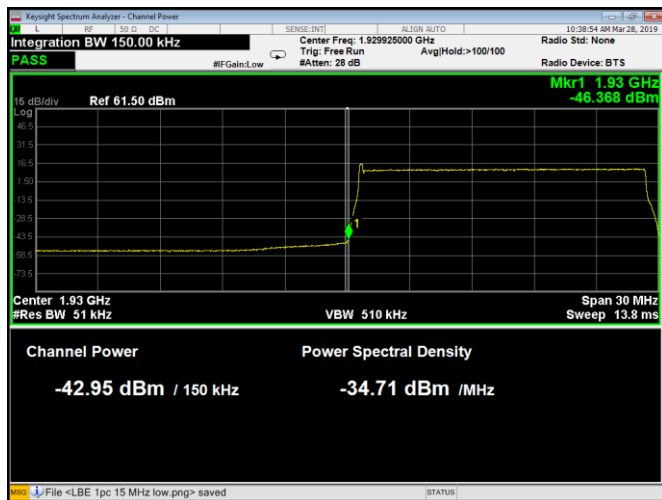


Figure 8.2-61: Conducted band edge emission at 1930 MHz, 15 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

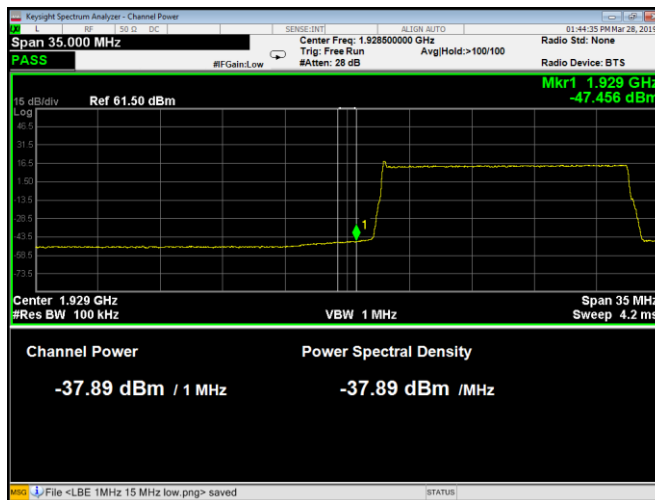


Figure 8.2-62: Conducted band edge emission at 1929 MHz, 15 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

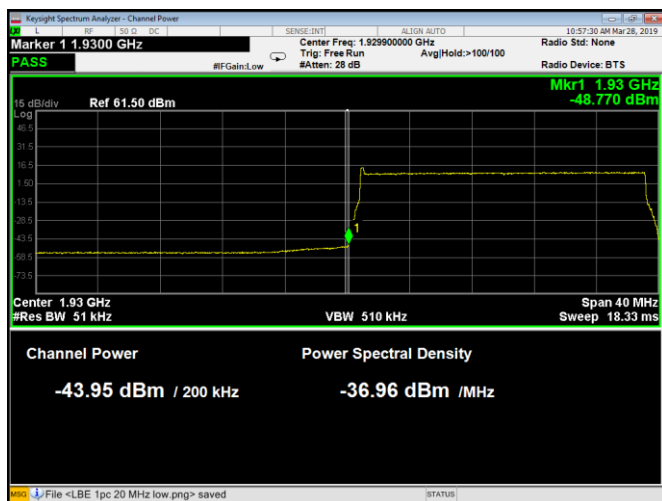


Figure 8.2-63: Conducted band edge emission at 1930 MHz, 20 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

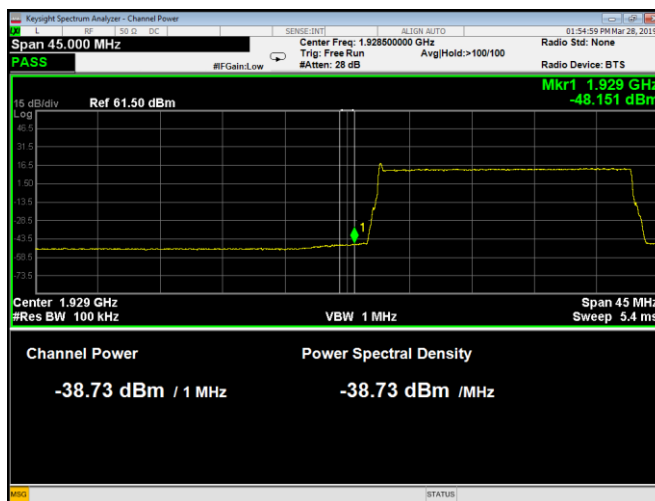


Figure 8.2-64: Conducted band edge emission at 1929 MHz, 20 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

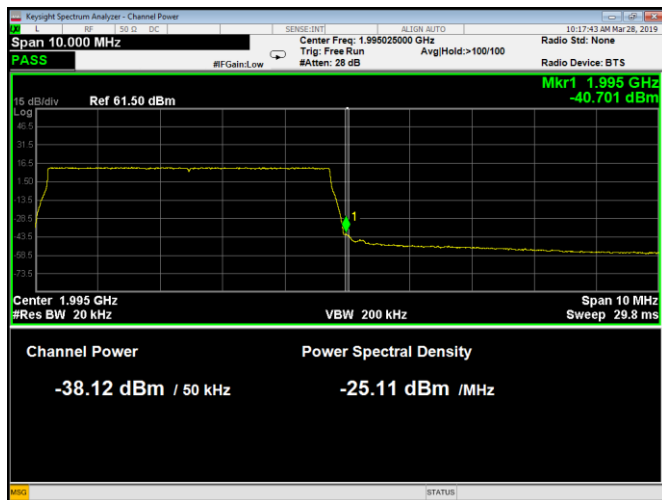


Figure 8.2-65: Conducted band edge emission at 1995 MHz, 5 MHz single carrier, QPSK (RBW = 1% of EBW)

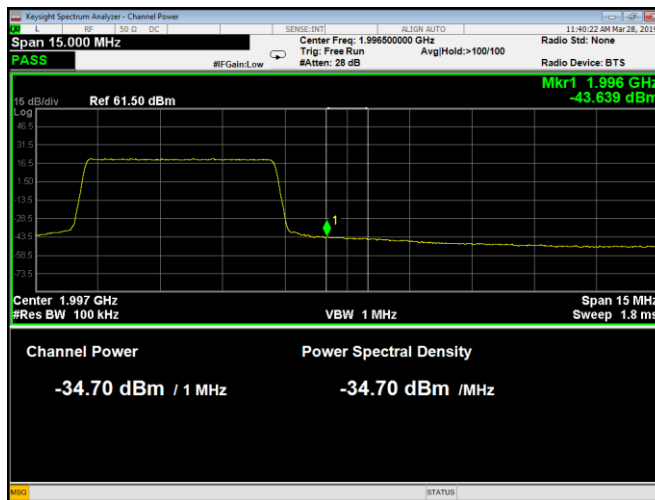


Figure 8.2-66: Conducted band edge emission at 1996 MHz, 5 MHz single carrier, QPSK (RBW = 1 MHz)

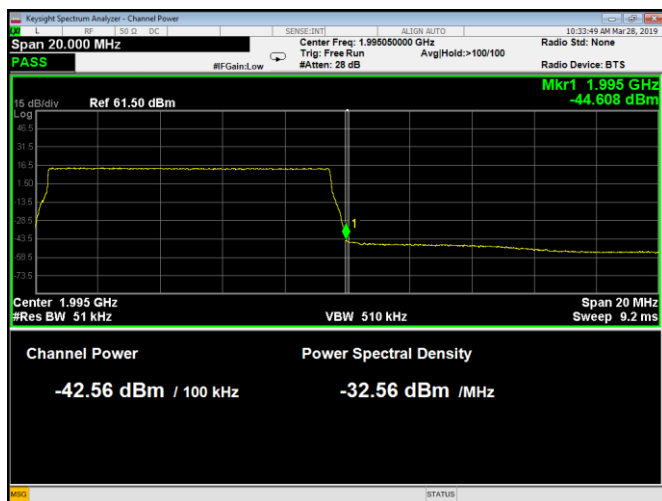


Figure 8.2-67: Conducted band edge emission at 1995 MHz, 10 MHz single carrier, QPSK (RBW = 1% of EBW)

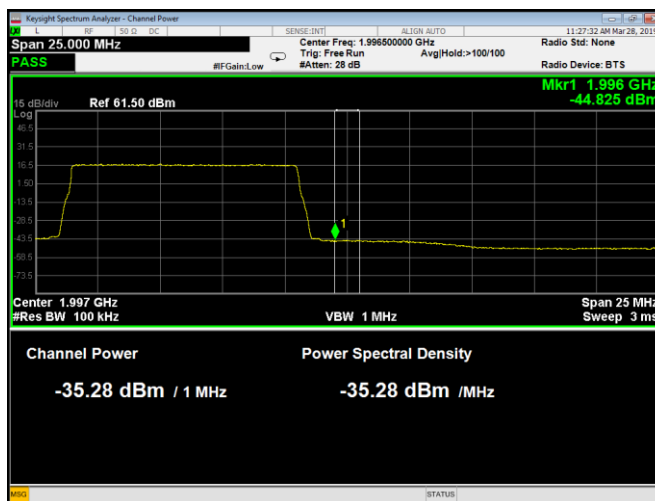


Figure 8.2-68: Conducted band edge emission at 1996 MHz, 10 MHz single carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

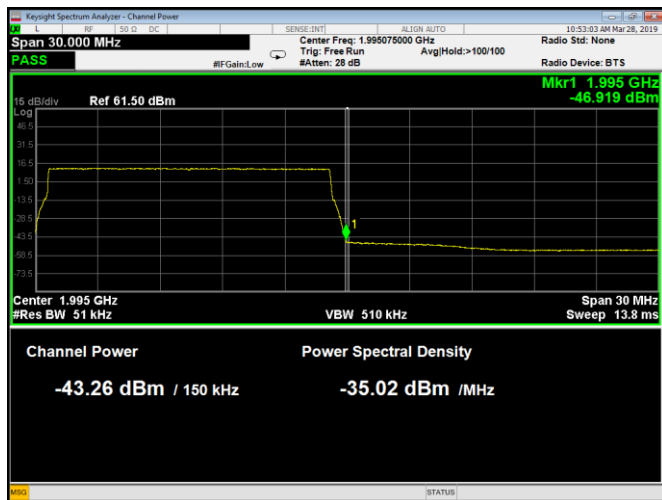


Figure 8.2-69: Conducted band edge emission at 1995 MHz, 15 MHz single carrier, QPSK (RBW = 1% of EBW)

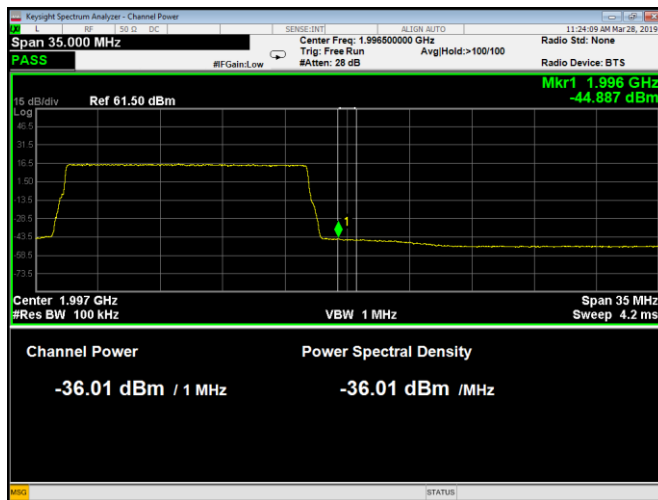


Figure 8.2-70: Conducted band edge emission at 1996 MHz, 15 MHz single carrier, QPSK (RBW = 1 MHz)

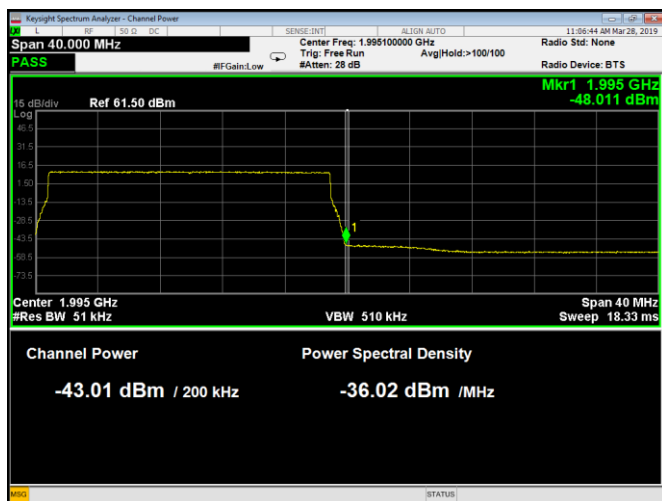


Figure 8.2-71: Conducted band edge emission at 1995 MHz, 20 MHz single carrier, QPSK (RBW = 1% of EBW)

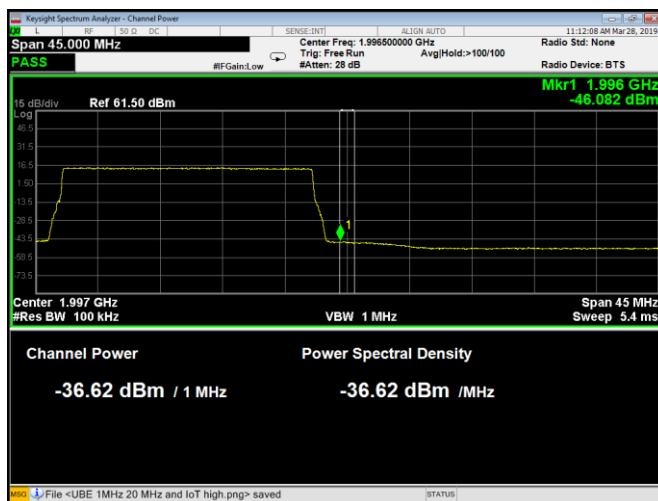


Figure 8.2-72: Conducted band edge emission at 1996 MHz, 20 MHz single carrier, QPSK (RBW = 1 MHz)

On the plots below the measured "Channel power" value must be lower, than -28.05 dBm

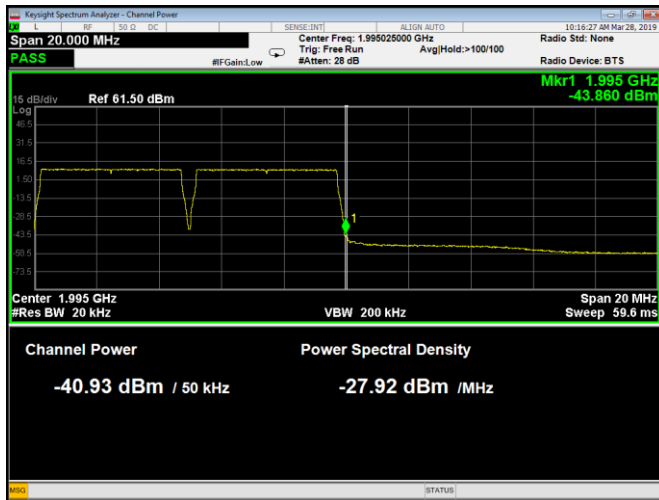


Figure 8.2-73: Conducted band edge emission at 1995 MHz, 5 MHz 2-carrier, QPSK (RBW = 1% of EBW)

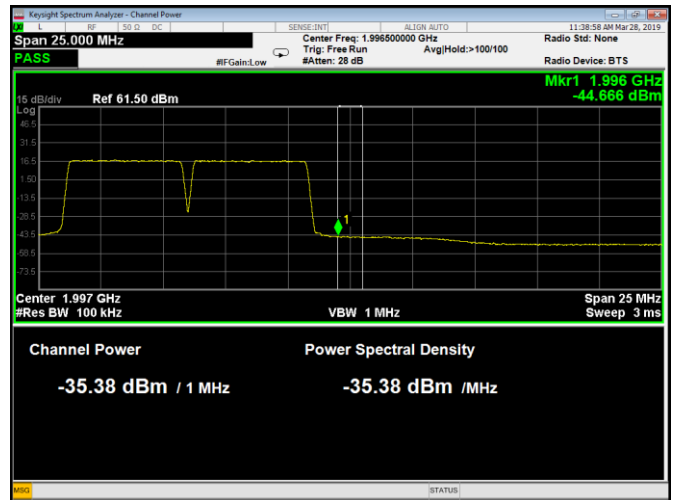


Figure 8.2-74: Conducted band edge emission at 1996 MHz, 5 MHz 2-carrier, QPSK (RBW = 1 MHz)

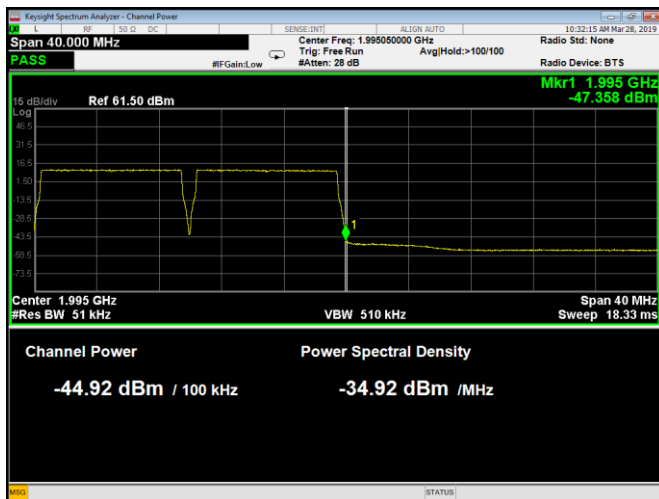


Figure 8.2-75: Conducted band edge emission at 1995 MHz, 10 MHz 2-carrier, QPSK (RBW = 1% of EBW)

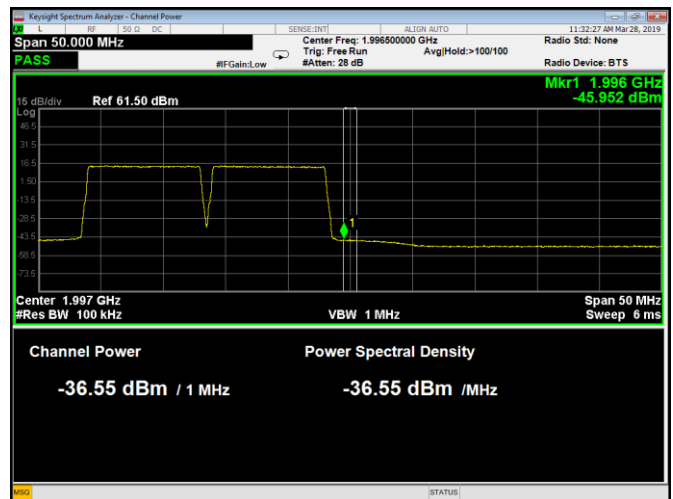


Figure 8.2-76: Conducted band edge emission at 1996 MHz, 10 MHz 2-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

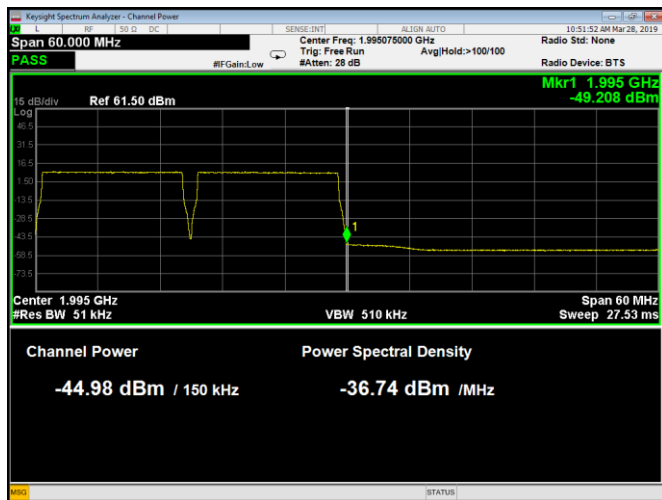


Figure 8.2-77: Conducted band edge emission at 1995 MHz, 15 MHz 2-carrier, QPSK (RBW = 1% of EBW)

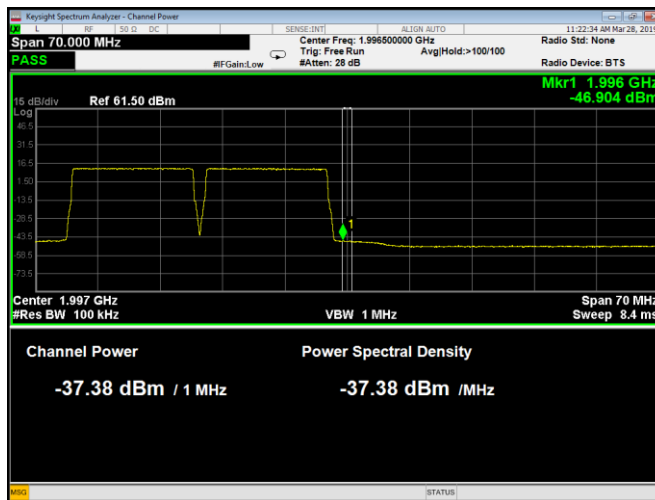


Figure 8.2-78: Conducted band edge emission at 1996 MHz, 15 MHz 2-carrier, QPSK (RBW = 1 MHz)

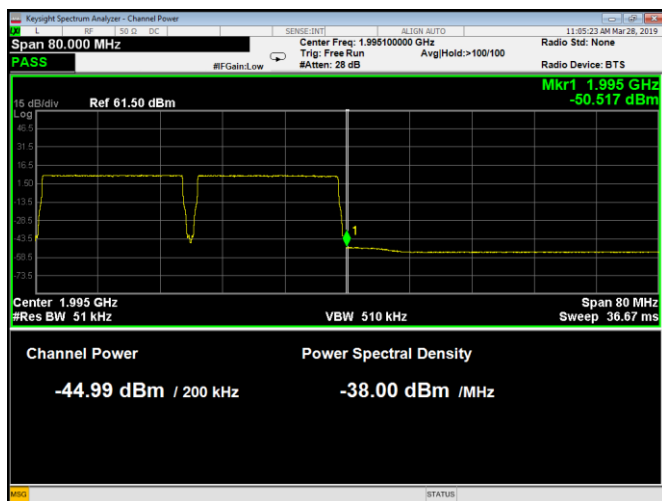


Figure 8.2-79: Conducted band edge emission at 1995 MHz, 20 MHz 2-carrier, QPSK (RBW = 1% of EBW)

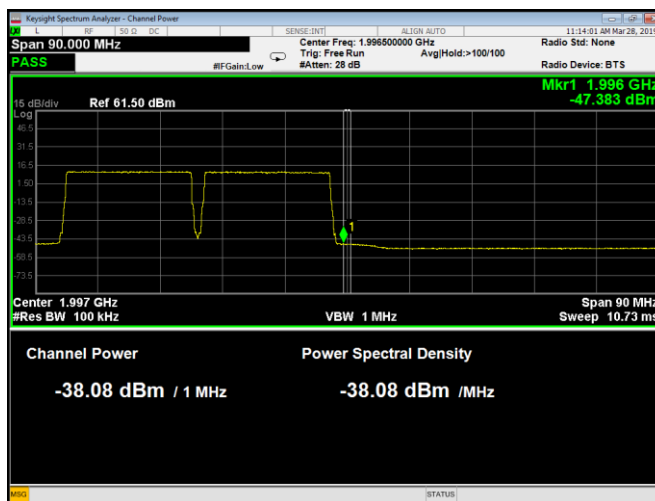


Figure 8.2-80: Conducted band edge emission at 1996 MHz, 20 MHz 2-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

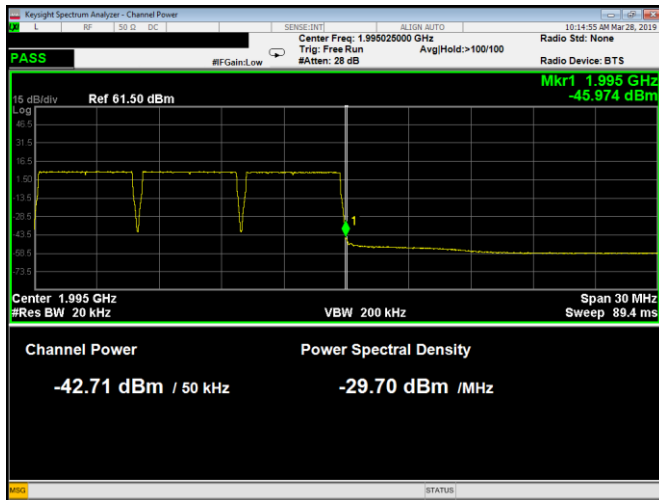


Figure 8.2-81: Conducted band edge emission at 1995 MHz, 5 MHz 3-carrier, QPSK (RBW = 1% of EBW)

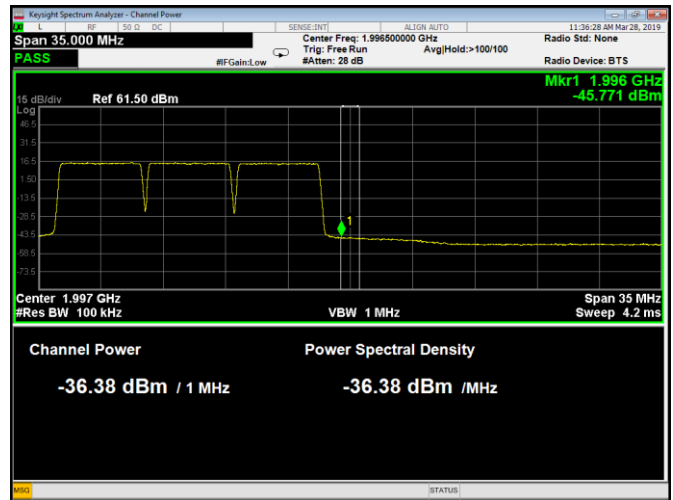


Figure 8.2-82: Conducted band edge emission at 1996 MHz, 5 MHz 3-carrier, QPSK (RBW = 1 MHz)

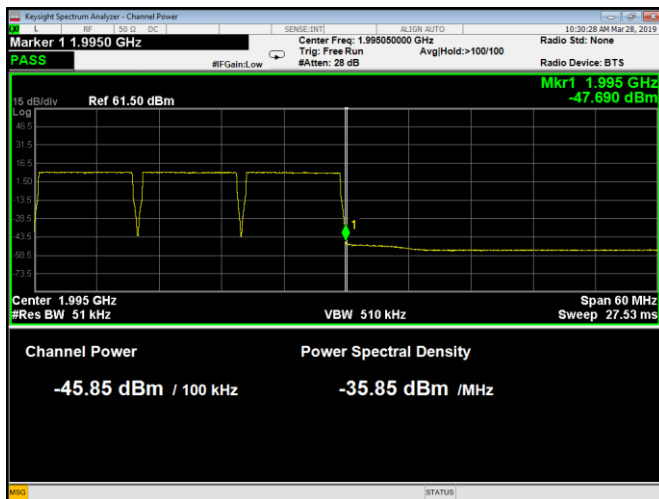


Figure 8.2-83: Conducted band edge emission at 1995 MHz, 10 MHz 3-carrier, QPSK (RBW = 1% of EBW)

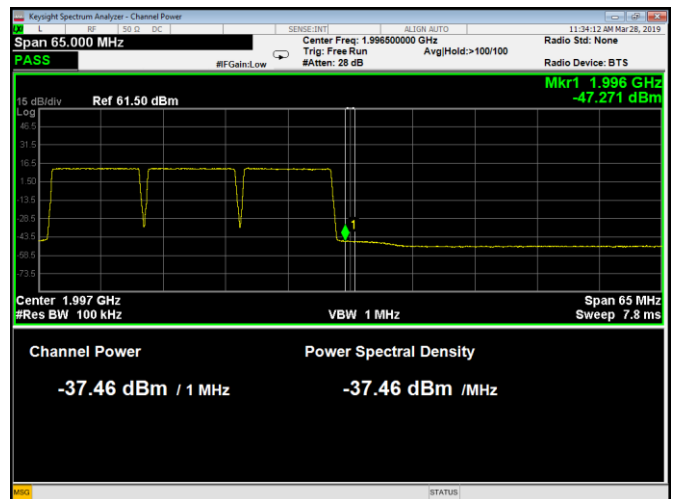


Figure 8.2-84: Conducted band edge emission at 1996 MHz, 10 MHz 3-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

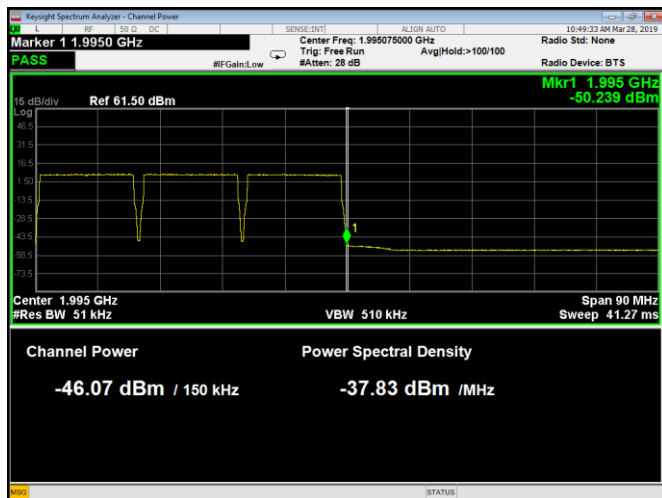


Figure 8.2-85: Conducted band edge emission at 1995 MHz, 15 MHz 3-carrier, QPSK (RBW = 1% of EBW)

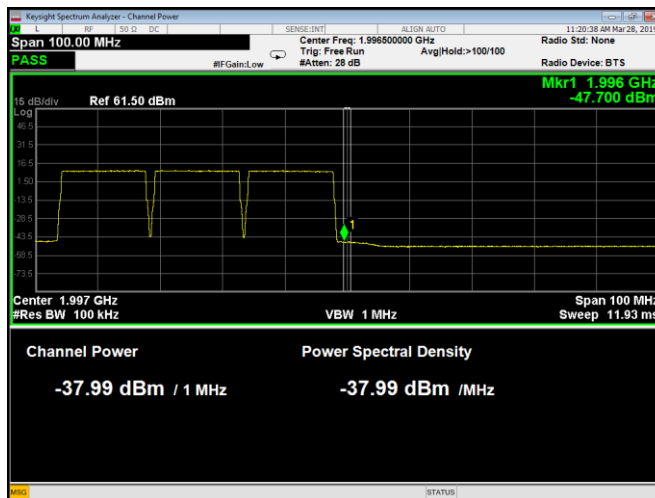


Figure 8.2-86: Conducted band edge emission at 1996 MHz, 15 MHz 3-carrier, QPSK (RBW = 1 MHz)

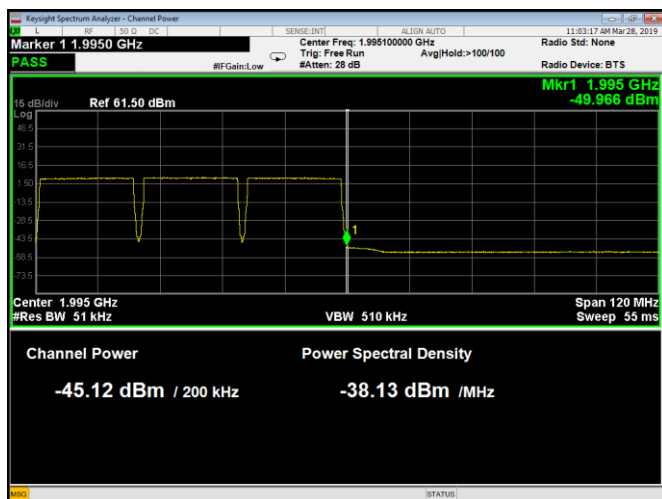


Figure 8.2-87: Conducted band edge emission at 1995 MHz, 20 MHz 3-carrier, QPSK (RBW = 1% of EBW)

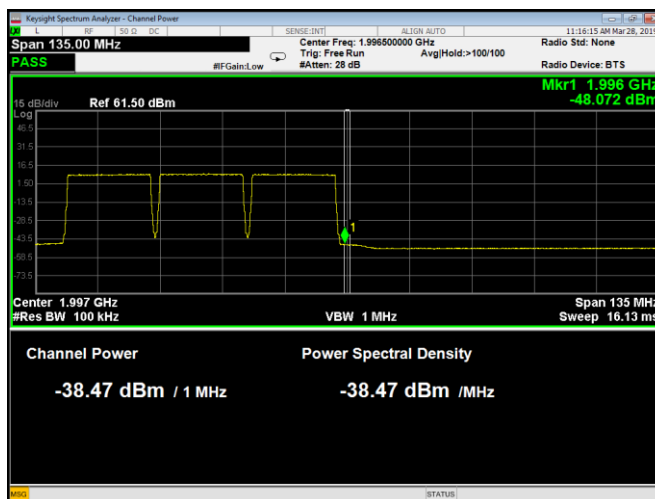


Figure 8.2-88: Conducted band edge emission at 1996 MHz, 20 MHz 3-carrier, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

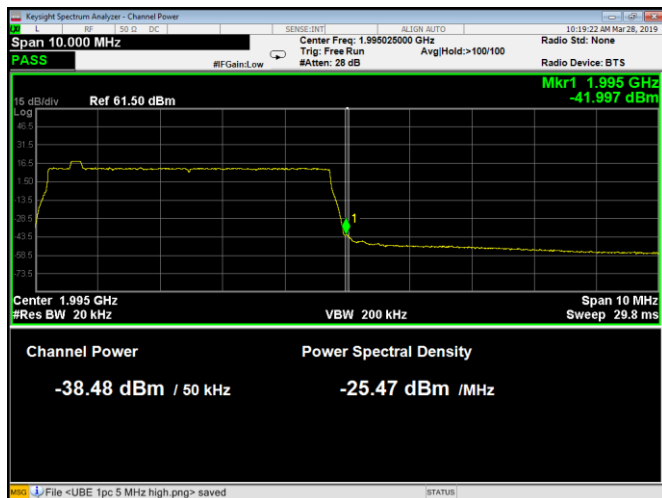


Figure 8.2-89: Conducted band edge emission at 1995 MHz, 5 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

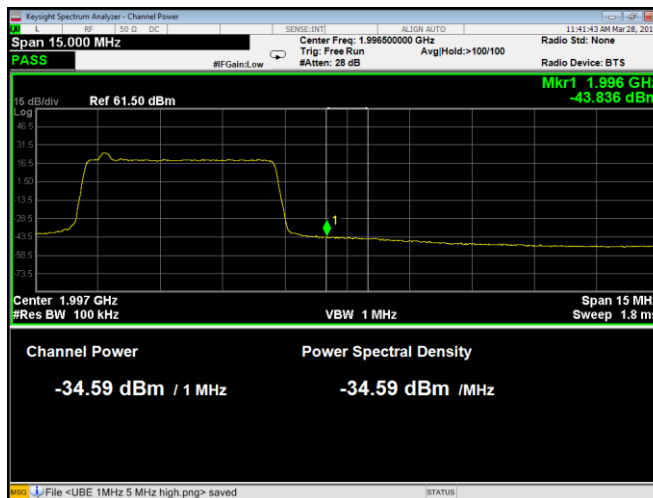


Figure 8.2-90: Conducted band edge emission at 1996 MHz, 5 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

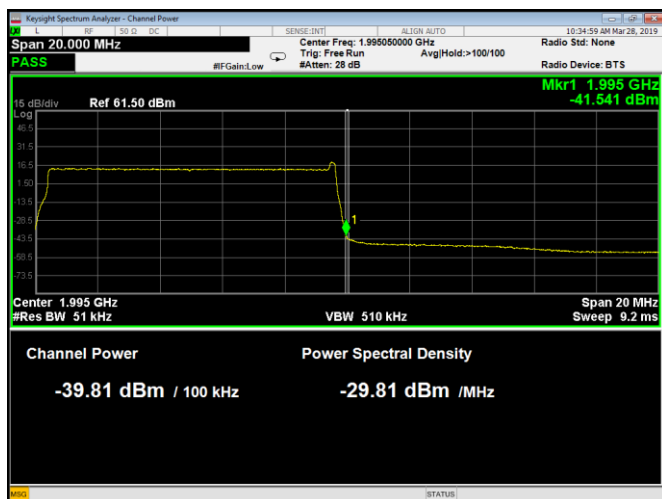


Figure 8.2-91: Conducted band edge emission at 1995 MHz, 10 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

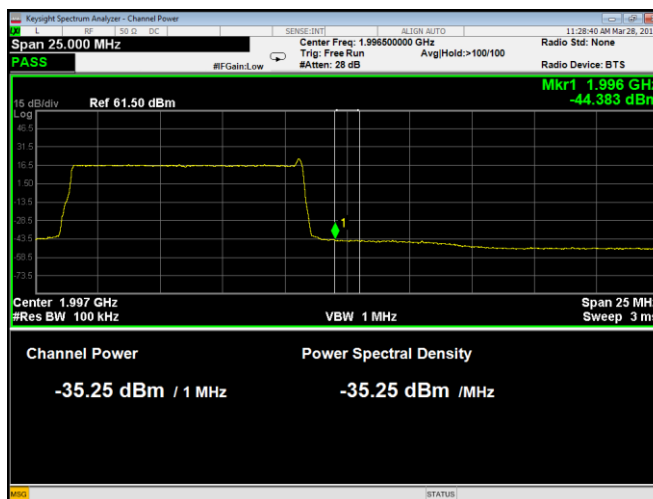


Figure 8.2-92: Conducted band edge emission at 1996 MHz, 10 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

On the plots below the measured “Channel power” value must be lower, than -28.05 dBm

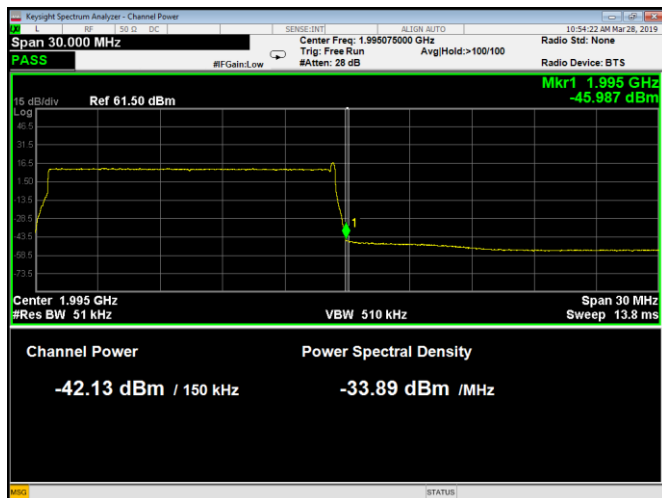


Figure 8.2-93: Conducted band edge emission at 1995 MHz, 15 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

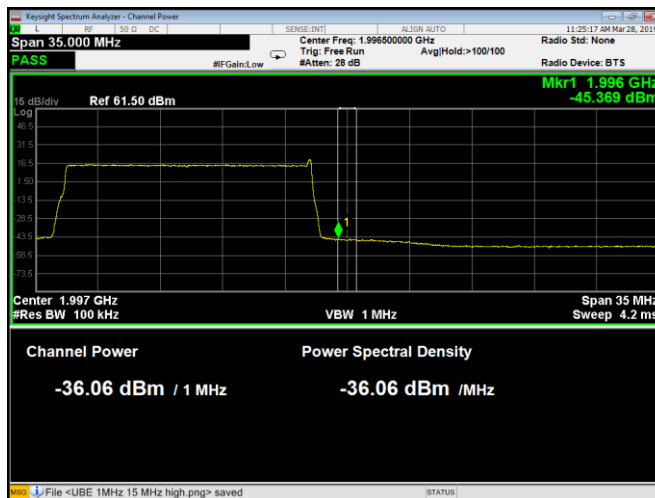


Figure 8.2-94: Conducted band edge emission at 1996 MHz, 15 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

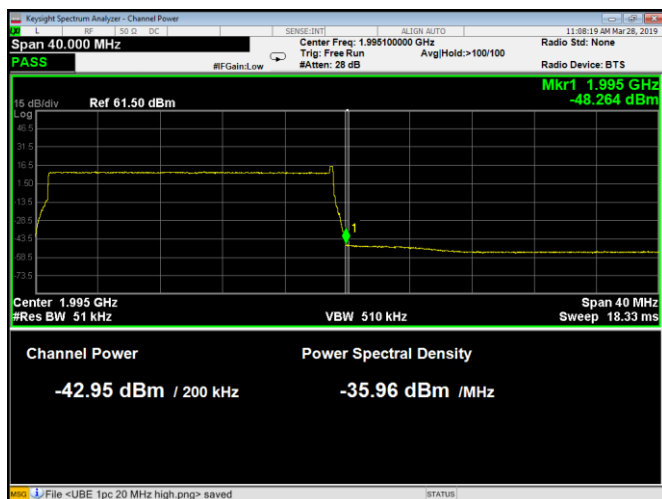


Figure 8.2-95: Conducted band edge emission at 1995 MHz, 20 MHz single carrier with IoT, QPSK (RBW = 1% of EBW)

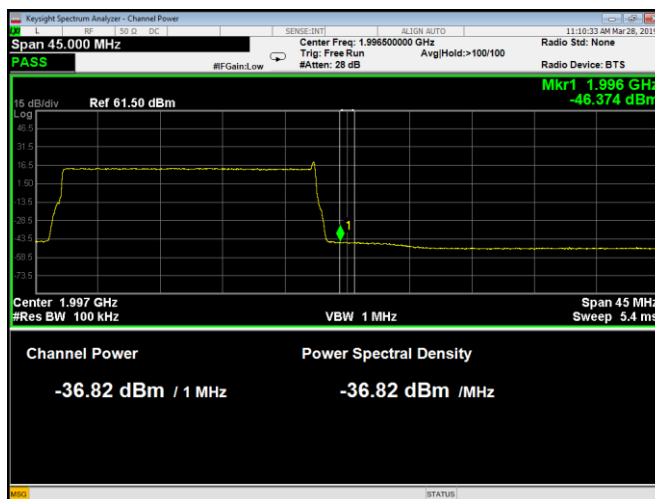


Figure 8.2-96: Conducted band edge emission at 1996 MHz, 20 MHz single carrier with IoT, QPSK (RBW = 1 MHz)

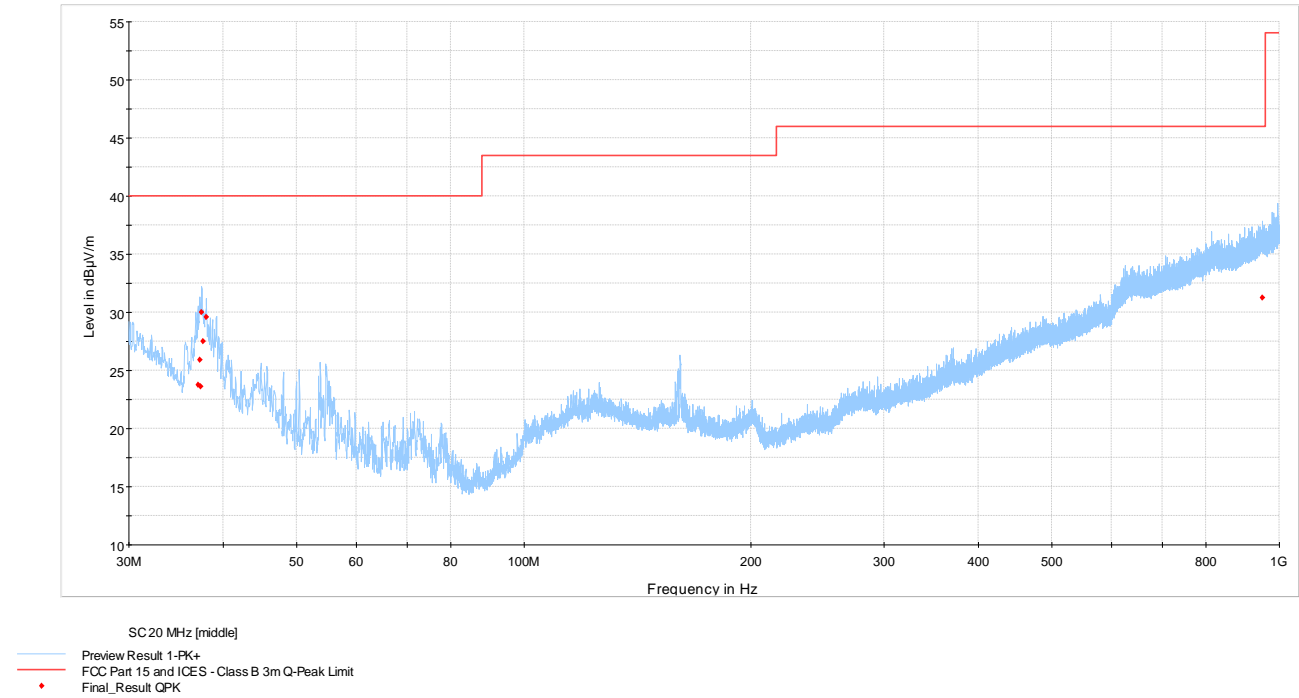
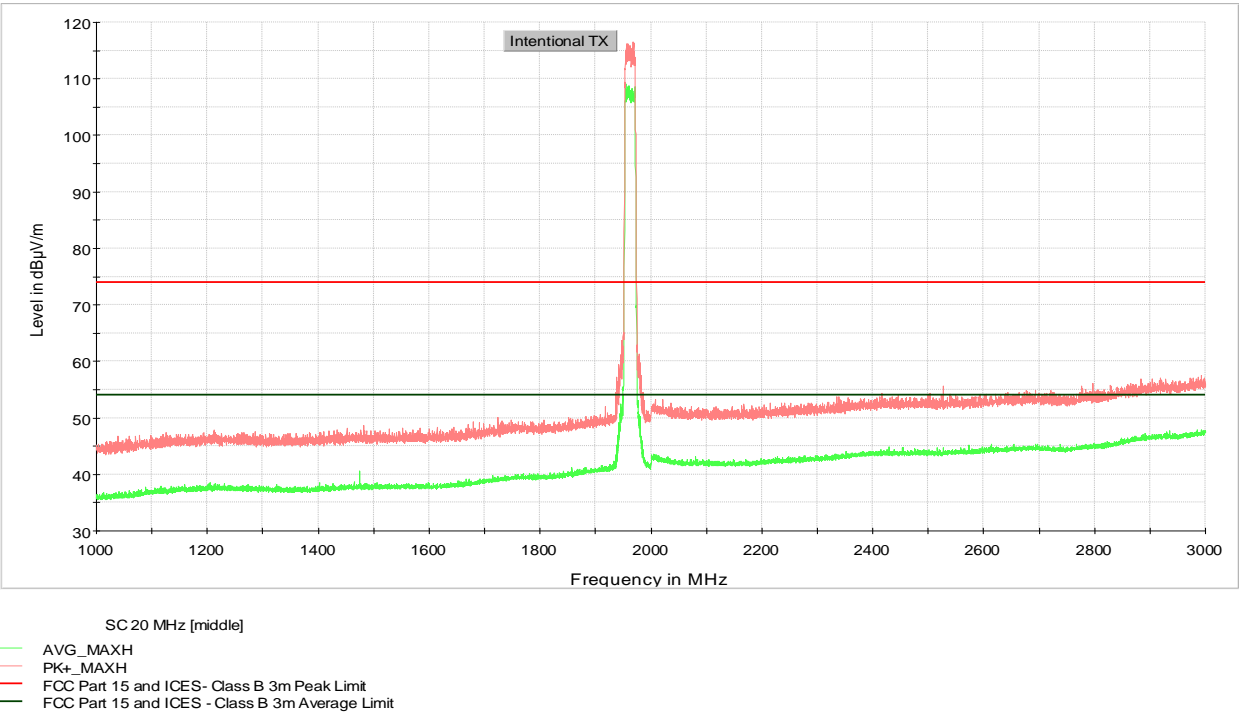


Figure 8.2-97: Radiated spurious emission below 1 GHz for single carrier operation, low channel

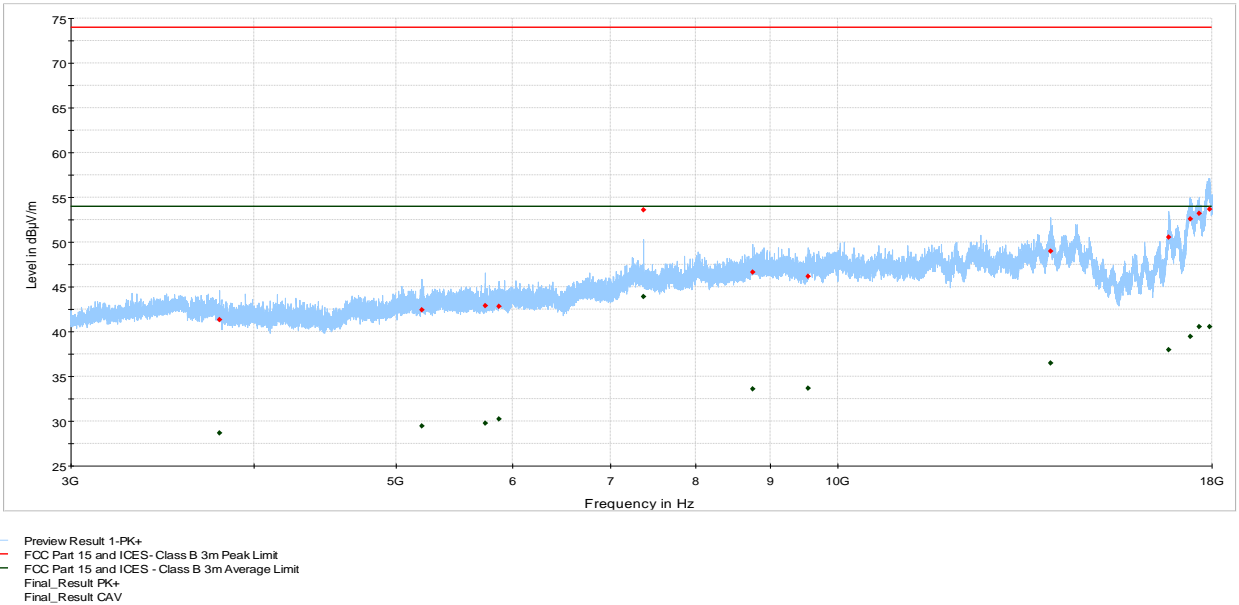
Table 8.2-1: Radiated emissions (Quasi-Peak) results

Frequency (MHz)	Quasi-Peak field strength ¹ (dBµV/m)	3 m Quasi-Peak limit ³ (dBµV/m)	Margin (dB)	Measurement time (ms)	Bandwidth (kHz)	Antenna height (cm)	Pol. (V/H)	Turn table position (°)	Correction factor ² (dB)
37.47	30.0	40.0	10.0	100	120	132	H	11	20.7



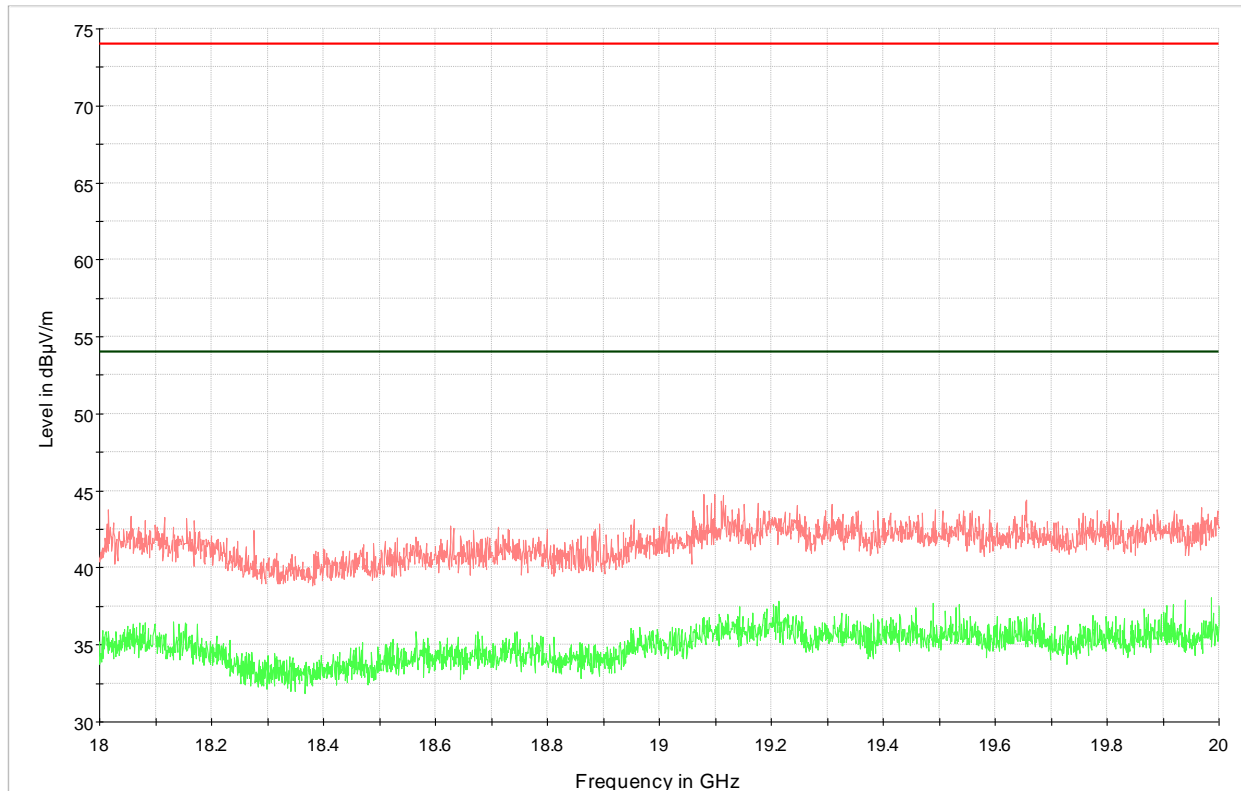
The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Figure 8.2-1: Radiated emissions spectral plot (1 to 3 GHz)



The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Figure 8.2-2: Radiated emissions spectral plot (3 to 18 GHz)



SC 20 MHz [middle]
 — AVG_MAXH
 — PK+_MAXH
 — FCC Part 15 and ICES - Class B 3m Average Limit
 — FCC Part 15 and ICES - Class B 3m Peak Limit

The spectral plot is a summation of a vertical and horizontal scan. The spectral scan has been corrected with the associated transducer factors (i.e. antenna factors, cable loss, amplifier gains, and attenuators).

Figure 8.2-3: Radiated emissions spectral plot (18 to 20 GHz)

8.3 FCC 24.235 and RSS-133, 6.3 Frequency stability

8.3.1 Definitions and limits

FCC:

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

RSS-133, Section 6.3:

The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

8.3.2 Test summary

Test date	April 1, 2019
Test engineer	Andrey Adelberg

8.3.3 Observations, settings and special notes

26 dBc points including frequency tolerance were assessed to remain within assigned band.

8.3.4 Test data

Table 8.3-1: Frequency error results

Temperature, °C	Voltage, V _{DC}	Frequency error, Hz
+50	48.0	-0.248
+40	48.0	0.009
+30	48.0	-0.117
+20	55.2	0.064
+20	48.0	0.085
+20	40.8	0.149
+10	48.0	-0.095
0	48.0	-0.116
-10	48.0	0.110
-20	48.0	-0.033
-30	48.0	-0.067
-40	48.0	0.326

Max negative drift: -0.248 Hz, Max positive drift: +0.326 Hz.

8.4 FCC Part 2.1049 and RSS-Gen, 6.7 Occupied bandwidth

8.4.1 Definitions and limits

FCC:

The 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.

RSS-Gen, 6.7

The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

8.4.2 Test summary

Test date	March 29, 2019
Test engineer	Andrey Adelberg

8.4.3 Observations, settings and special notes

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	$\geq 1\%$ of span
Video bandwidth	RBW $\times 3$
Trace mode	Max Hold